STATE OF GREEN ECONOMY
REPORT 2016

UNDP

كربون دبي
DUBAI CARBON

Published by

القمة العالمية للإقتصاد الأخضر
WORLD GREEN ECONOMY SUMMIT
5-6 October 2016 ٥-٦ أكتوبر، ٢٠١٦
Dubai, United Arab Emirates دبي، الإمارات العربية المتحدة

Title Sponsor

هيئة كهرباء ومياه دبي
Dubai Electricity & Water Authority

STATE OF GREEN ECONOMY REPORT 2016

HIS HIGHNESS SHEIKH MOHAMMED BIN RASHID AL MAKTOUM

VICE PRESIDENT AND PRIME MINISTER OF THE UNITED ARAB EMIRATES AND RULER OF DUBAI

> We recognise that preserving our energy resources will be one of the greatest challenges in our drive towards sustainable development. This, however, will not materialise unless the different facets of our society adopt energy conservation principles in their core values. The future generations will be the chief beneficiary of our achievements and the best judge of what we accomplish in this field.

HIS HIGHNESS SHEIKH AHMED BIN SAEED AL MAKTOUM

CHAIRMAN OF THE DUBAI SUPREME COUNCIL OF ENERGY

"There has been much progress to date in the move towards a green economy, where economic growth and environmental responsibility are given equal importance in the development of a sustainable future. Indeed, the green economy is an engine of growth, providing opportunities for both the public and private sector."

HIS EXCELLENCY BAN KI-MOON

SECRETARY-GENERAL OF THE UNITED NATIONS

"I commend His Royal Highness [Sheikh Mohammed Bin Rashid] Al Maktoum and the Cabinet for declaring 2015 as the Year of Innovation.

For the United Nations and the world, this is a year to take transformative steps towards a more sustainable, equitable and peaceful world.

We are the first generation that can end poverty and maybe the last that can avert the worst impacts of climate change.

When governments open their books to the public, they earn trust. And that is critical to building stronger communities and states.

Businesses also have great influence.

The private sector can serve the public interest with creativity and innovation.

States should reward corporations that are socially responsible.

I welcome incentives to encourage sustainable business practices."

On the occasion of the opening of the **UAE Government Summit, Dubai** (United Arab Emirates), 09 February 2015

HIS EXCELLENCY SAEED MOHAMMED AL TAYER

VICE CHAIRMAN OF THE DUBAI SUPREME COUNCIL OF ENERGY MD & CEO OF DUBAI ELECTRICITY AND WATER AUTHORITY

Dear Reader,

To achieve the goals of the long-term Green Economy for Sustainable Development national initiative launched by His Highness Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai, the UAE is striving to enhance its competitiveness and economic sustainability and to become a global model in sustainable and green initiatives. This has been supported through various projects and initiatives to build a sustainable green future.

The UAE Vision 2021 outlines strategies to build economic resilience in a sustainable environment that enhances happiness and the quality of life across the nation. The UAE has always been keen to develop legislation and frameworks to support the foundations of the green economy, as part of its vision to transform into one of the best countries in the world by 2021.

Dubai is progressing towards green and sustainable economic development, led by the initiatives of the public and private sectors, and the adoption of world-class practices and international standards.

The most significant of all outcomes during the World Green Economy Summit, held in Dubai, was the Dubai Declaration, which pledged a commitment to establish the Emirate as the capital of the Green Economy. This is a core objective of the Dubai 2021 strategy and clearly demonstrates the pioneering spirit of the Emirate in launching and embracing many prominent green initiatives and projects.

To this end, we are cooperating with many organisations within the UN to promote Dubai as the centre for both innovation and excellence in sustainable energy technologies for the people and the businesses of the UAE and the world.

THANK YOU FOR TAKING THE TIME TO READ THE GREEN ECONOMY REPORT 2016.

Saeed Mohammed Al Tayer

MD & CEO of DEWA

CHRISTIANA FIGUERES

EXECUTIVE SECRETARY OF THE UN FRAMEWORK CONVENTION ON CLIMATE CHANGE (UNFCCC)

> The global transition to a low-carbon, green economy is now inevitable and unstoppable. What will flow from the UN Paris climate agreement will be catalytic in fast forwarding that future.

NICOLAS HULOT

SPECIAL ENVOY OF THE FRENCH PRESIDENT FOR THE PROTECTION OF THE PLANET GOVERNMENT OF FRANCE

> We should no longer describe climate action as "urgent" as if it were a problem for the future. For the victims, the damage is already done.
>
> But renewable energies are more than ever the way forward. Today, they become the low hanging fruit. They will bring a world where every country will enjoy abundant energy within its borders. They will usher us to a world of peace.
>
> I commend the leaders of Dubai for showing us the way to such a world.

TABLE OF CONTENTS

CHAPTER 1
ECONOMIC GROWTH & DIVERSIFICATION

Chapter Statement, H.E. Reem Al Hashimy p14
The World We Want, Dr. Iyad Abumoghli p16
Analysis of the Sustainable Development Goals, Majid Al Suwaidi & Dane Mcqueen p22
Driving Growth Through Inclusive and Sustainable Industries, Stephan Sicars p25
Interview, H.E. Sultan Ahmed Bin Sulayem p30
Interview, Marwan Abdelaziz Janahi p33
Interview, H.E. Abdulnasser bin Kalban p36
Interview, Reem Ketait p43

CHAPTER 2
YOUTH & EMPLOYMENT

Chapter Statement, H.E. Saeed Mohammed Al Tayer p46
IRENA and Youth, Mohamed El-Farnawany p48
The Rise of the Green Collar Worker, Eng. Waleed Salman p50
Ambassadors for a Low-Carbon Future, Dr. Yousef Al Akraf p52
The UAE Youth Empowerment Strategy, Dr. Kenneth Wilson p56
Climate Change and Youth Engagement, Shaima Al Aydarous p59
A Sustainable Future Requires New Thinking, Pirjo Jantunen p62
The Power of Youth in Culture, Mohammed and Peyman Al Awadhi p64
Women's Empowerment in DEWA, Khawla Al Mehairi p69

CHAPTER 3
POWERING LIVES

Chapter Statement, H.E. Adnan Amin p70
Dubai, Capital of The Green Economy, Eng. Waleed Salman & Lars Josefsson p72
Interview, H.E. Ahmed Buti Al Muhairbi p76
Mohammed Abdelkareem Al Shamsi, Water Aid Foundation (Suqia) p82
Meet the Suqia Awards, Mohammed Abdelkareem Al Shamsi p84
A Solar Record, H.E. Mohammad Abdullah Abunayyan p90
Dubai Sustainable Energy Model, Taher Diab & Ilham Talab p94
Accelarating the Energy Transition, Amit Pathare p98
Natural Gas: The Economic Backbone, Adel Ahmed Albuainain p102
Interview, H.E. Ahmad Bin Shafar p104
Quality Assurance and Standardisation, Dolf Gielen p110
Favouring Nuclear Energy, Davide Contu p112
Supply and Demand go Hand-in-Hand, Jeremy Crane, Mhairi Main Garcia, Raed Bkayrat & Martin Haupts p118

CHAPTER 4
ROAD TO PARIS

Chapter Statement, Nicolas Hulot p120
Deep Decarbonisation, Guido Schmidt-Traub p122
Point of View, H.E. Sultan Al Jaber p126
Point of View, H.E. Saeed Mohammed Al Tayer p128
The UAE on it's Way to Paris, H.E. Dr. Thani Al Zeyoudi p130
Accelating the Transition to a Green Economy, Waleed Salman and André Schneider p133
The Dubai Declaration, Andre Schneider p135
Encouraging Efficiency, Omar Al Qurashi p137
Cities on the Road to Paris, Dr. Kishan Khoday and Dr. Walid Ali p138
Combating Climate Change, Mark Watts p140
Expect A Low-Carbon UAE, Tanzeed Alam p142
Action Now, Ben Ferrari p146
A New Era of Waste Management in Dubai, Eng. Abdulmajeed Saifaie p150

CHAPTER 5
URBAN & NATURAL ENVIRONMENTS

Chapter Statement, H.E. Eng. Hussain Nasser Lootah p152
Interview, H.E. Saeed Mohammed Al Tayer p154
Smart Applications for Smart Cities, H.E. Eng. Hussain Nasser Lootah p158
Point of View, Eng. Abdulla Rafia p162
Maintaining Efficiency, Abdulamir R. Fadhlani p163
Green Buildings 101, Eng. Khalid Mohamed Saleh Al Mulla p164
Point of View, Marwan Abdelaziz p167
Getting Around, H.E. Mattar Al Tayer p168
The Race is ON, Faisal Ali Rashid p170
Happy Green Living Spaces, Martyn Crook p172
Measuring the Amenity Value of Our Coastal Ecosystems, Ahmed Baharoon and Jane Glavan p176

CHAPTER 6
ENABLERS & PARTNERSHIPS

Chapter Statement, H.E. Mohammad Abdullah Abunayyan p180
South-South Cooperation, Edem Bakhshish p182
A Green Economy is a Strong, Sustainable Economy, Mark Kenber p186
Green Bonds, Sean Kidney and Beate Sonerud p190
Innovative Financing, Martin Hiller p192
Catalysing the Low-Carbon Economy Through Invesment and Trade, Timothy J.Richards And Sandra Winkler p195
Partners and Enablers, Marwan Abdelaziz Janahi p198
Innovation at Heart, H.E. Ahmed Al Muhairbi p200
Interview, H.E. Fahad Al Gergawi p202
Shams Dubai on Battery?, Claudio Palmieri p205
Capital Club, Christian Robert Horvath p206
Solar Revolutions in the Gulf, Dr. Raed Bkayrat p207

CHAPTER 7
CREATIVITY & RESEARCH

Chapter Statement, H.E. Yousef Hamad Al Shaibani & H.E. Dr. Mohammed Nasser Al Ahbabi p212
The UAE Space Agency, H.E. Dr. Mohammed Nasser Al Ahbabi p214
«Hope» for A Knowledge Economy p218
The Innovation Centre and R&D, Eng. Waleed Salman p227
Vision on Display p228
Think Tanks, Workshops and Action Based Research, Buti Saeed Al Ghandi p232
The Dubai Centeral Laboratory, Eng. Hawa Abdullah Al Bastaki p236
Enabeling Knowledge with Green Growth Knowledge, Benjamin Simmons p238
The Green Building Programme Made in Dubai, Nasser Al Shaiba p241

CHAPTER 8
LIFESTYLE & CONSUMPTION

Chapter Statement, Elon Musk p244
Social Capital and Well-Being, Professor Jeffrey D. Sachs p246
Retrofitting Dubai's Air-Conditioning, H.E. Ahmad Bin Shafar p250
Vehical Emissions in A Green Economy?, Dr. Eng. Waddah S. Ghanem Al Hashemi & Eng. P. Radhakrishnan p255
Waiting for Green, Pradeep Karunakaran p258
Forever Green, Nabil Battal p260
Green Business Networks and The Paperless Era, Jonas Edlund p264
Creative Active Urban Space, Eng. Dawoud AbdelRahman Al Hajri p267
Green Souks and Even Greener Parks, Mohamed Noor Mashroum p269
The Customer Focus, Eng. Amal Yahya Koshak p270
The UAE Energy-Efficiency Market, Hercu Viljeon p271
Fly More, Burn Less, Michael Gill p274

A SHORT NOTE FROM THE EDITOR

WELCOME TO THE STATE OF GREEN ECONOMY REPORT 2016

It does not feel like an entire year has passed since our last report edition – time has really flown by!

When we started this project back in early 2014, we spent months setting up the data gathering structures, identifying the information flow and the reporting categories as well as inviting partners and authors to participate.

Now more than one and a half years later we run a well-oiled machine with a superb team and very supportive partners. For this edition we received almost twice as much quality content than we could publish – a great indicator for the momentum green economic development has achieved in the UAE.

This is partially due to the fact that Dubai has had a head-start to the process since the 'Green Economy for Sustainable Development' initiative was proclaimed by the leadership back in early 2012. This was even before the Rio+20 Conference announced 'Green Economy' as the guiding principal for sustainable development for all nations.

In a broader context, 2015 was also an eventful year for our industry. We have seen countries renewing their commitments and increasing their efforts to achieve sustainable development under the United Nations Sustainable Development Agenda 2030 and in the lead up to the UNFCCC climate change negotiations in December 2015.

We are already in the middle of an important journey and remain very excited to see what 2016 holds for us in this region and the rest of the world. Sounds like plenty of material for further reports.

I sincerely hope you enjoy the read.

Warm Regards,
Michaela Neukirch

EXPO LIVE INITIATIVE: ENGINE OF INNOVATION

ECONOMIC GROWTH & DIVERSIFICATION

UNEP

UNIDO

THE POWER OF PARTNERSHIP

With less than five years to go until Dubai hosts Expo 2020, it is perhaps no surprise that our preparations are accelerating. While our city has become ever more synonymous with successful innovation, questions have been raised – and rightly so – as to what exactly Dubai has planned for this landmark event.

Dubai is adept at developing in new and exciting ways. Expo 2020 is committed to supporting the accelerated development of new innovations through our sub themes of opportunity, mobility and sustainability. One of the vehicles to achieve our ambitious goals is Expo Live, which will be launched at the end of 2015, a grant financing programme that translates the aspirations of the Expo 2020 themes into a global initiative.

Expo Live is the innovation and partnership programme of Expo 2020 Dubai. The vision of Expo Live is to harness the power of the World Expo and engage a broad array of participants in developing, sharing and showcasing innovative solutions to global challenges.

Expo Live backs up our pledge to help develop these solutions. Economic, social and environmental issues are closely intertwined and Expo Live provides an opportunity to assist with funding research and developing ideas across a broad spectrum, but where we see impact through originality of thought, breadth of vision and cross collaboration.

Expo 2020 is dedicated to using its unique platform to bring global communities together, forge new, long-lasting partnerships and innovatively address issues of universal concern. Through Expo Live, we will help create a legacy of social, environmental and economic transformation that will benefit us all.

H.E. REEM AL HASHIMY

Minister of State
EXPO 2020

In February 2008, H.E. was sworn in as Minister of State in the Cabinet of the United Arab Emirates. Her Excellency has managed the International Affairs Office of the UAE Prime Minister, His Highness Sheikh Mohammed Bin Rashid Al Maktoum, since her ministerial appointment. Additionally, she holds responsibility within the Ministry of Foreign Affairs, for the UAE's bilateral relations with Sub Saharan African countries, India, Pakistan and the Small Island Developing States (SIDS).

H.E. holds the position of Managing Director of the Dubai Expo 2020 Higher Committee as well as Director General of the Dubai Expo 2020 Bureau, in preparation for the upcoming mega event.

H.E. is Chairperson of the Emirates Competitiveness Council. In addition, she also served as Chairperson of Dubai Cares, a philanthropic organisation with the aim of improving access to primary education in developing countries.

H.E. completed her undergraduate degree at Tufts University, earning a BA in International Relations and French, followed by an MA from Harvard University. Prior to her current position as Minister of State, Her Excellency served as Commercial Attaché, and subsequently Deputy Chief, of the UAE Embassy to the United States of America, in Washington DC.

EXPO 2020
DUBAI, UNITED ARAB EMIRATES

THE WORLD WE WANT - AND HOW WE PAY FOR IT

By
Dr. Iyad Abumoghli

FINANCING FOR DEVELOPING SUSTAINABILITY IN THE ARAB GREEN ECONOMY AND THE STEPS REQUIRED FOR ITS IMPLEMENTATION

One of the major differences between the SDGs and the MDGs adopted in 2000, is the discussions on the means of implementation (MOI) which will not only provide guidance to the global community, but also aims to elaborate the tools that can be used to achieve its stated goals. Another difference is the high level of consultation that has taken place globally, regionally and nationally among governments, experts and stakeholders to draw together the new set of proposed goals.

The international community was busy in 2015 – which has been an exceptional year even for these exceptional times – as it drafts the "World We Want" as a post-millennium development goal (MDG) development agenda. With preparations starting as early as the Rio +20 Summit in 2012, governments, development organisations, different types of stakeholders, as well as the general public, have all been engaged in identifying the priorities for the future we want. A set of 17 sustainable development goals (SDGs) have been adopted by world leaders at the global Summit in New York in September.

CONSULTATIONS IN THE ARAB REGION

In the Arab world, the Arab High Level Forum on Sustainable Development (AFSD) is one of the five regional fora that were established by the United Nations Regional Commissions, recognising the importance of the regional dimension of sustainable development. This was acknowledged by the High-Level Political Forum on Sustainable Development (HLPF) in its 2014 ministerial declaration, which called on the Regional Commissions to involve member countries and relevant regional entities, major groups and other relevant stakeholders in these fora to develop regional perspectives on sustainable development. This global recognition was echoed at the regional level by the Council of Arab Ministers, who are responsible for the environment.

Following up on the successful deliberations of the first AFSD in Amman in April 2014, the second session was held in Manama during the period 5-7 May, 2015. This forum held a special significance as it coincided with intergovernmental negotiations on the post-2015 developmental agenda. The UN Secretary-General issued his synthesis report on December 4, 2014, entitled "The Road to Dignity by 2030: Ending Poverty, Transforming All Lives, and Protecting the Planet," which emphasised the elements of a transformative post-2015 agenda. The report encouraged the adoption of the proposal made by the Open Working Group (OWG) on the SDGs as the main basis for negotiation.

The consultative process in the Arab region, through the AFSD and other consultations (such as on accountability in Tunis in September, 2014) has endeavoured to develop regional perspectives on the SDGs. The transformation from the Millennium Development Goals (MDGs) to the SDGs was an issue of focus for UNEP and its partners – the Economic and Social Commission for Western Asia (ESCWA) and the League of Arab States. The second High-Level Forum, held in Bahrain, attracted 300 high-level representatives concerned with: sustainable development, from the economic, social, environment, technology, and planning sectors; as well as representatives from United Nations agencies; Arab development banks; the League of Arab States and its specialised agencies, civil society organisations working on sustainable development issues, universities and research institutions, parliaments, and the private sector.

> A set of **17 sustainable development goals (SDGs)** has been adopted

The discussions concluded by emphasising 19 recommendations addressing all the SDGs, the aspirations of the region, and the need to adopt clear, inspirational and adaptable means of implementation to assist countries in their achievement of their development goals. Not underestimating the central issue of poverty reduction, issues related to climate change, coastal degradation, water resources management, urban development, crisis and conflicts were also identified as regional priorities. Economic development was also a highlight of the forum, along with integrated prosperity, which leads to equitable and socially cohesive prosperous communities. Moreover, the green economy was placed at the centre of regional priorities – namely, to achieve new goals regarding sustainable development which had been pledged for adoption by regional governments and businesses. The green economy has been highlighted as one of the best means of implementation of the diversification of economic activities. This is why there is real value attached to the idea of building on Arab expertise in this field, through both international cooperation and technological transfer and financing.

CATALYSING INVESTMENT FOR A GREENER AND MORE INCLUSIVE ECONOMY

As the concept of a green economy continues to generate interest, gain momentum and provide opportunities at the global level, some Arab countries are showing a renewed commitment to the foregrounding of green policies as an integral element of their national economic and environmental strategies. Indeed, some countries have set ambitious targets that are expected to catalyse the transformation from a more conventional growth trajectory to one that is effectively sustainable.

AFSD participants focused on the role of economic policy, finance and investment in driving sustainability forward in light of the Addis Abba Conference on Financing for Development that took place in July, 2015. These discussions benefited from the "Financing Sustainable Development in the Arab Region" experts' report that was launched a month earlier by UNEP and ESCWA; bringing together many varied thought leaders in green economy and sustainable finance. The report estimated a baseline finance gap for Arab countries practising sustainable development, to be between USD 80-85 billion per annum in 2015 and 2016. It recognised that all possible financing sources, private and public – as well as domestic and international – need to be considered. The report concluded that a concerted effort has to be exerted to successfully attain SDGs in Arab countries and this should be guided by national priorities and regional and international cooperation, in order to enhance and energise the process of reform. This, it expects, will result in synergies to the benefit of all.

The AFSD also emphasised the role played by financial institutions and donors in integrating sustainable development principles into financial operations. To this end, it called for the adoption of an integrated approach, involving various funding options, whether public, private, national, international, traditional, or innovative. This was done so as to enhance national resource-mobilisation efficiency, and correct the sustainable financial base, through addressing tax evasion, widening the tax base, reforming the subsidy system, and combating illegal capital flows.

On the other hand, innovative ways to finance green-economy projects and more broadly sustainable development, could, it was argued, be found in specialist systems, such as Islamic financing. Islamic finance is based on collective responsibility. It supports socially inclusive development, with the aim of preserving wealth by circulating it and protecting its value. Islamic financial institutions allow for the use of religious alms (zakat) or endowments (waqf), which, they argue, can contribute to an effective institutional overhaul of the global financial system which would be able to enact a fully global development and climate-action agenda.

'Green Sukuk' are Shari'a-compliant products that are ideal for financing sustainable development, the AFSD continues. They can be considered as extremely useful financial development tools. Their distinctive feature is that they constitute flexible financial tools in terms of liquidity – unlike traditional western-model bonds. In principle, sukuk can be calibrated to a variety of needs, depending on the project at hand and they have proven to be effective tools for resource mobilisation in the Arab world and beyond. While private, non-Islamic financing is available in the region, it is not suitable, as it is not Shari'a compliant, due to its portfolio investment spread into non-halal or 'religiously acceptable' markets and products, and the taking of riba' or usury, as well as the high exposure to gharar or risk that is not supported by the tenets of Islamic finance (they are, in effect haram or 'religiously forbidden'). Green Sukuk, therefore, offer an important alternative for financing sustainable development in Arab and Islamic countries, and the world at large.

The strategic investment framework that was discussed at the AFSD focused strongly on the energy sector, given its importance as a natural non-renewable asset and its impact on health and carbon emissions. There is a trade-off that governments in the region face between sustaining economic growth and creating jobs on one hand, and reducing greenhouse gas emissions on the other. Specialised multilateral and bilateral financing institutions can manage such trade-offs and provide incentives to the financing of green investments. Thus far, however, Arab countries have not benefited greatly from these financing streams. The Green Climate Fund has established an important readiness programme to provide technical assistance to countries, support the accreditation process and help develop the project pipeline. Arab countries, it advises, should benefit from the programme to enhance its readiness.

In moving forward, it is imperative that the region meets the immediate needs of rebuilding the loss of capital stock due to the recent world financial crisis, while working towards achieving SDGs by 2030. This is particularly important as the region is going through considerable economic turmoil and continues to fight against the persistent challenges of poverty, starvation and child malnourishment, as well as many other serious development challenges. The untapped potential for innovative financial methods for sustainable development needs to be unlocked in the region in order to respond to the challenges it faces. *end*

About
DR. IYAD ABUMOGHLI

He is the Regional Director and Representative at UNEP in West Asia. He holds a PhD in Bio-Chemical Engineering and has more than 30 years of senior-level expertise in sustainable development, environment, innovation and knowledge management. He is a thought leader in strategic planning, programme implementation and oversight, and works extensively with local, national, regional and international organisations.

THE SUSTAINABLE DEVELOPMENT GOALS THAT COULD TRANSFORM THE WORLD BY 2030

01	End poverty in all its forms everywhere
02	End hunger, achieve food security and improved nutrition and promote sustainable agriculture
03	Ensure healthy lives and promote well-being for all
04	Ensure inclusive and equitable quality education availability and promote lifelong learning opportunities for all
05	Achieve gender equality for all
06	Ensure availability and sustainable management of water and sanitation for all
07	Ensure universal access to affordable, reliable, sustainable and modern energy
08	Promote comprehensive sustained, inclusive and sustainable economic growth; full and productive employment; and decent work conditions
09	Build resilient infrastructure, promote inclusive and sustainable industrialisation, and foster innovation
10	Reduce inequality within and amongst countries
11	Make cities and human settlements inclusive, safe, resilient and sustainable
12	Ensure sustainable consumption and production patterns
13	Take urgent action to combat climate change and its impacts (taking note of agreements made by the UNFCCC forum)
14	Conserve and sustainably use the oceans, seas and marine resources for sustainable development
15	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification and halt and reverse land degradation, and halt biodiversity loss
16	Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels
17	Strengthen the means of implementation and revitalise the global partnership for sustainable development [1]

1 The Guardian: http://www.theguardian.com/global-development/2015/jan/19/sustainable-development-goals-united-nations

ANALYSIS OF THE SUSTAINABLE DEVELOPMENT GOALS

By Majid Al Suwaidi & Dane McQueen

The SDGs will succeed and expand the UN's Millennium Development Goals (MDGs), which expire this year and have been perhaps the most successful tool to date to focus international attention on eight key goals, including eradicating extreme poverty and hunger; achieving universal primary education; promoting gender equality and empowerment of women; reducing child mortality; improving maternal health; combating HIV/AIDS, malaria and other diseases; ensuring environmental sustainability; and promoting global partnerships for development.

The 17 SDGs will also put poverty eradication at their centre, but they cover all aspects of development, from health to water to energy to gender equality to justice and, importantly, apply to all countries, not only developing countries. They have two key components: "goals" represent the area the international community should focus on, while "targets" provide quantitative outcomes within the sector to be met by 2030.

The Sustainable Development Goals (SDGs) are the high-water mark of the United Nations' (UN) work on sustainable development and represent a critical new framework for the UAE's domestic and foreign policies. A commitment from all 193 member countries of the UN, as well as thousands of international agencies, non-government organisations and companies, the 17 SDGs set social, economic and environmental outcomes to be achieved by 2030, uniting the international community under a single development vision. The 17 goals will accordingly influence how policies are made and how trillions of dollars are spent over the next 15 years.

As an example, SDG#7 calls for ensuring access to affordable, reliable, sustainable and modern energy for all, while the second target under this goal specifies a doubling of the rate of energy efficiency by 2030. Countries contribute to achievement of the SDGs through both domestic action and overseas aid and investment. Indicating their broad scope, the SDGs have 17 goals with 169 underpinning targets versus eight goals and 21 targets under the MDGs.

This outlook comes from the realisation that development is broader and more inter-linked than the MDGs allowed. For instance, for a child to receive decent medical care, the availability of a clinic isn't the only challenge. The clinic needs to have electricity and clean water, the right technology and educated, sufficiently-paid staff. The SDGs therefore provide a 'multi-disciplinary' lens, so that policies and programmes are designed and funded better.

This new approach won't come cheap though: it is estimated that achieving the SDGs will require USD 2 to 3 trillion dollars annually (for context, the annual GDP of the UAE is just over USD 400 billion).

The UAE has been one of the most active – and unique – players in the development of the SDGs, because it lies outside the traditional development paradigm of "rich, Northern" countries and "poor, Southern" countries. While it is a young, developing country, the UAE – through the vision of founding father His Highness Sheikh Zayed bin Sultan Al Nahyan and the contemporary leadership – has made such remarkable progress on health and education since independence that it is now ranked by the UN in the same development tier as countries like France and Japan. Additionally, for the last two years, the UAE has been the most generous provider of foreign aid in the world, as a percentage of gross national income[1].

This unprecedented status has given the UAE a powerful voice in the articulation of the SDGs – even from the beginning. The concept of the SDGs originated in the UN High-level Panel on Global Sustainability, a small group of thought leaders, including His Highness Sheikh Abdullah Al Nahyan, which was mandated to outline future international action on sustainable development. The UAE pushed the idea that both developed and developing countries must take action, especially in partnership with the private sector, and used concrete examples from its own history to illustrate how good policy and investment can deliver development results. Notably, it showed that there can be no real sustainable development without empowerment of women and that there can be no solution to the tremendous threat of climate change without low-carbon energy. The UAE also worked to raise the visibility of water, food, education and health in the SDGs, again drawing on strong evidence that such factors determine development.

In the three years of UN negotiations to finalise the SDGs, the UAE maintained this progressive, practical outlook, serving as a bridge between different negotiating groups and challenging many stereotypes about Arab and oil-exporting countries. Many countries were not aware, for instance, that the UAE has a law requiring female participation in company boards, or that it set the first renewable-energy targets in the Middle East, such as the 15% target by 2030 in Dubai. With the SDGs adopted by the UN in September 2015 at the Sustainable Development Summit, attended by over 150 heads of state and government, the UAE will now work to implement the SDGs on two levels.

Firstly, the SDGs are a domestic commitment for the UAE, requiring a contribution to the outcomes sought globally by 2030. Most of the targets will automatically be met at the national level because of the UAE's high development; however, they require alignment with existing UAE development plans, namely Vision 2021 and the UAE Green Growth Strategy, which has many SDG-relevant key performance indicators and sits under the Ministry of Environment and Water, with support from the Prime Minister's Office and the Ministry of Foreign Affairs. Each target will need assignment of a government agency to ensure progress and reporting and collectively they will require a lead agency for data harmonisation and submission.

Secondly, the SDGs will guide the UAE's substantial foreign aid. As part of the global effort to achieve the SDGs, donors must work to show that their funding is accelerating progress toward 2030. One of the key goals is also to use aid to attract private investment, so that the total amount of money going into developing countries is much higher than through aid or domestic government spending alone. The UAE has been a major advocate of this "crowding-in" approach and the Ministry of International Cooperation and Development, in its new aid strategy, shows how the UAE's programmes can contribute to different SDGs. The ministry will also monitor the UAE's programmes and report annually on the impact of UAE aid in regards to the SDGs.

While the UAE is just one country, and a relatively small country, His Highness Sheikh Abdullah Al Nahyan had a clear message at the Sustainable Development Summit: the UAE is committed to playing a disproportionately large role. It will use its aid, national policies, and innovation to make a difference by 2030. *end*

About
MAJID AL SUWAIDI

He is the UAE's lead negotiator on climate and sustainability issues and headed the UAE delegation in the SDG process.

About
DANE MCQUEEN

He is the senior advisor on development at the UAE Ministry of Foreign Affairs.

FOOTNOTES

1 http://www.oecd.org/newsroom/aid-to-developing-countries-rebounds-in-2013-to-reach-an-all-time-high.htm

DRIVING GROWTH THROUGH INCLUSIVE AND SUSTAINABLE INDUSTRIES

By Stephan Sicars

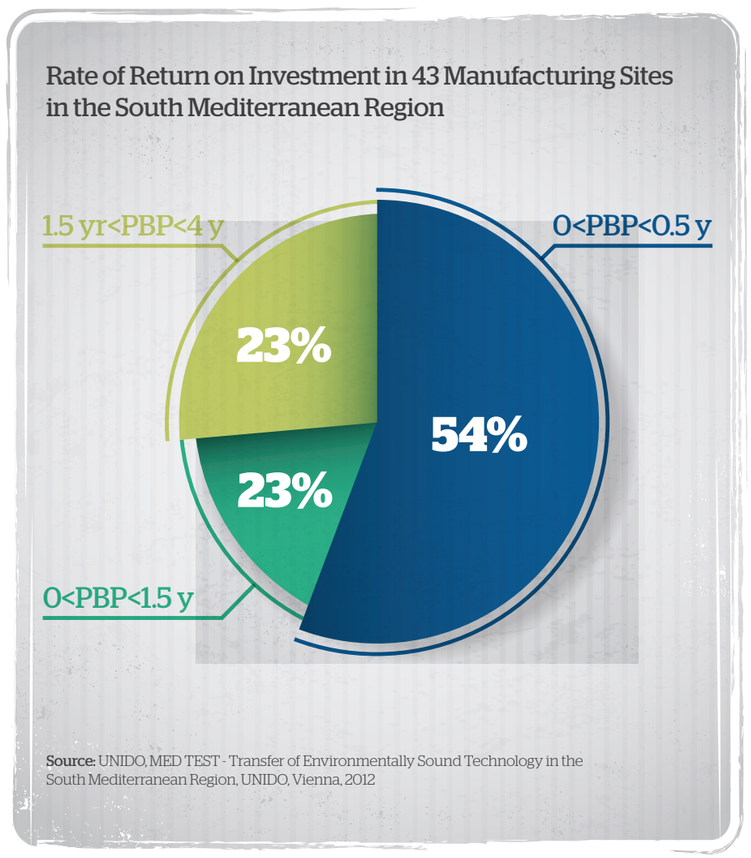
National economies today are facing a substantial range of environmental challenges that threaten to limit, or even reverse their future growth trajectories in the long term. The depletion of natural capital, soil erosion linked to climate change and the cleanup costs related to toxic pollution are but a few examples of how the environmental impact brought about by economic activity has stripped away some of the potential of future economic growth.

Industry has been a major driver of this growth[1]. It has lifted people out of poverty, provided large-scale employment, empowered women and raised the living standards of millions all around the world. The downside, historically, has been the depletion of natural capital and environmental degradation. As such, the pressure that this growth model has placed on our natural environment is heading beyond the limits of our planet's ecosystems[2]. There is, however, an increasingly large body of evidence to suggest that industrial – and therefore economic – growth can be directed largely without these negative side effects.

Several significant international efforts have been initiated to demonstrate how a pro-active approach can help economies grow sustainably. The United Nations Sustainable Development Goals (SDGs) offer a consensus-based global development framework and the United Nations Environment Programme (UNEP)'s Partnership for Action on Green Economy (PAGE) and the United Nations Industrial Development Organisation (UNIDO)'s Green Industry Initiative and Platform (GIIP) are examples of country and sector-level initiatives. Industry plays a central role in all of these approaches, and ultimately in any solution that leads to a decoupling of economic growth from its negative environmental impacts.

In order for economies to grow sustainably, and for nations to prosper in the face of adverse environmental and economic conditions, it is necessary that industries change the manner in which they produce goods and services, while retaining competitiveness. To this end, companies need to adopt new processes and technologies, reduce their reliance on finite resources, cut down fossil fuel consumption, embrace new business models and seek to close the materials loop.

By taking such measures, they will help to insulate themselves against raw-material price volatility, pre-empt and avoid resource shortages, comply with existing and anticipated emerging environmental compliance regimes and reduce business risks, all while minimising their environmental impact. UNIDO today, is helping industry make this transition through several specific initiatives.



Source: UNIDO, MED TEST - Transfer of Environmentally Sound Technology in the South Mediterranean Region, UNIDO, Vienna, 2012

The first area of emphasis is the promotion of resource-efficient and cleaner production, aiming at the continuous application of preventive environmental strategies to processes, products and services in order to conserve resources and reduce risks to humans and the environment.

Through UNIDO's Global Resource-Efficient and Cleaner Production (RECP) programme and its approach of Transfer of Environmental Sound Technologies (TEST), thousands of enterprises all over the world have benefited from increased resource productivity and the realisation of associated savings opportunities. The potential for scaling these results up is vast. It is estimated that by the year 2030, economic opportunities associated with global resource savings will amount to approximately USD 2.9 trillion annually.[3] This creates a sizeable business case for companies willing to make investments and take measures to increase the efficiency of their operations. The payback period for such investments has proven to often be surprisingly short.[4]

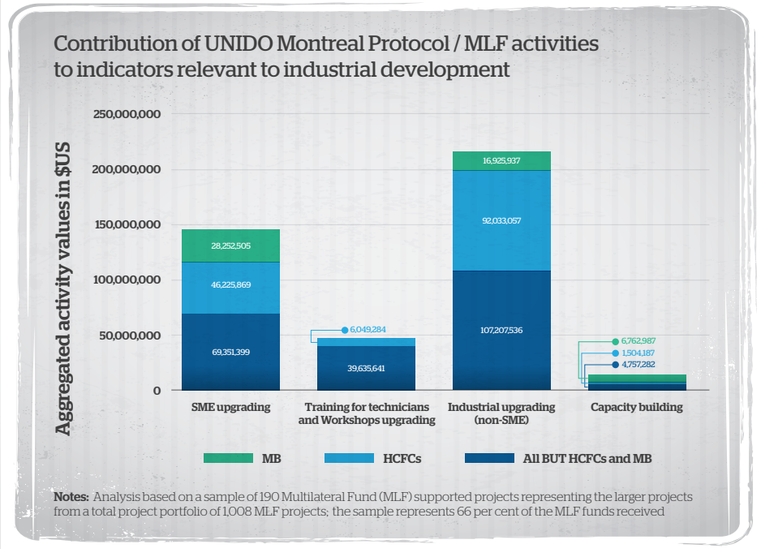
> "It is estimated that by the **year 2030** economic opportunities associated with global resource savings will amount to approximately **USD 2.9 trillion annually**"

While resource efficiency represents one side of the equation, increased economic growth is still largely tied to rising resource use. Increased resource consumption needs, therefore, to be counteracted by fostering recycling and simultaneously closing the material loop. This circular model of industrial production is restorative by design and aims to keep products, components and materials at their highest utility and value at all times.[5] A circular approach to manufacturing provides new opportunities for innovation in areas such as product design, alternate business models, food and farming and biological feedstocks.

A prime example of how growth can be achieved in a circular economy is found in the recycling industries. UNIDO promotes the establishment of e-waste management strategies at the national and regional levels. Such strategies address all stages of the e-waste recycling chain, including the design of collection schemes, the establishment of sustainable business models and the connection of these businesses with downstream markets for appropriate end-processing of each waste fraction. This results in the economically sound management of problematic waste and the generation of employment through the development of refurbishing and processing industries.

The development of new environmental industries, including recycling, waste management, pollution control, renewable energy, and environmental advisory services, will not only help create the infrastructure for a circular economy, but also offer the opportunity to tap into a sizeable global green market. The value of today's market for environmental products and services has been calculated as being EUR 1 trillion in size.[6]

Against this background, UNIDO is upgrading industries to help countries meet their obligations under a number of environmental compliance regimes related to the reduction and elimination of ozone-depleting substances, persistent organic pollutants, and mercury in industry. This has led to a substantial decrease in the release of harmful chemicals, and also an increase in the supply of green products and services, including technology sourced from the global South.

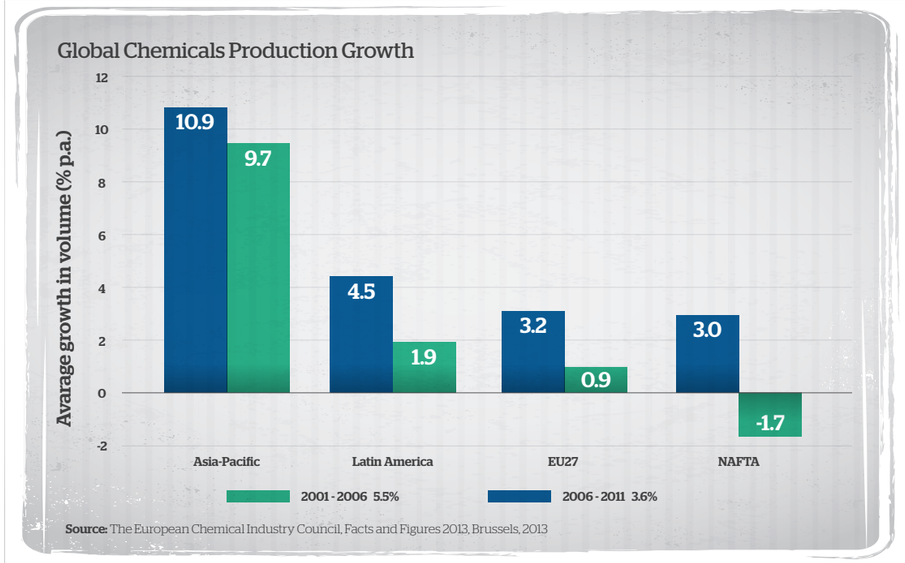


Notes: Analysis based on a sample of 190 Multilateral Fund (MLF) supported projects representing the larger projects from a total project portfolio of 1,008 MLF projects; the sample represents 66 per cent of the MLF funds received

Upgrading industry for better environmental performance has the added effect of benefiting a country's overall competitiveness on global markets. Environmental standards compliance and green certification significantly increase trade capacity and provide a reliable future growth path, given increasingly stringent buyer requirements and consistently rising international trade standards.

Furthermore, fostering the development and rapid growth of industries delivering environmental goods and services helps ease the transition of national economies in a downturn. For countries facing slower growth rates and a shift of focus away from primary and secondary industries, this form of diversification permits continued economic growth in new sectors along a sustainable development vector.

A different form of diversification is the adoption of alternative business models by industry. As an example, UNIDO has been promoting the leasing of chemicals by service rendered, as opposed to their purchase by volume, in developing and transition economies. Chemical leasing is a service-oriented business model that shifts the focus from the sales volume of chemicals to an approach based on value-addition. Using this model, a chemical's performance is sold, such as number of parts cleaned or surface area coated. A chemical manufacturer's profits are thereby linked to the efficiency of the product.



Source: The European Chemical Industry Council, Facts and Figures 2013, Brussels, 2013

As an example, in the case of Germany, calculations project a potential savings rate of EUR 46-100 million per year by the chemicals industry through the widespread adoption of chemical leasing.[7] Given the steady growth of global chemical demand and production, the potential economic and environmental gains would be significant if applied on a global level.

Ultimately, an inclusive and sustainable global industry is a fundamental prerequisite for the attainment of a green economy. The pursuit of resource efficient production, closing the material loop, re-tooling industry to improve its environmental performance and embracing alternative business models are means through which notable environmental and economic gains have been attained.

Scaling these results up and making them a core component of all coming industrial development will ensure that the prosperity of future generations is no longer a hostage of environmental circumstance and destructive patterns of past economic development. *end*

About
STEPHAN SICARS

He is the Director of the Environment Branch at UNIDO. For 10 years, Stephan Sicars was a Senior Programme Officer with the Multilateral Fund for the Implementation on the Montreal Protocol on Substances that Deplete the Ozone Layer.

Stephan is currently Director of the Environment Branch of UNIDO, which, through the implementation of projects, covers subjects such as cleaner production, water, the management of persistent organic pollutants as well as mercury, and emission reduction of non-CO_2 climate gases as well as phase-out of ozone depleting substances.

FOOTNOTES

1 UNIDO, Industrial Development Report 2013: Sustaining Employment Growth, UNIDO, Vienna, 2013
2 Global Footprint Network, 2015, World Footprint, http://www.footprintnetwork.org/en/index.php/GFN/page/world_footprint/, accessed on 3 July 2015
3 Dobbs, R. et al., Resource Revolution: Meeting the World's Energy, Materials, Food and Water Needs, McKinsey Global Institute, London, 2011
4 Source: UNIDO, MED TEST - Transfer of Environmentally Sound Technology in the South Mediterranean Region, UNIDO, Vienna, 2012
5 Ellen MacArthur Foundation, 2015, The Circular Model – An Overview, http://www.ellenmacarthurfoundation.org/circular-economy/circular-economy/the-circular-model-an-overview - accessed 31 May 2015
6 Hinterberger, F., Giljum, S. et al., Green Growth: From Labour to Resource Productivity - Best Practice Examples, Initiatives and Policy Options, Sustainable Europe Research Institute (SERI), Vienna, 2013
7 Budinger, V., Chemikalienleasing: Nutzen statt besitzen', Frankfurter Allgemeine Sonntagszeitung Verlagspezial Nachhaltigkeit, 14 June 2015, p. B4. Print.

INTERVIEW
H.E. SULTAN AHMED BIN SULAYEM

THE MIDDLE EAST'S BUSIEST PORT AND ITS OPERATOR SET THE PACE FOR ECONOMIC DIVERSIFICATION

AN EFFICIENT GATEWAY TO TRADE

> The port and Jebel Ali Free Zone together form over **20% of Dubai's GDP**

DP WORLD

Q1: WHAT IS YOUR BUSINESS DOING TO MAKE OPERATIONS MORE RESOURCE-EFFICIENT AND PROFITABLE?

H.E. S.A.B.S.: In 2014, we conducted a detailed energy consumption assessment across our portfolio, leading to the identification of more than 60 initiatives which are in varying stages of implementation. We also developed a water usage plan to enhance our ability to reduce freshwater consumption. At the same time, renewable energy alternatives are being implemented into our core business functions.

We also coordinate with regulators, governments and other organisations to take action (For example, DP World was a signatory of the Copenhagen and Cancun Communiqués). Last year, we developed and expanded our capability to recycle and manage waste, including working with stakeholders across the supply chain.

Our commitment to improving environmental performance was also reflected in the significant increase in our Carbon Disclosure Project (CDP) score. This rose from 70C in 2013 to 81B in 2014, placing DP World above average for the industry.

Meanwhile, our strategic partnership with the Carbon Ambassador Programme encourages Emirati university students to develop an idea of how to operate within a culture of sustainable development, so as to build on their interest, ameliorate their knowledge of sustainability, and help them to prepare to be our future leaders.

Q2: WHY DOES A COUNTRY'S PORTS NEED TO BE ENERGY EFFICIENT?

H.E. S.A.B.S.: The ports industry is a vital economic pillar supporting growth and prosperity for all. Efficiency and sustainability in this area is, therefore, imperative in order to ensure an economy's continuing success.

Spotlight on innovation

The Appliance of Tradition

The traditional mashrabiyya as a beautiful and efficient building thermal regulator

If you look at any old pictures of traditional Arab dwellings, the most striking aspect of the façade is always the mashrabiyya – a wooden lattice, carved into abstract shapes or flowers that acts to shade the building from the heat – and the eyes of strangers. The award-winning Al Bahr Towers in Abu Dhabi, designed by Aedas, features the world's largest computerised dynamic façade, using the mashrabiyya as its starting point.

Al Bahr uses the concept of adaptive flowers and the mashrabiyya intrinsically in its design. Through the clever use of geometry, the screen folds and unfolds in response to the sun, reducing solar gain by up to 50%, whilst simultaneously improving the entry of natural light and improving visibility.

With over 2,000 dynamic units constantly reacting to solar levels, the need for treated glass diminishes. This has the added effect of reducing artificial lighting and mechanical air conditioning, as well as improving visibility and user comfort. The resultant decrease in energy use is striking. Through reduced energy use, air-conditioning plant requirements are significantly smaller.

The Al Bahr Tower is not only a building that has grasped the problem of trying to minimise energy use to help with emission levels and sustainable building, it has also managed to keep to the traditions and heritage that are integral to the identity of the UAE – something that will encourage others elsewhere throughout the region to do likewise.

Q3: WHAT ROLE DOES INNOVATION PLAY IN ENERGY EFFICIENCY?

H.E. S.A.B.S.: Most countries and global organisations have already realised the benefits of reinforcing a culture of innovation to meet present and future people's needs.

To innovate doesn't necessarily mean that we must start again from the beginning; It's a matter of perspective and heterogeneous thinking. For example, one idea that we introduced at our flagship Jebel Ali terminal, was that we should use automatic on/off sensors on our lighting system – which consists of some 30,000 lamps. This has resulted in an energy saving of over 80% and a reduction in CO_2 emissions of 2,400 tonnes. Such measures not only help the environment, but also our bottom line – as energy saved, means money saved – and all businesses understand this.

Q4: WHAT ROLE CAN MARINE TERMINALS AND PORT OPERATIONS PLAY TO GUIDE THE UAE ECONOMY TOWARDS ECONOMIC DIVERSIFICATION?

H.E. S.A.B.S.: DP World's contribution to the development of the economy is clear when you consider that 80% of the UAE's non-oil trade comes through Jebel Ali. This helps us support projects that work to diversify our economy and contribute towards tourism and retail spending. For example, the Dubai Eye, Mall of the World, and Dubailand theme parks all use the port to import 90% of their building materials. The port and Jebel Ali free zone together form over 20% of Dubai's GDP.

Q5: WHERE DO YOU SEE DUBAI AS A LOGISTICS HUB IN GENERAL AND PORT OPERATIONS AS ECONOMIC DRIVERS IN PARTICULAR IN FIVE YEARS FROM NOW?

H.E. S.A.B.S.: Dubai's growth story is far from finished – indeed, the journey has just begun! As long as things need to be brought in to the country and exported from it, the ports industry will continue to play a vital role.

The Dubai Logistics Corridor is already proving the advantage of having a seamless customs clearance transport network that links air, sea and land.

Five years from now we'll be in a position to realise the full impact of Expo 2020, and in the run up to it, DP World is ready to handle the necessary cargo for the enormous construction and development projects already in the pipeline. *end*

About
H.E. SULTAN AHMED BIN SULAYEM

H.E. is the DP World Chairman since 30 May 2007. H.E. is a leading UAE and international businessman, whose visionary leadership spearheaded the rapid expansion of Dubai's infrastructure, including ports and free zones, contributing significantly to the phenomenal growth trajectory of the United Arab Emirates.

INTERVIEW
MARWAN ABDULAZIZ JANAHI

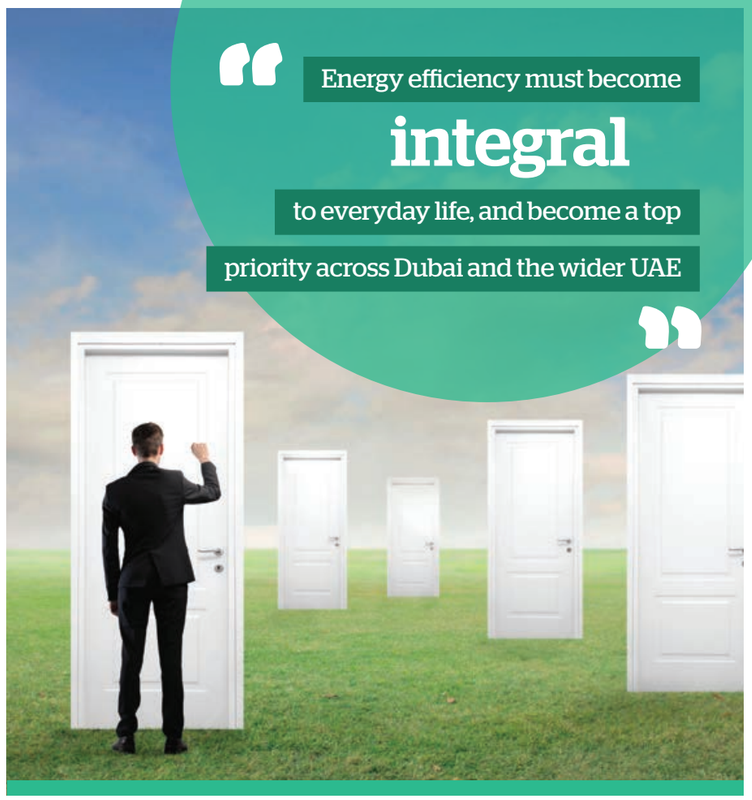
LOOKING FOR LOCAL JOB CREATION OUTSIDE THE MAINSTREAM

WHERE ARE THE OPPORTUNITIES?

Q1.: WHERE DO YOU SEE THE BIGGEST AREA OF GROWTH IN THE ALTERNATIVES INDUSTRY IN THE REGION?

M.A.J.: We see a huge opportunity in the region for solar energy and believe it will be a crucial element in achieving our green energy consumption goals in the coming years. According to the Middle East Solar Industry Association (MESIA), the largest solar power association in the Middle East, Dubai is one of the top three growth markets for solar power in the MENA region.

Dubai is not alone in pursuing such initiatives. Kuwait has announced plans to generate 15%of its energy needs via renewable sources by 2030, with the first of up to 100 solar-powered fuelling stations expected to be operational by 2017. Oman is proposing to set up four solar power plants, while just this year, competitiveness in the bidding process led to the lowest ever bids recorded for a solar power project in Jordan, which in turn could lead to further expansion of the industry in the wider region.



Q2: WHAT CHALLENGES DOES THE ALTERNATIVE ENERGY INDUSTRY FACE?

M.A.J.: The alternative energy and sustainability sectors in our region are still very much in their early stages, reflected in the generally tight lending policies followed by banks with regard to green-economy initiatives. Internationally, there has been a stronger take up of green financing with more than USD 16 billion in green bonds sold this year following issuance of USD 32.6 billion in 2014, according to data compiled by Bloomberg.

The fact that banks and finance companies are struggling to see the return on investment from green initiatives is, in my view, somewhat short-sighted. Conventional banking may not be a natural fit for new technologies due to the longer investment timelines, but it is crucial for banks to buy into the green initiatives outlined by the Government.

As we all know, economic development is taking its toll on the environment, even though the UAE has made great progress in reducing its carbon footprint. According to the UAE Ministry of Environment and Water, the country lowered its annual per capita emission of greenhouse gases to 24.16[1] tonnes last year, from 26.3[2] tonnes in 2006. Banks and financing firms must look at the long-term benefits for the environment, not just the short-term financial returns..

Q3: WITH ALL THIS POTENTIAL IN THE RENEWABLES SECTOR AND EXPECTED GROWTH, DO YOU PREDICT EMPLOYMENT LEVELS TO INCREASE?

M.A.J.: The growth of the sector will bring more job opportunities to the region. According to figures from the International Renewable Energy Agency (IRENA), the renewable energy industry created one million jobs globally in 2014, an 18% increase compared to the previous year; the GCC is set to generate 120,000 jobs annually through to 2030.

The challenge may lie in attracting and retaining world-class talent. Although the UAE ranks as the number one economy in the Middle East for recruiting and retaining talent, the INSEAD Global Talent Competitiveness Index ranks it at just 22nd globally. If we are to truly compete on a global level, we must provide the right tools to attract and retain emloyees. This will help ensure that we are able to compete with nations such as Switzerland and Singapore, who sit at the top of the INSEAD ranking table.

Q4: WHAT CAN COMPANIES AND INDIVIDUALS DO TO DRIVE GREEN-ECONOMY INITIATIVES?

M.A.J.: International bodies have a vital role to play as advocates for the green economy by applying pressure on the global community to make effective long-term changes. DEWA is a good example of this through their range of initiatives, including the Mohammed bin Rashid Solar Park which plans to triple production from 1000MW to 3000MW by 2030, build up to 100 car charging stations by the end of 2015 and develop research and innovation centres inside the Mohammed bin Rashid Solar Park. This will certainly help to diversify Dubai's energy mix.

One of the main factors we identified as being essential for helping the green economy to take shape is accountability. We have to ensure that viewpoints translate into meaningful discussion and that discussion leads to decisions which, in turn, spark action. It is imperative for individuals to assume responsibility for the conservation of energy within their immediate environments – residential buildings, cars and offices – to reduce energy usage. The smallest steps and behavioural change implemented on a daily basis by each of us will add up to a significant contribution to the global green movement. Energy efficiency must become integral to everyday life, and become a top priority across Dubai and the wider UAE. *end*

About MARWAN ABDULAZIZ JANAHI

Marwan Abdualziz Janahi is the Executive Director of Dubai Science Park (DSP), formerly known and EnPark and DuBiotech. DSP is the first business community dedicated to pioneering the growth of the region's sciences sector.

He is responsible for building the portfolio of companies within DSP and engaging closely with peers, government authorities and other key stakeholders to ensure the continued development of the industry.

DUBAI SCIENCE PARK

FOOTNOTES

1 The national: http://www.thenational.ae/uae/environment/uae-released-200m-tonnes-of-greenhouse-gases-in-2013
2 Trading Economics: http://www.tradingeconomics.com/united-arab-emirates/co2-emissions-metric-tons-per-capita-wb-data.html

INTERVIEW
H.E. ABDULNASSER BIN KALBAN

DUBAL HOLDING IS THE GOVERNMENT'S INVESTMENT ARM FOR THE POWER, COMMODITIES, MINING AND INDUSTRIAL SECTORS AND FACILITATES ECONOMIC DIVERSIFICATION AND GROWTH FOR THE EMIRATE

CEO, DUBAL HOLDING LLC

INVESTMENT AS THE MEANS TO DIRECT AN ECONOMY

Q1: THERE IS A LOT OF CONFUSION ABOUT THE RELATIONSHIP BETWEEN ICD AND THE ALUMINIUM SMELTER DUBAL. HOW DOES DUBAL HOLDING FIT INTO WHAT IS COMMONLY CALLED "DUBAI INC."?

H.E. A.K.: Dubal Holding is wholly-owned by the Investment Cooperation of Dubai (ICD) and is an investment arm for the Dubai Government in the power, commodities, mining and industrial sectors. We also manage a 50% stake in Emirates Global Aluminium (EGA), which is the owner of Dubai Aluminium (Dubal), Emirates Aluminium (Emal) and the new alumina refinery in Abu Dhabi.

Q2: WHICH SECTORS AND INDUSTRIES IS DUBAL HOLDING ACTIVE IN AND COULD YOU GIVE SOME EXAMPLES OF ASPECTS OF ENERGY AND INDUSTRIAL INFRASTRUCTURE BEING SUPPORTED?

H.E. A.K.: We are active in the Dubai power sector and are part of the developer consortium working on the 200MW Mohammed Bin Rashid Solar Power Plant, as well as the original 13MW pilot plant. We are also involved in the upstream alumina refinery and other related businesses, and are evaluating a number of investments in the commodities and manufacturing sectors, which will assist in broadening the Emirate's industrial base and which could also support the continued competitiveness of our aluminium business.

Q3: HOW - AND IN WHICH ASPECTS OF YOUR OPERATIONS - DO YOU INNOVATE?

H.E. A.K.: Our companies are constantly reviewing best practices and technologies worldwide to incorporate into our businesses. We are, in our aluminium smelting operations, at the forefront of research and development and have been successful in licensing our technology to other operators. International benchmarking is an important contributor to maintaining competitiveness in today's business world, be that in the technical, commercial or financing areas. We also like to work with strategic partners who are forward-looking and we strive to find synergies in our investments wherever possible.

Q4: AS ONE OF THE DRIVING FORCES BEHIND DUBAI'S ECONOMIC DEVELOPMENT, HOW DO DUBAL HOLDING'S OPERATIONS SUPPORT THE GOVERNMENT'S VISION?

H.E. A.K.: As a member of the Dubai Supreme Council of Energy, Dubal Holding looks to deploy capital in ways that support the Dubai Integrated Energy Strategy 2030, notably in clean-energy projects in the Emirate. We are also part of the Regulatory and Supervisory Bureau for the electricity and water sectors, which looks at future water consumption and how we may sensibly invest in new initiatives there. On the industrial side, we have a broad remit to invest in industrial businesses and infrastructure which, as I have stated above, serves to broaden Dubai's manufacturing base in both new and established technologies.

dubal Holding

> "The issue of economic **diversification** is one of our major tick-list items when it comes to **evaluating** a new investment **opportunity**"

Q5: WHAT ARE THE CRITERIA USED TO ASSESS DUBAL HOLDING'S INTERNATIONAL INVESTMENTS? DO YOU HAVE ANY MECHANISMS IN PLACE TO STEER YOUR INVESTMENTS TOWARDS SUSTAINABILITY?

H.E. A.K.: As far as international investments are concerned, the projects in which we take a stake have to not only provide superior financial returns, but they must also support the development of Dubai, including our existing emirate-based businesses. So, for instance, we are at present looking at international upstream and downstream investments in the aluminium sector. The upstream investments assist in providing raw materials on a secure and competitive basis, while downstream investments provide a market for our aluminium products in what is currently a challenging business environment. On the issue of sustainability, we are mindful that we live in an interconnected and ever-changing world where environmental matters and technologies are becoming increasingly important. As a shareholder in the Dubai Carbon Centre of Excellence, we are mindful of the fact that any international investments we make should align with the philosophy and best practices that Dubai Carbon promulgates, including resource efficiency, greenhouse gas emission monitoring and reductions and sustainable economic development criteria.

> "the projects in which we take a stake, have to not only provide **superior financial returns,** but they must also support the **development of Dubai**"

Q6: DUBAI HAS BEEN FOLLOWING A STRATEGY OF ECONOMIC DIVERSIFICATION SINCE PEAK OIL IN THE 1980S. WHAT DO YOU CONSIDER TO BE THE MAIN ACHIEVEMENTS AND WHERE DO YOU SEE THE BIGGEST POTENTIAL UNTIL 2021?

H.E. A.K.: It is unquestionably true that economic diversification helped Dubai rebound quickly from the global financial crisis of seven years ago. The trade, transportation and logistics sectors – and of course tourism – have held up and grown significantly in recent years. However, to an extent, we still have a lack of export diversification, with gold and jewellery tending to dominate. Solar energy aside, Dubai has a lack of natural resources, so our growth focus in the coming years will be on playing to our strengths, namely our strategic location, access to a wide and skilled labour pool, our business-friendly environment, good infrastructure and political stability. I am confident that Dubai will remain a centre of excellence in the GCC.

Q7: HOW DOES DUBAL HOLDING CONSIDER ECONOMIC DIVERSIFICATION WHEN MAKING INVESTMENT DECISIONS?

H.E. A.K.: Many of the projects we look at are in industries which are new to the Emirate. The issue of economic diversification is one of our major tick-list items when it comes to evaluating a new investment opportunity.

Q8: INVESTMENT IS SEEN AS ONE OF THE MAIN DRIVERS FOR GREEN ECONOMIC DEVELOPMENT. DO YOU FIND THIS TO BE TRUE WITHIN YOUR ACTIVITIES? COULD YOU GIVE EXAMPLES?

H.E. A.K.: We see the green agenda at work in many areas of business today, whether it be in vehicle emissions regulations in Europe and the US – which is potentially a source of business growth for aluminium products – or in the impetus towards renewable technologies in power generation in most countries in the world. But the move towards a greener planet will not happen without investment from enlightened and well-informed business people who have the vision to see that it is possible to both protect the environment and obtain an economic return on deployed capital. In this sense – and in the sense of the job creation that comes with it – investment can be a force for good in the world. *end*

About
H.E. ABDULNASSER BIN KALBAN

Armed with a degree in Electrical Engineering from Western Michigan University, USA and with almost two decades of all-round experience in the power sector handling gas/steam turbines etc., H.E. is now responsible for Dubai government's investments into power, commodities, mining and industrial sectors.

> "our growth focus in the coming years will be on playing to our strengths, namely our strategic location, access to a wide labour pool, our business-friendly environment, good infrastructure and political stability"

SPOTLIGHT ON INNOVATION

PRINTING THE FUTURE
DUBAI ANNOUNCES THE WORLD'S FIRST 3D-PRINTED OFFICE BUILDING

Dubai has been the focus for architectural innovation for many years now – especially with regard to sustainable planning. The latest move, however, takes Dubai's enthusiasm for creating remarkable architectural projects one step higher. His Excellency Mohammed Al Gergawi, the UAE Minister of Cabinet Affairs and Chairman of the National Innovation Committee, has announced that Dubai plans to 3D-print a one-story office.

Planned to be around 185 square metres in size and seven metres tall, the new structure comes from the partnership between Dubai and WinSun Global along with leading global architecture and engineering firms Gensler, Thornton Thomasetti, and Syska Hennessy. It will be printed in layers using a seven-metre-tall 3D printer, and then assembled on site in Dubai. It will be constructed from a mixture of special reinforced concrete (SRC), glass fibre reinforced gypsum (GRG) and fibre reinforced plastic (FRP).

The whole process will make the building highly sustainable as construction time will fall by up to 70%, reducing labour costs by up to 80%, and saving up to 60% of construction waste. Together, these savings mean better productivity, a better return on investment, lower energy costs, and increased sustainability.

By using state-of-the-art technologies to help in the creation of new, sustainable buildings, the UAE is able to improve its economy in line with the country's National Innovation Strategy and the vision of His Highness Sheikh Mohammed bin Rashid Al Maktoum, UAE Vice-President, and Prime Minister and Ruler of Dubai..

Advertisement

EMIRATES GLOBAL ALUMINIUM CORPORATE STRUCTURE

dubal Holding

Energy Industry Commodities

Dubai is at the forefront of the green economy race

THE GREEN DUBAI MAP

> It's all about making the green economy accessible for everyone and promoting real change.

Dubai was rated as one of the best places to live in the Middle East by American global consulting firm Mercer for good reason. The desert city has changed dramatically over the last three decades, becoming a major business centre with a dynamic and diversified economy and population. Given the city's rapid development, it may not seem so eco-friendly at first glance, but Dubai is turning green. During the last few years of the city's urban development, many measures have been taken by authorities to address environmental concerns and promote environmental sustainability and protection, contributing to global efforts to combat climate change.

Now, the green economy is becoming personal. The Dubai Green Economy Partnership (Dubai GEP), launched by H.H. Sheikh Hamdan bin Mohammed bin Rashid Al Maktoum, Crown Prince of Dubai and Chairman of the Dubai Executive Council initiated the Green Dubai Map.

The interactive map is designed to help visitors and residents connect with green resources for sustainable living.

Sustainable living promotes a lifestyle that encourages individuals and society to make more efficient use of Earth's natural resources. The Green Dubai Map will help users locate sites, businesses and establishments that contribute to the green economy. The aim is to put the spotlight on green activities in Dubai and help residents and visitors get the most out of this fantastic city, while keeping the eco-footprint small.

Looking for a green hotel, prefer purchasing from an organic supermarket, curious about the location of wind turbines or want to stroll in a park? The Green Dubai Map will show you all of these things, as well as the location of solar plants, recycling points, sustainable buildings and much more. It's all about making the green economy accessible for everyone and promoting real change. *end*

Find your way around the Dubai Green Map here:

http://greeneconomy.ae/greendubaimap/

INTERVIEW REEM KETAIT

THE IMPACT OF OIL PRICES ON RENEWABLE ENERGY

THE IMPACTS THAT RECENT OIL PRICES HAVE HAD ON RENEWABLE-ENERGY INVESTMENTS, BOTH GLOBALLY AND WITHIN FOSSIL FUEL DRIVEN ECONOMIES.

Q1: THE WORLD IS WITNESSING NOSE-DIVING CRUDE OIL PRICES – FROM USD 100 DOWN TO USD 50 PER BARREL RECENTLY. WHAT IMPACT HAS THIS HAD ON GLOBAL INVESTMENT IN RENEWABLES?

R.K.: Energy-market dynamics in the 21st century show that the volatility in oil prices does not directly affect renewables. There is comparatively little direct competition between renewable energy and oil. Global growth in renewables to date has mostly been for power-generation purposes, whereas oil still dominates the transportation sector. Therefore, the question of whether oil prices will displace dependency on renewables should not be on the table, where global trends show heavy dependency on natural gas, coal, and nuclear for power generation.

When one looks at the global power-generation scenario today, diesel and other petroleum-based products account for only 5% in power generation. In North America and Europe, oil accounts for a small proportion of electricity. For instance, diesel makes up 1% of the USA's power generation, with the remaining demand primarily met through natural gas and coal-fired generation. Only 1.9% of Europe's power generation is met by oil and its products. Post-Fukushima, Japan has been heavily dependent on coal and LNG for power supply, while oil products constitute less than 8% and are used for peak demand.

The GCC provides an interesting exception to this global picture. Some countries, like the UAE and Qatar, rely on gas-fired power plants, constituting nearly 100% in the UAE. Oil, however, has an important share of generation in other countries, such as the Kingdom of Saudi Arabia (50%) and Kuwait (70%), which use significant volumes of oil for electricity. In those cases, the rapidly falling cost of renewables is highly attractive. Future demand for energy is projected to increase by 8.3% per annum in the MENA region from 2015 to 2019, more than triple the global average of increase in demand for utilities, and renewables are increasingly the preferred option for meeting this demand.

In many importing countries, it is the soaring price of gas for that can further drive leaning towards renewables for power generation. Although natural-gas contracts have traditionally been indexed to oil prices, particularly in Asia, this link is eroding with the growth of LNG trading. In 2010, imported natural gas in the UAE was priced at around USD 2 per MMBTU through its strategic deal with Qatar, while the current global prices of natural gas and the upcoming need for a renewal of the deal from Qatar, along with spot imports in Dubai, can mean prices as high as USD 15 per MMBTU. The UAE can save USD 1.9 billion per year through to 2030 on the avoidance of fossil fuels by having 10% of renewables in its energy mix (REmap UAE, IRENA).

Q2: WHAT HAS DRIVEN THE COST-COMPETITIVENESS OF RENEWABLES?

R.K.: The relationship between oil prices and renewables is not of a cause-and-effect nature. Renewable-energy technologies have been falling in price, independent of conventional fuels. Solar, for instance, has become much cheaper through technology advances, shifts in the manufacturing process and economies of scale, with the introduction of Chinese panels as opposed to the prevailing German panels. Silicon prices have declined and advances in research have allowed for greater module efficiency. Increased competition in the solar market has also led to the lower cost of panels. China, for instance, incentivised solar power as it ramped up the PV cell production market to meet its ambitious solar targets, driving a fall in global prices given the sheer size of the Chinese market, hence diverting the market from Europe to Asia. In the UAE too, research and growing experience with deploying solar, such as through Masdar Institute, has brought down the cost of utilising renewable energy.

Although countries like the UAE currently do not subsidise renewables, solar competes strongly at a price of USD 5.84 cents per kilowatt-hour versus the cost of USD 9 cents per kilowatt-hour for natural gas power generation. In a recently successful investment in Dubai, solar reaches grid parity with traditional power plants proving that the decline in oil prices does not compromise the robustness of renewables in the region, especially given that the price of renewables has fallen by 80% over the past five years alone.

> The International Energy Agency estimated that between the **years 2015 to 2035, USD 48 trillion** will need to be invested in power generation globally

Q3: WHAT ABOUT THE GCC, WHAT REACTIONS CAN WE EXPECT FROM OIL PRODUCERS?

R.K.: The GCC is a special case, in that some countries in the region do rely on oil for a large part of their power generation. It is possible that oil prices will remain low. The recent Iran agreement might reintroduce an exporting country into the scene with a capacity of 3.5 million barrels per day. The quality of Iranian products will determine the long-term impacts on other exporters and prices. Additionally, Iraq and Saudi Arabia's production is reaching historic highs while the US expands the exploration of shale oil.

Considering Saudi Arabia, the world's top crude oil exporter, production levels increased to 10.333 million bpd in May 2015. The increase in oil production is not to export crude, instead it nourishes the Saudi economy by growing the refined-oil products export scene. Millions of barrels increase in production of refined-oil products such as diesel from its new refineries indicates a new-found potential competition with the Asian market.

Renewable energy is being taken increasingly seriously as a way of limiting domestic oil consumption. The announcement of the 50 megawatt solar project this month in Saudi Arabia has eased doubts of whether renewables would remain in the country's plans following the delay of a 41 GW solar plan by 2032 last January. Saudi Arabia's Electricity Company will purchase power from the plant at a price of 18.75 halalas per kilowatt-hour, setting new records in solar prices worldwide, and contributing to saving around 4 million barrels of diesel for power generation that correspond to USD 240 million in savings.

Similarly, in the UAE, solar energy has long been pursued as a means of reducing gas demand and avoiding the use of diesel and other products. Shams One, a concentrating solar power plant opened in 2012 by Masdar, was the first large-scale investment of its kind in the region.

About REEM KETAIT

She is an energy analyst at the Directorate of Energy and Climate Change in the Ministry of Foreign Affairs. In addition to renewables, she is passionate about energy modelling and engaging in development related efforts. Prior to joining the Ministry of Foreign Affairs, she pursued her Masters in Engineering Systems and Management at the Masdar Institute of Science and Technology.

Q4: LOOKING FORWARD, HOW WILL COUNTRIES' CHOICES FOR ENERGY EVOLVE? WHAT IS THE OUTLOOK FOR RENEWABLES?

R.K.: From 2000 to 2013, renewables accounted for 57% of the global investment in new power-generation plants. The International Energy Agency estimated that between the years 2015 and 2035, USD 48 trillion needs to be invested in power generation globally. Additionally, global World Bank investments in 2012 were around USD 3,615 million for renewables and USD 880 million for upstream oil, gas and coal investments combined. All of these investments are heading towards a clear choice; the renewables path.

Governments realise the value of stabilising economies and currencies by resorting to power-generation processes that do not require the purchase of fuel, as is the case with solar-power generation. A leading example of this is the UAE government, which dedicated more than USD 500 million in the form of soft loans and grants for the purpose of power generation using renewables in developing countries like Egypt, Afghanistan, and Morocco, amongst others. The adoption of solar systems on a residential scale, for instance, only highlights the value in renewables, as it restores energy equality without making economies vulnerable to political instabilities, as can happen when relying on fossil fuels. *end*

BIGGER STEPS; SMALLER FOOTPRINTS

YOUTH & EMPLOYMENT

IRENA
International Renewable Energy Agency

YOUTH ENGAGEMENT RESHAPED ITSELF IN 2014, WITH THE CARBON AMBASSADOR PROGRAMME THAT TRAINS 80 UAE STUDENTS EVERY YEAR ON THE PRINCIPLES OF SUSTAINABILITY, CARBON MANAGEMENT AND CLIMATE CHANGE MITIGATION.

DEWA's Carbon Ambassador Programme has proven to be a success. In this year's new programme for 2015-2016, we have doubled the number of students to 80 and, under the auspices of H.H. Sheikh Ahmed bin Saeed Al Maktoum, Chairman of the Dubai Supreme Council of Energy, we were delighted to graduate last year's entrants at the inauguration of the World Green Economy Summit in April 2015.

The experience we have gathered on our journey has been invaluable. Today, we have 40 young people who show so much promise and potential, and who are able to translate this enthusiasm and experience into real action that will create a new, innovative and sustainable future for the UAE, and for the world. They, in turn, will help us guide our newest Carbon Ambassadors into facilitating this admirable goal.

As His Highness Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai, once said, "To be creative is to add something new to life, as opposed to being a passive part of it. And while we may not live for hundreds of years, the products of our creativity can leave a legacy long after we are gone." The Carbon Ambassador Programme is a manifestation of this idea: that we are the drivers of our progress and can create the future we desire if we follow up with real action to support our ambitions.

Our Carbon Ambassadors are our future. It is their innovation, their vision and their foresight that will help create a new, forward-looking generation of thought-leaders: a new generation who will lead the nation in creating and pursuing future strategies and programmes, as well as assisting in the successful implementation of the UAE Vision 2021 and the Dubai Integrated Energy Strategy 2030, to reduce energy demand by 30% by 2030 and support the Green Economy for Sustainable Development initiative. Over the next 15 years, it is this new generation's capability and determination that will make the UAE one of the "best" nations in the world, based on the creativity, innovation, learning, and knowledge of its citizens.

H.E. SAEED MOHAMMED AL TAYER

Managing Director and CEO of DEWA

H.E. Saeed Mohammed Al Tayer, Vice-Chairman of the Supreme Council of Energy and MD and CEO of Dubai Electricity and Water Authority (DEWA).

H.E. Saeed Mohammed Al Tayer has overseen the rise of DEWA, which has become one of the most efficient utilities in the world, and a profitable and efficient service provider with minimal power and water losses, which is contributing to making Dubai one of the happiest cities in the world. Under his leadership at DEWA, the utility is working closely with its key stakeholders to develop carbon management, energy-efficiency and energy-and water-efficient consumer goods. At the Dubai Supreme Council of Energy, he has overseen Dubai's energy diversification strategy, the introduction of solar power, and demand-side management. Al Tayer has been the driving force behind the formation of the Carbon Ambassador Programme in December 2013 and His Excellency Ban Ki-moon, Secretary General of the United Nations, has personally thanked him for his support for the next generation.

هيئة كهرباء ومياه دبي
Dubai Electricity & Water Authority

IRENA AND YOUTH: PREPARING THE NEXT GENERATION OF ENERGY LEADERS

By Mohamed El Farnawany

TRAINING FUTURE LEADERS THROUGH UNIVERSITY PROGRAMME DATABASES, MODEL NEGOTIATIONS FOR RENEWABLE ENERGY DEPLOYMENT AND SCHOLARSHIPS

The energy landscape has shifted dramatically in recent years. Renewable-energy technologies are improving, costs are declining, and sector investment is growing along with more ambitious sustainable energy and climate policies worldwide.

As the energy transformation continues, the need for trained human capital becomes critical. More than 7.7 million people are currently employed in the renewable-energy sector worldwide[1], and this number is expected to increase in coming years. Given the number of people needed to meet the expected demand for skilled labour in the sector, the importance of education and training policies cannot be overstated.

To keep pace with the demand for an expanding skilled workforce, the International Renewable Energy Agency (IRENA) facilitates a number of programmes that encourage international youth to engage and train today on the energy issues and innovations of tomorrow.

One of IRENA's primary vehicles for this is the IRENA Renewable Energy Learning Partnership (IRELP), which promotes technical development and education in the sector through engagement with private training institutions and renewable-energy employers. The IRELP online platform provides access to more than 3,000 courses, degree programmes, webinars, internships, resource guides and teaching resources in the sector. It facilitates internships for students, supports teaching on renewable energy and identifies education gaps that could hinder future renewable energy deployment, particularly in Asia, Africa and Latin America.

IRENA also encourages engagement in the international decision-making process. In April 2015, we organised the first-ever Model IRENA programme, a two-week training series culminating in a full-day simulation exercise for students and young professionals to discuss the advancement of the renewable-energy agenda worldwide. Fifty students from seven UAE universities and young professionals assumed the role of IRENA delegates, presented their country's position and made innovative proposals. Proposals included the implementation of educational initiatives at their universities and the development of research tools to identify the tangible benefits of implementing renewables in IRENA member countries.

> The IRENA Scholarship programme **awards 20** promising applicants a graduate scholarship at the Masdar Institute of Science and Technology

The agency's engagement with youth is complemented by the IRENA Scholarship and Junior Professional Associate programmes. The IRENA Scholarship programme awards 20 promising applicants a graduate scholarship at the Masdar Institute of Science and Technology. To date, a number of IRENA scholars have progressed to internships and short-term professional assignments at the agency. The Junior Professional Associate programme provides a career entry point for young professionals to the international energy industry.

Youth engaged with IRENA through these various platforms are joining the vanguard of the movement for a sustainable energy future. We hope that through our work, young people will return to their universities and workplaces with fresh ideas for the adoption and use of renewable energy. IRENA's work is in line with the UAE's National Innovation Strategy driven by H.H. Sheikh Mohammed bin Rashid Al Maktoum, which cites renewable energy as one of seven key sectors in making the UAE a world innovation leader.

The case for renewable energy has never been stronger. As governments around the world embrace clean energy resources and game-changing technologies, all citizens, but particularly youth, can help ensure the positive momentum continues. *end*

About MOHAMED EL-FARNAWANY

He is the Director of Strategic Management and Chief of Staff at IRENA. He started his work with the agency in October 2011 as Chief of the Governance Support Office and Secretary of the Governing Bodies. Previously he worked in Paris representing Egypt as Minister Plenipotentiary, Deputy Chief of Mission and Charge d'Affaires. He has also held a number of positions in his government and its diplomatic service, including Special Assistant to the Minister of Foreign Affairs, Officer in Charge of U.S. relations and the Middle East Process in the Minister's Cabinet, and Political-Economic Officer - Congressional Liaison of Egypt's Embassy in Washington DC.

FOOTNOTES

1 Reference is: Renewable Energy and Jobs – Annual Review 2015 by IRENA

FACT BOX

Do you want to know more?

More on IRELP: http://www.irena.org/IRELP

More on Model IRENA: http://irenanewsroom.org/2015/04/27/youth-leaders-take-on-energy-and-climate-issues-during-model-irena-2/

More on the IRENA scholarship programme: http://www.irena.org/scholarships

Spotlight on innovation

Watering Tomorrow's Growth

DEWA launches an initiative to provide Emirati orphans with sustainability training

In July 2015, Dubai's Electricity and Water Authority (DEWA) announced a new programme. Dubai is famous for its initiatives – especially those to do with sustainability, the green economy and reducing carbon emissions. It was with this spirit of altruism that in July 2015 DEWA announced its intention to help a group within UAE society that needed extra support: orphans.

The Ruwad Initiative is aimed at educating UAE orphans in sustainability. 383 young people were chosen to head the first tranche who will benefit from this training, with the hope that they will be enlightened and empowered and go forward to learn more about their place in the development and protection of the UAE in the years to come.

Initially, the top students were sent to Singapore for six days to attend workshops at the International Creativity Camp, participate in competitions and complete projects with the purpose of serving the UAE. After they returned, they attended orientation sessions at Jebel Ali Power Station, the Mohammed bin Rashid Al Maktoum Solar Park, DEWA Academy, and the Mai Dubai Factory.

Any student can be a potential leader of tomorrow. This is why DEWA and Dubai are helping students whose social and economic status needs extra attention. It is the right of all Emiratis to engage in the future of the country and practices like this will help UAE nationals integrate into a future society better – something that is a benefit to all.

THE RISE OF THE GREEN COLLAR WORKER

GREEN JOBS FOR A GREEN ECONOMY

The renewable energy sector currently employs over 7.7 million people worldwide, according to IRENA, and as the UAE aims to take a leadership position in the global sustainability agenda, the need to develop and strengthen green employment across sectors within the country is becoming increasingly crucial. The UAE has markedly scaled up its industries, facing head on such traditional challenges as water scarcity and a heavy reliance on the oil and gas industry. The UAE's Green Growth Strategy comes at a crucial time for the nation, as we gear up for what promises to be the most sustainable and energy-efficient world's fair in history, Expo 2020, and prepare for Dubai and Abu Dhabi transitioning into highly efficient and streamlined smart cities. This strategy is ideal in meeting future challenges including urbanisation, the impact of climate change and the rising demand for energy.

هيئة كهرباء ومياه دبي
Dubai Electricity & Water Authority

POINT OF VIEW

ENG. WALEED SALMAN

Vice Chairman of the World Green Economy Summit, and the EVP of Strategy and Business Development at DEWA

THE DEMAND FOR GREEN JOBS

The resilience of economic demand can be seen best during times of economic volatility. During the world's most damaging recession in recent history, employment in green sectors managed to grow against all the odds. Just as the industrial revolution called for a legion of skilled workers to mine coal, stoke engines and work in assembly lines, we are now in an age where the longevity and success of world economies is contingent on its green workforce.

Green job categories are as diverse as the umbrella term encompassing the values and benefits of sustainability and any job that contributes to establishing and preserving a sustainable economy can be considered as a green job. In the UAE, the sector is poised to flourish, already employing a range of professionals as disparate as solar panel engineers, urban landscape architects, organic farmers, HVAC technicians and ESCO consultants.

> "Green job categories are as diverse as the umbrella term encompassing the values and benefits of sustainability"

RENEWABLE ENERGY AND ENERGY SERVICES

Projections reveal that the renewable-energy sector in the GCC will generate about 116,000 jobs every year up to 2030. This sector works well in the UAE owing to its proven success in harnessing concentrated solar-power plants with the record-breaking Shams 1 project and the Mohammed Bin Rashid Al Maktoum PV Solar Park in Dubai . The UAE's abundance of sunshine and scarcity of water poses an interesting opportunity for the solar sector and solar desalination. For every megawatt of solar energy generated, 15 jobs can be created across the value chain, and this figure alone suggests the opportunities the renewable-energy sector can bring in the near future.

Green jobs in the energy-efficiency sector are expected to increase to more than 65,000 jobs by 2030, encompassing the potential in engineering, construction, HVAC and financial consultancy in the UAE, as ESCOs gain momentum in retrofitting the nation's built-infrastructure.

AHEAD OF THE RISING DEMAND

The Green Growth Strategy aims to create 160,000 new jobs and boost the nation's GDP by 4-5% in the next 15 years. In order to promote green jobs, however, there is a pressing need to establish a robust economic infrastructure that creates the demand and optimal conditions for these sectors. The UAE established its framework for sustainable development, Vision 2021, early in its green path, setting strategies for a green economy in anticipation of the inevitable increase in demand. This includes supporting a funding mechanism for sustainable retrofitting, the adoption of clean technologies, ramping up capacity for the nation's projected population increase and targeted awareness to build campaigns that encourage sustainable practices in the private sector.

In order to identify current opportunities and skill gaps as a baseline for future growth, Dubai Carbon has intensified research in order to quantify the direct number of green jobs in Dubai, working in conjunction with Kaptan World. Based on preliminary findings, Dubai Carbon aims to develop a methodology to project future green employment that is scalable, meets Dubai's unique growth trajectory and has a focus on building cohesive and conducive public policies, in order to assist in education and research and incentivise the private sector – the largest employer in Dubai.

In principle, green jobs can be found in all sectors of an economy, and all sectors and jobs can potentially become greener. Dubai Carbon's preliminary research has already identified the most coveted green jobs in Dubai at present and extrapolating from these findings, the job categories that are likely to be in demand in the near future, including energy-efficiency consultants and engineers that can work across sectors.

It is evident that there is huge potential for the creation of more green jobs in the UAE, which in turn, are able to deliver many more positive economic, social and environmental benefits for the country, including attracting foreign investment and new technologies, decreasing waste and emissions, encouraging resource efficiency and ultimately improving quality of life in the long-term. Ultimately, the residents of the UAE are the most vital resource in providing the nation with a competitive advantage for a sustainable future. *end*

He is the Vice Chairman of the World Green Economy Summit and the EVP of Strategy and Business Development at Dubai Electricity and Water Authority. He is in charge of corporate strategy and business development and oversees new business ventures in areas such as product diversification (e.g. Mai Dubai), energy efficiency (e.g. Etihad Energy) and low-carbon development (e.g. Dubai Carbon). He is a leading figure in the Emirate's quest for green economic development through his involvement as a member of Dubai Supreme Council of Energy, the World Green Economy Summit, the Green Economy Partnership and internationally in the 'De-carbonise Energy' Global Agenda Council of the World Economic Forum.

AMBASSADORS FOR A LOW-CARBON FUTURE

By
Dr. Yousef Al Akraf

HOW TODAY'S EMIRATI STUDENTS ARE THE NATION'S BEST HOPE FOR A GREENER FUTURE

Students represent an incredible opportunity in catalysing the UAE's sustainable development goals. Recognising this untapped potential, the Dubai Electricity and Water Authority (DEWA), with the support of Dubai Carbon, has introduced the Carbon Ambassador Programme to guide students with an interest in low-carbon development toward key areas that are primed to witness a spike in demand in the near future.

> REALISING THIS VISION, HOWEVER, WILL REQUIRE THE UAE TO HONE A UNIQUELY SKILLED DOMESTIC TALENT POOL

> The programme is a five-year roadmap where current students are groomed to be true ambassadors across vertical sectors for the nation's low-carbon development

The UAE has strategically introduced a number of initiatives that all dovetail into the nation's overarching plan for sustainable socioeconomic development, including UAE Vision 2021, Dubai Plan 2021 (DP2021), the Dubai Integrated Energy Strategy, and the Green Building Code. In theory, all of these strategies can ensure long-term success for the UAE, setting a global benchmark for other nations to learn and adapt. Realising this vision, however, will require the UAE to hone a uniquely-skilled domestic talent pool. The Carbon Ambassador Programme is officially supported by a number of bodies, acknowledging the need for a dedicated educational programme to train a future workforce of skilled and innovative professionals in tandem with the growing number of green jobs. The programme is supported by United Nations Development Programme (UNDP) and the Department of Energy and Climate Change (DECC) at the UAE Ministry of Foreign Affairs (MoFA), along with others entities including DP World, recognising the programme's immense potential for the nation's projected economy. The programme is a five-year roadmap where current students are groomed to be ambassadors for the nation's low-carbon development.

Carbon Ambassadors are expected to develop a definitive set of technical skills that include project management, communication and decision-making, so that jointly, leadership qualities are imbued in each of these future sustainability trained environment engineers. Subject area experts will mentor and guide the students throughout the programme while the students find their own niche in the field.

The programme follows a holistic thematic structure and has been designed to give students a conceptual, macro-level view of key focus areas within low-carbon development, such as sustainability, carbon emission reductions and mitigation and adaptation. This is coupled with dedicated training workshops and collaborative projects aimed to ramp up their knowledge in each of these areas, which can then be utilised for real-world solutions, encapsulated in an overall turnkey project at the end of the programme.

SUSTAINABLE BUS STOPS OF THE FUTURE

In the inaugural cycle 2014/15, students were divided into four groups for the turnkey project, which involves repurposing a 20-foot shipping container as a fully functional solar powered and self-sustainable bus stop with an allocated budget of USD 10,000 from DP World. The project requires the teams to design and execute the conversion, including the interior design of these bus stops. Equipped with PRINCE2 training, assistance from their mentors, external AutoCAD experts and the Dubai Carbon team, the ambassadors address the three themes of sustainability: carbon emission reductions, mitigation and adaptation in the design stage.

The main focus of the project was to present these sustainable bus stops as feasible for eventual implementation and replication in Dubai. Locally sourced resources are used in the fabrication of the containers and by breathing life into these old shipping containers with the principle of the three Rs – reduce, reuse, recycle – the insulation, painting and even furniture are all environmentally friendly.

Aesthetically, the project has been conceptualised to reflect the UAE's unique culture and history, inspired by the camel caravan that has captured the world's imagination for centuries. Each bus stop will eventually stand out as a unique landmark throughout the city, adding character to Dubai's rich cityscape and raising awareness among residents on the functionality and beauty of sustainable design. As eye-catching units, these bus stops also have the potential to drive an increased interest in public transportation, which in itself is a positive for Dubai's sustainable future.

In terms of function, the bus stops are designed to be powered by rooftop solar modules, with the guidance of energy experts at AstraEnergi and BuroHappold to ensure the technology's functionality and longevity.

A key element in demand-side energy management is to encourage energy conscious behaviour in users, which is why the project stresses awareness-building strategies; energy-efficient fixtures, appliances, insulation, heat-reflective paint and shading structures, and posters encouraging behavioural change are all in place to address this.

Having developed essential green building-skills from the programme under the guidance of BuroHappold Engineering, CH2M Hill, and the Consolidated Contractors Company, the students have honed their project management skills and knowledge of the tendering and procurement process, along with crucial technical knowledge on architectural drawing and energy modelling.

هيئة كهرباء ومياه دبي
Dubai Electricity & Water Authority

كربون دبي
DUBAI CARBON

The ambassadors' year-long effort in creating these bus stops was showcased at WETEX in April 2015 and at the opening ceremony of the World Green Economy Summit 2015 where the Carbon Ambassadors officially graduated from the programme.

The challenge in training the next generation of sustainability leaders lies in emphasising the connection between sustainable development and jobs and businesses of the future. The success of the Carbon Ambassador Programme highlights how tertiary training, with the knowledge and financial backing from private-sector partners, can effectively encourage green innovation that can impact an entire nation. The programme – as a blueprint for the world at large – has demonstrated how sustainability can be mainstreamed in education to develop the next generation of globally responsible leaders.

On the global stage, two of the team leaders in the 2015 programme, Al Anoud Al Kendi and Noura Al Marzouqi, had the chance to represent the programme during their brief meeting with Ban Ki-moon, Secretary-General of the United Nations, during his visit to Dubai for the Government Summit in early 2015.

Ban Ki-moon praised the Carbon Ambassador Programme for its concerted effort in galvanising Dubai's young talent pool to take a lead in the global sustainable-development agenda. As the programme matures, there is true potential for the UAE to demonstrate its long-term commitment to develop and sustain a green economy, with technically proficient, creative and innovative Carbon Ambassadors in every field of business. *end*

About DR. YOUSEF AL AKRAF

As Executive Vice President (EVP) Business Support and the VP of Human Resources (HR) at DEWA. He is responsible for leading and directing all Business Support and Human Resources Division functions in line with set strategic and operational targets and activities, by ensuring efficient execution of these targets and activities in order for the corporate requirements of the Authority to be met.

"Through the Carbon Ambassador Programme, CH2M has had the pleasure of working with the next generation of thought leaders in the UAE who will be instrumental in guiding and executing the transition to a green economy. Youth programmes such as this are a critical feature of this transition since young people bring energy and innovation to problems, helping to find new solutions for the challenges we face."

Nicholas Lander,
Regional Sustainability Lead at CH2M

"It is neither our privilege, nor our prerogative which governs our intention to create a more sustainable future for mankind; it is our irrevocable duty.

We believe that by transferring knowledge, sharing ideas and creating a platform for creativity, we can change attitudes and behaviours, which is fundamental to our evolution towards a sustainable Earth. Our challenge is to create initiatives in which youth may participate in order to develop more contributors and fewer spectators. This will foster a generation of leaders who not only share a vision of a sustainable future, but also act to preserve the planet we were born to roam."

Marlise Nel,
Managing Director at Panmed

DID YOU KNOW?

SOLEPOWER

Generate power whilst walking? This is the goal of a new crowdfunding project started on site Kickstarter. The new slab, called SolePower, works with a charging cable supplied, which can be vented out through the hole in the shoe laces. The cable connects to a special battery, which can be fastened to the shoe or, alternatively, linked to the user's ankle with a special band.

The efficiency of the charging system is to allow you to recharge the battery of an iPhone or a smartphone after 2-2.5 mile walk (about 3-3.5 kilometers).

"I commend His Highness Sheikh Mohammed Bin Rashid Al Maktoum for his visionary leadership. I thank His Highness Sheikh Ahmed Bin Saeed Al Maktoum for transforming the energy sector, and His Excellency Saeed Mohammed Al Tayer for empowering youth. I applaud UNDP, the Dubai Supreme Council of Energy, and Dubai Carbon for launching the Carbon Ambassador Programme. This programme is helping students to address climate change, sustainability and energy efficiency. I was deeply impressed by the participants I met in the United Arab Emirates in February. The Carbon Ambassador Programme shows how empowered young people can make a difference."

Ban Ki-moon,
Secretary General of the United Nations
(On the occasion of the opening of the second World Green Economy Summit, Dubai, April 2015)

"Young people are in a unique position to influence the UAE's transition to a green economy. They sit instinctively at the intersection between technology and social interaction, which is the key nexus on this journey. I have also seen an appetite from young people to be involved in 'green' learning initiatives like Carbon Ambassadors and Eco Schools – and the passion and energy is evident. However, there is a need for more seasoned professionals to support, to inspire, to teach, to guide, and ultimately, to mentor the young green warriors of today into becoming the leaders of tomorrow and to uphold the UAE spirit of innovation, sustaining the economy for future generations."

Robert Okpala,
Group Director at BuroHappold Engineering

THE UAE YOUTH EMPOWERMENT STRATEGY

By
Dr. Kenneth Wilson

MOVING FORWARD TOWARDS A SUSTAINABLE FUTURE BY INCORPORATING YOUNG PEOPLE INTO THE DECISION-MAKING PROCESS

The Ministry of Culture, Youth, and Community Development has been working on a new strategy aimed at empowering Emirati young people across the country. As part of this strategy, the ministry has gathered the opinions of young Emiratis between the ages of 15 and 34. The strategy has focused on how best the country can empower young people so they become more positive contributors to the economy and society and how they can most effectively assist themselves to fully develop their respective potentials.

> THE MINISTRY HAS **SET UP A SERIES OF FORA,** ALONGSIDE AN ATTITUDE SURVEY **OF BELIEFS AND OPINIONS** OF YOUNG PEOPLE WHO WILL BE INVOLVED IN **FUTURE DECISION-MAKING ACTIVITIES**

> Over the next five years, young people in the UAE will have far more influence than could have been considered possible a generation ago

> there is greater success in **implementing working youth policies** where there are real and demonstrable avenues for young people to not only speak, **but also to have their opinions taken seriously**

Central to this process is the understanding that training and education for all in a growing knowledge-based economy is essential for future success. To this end, the ministry has set up a series of fora, alongside an attitude survey of beliefs and opinions of young people who will be involved in future decision-making activities. The results are expected towards the end of 2015 after a full examination and discussion of the issues they raise can be assessed. These discussions were benchmarked through the examination of empowerment policies from more than the 60 countries that have youth strategies already in place. The UAE has been keen to examine how this approach had been carried out and the themes that were considered. The factors considered included education, employment, health and well-being, housing, citizenship, community development and communal or national identity.

At the heart of the matter for the UAE, was the role that young people play regarding sustainable economic development, and the responsible use of resources through developing economically sustainable methods of production. A number of countries have very different approaches and some, arguably, are better at how they approach a subject than others. For example, some countries have highly formal structures for bringing young people into policy and agenda setting. In general, however, there is greater success in implementing working youth policies, where there are real and demonstrable avenues for young people to not only speak, but also to have their opinions taken seriously.

The Middle East does have its own particular issues regarding young people, however. The ILO (International Labour Organisation) has forecast that youth unemployment in the region will reach 29% by 2016 and underscores the pessimistic predictions made a few years ago. The ILO has labelled this figure 'disturbingly high', and given the propensity for high unemployment in younger people to act as a catalyst in social dynamics, as proven by the events of 2011 and the so-called Arab Spring, it is a potentially dangerous precursor to social unrest.

Thankfully, however, the UAE seems to be free of such worry, thanks at least in part to the actions of the government to address these challenges. Also, low youth unemployment is an important factor, when added to the sense that Emirati youth does not have the feeling of displacement and disconnectedness that has been the case in other Middle Eastern countries.

Nevertheless the UAE should not be complacent and should encourage young people to participate productively in the economic and social development of the country. It is essential that young people have a real voice for change and through educational empowerment can contribute to society as productive, creative and innovative individuals.

As to whether Emirati young people see things as their peers in Europe and the USA do regarding empowerment, is hard to gauge as there are many cultural differences between mainstream culture in Europe and the US when compared to Gulf countries. The central roles of religion, family and the political ruling structure are very different, and the cultural approach to decision-making also varies widely. In the Gulf, it could be argued that challenging the status quo is not as common, since nationals expect rulers and leaders to provide solutions rather than having to seek them out. This may also account for the difference in approach to entrepreneurship, although this cannot be seen as anything more than a generalisation of the reality on the ground.

As 2020 approaches, the future is closer than ever with regard to changes in how society works. Over the next five years, young people in the UAE will have far more influence than could have been considered possible a generation ago. As education, health, entrepreneurship, community participation and volunteering take a firmer hold within the UAE's culturesphere, there is certain to be an acceleration in the speed of change; change whose roots are already strong and promise to bear fruit in the foreseeable future. *end*

About
DR. KENNETH WILSON

He is an advisor in the office of the Minister of Culture, Youth and Community Development

He was previously Associate Provost at Zayed University and before that, Director of the National Research Foundation. He is currently overseeing the preparation of the UAE Youth Empowerment Strategy.

"At the heart of the matter **for the UAE** was the role that young people play regarding **sustainable** economic development"

CLIMATE CHANGE AND YOUTH ENGAGEMENT

By
Shaima Al Aydarous

Climate change will be one of the most important things shaping the world today's young people will live in. Emirati youth, therefore, need to become engaged in climate issues.

"**CLIMATE CHANGE** IS A CROSS-CUTTING ISSUE THAT IS **ADDRESSED IN DIFFERENT WAYS** BY GOVERNMENT, BUSINESSES, ACADEMIA AND THE PUBLIC"

When you ask people what they think climate change really means, you may receive a variety of answers that include recycling, tree huggers, an inconvenient truth, planting trees, saving energy and so on. These are not necessarily wrong answers, but they are incomplete.

Climate change is a multifaceted issue that governments, businesses, academia and the public all address in different ways. Climate change is a global environmental challenge caused by human activity and it affects countries differently. It is a global issue, which means that all individuals need to take action in order to limit the affect it has on their respective countries. If the issue is not adequately addressed, there is the potential of a negative ripple effect on the environment, economy and society. At the same time, climate change can also bring opportunities such as encouragement for greener development and sustainable consumption and production.

As part of the UAE's negotiating team for the United Nations Framework Convention on Climate Change, I note that sometimes it is challenging for people to appreciate the urgency and the magnitude of the issue. There seems to be a need to close the gap of what is being discussed at international conferences when engaging the public, particularly young people. There are however, different ways to address this, through public policy and educational and capacity-building programmes.

One example of this approach is the UAE Green Growth Strategy, which was adopted in 2015, and supports the UAE's transition to a greener and more climate resilient economy. It addresses local capacity-building as one of the main pillars for implementation. Through the strategy, it is estimated that around 30,000 additional university graduates are required to support its implementation. Engaging young people in issues relating to climate change and inspiring them to pursue the area in their studies and careers, will therefore become an important factor in the successful implementation of this strategy.

> "I OBSERVE THAT SOMETIMES IT IS **CHALLENGING** FOR PEOPLE TO APPRECIATE **THE URGENCY** AND **THE MAGNITUDE** OF **THE ISSUE**"

> "the Young Future Energy Leaders programme [...] offers **opportunities** for students and professionals to engage in **finding practical solutions in the field of** renewable energy and sustainability"

Recognising the importance of youth engagement, the UAE is undertaking a number of initiatives. Educational programmes, such as the Environment Agency – Abu Dhabi's Sustainable School Initiative, is one example of how to raise awareness of climate change with students. This initiative introduces to and engages primary and secondary school students on essential sustainability issues, including climate change. The programme also encourages, students to engage and contribute to initiatives. For example, students have initiated projects to collect water from air-conditioners for irrigation and have taken home what they have learned in school, which has resulted in lowering their household energy consumption and utility bills at the same time. Such programmes are essentially contributing to changing behaviour and increasing resource efficiency in the community.

Another successful initiative is the Young Future Energy Leaders programme, led by the Masdar Institute of Science and Technology. The scheme offers opportunities for students and professionals to engage in finding practical solutions in the field of renewable energy and sustainability, in order to mitigate against climate change. Also, Heroes of the UAE, a partnership between the Abu Dhabi Environment Agency and the Emirates Wildlife Society, has a huge range of ideas for how our choices in daily life can help address some of the challenges facing the UAE, from climate change to water conservation.

In order to inspire the younger generations and expose them to the international dialogue on climate change, the Ministry of Foreign Affairs is collaborating with Dubai Electricity and Water Authority and Dubai Carbon Centre of Excellence on the Carbon Ambassador Programme. We had one of the ambassadors join the UAE delegation to climate change negotiations that took place in Lima, Peru at the end of 2014, giving them firsthand experience on how the issue of climate change is discussed in international settings.

I see all these campaigns as a great opportunity for my generation to get involved in shaping the future. Become involved with the Carbon Ambassador Programme; join the Young Future Energy Leaders; come meet us at the World Future Energy Summit in January or at WETEX next October. It's our future, after all. *end*

About
SHAIMA AL AYDAROUS

She is a Climate Change Analyst at the Directorate of Energy and Climate Change, which is a department of the Ministry of Foreign Affairs

Join the Young Future Energy Leaders here:
http://yfel.masdar.ac.ae

Become a Carbon Ambassador here:
http://dcce.ae/programmes/

A SUSTAINABLE FUTURE REQUIRES NEW THINKING

By
Pirjo Jantunen

FUTURE ENERGY LEADERS ARE HERE

TO MAKE THE TRANSITION TO A SUSTAINABLE ENERGY FUTURE HAPPEN

CLIMATE CHANGE' CHALLENGES US

Every day, all over the world, people are facing diverse challenges due to climate change, water scarcity, energy shortages, pollution and food security. One of the biggest challenges our generation faces is climate change and it is exacerbated by human activity. In particular, carbon emissions are likely to be a major cause. The energy sector is one of the major contributors, but it is also a sector that climate change will disrupt most, both now and in the future. Therefore, in order to maintain acceptable living conditions on the planet that we are leaving to future generations, a transition to sustainable energy production is needed.

Sustainable energy production requires rethinking the current energy mix and increasing clean-energy production, however, it is not all about energy sources. In order to reach energy sustainability, three core dimensions need to be balanced: energy security; energy equity; and environmental sustainability.

This means that we need to change not only the way we produce energy, but also the way we consume it. Indeed, we need to think about how we manage demand, and how we increase energy efficiency across all sectors, including the residential, commercial, industrial and transport sectors.

> **ALBERT EINSTEIN NOTED THAT** TRUE LEADERSHIP IS THE BELIEF THAT YOU CAN'T SOLVE PROBLEMS USING THE SAME THINKING THAT CREATED THEM IN THE FIRST PLACE

About
PIRJO JANTUNEN

As Chair of the World Energy Council's Future Energy Leaders, she believes that the transition to a sustainable energy future, as well as to a successful Future Energy Leaders' programme, requires co-operation and participation. She works for Helen Ltd., Finland, where she develops corporate social responsibility, stakeholder involvement and responsibility policies and communications tools.

A VARIETY OF SOLUTIONS

It is easy to agree that change is needed. However, one simple solution to the problems we face does not exist and there is no one-size-fits-all solution for a sustainable energy system. For example, in northern Finland, dark, cold winters significantly increase energy consumption, but we are able to produce solar power during the summer. In the United Arab Emirates, the energy sector faces its own challenges due to very different local conditions, but in both countries, sustainable energy solutions are the ones increasingly drawing on local resources. This is because, despite the variety of energy sources and solutions used globally, the change required is so important, that small modifications in existing systems are not enough. What we need is an energy revolution.

FUTURE ENERGY LEADERS TO MAKE THE CHANGE

Albert Einstein noted that "True leadership is the belief that you can't solve problems using the same thinking that created them in the first place". For a successful energy transition, fresh thinking, innovation and new approaches are required and those most capable of boosting the transition are young, enthusiastic, energy professionals.

One excellent platform for these young energy experts to increase their knowledge and develop leadership qualities is the World Energy Council's Future Energy Leaders programme. The programme consists of 100 exceptional, young professionals who have a passion to shape the global energy future. The programme is designed to build on the ideas and innovative potential of the next generation, helping develop new ways of thinking to frame the future of sustainable energy.

The Future Energy Leaders network represents everything that is needed to change the energy industry: its members come from all parts of the world; represent diverse sectors such as government, industry, academia, civil society and social entrepreneurship; and have excellent knowledge to share on a variety of issues. Most importantly, Future Energy Leaders have the passion to shape the energy solutions for tomorrow and so, hopefully, change the world.

In order to meet the challenge, I encourage you to involve future energy leaders and young professionals in the energy transition. We, the Future Energy Leaders, might not yet have the experience present energy leaders have, but this is also where our greatest value is. We have a fresh view and the ability to ask the questions you may never have thought of. *end*

THE POWER OF YOUTH IN CULTURE

By Mohammed and Peyman Al Awadhi

TAKING EMIRATI CULTURAL AND INTELLECTUAL CONNECTIONS GLOBAL

Innovative thinkers can look at something ordinary and see the extraordinary; we see this everyday with the young people we work with, their fresh mindset carrying us forward, everywhere in the world.

Peeta Planet is a hybrid TV-web travel show that does things differently. Rather than taking the standard travel format of visiting major attractions and following guidebooks, we are two brothers who seek out more authentic experiences, encouraging social travel where visitors discover cities through the eyes of the locals.

We produce and host Peeta Planet, but it is directed by the half a million strong "Peeta Pilots", who steer the show via social media from around the globe. This audience consists of passionate people who believe in the values of cross-cultural collaboration and dialogue and the Peeta Pilots, as members of the Peeta Planet online community, guide the direction of travel. It is they who choose which countries will be visited, what should be seen, what blogs should be read, who to meet and even what food will be consumed and where.

This is the fundamental basis of the social travel concept, which generates significant audience engagement.

The show's premise focuses on local communities and local experiences, but it goes a step further than this, by also concentrating on how our human connections are developed across different cultures, while at the same time, staying true to our own unique characters and maintaining pride in our own cultures.

DON'T BE A **TOURIST**. BE A **SOCIAL TRAVELLER**

> "To this end, we made the conscious decision to **wear kandooras** in an effort to maintain our **cultural identity**"

To this end, we made the conscious decision to wear kandooras in an effort to maintain our cultural identity. As Emiratis in particular, and as Arabs in general, we are very conscious of how appearance and identity can affect an individual's interactions while travelling. We don't change who we are or what we would usually wear at home.

We make a point of wearing kandooras and ghutras on camera to spark cross-cultural interaction and dialogue, show pride in our heritage and dispel some of the negative stereotypes that exist globally around the topic of Arabs and travel. This is also how we connect to the youth at home, who live the daily reality of being young, Arab, and citizens of a globalised world.

The format has been a success: with an award-winning reality social travel show following us as we travel across the world, learning about cities through the eyes of the young change-makers who are shaping the future through their work – whether it is through art, music, technology, food or philanthropy. These proactive individuals and groups allow both us, the presenters, and the viewers a unique insight into the cities they so feel passionately about, in a far more integrated way than any guidebook. Currently, Peeta Planet is broadcast to more than 50 million viewers across the Middle East, and has a digital viewership spanning six continents. Through its social media networks, the show reaches seven million users a week and it is still growing.

FACT BOX

Peeta Planet follows the brothers as they travel across the world, seeing and learning about new cities through the eyes of the young and creative change-makers who shape them. Today, Peeta Planet is broadcasted to over 50 million viewers across the Middle East, and has a digital viewership spanning six continents. Through its social media networks, the show reaches seven million users a week and it is growing.. They are currently embarking on the world's largest Instagram-based tourism campaign and the first tourism campaign driven solely by social media, showing Dubai to the world. The #MyDubaiTrip will fly in 12 of the world's most influential Instagrammers to experience Dubai through itineraries that have been thoughtfully moderated by some of Dubai's leading social media personalities. The campaign will hopefully reach millions of Instagram users across the world.

> We produce and host Peeta Planet, but it is directed by the half a million strong **"Peeta Pilots"**, who steer the show via social media **from around the globe**

Through our production company, we have partnered with twofour54 Abu Dhabi and UTURN Ent, the most viewed YouTube channel in Saudi Arabia. Peeta Planet is also supported by such business leaders as Google MENA and InterContinental Hotel and Resorts Group. In addition to the regular shows, Peeta Planet recently partnered with Dubai's Department of Tourism and Commerce Marketing (DTCM) on the #MyDubai initiative, producing a 12-episode travel series as part of a broader tourism campaign.

In what was potentially the world's largest Instagram-based tourism campaign, the top Instagrammers from around the world won places to visit Dubai to experience crowd-sourced itineraries thoughtfully moderated by some of Dubai's leading social media personalities. The series is scheduled to air later this year.

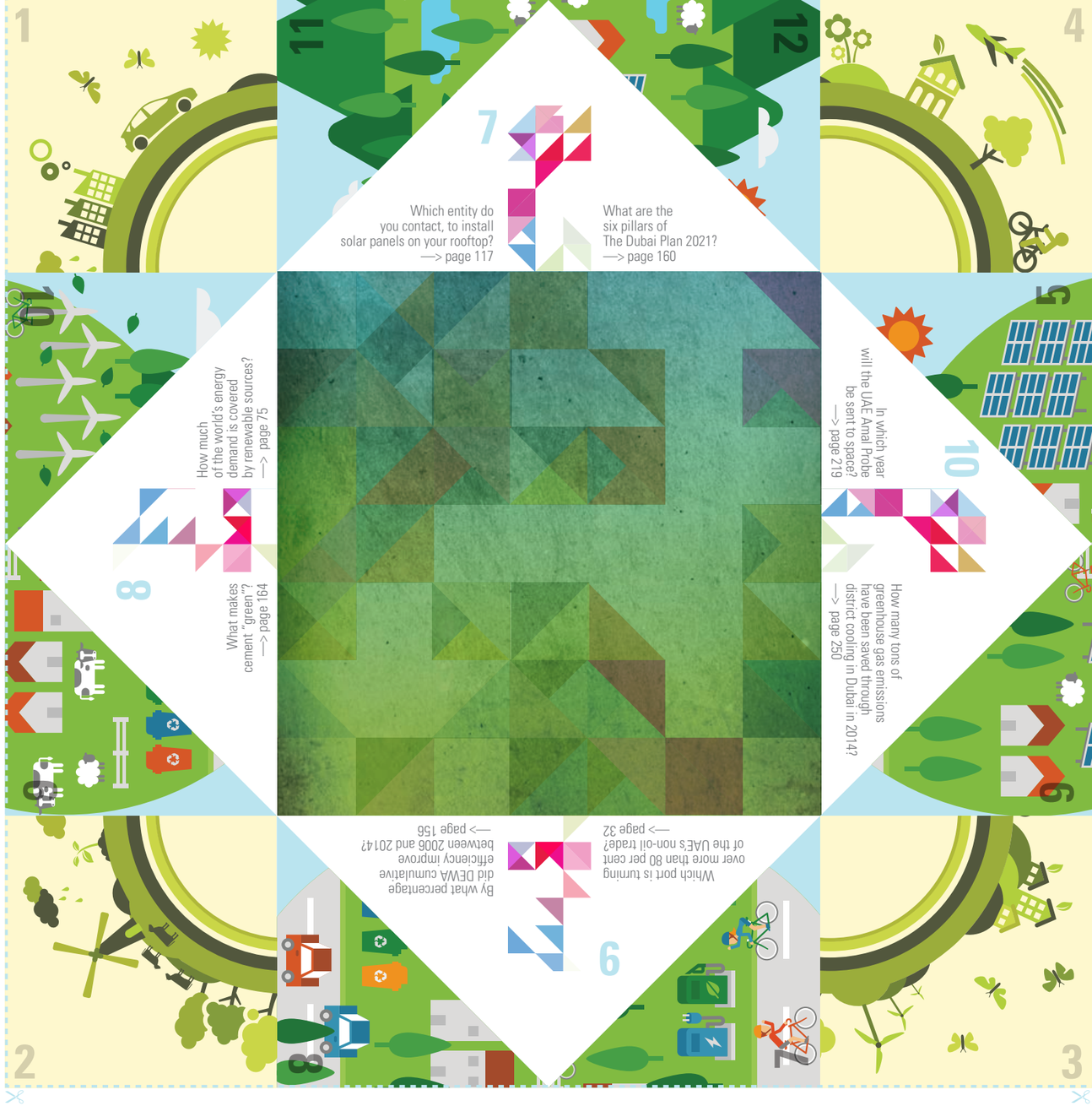
We have seen much of this innovative and creative spirit in our involvement in the Sheikh Mohammed Establishment for Young Business Leaders, a governmental organisation whose vision is to nurture this entrepreneurial spirit amongst Emiratis. Initiatives such as Peeta Planet have the potential to shape the future of Dubai as they are inspiring examples of active youth voices. Our message to everyone is that as human beings and world citizens, we are inherently more alike than we are different; it is easy to forget this amidst negative hype in the media..

Our other message is about hope. We tell the stories of amazing young innovators and how they have beaten the odds to achieve great things with limited resources. If these people can do it, it serves as an example of how anyone can. This ambition, cultural awareness and global understanding has the power to influence and motivate, encouraging potential youth innovators and change-makers from Dubai to shape our communities and our future. *end*

About
MOHAMMED AND PEYMAN AL AWADHI

Mohammed and Peyman Al Awadhi are the Co-Producers and Co-Hosts of Peeta Planet, Co-founders of Qabeela New Media - a production company which produces and distributes entertaining and socially conscious films. They specialise in building social communities through the integration of social media with film making. They are the Co-producers and Co-hosts of the award-winning reality social travel show Peeta Planet. They have been inducted onto the "Most influential Emiratis under 40" list, on the occasion of the UAE's 40th National Day celebration. Mohammed and Peyman are both members of the Sheikh Mohammed Establishment for Young Business Leaders, a government organisation whose vision is to nurture entrepreneurial spirit amongst Emiratis.

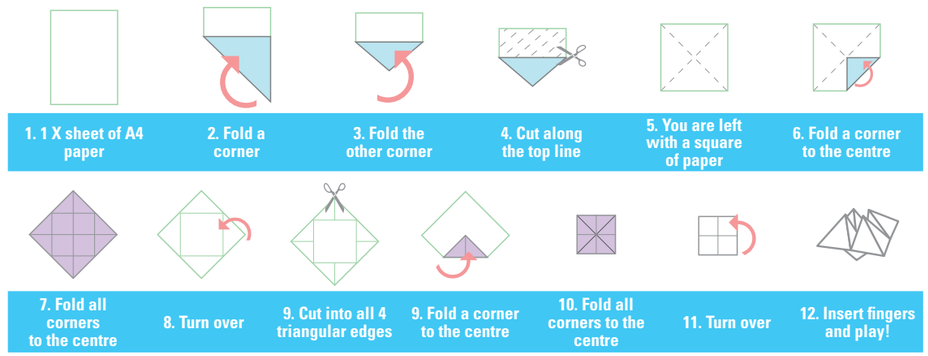
@mohamedparham @peymanalawadhi



THE GER CHATTERBOX GAME

How to Play:

- Begin with the thumb and index fingers of each hand in the four pockets of the Chatterbox
- Have the 2nd player pick one of the numbers on the top four flaps. If the choice is 2 for example, read out the number 2 while alternating a pinching and pulling motion with the chatterbox
- Each pinch will expose four of the numbers on the inner flaps, and each pull will expose the other four numbers
- After reading out 2, the 1st player will be showing one of the sets of four numbers
- The other player will then pick one of those numbers and the responding action is the alternating pinch and pull from the first round
- Once the number has been counted, four numbers will be exposed. After one is picked, the chatterbox will unveil a question. Open the report on the given page to find the answer



Did you know this game is called a Chatterbox, and it was created by a very talented Intern from Dubai Carbon?

Mira Al Falasi, supported Dubai Carbon in so many ways, through technical work and through great creative ideas such as this game.

Want to be part of the team at Dubai Carbon and share your creativity?

Let us know at: anofferyoucantrefuse@dcce.ae

WOMEN'S EMPOWERMENT IN DEWA

By
Khawla Al Mehairi

HOW DEWA IS ENCOURAGING WOMEN TO TAKE THEIR FULL AND EQUAL PLACE IN THE FUTURE OF THE UAE

KHAWLA AL MEHAIRI
VICE-PRESIDENT OF MARKETING AND CORPORATE COMMUNICATIONS AT DEWA

Since its establishment in January 2010, DEWA's Women's Committee has completed numerous effective steps that have contributed to the empowerment of women working at DEWA, enhancing their sense of contentment and happiness by encouraging them to interact and establish a stimulating work environment based on a proper work-life balance.

DEWA established the Women's Committee in line with the vision of H.H. Sheikh Mohammed Bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai, to empower women. In order to do so, the Women's Committee has adopted an integrated approach to explore various concerns women have – such as personal development and psychological, vocational, educational, health, family and environmental sustainability issues – and to implement them into plans and programmes that comply with the scope of the committee's work and objectives, to develop personal skills and a lifestyle that help women deal with different challenges and from which they can achieve long-term benefits.

One of the most important benefits this has created is that women at DEWA have become some of the most powerful ambassadors for Dubai in spreading awareness about the importance of electricity and water conservation in their daily lives. We enable them in the work place and in turn, they enable their families and homes with the means to live in a more sustainable way. If anything, the women who work at DEWA act as one of our most powerful channels of communication with society and help instil a culture of conservation and sustainability within Dubai society.

This potential has yet to be fully realised, so we can expect much more. I share the belief of H.H. Sheikh Mohammed Bin Rashid Al Maktoum, when he wrote in his book Flashes of Thought, "It is our job to provide an environment that unlocks women's potential. Given that, I am confident that women will perform nothing short of miracles. We have moved beyond the phase of empowering women. Indeed, we are empowering society itself through its women."

Khawla Al Mehairi is Vice President of Marketing & Corporate Communications at Dubai Electricity & Water Authority. She has succeeded in realising the vision and brand strategy of DEWA; positively positioning its reputation as a sustainable innovative world-class utility. She is a seasoned high-achieving leader with over 17 years of rich professional and corporate experience in the private and public sectors.

H.E. Saeed Mohammed Al Tayer with Khawla Al Mehairi
and other members of the Women's Committee at the Dubai Electricity and Water Authority.

Today the UAE is ranked first globally for treating women with respect. The UAE has institutionalised empowerment for women, with the formation of the UAE Gender Balance Council and the legal requirement that at least one woman should sit on a board of directors.

As women have advanced in society, so has sustainability, which will be driven by the power of women, today and for generations to come. *e.m.d*

هيئة كهرباء ومياه دبي
Dubai Electricity & Water Authority

INNOVATION DRIVES THE TRANSITION TO RENEWABLE ENERGY

RENEWING THE FUTURE

Recent years have seen dramatic shifts in the energy landscape. Renewable energy has gone mainstream, with technology improvements and cost reductions – together with increasing investment, firmer political will, more ambitious policies, easier learning curves and a growing appreciation of the benefits – leading to accelerated renewable-energy innovation and installation around the world.

Very significant cost reductions have made renewable energy the most cost-competitive power source in many markets. The purchase agreement for 200MW of solar photovoltaic power in the United Arab Emirates at USD 0.054/kWh – the world's lowest solar power price to date – and a recent tender bid of USD 0.041/kWh for onshore wind in Egypt underline that renewables are increasingly the least-cost option for new supply.

This transformation has been driven by investments in research and development. As deployment, as well as demonstration projects, of renewable-energy technologies become more widespread, we are also seeing increasing innovation in business and financing models, along with market structure and regulation.

Grid integration and associated technologies, such as battery storage, offer opportunities for further innovation. Achieving higher levels of variable renewable power, by extension, unlocks new economic opportunities in manufacturing, project development, trade and local job creation.

In 2014, employment in the renewable-energy sector reached 7.7 million globally (excluding large hydropower jobs), according to the latest research by the International Renewable Energy Agency (IRENA). Along with economic considerations, social benefits such as improved health make a compelling case for greener economic growth.

The potential is there. Renewable energy can help to revive economies that suffer from jobless growth and, further, can spread economic prosperity worldwide, improve every country's energy security and lift millions out of energy poverty. We are on the cusp of a third industrial revolution – one powered by clean, secure and sustainable energy.

With viable technologies and a rich renewable resource base at our disposal, along with growing ranks of entrepreneurs, multinationals and small and medium-sized enterprises in the sector, the case for renewables to become a primary energy source in many markets has never been stronger.

IRENA's REmap 2030 analysis – spanning 26 countries that account for 75% of energy use – finds that doubling the share of renewables in the global energy mix is entirely possible, in time to avert the worst impacts of climate change. The renewable-energy technologies available today can achieve this doubling, in combination with greater energy efficiency and improved energy access around the world. Moreover, fulfilling these objectives will be cheaper and cleaner than continuing with fossil fuels, if we consider all the costs related to human health and climate change. Renewables are, therefore, central to the green economy of the future.

To attract the necessary investments, renewable energy will have to compete on a level playing field. Policy innovation will be crucial in many different markets to create the enabling conditions for renewable energy to flourish. International cooperation will facilitate the sharing of experiences, best practices and innovative market mechanisms.

Through engagement with countries and decision-makers worldwide, IRENA supports this global energy transformation. Together we must continue finding, testing and demonstrating new solutions. The historic opportunity is upon us to create a sustainable energy future for us all.

H.E. ADNAN AMIN

Director-General IRENA

H.E. Adnan Amin was elected IRENA Director-General in April 2011 and is responsible for establishing a sound institutional management structure and clear strategic vision for the implementation of the agency's mandate to promote the adoption and use of renewable energy worldwide. He brings to this position over 25 years of experience in the fields of international environment and sustainable development policy. Previously, He served as Director of the New York Office of the United Nations Environment Program (UNEP) and Special Representative of the UNEP Executive Director.

IRENA
International Renewable Energy Agency

POWERING LIVES

WORLD ECONOMIC FORUM

DUBAI, CAPITAL OF THE GREEN ECONOMY

By Eng. Waleed Salman & Lars Josefsson

A WORD FROM THE WORLD ECONOMIC FORUM GLOBAL AGENDA COUNCIL

> **TARGETING** THE COMMERCIALISATION OF HIGH POTENTIAL **TECHNOLOGIES** IS PROBABLY THE MOST **COST-EFFECTIVE** ACTION THAT **CAN BE TAKEN**

Technologies to decarbonise energy will be at the core of tackling climate change effectively, as seen at the 2015 G7 summit in Germany, where political leaders underscored the importance of limiting global warming to below 2 degrees Celsius and committed to decarbonisation of the global economy over the course of the century. Notably, the G7 committed to "developing and deploying innovative technologies striving for a transformation of the energy sectors by 2050."

With the consumption and production of energy representing around two-thirds of greenhouse-gas (GHG) emissions globally, solving climate change involves both solutions to decarbonising energy and its efficient use. The focus is on technologies with high potential to decarbonise energy and how to accelerate deployment. Despite progress on technologies such as solar, wind and energy efficiency, the world is not yet on track to achieve the Intergovernmental Panel on Climate Change (IPCC) targets set to avoid the serious consequences of climate change. Faster action is required.

This lack of adequate change necessitates increasing deployment of technologies that are market-ready and the development of new technologies and solutions. Reducing the GHG footprint of energy-value chains will be at the heart of tackling climate change, but there is no quick fix.

Historically, the innovation cycle from idea to large-scale implementation has been around 30 years in the energy sector; its speed is increasing, but change will still take the form of a long-term transition. It is vital for renewable and low-carbon energy to be deployed more broadly to increase the share of these resources in the global energy-mix. In addition, energy must be consumed more efficiently in major-use sectors such as industry, buildings and transportation, and sustainable energy solutions must be found to provide affordable energy to low-income households.

There has been some positive change. Over the past 10 years, there has been rapid growth in the deployment of renewable-energy sources such as solar and wind, and in many countries a step-change has been made in energy efficiency. Today, wind and solar have reached grid-parity cost levels in many markets, with further cost decreases expected. Wind and solar are examples of what can be done when enablers are in place for production subsidies in the form of both feed-in tariffs and tax credits. Concurrently, more open trade has helped create global markets for these technologies. These developments exemplify the power of markets to drive change through investment when the business case for lower-carbon energy is attractive.

In 2014, renewables were the fastest growing form of energy, accounting for one-third of the increase in total primary energy use, but more can be done. Renewables still account for only around 3% of the world's energy needs. Despite rapid growth in low-carbon energy, regulation and investments have not always been the most effective in terms of the cost of carbon-emission reduction, nor have they unlocked low-carbon energy solutions at a speed and scale commensurate to the climate challenge at hand.

Spotlight on innovation

PV Cheap

DEWA announces the lowest-ever cost for solar-energy

Solar energy, or more technically, photovoltaic energy, is a way of converting the energy of the sun into direct current electricity. It's done through the use of semiconducting cells ionised by the effect of sunlight on their surface resulting in the generation of electricity.

For many years, it was assumed that the costs of PV energy would always be more than fossil fuels such as oil, gas or coal. Thanks to technological change, itself spurred on by the need to create more sustainable energy sources to reduce greenhouse gas emissions, this has changed remarkably in a few years.

In early 2015, the Dubai Electricity and Water Authority (DEWA) and ACWA Power, a Saudi Arabian developer, investor and operator of power plants jointly announced that they were in the process of beginning work on the development of a 260MW PV power plant in the Mohammed bin Rashid Al Maktoum Solar Park in Dubai.

What made this announcement even more remarkable is that its levelised cost will be approximately USD 5.4 cents/kWh – and is guaranteed by DEWA for 25 years. This price is not only the lowest ever levelised cost of electricity announced for a PV plant, it's actually cheaper than using traditional fuels.

This investment has proven that the use of renewable and sustainable fuels is not only cost-effective, but thanks to the work done over recent years, is sufficiently good to out-compete traditional fuel costing – and with zero emissions.

> Historically, the innovation cycle from idea to large-scale **implementation** has been around 30 years in the energy sector

About
ENG. WALEED SALMAN

He is the Vice Chairman of the World Green Economy Summit and the EVP of Strategy and Business Development at Dubai Electricity and Water Authority. He is also in charge of corporate strategy and business development and oversees new business ventures in areas such as product diversification (e.g. Mai Dubai), energy efficiency (e.g. Etihad Energy) and low-carbon development (e.g. Dubai Carbon). He is a leading figure in the Emirate's quest for green economic development through his involvement as a member of Dubai Supreme Council of Energy, the World Green Economy Summit, the Green Economy Partnership and internationally in the 'De-carbonise Energy' Global Agenda Council of the World Economic Forum.

There is no single solution; decarbonising energy requires a range of technologies that can be deployed at competitive costs. While some technologies have reached maturity and are attracting high levels of investment, they still have the potential to grow and decrease in cost. Others require more basic research, applied research and development or pilot testing to take them to maturity.

There is no clear forecast on how quickly different technologies will scale up, but there are a number of areas that hold great potential for decarbonising energy up to 2050, if properly enabled. These include short-term, market-ready solutions, such as solar; wind; nuclear third generation; efficiency in buildings, transportation and industry processes; and medium-term solutions that are not yet market-ready, but hold significant potential for acceleration and deployment, such as advanced power storage; carbon-negative technologies; geothermal; ocean energy and biofuels, amongst others.

> **RENEWABLES STILL ACCOUNT FOR ONLY AROUND 3% OF THE WORLD'S ENERGY NEEDS**

About
LARS JOSEFSSON

He is Chairman of the World Economic Forum´s Global Agenda Council on Decarbonizing Energy. He served as CEO at the Swedish power utility Vattenfall from 2000 to 2010. He is a graduate of Chalmers University of Technology (Applied Physics) and is also Professor at the Brandenburg Technische Universität. He now serves on different Boards: a.o. Robert Bosch and Brookfield Renewable Energy. Mr Josefsson is the founder of BioElectric Solutions.

Under the right conditions, the speed and deployment of innovation can be accelerated compared to business-as-usual scenarios. Targeting the commercialisation of high-potential technologies is probably the most cost-effective action that can be taken. Different enablers will have differing effects on accelerating given technologies. Some enablers, such as pricing carbon, will have a broad positive impact but will not necessarily be sufficient to unlock all high-potential solutions. Therefore, a mix of enablers is the most effective solution, ranging from a price signal for carbon, which will boost the market appetite for lower-carbon energy solutions, to stimulating innovation and public-private partnerships to accelerate breakthroughs. Energy-efficiency standards and labelling in consumer goods, transportation and buildings has also proven to be effective in improving energy conservation and efficiency.

Other enablers include eliminating trade barriers, such as tariffs on low-carbon and energy-efficient technologies, and smarter infrastructure planning to eliminate energy wastage through more efficient transportation and industrial processes, as well as city design.

There is also much that can be done on the individual level. Consumers are growing increasingly aware of the risks of climate change. There are public and private information campaigns, smart business models to overcome investment and financing challenges for distributed low-carbon energy or to offset personal GHG emissions, amongst the enablers that increase public awareness and facilitate behavioural change.

To minimise the overall GHG abatement costs and the costs of energy, it is important at the organisational level that carbon and energy-market mechanisms enable companies to optimise investments and technologies across geographies. Regional and, where possible, globally coherent frameworks are better than myriad national schemes so that mechanisms for crediting carbon reduction from measures taken abroad can lower the costs of GHG reduction and increase market opportunities for low-carbon technologies.

As projected growth in energy consumption and GHG emissions is dominated by major emerging economies, it is crucial to enable solutions suitable for these markets, as well as advanced economies. Enabling suitable and affordable low-carbon solutions that can be deployed globally will make a real and lasting difference. *end*

INTERVIEW
H.E. AHMED BUTI AL MUHAIRBI

AN INTERVIEW WITH THE SECRETARY GENERAL OF THE DUBAI SUPREME COUNCIL OF ENERGY

THE CHANGING NATURE OF DUBAI'S ENERGY POLICY

The Secretary General of the Dubai Supreme Council of Energy (DSCE) is interviewed about the first results of ongoing programmes of the Dubai Integrated Energy Strategy 2030 (DIES 2030), its current update, and policies on gas reserves and pricing and carbon abatement.

المجلس الأعلى للطاقة
Supreme Council of Energy

Q1: EARLIER THIS YEAR, DUBAI ANNOUNCED IT IS CHANGING THE COMPOSITION OF ITS ENERGY MIX AND INCREASING ITS RENEWABLE ENERGY TARGETS. PLEASE CAN YOU EXPLAIN WHY?

H.E. A.B.M.: Our renewable-energy targets were first announced in 2011 within the Dubai Integrated Energy Strategy 2030. The strategy pioneered the concept of an energy mix in the Emirate which included the first phase (13MW) of the Mohammed Bin Rashid Solar Plant and the other projects in the pipeline at that time. Dubai made the decision to diversify sources of energy as a way of securing sustainable and reliable sources for its growth in future.

When it comes to renewables, our initial goals were 1% by 2020 and 5% by 2030. However, the current attractive pricing of solar energy has made us revisit the targets. Earlier this year, the Dubai Electricity and Water Authority (DEWA) achieved very competitive pricing in its request for proposal for a new 200MW plant in the Emirate.

We have announced an intermediate goal of 15% renewable energy by 2030 but are undertaking a thorough analysis during our DIES 2030 update. We think solar is reliable and that the Middle East should be the driver, in order to sustain our oil and gas resources for as long as possible. Clean coal and natural gas will constitute the remainder of Dubai's energy mix.

Q2: YOU MENTIONED THE DUBAI INTEGRATED ENERGY STRATEGY 2030 IS CURRENTLY BEING REVIEWED. WHY IS THIS NECESSARY AND WHAT ARE SOME OF THE OTHER CHANGES TO BE EXPECTED BESIDES THOSE YOU OUTLINED ABOVE?

H.E. A.B.M.: As per law number 19 of 2009, through which the Dubai Supreme Council of Energy was established, the strategy has to be reviewed every three years to ensure we keep in focus what is truly important – a leading position globally for Dubai in terms of energy management. Besides outlining the necessity to diversify the energy mix, the strategy also focuses on the sustainability and security of supply and on demand-side management to ensure that existing energy resources are used as efficiently as possible before new capacity is developed. We are also looking at waste-to-energy. These technologies have been used widely in some parts of Europe to satisfy their needs for heating, for example. Dubai Municipality is looking into the possibility of producing electricity from domestic waste.

Q3: WHAT IS THE DSCE'S ROLE IN MAKING DUBAI THE 'SMARTEST CITY'?

H.E. A.B.M.: In line with the vision of H.H. Sheikh Mohammed Bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai, and Dubai Plan 2021 we intend to make Dubai a smart, integrated, connected city that is sustainable with its resources. We also intend to ensure that Dubai improves its quality of life and establishes itself as a role model for the world in the green economy. To this end, we launched the Dubai Green Transport initiative, to encourage the use of sustainable transport by hybrid and electric vehicles. This will contribute to a 19% decrease in total carbon emissions in Dubai, with transport being a key contributor.

Moreover, as part of the implementation of the strategy to decrease overall carbon emissions in Dubai, we have plans to reduce emissions by around 16% by 2021. The Supreme Council of Energy will cooperate with government authorities, especially those owning large fleets of vehicles, to encourage them to purchase hybrid or electric cars in the future. This will ensure the successful implementation of this initiative, which Dubai anticipates will achieve a 10% increase in the number of hybrid and electric cars by 2030.

ROADMAP

2010

- DSCE Office Creation

2011

- Strategy Deployment
- Demand Reduction Measures - First Wave
- Smart Meters Deployment

DSCE Organisational Build up

2012

- Integrated Gas Supply Strategy
- Funding & Financial Mechanisms
- Demand Reduction Measures - Second Wave
- Technical Codes (Solar)

Efficiency & Demand Reduction

2013

- Smart Grid
- Eight Programs for Demand Reduction
- Super ESCO Created

2014

- DSM Agency (planned)
- Green Building Code (Implementation Target)
- (2014-18) Deployment of Smart Meters and Smart Grid
- 200MW Solar Plant - (2017) Comissioning

Energy Supply Solar Clean Coal

2020

- Clean Coal Power Plant

Note: Target years may be adjusted to accommodate projects execution schedule.

Q4: WHAT ARE YOU DOING TO RAISE AWARENESS AMONGST THE PUBLIC OF YOUR WORK AND OF THE NEED TO STOP WASTING ENERGY AND WATER RESOURCES?

H.E. A.B.M.: DSCE, along with its affiliated bodies, has a structured approach to addressing energy and water conservation. For example: DEWA recently launched a new awareness campaign with the theme is Every Drop Matters, which is part of the awareness initiatives and programmes that DEWA launches periodically to encourage the whole of society to use natural resources responsibly. These drives enhance people's environmental green practices and contribute to establishing a culture of sustainability to support the sustainable development of Dubai.

There are also platforms, such as the Water, Energy, Technology and Environment Exhibition (WETEX) and the World Green Economy Summit (WGES). Under the DSCE, the Emirates Energy Award (EEA) grants prizes to projects such as renewable energy, innovation, clean technology, and R&D from the Middle East and North Africa region, as well as serving as a platform to encourage good practice throughout the region. The total prize budget of EEA is USD 1 million for the winners, and it looks at innovation, as well as the economic, environmental and social impact of projects. *end*

About
H.E. AHMED BUTI AL MUHAIRBI

H.E. is the Secretary General of Dubai Supreme Council of Energy (DSCE). With overall 25 years of experience in oil and gas, Ahmed Al Muhairbi uses his comprehensive knowledge of well technology as well as his petroleum engineering education, focusing on operational and technical recommendations on field development and drilling plans. H.E. has gained experience in the management of gas storage for power generation in existing fields in the Emirate of Dubai

MOHAMMED BIN RASHID AL MAKTOUM GLOBAL INITIATIVES

سقيا الإمارات
UAE WATER AID

- Spreading knowledge
- Empowering communities
- Entrepreneuship and innovation for the future
- Combating poverty and illness

In 2015, H.H. Sheikh Mohammed bin Rashid Al Maktoum established the "Mohammed bin Rashid Al Maktoum Global Initiatives Foundation", an umbrella foundation consolidating 28 organisations, with four primary goals: combating poverty and disease, spreading knowledge, empowering communities and entrepreneurship and innovation for the future. Combined, the Foundation's initiatives will target 130 million people in 116 countries. Under the field of combating poverty and disease, Suqia will take the lead in research towards water shortage solutions in the region. *end*

GLOBAL ACHIEVEMENTS SO FAR

46
hospitals built

23 million
people treated and protected from blindness

81 million
distributed vaccines and medications to treat blindness

1.5 million
households in 40 countries provided with support and relief

6.5 million
people provided with drinking water

700,000sq ft
world's largest humanitarian hub

GLOBAL INITIATIVES GOALS BY 2025

30 million
people to be treated and protected from blindness and eye diseases

Dh 2 billion
investment to establish reasearch centers and hospitals

2 million
households to be supported and enabled in 400 countries

Dh 2 million
investment towards water research in the region

HIS HIGHNESS SHEIKH MOHAMMED BIN RASHID AL MAKTOUM

VICE PRESIDENT AND PRIME MINISTER OF THE UNITED ARAB EMIRATES AND RULER OF DUBAI

"Humanitarian work and development nowadays have transformed and today's challenges require huge global foundations to contribute in creating real social change. The huge challenges faced by our region require a foundation of a scale that can meet the scale of these challenges."

H.H. Sheikh Mohammed bin Rashid Al Maktoum,
Vice President and Prime Minister of the UAE,
Ruler of Dubai

UAE WATER AID FOUNDATION (SUQIA)

By Mohammed Abdulkareem Al Shamsi

BOLSTERING THE UAE'S GLOBAL POSITION IN HUMANITARIAN AID

سقيا الإمارات
UAE WATER AID

The UAE has established a global role in international efforts to combat humanitarian challenges, as well as having a strong presence in the areas of emergency and long-term humanitarian aid in all parts of the world.

H.H. Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minster of the UAE and Ruler of Dubai, issued a law establishing the the UAE Water Aid Foundation (Suqia) as a non-profit organisation and a decree forming its board of trustees. The board is chaired by the Managing Director and Chief Executive Officer of DEWA, with board membership comprising one representative each from the Ministry of International Cooperation and Development, the UAE Red Crescent Authority, UAE University, Khalifa University of Science, Technology and Research, and two representatives from DEWA.

The foundation bolsters international efforts to provide potable clean water to people in need and fights water-related diseases that threaten lives. It contributes to finding permanent and sustainable solutions to water scarcity around the world. This is achieved by providing new and innovative technological solutions, such as solar-powered water desalination for communities that suffer from scarcity and/or contamination of drinking water. It conducts studies and research in coordination and partnership with educational, academic and international organisations to enhance potable water production using renewable-energy sources and contributes to financing and supporting water-technology projects to combat drought. The foundation also supervises a one million US dollar annual award for research that develops new technologies and mechanisms to produce water using solar power.

The foundation launched a number of campaigns to distribute water to Ramadan tents and mosques in collaboration with associations and charities in the UAE and provided relief assistance for Yemen in cooperation with the Ministry of International Cooperation and Development. It is also cooperating with DEWA in the field of research and development on desalination and purification of water using solar energy. The foundation is also cooperating with The Mohammed bin Rashid Al Maktoum Charity and Humanitarian Establishment for the provision of potable water in various developing countries.

In June 2014, H.H. Sheikh Mohammed bin Rashid Al Maktoum launched the UAE Water Aid 'Suqia' campaign to provide access to fresh drinking water for five million people around the world. The campaign received great support and was a remarkable success. It surpassed its targets, collecting over AED 180 million, enough to provide potable water to over seven million people around the world. *end*

About
MOHAMMED ABDULKAREEM AL SHAMSI

He is the Acting Executive Director of UAE Water Aid Foundation (Suqia). He has contributed to DEWA's corporate sustainability programme, which resulted in updating DEWA's sustainability strategy map, and formulating climate change strategies through the carbon emission reduction programme..

Prior joining DEWA, Al Shamsi worked in a number of leading financial institutions in the UAE.

H.E. SAEED MOHAMMED AL TAYER ON THE ESTABLISHMENT OF SUQIA

"

The wise vision of His Highness Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai, represented in the launch of the UAE Water Aid initiative last year, has formed the UAE Water Aid Foundation as a national organisation that will continue to enhance the UAE's pioneering and global position in pursuing humanitarian initiatives and aid with sustainable findings and positive effects in serving arid areas suffering from drought and clean water scarcity and providing clean and potable water using the latest technologies, including purifying and desalinating water, using solar energy.

Our wise leadership believes in the importance of cooperation among humanitarian organisations and agencies across the UAE for keeping up with new developments in the humanitarian arena and participation with international efforts. The law establishing the UAE Water Aid Foundation stresses supporting partnerships between the UAE Water Foundation and international, regional, Arab, local and civil organisations and others that have similar objectives to combat water scarcity, as the foundation is keen to reach out and serve humanity around the world.

The goals of the UAE Water Aid Foundation are not confined only to the provision of potable water to the needy across the globe. It looks beyond to contribute and find innovative and sustainable solutions to the problem through research and development, focusing on the use of solar energy to provide pure water. This is why His Highness has established an international award worth one million US dollars to emphasise the UAE's concerns about actively finding a solution to the challenges facing humanity.

The Foundation's Board of Trustees would like to pay tribute and their deepest thanks and appreciation to the wise leadership for establishing the UAE Water Aid Foundation as an international testament to the humanitarian efforts exerted by the UAE to serve those in need across the world and commits itself to maximising its efforts to achieve the noble aspirations of our leadership in serving humanity.

"

H.E. Saeed Mohammed Al Tayer,
Chairman of the Board of Trustees

MEET THE SUQIA AWARDS

By Mohammed Abdulkareem Al Shamsi

ENCOURAGING SUSTAINABLE AND INNOVATIVE SOLAR-ENERGY SOLUTIONS TO WATER PROBLEMS

The UAE Water Aid Foundation (Suqia) was launched in March 2015 to help underprivileged people in areas that are in desperate need of potable water.

Building on this goal and tying in with the UAE's ambition to become a knowledge-based economy with a strong focus on technology, R&D and innovation, His Highness Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai, announced the launch of a USD 1 million global award to find sustainable solutions to water scarcity across the world.

The Mohammed bin Rashid Al Maktoum Global Water Award aims to support this goal, encouraging leading corporations, research centres, institutions and innovators from across the world to compete to find sustainable and innovative solar-energy solutions to water problems. "We will work on searching for durable and radical solutions to the problem of water scarcity using solar energy, which God blessed our planet with, in the process of purification and desalination of water in needy areas around the world," said H.H. Sheikh Mohammed bin Rashid Al Maktoum on the announcement of the award. "We invite all research institutions around the world to participate in a competition of USD 1 million to be awarded to people who can find sustainable, cheap and innovative solutions." Water shortages and solar energy go hand-in-hand in many parts of the world, but very few nations have been able to bridge the two resources via solar power. It makes sense to employ the abundant solar resources in the Middle East to tackle the perennial problem of providing clean water, hence the focus on a solar-driven solution for securing a safe, steady and sustainable water supply. The award is comprised of three categories: innovative projects for companies, innovative studies and research, and young innovators.

MOHAMMED BIN RASHID AL MAKTOUM GLOBAL WATER AWARD CATEGORIES

The Company category is a direct call to small, medium and large companies for projects that aim to rationalise water usage and improve water management using solar energy. Applicants must clearly show measurable results in increased water production, desalination and purification and reduction in water wastage. The Innovative Studies and Research category encourages research centres, educational institutions and non-profit organisations to submit innovative technologies or process designs that utilise solar energy to desalinate and purify water, or otherwise lead to effective water-resource management. The project submitted has to have been in execution for a period of no less than a year prior to submission. Young innovators, with an age limit of 40, gives the opportunity for high school and university students to present innovative technological solutions to address water scarcity using solar energy, with the project running for at least six months prior to submission.

The award's purpose is clear: to find and support innovative solutions for water management to assist humanitarian development worldwide. The challenge is set, with companies, research institutes and young innovators invited to compete with their innovative solar-powered solutions. *e.m.d*

Spotlight on innovation

Celling Up

Hydrogen fuel cells and the search for sustainable off-grid transport

If you've been filling your car this summer in the UAE, you'll have noticed prices have gone up. With more than a 20% increase at the pumps, the need for innovation alternatives has never been more pressing. Enter hydrogen. Fuel cell technology is nothing new – it was first incorporated into a car in 1959 – but now the need for environmental protection is more pressing than ever and higher on the agenda and former considerations about cost and convenience are fading as the will to make changes becomes ever stronger.

Fuel cells aren't like batteries – they offer an opportunity to travel off-grid that electric cars can only dream of. This is because they generate electricity from their compressed store of hydrogen, allowing power to be accessed on demand. By creating hydrogen using renewable sources of energy, it's possible to have zero emissions and it's cheap and highly sustainable, with only water vapour released.

So far, Hyundai and Toyota have both introduced commercial models that are street legal: the Hyundai ix35 FCEV appeared in 2013 and the Toyota Mirai in 2014. In April 2015, Dubai Carbon signed a memorandum of understanding with AFC Energy PLC (AFC L.) at WETEX 2015 for around 300MW of AFC L. fuel cells in Dubai. This allows Dubai to head the field in zero-emission vehicles in places that need to do so for health and public safety and in places where there are yet to be electric refuelling stations.

THE SUN RISES ON JEBEL ALI PORT

HOW THE SHAMS SMART INITIATIVE IS BEGINNING TO MAKE REAL CHANGES IN JEBEL ALI PORT

DP WORLD

With the introduction of the Shams Dubai Smart Initiative, the doors for solar-grid connection have been opened in Dubai. The beneficiaries are not only savvy homeowners, but also commercial entities with large amounts of unused space.

Several entities in Dubai are currently evaluating their options following the first small-scale grid-connected installation at Dubai World Central's Al Maktoum International Airport. One of these is DP World, which operates Jebel Ali Port, the largest marine terminal in the Middle East. The initiative has evolved from DP World's ongoing resource-efficiency programme, aimed initially at cost savings and demand shaving, but now also including low-carbon power generation.

Bids have already been received and an implementation partner will be selected. The successful bidder will operate the installation under a power purchase agreement (PPA) and construction is slated to start in early 2016. A total of 24 locations are being evaluated under the initiative, mainly office building rooftops and car parks in the Jebel Ali Freezone (JAFZA). Phase one of the project will comprise approximately eight to 10 Mega Watts (MW) of power generation, which, in time will be gradually scaled up to produce up to 100MW by 2020.

This initiative by Dubai's Electricity and Water Authority (DEWA) aims to facilitate the speedy adoption of clean power in the Emirate. *end*

Advertisement

دبي الذكية SMART DUBAI
STRATEGIC PARTNER

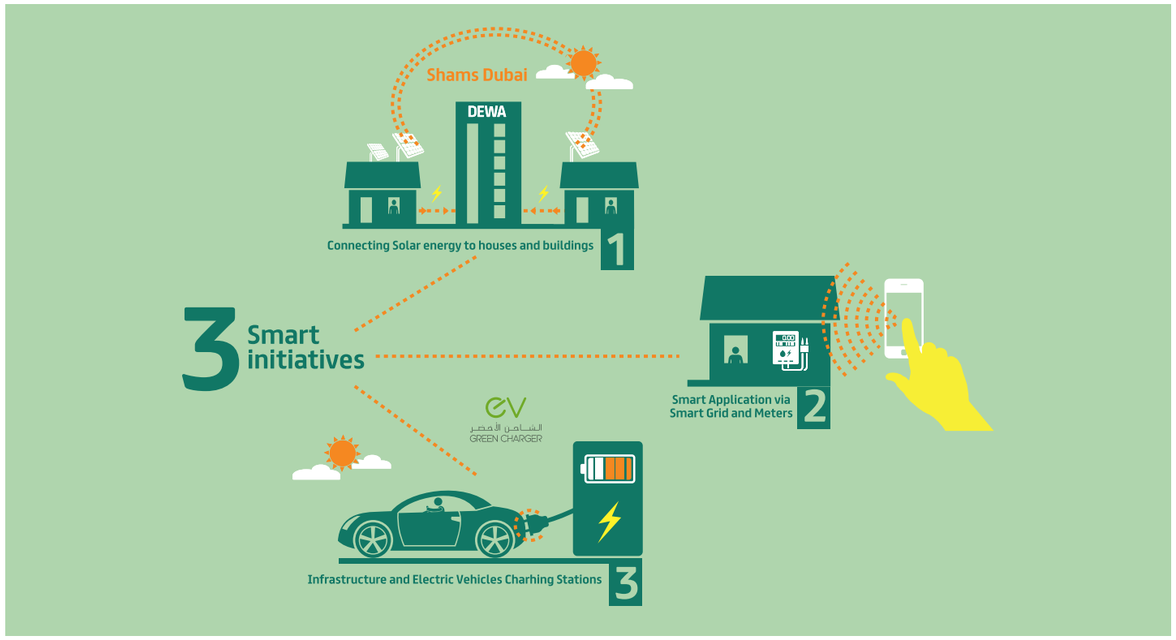
هيئة كهرباء ومياه دبي
Dubai Electricity & Water Authority

TOWARDS A SMARTER FUTURE 'HADHREEN' – AT YOUR SERVICE

In support of the vision of **His Highness Sheikh Mohammed bin Rashid Al Maktoum,** Vice President and Prime Minister of the UAE and Ruler of Dubai, to make Dubai the Smartest City in the world, DEWA is fully committed to support Dubai's vision.

DEWA is fully prepared to turn this vision into reality by offering new smart initiatives and services to the community of Dubai through the Solar Panel drive which will supply all homes and buildings with renewable energy, the Smart Applications initiative which will give customers access to the Smart Grid and Meters, and the infrastructure and electrical car charging stations.

Together, we can make this vision a reality.



For installation details, contact your DEWA contractor. Or mail to smartdubai@dewa.gov.ae

INITIATIVE 1: Shams Dubai Connecting Solar energy to houses and buildings

INITIATIVE 2: Smart Application via Smart Grid and Meters

INITIATIVE 3: EV Green Charger Infrastructure and Electric Vehicles Charging Stations

DUBAI

For generations to come

DEWA SMART WORLD | DEWA_OFFICIAL | DEWAOFFICIAL | DEWAOFFICIAL | DEWAVIDEOGALLERY | CALL US 04 6019999 | www.dewa.gov.ae | EXPO 2020 DUBAI, UNITED ARAB EMIRATES

A SOLAR RECORD

By H.E. Mohammad Abdullah Abunayyan

THE NEW-FOUND COMPETITIVENESS OF SOLAR PV TECHNOLOGY

A new report from GlobalData predicts that total global solar PV installed capacity will reach 652GW by 2025. With an expected 55 gigawatts of solar photovoltaic power set to be installed this year, the global PV market is forecast to grow 36% in 2015 alone, according to GTM Research's "Global PV Demand Outlook 2015-2020: Exploring Risk in Downstream Solar Markets" report. This is a significant increase from the market's 2% growth in 2014. With costs continuing to fall, it appears solar is entering a new era of economic competitiveness.

> "The results of this solar tender are predicted to have **far-reaching effects** across the solar power market and industry value chain, both in the **region and global markets**"

This is certainly true when it comes to the recent bids submitted to Dubai Electricity and Water Authority (DEWA) for the second phase of the Mohammed bin Rashid Al Maktoum Solar Park, which indicate the new-found competitiveness of solar PV technology. DEWA signed a Power Purchase Agreement (PPA) and Shareholder Agreement with an ACWA Power and TSK-led consortium for the 200MW second phase of the Mohammed bin Rashid Al Maktoum Solar Park at a never-before-seen price of USD 0.054/kWh. This agreement means that the solar power generated from this phase will be sold to DEWA at a fixed rate of USD 0.054/kWh over 25 years, beginning in 2017.

This gives the UAE another world record – the planet's lowest prices for solar energy – and it could very well be a game-changer for the solar sector. High costs for solar PV have previously been an obstacle prohibiting growth in the sector, but this price means solar energy is not only cost-competitive with conventional forms of power generation, but in the UAE it is even cheaper.

The results of this solar tender are predicted to have far-reaching effects across the solar power market and industry value chain, both in the region and global markets. The region's untapped solar energy potential is vast and this groundbreaking price is likely to accelerate construction of both solar PV and concentrated solar power (CSP) plants. It provides a real-world demonstration of the cost-effectiveness and scalability of solar PV technology that can propel the uptake of renewable energy. According to a report released by the International Renewable Energy Agency (IRENA), with every doubling of cumulative installed capacity, solar PV module prices are expected to fall by 18-22%, so this incredible price is undoubtedly a step in the right direction for renewables.

One of the largest strategic new Independent Power Producer (IPP) projects in the renewable-energy market worldwide, the Mohammed bin Rashid Al Maktoum Solar Park will also strengthen the position of Dubai as a global hub for trade, finance, tourism, sustainability and green economy and as an international role model for achieving the highest standards in energy efficiency. The project contributes both to the Green Economy for Sustainable Development initiative launched by H.H. Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai, to make the UAE one of the global leaders of sustainability and a hub for the export and re-export of green products and technologies and to the Dubai Plan 2021, which aims to create a society that meets the needs of the citizens and residents of the Emirate. The PPA agreement also supports the Dubai Integrated Energy Strategy 2030, developed by the Dubai Supreme Council of Energy to diversify Dubai's energy mix. Accordingly, solar energy will account for 7% of total energy production by 2020 and 15% by 2030. Further expansion will see the Solar Park generating 3,000MW of electricity when complete in 2030.

The record price achieved by DEWA is a clear demonstration of the ongoing global energy transition. It is a landmark deal in terms of the extremely competitive cost at which the project will generate power and builds the potential for a much greater take-up of renewables, while ensuring that the UAE continues to be at the forefront of solar-energy development and deployment in the region. *end*

About
H.E. MOHAMMAD ABDULLAH ABUNAYYAN

H.E. is the Chairman of ACWA Power and Abunayyan Holding Company and also serves as Chairman and member of the Board of Directors of many reputed companies, including the National Agriculture Development Company and the Saudi Research and Marketing Group besides holding a number of prestigious leadership positions helping spearhead the Kingdom's economic development.

> **SOLAR ENERGY** WILL ACCOUNT FOR **7% OF TOTAL ENERGY PRODUCTION BY 2020 AND 15% BY 2030.** FURTHER EXPANSION WILL SEE THE **SOLAR PARK GENERATING 3,000MW** OF ELECTRICITY WHEN COMPLETE IN 2030

Advertisement

ACWA POWER
أكوا باور

From Saudi to the Globe

18.0 GW of Electricity
2.5 million m3/day of Desalinated Water
33 plants in 10 countries across 3 continents

www.acwapower.com

DUBAI SUSTAINABLE ENERGY MODEL

INSIGHTFUL VISION TOWARDS SUSTAINABLE GROWTH

A TURNING POINT IN DUBAI'S ENERGY LANDSCAPE

By Taher Diab & Ilham Talab

المجلس الأعلى للطاقة
Supreme Council of Energy

"IN A RAPIDLY CHANGING WORLD, **DUBAI HAS SEIZED THE OPPORTUNITY** TO FOLLOW A **SUSTAINABLE-DEVELOPMENT PATHWAY** AS IT CONTINUES TO GROW"

In recent years, Dubai has positioned itself on the global map as the regional hub for tourism, logistics and finance. Today, the Emirate is one of the fastest growing cities in the world. This translates into relatively high demand for electricity and water. Forecasted electricity demand for the next decade is projected to grow annually by 5-6% [DEWA Sustainability Report 2013]. Therefore, demand reduction and energy efficiency are considered top priorities in Dubai's Green Agenda.

To fuel its economic growth and maintain its prominent regional and global position, Dubai initiated a smart strategy to manage demand, diversify fuel sources, secure supply and foster green growth. Under the leadership of His Highness Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai, the Emirate took progressive strides in integrating solar power into its energy portfolio, which is currently dependent mainly on imported natural gas. Its robust regulatory framework and commercial terms have attracted international and regional investors and led to the achievement of the lowest levelised cost of electricity (LCOE) for the 200MW solar photovoltaic (PV) power plant: less than USD. 0.06 per kWh. This development marks a turning point in the journey to diversify Dubai's energy mix and demonstrates the value proposition of strategic public-private partnerships for risk management, knowledge transfer and job creation.

The Dubai Sustainability Model, which is a manifestation of DSCE's structural approach to drive the energy transformation of the Emirate, is based on 10 pillars that form a comprehensive foundation for energy-sector governance.

THE JOURNEY TO A SUSTAINABLE FUTURE

The achievements of Dubai are a natural result of the exemplary governance model of its energy sector, a model that is referred to as one of the few comprehensive demonstrations of streamlined energy-sector management. This model stems from the Dubai Integrated Energy Strategy (DIES) 2030, which was launched in 2011 by the Dubai Supreme Council of Energy (DSCE) and is reviewed periodically. The DIES details a roadmap for achieving various targets by 2030, based on building a world-class regulatory framework to accelerate the diversification of the energy mix and facilitate effective demand-side management. It is aligned with the national and local vision, making it the launching pad in terms of meeting the UAE Vision and Dubai Plan 2021 energy-sustainability objectives.

Several initiatives and targets championed by DSCE entities emerged from DIES 2030, notably:

- Established a transparent regulatory framework to support investment in energy efficiency and clean technology.
- Set a target and roadmap to increase solar installed capacity to 15% by 2030 (approximately 3,000MW).
- Set a strategy to reduce electricity and water demand by 30% in 2030 compared to business as usual (BAU).
- Created a market for energy-service contracting companies (ESCOs) to drive energy efficiency projects, starting with retrofitting government buildings, by establishing Etihad ESCO to support the growth of local ESCOs and facilitate access to finance.
- Allowed distributed solar generation in residential and commercial buildings, while connecting them to the DEWA grid (Shams Dubai Project), for the first time in the UAE and the region.
- Established the Green Mobility Initiative to reduce consumption of road transportation fuel - the third largest contributor to greenhouse gases (19%). Dubai is leading by example as it mandates the introduction of hybrid and electric vehicles (EVs) within eligible government entities to create a market for such vehicles and contribute to the Dubai Smart City initiative.
- Developed a comprehensive Carbon Abatement Strategy with a target to reduce greenhouse-gas emissions (GHG) by 16% in 2021, compared to the BAU scenario for the same year.

These selected achievements are a manifestation of the Dubai Sustainable Energy Model illustrated in Figure 1. The model is based on 10 pillars that form a comprehensive foundation for energy-sector governance.

Figure 1: The 10 pillars of the Dubai Sustainable Energy Model, illustrating the journey towards a sustainable and green economy.

MARKET TRANSFORMATION

One of the pillars of the Dubai Sustainable Energy Model and a crucial factor in transforming the energy market of Dubai is the review of the electricity and water tariff structure. In 2011, DEWA introduced cost-reflective tariffs to incentivise lower consumption and encourage efficiency in the use of electricity and water. This sent positive signals to clean-energy investors as the market became economically attractive for renewable-energy technologies, allowing for successful public-private partnerships (PPP).

Today, Dubai has delivered on its commitment to renewable energy and established the foundation for a green economy. Before October 2013, the city's total installed solar PV capacity was about 4.5MW, scattered across residential and commercial applications. This figure almost tripled with the commissioning of the 13MW solar PV power plant as the first phase of the Mohammed Bin Rashid Al Maktoum Solar Park in October 2013. Less than two years later, Dubai's efforts to open the energy market for independent power producers resulted in a new global benchmark of the cheapest unsubsidised levelised cost of energy generated by solar PV in the world for the 200MW solar PV plant. This record breaking PPP deal placed solar on a par with conventional sources, such as natural gas, and transformed how utilities, project developers, policy makers and consumers perceive solar energy in Dubai and the region. In addition, fostering partnerships leading international firms in clean energy leveraged funding sources and helped balance the risk between government and private investors. Dubai is also developing its local capacities through the transfer of knowledge and skills.

The transformation of the energy sector in Dubai is also taking place on the customer side. Dubai residents can now generate their own electricity, using solar panels that can feed extra energy into Dubai's power grid. This will gradually elevate consumers to "prosumers": a term used to describe consumers who generate part of their own energy consumption.

STEADY STEPS TO BECOME A ROLE MODEL IN ENERGY MANAGEMENT AND SUSTAINABILITY

In a rapidly changing world, Dubai has seized the opportunity to follow a sustainable-development pathway as it continues to grow. The clear and supportive vision of the leadership has paved the way for developing a long-term strategy and delivering phased but steady implementation progress to achieve the goals of the Integrated Energy Strategy 2030. This has galvanised the trust of the private sector, resulting in successful public-private partnerships (PPP) that drove the cost of solar energy to low rates, positively impacting the future of solar energy not only in Dubai, but also across the entire region. The Emirate's model is emerging as a benchmark for the transition to a sustainable-energy future in a region historically perceived as synonymous with oil. As we approach 2030, Dubai is expected to turn its sunny days into sustainable fuel for generations to come and deliver strategic programmes to support its Green Agenda, becoming a role model for energy management and sustainability. *end*

About TAHER DIAB

He is Senior Director of Strategy & Planning at Dubai Supreme Council of Energy and Secretary General of the Emirates Energy Award. His career has spanned over 26 years of diversified experience in business planning, strategy development, corporate governance, sustainability and HSE and quality management systems. He worked with the U.S. Environmental Protection Agency, the ADNOC Group (UAE) and Qatar Petrochemical Company before joining the Dubai Supreme Council of Energy in April 2011.

His is actively involved in the strategic development of diversified energy sources, demand and supply management in Dubai and devising work plans for achieving the Dubai Integrated Energy Strategy 2030.

About ILHAM TALAB

She is the Business Analyst – Strategy & Planning of Dubai Supreme Council of Energy. She is currently supporting strategic decision-making for the Dubai energy sector through the development of its Integrated Energy Strategy 2030. Previously, she worked at the International Renewable Energy Agency (IRENA), designing and implementing capacity-building programmes to assist developing countries in transitioning to sustainable-energy futures. She obtained her Mechanical Engineering master's degree from Masdar Institute of Science and Technology in 2011.

ACCELERATING
THE ENERGY TRANSITION

By
Amit Pathare

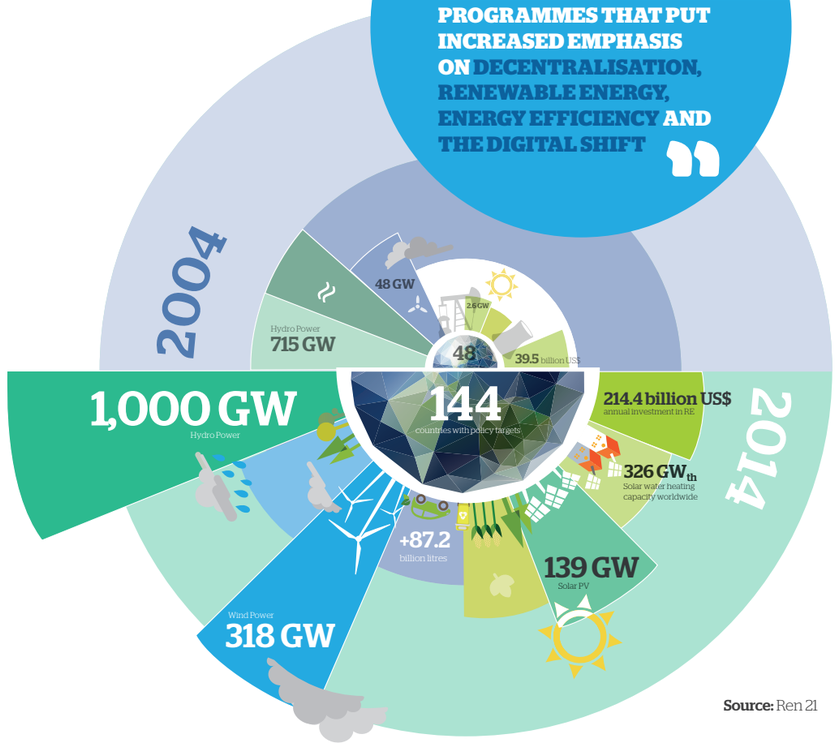
CHANGING ENERGY PRIORITIES IN THE 21ST CENTURY

There was a time when power-sector planning, at least in the developed world, was considered a reasonably well-established and relatively staid affair, as existing generation portfolios were adequate to meet demand with a fairly high degree of reliability and growth in demand would inevitably require additional power-generation capacity. This need would be satisfied through the building of (usually) new thermal or hydro power plants.

Moreover, market prices were generally sufficient to cover both the upfront capital investment for construction, as well as the ongoing costs incurred in operating these plants over their lifetimes. The system as a whole was highly centralised, with large plants connected to a high voltage transmission grid, which was ultimately connected to consumers through existing distribution networks.

The system was of course not without its risks – owners of power plants were always subjected to the vagaries of economic cycles that impacted demand growth. And like any other business, it took a combination of technical, operational and financial acumen to steer a portfolio of large investments such as power plants through their operating life-cycles. The sector has clearly seen a series of developments since the 1970s in regulatory frameworks and market design that sought to better align economic incentives, but until recently, the underlying premise of a large centralised power system with clearly demarcated producers and consumers has remained unchanged.

> DUBAI, FOR INSTANCE, HAS RESPONDED BY LAUNCHING **TWO LANDMARK** PROGRAMMES THAT PUT INCREASED EMPHASIS ON DECENTRALISATION, RENEWABLE ENERGY, ENERGY EFFICIENCY AND THE DIGITAL SHIFT



Source: Ren 21

The narrative above, has however, been changing rapidly over the past few years, propelled by the confluence of four key factors:

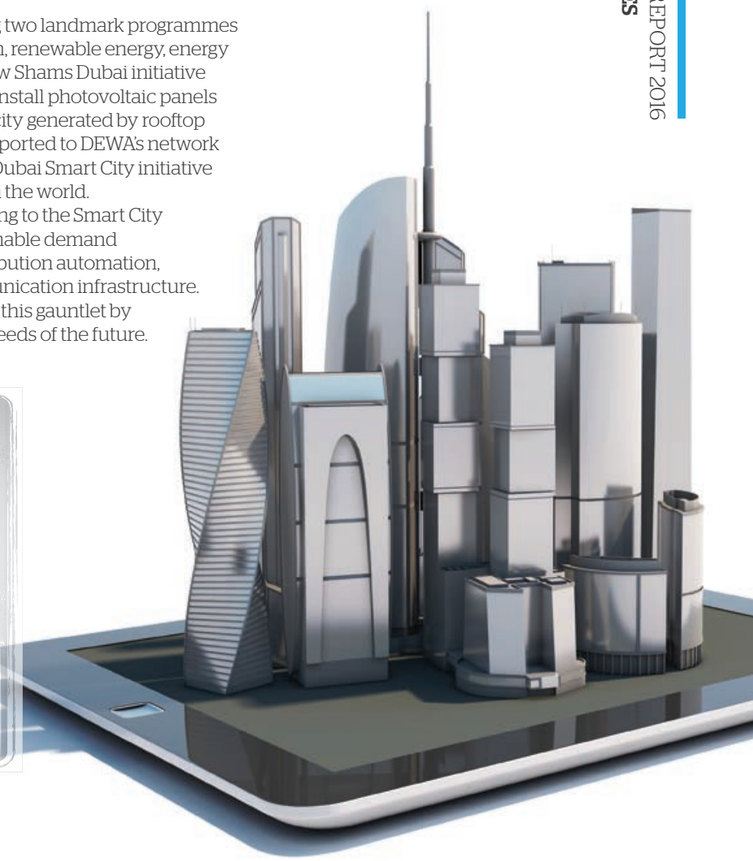
- The rapid evolution of renewable generation and power storage technologies
- Depressed electricity demand recovery (especially in the developed world)
- An emergence of new business models that exploit the emerging convergence of the energy industry with the IT, telecom, automotive and construction sectors
- An increased awareness of the impact of energy choices on climate change

In the early stages, the effects of these key changes were dismissed as being part of the usual cyclicality that the sector had always encountered, but it is now becoming evident that these changes are something more: they are a structural and permanent shift. As part of this shift, the customer is emerging as a key actor in the energy transition. The vital question is, therefore, which solutions do customers expect from their energy suppliers in this new energy world? And can existing utilities bring these solutions, or meet these new expectations?

Dubai, for instance, has responded by launching two landmark programmes that put increased emphasis on decentralisation, renewable energy, energy efficiency and the digital shift. Firstly, DEWA's new Shams Dubai initiative encourages household and building owners to install photovoltaic panels on rooftops to generate solar power. The electricity generated by rooftop solar energy is used on site and the surplus is exported to DEWA's network with a discount on the user's bill. Secondly, the Dubai Smart City initiative aims to transform Dubai into the smartest city in the world.
The energy-related objectives of DEWA pertaining to the Smart City initiative will cover developing a smart grid to enable demand response, PV integration, electric vehicles, distribution automation, smart metering and comprehensive telecommunication infrastructure. The challenge for the private sector is to take up this gauntlet by moulding new businesses better-suited to the needs of the future.

Put a different way, the activities of a responsible player in the new energy domain should be guided by three main considerations:

- Maintaining security and reliability of supply in a more decentralised energy landscape
- Operating commercially competitive businesses
- Protecting the environment



> Designing simple and accessible Rooftop Solar PV solutions for a broad range of customers will require not only a familiarity with the technology itself, but also implementation teams that take care of customers' entire projects from start to finish

Balancing these considerations is not always easy, as maintaining supply-security or reliability and protecting the environment incurs additional costs, so impacting the bottom-line. Achieving this balance requires an emphasis on innovation through new technologies, business models and financing mechanisms.

To take a specific example, designing simple and accessible rooftop solar PV solutions for a broad range of customers will require not only a familiarity with the technology itself, but also implementation teams that take care of customers' entire projects from start to finish (design to authority's approval, installation, operation and maintenance). Learning lessons from the FMCG sector, we need to make solar systems accessible with innovative financing solutions to reduce our customers' upfront costs and generate savings over the life of the installations. ENGIE sees a great potential in Dubai to transform the energy landscape with decentralised energy and intends to offer this expertise to service our commercial and industrial customers.

> **THE PATHWAY** TO THE FUTURE ENVISAGES **A SUSTAINED CONVERGENCE** BETWEEN INDUSTRIES

Building innovative partnerships with complementary industries is vital to exploiting the emerging convergences between sectors. An example of this collaboration can be seen in the work that ENGIE's Middle East Lab – together with Suez Environnement, Masdar, and Masdar Institute – has carried out in the UAE's Masdar Renewable Energy Seawater Desalination Programme.

This comprehensive R&D project aims to demonstrate the feasibility of a marketable, environment-friendly desalination technology which is powered exclusively by renewable energy. The R&D project's goal is to demonstrate that desalination technology can be powered by 100% renewable energy to select the most practical and economical solar-energy technology and so supply a full scale seawater reverse osmosis unit (SWRO) with locally produced renewable energy. Moreover, it aims to develop the techno-economically optimised design of a full-scale solar-energy power plant, coupled with the SWRO plant, to take advantage of any energy and/or water storage capacity for a more economical solution, as well as to demonstrate through simulations, the ability to produce the required quality and quantity of fresh water on a large scale SWRO unit according to the particular conditions of a selected UAE site.

ENGIE is involved in every phase of the project and is providing the techno-economic assessment and design of solar-energy sources. We are also carrying out the analysis of several scenarios (e.g. PV, PV and electrical storage, PV and solar thermal, CSP, CSP and thermal storage, CPV and electrical storage) and assessing the CAPEX, OPEX, and NPV of each scenario. We will then integrate this analysis into an overall cost optimisation for the desalination process that will result in the lowest possible water production cost.

ENGIE is also participating in a renewable-energy integration demonstrator in Singapore, which sees the implementation of a hybrid micro-network on the island of Pulau Semakau, which will combine various sources of renewable energy (wind, solar, and marine), fossil fuels and the storage of energy.

With advances in energy storage technologies, Green Mobility is also emerging as one of the themes of this energy transition. ENGIE has been a long-standing partner of the University of Leuven Solar Car Team, which participated in the Abu Dhabi Solar Challenge in January 2015, finishing in third place. We have contributed performance enhancements that have led to notable improvements in the vehicle's solar panels and electronic components (in particular, the battery recharging efficiency).

These improvements are thanks to the Laborelec External Solar Panel Testing Site and the brand-new ENGIE Battery Lab.

The pathway to the future envisages a sustained convergence between industries. For example, advances in organic PV technology and depositation techniques on glass substrates is expected to improve the economics of PV panels integrated in glass facades on buildings. The push for more energy-efficient buildings and neighbourhoods is leading to an integration of energy choices made in conjunction with urban planning, ergonomics and lifestyle management. Moreover, rapidly improving power-storage technologies are advancing the convergence of energy and mobility solutions for cities.

Finally, advances in data analytics (machine-learning and neural-networks) and metering are culminating in the emergence of the Internet of Things. Approximately 3.9 billion connected objects were in use in the world in 2014 and according to Gartner, this figure is expected to rise to 25 billion by 2020. The Internet of Things will dramatically transform the scope of entire industries. For utilities, it should enable the development of new businesses and applications such as smart-metering, water-leak detection, smart-building management and green mobility. It will enable a single provider to offer value-added services across multiple utilities such as power, gas, water, telecommunications and high-speed internet access.

From the perspective of independent power producers, the shift to a decentralised model based increasingly on renewables brings implications for their existing thermal asset portfolios. There is room for both renewable and thermal assets to operate, but several assets in Europe and the Americas that were designed for baseload operation are now operating in peaking mode, if not having already been mothballed. The transition also brings additional challenges for regulatory frameworks and market design at the country, region, and even global, level.

These are questions that increasingly set the context in the pathway to the COP21 in Paris. The central agenda is for the world to implement a sustainable pathway to decarbonisation. The cold reality is that the so-called "carbon budget" (i.e. the amount of CO_2 that can be emitted over the next 50 years to limit the average global temperature rise to 2°C) is a fraction of the carbon content in the proved fossil-fuel reserves that can be commercially exploited. The ongoing displacement of fossil fuels by renewables, together with swings in the crude oil price over the past two years, has reduced the extent of the recoverable reserves. But this is not likely to be enough – this is why ENGIE has been a strong advocate for putting a price on carbon in order to accelerate the transition.

The need of the hour is to redefine humanity's relationship to energy in order to make energy a source of progress and a component of sustainable development. Energy that is widely accessible, safer more intelligently used is better both for human beings and the environment. *end*

About
AMIT PATHARE

He is the Executive Director for ENGIE Lab in the Middle East, India & Africa

ENGIE Lab is devoted to R&D in energy and environment technologies. Amit also works extensively on new business approaches for distributed energy, smart city and green mobility initiatives.

About the Group

ENGIE develops its businesses (power, natural gas, and energy services) around a model based on responsible growth to take on the major challenges of energy transition to a low-carbon economy. It also creates access to sustainable energy, aids in climate-change mitigation and adaptation, and improves security of supply and the rational use of resources. The Group employs 152,900 people worldwide, and achieved revenues of EUR 74.7 billion in 2014.

NATURAL GAS:
THE ECONOMIC BACKBONE

By Adel Ahmed Albuainain

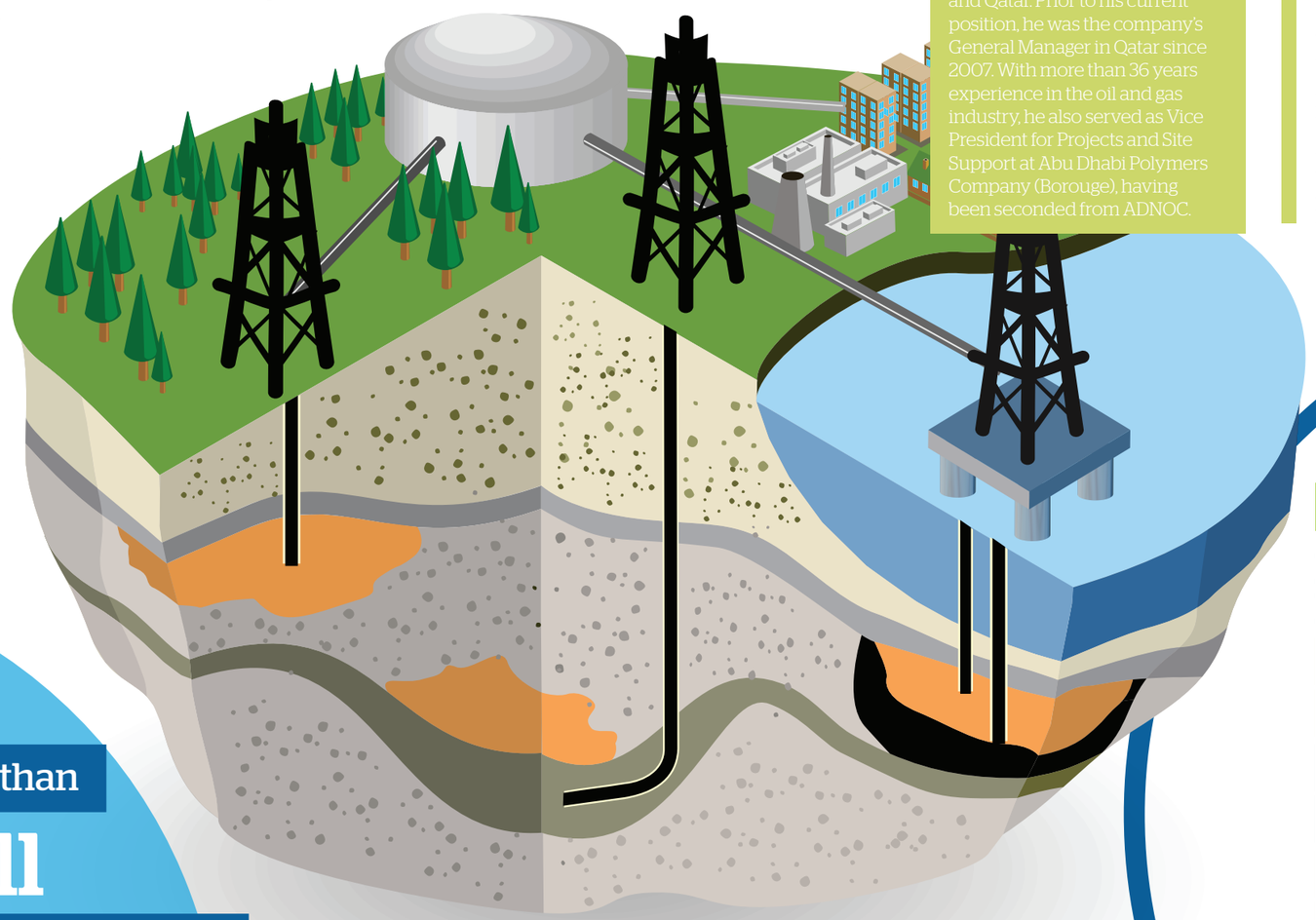
THE DOMINANT ROLE OF NATURAL GAS IN THE UAE'S INDUSTRIAL GROWTH AND DEVELOPMENT

While the role and profile of the UAE's oil strength has given the country prestige and power, it is natural gas that has fuelled rapid industrial growth, and with it, economic development and diversification. Natural gas accounts for more than 90% of all electricity generation in the country – reaching more than 27 gigawatts (GW) of installed fossil-fuel generating capacity across the seven emirates in 2013, according to the UAE's National Bureau of Statistics.

The UAE's power and desalination plants require gas as their energy source, helping to support the growth of the country's industrial zones and with them major manufacturing sectors such as aluminium, steel and petrochemicals. Around 50% of that electricity demand is being met through domestic production of gas, while the rest is currently imported. This is happening in the form of Liquefied Natural Gas (LNG) under contract, while our own Dolphin Gas Project delivers volumes of natural gas from Qatar to help meet 30% of the UAE's energy requirements every single day.

The last 10 years have seen rapid industrial, economic and demographic growth which has strained the country's electricity capacity. The UAE Ministry of Energy estimates that demand for energy will grow at 9% per annum and to address this, new energy sources are being introduced into the country's energy mix. By 2017, we will see nuclear energy help meet as much as 20% of the demand, as well as a steady growth in renewable energy – in particular, solar.

However, natural gas will still play the dominant role in driving industrial growth; estimates suggest more than 70%, because its utilisation sits at the heart of the country's sustainable development agenda and the fuel plays a key role in the country's efforts to reduce its environmental impact.



> Natural gas accounts for more than **90% of all** electricity generated in the UAE

About
ADEL AHMED ALBUAINAIN

He is the Chief Executive Officer at Dolphin Energy Limited. He is responsible for the direction of the company and its activities in the UAE and Qatar. Prior to his current position, he was the company's General Manager in Qatar since 2007. With more than 36 years experience in the oil and gas industry, he also served as Vice President for Projects and Site Support at Abu Dhabi Polymers Company (Borouge), having been seconded from ADNOC.

A number of projects have been designed to maximise the gas value chain while others have been or are in the process of being completed, that are technically challenging. Each will play a role in helping meet the rapidly increasing demand for natural gas – specifically, Al Hosn Gas, the joint venture between ADNOC and Occidental Petroleum, which came online in January 2015, and another technically challenging sour gas project in the Bab gasfield, which is being overseen by an ADNOC–Shell joint venture and is in an advanced state of development.

Media reports in May 2015 stated that both projects have been slated to help drive industrial and economic development in Al Gharbia, including the creation of a flourishing small and medium enterprises (SME) sector and with that, thousands of new jobs across the local economy.

However, the value given to gas and its role in shaping future development goes beyond comprehensive investment in new gas fields. Processing facilities are being built or expanded to enhance availability. Mubadala's joint venture with IPIC, termed Emirates LNG, will be capable of importing 1.2 billion cubic feet of gas per day, when operational.

And at our own gas plant in Ras Laffan, at the end of March 2015, we completed the installation of three new export gas compressors to increase our compression facilities. While this has not resulted in new volumes of natural gas, it does mean that we have enhanced our levels of reliability for natural gas exports to the UAE.

Finally, a major education and awareness drive about the need for energy efficiency is encouraging lower consumption, while the country's eventual use and adoption of Carbon Capture Utilisation and Storage (CCUS) as an alternative means of gas injection in the oil recovery process will free up natural gas as well as help reduce carbon emissions.

It is clear that, to date, natural gas has acted as the catalyst for the UAE's industrial growth and economic development. And even though new energy sources are emerging driven by policy changes in the sector, natural gas will still remain at the heart of the country's future. *end*

> IT IS CLEAR THAT, TO-DATE, NATURAL GAS HAS ACTED AS THE **MAIN CATALYST** FOR THE UAE'S INDUSTRIAL GROWTH AND ECONOMIC DEVELOPMENT

FACT BOX

NATURAL GAS IN FIGURES*

- Over 90% of the UAE's electricity production is fuelled by natural gas
- 50% of natural gas requirements are met through imports
- Supply from the Dolphin Gas Project meets 30% of the UAE's total electricity demand

*Statistical Annual Report Electricity and Water 2011-2013, Ministry of Energy 2014

INTERVIEW
H.E. AHMAD BIN SHAFAR

EMPOWER
ENERGY SOLUTIONS

THE EMIRATES CENTRAL COOLING SYSTEMS CORPORATION (EMPOWER) HAS BEEN IN OPERATION SINCE 2004 AND HAS BEEN AN INTEGRAL PART OF DUBAI'S DEMAND-SIDE MANAGEMENT ACTIVITIES EVER SINCE. H.E. AHMAD BIN SHAFAR, CEO OF EMPOWER, ELABORATES ON HOW IT WORKS.

THE BRIGHT FUTURE OF SUSTAINABLE DISTRICT COOLING IN DUBAI

Q1: IN WHAT WAYS DOES EMPOWER FOCUS ON ENERGY-EFFICIENT AND ENVIRONMENTALLY FRIENDLY COOLING SOLUTIONS?

H.E. A.B.S.: We at Empower focus on accelerating the pace of replacing traditional systems with new environmentally friendly technologies because we believe that these solutions will conserve precious energy and water resources and reduce our carbon footprint. In a typical residential unit, for instance, district cooling systems can cut energy usage by 45 to 50%, compared to conventional climate control systems.

Q2: HOW DOES EMPOWER ENCOURAGE THE EFFICIENT USE OF ENERGY RESOURCES THROUGH DISTRICT COOLING SERVICES (DCS)? WHAT EFFICIENCIES ARE ACHIEVED THROUGH DISTRICT COOLING RATHER THAN CONVENTIONAL SYSTEMS?

H.E. A.B.S.: Since adopting district cooling services in the UAE, we've realised that this technology could contribute strongly to energy savings and conservation of natural resources. Indeed, our strategy has made us a major contributor to Dubai's transition towards a green economy.

District cooling provides energy-efficient cooling by centralising chilled water production for mega real estate developments, instead of installing outmoded individual units in each building. The centralised system results in lower capital and operating costs, so reducing air-conditioning set-up and energy costs per building. Likewise, water is cooled in central plants and distributed through a network of piping systems to individual buildings.

All in all, district cooling systems are far more efficient than conventional systems, using half the energy consumed by existing systems and at the same time meeting the growing demand for cooling services in Dubai.

Q3: WHAT ARE THE SPECIFIC CHALLENGES FOR COOLING IN THE UAE ENVIRONMENT?

H.E. A.B.S.: Technically, scarcity of the main input of district cooling systems:, water, is a major challenge. Empower overcame this limitation through alternate sources, for example, TSE Technology. This is an award-winning innovative technology where treated sewage water is further processed at district cooling plants and used to produce chilled water. This technology saves a lot on precious potable water. Another significant challenge is reducing electricity consumption during peak hours, especially in summer. We address this issue seriously and help DEWA to reduce peak-time consumption, through TES (Thermal Energy Storage) technology. We produce chilled water during off-peak hours and transmit the same to buildings during peak hours..

Q4: WHAT CORE COMPETENCIES DOES A DISTRICT COOLING SYSTEM FOCUS ON?

H.E. A.B.S.: It needs to focus on several, including, but not limited to: optimised investment; energy efficiency; the quality of the cooled air; reduced carbon emissions; achieving customer satisfaction; high operational efficiency; and providing value to shareholders. It's worth mentioning at this point that we support the spread of district cooling systems and their adoption as part of United Nations Environment Programme (UNEP) initiative, which focuses on key areas such as technical, capacity building and training, communication and outreach. These four areas essentially reflect our core competences.

Q5: EMPOWER IS THE WORLD'S LARGEST DISTRICT COOLING SERVICES PROVIDER IN TERMS OF CAPACITY. WHAT'S THE CURRENT CAPACITY AND WHAT ARE SOME OF YOUR MAJOR PROJECTS?

H.E. A.B.S.: Empower currently produces over 1 million RT of district cooling through 62 plants spread across the Emirate of Dubai. Empower provides environmentally responsible district cooling services to mega real estate developments, such as Jumeirah Group, Business Bay, Jumeirah Beach Residence, Dubai International Financial Centre, Palm Jumeirah, Jumeirah Lake Towers, Ibn Battuta Mall, Discovery Gardens, Dubai Healthcare City, Dubai World Trade Centre Residences and Dubai Design District, among others.

> "In 2015, the cumulative total demand for refrigeration in the Middle East has reached **2.9 million tons**"

Q6: THE DUBAI INTEGRATED ENERGY STRATEGY IS DESIGNED TO IMPROVE ENERGY DEMAND EFFICIENCY AND TO CLOSE THE ENERGY SUPPLY GAP BY UP TO 40% BY 2030. HOW IS EMPOWER WORKING TOWARDS THIS GOAL?

H.E. A.B.S.: By 2015, the cumulative total demand for refrigeration in the Middle East has reached 2.9 million tonnes. District cooling can potentially reduce annual carbon dioxide emissions by about one tonne for every tonne of district cooling demand served. This can directly impact increasing demand by lowering emissions by about 2.8 million tons annually. Despite its multiple benefits, the energy-intensive nature of district cooling has set the tone for providers to explore innovative ways to minimise water wastage and efficiently operate chiller systems, while at the same time lowering operational costs.

Since its inception in 2003, EMPOWER has provided the city with environmentally viable district cooling services (DCS), by increasing energy efficiency and reducing greenhouse gas (GHG) emissions such as carbon dioxide.

In June 2013, the 'International District Energy Association' (IDEA) awarded EMPOWER the first 'Annual Innovation Award' for the effective use of Treated Sewage Effluent (TSE) in combination with a reverse osmosis (RO) process to optimise the efficiency of our large district chilled water plants and to minimise the use of valuable potable water by testing a series of blended proportions to maximise water savings. In 2015, Empower again won the Innovation Award for its Centralised Metering Data Management System with 50,000 smart meters.

Moreover, the Dubai Supreme Council of Energy formed an Advisory Committee to study various energy programmes and projects in Dubai and present their recommendations. The committee studied different options to increase the use of district cooling systems across Dubai, particularly in new projects. They studied data and analysed costs. District-cooling systems are more environmentally friendly and use less energy compared to conventional air-conditioning systems, helping reduce the carbon footprint.

FACT BOX

District Cooling and Energy Savings?

Energy savings reached 837MW in 2014. This is equal to eliminating the CO_2 emissions of more than 380,000 cars on UAE roads.

Q7: WHAT STRATEGIES DOES EMPOWER ADVOCATE TO HELP POSITION DUBAI AS A GLOBAL LEADER IN SUSTAINABILITY AND REDUCE ITS CARBON FOOTPRINT?

H.E. A.B.S.: The energy consumption of district cooling chillers is around 50% lower than traditional systems and as a result, both energy consumption and carbon emissions are substantially reduced when compared to the traditional technology. Our savings in terms of power reached 837MW in 2014. This is equal to eliminating the CO_2 emissions from more than 380,000 cars on UAE roads.

Likewise, Treated Sewage Effluent (TSE) and Thermal Energy Storage (TES) are eco-friendly technologies. We have achieved savings of 194 million imperial gallons of fresh water in 2014 – enough to fill 354 Olympic-size swimming pools. The reduced water use was the result of using TSE water resources in cooling operations. What's more, as a proactive step, Empower switched to TSE water in all the other older plants as part of Dubai's strategic plan – to save priceless fresh water. Under the directive and vision of both the UAE and the Dubai government, which demands a move towards sustainable practices, we have been able to achieve levels of global excellence in adopting TSE water for district cooling services, proving that district cooling is the ideal solution for meeting the demand of the refrigeration sector without compromising on fresh water savings.

District cooling helps the environment by increasing energy efficiency and reducing emissions, including air pollution, the greenhouse gas (GHG) carbon dioxide (CO_2) and ozone-destroying refrigerants. Most Middle Eastern governments are parties to the United Nations Framework Convention on Climate Change and with most countries in the region having extremely high per capita GHG emissions, this issue will become increasingly important in government policy.

District cooling can reduce annual CO_2 emissions by about one tonne for every ton of district cooling refrigeration tons demand served. The envisioned district cooling potential in the Middle East, which had a cumulative total of 2.9 million tons of refrigeration demand by 2015, could reduce carbon dioxide emissions by about 2.8 million tons annually. District cooling is also environmentally friendly. It enables the use of alternative and cheaper fuels and can achieve a 50% reduction in power consumption, easing the burden on power generation infrastructure and lowering greenhouse-gas emissions.

At Empower, we have made it our mission to offer sustainable solutions by delivering reliable, cost-effective and world-class, environmentally friendly district cooling services. With a total cooling capacity of over 1 million refrigeration tons in 2014 from 62 plants across the UAE, Empower's district cooling solution saved 837MW in power-plants capacity last year, while serving 50,000 customers with chilled air.

As members of the energy industry, we see it as our responsibility to operate and develop in an environmentally friendly manner. The good news is that the UAE is on the path of sustainable development. With the launch of the Green Economy Initiative, under the patronage of H.H. Sheikh Mohammed bin Rashid Al Maktoum, the Vice-President and Prime Minister of the UAE and Ruler of Dubai, reducing carbon emissions has been identified as a key activity that industries in this country are required to focus on.

Empower's carbon-emission reduction mission is in line with the UAE's long-term initiative to build a green economy. Its visionary leadership has already encouraged companies to support environmentally friendly initiatives, and it's the duty of responsible entities like Empower to integrate sustainability into their operations.

AWARD-WINNING RESEARCH AND DEVELOPMENT

Empower has been involved, from its inception, in R&D activities in line with Dubai's vision on innovation for a sustainable neighborhood. Empower's in-house R&D team effectively implemented Treated Sewage Effluent (TSE) systems in combination with Reverse Osmosis (RO) systems at its DC plants. For this, Empower was awarded by the International District Energy Association (IDEA) in 2013. The technology helps to save millions of gallons of potable water otherwise used in district cooling plants and process.

IDEA honoured Empower with the IDEA Innovation Award again in 2015, in recognition of its centralised metering data management system that manages more than 50,000 smart meters. With the current number of existing meters installed and being maintained for end-users' district cooling consumption, almost 33,304 meters are on-line and the number is set to increase to 50,000 meters by end of 2015.

SUSTAINABLE ENERGY FOR ALL: DISTRICT COOLING

Every year the United Nation's Climate Summit gathers the world leaders to champion an ambitious vision, anchored in action that will enable a meaningful global agreement to mitigate the effects of climate change. In the lead up to the game-changing climate change negotiations in Paris in December 2015, Ban Ki-moon, the UN's Secretary- General, invited leaders from government, finance, business and civil society to engage in activities to reduce emissions, strengthen climate resilience and mobilise political will towards a meaningful legal agreement .

The 'Sustainable Energy for All Global Energy Efficiency Accelerator Platform' policy session was one of these crucial tools to share existing solutions and build consensus. Held in New York in September 2014, the session brought together stakeholders to discuss how energy efficiency can help to reach goals to avert climate change, as well as contribute to economic development, growth and productivity. Empower provided an insight into the United Arab Emirates' experience on energy efficiency and the savings potential from district cooling.

Consequentially, the organisation officially endorsed the United Nations Sustainable Energy for All initiative to educate government leaders across the Middle East and North Africa on the best practices of district cooling, drawing from Empower's extensive experience in building the world's largest district cooling systems in Dubai. Empower's Chief Executive Officer, H.E. Ahmad Bin Shafar, was amongst the many influential signatories of a joint statement emphasising the specific advantages of greater deployment of district cooling systems as part of a Global District Energy Accelerator Program, developed by the United Nations Environmental Program.

District cooling was recognised for its positive impact on the climate, especially in the Middle East region. The growth of district cooling has played a critical role in improving energy efficiency and decreasing water consumption for the major new developments, for example in Dubai. For the past decade, district cooling systems, like those built by Empower, incorporate integrated structures that use up to 50% less energy than traditional air-conditioners. *end*

EMPOWER
ENERGY SOLUTIONS

"Empower currently produces **1.045 million tonnes** of district cooling through 62 plants spread across the Emirate of Dubai"

"Our saving in terms of power reached **837MW** in 2014"

About
H.E. AHMAD BIN SHAFAR

H.E. is the Chief Executive Officer (CEO) and founding member of Emirates Central Cooling Systems Corporation (Empower)

As CEO, H.E. provides strategic direction with the goal of making Empower a blue chip company and one of the most efficient and profitable district cooling services (DCS) providers in the world. Under his leadership, Empower grown to be the world's largest district cooling services provider by capacity.

H.E. is also the Chairman of the Board of Directors of Empower Logstor Insulated Pipe Systems (ELIPS), a strategic joint venture between Empower and Logstor, a world leader in pre-insulated pipe systems, and a board member of the USA based International District Energy Association (IDEA), the foremost authority of the global district energy industry.

Q8: WHAT GOALS DOES EMPOWER HAVE WITH REGARD TO EXPO 2020?

H.E. A.B.S.: Empower is extremely proud that the UAE has won the bid to host this global event and we believe Dubai is uniquely positioned to host an international event of this scale. As a bridge between East and West and a gateway to emerging markets, Dubai has proved to be the best candidate to welcome traders, visitors and representatives from across the globe.

Our main goal for Expo 2020 is to be a primary player in meeting most of the cooling demand for Expo 2020 through delivering a reliable, world class, sustainable and efficient district cooling system that has minimal impact on the natural resources of the Emirate of Dubai throughout the duration of the exhibition. As Empower continues to focus on finding solutions to conserving energy and water, it has a strong commitment to sustainability – which is one of the sub-themes of the 2020 event.

We have started to see rapid development across the city ahead of the mega-event, and we hope to be an important component of Dubai's move to be a sustainable and environmentally friendly city as it welcomes the world to Expo 2020. Dubai is the first city in the Middle East, Africa or South Asia to be awarded a World Expo, and so we're driven by our commitment to sustainability and ready to take part in this global event that is a real success for both Dubai in particular, and the UAE as a whole.

Q9: HOW DO YOU SEE NEW TECHNOLOGIES IMPACTING ON EMPOWER'S FUTURE GROWTH?

H.E. A.B.S.: Empower's innovations and R&D help us stay ahead of the field thanks to the unique features of operating district cooling plants. This provides our customers additional value. Whether you consider the role of TSE, TES, our centralised meter data management system, or our Command Control Centre, they are all customer-focused technologies with an eye on the future through better sustainability. We feel that it is important to make the most of technology through the deployment of environmentally friendly solutions with the least possible effect on the environment and natural resources. *end*

QUALITY ASSURANCE AND STANDARDISATION

BOOST RENEWABLE ENERGY PROJECT DEVELOPMENT

By
Dolf Gielen

While renewable energy is now an increasing part of today's energy mix, project developers still need to convince investors and financial backers to support their projects. Even with mature technology like hydropower, onshore wind and solar photo-voltaics (PV), the perceived investment risk remains high.

This is where standardisation and quality assurance have proven to be indispensable. Quality assurance frameworks ensure that products and services perform as expected. This builds the credibility necessary for the creation of healthy, efficient and rapidly growing technology markets and ensures that expectations can be met from investors and end-users on technology performance, durability and safety.

Through increased market recognition, standards and testing methods spur technological improvements. In the US State of Florida, a compulsory testing standard for solar water systems drove a 36% improvement in their efficiency over a five-year period. Assured quality is also a powerful tool to mitigate technical risk and provides a secure environment for large investments as commercial banks often require the use of equipment certified to international standards to approve loans.

Policy support schemes that integrate standards and quality-assurance instruments result in higher-quality products and services.

Incentive policies can increase the effectiveness of renewable-energy technology (RET) through the inclusion of mechanisms to ensure that systems deliver as planned. At present, 14 States in the US request contractor licensing and four request equipment certification for either solar or wind energy technologies. For solar photo-voltaic and thermal technologies, the State of Arizona, for example, requires residents to use certified equipment quality for a personal income tax credit.

However, significant gaps remain in implementing quality assurance and standardisation in the renewable energy sector. Applicable international standards may be hard to find, adopting them may present a challenge, or the necessary institutional infrastructure may be costly to put in place.

In order to bridge these gaps, IRENA has developed a first-of-its-kind online platform for access to international standards for renewable energy. INSPIRE – International Standards and Patents in Renewable Energy – is a single platform where users can search some 400 RET standards across the globe, obtain abstracts, link to development organisations and create real-time reports. The platform also provides access to related material from IRENA and partner organisations, learning material on how to use standards within policy frameworks and information on who is engaged in developing international RET standards. Maps show which countries are most active in RET standardisation processes, helping to create networks between standards developers and users.

IRENA continues to expand its work in the area of standardisation and quality assurance. Examples include: an in-depth analysis on how to operationalise quality assurance frameworks for solar photovoltaic technologies, as well as supporting national electricity/power regulatory bodies with standards for integrating variable renewables into electricity grids.

To foster global renewable-energy technology markets, countries need to continue engaging in the international standardisation process, supporting the development of infrastructure to implement standards in quality assurance frameworks and incorporating standards into regulatory frameworks. All these will result in lower risks and greater confidence from investors and end-users in renewable-energy technologies. *end*

About DOLF GIELEN

He is the Director of IRENA's Innovation and Technology Centre, and has, since 2011, overseen the agency's work on advising member countries in the area of technology status and roadmaps, energy planning, cost and markets and innovation policy frameworks. Before joining IRENA, Dolf was Chief of the Energy Efficiency and Policy Unit at the United Nations Industrial Development Organization (UNIDO), Vienna, managing large projects involving energy efficiency and renewable energy (including Sri Lanka, Ukraine and India).

SUMMARY RECOMMENDATIONS FOR POLICY-MAKERS FOR EACH MARKET STAGE

> In the US State of Florida, a compulsory testing standard for solar water systems drove a 36% improvement in their efficiency over a five-year period

FACT BOX

Find INSPIRE – International Standards and Patents in Renewable Energy – at http://inspire.irena.org/

FAVOURING NUCLEAR ENERGY!

By
Davide Contu

ON THE POSITIVE PUBLIC PERCEPTION OF NUCLEAR ENERGY IN THE UAE

A great deal of pressure has been assigned by the international community to mitigating climate change. To work towards this goal, the primary aim regards reducing fossil-fuel consumption, thereby reducing greenhouse-gas emissions (GHG)[1]. Nuclear energy allows a reduction of GHG to a considerable extent, as no CO_2 is emitted while generating electricity[2]. Depending on the energy situation, it can also help enhance energy diversification and mitigate specific energy-security risks[3]. Nonetheless, the possibility of accidents, the disposal of radioactive waste, the risk of nuclear proliferation and the uncertainties about construction time and costs make the implementation of nuclear energy controversial[4]. A number of years have passed since Chernobyl and public acceptance of nuclear energy has been increasing. In 2009, there were 52 countries considering nuclear-energy implementation[5].

> 33% favour the construction of nuclear plants in the UAE. What is more, including neutral respondents, non-opposers are the vast majority, amounting to 76% of the sample.

The nuclear accident in Fukushima in 2011, has, however, made the issue more contentious. Italy, for example, has stopped plans for future installations after a referendum which took place a few months after the accident. This mirrors what happened more than 20 years ago after the Chernobyl accident, which played a crucial role in Italy bringing the old-technology nuclear era to an end. In addition, Germany and Switzerland announced that they would gradually phase out nuclear energy[6]. The situation is quite the contrary in the UK. In 2008, the British government declared nuclear power to be "an attractive economic proposition to them (the investors)", yielding "economic benefits for the UK"[7]. Currently, in a context in which all but one of the existing nuclear plants will be closed by 2023[8], four new reactors are planned by EDF while Hitachi Ltd intends to build "between two and three new nuclear reactors"[9]. Other countries have also been investing in nuclear. In January 2015, there were 69 reactors under construction in 15 countries[10]. What is more, according to the World Nuclear Association (WNA), 45 countries were considering starting nuclear programmes as of June 2015. Among these are the UAE, which aims to become a role model for nuclear-energy development worldwide[11]. The UAE's plan is to have four reactors in operation by 2020 in Barakah. WNA reports that the first unit will be completed in 2017 as expected and construction of the second unit started in May 2013. Importantly, nuclear energy appears to be a practical option for the UAE to mitigate GHG emissions, in comparison with renewable energy sources and carbon capture/sequestration[12].

The present study focuses on the public acceptance of nuclear energy in the UAE. In this work, we present the results of an online survey conducted by YouGov in July 2015, with a sample of 1,912 respondents residing in the UAE. This sample, drawing from an online panel of over 434,000 members in the MENA region, is broadly representative of the UAE population by age, gender and nationality group. Specifically, it consists of 65% male and 35% female respondents; 13% aged 18-24, 49% aged 25-34, 24% aged 35-44 and 14% aged 45 or more; 8% UAE nationals; 50% residing in Dubai, 24% in Abu Dhabi, 17% in Sharjah, 9% in the Northern Emirates.

Results are presented following this order: 1) concerns about climate change, 2) preferences towards energy sources, 3) benefits and risk perception of nuclear energy and 4) acceptance/opposition of nuclear plant construction in the UAE.

All in all, UAE residents show considerable concern about climate change (see Figure 1). Specifically, 21% stated they are very concerned, whereas only 3% stated they are not concerned at all. Moreover, almost 6 out of 10 (59%) believe that the average temperature will increase in the UAE. In addition, 46% believe the UAE's emissions contribute to climate change.

As regards the preferences towards different energy sources (Figure 2), 55% think the UAE should invest mostly in solar/photovoltaic. This is followed by oil (42%), gas (38%) and wind energy (36%). Nuclear energy comes next with 26%, more than geothermal, biomass and coal. Only 11% do not want the UAE to invest anything in nuclear energy, while 24% do not have an opinion/do not know. Focusing on nuclear energy, the view is mixed as to whether the risks of nuclear energy are justified by the benefits and the contribution to mitigating climate change (Figure 3): 32% believe this is the case, whereas 30% think the opposite and, 38% are unsure.

The most promising findings in terms of public acceptance pertain to the risk perception of nuclear energy in the UAE (Figure 4). The following risks were considered: risk of catastrophic accidents, damage/threats to the environment, damage/threats to human health, terrorist attacks, military use of nuclear power and nuclear waste disposal accidents. Respondents were asked to state the likelihood of these risks, distinguishing between the UAE and in general.

Figure 1: How concerned are you, as individual about climate change?

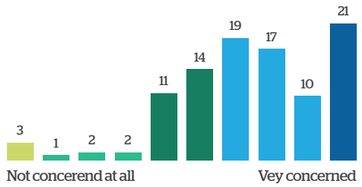


Figure 2: In your opinion, how much should the UAE invest in...

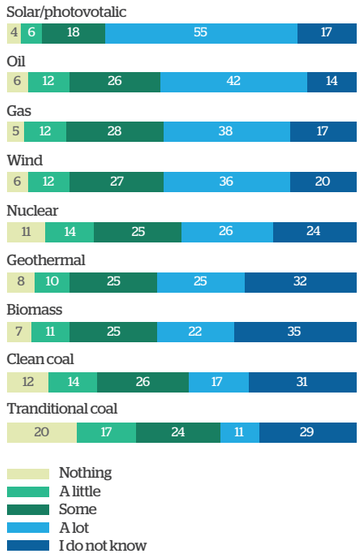
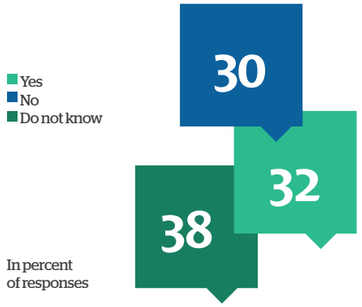


Figure 3: In your opinion, are the risks of nuclear energy justified by its benefits and contribution to climate change?



Remarkably, the UAE is associated with significantly lower perceived risks. The lowest likelihood is associated with the risk of terrorist attacks (37%) and the military use of nuclear power (37%). This is of paramount importance as attitudes towards and preferences for nuclear power appear to be driven more by perceived risks and safety than by perceived environmental benefits[13]. Instead, no substantial difference is observed when considering perceived benefits in general as opposed to the UAE, as shown in Figure 5. The benefits considered to be most likely are technology development (53%), energy-source diversification (53%) and economic growth (52%).

Figure 4: In your opinion, how likely are the following risks associated with nuclear energy?

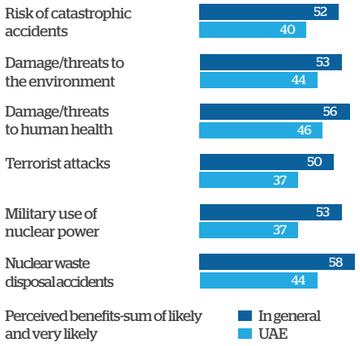
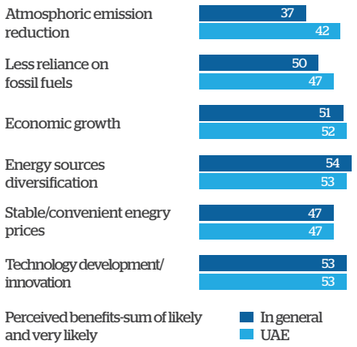
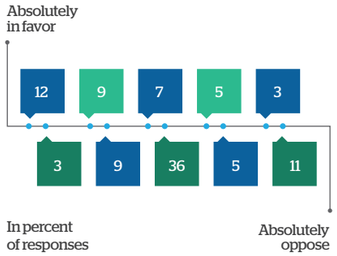


Figure 5: In your opinion, how likely are the following benefits associated with nuclear energy?



Finally, we consider views regarding the construction of nuclear plants in the UAE (Figure 6). Respondents were asked to select a score between 1 and 10, where 1 means "absolutely oppose" and 10 means "absolutely in favour". A score of 5 or 6 can be interpreted as a neutral view, whereas scores lower than 5 indicate opposition and scores greater than 6 can be interpreted as support. 33% are in favour, 43% are neutral and 24% are not in favour/oppose.

Figure 6: What is your opinion towards the construction of nuclear plants in the UAE?



In a nutshell, results indicate that respondents associate significantly lower risks to nuclear energy in the UAE. This may indicate trust towards the UAE participants involved in the planning and implementation of nuclear-energy projects. This is crucial in order to secure public acceptance of nuclear energy, as shown repeatedly in the relevant literature. In line with this, 33% favour the construction of nuclear plants in the UAE. What is more, including neutral respondents, non-opposers are the vast majority, amounting to 76% of the sample. Further investments in communication with the public could foster even higher acceptance, with the message focusing on the UAE's commitment to excellence and the safety of the nuclear-energy programme. *end*

About DAVIDE CONTU

He is a quantitative researcher with a solid background in applied economics, specialising in choice modelling. He has been investigating preferences and attitudes towards energy sources in Italy, the UK and now the UAE. He is affiliated with the London School of Economics and Political Science and collaborates with YouGov MENA.

REFERENCES

AlFarra H J, Abu -Hijleh (2012) The potential role of nuclear energy in mitigating CO_2 emissions in the United Arab Emirates. Energy Policy 42:272-285

Ansolabehere S, Deutch J, Driscoll M, Gray P, Holdren J, Joskow P, Lester R, Moniz E, Todreas N, Beckjord E (2003) The future of nuclear power: an interdisciplinary MIT study

Apergis N, Payne J E, Menyah K, Wolde-Rufael Y (2010) On the casual dynamics between emissions, nuclear energy, renewable energy, and economic growth. Ecological Economics 69(11):2255-2260

BERR-Department for Business Enterprise and Regulatory Reform (2008) A white paper on nuclear power

Berthélemy M, Rangel L E (2015) Nuclear reactors' construction costs: The role of lead-time, standardization and technological progress. Energy Policy 82:118-130

Choi Y, Lee S, Cho N, Lee B (1998) Development of the public attitude model toward nuclear power in Korea. Annals of Nuclear Energy 25(12):923-936

De Boer C, Catsburg I (1988) A report: the impact of nuclear accidents on attitudes toward nuclear energy. The Public Opinion Quarterly 52(2):254-261

DECC-Department of Energy and Climate Change http://www.decc.gov.uk/en/content/cms/meeting_energy/nuclear/nuclear.aspx

De Groot JI, Steg L., Poortinga W (2013). Values, perceived risks and benefits, and acceptability of nuclear energy. Risk Analysis 33(2):307-317

ENEC (2014) http://www.enec.gov.ae/nuclear-energy-in-the-uae/uae-nuclear-energy-policy/

European Commission (2007) Renewable Energy Road Map- Renewable energies in the 21st century: building a more sustainable future. Brussels, EU COM (2007) 8484 final

European Commission (2009) Directive of the European Parliament and the Council of the European Union 2009/28/EC of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC. Strasbourg, EU

European Commission (2011) Communication from the commission to the European Parliament, the council, the European Economic and Social Committee and the Committee of Region. A roadmap for moving to a competitive low carbon economy in 2050. COM (2011) 112

Hayashi M, Hughes L (2013) The policy responses to the Fukushima nuclear accident and their effect on Japanese energy security. Energy Policy 59:86-101

Itaoka K, Saito A, Krupnick A, Adamowicz W, Taniguchi T (2006) The effect of risk characteristics on the willingness to pay for mortality risk reductions from electric power generation. Environmental and Resource Economics 33: 371-398

Jewell J (2011) Ready for nuclear Energy? An assessment of capacities and motivations for launching new nuclear power programs. Energy Policy 39:1470-1055

Kato T (2006) Effectiveness of compensation for the risk of living near a nuclear power plant station: A natural experiment. III World Congress of Environmental and Resource Economics, Kyoto Japan

Kessides I N (2010) Nuclear Power: Understanding the economic risks and uncertainties. Energy Policy 38:3849-3864

Kessides I N (2012) The future of the nuclear industry reconsidered: Risks, uncertainties, and continued promise. Energy Policy 48:185-208.

NDA-Nuclear Decommissioning Authority (2011) Strategy, effective from April 2011. Available at http://www.nda.gov.uk/documents/upload/NDA-Strategy-Effective-from-April-2011-full-colour-version.pdf

Riddel M, Shaw D (2003) Option wealth and bequest values: The value of protecting future generations from the health risk of nuclear waste storage. Land Economics 33(1):537-548

Rosa E, Dunlap R (1994) Poll trends: nuclear power: three decades of public opinion. The Public Opinion Quarterly 58(2):295-324

Samseth J (2013) Will the introduction of renewable energy in Europe lead to CO_2 reduction without nuclear energy? Environmental Development 6:130-132

Srinivasan T N, Gopi Rethinaraj T S (2013) Fukushima and thereafter: Reassessment of risks of nuclear power. Energy Policy 52:726-736

UNFCCC-United Nations Framework Convention on Climate Change (1992) Available at http://unfccc.int/not_assigned/b/items/1417.php

Vander Beken T, Dorn N, Van Daele S (2010) Security risks in nuclear waste management: Exceptionalism, opaqueness and vulnerability. Journal of Environmental Management 91:940-948

Van der Zwaan B (2013) The role of nuclear power in mitigating emissions from electricity generation. Energy Strategy Reviews 1(4):296-301

Wang Q, Chen Xi, Yi-chong Xu (2013) Accident like the Fukushima unlikely in a country with effective nuclear regulation: Literature review and proposed guidelines. Renewable and Sustainable Energy Reviews 71:126-146

Watson J, Scott A (2009) New nuclear power in the UK: A strategy for energy security? Energy Policy 37: 5094-5104

FOOTNOTES

1 EC 2007; 2009; 2011; UNFCCC 1992
2 Apergis et al. 2010; Srinivasan and Gopi Rethinaraj 2013; Hayashi and Hughesm 2013; Wang et al. 2013; Samseth 2013; Van der Zwaan 2013
3 Watson and Scott 2009
4 Kassides 2010; Kassides 2012; Vander Beken et al. 2010
5 Jewell 2011
6 Wang et al. 2013
7 BERR 2008
8 NDA 2011
9 DECC 2013
10 Berthélemy and Rangel 2015
11 ENEC 2014
12 AlFarra and Abu -Hijleh 2012
13 Itaoka et al. 2006; Kato 2006; Riddel and Shaw 2003; Ansolabehere et al. 2003; Choi et al. 1998; Rosa and Dunlap 1994; De Boer and Catsburg 1988

"RESULTS INDICATE THAT RESPONDENTS ASSOCIATE SIGNIFICANTLY **LOWER RISKS TO NUCLEAR ENERGY** IN THE UAE"

SHAMS DUBAI

A STEP-BY-STEP GUIDE TO GRID-CONNECT YOUR SOLAR INSTALLATION

In early 2015, Dubai announced it is to encourage distributed clean energy generation through a specially created programme: the Shams Dubai Smart Initiative.

The programme creates opportunities for individuals and private companies to generate their own electricity using solar photovoltaic systems, which convert sunlight into electricity. Launched by the Dubai Electricity and Water Authority (DEWA), the programme sets out the rules and regulations for safely connecting solar systems to the grid and also screens service and equipment providers serving the new sector.

CONNECTING SOLAR ENERGY TO HOUSES AND BUILDINGS

The programme aims to facilitate the speedy adoption of clean power in the Emirate and many of its steps can be completed online. Once a contractor or consultant has been chosen for a project, they are required to apply to DEWA for a no-objection certificate on behalf of their client. Upon receiving this, the work of designing and costing a system can begin. This is followed by an application for design approval. Once a system is installed, DEWA inspectors will perform a site visit before allowing the new system to connect to the grid.

The approval process aims to ensure that the highest standards are maintained when executing projects. As the Emirate's electricity grid can accommodate the addition of significant amounts of power, currently there are no restrictions on the size of systems. It is expected that solar rooftop systems will cater to the energy needs of the facilities where they are installed. Excess power will be fed into the grid and offset against the amount of conventional energy an entity purchases from DEWA.

The first installation that was connected to the grid under the scheme was a 30KW solar array at Dubai World Central - Al Maktoum International Airport. *end*

SOLAR PV PLANT CONNECTION PROCESS

THE CONNECTION PROCEDURE CONSISTS OF 4 DIFFERENT STAGES:

- A — No Objection Certificate (NOC)
- B — Design Approval
- C — Inspection and Connection
- D — Generation

01 ENGAGING WITH CONTRACTORS/ CONSULTANTS
Customer contacts one of DEWA's enrolled consultants or contractors to investigate feasibility and get guidance on the best solution for the solar PV system in compliance with DEWA standards.(1)

02 NOC APPLICATION
The consultant or contractor submits the DEWA building Solar NOC (2) application to DEWA

03 DESIGN APPROVAL APPLICATION
Upon receiving the DEWA building solar NOC, the consultant or contractor submits application and relevant documents for solar PV design approval (3)

04 TECHNICAL DESIGN APPROVAL DOWNLOAD
Upon receiving the solar PV design approval, the assigned consultant or contractor will be provided with an estimate of the applicable connection fee.(4)

05 NOTIFICATION TO DEWA
The consultant or contractor notifies DEWA through the system that field works have been completed and the installation is ready for inspection and connection.

06 SITE INSPECTION & CONNECTION
The consultant or contractor coordinates with DEWA and the customer to facilitate site technical inspection, signing of the connection agreement, meter installation and connection of the solar PV system to DEWA grid. (5)

07 SOLAR GENERATION
Once the system is connected, the customer can generate his/her own electricity using solar energyand feed any surplus back to DEWA grid. DEWA will offset the customer's bill accordingly.

(1) The consultant or contractor will act as your agent and will advise you on the best possible solution for your system.
(2) As per the Terms and Conditions, the capacity installed cannot exceed the maximum load allowed at customer's premises. Moreover, DEWA may impose a lower threshold should it be justified by technical limitations related to the integration of your PV system into the power distribution grid.
(3) A number of technical documents need to be submitted to DEWA, such as the site plans, system design plans and details of the proposed equipment, compliance with DEWA regulations.
(4) For systems with installed capacity over 400kW, the cost of some dedicated equipment for grid intgration might be added to the standard connection fee . A budgetary estimate of such cost can be provided in the early stages of application process upon request, provided the consultant or contractor sumbit the required technical technical information
(5) For installation above 100 kW, plant perfromance test should previously be completed successfully.

SUPPLY AND DEMAND GO HAND-IN-HAND

HOW THE PRIVATE SECTOR CAN ASSIST DUBAI IN ACHIEVING ITS RENEWABLE-ENERGY TARGETS

A lot can be said about regional organisations such as Masdar or KA CARE and their efforts to promote the development of sustainable clean energy in the region, but in terms of implementation, Dubai has clearly taken the lead. DEWA secured a record low tariff of USD 0.054 per kWh, which is on par with power generated through conventional gas-fired combined cycle power plants, with the successful consortium about to start construction of the second phase of the Sheikh Mohammed Bin Rashid Al Maktoum Solar Park and the bidding process for the third phase commenced. "Dubai has the potential to lead the region, not only in utility-scale solar projects but also in small-scale solar-power generation and in developing other types of renewable energy," says Mhairi Main Garcia, Counsel at Ashurst. "The development of renewables in the Emirate is not just a flash in the pan. Dubai took a giant stride earlier this year, completing the second phase of the Mohammed bin Rashid Al Maktoum Solar Park, with the issuance of the RFP for the mammoth 800MW third phase imminent. Large-scale utility-sized renewable-energy projects in Dubai are not only achievable but, at least in terms of solar PV, are capable of competing on cost with conventional energy. Challenges remain, however, in developing an attractive investment and regulatory environment for smaller scale renewable projects."

In addition to the expansion of the solar park, DEWA launched Shams Dubai, a net metering scheme which enables building owners to reduce their utility bills by offsetting some power consumption through solar power, with the potential to add several hundred MWs annually to the DEWA grid. According to Jeremy Crane, CEO of Adenium Energy Capital, "Shams Dubai has the potential to significantly reduce the carbon emissions for many of the large commercial and industrial industries in Dubai. For the first time, they can directly generate electricity for themselves, on their premises. The future of solar power in the Middle East has never been so bright." With so much promise in the sector of renewable energy in general and solar energy specifically, it is foreseeable that more investment from international entities will be seen in Dubai. "We think the current development in Dubai provides excellent opportunities in distributed solar – a sector we are actively investing in," says Martin Haupts, Managing Director of Phanes Group.

> A successful renewable-energy strategy should include a number of key elements, such as a strong focus on improving energy efficiency across all sectors.

This puts Dubai in a good position specially since DEWA increased the percentage of renewables in the energy mix to 15% by 2030. However, to achieve this ambitious target, it won't be enough to simply deploy more photovoltaic solar-power capacity. A successful renewable-energy strategy should include a number of key elements, such as a strong focus on improving energy efficiency across all sectors. This requires a smart grid, with sufficient demand-management capability to manage, for example, weather-related fluctuations in solar-power production. Additionally, it would be advisable to open the Shams Dubai programme to other renewable-energy technologies such as micro wind turbines, fuel cells or biogas-fired generators. Another potential source of clean energy is the environmental sector, where energy from waste, biogas and waste-heat recovery solutions could provide a substantial source of dispatchable clean power.

Finally, diesel-fuel consumption can also be reduced by encouraging the use of solar power, rather than diesel generators, for off-grid application. To make this happen, it is important for Dubai to continuously improve the existing regulatory framework to enable sufficient private investment in clean-energy solutions. "We strongly believe that Solar PV energy can play a major role in helping rapidly develop Dubai to become a leading smart city with a reduced overall carbon footprint," concludes Raed Bkayrat, VP of Business Development Middle East for First Solar. *end*

About THE AUTHORS

JEREMY CRANE
CEO of Adenium Energy Capita

MHAIRI MAIN GARCIA
Counsel at Ashurst

RAED BKAYRAT
VP Business Development Middle East for First Solar.

MARTIN HAUPTS
Managing Director
Phanes Group

THE WORLD'S FUTURE AT THE 2015 PARIS CLIMATE CONFERENCE

LEADING THE CRITICAL CLIMATE CHANGE NEGOTIATIONS IN DECEMBER 2015

From November 30 to December 11, 2015, Paris will host COP21 – the 21st session of the conference of parties to the United Nations Framework Convention on Climate Change. The 2015 Paris Climate Conference is expected to see the adoption of a new international climate agreement that will hold the increase in global warming to below 2°C by the end of this century – something in which all nations have a huge stake, since it will be critical for present and future generations.

The international political response to climate change began at the Rio Earth Summit in 1992, where the 'Rio Convention' included the adoption of the UN Framework on Climate Change (UNFCCC). The UNFCCC entered into force in 1994 and now has a near-universal membership of 195 parties. The treaty under the UNFCCC, the Kyoto Protocol, from 1997, allowed the convention to come into force in 2005. The protocol's first commitment period started in 2008 and ended in 2012. A second commitment period was agreed on to run from 2012 to 2020, known as the Doha Amendment to the protocol, in which signatory developed countries committed to reduce GHG emissions by at least 18% below the 1990 figure, while developing countries agreed to craft nationally appropriate mitigation actions (NAMAs) to reduce their emissions below business as usual by 2020 in line with their national development objectives.

Since 2012, work has concentrated on creating a post-2020 agreement with the 21st session in Paris being the crossroads. COP21 faces a number of challenges that affect us all, whether we are in developed or emerging economies. It aims to create a binding and universal agreement on climate for every nation on Earth and lays the foundations for what will come after 2020. This is not an easy task for the host nation, France, and it is its national delegation that will chair the conference. Many of the world's economies are still struggling to reduce their greenhouse-gas emissions and all countries are expected to submit their national contributions by October. It is expected to be one of the largest climate conferences ever organised, with around 40,000 participants in total.

COP21 could be summed up in many ways, but perhaps the three key ideas of urgency, hope and ambition are the fundamental issues we need to face as a species. There is an urgency to what needs to be done: there is already ample evidence that the planet has been under attack from our inaction until comparatively recently. For too long we have avoided the issues that global warming is already actively bringing to life on Earth. There is hope, too. World leaders now see the need for change – and rapid change at that. There is a growing movement that supports innovation in technology and in the practices and policies we follow to reduce the impact we have on the planet.

Lastly, we have ambition: to make changes now that will have immediate effects that will slow down global warming and eventually stop it. It is our investment in innovative and sustainable methods and technologies that will help create a sustainable future for us all. Financing the resulting energy transition, particularly for developing countries, remains a critical issue. I strongly argue that clearly identifying financial instruments will be key to creating confidence, a key prerequisite for the success of the Paris conference.

France has been working alongside its European Union partners to remain at the forefront of innovation and change. It has stated fervently that change is possible and can be effective. It has pleaded consistently for the adoption of ambitious reduction targets by the European Union, which materialised with the EU Energy Climate Framework adopted in October 2014 and the EU contribution to COP21 submitted in March 2015. France has already achieved one of the lowest levels of per capita greenhouse-gas emissions of any developed country. Its parliament has adopted a law for energy transition and green growth which will pave the way for further progress.

At COP21 in December 2015 in Paris, France will lead the charge in preparing the groundwork for a dramatic transition in environmental practices and will support the new technologies that are now coming to the fore in our battle against climate change. Our best wishes to the "negotiators" for a very successful conference.

NICOLAS HULOT

Special Envoy of the French President for the Protection of the Planet, Government of France

Nicolas Hulot has been France's Special Envoy for the Protection of the Planet since 2012, and is a former reporter, writer and television programme producer. He is the Chair of the Nicolas Hulot Foundation for Nature and Mankind, a leading environmental NGO and creator of the Ecological Pact, which through the support of politicians, industrialists and the general public helped raise the environment higher on the political agenda.

Liberté • Égalité • Fraternité
RÉPUBLIQUE FRANÇAISE

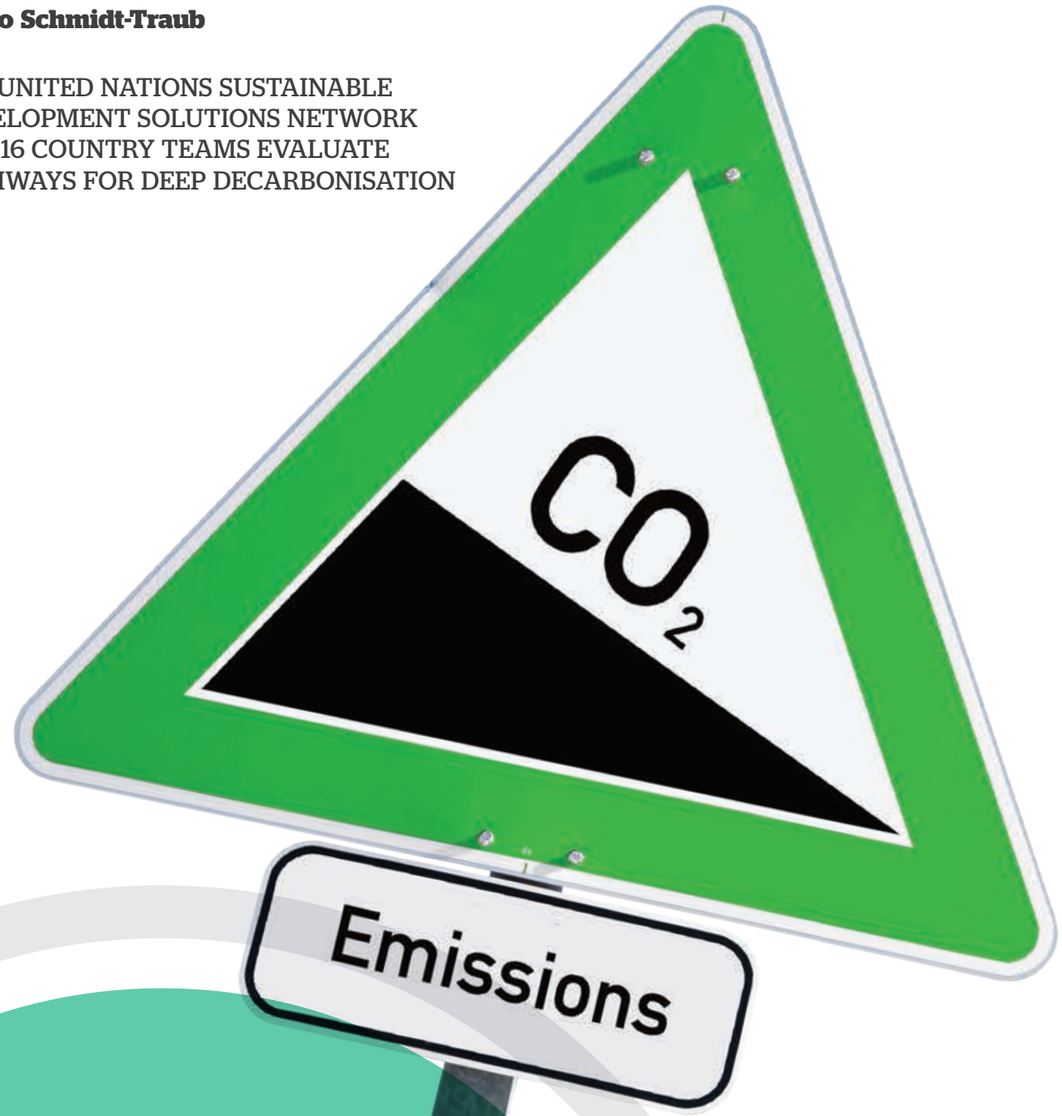
THE ROAD TO PARIS

SUSTAINABLE DEVELOPMENT SOLUTIONS NETWORK
A GLOBAL INITIATIVE FOR THE UNITED NATIONS

DEEP DECARBONISATION

By
Guido Schmidt-Traub

THE UNITED NATIONS SUSTAINABLE DEVELOPMENT SOLUTIONS NETWORK AND 16 COUNTRY TEAMS EVALUATE PATHWAYS FOR DEEP DECARBONISATION



"Every country needs a long-term deep decarbonisation pathway to ensure that **action taken today** is consistent with long-term objectives"

"WE HOPE THAT **CLIMATE CHANGE COP21** WILL RECOMMEND TO ITS MEMBER COUNTRIES **THE PREPARATION OF NON-BINDING LONG-TERM** (DECARBONISATION) PATHWAYS"

To prevent dangerous climate change, governments around the world agreed in 2010 to limit the increase in global temperatures to less than 2°C above pre-industrial levels. While a large and growing number of countries, cities and corporations have pledged to reduce their greenhouse gas emissions, these pledges taken together are far from sufficient to stay within the 2°C limit. In the absence of additional commitments to reduce emissions, global mean temperatures may increase between 3.7°C and 4.8°C compared to pre-industrial levels. When accounting for full climate uncertainty, this range extends from 2.5°C to 7.8°C by the end of the century. The consequences of such a temperature rise would be catastrophic. The science is clear: global warming beyond 2°C carries the risk of grave and irreversible harm to human wellbeing and development prospects in all countries.

In spite of the importance of the 2°C limit, very few countries have looked seriously into how they can "decarbonise" their economies by reducing emissions of carbon dioxide, methane and other greenhouse gases in line with the global carbon budget. To fill this gap, the Sustainable Development Solutions Network (SDSN) and the Institute for Sustainable Development and International Relations (IDDRI) launched the Deep Decarbonisation Pathways Project (DDPP) in October 2013. The project currently comprises institutions from 16 countries at different stages of development that represent about 70% of global GHG emissions (Australia, Brazil, Canada, China, France, Germany, India, Indonesia, Italy, Japan, Mexico, Russia, South Africa, South Korea, the United Kingdom and the United States). Each country team addresses the question of how their respective country can decarbonise its energy system in a way that is consistent with national socio-economic development objectives and the global carbon budget for 2°C.

Since investments in power generation, industrial plants, buildings and other infrastructure have lifetimes in excess of 30 years, decarbonisation must be pursued over the long-term through to 2050. Decisions made today with regards to, say, power generation and transport infrastructure, will have a long-term impact on future greenhouse-gas emissions. For this reason, every country needs a long-term deep decarbonisation pathway to ensure that action taken today is consistent with the long-term objective of deep decarbonisation by mid-century. Short-term strategies and policies must be based on a "back-casting" from this decarbonised energy system.

THE DDPP HAS FOUND THAT DEEP DECARBONISATION OF NATIONAL ENERGY SYSTEMS IS POSSIBLE IF THREE PILLARS ARE PURSUED WITH DETERMINATION:

01

Energy efficiency and conservation:

greatly improved energy efficiency in all energy end-use sectors, including passenger and goods transportation, through improved vehicle technologies, smart urban design and optimised value chains; residential and commercial buildings, through improved end-use equipment, architectural design, building practices and construction materials; and industry, through improved equipment, production processes, material efficiency and re-use of waste heat

02

Low-carbon electricity:

decarbonisation of electricity generation through the replacement of existing fossil-fuel-based generation with renewable energy (e.g. hydro, wind, solar, and geothermal), nuclear power, and/or fossil fuels (coal, gas) with carbon capture and storage (CCS)

03

Fuel Switching:

switching end-use energy supplies from highly carbon-intensive fossil fuels in transportation, buildings, and industry to lower carbon fuels, including low-carbon electricity, other low-carbon energy carriers synthesised from electricity generation or sustainable biomass, or lower-carbon fossil fuels

A first report by the DDPP was released in 2014 and will be followed by a second report in October 2015. The revised national pathways are consistent with keeping the global temperature increase to less than 2°C.

The project has already generated a number of critical lessons. First, the national DDPs show the feasibility of deep decarbonisation in the context of sustained economic growth, particularly in developing countries, but only if we adopt goal-oriented long-term approaches. They also provide a foundation for national discussions on how these twin objectives can best be achieved. Second, results of the DDPP show the vital importance of international cooperation on the development and diffusion of low-carbon technologies. Third, we now have long-term national pathways that can inform the design and implementation of the shorter-term emission reduction objectives that are currently under discussion in the run-up to the December 2015 climate conference in Paris.

As the world prepares for this conference, we were encouraged to read the endorsement of the critical importance of long-term approaches by G-7 leaders in Elmau, Germany:

> (...) WE EMPHASISE THAT DEEP CUTS IN GLOBAL GREENHOUSE GAS EMISSIONS ARE REQUIRED WITH A DECARBONISATION OF THE GLOBAL ECONOMY OVER THE COURSE OF THIS CENTURY. (...) WE COMMIT TO DOING OUR PART TO ACHIEVE A LOW-CARBON GLOBAL ECONOMY IN THE LONG-TERM INCLUDING DEVELOPING AND DEPLOYING INNOVATIVE TECHNOLOGIES STRIVING FOR A TRANSFORMATION OF THE ENERGY SECTORS BY 2050 (...)

G-7 Summit, Elmau, Germany, 7-8 June 2015

FOLLOW GUIDO SCHMIDT-TRAUB ON TWITTER

@GSCHMIDTTRAUB

TO GET THE LATEST NEWS AND INTERESTING FINDS IN THE FIELD OF SUSTAINABLE DEVELOPMENT

About
GUIDO SCHMIDT-TRAUB

He is the Executive Director of the UN Sustainable Development Solutions Network. He was previously CEO of Paris-based CDC Climate Asset Management, and Partner at South Pole Carbon Asset Management in Zurich. He led the UNDP MDG Support Team and was Associate Director of the UN Millennium Project in New York.

> We hope that Climate Change COP21 will recommend to its member countries the preparation of non-binding long-term (decarbonisation) pathways

We hope that the Climate Change COP21 will recommend that its member countries prepare non-binding long-term pathways that chart out the energy transformation that every country must undertake so that the world as a whole can stay within the 2°C ceiling. These pathways will provide the framework for shorter-term nationally determined contributions and agreements on burden sharing.

All members of the Deep Decarbonisation Pathways Project are available to support other countries in preparing such pathways. To this end, we are planning to invite institutions from other countries to join the project. We will also publish national Deep Decarbonisation Pathways and synthesise implications from our work for the climate agreement. In this way the DDPP hopes to support a strong agreement at COP21. *end*

Spotlight on innovation

Downtown Trolleywood

Emaar introduces the new Downtown zero-emission tram service

Why travel to Hollywood when you have 'Trolleywood' on your doorstep in Downtown Dubai? Emaar has announced another world-first: a hydrogen-powered tram that is a zero-emitter. The fleet of traditionally styled double-decker trams has been specially designed and imported for Emaar and is particularly striking in bright red livery and gold and green trim.

Each tram can carry up to 50 people has both open and air-conditioned seating. As part of the initial phase, the trams, which are driver-operated, will cover just over a kilometre of track, offering a relaxed transport experience for people, and in later phases, they will run along seven kilometres track for the benefit of tourists and local residents.

While it is evidently an attraction for those visiting Dubai, the service does actually have real infrastructure benefits as it enhances connections between major locations such as Burj Khalifa, Dubai Mall, Dubai Fountain and Souq Al Bahar, as well as to wider Dubai transport networks, such as the Dubai Metro through an air-conditioned travellator and public transport that includes Dubai's Roads and Transport Authority's many buses and taxis.

Powered by hydrogen fuel cells, the trams themselves are zero-emitters, the hydrogen will potentially become an efficient fuel in the near future. They offer travel at a relaxed 10 kilometres per hour, with several crossings for passenger and pedestrian safety. The tram goes a long way towards a redefinition of urban mobility, as it provides convenient, sustainable transport that supports Dubai government's green economy and sustainability goals. The new system is a valuable stimulus to the city's economy.

A NEW OPTIMISM

CLEAN ENERGY AND CLIMATE CHANGE POLICY CAN WORK FOR THE UAE

The issue of climate change has never been higher on the international agenda. In December this year the UAE will be actively engaged at the 21st Conference of Parties (COP21) of the United Nations Framework Convention on Climate Change (UNFCCC) in Paris. This high-level gathering, to be attended by a number of heads of state and heads of government, has a significant goal to meet: to shape the new international agreement on climate change that will apply after 2020.

The last time climate change was discussed at such a high level was at COP15 in Copenhagen in 2009. Although expectations were high, that meeting failed to agree on the ambitious deal it was aiming to achieve.

> Many have argued that ambitious climate action presents a fundamental threat to fossil fuel producers [...] but the right policy, driving the right investments, can actually support both the environment and our economic development

POINT OF VIEW

H.E. DR. SULTAN AHMED AL JABER

UAE Minister of State and Special Envoy for Energy and Climate Change

REASONS FOR OPTIMISM

I am optimistic that this time things will be different for two reasons: the first regarding technology; and the second, the climate negotiations themselves.

Technological change has perhaps made the biggest jump in recent years. Traditionally, reducing emissions has meant adopting expensive clean technologies and discussions have centred on who pays and at what cost. We have now reached the point where promoting clean energy, which is the main way of reducing emissions, makes clear economic sense in many parts of the world. Take the example of the recent bids for the Mohammed Bin Rashid Al Maktoum Solar Park, which were awarded at prices below USD 0.06 (around AED 0.22) per kilowatt-hour. This makes solar power considerably cheaper than most sources of imported natural gas. For other GCC countries that use oil for power generation, the savings are even greater.

This matters for the world in several ways. Firstly, we will see clean energy provide a much larger share of new investment and this will make it much easier to bring emissions down. Secondly, we will see high-value jobs and wealth creation emerge in countries that build the market for renewable energy. But there is a third reason that is often not understood: renewable energy will be essential for the long-term sustainability of oil and gas exports in the GCC.

H.E. Dr. Sultan Ahmed Al Jaber is a Minister of State of the United Arab Emirates and member of the federal cabinet.

As the UAE Special Envoy for energy and climate, Dr. Al Jaber works to see that the UAE's positions and interests are represented in international multilateral dialogues.

As Energy CEO at Mubadala, Dr. Al Jaber oversees the company's oil and gas interests as well as its renewable energy portfolio. He is also the former CEO and now Chairman of Masdar, one of the leading global renewable energy companies.

CLEAN ENERGY IS ESSENTIAL TO SUPPORT OUR OIL AND GAS EXPORT POSITION

GCC countries are growing fast in terms of both population and economy; we are using more and more energy at home, leaving less to export. The UAE uses little oil for power generation, but relies on significant volumes of imported natural gas. Although we have significant gas reserves, we need a strategy that maximises the sustainability of these reserves. Power from solar plants allows us to reduce expensive imports of liquefied natural gas, bringing direct savings to the national economy.

This is important not only for our countries but for the world. Oil from the Gulf is not just among the most affordable in the world to produce – it also generates among the lowest emissions. Favourable geology, shallow seas and highly efficient companies mean that it takes much less energy, and therefore emissions, to produce a barrel of oil here than in deep sea fields, shale reserves and other sources, creating a win-win situation.

Renewable energy is directly reducing emissions and cutting costs. It actively supports our oil and gas industries by limiting consumption and freeing fuels for export. And, it makes our comparatively low-emission fuels available for world markets, displacing more polluting alternatives – which turns the logic of climate policy on its head. For years, many have argued that ambitious climate action presents a fundamental threat to fossil-fuel producers like the UAE. But the right policy, driving the right investments, can actually support both the environment and our economic development.

A BETTER POLICY ENVIRONMENT

In the past, climate negotiations – my second reason for optimism – have focused too much on setting legally binding targets for emissions. This may be appropriate for large, mature, developed economies - though even they have found such targets challenging - but it's not the right approach for rapidly-developing economies such as the UAE. We have to get the policy right.

I am encouraged that today's negotiations are different. All countries are expected to join in efforts to limit emissions, but they do so on the basis of actions that suit their own national circumstances. In the language of the negotiation, countries are presenting "intended nationally-determined contributions". In other words, they are free to decide what actions work best for them and how these should be implemented. By sharing these actions internationally, countries can learn from each other and find ways to go further.

There is still plenty to be done. The UAE delegation will be working hard in Paris to ensure the new agreement is one that provides a supportive framework for countries to drive clean-energy investments, rather than presenting threats to development. These negotiations are never simple, but I am confident that we are closer than ever before to the right model for an international climate change agreement. *e.m.d*

> We have now reached the point where promoting clean energy, which is the main way of reducing emissions, makes clear economic sense in many parts of the world

THE 'ROAD TO PARIS 2015' INITIATIVE

THE IMPORTANCE OF WGES 2015 WITH REGARD TO COP21

The World Green Economy Summit was initiated by Dubai Electricity and Water Authority (DEWA) and World Climate Ltd (WCL) in 2014 in Dubai, to bring together leading companies, financiers, cities and thought-leaders to develop scalable solutions to accelerate the transition to a green economy.

> The Paris Solutions Agenda outlines **Dubai's commitment to sustainability,** and green economy through policy innovation, finance and knowledge sharing.

> The World Green Economy Summit 2015 (WGES 2015) in Dubai, the second annual summit of its series, brought together over 2,000 delegates and over 40 partners and sponsors under the theme 'Global Partnerships for a Sustainable Future.'

POINT OF VIEW

H.E. SAEED MOHAMMED AL TAYER

Managing Director and CEO of DEWA

هيئة كهرباء ومياه دبي
Dubai Electricity & Water Authority

The World Green Economy Summit 2015 (WGES 2015) in Dubai is the second annual summit of its series, and brings together over 2,000 delegates and 40 partners and sponsors under the theme 'Global Partnerships for a Sustainable Future.'

H.E. Saeed Mohammed Al Tayer, Vice-Chairman of the Supreme Council of Energy and MD and CEO of Dubai Electricity and Water Authority (DEWA).

Al Tayer has overseen the rise of DEWA, which has become one of the most efficient utilities in the world, and a profitable and efficient service provider with minimal power and water losses that is contributing to making Dubai one of the happiest cities in the world. Under his leadership at DEWA, the utility is working closely with its key stakeholders to develop carbon management, energy-efficiency and energy-and water-efficient consumer goods. At the Dubai Supreme Council of Energy, he has overseen Dubai's energy diversification strategy, the introduction of solar power, and demand side management. Al Tayer has been the driving force behind the formation of the Carbon Ambassador Programme in December 2013 and His Excellency Ban Ki-moon, Secretary General of the United Nations, has personally thanked him for his support for the next generation.

WCL specialises in developing strategic green global multi-stakeholder platforms and has worked in partnership with leading global organisations, media and Fortune 500 companies. It is also the originator of the 'Road to Paris 2015' initiative.

The main objectives of WGES 2015 were to continue the summit as a premier international platform for the green economy, follow up on commitments made through the Dubai Declaration and develop the WGES Public-Private Partnerships Platform. Furthermore, in the context of the fast-approaching UNFCCC Conference of Parties in Paris in 2015 (COP21), it was imperative to create strong links to the UN's international negotiations on climate change.

WGES 2015 discussed four major topics: the green economy framework, international leadership, global partnerships and innovation. It built on the outcomes of WGES 2014, in particular the Dubai Declaration, which underlines the city's commitment to becoming a global hub for the green economy.

Specific to the COP process, Dubai demonstrated its commitment to climate change mitigation globally when I handed over the Paris Solutions Agenda to Nicolas Hulot, Special Envoy to the French Presidency for the Protection of the Planet.

The Paris Solutions Agenda outlines Dubai's commitment to sustainability, and green economy through policy, innovation, finance and knowledge sharing.

WGES has also been integral to the 'Road to Paris 2015' initiative, which is a community and participatory platform created to provide solutions to climate change and to support the signing of a binding agreement at COP21.

The initiative started at the World Green Economy Summit (WGES) in 2014, and continued throughout the World Summit of Regions for Climate, the World Climate Summit in Lima in December 2014 and again at the WGES in Dubai in April 2015, and will conclude at the COP21 negotiations in Paris in December 2015. *end*

THE UAE ON ITS WAY TO PARIS

THE MOST IMPORTANT CLIMATE-CHANGE MEETING IN OVER A DECADE

The world will meet in Paris in December 2015 to negotiate a new global climate change agreement. This meeting, the 21st Conference of the Parties (COP21) to the United Nations Framework Convention on Climate Change (UNFCCC), is destined to be the most important climate-change meeting in over a decade.

POINT OF VIEW

H.E. DR. THANI AL ZEYOUDI

Permanent Representative of the United Arab Emirates to the International Renewable Energy Agency (IRENA)

Climate change presents a serious risk to the global environment, society and economy. The effects have been well-documented, impacting on our physical surroundings and resources, but we have the opportunity to shape an effective global response to this challenge. It will not be easy and it must be immediate, as there can be no long-lasting, affordable development if we lose control of our climate. It is essential for all countries to join the effort to mitigate emissions and adapt to climate change.

While climate change is a global concern, some countries face a challenging balancing act between their developmental priorities and addressing a problem that they did not have a major role in creating. The Gulf countries face particular challenges, given their reliance on fossil fuels as a mainstay of government budgets and revenues. While the UAE's emissions account for less than half of one percent of global emissions, this does not mean the problem can be ignored. Instead, this allows the UAE to take on a key role in helping achieve a meaningful agreement.

> "Shams 1 in Abu Dhabi and the Mohammed bin Rashid Al Maktoum Solar Park are just two examples of the investments that have been pursued in this area."

The UAE experience can show that the climate-change challenge is matched with opportunity. There is no denying that oil has played a pivotal role in our economy, but the leadership recognises that a comprehensive strategy of diversification is vital for a resilient and sustainable economy. To this end, we have actively pursued economic diversification, expanding into such industries as healthcare, aerospace, microsystems and service industries. More recently, clean-energy technologies have become part of this diversification. The UAE set ambitious energy targets, with 24% of the total energy mix coming from clean-energy sources by 2021. These low-carbon energy targets are a first for the region and incorporate technologies such as wind, solar and safe nuclear power. Shams 1 and the Mohammed bin Rashid Al Maktoum Solar Park are just two examples of the investments that have been pursued in this area.

Concurrently, we are finding more efficient ways to use energy and lowering fossil-fuel emissions in a range of ways that continue to boost our economy. Efficiency has become the norm, with efficiency standards instituted for cooling systems and lighting and the development of a set of sustainable buildings standards. The recent lowering of energy subsidies also plays into this drive for efficiency and there is more to come.

Transforming to a diversified economy requires commitment, vision and innovation. In the UAE, flagship projects such as Masdar, a world leader in sustainable development, innovation and green technology, and the sustainability-focused Dubai's Expo 2020 demonstrate this commitment. These are clear examples of a country working within its circumstances to limit emissions and continuing to advance economically. It is this kind of approach that can form the basis for a climate-change agreement.

There has already been some movement from the international climate regime in this direction, with a shift towards nationally determined contributions, rather than broad emission targets. This structure allows countries to harness their strengths and work within their circumstances to find the necessary balance.

One thing is clear. Never has there been a better time to build a global framework to address the problem, and opportunities, of climate change. Working together, we can all achieve more. *end*

He is the Permanent Representative of the United Arab Emirates to the International Renewable Energy Agency (IRENA) and Director of the Directorate of Energy and Climate Change (DECC) within the UAE's Ministry of Foreign Affairs

CERTIFIED EMISSION REDUCTION PROJECTS IN THE UAE

HOW THE UAE IS SUCCESSFULLY ADDRESSING THE THORNY ISSUE OF EMISSION REDUCTIONS

A total of 14 UAE projects – based in Abu Dhabi, Ras Al Khaimah and Dubai – are registered with the Clean Development Mechanism (CDM). Most of these projects are already benefiting from the financing opportunities provided under the Kyoto Protocol of the United Nations Framework Convention on Climate Change (UNFCCC).

UAE-based projects generated 617,974 CO_2 tonnes of certified emission reductions (CERs) by August 2015. This makes the UAE a regional leader.

Among the latest additions to the line-up of UAE-based CDM projects is a small-scale solar photovoltaic plant in Dubai. With a capacity of 13MW, the plant relies on thin-film PV technology. It was commissioned by the Dubai Electricity and Water Authority (DEWA) and is the Emirate's first solar project of this kind.

The location of the project was chosen after assessing the climate and weather conditions, particularly regarding solar radiation, wind and sand dust. The geomorphology, topography and existing or planned use of the sites around the plant were also evaluated, and emission reductions anticipated from the project were estimated based on the calculated grid emission factor of the DEWA electricity system. This relies mostly on natural gas for the production of electricity.

The plant was registered as a small-scale CDM project in 2012 and has been in operation since the end of September 2014. It has so far generated CERs equalling 10,635 CO_2 tonnes. It is part of an ambitious renewable-energy initiative in Dubai – the Mohammed Bin Rashid Al Maktoum Solar Park, with a capacity of 1,000MW. Following the success of the 13MW pilot, DEWA has already commissioned the 200MW as second phase. Scheduled for completion in 2017, the plant is applying for CDM registration and its application is currently under validation.

In April 2015, an 800MW third phase was announced for the Mohammed bin Rashid Al Maktoum Solar Park. Dubai is also currently looking into the feasibility of establishing a CDM programme of activities around the development of solar energy in the Emirate of Dubai.

Other CDM projects in the UAE are also successfully generating CERs. The largest amount of credits has been generated by the Emirates CMS Power Company in Abu Dhabi, a combined cycle power and desalination plant operating in Al Taweelah. The project involved capturing waste heat to generate electricity. It is running successfully with a total of 476,446 CO_2 tonnes of CERs issued so far. Other successful CDM projects have originated in the energy and renewable-energy sectors as well as cement production and landfill gas capture. *end*

هيئة كهرباء ومياه دبي
Dubai Electricity & Water Authority

كربون دبي
DUBAI CARBON

ACCELERATING THE TRANSITION TO A GREEN ECONOMY

By Eng. Waleed Salman and André Schneider

OUTCOMES AND RECOMMENDATIONS FROM THE WORLD GREEN ECONOMY SUMMIT 2015

The World Green Economy Summit (WGES) was initiated by the Dubai Government as a means to accelerate globally scalable solutions for the green economy. In the context of Dubai's own sustainability objectives and the climate negotiations in December 2015 in Paris, the outcomes and recommendations of WGES 2015 contribute to the long-term vision of making Dubai the 'International Capital of the Green Economy', and the pursuit of a universal agreement for climate change.

WGES 2015 brought together close to 2,000 delegates from more than 40 countries, and a programme of over 100 local and international green-economy experts. During the two-day summit, delegates, experts and stakeholders discussed relevant solutions and commitments needed to secure the transition to a green economy. Based on the discussions at WGES 2015, the overall recommendations were as follows:

- Global Cooperation: the effort to address climate change challenges needs to be massively scaled up, with a specific focus on rapidly developing the green economy. We need to identify and scale what is working globally, based on an increased capacity to share knowledge and experience and build on lessons learned.
- Widen our Scope: during WGES 2015 it was indicated that green projects need to extend beyond renewable energy and energy efficiency projects to include transportation, water and waste management and production-related issues.
- Strategic Partnerships: we need to accelerate the development of public-private partnerships (PPPs) to facilitate the implementation of green projects and initiatives.
- Scale-up Green Finance: in order to adequately scale-up green initiatives we require an innovative approach to green finance, based on the diversification of financing options for green projects. The right financial mechanisms already exist, but we need to better address the risks of financing such projects, and encourage innovative finance at the project development stage.
- Cities are the Future: cities will be the key drivers of the green economy. We must facilitate inter-city collaboration, and support capacity-building for cities to engage in large-scale green PPPs.

About
ENG. WALEED SALMAN

He is the Vice Chairman of the World Green Economy Summit and the EVP Strategy and Business Development at Dubai Electricity and Water Authority. He is also in charge of Corporate Strategy and Business Development and oversees new business ventures in areas such as product diversification (e.g. Mai Dubai), energy efficiency (e.g. Etihad Energy) and low carbon development (e.g. Dubai Carbon). He is a leading figure in the Emirate's quest for green economic development through his involvement as a member of Dubai Supreme Council of Energy, the World Green Economy Summit, the Green Economy Partnership as well as internationally in the 'De-carbonise Energy' Global Agenda Council of the World Economic Forum.

CONTRIBUTING TO A GLOBAL DEAL

Dubai demonstrated its commitment to climate change mitigation globally as H.E. Saeed Al Tayer, DEWA MD and CEO, handed over the Paris Solutions Agenda to Nicolas Hulot, Special Envoy to the French Presidency for the Protection of the Planet. The Paris Solutions Agenda outlines Dubai's commitment to sustainability, and H.E. Saeed Al Tayer will present these contributions at the Climate Change COP21 in Paris in December 2015. Dubai's contributions to the climate agenda are based on its commitment to the green economy through policy, innovation, finance and knowledge-sharing.

DUBAI – AN INTERNATIONAL HUB FOR THE GREEN ECONOMY

Already a flourishing hub for finance and trade, Dubai is uniquely positioned as a potential international hub for green economy solutions, due to strong commitments from the Government to develop Dubai into a leading, smart, green city. This clear signal from the Government has created a predictable regulatory environment, which has attracted a volume of green investments. As articulated at WGES 2015 by H.E. Ahmed Buti Al Muhairbi, Secretary General of the Dubai Supreme Council of Energy:

"[Dubai] has built confidence within the private sector and we have seen strong interest and engagement in our [green] projects, reflecting our commitment to the PPP model as a prudent approach to the new era of project development".

The PPP model and other innovative financing solutions are being adopted in Dubai to catalyse green investments, with the formulation of a Green Fund in the works.

The success of green projects in the Emirate of Dubai is a clear demonstration of why government leadership and a predictable regulatory framework is essential for the development and implementation of sustainable solutions – further stressing the need for a universal agreement on climate change. *end*

About
ANDRÉ SCHNEIDER

He is the Chairman of World Climate Ltd. He has worked with the World Economic Forum where he was instrumental as Managing Director and Chief Operating Officer. Today André brings his extensive strategic and execution expertise as the Vice President of the Swiss Federal Institute of Technology in Lausanne and Chairman of the Board at World Climate Ltd.

"In order to adequately scale-up green initiatives we require an innovative approach to green finance, based on the diversification of financing options for green projects"

THE DUBAI DECLARATION

By André Schneider

PAVING THE WAY TO DUBAI AS THE INTERNATIONAL CAPITAL OF THE GREEN ECONOMY

The Dubai Declaration is formulated in alignment with Dubai's national and international sustainability initiatives, with the long-term vision to make Dubai the 'International Capital of the Green Economy'.

The Dubai Declaration was initially launched in April 2014 at the inaugural World Green Economy Summit and has evolved through a dynamic and consultative approach involving relevant partners, experts and stakeholders. At WGES 2015, held in Dubai in April 2015, the updated declaration was announced.

The Dubai Declaration 2015 – which has been built upon last year's commitments, also includes a number of new initiatives that have been developed over the past year. The main challenges to Dubai realising its green-economy vision have been identified as communicating local initiatives, developing large-scale projects and scaling existing solutions. The Dubai Declaration seeks to address these challenges through the strategic themes of 'Dubai the International Capital of the Green Economy', 'Global Partnerships', and 'Green Finance' respectively.

"The Dubai Declaration serves as an important tool **to streamline** the overall commitments and messaging of Dubai's sustainability initiatives"

DUBAI THE INTERNATIONAL CAPITAL OF THE GREEN ECONOMY

The Dubai Declaration serves as an important tool to streamline the overall commitments and messaging of Dubai's sustainability initiatives. The updated 2015 Declaration integrates key initiatives of the Dubai Integrated Energy Strategy, and highlights youth engagement and innovation as emerging priority areas.

GLOBAL PARTNERSHIPS

With public-private partnerships (PPPs) identified as a key vehicle for green projects, special focus has been placed on developing global and strategic relationships. Developing large-scale PPPs in Dubai will support sustainable infrastructure projects, and other city-level initiatives that will accelerate Dubai's transition to a leading green and smart city. Developing PPPs across borders will not only attract existing solutions to Dubai, but will also serve as a platform for promoting locally developed technologies and best practices.

GREEN FINANCE

In recognition of the integral role innovative finance plays in the scaling-up of green initiatives, the declaration focuses on green finance. It also outlines Dubai's commitment to continue fostering the development of innovative finance solutions, and a concrete initiative to launch a green fund. In addition, Dubai will look outwards to assemble international best practice in green finance through the World Green Economy Summit platform.

FULFILLING 2014 COMMITMENTS

Over the last year, Dubai has worked hard to fulfil the 2014 commitments of the Dubai Declaration and has made great strides towards a green transition through a number of innovative projects and initiatives. One of the most significant projects has been the Mohammed Bin Rashid Al Maktoum Solar Park which has made global headlines, thanks to the PPP between DEWA and ACWA Power for the 100MW expansion, becoming the most competitively-financed solar project in the world. Additionally, the ESCO model for energy efficiency has been successfully implemented through the Etihad Super ESCO, which has signed a number of energy performance contracts with some of the largest property developments in Dubai.

On the policy side, the Dubai Sustainable Energy Model has been formulated by the Dubai Supreme Council of Energy, and identifies their 10 priority areas for supporting the development of the green economy. The Sustainable Energy Model supports the overarching objectives of the Dubai Integrated Energy Strategy.

Internationally, Dubai has positively contributed to the Climate Change COP21 solutions agenda by actively supporting the "Road to Paris" through showcasing solutions and models of best practice internationally. Over the course of the year, Dubai has collaborated with a number of international organisations and governments, such as UNIDO, UNDP and the French government, to support international climate change mitigation efforts. As a result, H.E. Saeed Mohammed Al Tayer, DEWA MD and CEO was recognised by UNDP as a Middle East Champion for Energy for his support and contribution to sustainable development in the region.

THE PATH AHEAD

The Dubai Declaration is a dynamic and responsive tool which will guide the acceleration of Dubai's green-economy transition in the years ahead. The commitments of the Dubai Declaration are developed and monitored annually, with the annual World Green Economy Summit serving as an action-forcing mechanism and platform where progress is communicated and discussed. *end*

ENCOURAGING EFFICIENCY

By
Omar Al Qurashi

THE EMIRATES ENERGY AWARD'S MECHANISM TO STIMULATE ENERGY EFFICIENCY

About
OMAR AHMED AL QURASHI

He is the Vice Chairman of Marketing & Event at Emirates Energy Award. He joined DSCE in November 2011 and in his present role, is responsible for managing the stream of DSCE's corporate communications, as well as its media, PR, and general services that include HR, Finance and IT. Prior to his current role, he was Director of Communications at Royal Dutch Shell in Dubai.

The Emirates Energy Award (EEA) is organised by DSCE under the patronage of H.H. Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of the United Arab Emirates, and Ruler of Dubai. We at the Dubai Supreme Council of Energy (DSCE) encourage the rational use of energy and resources among both public and private sectors, including both organisations and individuals across the MENA region. Our aim is to highlight the best practices and pioneering work in energy efficiency, alternative energy, sustainability and protection of the environment.

Over the past three years, we have received more than 200 applications in both cycles from the UAE, and the wider MENA region. Winners have been awarded based on their achievements in energy management and conservation, and their efforts highlighted across the energy sector, providing them with valuable recognition. The majority of winners were from energy-efficiency and R&D projects aimed at saving money, time and most importantly, helping to reduce carbon footprints and protect the environment.

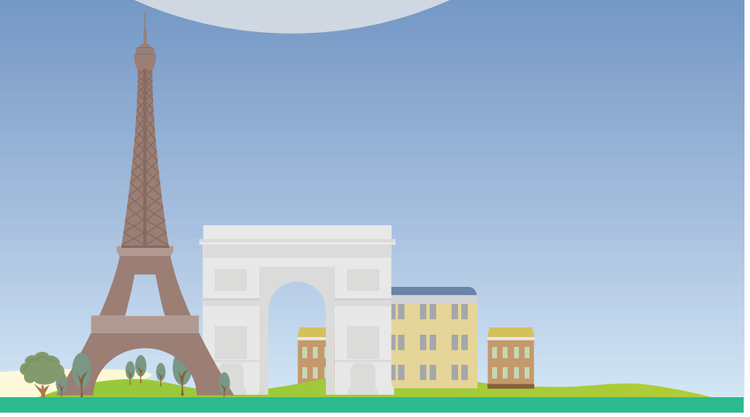
As an example, one of the winners was a Bedouin woman from The Friends of Environment Society Jordan who cannot read or write. Nevertheless, she travelled to Barefoot College in India to study how to utilise solar power, aiming to help Jordanian villages introduce solar. She went through a profound transformation, returning after two months with the knowledge and skills to earn an income and achieve for her community what others had not.

This is an inspirational real-life example of practical steps that can be taken to promote energy efficiency and reduce carbon footprints. *end*

CITIES ON THE ROAD TO PARIS

By Dr Kishan Khoday and Dr Walid Ali

DUBAI LEADS THE WAY TO COP21 IN THE MIDDLE EAST



> TO DATE **MORE THAN 425 CITIES** HAVE MADE CARBON EMISSION REDUCTION COMMITMENTS ON **THE ROAD TO COP 21 IN PARIS**

The world is gearing up for the 21st meeting of the Conference of the Parties (COP) under the United Nations Framework Convention on Climate Change (UNFCCC). It is the annual gathering of country representatives from around the world who meet to negotiate progress in fighting climate change. COP21 will convene in Paris in December 2015 and is expected to be an important milestone, with a new climate agreement expected to be agreed among states. While much attention has been placed on the process of balancing interests and negotiating positions among state representatives, another critical process has been unfolding during the past few months on the Road to Paris.

As part of a bottom-up engagement of non-state actors in support of the new climate agreement to be forged at COP21, a Non-State Actor Zone for Climate Action (NAZCA) was established by the UNFCCC as a repository of climate commitments by cities, sub-national regions, companies and investors. It was launched at COP20 in Lima, alongside the Lima-Paris Action Agenda and meant to build momentum on key issues.

Cities stand on the frontline of the challenges and opportunities to develop a low-carbon model of development and combat the risks from climate change. Studies show that 80% of carbon emissions are influenced by patterns of energy generation and consumption in cities. National-local partnerships for climate action are thus the key, but local governments often see themselves as outliers in a climate-change process driven by intrastate processes.

To date, more than 425 cities have made carbon-emission reduction commitments for COP21 in Paris. Apart from the impressive scale of the response, has been the impressive nature of these voluntary commitments. A total of 74 cities from North America, Europe, Japan and Australia have pledged to reduce greenhouse-gas emissions by 80-100% – some by 2020, others between 2030 and 2080.

Some cities, such as Amman, Jordan, the only participant in NAZCA from the Arab region, have made more general pledges to reduce emissions and report publically on an annual basis via parallel processes such as the Compact of Mayors. Others, such as Cochin in India – one amongst an impressive 15 cities across the country to have made pledges – has pledged to increase energy efficiency by 5% by 2020, and to increase the share of renewable energy in the overall energy mix by the same level. An example of the political will, institutional capacity and resources to take action at the city level, Cochin has already made progress on its pledge. The recently opened Cochin International Airport (CIA) is the world's first airport to be run completely on solar power.

ROAD TO PARIS
SOLUTIONS FOR COP21

Despite the low levels of city pledges and engagement in the UN process from the Arab region, one example of a city seeking to do its part is Dubai. As illustrated in the State of Green Economy Report 2016, the federal system of the United Arab Emirates provides space and support for the local ambitions of Dubai to emerge as a hub for green economic innovation and growth. Low-carbon, climate-resilient solutions stand at the core of this process. For example, as part of its scaled-up ambitions, in 2015, Dubai tripled its renewable-energy targets, with 15% of its power mix to come from renewable sources by 2030 – up from a target of just 5% at the start of 2015. Meanwhile, Dubai has also taken the bold step this year to increase its targets for energy efficiency – aiming at reducing energy consumption rates by 30% by 2030. This now sets the bar high for climate action among cities in the region, and beyond.

About
DR. KISHAN KHODAY

He is the Team Leader for Climate Change, DRR and Resilience in The Arab Region at The United Nations Development Programme

About
DR. WALID ALI

He is the Regional Climate Change Specialist for the Arab Region at The United Nations Development Programme

> Despite the low levels of city pledges and engagement in the UN process from the Arab region, one example of a city seeking to do its part **is Dubai**

The progress seen in Dubai has been about more than a vision of low-carbon development and increased investment in clean technology; it has also been about bold public policies, strategies and regulatory frameworks related to urban growth and planning, along with well-aligned leadership across both national and city levels.

At the national level, the UAE hosts the International Renewable Energy Agency (IRENA); it also hosted the Abu Dhabi Ascent in 2014 as a strategic preparatory gathering to the UN Secretary General's Climate Change Summit in 2014, as well as the annual World Future Energy Summit. The UAE also plans to launch its National Energy Strategy 2035 to express ambitious goals for renewable energy and energy efficiency, following on from its national green growth strategy established in recent years, which acts as a base for global competitiveness and encouragement for a high-tech knowledge economy.

The alignment of global, national and local visions on climate change, the coordination of local and global partnerships and investments, and the creation of new local institutions for 'climate governance' and low-carbon development, are some of the lessons which could well place Dubai on the path to becoming a future leader amongst cities. As we move into the post-COP21 era of bottom-up climate action, Dubai's efforts could serve as a catalyst for innovation and partnerships in the UAE, and in other parts of the Arab world and beyond. *end*

COMBATING CLIMATE CHANGE

By Mark Watts

BY HELPING MEMBER CITIES CREATE, SHARE AND MEASURE THE IMPACT OF CLIMATE ACTION, C40 ACCELERATES MITIGATION AND ADAPTATION RESULTS

Cities are also vulnerable to climate impact, such as sea level rise, storm surges, heat waves and drought. If cities continue to develop according to the prevailing 20th century model of sprawl, ever-increasing natural resource consumption and private motor-vehicle transport, catastrophic climate change will be inevitable.

Fortunately, the evidence is mounting that following a low-carbon urban pathway will deliver stronger economic performance and faster improvement in living standards. Moreover, through the C40, big-city mayors have demonstrated an ability to work together and achieve concrete results; good ideas spread rapidly across the C40 network, creating modern, resilient cities.

Cities are the drivers of our planet's future. That's why I am proud to be Executive Director of C40 Cities Climate Leadership Group, now in its 10th year. It is a network that connects more than 75 of the world's greatest cities, representing more than 500 million people and one quarter of the global economy. C40 drives urban action to tackle climate change by reducing greenhouse-gas emissions and climate risks, while at the same time increasing the health, wellbeing and economic opportunities of urban citizens.

To move to a "climate-safe" world, in which global temperature rise is kept below two degrees Celsius, global greenhouse-gas emissions need to peak by 2020 and decline by at least 80% by 2050. According to the New Climate Economy, cities are responsible for 70% of global emissions, they are economic powerhouses and they are where all global population growth is projected to occur over the next 35 years. It is therefore not possible to tackle climate change without strong action in cities.

> "Cities are responsible for 70% of global emissions, they are economic powerhouses and they are where all global population growth is projected to occur over the next 35 years"

About
MARK WATTS

He is the Executive Director of the C40 Cities Climate Leadership Group. Prior to joining C40, he was the Director of Arup's energy consulting team based in London. Focused on cities and sustainability, he led Arup's partnership with the C40 group of cities committed to tackling climate change.

C40 CITIES
CLIMATE LEADERSHIP GROUP

In Dubai, a C40 member since 2015, we see a commitment to implementing smart and sustainable actions to fight climate change, including a carbon abatement strategy aimed at cutting greenhouse-gas emissions in priority sectors by 16% in 2021, compared to estimated business as usual for the same year. The Dubai Integrated Energy Strategy 2030 focuses on a more sustainable supply of energy including renewable targets and enhancing energy efficiency of power, water and fuel.

Dubai demonstrates that cities are a key part of the solution to climate change. While national governments have struggled to work together to solve the global climate crisis, big-city mayors are cooperating through organisations like C40 and efforts like the Compact of Mayors to deliver concrete results.

C40 has spent 10 years empowering cities so they take climate action: conversations facilitated in C40 workshops and at our mayors' summits have resulted in more than 8,000 concrete actions taken on the ground to combat climate change. When one C40 city implements a successful strategy, we help other cities follow suit.

Runaway climate change is a threat to our future. Ensuring a climate-safe world will require agreement between countries, but cities are playing a crucial role in getting us on the right path. By helping member cities create, share and measure the impact of climate action, C40 accelerates results and helps to transmit the most successful solutions around the world. *end*

EXPECT A LOW-CARBON UAE

By
Tanzeed Alam

THE NEED FOR THE UAE TO MAKE A STRONG AND AMBITIOUS COMMITMENT ON CLIMATE CHANGE

> "The UAE has a **unique opportunity** to show leadership and embrace the **climate challenge**"

The world urgently needs more leadership on the climate-change issue and this year's Paris Climate COP21 would benefit enormously if the UAE made a strong and ambitious international mitigation commitment on climate change. Such a commitment would send a signal to the rest of the world that the thought leader amongst the Gulf States and a major exporter of fossil fuels is taking the issue seriously.

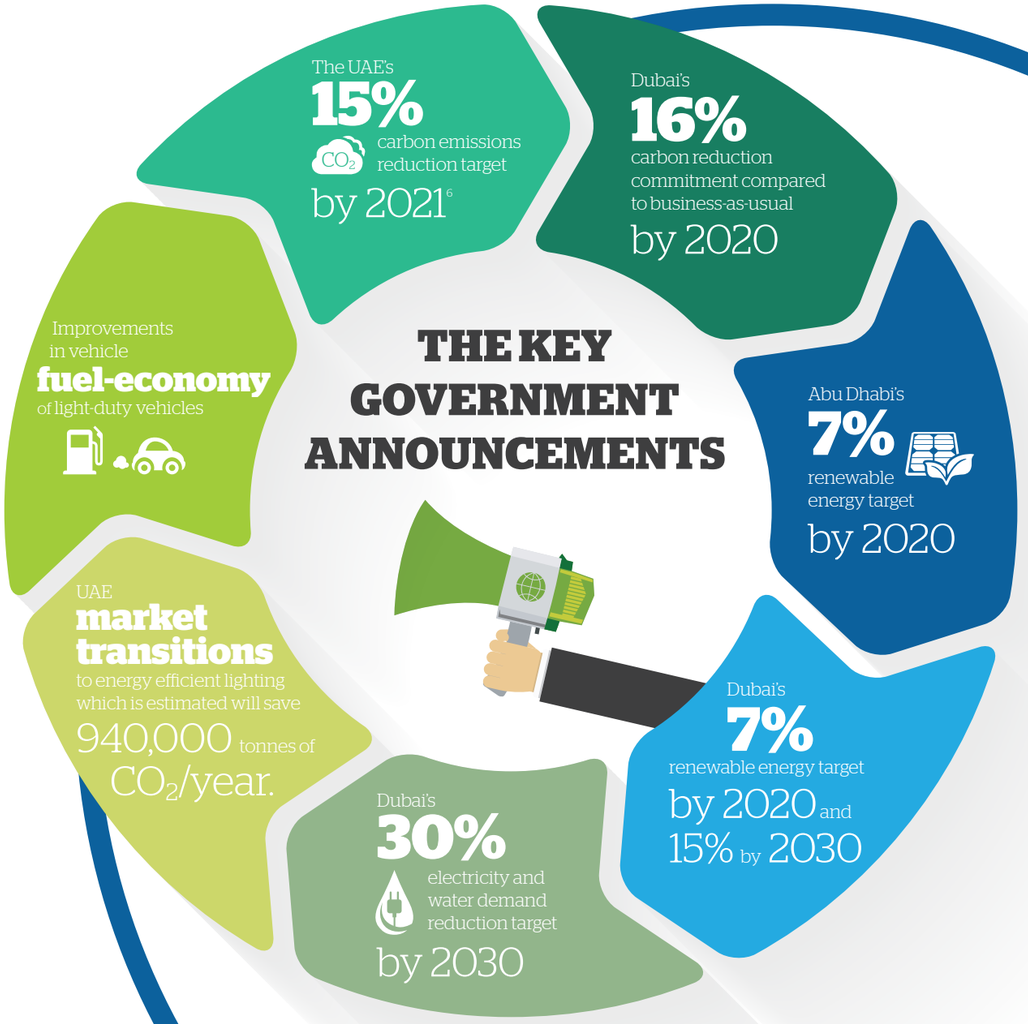
Coming from a region that has historically not had the best reputation for acting positively in the United Nations Framework Convention on Climate Change (UNFCCC), it would be a very positive contribution to global dialogue this year. While the UAE is not a large total emitter of greenhouse gases, its per capita emissions are five times higher than the world average and its total emissions have risen by, on average, 5% per annum during 1994-2013.[1] The UAE is also relatively well-developed compared to other developing countries, with a rapidly growing economy amongst the most diversified in the Gulf region, high per capita GDP and with high levels of education and access to top-quality healthcare. The country's stated aim of becoming one of the "best" countries in the world by 2021 is ambitious and shows how forward thinking the leadership is. This forward-thinking leadership should also include action on climate change which will be one of the main challenges of future generations.

It is a common misconception that the UAE, part of the Gulf region, which collectively accounts for 34% of the world's proven oil reserves, does not have a stake in a strong global climate deal to keep temperatures less than 2°C above pre-industrial levels. Emerging research from the Abu Dhabi Global Environmental Data Initiative (AGEDI)[2] highlights the fact that the country is extremely vulnerable to the impacts of climate change within and outside its borders. For example, increased salinity of coastal waters due to climate change[3] will affect the ability of desalination plants to provide sufficient drinking water for a growing UAE population – which reached 8.2 million in 2010[4].

This will make the country extremely vulnerable, especially as its strategic groundwater reserves are mostly used for domestic agriculture. The country is already one of the most water-scarce in the world[5]. Being a major food importer, means that any disruption of food production due to drought in its trade partners will directly affect the UAE's food security. To have a chance of avoiding this vulnerability, the UAE has a clear stake in, and would benefit largely from, a strong global climate-change agreement. The UAE should also take steps to further understand its vulnerability to the impacts of climate change and start to develop science-based adaptation plans.

Making a pledge to reduce its greenhouse-gas emissions pre- and post-2020 is something that would be easily feasible for the country as many announcements have been made, with some committed to, in government plans, policies and legislation. We recommend that the key government announcements are actually implemented and (see below list) submitted as part of the UAE's Intended Nationally Determined Contribution (INDC) to the UNFCCC this year. Doing so would enable the UAE to demonstrate more international leadership and keep in line with best practice globally. For example in 2010, Mexico, a large fossil fuel exporter, made a commitment to reduce GHGs by 30% of the business-as-usual situation by 2020. The total impact of the UAE's targets, and others that it has in place, on the country's GHG emissions will need to be assessed:

KEY RECOMMENDATIONS TO INCREASE AMBITION



> **MAKING A PLEDGE** TO REDUCE ITS GREENHOUSE-GAS **EMISSIONS** PRE- AND POST-2020 IS SOMETHING THAT WOULD BE **EASILY FEASIBLE** FOR THE COUNTRY AS MANY ANNOUNCEMENTS HAVE BEEN MADE

While implementing the initiatives listed above would go some way towards reducing the country's GHG emissions, there is still more room for increased ambition. An example is the huge potential for surpassing current targets for renewable energy – a recent report issued by IRENA and the UAE Ministry of Foreign Affairs stated that by 2030, 25% of total UAE power generation could be met by renewable sources[7], which would also create thousands of jobs. The economics of such a transition is clear; the recent world-record low price for solar PV at USD 0.054/kWh was awarded in Dubai for a 200MW plant, means that solar is the cheapest form of electricity generation in the UAE.

The UAE has a unique opportunity to show leadership and embrace the climate challenge. Our recommendations for it to do so, are as follows:

- Identify a peak date for carbon emissions in line with international best practice
- Consider a national pre-2020 net carbon reduction commitment (like Dubai), with targets to 2030 and beyond
- Develop a national climate change and energy policy that highlights policy instruments and clear institutional roles and responsibilities to deliver more ambitious renewable energy and energy efficiency targets, continued action on subsidy reform and climate change adaptation
- Make an international commitment to the UNFCCC on reduction of GHG emissions in line with other emerging economies that are also rich in fossil fuels (e.g. Mexico)
- Influence other Gulf countries to make similar commitments given the efforts underway already in those countries on renewable energy development and energy efficiency

Keeping climate change to less than 2°C above pre-industrial levels will mean the world will rapidly move away from the consumption of coal, oil and gas. This global movement away from fossil fuels is growing in momentum and would imply that economic sectors which rely on exporting and consuming large quantities of fossil fuels will be vulnerable. The UAE could insulate itself from such vulnerability by taking the above concrete steps and by prioritising climate change as a key issue for national action. This would also enable it to diversify its economy in sectors that offer it a lower carbon future and help fulfil a dream of the late founding father and President of the UAE, H.H. Sheikh Zayed bin Sultan Al Nahyan:

"We must not rely on oil alone as the main source of our national income. We have to diversify the sources of our revenue and construct economic projects that will ensure a free, stable and dignified life for the people." *end*

About TANZEED ALAM

He is the Climate and Energy Director of EWS-WWF. Since 2001, the Emirates Wildlife Society has been working in association with WWF (EWS-WWF) as a non profit environmental organisation in the UAE and gulf region to conserve biodiversity and tackle climate change, through science-based policy work and raising awareness. Tanzeed Alam develops the strategic direction and vision for EWS-WWF's engagement on climate change and energy for the UAE and the Gulf region. He is responsible for developing and overseeing the implementation of the organisation's 2015-2020 climate change and energy strategy and managing a team of four highly talented individuals. By 2020, EWS-WWF hopes to see the UAE make climate change a national priority, and take significant steps to low-carbon development.

FOOTNOTES

1 Taken from actual figures published in the UAE's national communications on climate change to the UNFCCC and the 2012 and 2013 greenhouse gas inventories.
2 AGEDI has a programme of work on climate change impacts and vulnerability assessment: https://agedi.org/?page_id=15
3 Abu Dhabi Global Environmental Data Initiative (2015) regional ocean modelling - policy maker summary for AGEDI's local, national and regional climate change programme.
4 UAE National Bureau of Statistics, 2010: http://www.uaestatistics.gov.ae/ReportPDF/Population%20Estimates%202006%20-%202010.pdf
5 See Abu Dhabi water resources and management strategy 2015-2020 and Abu Dhabi Climate Vulnerability, Impacts and Adaptation report (2009)
6 Ministry of Energy (2015) UAE state of the energy report 2015.
7 IRENA, Masdar Institute & UAE Ministry of Foreign Affairs (2015) REMAP 2030 UAE http://irena.org/remap/IRENA_REmap_UAE_report_2015.pdf

DID YOU KNOW?

Producing 1kg of aluminum requires **14/16 kWh** of electricity, while producing the same amount from recycled materials requires only **0.7/0.8 kWh.**

Did you know that we can make...
- one pair of glasses from 3 cans.
- one car tire from 640 cans.
- one bicycle from 800 cans.

Did you know that 1kg of recycled aluminum requires 45100 kcal less energy in its production compared to using raw materials. The same energy can be used to light 210 bulbs for 1 hour.

ACTION NOW!

By
Ben Ferrari

HOW BUSINESSES, REGIONS AND EMIRATES CAN BUILD THE GLOBAL GREEN ECONOMY

> "States and Regions Alliance [...] members account for **331 million people,** 11% of global GDP and **2.56 gigatons of CO_2** – which is about 9.1% of global emissions"

We all know we need a strong agreement on climate action at the global conference in Paris (COP21). But as the representatives of around 200 countries get ready to commit to a historical global climate deal, we must not overlook how the necessary action will be implemented. In particular, by those actors already on the frontline of tackling climate change through creating a low carbon economy: businesses and state and regional governments.

At the Climate Group we are already working closely with these 'non-state actors', because they are taking some of the boldest steps to lead the global green economy. While national governments and international bodies have the essential job of delivering a robust global framework, businesses and state and regional governments are taking concrete, ambitious and pioneering climate actions that heads of state could certainly learn from.

A core programme of the Climate Group is the States and Regions Alliance. We bring together 31 governments from across the world that are setting ambitious climate targets and moving their investments from fossil fuels to clean energy. The impact of these actions is huge. Taken together, alliance members account for 331 million people, 11% of global GDP and 2.56 gigatons of CO_2 – about 9.1% of global emissions.

By bringing these members together, we encourage a powerful network of like-minded peers to learn from each other and benefit from our policy innovation work, as bigger teams bring benefits for everyone. We also tell their stories to the world by writing about them, putting leaders on the stage at global events and getting their innovative policy research talked about around the world.

Many of the Climate Group's states and regions members have also acknowledged the effectiveness of emissions trading systems (ETS), by making them economy-wide and legally binding. This is the case for California, for example, whose cap-and-trade programme was extended in January to cover 85% of the state's greenhouse-gas (GHG) emissions, and now includes industrial emitters, electric utilities, transportation fuels and natural gas.

California foresees the costs of the ETS programme to gradually shrink over time, as industry and households make long-term capital and investment decisions. This reflects how states are increasingly seeing the financial benefits of their low-carbon investments, realising that in the end, it costs more to ignore climate change than to deal with it. California's appliance and building efficiency policies have saved citizens over USD 65 billion and created 1.5 million jobs, which is why the government is investing further and setting increasingly ambitious targets.

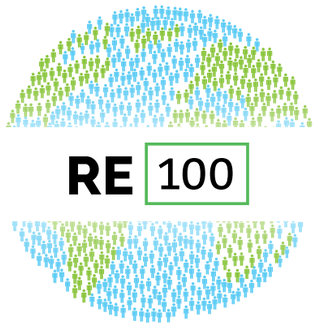
One thing that has become increasingly clear is the necessity of getting clear and consistent data about what states, regions and other non-state actors from all over the world are already doing to reduce carbon emissions. This information is needed by world leaders to demonstrate that a low-carbon transition is already underway and that a robust, legally binding deal will multiply the positive impacts of existing commitments and actions, and importantly, encourage many more.

This is why The Climate Group, together with other organisations working with sub-national governments – including CDP, R20 and nrg4SD – and supported by the United Nations, developed the Compact of States and Regions, the first ever single, global account of GHG reduction targets made by state and regional governments. The first disclosure report of the governments' commitments and achievements will be presented during COP21, and updates will then be published each year. Comparative information at a global level will also help governments looking for new green policies to understand which solutions are working and which ones can be more effective, according to their own contexts and needs.

To get an even better idea of the climate solutions that can make the biggest impact, we must also look to the business community. Today, more corporate leaders than ever before recognise that investing in clean technologies and low-carbon business models is a smart business decision. The bottom-line benefits are now regularly demonstrated in company disclosures and annual reports.

One year ago, the Climate Group and CDP launched the RE100 campaign, which encourages businesses from all over the world to commit to 100% renewable energy. More than 20 of the world's most influential companies committed to actions through RE100 and the campaign is gaining traction in key economies such as India and China. These companies are reducing their GHG emissions, increasing their investments in renewable energies and developing smart energy projects. And critically, companies are also sharing knowledge and best practice with others to accelerate this transition. By connecting hugely influential global brands, RE100 has the power to drive a major transformational shift in the global energy market.

IKEA, the world's biggest furniture retailer, is a founding member of RE100. With sustainability at the heart of its business model, IKEA aims to become energy independent globally by 2020. So far its operations in Sweden, Norway, Finland, Denmark and Canada have already met this goal, and its offices in Poland and the US are well on track. But not only are IKEA's offices energy independent, the company has also committed to purchasing 314 wind turbines by the end of 2015. Some of its wind farms are already producing more energy than its operations even need. And that's just one of the many low-carbon actions in which the company is seeing both short and long-term returns.



> **“Formula E** is showcasing the power of green transport by developing the **first all-electric racing championship,** and is now working to become **carbon neutral”**

There are many more companies leading the way, around the world. Major sectors of the world economy are now reaching a low-carbon tipping-point, but progress must be accelerated. Take transport for example. In 2010 the industry accounted for 23-24% of global GHG emissions, with road transportation the most polluting of all. However, the scale-up of key low-carbon mobility solutions, such as electric vehicles has been disappointingly slow. So how can we give more visibility to such innovative technologies to ensure that they are better understood? How can we help ensure the imagination of the public is captured by the potential of these new modes of transport?

One of our RE100 partners, Formula E, is showcasing the power of green transport by developing the first all-electric racing championship and is now working to become carbon neutral. The racing cars are charged by generators powered by glycerine, a fuel which has extremely low emissions, producing no smoke or noise. On top of this, the series is planned carefully to make sure all equipment can be moved via sea or road, to reduce air travel as much as possible. And just like the Formula 1 series, Formula E is attracting major corporate sponsors. The championship is truly shaping and communicating an exciting vision of electric vehicles that challenges many pre-conceptions.

This story is not unusual. Business leaders in sectors around the world are increasing their environmental commitments because investors, stakeholders and consumers are rewarding it. In a bid to lead this economic and social shift, today the business community is voluntarily asking to be more involved in the global low-carbon transition, pushing governments to follow their example of bolder climate policy, investment and global collaboration.

This new level of ambition from corporate leaders was plainly showcased when we hosted the first-ever Climate Week Paris in May 2015. Momentum has then continued throughout the year, with a stream of game-changing announcements from unexpected and powerful actors, such as major oil companies calling for carbon pricing systems.

World leaders meeting in Paris this December 2015 should need no more evidence that businesses or sub-national governments are acting on climate. The rocketing global impact of the Climate Group's collaborative projects such as RE100 and States and Regions sends a strong message to other companies, the wider energy sector, policymakers at all levels and international negotiators at COP21: that the post-Paris 2016-2020 period will belong to non-state actors.

Of course there is no doubt these actors want this critical year to end on a robust, legally binding, global agreement, but a climate deal will only come into force in 2020. It is the huge emissions that will be cut by corporations and sub-national governments – and the knock-on influence on leaders around the world – that will spur us toward our goal of keeping global temperatures below a two-degree rise.

Above all, this year must end with global, sub-national and business leaders around the world embracing their joint responsibility to shape a better, more prosperous, green economy. Together, they have the power to make history. *end*

FACT BOX

Spotlight on São Paulo

The Brazilian state is one of the most populous in the world, with 41 million inhabitants, accounting for almost 34% of Brazilian GDP. Renewable energies (biomass and hydro) currently account for 94.1% of the state's primary energy production mix. This clean energy production is also reflected in the power sector mix, where renewables account for 93% of the total production. It is an impressive achievement, which proves that clear and effective climate policies can be implemented successfully at a local level to produce sound results.

About
BEN FERRARI

Ben Ferrari is International Partnerships Director at The Climate Group, where he is responsible for corporate programmes and strategy. Prior to this, he was Managing Director at Imprimatur Capital Ltd, an international technology investment company, and has served as an expert at the European Commission and the Council of Europe.

A NEW ERA OF WASTE MANAGEMENT IN DUBAI

By Eng. Abdulmajeed Saifaie

DUBAI MUNICIPALITY'S PROGRAMME TO TACKLE DUBAI'S WASTE CHALLENGE

Dubai Municipality (DM) is dedicated to applying international best practice in the provision of services and proactively promote individual environmental responsibility. Amongst DM's projects is the development of an efficient waste-management system. Door-to-door waste collection allows for an "at source" waste segregation programme, that increases the collection rate of recyclables, while providing disposal options for unrecyclable waste. The system provides two bins to each household – one for recyclable items and the other for general waste – to allow for easy waste segregation.

Recycling centres are being developed for the public disposal of recyclable materials that may not be included in curb-side collection so as to reduce general waste disposal and create a recycling mindset. This initiative is projected to increase recycling efforts and reduce the quantity of waste going to landfills.

In a further effort to promote recycling and reduce collection costs, solar-powered trash compactors are being installed. The 'Big Belly' waste containers use solar power for all their energy needs. Given compaction capabilities, each bin can hold six to eight times more waste than a standard bin. Volume sensors installed in the bin trigger compaction and the Big Belly stations are connected through CLEAN management software, which allows for monitoring of fill levels, routing of collection programmes, and alerts. The result is an increase in collection efficiency, reductions in fuel consumption and manpower and greater equipment utilisation.

In addition, a gas-recovery system has been put in place at the Al Qusais landfill. One of the largest landfills in the Middle East, Al Qusais covers around two square kilometres and receives approximately 7,000 tonnes of municipal solid waste per day, delivered by more than 1,200 trucks. The Al Qusais landfill gas project is a operational clean-development mechanism (CDM) project, registered under the United Nations Framework Convention on Climate Change (UNFCCC) Kyoto Protocol - Project No. 8269 for the reduction of methane (CH_4) – a greenhouse gas. The project is unique, as it is implemented within the active landfill, with operations and methane gas capture running simultaneously. Given the volume of waste handled, this project is the biggest of its nature in the Middle East, extracting approximately 60% of the volume of gas, due to the state-of-the-art system design.

The project was completed in January 2013 and runs continuously, resulting in an annual reduction of more than 350,000 tonnes of CO_2. A GE Jenbacher 1MW gas engine has also been installed on-site to supply power to the gas flare plants and site offices, making the site self-sustainable.

At all DM landfill sites, Smart Gate Systems (Nafith) are being utilised to control vehicle entry. This automated entry-management system uses Radio Frequency Identification (RFID) technology, Automatic Number Plate Recognition (ANPR) and smart software to gather weight information and apply automatic credit deductions, reducing the time required for vehicle entry and thereby curbing emissions. The system also eliminates the use of paper in entry transactions and reporting.

Dubai Municipality furthermore launched underground waste compactors. This system is an innovative solution to address the waste disposal needs in busy and heavily populated public areas. The system eliminates the space that is supposed to be occupied by communal bins. Having a compacting mechanism, the system has more storage capacity which in turn reduces collection frequency to empty the container. The underground waste collection system also eliminates odours, protects the machinery from vandalism and provides a better aesthetic appearance to the area.

Another initiative worth mentioning is the vehicle tracking system – a Global Positioning System (GPS) based technology that provides real time management and a tracking system for fleets. The system is also integrated with efficiency and security applications to enhance the productivity of the waste collection vehicles and manpower of Dubai Municipality.

The system is characterised by its flexibility, stability and continuous uninterrupted performance. Incorporated in the design are a wide range of functionalities such as vehicle maintenance, vehicle tracking and diagnostics, driver management, speed management and fuel and safety management. *end*

About
ENG. ABDULMAJEED SAIFAIE

He is the Director of the Waste Management Department at Dubai Municipality. He has been working with Dubai Municipality for the past 24 years. He has headed the Waste Management Department since 2010. Prior to this, he was the Director of the Sewage and Irrigation Network Department. He holds a Bachelors degree in Electrical Engineering from the University of Oklahoma, USA.

> "The system provides two bins to each household – one for **recyclable items** and the other for **general waste** to allow for easy waste segregation"

VIRTUAL GREEN BUILDINGS IN 3D

YouGov
What the world thinks

THE GREEN BUILDINGS APP CAN BE USED ANYWHERE

It is generally agreed that innovation is an essential element in creating a sustainable economy. Innovation and forward-thinking are the cornerstones in initiating and developing mechanisms for ensuring environmental preservation for the generations to come. Green buildings – and the methods and strategies required for sustainable urban development – is one area where innovation is essential. This has become a prime topic of discussion across the globe, given the important role green-construction plays in preserving the environment and increasing efficiency in the use of natural resources. To this end, Dubai Government has developed and applied green building-codes across Dubai, in order to lead the Emirate down the path of sustainability, with 2020 set as an initial milestone.

The application of green building standards was introduced in two stages. The initial stage, launched in 2011, was to make green building practices mandatory for all government buildings. This was expanded to include all private and government buildings in 2014. In order to ensure correct application of these green codes and adherence to the principles, Dubai Municipality has expended significant effort in developing a sustainable culture among community members, building awareness of sustainable behaviour and its importance in future development by conducting seminars and lectures, running educational campaigns and holding, as well as participating in, relevant exhibitions. These activities have seen increased engagement from the community audience on every level.

In 2013, a prototype building model was developed following green-building guidelines. Launched as "The Green Building", it was used in exhibitions and educational campaigns to clearly illustrate green-building principles. In 2015, the presentation of this prototype was altered in a smart way to increase accessibility. Rather than the traditional physical model, the prototype was converted into an interactive application for smartphones that can be accessed at any time.

The Green Buildings app developed by Dubai Municipality provides an overview of the concept of green housing and offers a conceptual explanation on how to apply the conditions and specifications for green building standards in residential villas. The fundamental idea behind the project was focused on creating an educational app that illustrates the principles of green building in a simple way, with the rules applied in the green building prototype. The app takes the user on a virtual tour around a villa while explaining the regulations, where they are operating, how to apply them and the subsequent outcomes.

The smart app is designed to eliminate any confusion around the regulations and to directly guide and educate users on green building-codes, while also elucidating the benefits of sustainable building methods. This innovative use of technology provides a clear example of green-building regulations, providing a 3D model to illustrate the codes in practice and encouraging users to adopt sustainable practices.

H.E. HUSSAIN NASSER LOOTAH

Managing Director
Dubai Municipality

H.E. Engineer Hussain Nasser Lootah is Director General of Dubai Municipality. In this capacity, he chairs and sits on the boards of a number of semi-governmental organisations. He is a also a member of The Executive Council of Dubai Government. Throughout his career, he has been a champion for urban development in the Gulf – always driven by the ambition to make Dubai one of the most liveable cities on this planet. His influence extends through membership of numerous governmental and non-governmental boards, committees and councils, both at the local and international level.

بلدية دبي
DUBAI MUNICIPALITY

INTERVIEW

H.E. SAEED MOHAMMED AL TAYER

هيئة كهرباء ومياه دبي
Dubai Electricity & Water Authority

HOW THE EMIRATE IS BRINGING THE ROYAL MOTTO "INNOVATE OR STAGNATE" TO LIFE

DUBAI 2.0

Q1: WHAT ARE YOUR PLANS FOR DUBAI AND YOUR PROGRESS TO DATE?

H.E. S.T.: DEWA's plans are intended to help achieve His Highness' vision to transform Dubai into one of the smartest cities in the world. DEWA has launched three smart initiatives that are part of Smart Dubai. We have already made significant progress in our efforts to support this vision.

The first is the Shams Dubai initiative, which encourages tenants and owners of residential and commercial buildings to place photovoltaic solar panels on their roofs, which generate solar power to offset existing bills, with excess power exported to the DEWA grid. It also supports diversifying the energy mix by promoting the use of clean and renewable-energy sources to build a sustainable future for the Emirate. Launching the initiative implements council resolution number 46 of 2014, issued by H.H. Sheikh Hamdan bin Mohammed bin Rashid Al Maktoum, Crown Prince of Dubai and Chairman of the Dubai Executive Council, to regulate solar-power connections to Dubai's power grid. DEWA has already made progress with this, with Dubai Airports opening a solar array at its staff accommodations at Dubai World Central airport.

The second is the Smart Applications and Smart Meters initiative, which will see the installation and retrofitting of smart meters across Dubai, in order to enable owners and residents to monitor and measure their energy and water-use. DEWA is installing 200,000 meters in the first phase and providing smart applications to allow remote access to meters. In the second phase, in 2016, we will install more smart meters and enhance the smart grid to enable the complete monitoring of energy and water-use in Dubai. Within five years, we expect to have over 1,200,000 smart meters installed throughout the Emirate.

The third is the Green Charger initiative, which is well underway. This initiative will roll out 100 electric-vehicle charging stations across Dubai to support the uptake of electric vehicles in the Emirate. DEWA opened its first charging station at its head office in February this year and has completed the first phase, with 16 stations installed across Dubai, including at Dubai Silicon Oasis. The second phase will see a further 84 stations installed.

We are not resting on our successes, however, continuing to identify and innovate within these initiatives to raise the standard for success and help Dubai become a global hub for the green economy.

> "A smart city is a place for creative and empowered people who live in a cohesive society, with a **sustainable** and **competitive economic system,** and who adopt global standards using the **latest technologies and creative innovations**"

Q2: WHAT ARE THE KEY DRIVERS FOR DUBAI TO BECOME A SMART CITY?

H.E. S.T.: His Highness Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai, has proclaimed his vision for Dubai to become the happiest and smartest city in the world. This is outlined in the Dubai Plan 2021, which aims to make the city efficient and sustainable in using its resources and providing seamless and integrated services to its citizens and residents, to ultimately make them happier.

A smart city is a place for creative and empowered people who live in a cohesive society, with a sustainable and competitive economic system, and who adopt global standards using the latest technologies and creative innovations.

Technological creativity and innovation are key enablers for stimulating a creative environment and optimising the efficient use of all available resources in smart cities. These create a social communication system and an efficient and easy-to-use infrastructure for services, such as transportation, communications, electricity, water and educational services.

One of the goals for smart cities is to sustainably provide energy and water for everyone. This is why we are focusing on developing our renewable-energy projects, enhancing energy efficiency and reducing our impact on the environment.

Of course, it's people who drive the transformation into a smart city, where continuous development, creativity and innovation become a way of life. This drive is guided by the vision of our wise leadership to create sustainable growth and prosperity for us all.

Another key driver for smart cities is public-private partnerships, where the public and private sectors bring their best values to initiatives that serve the greater good and happiness of the people.

Smart cities are seamless in nature and comprise high-quality knowledge communications, social infrastructure and smart systems that empower leaders with the knowledge they need to make better decisions and to optimise the efficient use of resources. This makes cities sustainable for the next generation, as well as the generations to come.

Q3: HOW DOES DEWA PLAN TO SUPPORT DUBAI BECOMING THE WORLD'S SMARTEST CITY?

H.E. S.T.: UAE Vision 2021 aims to position the country as a leading global hub in sustainability, competitiveness and the green economy. The long-term Green Economy for Sustainable Development initiative, launched by His Highness Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai, paved the way for this to happen. In order to become a smart city, a city must firstly become sustainable and smarter in the way we use resources.

I have already outlined three key smart initiatives to support the Smart Dubai initiative. In addition to these, Dubai Electricity and Water Authority (DEWA) has been building sustainable systems that adopt technological innovations to improve the efficiency of electricity and water infrastructure, in line with the highest international standards, to support an advanced competitive economy.

DEWA cumulative efficiency improved by 28.36 per cent between 2006 and 2014, using the latest technologies and adopting technological innovations.

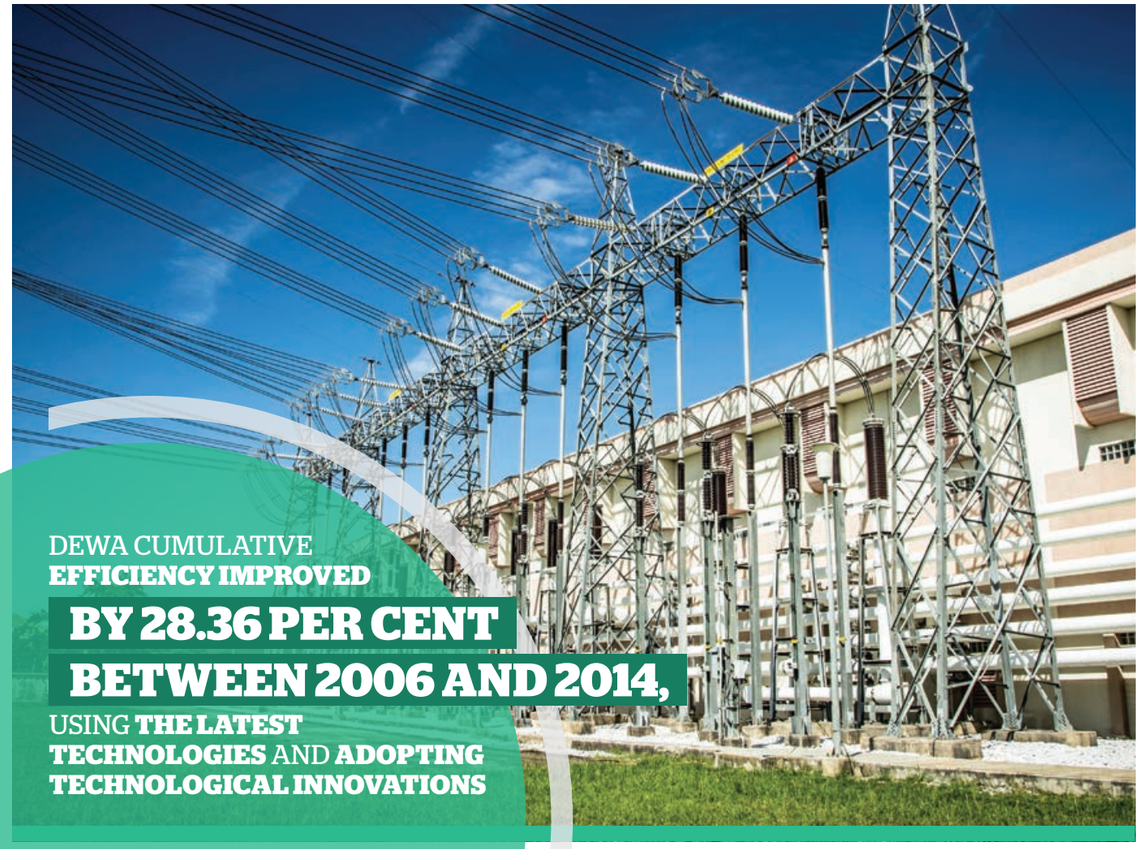
DEWA has surpassed leading European and American companies by reducing losses in power transmission and distribution networks to 3.26%, compared to 6-7% in Europe and the USA. Water-network losses decreased to 9.1%, compared to 15% in North America. DEWA's results are among the best internationally for customer minutes lost per year. DEWA reached 4.9 minutes in 2014, compared to 15 minutes recorded by leading utilities in the European Union.

In order to support the development of Dubai as a smart city, DEWA has developed a smart-grid strategy, focused on many aspects, including demand-side management, energy efficiency and operational improvement.

As part of this strategy, DEWA identified nine programmes, including advanced metering infrastructure, asset management, demand response, distribution automation, information technology infrastructure, substation automation, system integration, telecommunications and big data and analytics. Smart-grid implementation is a criterion for Dubai to successfully become a smart city. The seamless availability of round-the-clock integrated and connected services that meet daily living requirements is essential.

In 2009, DEWA began its transformation into a smart-grid utility. It was the first government organisation to achieve 100% smart transformation, less than a year after the Smart Dubai initiative was announced. Adoption of smart services was 60% in 2014. DEWA's smart app, which was launched in 2010, provides over 150 services and features that make life easier for everyone, including people with special needs, by enabling users to complete transactions anytime, anywhere.

To build the smart grid across its generation, transmission and distribution operations, DEWA uses state-of-the-art communication technologies in all of its operations. Besides building the infrastructure, we are also actively educating the public about our smart applications, with over 60% of our customers now using smart services.



DEWA CUMULATIVE **EFFICIENCY IMPROVED BY 28.36 PER CENT BETWEEN 2006 AND 2014,** USING **THE LATEST TECHNOLOGIES** AND **ADOPTING TECHNOLOGICAL INNOVATIONS**

> DEWA has surpassed leading European and American companies by reducing losses in power transmission and distribution networks to 3.26%, compared to 6-7% in Europe and the USA

Q4: HOW WILL SMART CITIES IMPROVE ECONOMIC COMPETITIVENESS AND GROWTH?

H.E. S.T.: Our leadership has established a clear vision for all to aim for, with targets and milestones geared towards become number one in everything we do; raising the competitiveness of the country to become one of the best nations in the world by 2021. Without a doubt, smart cities will contribute to the economic competitiveness of the country.

The availability and seamlessness of services contributes to the efficiency of service delivery, making the way we do business even easier. This has a positive impact, raising standards of living, attracting investments and establishing Dubai's position as a global hub for trade, finance, tourism and the green economy.

Diversification of the energy mix and ensuring its sustainability is key in the transition towards a smart and sustainable city. This includes the use of renewable-energy sources such as solar energy and the implementation of demand response as part of the Dubai demand-side management programme.

This programme addresses a key objective of the Dubai Integrated Energy Strategy 2030; to reduce energy demand by 30% by 2030. DEWA estimates that the current costs for its strategic projects is approximately AED 30 billion. However, it will create a total value of AED 82 billion, a net saving of AED 52 billion.

DEWA represented the UAE in the World Bank's Doing Business Report. The UAE moved from 10th position in 2011 to 7th in 2013. In 2014 and 2015, the UAE jumped to 4th place globally and is first in the Middle East and North Africa for access to electricity. This is not good enough for us. We want to reach first place globally. This requires a serious commitment to innovation, which will become a key driver for the sustainability of smart cities to become truly functional and efficient and thus reflect the wise words of His Highness Sheikh Mohammed bin Rashid Al Maktoum, when he said, "Innovate or stagnate". As His Highness said, "Achieving today's vision will stimulate us to achieve a more ambitious, advanced and innovative vision." *end*

About H.E. SAEED AL TAYER

H.E. Saeed Mohammed Al Tayer, Vice-Chairman of the Supreme Council of Energy and MD and CEO of Dubai Electricity and Water Authority (DEWA).

Al Tayer has overseen the rise of DEWA, which has become one of the most efficient utilities in the world, and a profitable and efficient service provider with minimal power and water losses that is contributing to making Dubai one of the happiest cities in the world. Under his leadership at DEWA, the utility is working closely with its key stakeholders to develop carbon management, energy-efficiency and energy-and water-efficient consumer goods. At the Dubai Supreme Council of Energy, he has overseen Dubai's energy diversification strategy, the introduction of solar power, and demand side management. Al Tayer has been the driving force behind the formation of the Carbon Ambassador Programme in December 2013 and His Excellency Ban Ki-moon, Secretary General of the United Nations, has personally thanked him for his support for the next generation.

SMART APPLICATIONS FOR SMART CITIES

EDUCATING THE UAE'S POPULATION THROUGH THE MEDIUM OF THE SMARTPHONE AND TABLET

It was in 2012, when His Highness Sheikh Mohammed Bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai, announced the creation of a national green initiative in the UAE under the theme "a green economy for sustainable development." In the three years since that announcement, the UAE has moved steadily towards its goal of a sustainable and green economy that rewards innovation and helps the environment. Dubai Municipality's strategic direction works closely with these goals in its approach to creating a new Dubai as a smart city of the future for Dubai Expo 2020 and the UAE Vision 2021 policy.

Dubai's 2015 strategic plan, Dubai Plan 2021, ties in with these projects and policies. It has six elements that include: making Dubai a city of connected people and a place where its citizens want to live and work; increasing social cohesion; ensuring it is a place with pioneering government that is a hub for the world economy; and perhaps most importantly here, building a smart and sustainable city.

The plan specifically looks towards implementing green specifications for all new and existing buildings in Dubai. These specifications were launched by Dubai Electricity and Water Authority (DEWA) and Dubai Municipality, as the Green Building Regulations and Specifications. The main focus of these specifications is to regulate the construction of buildings and their consumption of electricity and water, ensuring that innovative new technologies to develop energy and water reclamation and saving are integrated.

POINT OF VIEW

H.E. ENG. HUSSAIN NASSER LOOTAH

Director General of Dubai Municipality

H.E. Eng. Hussain Nasser Lootah is a civil engineer who also sits on the boards of several UAE NGOs. He is also a member of the Executive Council of Dubai Government.

بلدية دبي
DUBAI MUNICIPALITY

What this means for Dubai is not just estimated savings of AED 10 billion over the next 15 years, but also the reduction of waste, the protection of the local environment, a reduction in the use of precious natural resources and improvements in carbon footprint levels that impact climate change and global warming – both of which affect the future of the whole of humanity, not just the UAE.

> **HIS HIGHNESS SHEIKH MOHAMMED BIN RASHID AL MAKTOUM** has pushed vigorously for **e-government,** and **Dubai Municipality** has followed this closely

Over the past four years, Dubai Municipality has expended a great deal of effort in creating new ways of communicating its message of sustainability to not only the construction and hospitality sectors, but the general public as well. The idea is to communicate how changing their own personal way of living can impact the future much more than they might have imagined, ultimately making the plan more successful.

Apart from the traditional seminars, lectures, educational campaigns, and exhibitions, Dubai Municipality has adapted technology to work for residents. His Highness Sheikh Mohammed bin Rashid Al Maktoum has pushed vigorously for e-government and Dubai Municipality has followed this closely by developing an app for all major smartphones and tablets that explains and demonstrates the new laws and regulations in a realistic setting that includes 3D.

The idea of the project was to create a smart interactive and educational app that illustrates how typical residential villas fare when compared to the new regulations – allowing citizens and residents alike the opportunity to bring their properties up-to-date. The app is simple, effective and highly innovative – designed for today's homeowner, talking a language they understand, simply and effectively. The app is available from app stores and Google online. *end*

"[Strategic Dubai Plan 2021] [...] **has six elements** that include making Dubai a city of **contented people** and a place where its citizens **want to live and work**"

حكومة دبي
GOVERNMENT OF DUBAI

بلدية دبي
DUBAI MUNICIPALITY

الخرسانة الخضراء لمستقبل أكثر استدامة
Green Concrete for a Sustainable Future

#عُملاؤنا_غايتُنا
800900
للاستفسارات والاقتراحات والشكاوى
For Suggestions & Complaints & Notifications
www.dm.gov.ae

رؤيتنا: بناء مدينة متميزة تتوفر فيها استدامة رفاهية العيش ومقومات النجاح.
Our Vision : Creating an Excellent City that Provides the Essence of Success and Comfort of Sustainable Living

Facebook/DubaiMunicipality Twitter/DMunicipality Instagram/dubaimunicipality Youtube/DubaiMunicipalityUAE

KEEPING UP
WITH AN EVER-GROWING ECONOMY

Dubai has experienced rapid change that is likely to continue. Although there will be a slow-down and correction every five to seven years, it will continue to grow overall, driven by demand. Dubai Municipality's view on maintaining this growth in the long-term is to rely on sustainable development principles. These principles call for adherence to the Urban Plan 2020, regarding infrastructure and superstructure development according to planned land-use. This will result in economic development that stems from social needs, while promoting environmental protection. Extending further into the future, Dubai will continue along the path of sustainable development, which is embedded in the next version of the urban plan which looks at 2020 in detail and projects forward to 2050.

The strategies Dubai Municipality follows are based on the UAE National Agenda, the Dubai Agenda 2021, the Dubai Integrated Energy Strategy (DIES 2030) and the Dubai Municipality Strategy 2021. These ensure that Dubai continues to evolves. sustainable development is directly linked to urban evolution and Dubai will continue to focus on diversifying its economy, utilising the latest available technologies in communication, and calling for innovation in order to achieve the ultimate social goal of a happy and prosperous city.

The most significant changes to come will involve altering economic growth from conventional industries to an innovation basis and turning the classical economy into a circular economy with comprehensive material management at a base. Another aspect is smart-city development, which will help Dubai on the path to zero emissions. Dubai's history shows that despite limited resources, impressive results can be achieved through vision and progression. This fact alone is enough urge Dubai onwards to a brighter future through innovation. *end*

بلدية دبي
DUBAI MUNICIPALITY

Eng. Abdulla Rafia is currently Assistant Director-General for the Engineering and Planning Sector committee, as well as being the head of Dubai Municipality's Sustainability Committee. He is also a board member of the Dubai World Trade Centre, the Dubai Green Economy Partnership, the Energy Service Company (Etihad ESCO) and the Demand Side Management (DSM) committee of the Dubai Supreme Council of Energy (DSCE).

POINT OF VIEW

ENG. ABDULLA RAFIA

Assistant Director-General for the Engineering and Planning Sector, Dubai Municipality

MAINTAINING EFFICIENCY
IN PUBLIC SPACES

By
Abdulamir R. Fadhlani

Creating a green economy is a broad task, but small changes can have a large impact. To this end, Dubai Municipality's Maintenance Department has set to work on a number of initiatives to contribute to energy savings and the preservation of the natural environment.

"1,000 LIGHTS **SWITCHED TO SOLAR** ANNUALLY UNTIL ALL PARK LIGHTING USES THESE **ENVIRONMENTALLY FRIENDLY SYSTEMS**"

About
ABDULAMIR R. FADHLANI

He is the Head of Maintenance and Facilities Section in the Maintenance Department at Dubai Municipality. He started his career with Dubai Municipality as an electrical engineer in their electrical section. In 2004 he was promoted as Head of Section after the creation of the new general maintenance department.

بلدية دبي
DUBAI MUNICIPALITY

Parks across Dubai are seeing changes in their illumination, with standard pole-lights being replaced by solar-energy powered ones. To date, 1,000 lights have been switched to solar with the same number scheduled for replacement annually until all park lighting uses these environmentally friendly systems.

In addition, solar heaters are being utilised in public areas such as DM's abattoirs, which previously used diesel engines for water heating. The solar heaters contribute to a significant reduction in fuel consumption and CO_2 emissions. The DM AL Quoz Graveyard has also turned to solar to replace electric water-heaters and the same initiative is in progress at the AL Muhaisanah Labour Camp.

Swimming pools are a natural target for heater replacement, with Mushrif and Al Mamzar parks trading standard electric heaters for heat pumps, reducing energy consumption by 33%. Other projects include replacing the standard lighting systems at 15 of DM's buildings with highly efficient LED lamps, reducing consumption by 43%. Seven locations have seen the installation of mist-cooling systems to chill the areas surrounding the CAC condensers, creating further efficiency and Al Towar Centre's air-conditioning now uses a remote monitoring system, reducing electricity consumption by 18%. The same is under progress in Naif Market and at Dubai Central Laboratory buildings. Even the roofs of the City Hall and Al Towar Centre are going green, as they are being planted and irrigated using air-conditioning drainage water. These small changes together add up to big savings. *end*

GREEN BUILDINGS 101

By Eng. Khalid Mohamed Saleh Al Mulla

In line with Dubai's commitment to becoming a world-leading green city and to ensure Dubai Expo 2020 is presented as an environmentally sustainable event, Dubai Municipality developed the "Green Building Regulations and Specifications" in 2011, and has now made these mandatory for both public and private sector developments. This is widely considered to be one of the most important pieces of legislation adopted for protecting the environment and its natural resources, as well as ensuring the health and welfare of Dubai's residents.

The drivers in this process are not only the cost-reductions secured from more energy-efficient buildings, but also increased environmental responsibility to ensure a healthy environment for the Emirate, long into the future. The Green Building Regulations have not provided a ratings system until now, but rather form a baseline for responsible urban development.

The Green Building Regulations comprise the best international standards adapted to the local environment, economy and culture of Dubai. The aims are three-fold: (a) to improve the performance of buildings by reducing the consumption of energy, water and materials; (b) to ameliorate public health, safety and general welfare; and (c) to enhance the planning, design, construction and operation of buildings. The Green Building Regulations and specifications encourage all developers to build towards a greener future. The regulations directly affect all aspects of the construction process for new buildings and buildings undergoing significant extension or renovation, from initial site selection and building design through to construction, post-completion building operation and maintenance, and demolition of the building at the end of its useful life.

Additionally, from April 2015, all new buildings in the Emirate will be required to use green alternatives to replace Portland cement (OPC), the major component of concrete mix that has been found to emit toxic gases. With each tonne of OPC produced generating more than one tonne of carbon dioxide (CO_2) and other toxic gases, Dubai Municipality (DM) has made it mandatory for consultants and contractors to use greener and safer alternatives such as green cement.

The green building regulations and specifications are comprehensive. The 79-point framework relates to access and mobility; ecology and landscaping; light pollution; solar reflection requirements for building exteriors; responsible construction; environmental impact assessments; building vitality; energy and water performance; and materials and waste. To date, more than 10 million square metres in Dubai have received green certification. In addition to these measures already in place, Dubai Municipality is currently developing a new green building rating system called Saa'fat which will have an even broader impact on new construction in the Emirate.

> "The 79-point framework relates to access and mobility; ecology and landscaping; light pollution; solar reflection requirements for the buildings' exteriors; responsible construction [...]"

> "from April 2015, all new buildings in the Emirate will be **required to use green alternatives** to replace Portland Cement (OPC)"

Specific examples of advanced green buildings in Dubai include DEWA's Sustainable Building completed in February 2013 in Al Quoz. This is the largest government building in the world to secure a LEED Platinum rating. The extensive green features have led to a 66% reduction in energy consumption and a 48% reduction in water consumption. Dubai Municipality's first commercial green building, Al Fahidi Souk in Bur Dubai is another prime example; this complex is estimated to use 45% less energy and 20% less water compared to conventional systems by applying energy-saving systems, natural lighting, and eco-friendly building materials and insulation methods.

Sustainable construction has become an underlying principle in the UAE as robust economic plans feature strong environmental platforms. Driving the low-carbon future of the UAE is the commitment to green infrastructure and smart buildings, that ensures eco-friendly architecture through the use of energy-efficient air-conditioning units, recyclable construction materials, renewable energy systems for heating and cooling, and automated thermostats. Green buildings and green building-materials are therefore a vital component in Dubai's strategic plan to become a green city and are an integral part of the long-term national initiative to build a green economy. The green building regulations and specifications are not just about buildings, they are also about promoting a healthier community lifestyle. *end*

About
ENG. KHALID MOHAMED SALEH AL MULLA

He is the Director of the Building Department at Dubai Municipality. He is is also the Vice Chairman of the Green Building Committee amongst other appointments, the Chairman of the main committee for the improvement of the construction permit process in Dubai, as well as heading the updating of the building specifications team. He sees Dubai taking the regional lead in green buildings to become one of the most liveable and happy cities in the world.

بلدية دبي
DUBAI MUNICIPALITY

Think of us as a close conversation between 434,000 of your brand's best friends.

It's the heart of YouGov. An online community of thousands of people in MENA, engaging in a continuous online conversation. About their beliefs. Their behaviours. And your brand.

With that continuous stream of data, and our own broad research expertise, we've created a suite of sophisticated services: YouGov BrandIndex, the daily brand perception tracker. YouGov Omnibus, the most cost-effective way to get answers fast. Plus a full spectrum of custom quantitative and qualitative solutions.

Contact us at info.me@yougov.com or on +971 4 367 0340 to find out more.

mena.research.yougov.com

YouGov®
What the world thinks

HABITATS OF THE FUTURE

LIVING SMARTER FOR A BETTER TOMORROW

> One prime example is Singapore, globally recognised for embracing technology as part of its aim to become the world's first Smart Nation by 2020

The age of the smart city is upon us. The use of digital technology to enhance the quality of life, improve the performance of urban services and reduce costs and resource consumption is a global phenomenon. Dubai is at the forefront of this societal change and is deeply committed to becoming one of the smartest cities in the world.

To drive the vision of Vice President and Prime Minister of the UAE and Ruler of Dubai, H.H. Sheikh Mohammed bin Rashid Al Maktoum and ensure the emergence of Dubai as a smart city, we must learn from the experience of other nations.

One prime example is Singapore, globally recognised for embracing technology as part of its aim to become the world's first Smart Nation by 2020. In 2014, Singapore set the Guinness World Record for the largest vertical garden and the government offers commercial and residential customers a 50% subsidy for installing vertical greenery solutions.

To bypass transport congestion and environmental degradation, we need to study the urban development issues that other fast-expanding cities have faced. So far, Dubai Roads and Transport Authority (RTA) has done an incredible job in tackling transport issues with the Dubai Metro and the new Dubai Tram. A globally growing concern is the long-term sustainability of fuel use. Dubai Science Park's business partner, PTL Solar, is helping to address this by looking at how hydrocarbon dependency can be reduced. They currently work with some of the largest climate-change partnerships to provide renewable-energy solutions for solar lighting, residential solar housing systems, solar farming, solar transportation, solar-power backup-systems and solar-aviation operations.

The ambition is clear on the part of Dubai's government, as well as from its businesses and citizens. Going forward, we must focus our attention on the identification, training and facilitation of smart people to build our smart cities. The recruitment of world-class talent is a challenge in any market, but if we are to be successful, investing in the right people is a crucial step towards developing the smart systems of the future. *end*

DUBAI SCIENCE PARK

POINT OF VIEW

MARWAN ABDULAZIZ JANAHI

Executive Director of Dubai Science Park

GETTING AROUND

DUBAI'S TRANSPORTATION MODE OF THE FUTURE

By
H.E. Mattar Al Tayer

How does the Roads and Transport Authority (RTA) create integrated public transport solutions and smart access to get Dubai ready for 2021? As Dubai grows, so does the RTA, whose strategic goals are based on those of Dubai Government. The RTA's main function is to develop an integrated and sustainable transportation system and clearly, such a system is one of the main pillars that support Dubai's competitiveness and economic advancement.

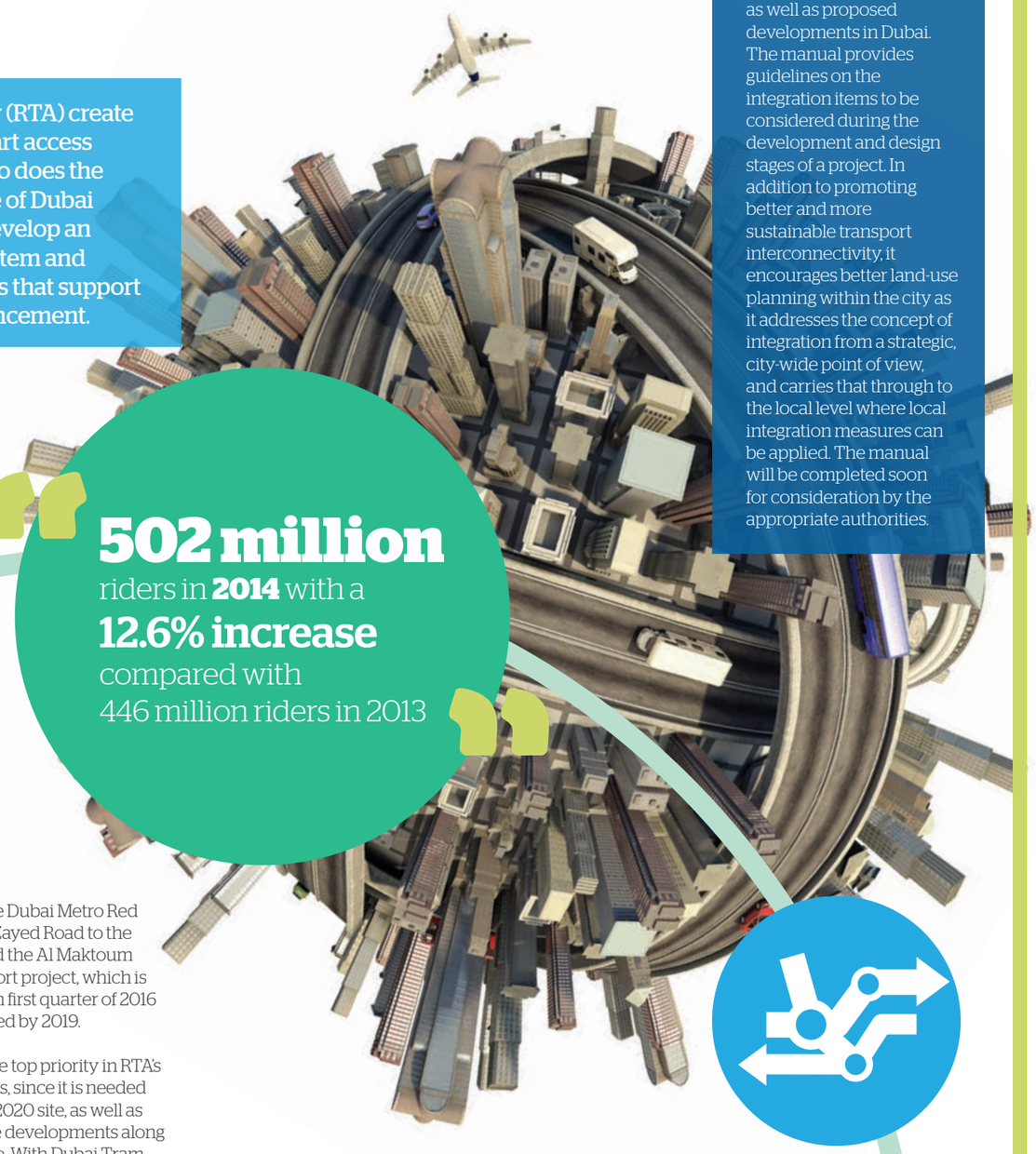
Our transport projects, which include Dubai Metro, Dubai Tram, our large fleet of buses and taxis and our water transport ferries, buses, and taxis, have collectively helped in increasing our public transport share from 6% in 2005 to 14% in 2014. Our ultimate goal is to achieve a 20% public transport share by 2020 and 30% by 2030, helping to achieve a greener economy.

We have made significant strides in terms of achieving our goals. The public transport ridership comprising Dubai Metro, Dubai Tram, buses and marine transit modes (water ferries, water taxis, and buses) in addition to our taxis (Dubai Taxi and franchise companies), topped 502 million riders in 2014 with a 12.6% increase compared with 446 million riders in 2013. The average daily ridership on our integrated transport system in 2014 was 1.38 million per day compared to an average of 1.2 million in 2013 and one million in 2012.

The RTA has a critical role in planning for the future and has participated in formulating Dubai Strategy Dubai 2021, around which we developed our corporate strategic plan. Throughout the planning process, the RTA ensures that the proposed initiatives and programmes all serve and integrate with that vision.

In terms of creating an integrated public transport network leading up to 2021, we definitely have a lot to look forward to. Highlighting our rail projects, we look forward to the construction of the Dubai Metro Red Line from Sheikh Zayed Road to the Expo 2020 site and the Al Maktoum International Airport project, which is expected to start in first quarter of 2016 and to be completed by 2019.

This project has the top priority in RTA's portfolio of projects, since it is needed to serve the Expo 2020 site, as well as existing and future developments along the proposed route. With Dubai Tram a phenomenal success like the metro, we are currently studying stage Two of the Dubai Tram which will extend over roughly five kilometres from the current location of the tram depot up to the Jumeirah Beach Hotel and the Mall of the Emirates. This extension project is in its design stage.



> **502 million** riders in **2014** with a **12.6% increase** compared with 446 million riders in 2013

The RTA is also committed to enhancing the connectivity between transport modes and land use. We see the value of producing guidelines that will enhance transport integration for existing urban environments, as well as proposed developments in Dubai. The manual provides guidelines on the integration items to be considered during the development and design stages of a project. In addition to promoting better and more sustainable transport interconnectivity, it encourages better land-use planning within the city as it addresses the concept of integration from a strategic, city-wide point of view, and carries that through to the local level where local integration measures can be applied. The manual will be completed soon for consideration by the appropriate authorities.

Over the coming years, the RTA will continue developing Dubai's transportation infrastructure and optimising system efficiency. Areas that will receive more focus include: the introduction of more smart services and applications; personalised services; new technologies; and increased reliance on public transport.

The RTA is committed to investing in new, smart technology as part of its contribution towards achieving Dubai Government's vision of becoming the world's smartest city. It plans to do this by leveraging internal and external capabilities of the cloud, IoE, analytics, and social, mobile, and other systems. The RTA is thus in a unique position to contribute towards the happiness of Dubai's citizens and visitors alike.

The RTA launched 10 smart apps last year, including RTA Dubai, Smart Parking, Smart Drive, Smart Salik, Wojhati, Smart Taxi, Drivers and Licensing, Public Transport, Sharekni and the Corporate Services app, with 173 smart services contained within. These applications use business as well as technical solutions that enable RTA's customers to access RTA services from anywhere, at any time, and deliver a superior user-experience.

At the same time the RTA recognises the importance of social media, the empowerment of customers, and their need and desire for social collaboration and engagement. Being able to ask and obtain real-time feedback from multiple levels of interaction, and further, to be able to analyse data and go back to the public and our customers with a meaningful response, will be possible thanks to the utilisation of the latest technology in socialmedia interaction-analysis and customer relationship management tools.

All of the business and technical initiatives outlined above are in line with the RTA's vision to enable safer, smarter and smoother transportation for all. The RTA will continue to invest in new technology and systems and will always be a front-runner in adopting new technology, transitioning to a full customer-centric business model, where all interactions with the public will be personalised, unobtrusive, fast, and efficient.

The RTA believes deeply in Sheikh Mohammed bin Rashid Al Maktoum's vision – that the UAE Government makes its citizens and visitors to Dubai happy at all times and its actions are a result of this inspirational leadership. *end*

About H.E. MATTAR AL TAYER

H.E. is the Director General, Chairman of the Board of Executive Directors, Roads and Transport Authority.

He is a professional civil engineer, who graduated from the University of Wisconsin in 1983 and holds an Honorary Fellowship of the British Institute of Civil Engineers (ICE), 2010.

He was assigned the task of leading the Roads and Transport Authority in November 2005. Under his leadership and driving force, he established a competent and experienced specialist workforce, thereby driving the organisation through remarkable achievements that have positioned RTA as a world-class organisation.

Prior to taking the helm with RTA, H.E. M. Al Tayer worked in Dubai Municipality starting in 1983, assuming several leadership roles and eventually moving to become Deputy Director General of the Dubai Municipality.

المجلس الأعلى للطاقة
Supreme Council of Energy

THE RACE IS ON

By Faisal Ali Rashid

GREEN VEHICLE FLEET MANAGEMENT IS SPEEDING UP

Going green, in terms of fleet management, goes beyond the usage of hybrid vehicles and fuel alternatives. It is about establishing prudent guidelines and superior practices and integrating them into fleet-management solutions. Given increasingly expensive fuel costs and myriad environmental and health impacts due to climate change and pollution, there is pressure on organisations to seek measures to improve efficiency to ensure a sustainable future.

> A contributing factor is customer preferences for **larger engine** sizes, **higher safety** standards and **superior vehicle power**

On the positive side, within the last two decades, a range of innovative vehicle technologies and efficient fuel-management options have become available to public fleet end-users, government entities and business institutes. Though there have been dramatic reductions in greenhouse-gas emissions within the sector – due largely to advancements in vehicle technology and fuel upgrading – the average fuel consumption of current vehicles has not seen significant improvement. A contributing factor to this is customer preference for larger engine sizes, higher safety standards and superior vehicle power.

There is a good business case for initiating a green approach to transport; establishing green fleet management reduces operational fuel costs and enhances sustainability. Given this, with a range of options available for green fleet management, fleet administrators can improve the environmental performance of vehicles and reduce fuel consumption, generating organisational savings.

Public and private transport accounts for approximately 30% of all CO_2 emissions in the world and 22% of emissions in the Emirate of Dubai, according to the 2013 UAE Greenhouse Gas Inventory of the UAE Ministry of Energy. Transport also tends towards high operational costs due to fuel usage; putting tighter energy-efficiency processes and measures in place is not only sensible, therefore – but also essential.

By placing measures such as the adoption of fuel-efficient vehicles, the development of driver education and awareness programmes, efficient trip planning and mileage reductions at the centre of transport operations, organisations not only reduce operational costs, but also contribute to improvements in human health and environmental sustainability, without compromising core business success. *end*

> Within the last two decades, a range of innovative vehicle technologies and efficient fuel-management options have become available to public fleet end-users, government entities and business institutes

About
FAISAL ALI RASHID

He is the Energy Demand-Side Director for the Dubai Supreme Council of Energy. He has extensive experience in energy management including supply, strategy and demand, as well as a strong background in industrial process plants – including oil and gas, power and water-generation processes, material handling processes and glass manufacturing. In his current role, he looks after the entire energy-demand management spectrum of the Emirate of Dubai.

Spotlight on innovation

The Cool Space

The business of keeping cool outside this summer in the UAE

As the hot and humid summer advances in the UAE, customers retreat into the air-conditioned cool of buildings. Whether you are at home or out in town, staying outside during the oppressive summer days and nights isn't often a realistic option. But what if there were ways to keep the outdoors cool? WSP and Parsons Brinkerhoff have worked together to come up a modern, energy-efficient solution that could do just that – and save money and power, too.

The Outdoor Space Comfort research project combines the findings of the latest research in comfort and info-age software to create a system that allows outdoor space to be reclaimed – even in the UAE summer heat. The project, already in use in a number of locations has made a noticeable impact in that it has reduced uncomfortable hour-time by 10%; shown a significant drop in water consumption; and made the of commercial outdoor spaces two months longer than was previously possible.

Naturally, the ability to reclaim commercial space has significant potential for UAE businesses – especially restaurants and cafes – which find yearly drops in consumer activities during these months. There is also a multiplier effect, in that indoor lighting air-conditioning and other indoor expenses are negated. This means that businesses are more profitable, and the country secures a greater reserve of its natural resources for the future, making itself sustainable at the same time for generations to come.

HAPPY GREEN LIVING SPACES

By
Martyn Crook

HOW A GREEN OASIS IN THE DESERT CAN BE ENVIRONMENTALLY-FRIENDLY

Green-living landscaping projects in the UAE have the potential to revitalise communities, improve the quality of life and ultimately achieve the nation's sustainable development goals.

"PHASE II AIMS TO INTRODUCE AL BARARI TO A WIDER, GLOBAL DEMOGRAPHIC, AS AN AMBASSADOR FOR THE UAE'S GREEN VISION."

A decade ago, the desert south of Nad Al Sheba was little more than a stretch of empty sand. In 2005, the dunes were transformed into the community now known as Al Barari. As the first sustainable residential community of its kind in the Middle East, it offers its residents a community with a natural feel that attempts to fuse greenery with luxury.

Initiatives at Al Barari are executed with sustainability as a key driver. More than 80% of the development is green space and we are constantly seeking new ways to further minimise our environmental impact. This is why we are one of the lowest density developments in the region.

WATER MANAGEMENT

The water management systems at Al Barari incorporate many applications that work collectively to ensure that the grounds are watered efficiently and sustainably. These water management systems include a smart irrigation system to ensure plants are not over-watered, thanks to perched water tables, lined waterways and special soil treatments. Moreover, irrigating foliage through a smart-drip system helps conserve water and is ultimately better for plant life as the process adjusts to their needs in real time, thanks to Al Barari's own weather station that gathers data on a variety of markers relevant to the landscape, including temperature, humidity, sunlight and wind.

An on-site reverse-osmosis plant collects any water used as well as that taken from a nearby sewage-treatment plant at Dubailand that creates Class A water for irrigation and pollution traps which prevent ground contaminants and litter.

Run-off from villa rooftops is collected in drainage trenches and 'soakaways' to help replenish groundwater reserves and as Al Barari villas have individual energy-efficiency home systems, residents are encouraged to recycle through underground waste systems situated around the development, which separate organic from inorganic waste.

THE REGION'S LARGEST 'GREEN PLANT' NURSERY

Al Barari's nursery, Green Works, has dedicated 18 hectares to over 1,800 plant varieties and was launched in early 2012 to make Al Barari a self-sufficient cultivation centre for water-efficient and resilient plants and trees to cope with the UAE's desert climate. Plants grown here are cultivated to international standards and acclimatise more effectively to UAE conditions. Additionally, over the years, Al Barari has researched and cultivated many plant varieties that consume less water and now thrive in the UAE. As a result of the high density of trees, which is in itself a benefit, the ground within Al Barari is cooler in temperature and therefore requires less water from the irrigation system.

Green Works has also developed a green waste-processing facility that channels quality organic compost back to Al Barari as an organic fertiliser to maintain and enhance healthy soil. The composting process requires the construction of green waste dumps and then waiting for the materials to decompose into humus. This process takes approximately six months before it is ready to use in the gardens. Compost is a key ingredient in sustainable landscaping.

THE URBAN LANDSCAPE

Inspired by the Bedouin, a natural shade-canopy formed by the planting of UAE climate-tolerant trees allows the estate to stay cool in the summer and has prevented the 'heat-island' effect. Al Barari enjoys plentiful natural light and shade and its residences have been designed to occupy leaf-shaped clusters to assist wind-flow and minimise building impact. Al Barari has effectively created its own microclimate through the use of waterways, maintenance of the natural typography, the harnessing of wind, and through dense planting measures, resulting in a community that is on average three to five degrees Celsius cooler than the rest of Dubai.

INSIDE THE BOX THINKING
TRENDING: INNOVATIVE AND SUSTAINABLE MODULAR-BUILDINGS FROM SHIPPING CONTAINERS

If someone suggested that you take up residence or open your office in a shipping container, you might rightly think them a little strange. And yet, this is precisely what we have witnessed all over Dubai's public spaces in the last years.

One prime example has been the graduation project of the DEWA Carbon Ambassador Programme at the World Green Economy Summit. The class of 2015 received praise from no other than Ban Ki-moon, Secretary General of the United Nations for their four sustainable bus stops made from re-purposed and fully re-furnished shipping containers. The end of service containers were donated by DP World and left to the imagination of the next generation of creative minds as part of their annual programme.

Other projects are the new permanent building development at Techno Park, Dubai using 42 40-foot-high shipping containers over an area of 13,440 square feet to provide well-insulated offices, each with a reception, conference and prayer rooms and dining facilities, too. The Design District D3, Burj Khalifa and Dubai Kite Beach have recently seen temporary installations of containers acting as food stalls, pop up shops and designer boutiques. At the end of 2015, Sheikh Zayed Road even saw a temporary marketing installation.

You might be forgiven or thinking that shipping containers are less than perfect as building materials. But the contrary is true as they are built for extreme conditions and have a tensile strength that exceeds IBC standard codes. Furthermore their modularity allows for flexible application and much re-use. Utilising these existing structures also removes the need for raw materials – a perfect CV for a fast moving urban landscape with sustainability ambitions like Dubai.

SPOTLIGHT ON INNOVATION

THE VISION AHEAD

Phase I has seen the handover of the majority of the 217 villas to residents, with six of the 34 themed gardens completed. And, as part of the diversification plans already established, the development features Green Works, a plant nursery; The Farm, a unique concept restaurant where fresh, ethically-sourced food is used; the Body Language health club; and a destination spa, Heart & Soul.

Phase II aims to introduce Al Barari to a wider, global demographic, as an ambassador for the UAE's green vision. It will see the creation of a six-star boutique hotel, retail spaces and further residential development. It is certain that whatever Al Barari builds in the future, it will definitely be green and be an extension of existing sustainable developments.

The UAE has achieved many sustainable development goals, including the setting-up of solar parks and green financing-infrastructure. Sustainability can be defined as 'the need for comfortable, happy spaces to live and work in', of which Al Barari is a sound example. The concept of green living spaces goes beyond foliage and residential appeal; it is an opportunity for cities to design and foster a community that ultimately integrates the social, economic and environmental aspects of sustainability. *end*

About MARTYN CROOK

He is the Business Development Director of Al Barari. and has been involved indirectly with the company for many years because of family ties. He has a deep understanding of the original vision, and the commitment to sustainability Al Barari has made. In his role, he oversees the sales and marketing team and makes strategic decisions for the company's expansion.

PLANTING THE FUTURE

THE CONCEPT BEHIND AL BARARI

Conceived by Zaal Mohammed Zaal in 2005, Al Barari twins sustainability and luxury as essential elements of city life. Naturally, this means that 80% of the development is green space. The community is 15 minutes away from Downtown Dubai, yet remains the lowest density development in the UAE, with over 16.4 kilometres of lakes, freshwater streams and waterways.

Al Barari's landscape company, Green Works, is the region's largest privately-owned plant nursery. Its operations cover 38 hectares of the development and it grows over 700 plant varieties. The nursery is known for its efforts in research and development, having experimented with more than 1,800 varieties over the past 10 years to ensure sustainable horticulture.

Al Barari comprises four main sub-developments: 189 residences, 28 luxury villas in The Reserve; 307 apartments in Ashjar; 157 duplexes, penthouses and 'sky villas' in Seventh Heaven, and 99 four-bedroomed villas in The Nest. *end*

MEASURING THE AMENITY VALUE OF OUR COASTAL ECOSYSTEMS

By Ahmed Baharoon and Jane Glavan

THE ECOSYSTEM SERVICES ASSESSMENT PROJECT HAS PROVIDED A FIRST LOOK AT THE VALUE OF COASTAL ECOSYSTEMS IN THE EMIRATE OF ABU DHABI

Accurately measuring the benefits of protecting our environment – and the risk of inaction – provides leaders with a sound basis for informed decision-making with sustainability at its core. The Abu Dhabi Blue Carbon Demonstration Project, or Phase I of the Blue Carbon Project, did just that and also necessitated further studies on the value of our coastal ecosystems.

Launched in 2012 by AGEDI with support from the Abu Dhabi Environment Agency, phase one of the Blue Carbon Project sought to drive an existing commitment to make informed decisions by providing a detailed understanding of carbon sequestration and storage in coastal areas home to salt marshes, mangroves and sea grass beds, which are considered to store carbon substantially more than their terrestrial counterparts. On an international level, it provided an opportunity and benchmark for other blue carbon initiatives through hosting international observers who could develop similar science and data-management tools. Locally, phase one saw the values of blue carbon and related ecosystem services incorporated into the coastal and marine management policies of the Emirate of Abu Dhabi, such as in the Abu Dhabi Climate Change Strategy, ensuring the sustainable preservation of these environments.

The success of the Abu Dhabi Blue Carbon Demonstration Project led us to initiate the National Blue Carbon Project (phase two), in addition to expanding the science of blue carbon to the northern and eastern regions of the UAE. Phase two extended the understanding and valuation aspects of coastal blue carbon ecosystem services: the Ecosystem Services Assessment project.

The assessment project used available evidence that suggested that the increasing incidence of HAB (harmful algal blooms), or red tides, was a potential indicator of declining marine ecological functionality. Should current trends in marine degradation continue, large-scale losses of coastal amenity might be predicted. It saw contingent valuation employed to study the willingness to pay for the preservation of coastal marine habitats that have already been studied, with the objective of assessing the full range of ecosystem benefits that should be taken account of in complex land-use decision-making in order to lessen negative environmental impacts.

An eco-futures participatory modelling process was used in a workshop of invited stakeholders, including biodiversity and marine-policy experts. Using local knowledge and available data, this populated a systems model to identify priority services and simulate future scenarios.

The workshop findings indicated that the contingent valuation analysis should focus on the potential decline of amenity values for coastal property owners and beach users, such as hotel owners, apartment owners and beach users arising from the increasing frequency and duration of large-scale HAB occurrences, as a proxy for all events which would preclude people accessing the waterways.

"THE VALUE OF COASTAL AND MARINE RESOURCES SUPPLIED ACCORDING TO BEACH VISITORS TOTALLED **AT AED 2.5 BILLION** (USD 683 MILLION) PER YEAR"

A different questionnaire was prepared for each of the two stakeholder groups: hotel or real-estate managers, and beach visitors. For the 31 hotel or real-estate managers, the objective was to quantify the value of the current coastline to commercial operations that relied on a beachfront component to complement their service offering. Meanwhile, for the over 100 beach visitors[1] to principal beaches, we sought to determine the value of the coastal amenity in the eyes of tourists and residents.

In the event of a reduction in water quality that would lead to red tide (as a proxy to disamenity), our conservative findings found that the combined willingness to accept compensation (WTA) among both stakeholder groups amounted to roughly AED 3 billion (or USD 824 million) per year, with even further indirect impact anticipated.

Within the hotels or real-estate managers group:

- The WTA for the hotels alone was AED 415 million (USD 113 million) per year – approximately 9% of the total revenue for all of Abu Dhabi's hotels in 2013, which was estimated to be AED 55 billion (USD 1.5 billion).
- Over 13 years, the average period before major refurbishment is expected, the Net Present Value (NPV) is estimated at AED 4.7-7.71 billion (or USD 13-21 billion).

Such a decline in individual hotel revenue would require compensation of approximately 30%-35% of turnover. Furthermore, the sector-wide impact could include a short-term decline in sector revenue, resulting in the shrinking of the hospitality and related economic sectors, and may indirectly affect perceptions of Abu Dhabi as a holiday destination. These findings show the need for services provided by healthy and legacy coastal ecosystems to be maintained so that long-term diversification can be strengthened.

Meanwhile, within the beach visitor stakeholder group

- A vast majority (over 75%) of both the residents and tourists sampled were willing to accept compensation to go to an alternative beach for recreation purposes
- The value of coastal and marine resources supplied according to beach visitors totalled AED 2.5 billion (USD 683 million) per year – a conservative estimate, as it assumes that only 4.2% of the residents of Abu Dhabi visit these beaches
- For one alternative beach visit, lower income resident and tourist households provided a higher offset cost of AED 250 and 280 respectively, with the higher amount indicated due to the inability to cover additional travel expenses, compared to AED 60 and 80 for higher income households
- In the event of a complete loss of services, the higher income beach visitor households surveyed actually indicated a higher offset cost (AED 3,125 per visit for residents and AED 5,300 for tourists) than lower income households (AED 550 for residents and AED1,150 for tourists), indicating a variation in the sense of the value of money
- Those who would not consider going to an alternative beach in any scenario indicated a much lower offset cost at an average of AED 30 for higher income tourists and AED 300 for lower income tourists

By measuring the costs of HAB, this project has provided a first partial estimate of the value of marine ecosystems and their services. Furthermore, a decline in coastal amenity due to a declining marine ecosystem condition would not only have costs to current users and the leisure industry, but would constrain the future growth of the leisure industry. By taking action to avoid these losses, Abu Dhabi's global image and its tourist economy would be strengthened.

The Ecosystem Services Assessment project has provided a first look at the value of our coastal ecosystems. By empowering key stakeholders with actionable, reliable information, AGEDI and its partners are paving the way for continued responsible, sustainable development in the future – a key aspect of the UAE's national agenda. *end*

About JANE GALVAN

She is the Partnership Project Manager at AGEDI. She has managed a range of AGEDI's milestone projects, including the Abu Dhabi Blue Carbon Demonstration Project, the largest project of its kind worldwide, and she is leading the Climate Change Programme, which is the most comprehensive study of the issue for the region. Jane has also been involved in the Biodiversity Systematic Conservation Assessment, which was the first web-based environmental report in the Middle East.

About AHMED ABDULMUTTALEB BAHAROON

He is the Executive Director of the Environment Agency – Abu Dhabi's (EAD) – Abu Dhabi's environmental science, information and outreach sector. He is also leading the support provided to EAD in its environmental education, awareness and outreach agenda, and the enabling of public access to environmental information. He is also Acting Director of the Abu Dhabi Global Environmental Data Initiative (AGEDI) – an initiative of EAD and the United Nations Environment Programme (UNEP) with the mandate to facilitate access to quality environmental data.

> The survival of the **mangroves** in the coastal ecosystem is the key to **preserving sustainability** in our Emirate and to guarantee a **better environmental future.**

FOOTNOTES

1 The beach visitors surveyed, both tourists and residents, came from diverse countries. 86 of the 103 questionnaires were completed by residents, 70 of the 86 by the three middle-income categories varying from AED 3,000-60,054 per month (USD 817-16,350 per month). People between 20 and 40 years of age dominated the sample at all of the beaches. A total of 103 beach visitor questionnaires were completed from four principal beaches: Al Bateen, Corniche, Saadiyat and Yas beaches.

HAND IN HAND

ENABLERS & PARTNERSHIPS

UNOSSC

PUBLIC-PRIVATE PARTNERSHIPS AS GREEN ECONOMY CATALYSTS

Under the 'Green Economy for Sustainable Development' initiative launched by H.H. Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai, the UAE is set to establish itself as one of the global leaders in sustainability. In line with this vision, Dubai Electricity and Water Authority (DEWA) signed a Power Purchase Agreement (PPA) and Shareholder Agreement with an ACWA Power and TSK-led consortium for the second phase of the Mohammed bin Rashid Al Maktoum Solar Park, to produce 200MW of photovoltaic solar power.

ACWA Power will finance, build and operate the photovoltaic plant and will receive a 25-year PPA starting in 2017. The project, one of the largest strategic new Independent Power Producer (IPP) projects in the renewable-energy market worldwide, occupies 4.5 square kilometres and will achieve a reduction of 400,000 tonnes of CO_2 emissions annually. It also sets a milestone for utility-scale solar power generation with a landmark tariff of USD 0.054/kWh.

Signing the first agreement based on the Independent Power Producer model supports the Dubai Plan 2021 and is a key step towards achieving the objectives of the Dubai Integrated Energy Strategy 2030, which outlines ambitious goals for solar-powered electricity to play a role in Dubai's energy portfolio, significantly increasing renewables in the energy mix. Solar energy will account for 7% of total energy production by 2020 and 15% by 2030. Planned further expansion will see the Solar Park generating 3,000MW of electricity when complete in 2030.

It's clear that solar is set to play a key role in diversifying the energy mix. When combined with the right combination of enablers – a politically stable environment and the availability of low-cost finance – solar PV technology becomes commercially cost-effective, as can be seen with this latest development. In this way, the partnership between DEWA and ACWA Power demonstrates Dubai's commitment to delivering reliable and sustainable electricity at the lowest tariff, as yet another step forward in Dubai's efforts to secure a bright, sustainable future for its citizens. Additionally, this partnership demonstrates how public-private partnerships can contribute to the global green economy as a replicable case study for other projects and stakeholders.

H.E. MOHAMMAD ABDULLAH ABUNAYYAN

Chairman of ACWA Power and Abunayyan Holding Company

H.E. is the Chairman of ACWA Power and Abunayyan Holding Company and also serves as Chairman and member of the Board of Directors of many reputed companies, including the National Agriculture Development Company and the Saudi Research and Marketing Group, besides holding a number of prestigious leadership positions helping spearhead the Kingdom's economic development.

ACWA POWER

'SOUTH-SOUTH COOPERATION' AS A MEANS OF FOSTERING INNOVATION IN APPLYING RENEWABLE ENERGY FOR INCREASED WATER SECURITY

By
Edem Bakhshish

> At the launch of the UAE Water Aid Foundation back in 2014, His Highness Sheikh Mohammed bin Rashid Al Maktoum announced the award of USD 1 million to any research institute that would devise a sustainable solar-powered way to solve the problem of water scarcity.

WHAT IS SOUTH-SOUTH COOPERATION?

According to the most common definition of South-South Cooperation (SSC) that is also referenced in the United Nations operational guidelines framework in support of South-South and triangular cooperation (SSC/17/3), South-South Cooperation is a process whereby two or more developing countries pursue their individual and/or shared national capacity-development objectives through exchanges of knowledge, skills, resources and technical know-how, and through regional and interregional collective actions, including partnerships involving governments, regional organisations, civil society, academia and the private sector, for their individual and/or mutual benefit within and across regions. South-South cooperation is not seen as a substitute for, but rather as a complement to, North-South cooperation.

SOUTH-SOUTH COOPERATION'S BEST FITS THE PURPOSE OF ADDRESSING ENVIRONMENTAL CHALLENGES

The definition quoted above implies that, inter alia, the process of South-South Cooperation fits the purpose of responding to shared development challenges, as well as seeking mutual benefit for the cooperating countries. Environmental challenges – such as the lack of sustainable access to water resources – do not recognise borders between countries: depleting natural water supplies pose a common threat to nations in the global South. Employing the South-South Cooperation model could, therefore, definitely bring about additional advantages, such as cost and time efficiency, informed by the key characteristics of South-South Cooperation.

SUCCESSFUL SOUTH - SOUTH COOPERATION IN ONE AREA LAYS THE GROUNDWORK FOR BROADER POLICY DIALOGUE ON OTHER ISSUES

The potential benefits of finding effective solutions, say for sustainable access to sufficient volumes of fresh water, is an obvious and convincing reason to sit around a table and collaborate, and would justify a constructive dialogue between countries in the global South beyond any socio-economic differences and political disaccord. This could potentially serve as a bridge to reach broader consensus and contribute in creating an atmosphere of solidarity, mutual respect, and openness in addressing an array of other issues that the nations face.

INNOVATIVE SOLAR-POWERED WATER DESALINATION

One of the promising scenarios involves sustainable access to fresh water through the use of solar-powered desalination technology. To combat impending and sometimes already occurring water shortages, several countries have turned to desalination to derive potable water from seawater. While a few critical technological and financial challenges still remain, it is commonly agreed that continued innovation and research in the longevity and efficiency of solar panels will make solar-powered desalination one of the most economically advantageous methods in the long-term.

TRANSITION FROM CONVENTIONAL WATER DESALINATION TECHNIQUES

There are several methods currently in use for conventional water desalination. Often, fossil fuels are used as a primary source of energy to drive the entire water desalination process. These include reverse-osmosis, multi-stage flash distillation, and dual-purpose power plants.

Reverse-osmosis is one the simplest forms of desalination, only requiring external pressure to push seawater through a membrane which filters out the salt. The process requires skilled personnel to operate the systems; the membranes are also complex polymers that require precise manufacturing, in areas where expertise adapted to the local environment is invaluable.

In multi-stage flash distillation, seawater is pumped into a heater, then allowed into another container that is significantly lower in pressure; which causes the seawater to momentarily boil and thereby converting to steam. Dual-purpose power plants create both electricity and water, where a power plant's turbine is designed to spin off excess steam that is then used to power the water desalination facility, resulting in a highly efficient use of resources and energy. Here again, technical know-how is needed, but this can be provided by experts from the region in an effort to support South-South cooperation.

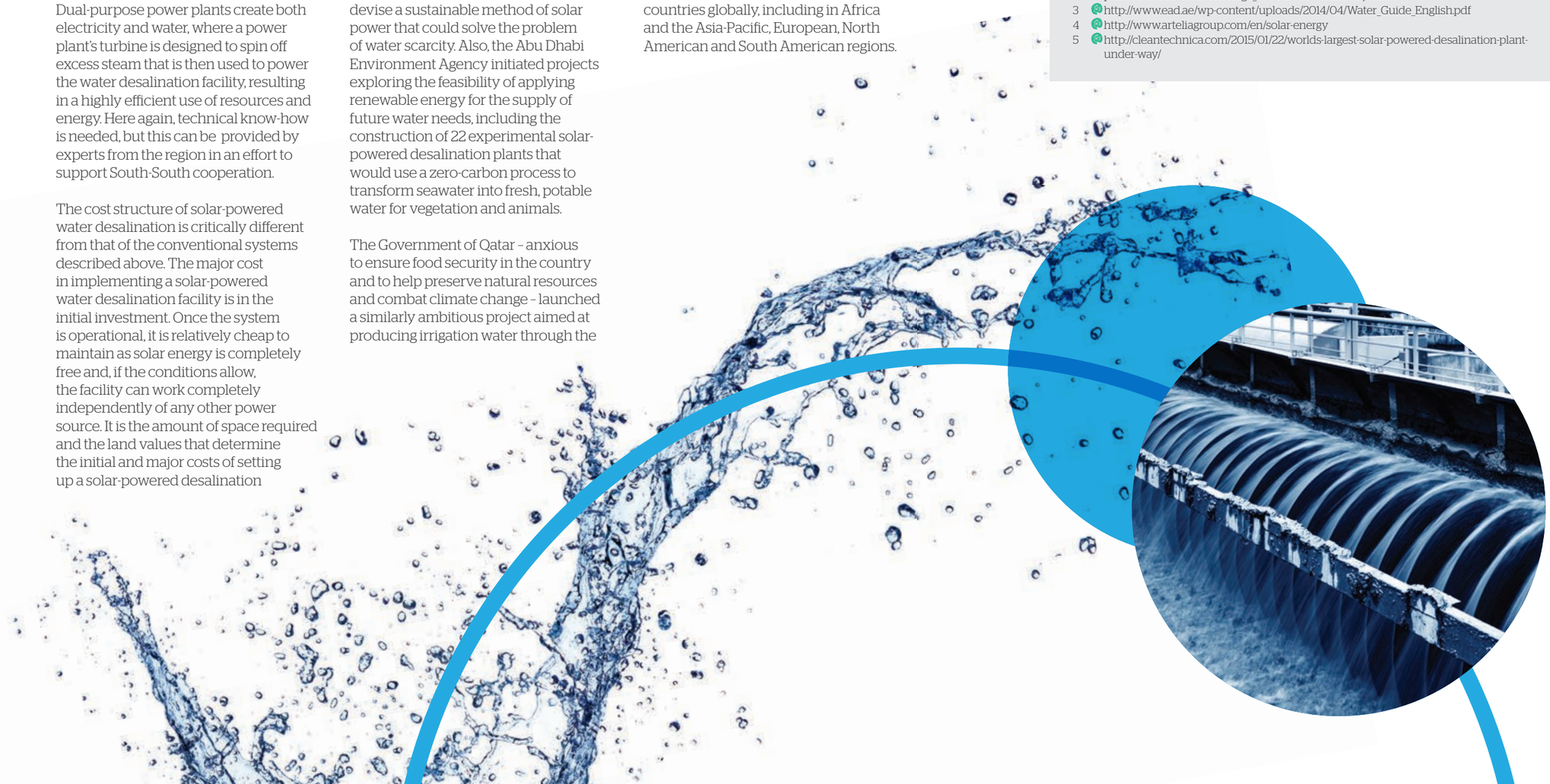
The cost structure of solar-powered water desalination is critically different from that of the conventional systems described above. The major cost in implementing a solar-powered water desalination facility is in the initial investment. Once the system is operational, it is relatively cheap to maintain as solar energy is completely free and, if the conditions allow, the facility can work completely independently of any other power source. It is the amount of space required and the land values that determine the initial and major costs of setting up a solar-powered desalination facility. Solar panel prices are also a main determinant of the cost of such a facility. There may also be need to review the environmental impact, if any, of setting up such large solar panel arrays over desert or dry-land areas.

As technology continues to improve, and with prices of conventional fuel sources ostensibly set to increase in the long-run as reserves become depleted, it would be fair to expect that solar-powered desalination will be an efficient and affordable option in the future. Even today, numerous countries and international players are investing a considerable amount of effort and resources into research and development, as well as into pilot projects on solar-powered water desalination.

At the launch of the UAE Water Aid Foundation in 2014, His Highness Sheikh Mohammed bin Rashid Al Maktoum announced the award of USD 1 million US to any research institute that could devise a sustainable method of solar power that could solve the problem of water scarcity. Also, the Abu Dhabi Environment Agency initiated projects exploring the feasibility of applying renewable energy for the supply of future water needs, including the construction of 22 experimental solar-powered desalination plants that would use a zero-carbon process to transform seawater into fresh, potable water for vegetation and animals.

The Government of Qatar – anxious to ensure food security in the country and to help preserve natural resources and combat climate change – launched a similarly ambitious project aimed at producing irrigation water through the use of solar energy to desalinate sea water, thereby reducing the need for fossil fuels. Through the Qatar General Electricity and Water Corporation (KAHRAMAA), the Government of Qatar aims to construct standardised desalination plants, each with a nominal capacity of 150 000m^3 per day, and the number of plants constructed to be a function of water demand. Moreover, Saudi Arabia recently began an ambitious initiative to build the world's largest solar powered, jellyfish-fighting water desalination plant near the northeastern city of Al Khafji. It is expected that the plant will have a 15-megawatt solar array using polycrystalline solar cells engineered by the King Abdulaziz City Science and Technology Research Agency.

The above examples are just a quick snapshot of a few efforts undertaken in three Gulf countries; similarly ambitious, forward-looking initiatives are being pursued in many other countries globally, including in Africa and the Asia-Pacific, European, North American and South American regions.



TURNING THE BEST SOLUTIONS FOR SOLAR-POWERED WATER DESALINATION INTO AN "OPEN-SOURCE"

This brief overview, makes it clear that countries and prominent international players in the global South could join efforts and their existing knowledge and expertise in the spirit of South-South Cooperation, in order to find the most cost-efficient and replicable technology for solar-powered water desalination.

This would mean that while individual pilot facilities and investment projects could continue to be developed and managed separately and in accordance with their business plans, the results of innovative research and development should be shared publicly in a regular manner and become an "open-source" base of knowledge and expertise, allowing countries and players that otherwise may not be in a position to invest in high-cost research and development to still work on their pilot facilities, contribute to generating the wealth of positive experience in solar-powered water desalination, and to contribute to turning the dream into reality; that is to say, when the supply of clean fresh water meets expected demand and the world can experience life in the future without the fear of water shortages. *end*

FOOTNOTES

1 http://www.wpi.edu/Images/CMS/UGP/Solar_Desalination_Poster.pdf
2 http://www.pv-magazine.com/news/details/beitrag/dubai-offers-1-million-solar-solution-prize-to-tackle-water-shortage_100015768/#axzz3dilyuxh9
3 http://www.ead.ae/wp-content/uploads/2014/04/Water_Guide_English.pdf
4 http://www.arteliagroup.com/en/solar-energy
5 http://cleantechnica.com/2015/01/22/worlds-largest-solar-powered-desalination-plant-under-way/

About EDEM BAKHSHISH

He is the Chief of Division for Arab States at Europe and CIS, United Nations Office for South-South Cooperation. He has 18 years of cross-practice advisory and leadership experience in various UN-supported human development initiatives. Areas of professional focus include South-South and Triangular Cooperation, local economic development and microfinance, local governance and results-based budgeting, HIV/AIDS prevention, gender mainstreaming and knowledge management.

FACT BOX

The United Nations Office for South-South Cooperation stands ready to support practical experience sharing on solar-powered water desalination and to bring together interested partners from the global South willing to work together. If you are interested in contributing to the proposed initiative please contact us at ssc.arabstates@undp.org

A GREEN ECONOMY IS A STRONG, SUSTAINABLE ECONOMY

By
Mark Kenber

KEY WATCHWORDS OF THE TRANSITION ARE INNOVATION, LEADERSHIP AND COLLABORATION

"California's appliance and building efficiency policies have saved citizens over **USD 65 billion** and created **1.5 million jobs**"

The green economy has never shown as many positive signals as it is showing today. The successful outcomes we are seeing now are the result of years of collaboration between businesses and governments from across the world, which have scaled up low-carbon solutions and developed successful stories that exemplify a global 'clean revolution'.

In the last 10 years, The Climate Group, an award-winning, international non-profit organisation, has helped lead this global low-carbon transition. We work with international corporates and policymakers to support innovative business models, new climate finance mechanisms and bold policy frameworks – and these governments and businesses we work with are now proving to be the world's low carbon leaders.

Being based in China, India, Europe and North America, The Climate Group witnesses great examples of low-carbon leadership in very different contexts. This is why we are confident in saying that the vision of the United Arab Emirates and Dubai leadership, alongside the pioneering and innovative approach of Dubai Carbon, has the potential to unlock the next phase of the green economy. We believe the region has the prospect of becoming a major global hub for clean energies and technologies. And not only will this help reshape global markets, it will greatly benefit the region's economy and citizens.

Today the global green economy is worth USD 5 trillion, growing five times faster than the global economy as a whole during the period between 2007-2010. According to United Nations projections, over the next 20 years the low-carbon economy will bring about 60 million more jobs – a trend confirmed by recent data showing growth in the renewables sector. Almost one million new jobs were created in this sector in 2013 alone, with the solar industry leading the way and bringing total green jobs globally up to six-and-a-half million.[1]

In fact, solar power has been leading the clean-energy sector as a whole in recent years. Since 2010, more solar photovoltaic (PV) capacity was added in the world than in the previous 40 years, with global investment in solar energy totalling almost USD 150 billion in 2014, according to Bloomberg New Energy and Finance. And this growth isn't set to stop. If we look at the future energy scenarios provided by the International Energy Agency, solar energy alone could account for up to a third of global power demand from 2060.

The UAE is in a unique geographical position to lead global solar markets. Located in a 'solar hotspot', it has great potential to turn solar power into its primary energy source. A report published in March by the International Renewable Energy Agency and Masdar Institute of Science and Technology, suggested that renewables in the UAE's energy mix could increase from its current pilot stage of 10% by 2030 to more than 25% that same year due to rapid adoption, saving the country's economy USD 1.9 billion a year. Our recent report 'The UAE: Hub of the Next Energy Revolution?' also showcases evidence of how the UAE's green growth plans – which will create 160,000 new jobs by 2030 and boost GDP by up to 5% – are set to turn the country into a global low-carbon leader, if it harnesses its solar potential.

In recent years, The Climate Group has been working closely with stakeholders and government representatives in the UAE to support this low-carbon shift, sharing platforms and expertise around green policy frameworks and clean technologies. For example, one of our flagship programmes is the States and Regions Alliance, a global network which has grown to 31 state and regional governments, and represents some of the largest economies and most populated areas in the world. This high-profile network has made it possible for global government leaders to drive investment in renewable energy, establishing partnerships and creating policy frameworks that have unlocked further low-carbon development.

FOOTNOTES

1 http://www.irena.org/publications/rejobs-annual-review-2014.pdf

About MARK KENBER

He is CEO of The Climate Group. An economist and climate policy expert, he advised UK Prime Minister Tony Blair on the Breaking the Climate Deadlock initiative, which set out the rationale for a global agreement. He also co-founded the Verified Carbon Standard, the world's leading voluntary carbon market.

During the World Green Economy Summit in Dubai in April 2015, we co-hosted a meeting of national and sub-national government entities from the Gulf, in association with the Dubai Supreme Council of Energy, to explore collaboration on data sharing, regional pilot projects, standards and benchmarking, and create peer-to-peer learning exchanges with sub-national government innovation leaders around the world. This followed an earlier workshop in Dubai for government and business entities in the region to explore and address the challenges related to extreme temperatures and high energy demand, which has resulted in accelerating the deployment of LED street lighting on a large scale. The Climate Group also held a workshop with the support of Dubai Carbon as part of our 'The Future of Energy' series, which brings together experts from business, government and civil society to discuss the world's energy outlook. The event confirmed both the commitment and the capacity within the UAE to provide in-depth analysis of future energy trends and unlock low-carbon solutions which will strengthen and build resilience in the region's vibrant economy.

There is every reason to believe that this shift bodes well for the region and others like it.

The Climate Group recently launched a 'Climate Barometer' – a survey of global business, government and international institution leaders regarding their confidence levels that the right policies, technologies and finance conditions are being put in place to support low-carbon economic growth. From its baseline, it has ticked progressively upwards and we expect confidence to continue to grow in this direction. The announcement during the G7 summit in June by government leaders of the most advanced economies to cut their greenhouse gas emissions by 40-70% by 2050 based on 2010 levels, and to decarbonise their economies by the end of the century, is evidence of the current trend.

With the global climate talks in Paris (COP21), there is still a lot of work to be done. The Climate Group intends to work with its partners in Dubai and elsewhere to accelerate the transition to a strong green economy – and enable our partners to fully maximise their opportunities.

Our Climate Week events in New York City and elsewhere have proved to be a powerful platform for convening leaders for urgent action and catalysing new initiatives. For instance, Climate Week 2014 saw the launch of our RE100 campaign, a global collaborative initiative of influential businesses committed to 100% renewable electricity, working to massively increase corporate demand for renewable energy. Today more than 40 companies from Europe, the US, China and India are part of RE100 – spanning a wide range of industrial sectors. They include IKEA, Philips, Nestle, Unilever, Goldman Sachs, Mars, Nike, Starbucks and Walmart. These companies are aware that investing in renewable electricity makes business sense; for example, it can increase energy security and provide greater control over costs. RE100 shares the successes companies are experiencing as they work towards their 100% goals, inspiring more and more companies to join.

Much of The Climate Group's work with the private sector also focuses on developing innovative finance mechanisms which allow rapid scale-up of clean energy and technology. Our Bijli project in India is a particular example of this. Around 50% of the country's rural population, representing around 80 million households, has little or no connection at all to the national grid. Any attempt to connect these parts of India to the grid must take into account the exponential growth – and wealth – of the population and its fast-growing energy demands. So far, Bijli has not only connected 50,000 people in the rural areas of three Indian regions (Maharashtra, West Bengal and Uttar Pradesh) to cleaner energy in two years; it has also developed an innovative financing scheme which will enable a massive scaling-up of off-grid renewable energy in these and other regions.

For The Climate Group, the key watchwords of the transition to a strong green economy are innovation and leadership. Another is collaboration. That is why September 2014, The Climate Group hosted the launch of the We Mean Business coalition, a group of world-leading business and climate organisations of which we are a founding member. The We Mean Business coalition today represents thousands of top companies and investors, which are working together to accelerate the transition toward a global low-carbon economy. The coalition is giving a unified business voice to our message: that a green economy is smart business and makes economic and political sense.

The State of the Green Economy Report 2016 shows the huge strides being taken, and the great progress achieved, in pursuit of our shared goal. It shares a powerful collective vision and practical success stories. In turn, these stories will inspire businesses and policymakers and promote further collaboration and knowledge-sharing. The Climate Group is proud to be working with Dubai Carbon and our partners in the region to support the leadership and innovation being demonstrated here, and will continue to collaborate with all those who seek to build what is surely the only viable future for humanity – a strong, sustainable green economy, that brings prosperity and opportunity for all. *end*

FACT BOX

Have you heard of Formula E?

Formula E is a ground-breaking FIA single-seater championship and the world's first fully-electric racing series. The inaugural season began in Beijing in September 2014, ending in London in June 2015, with the series competing in 10 of the world's leading cities. The championship has 10 teams, each with two drivers, racing on temporary city-centre circuits to create a unique and exciting race series designed to appeal to a new generation of motorsport fans. Formula E aims to represent a vision for the future of the motor industry, serving as a framework for R&D around electric vehicles,, accelerating general interest in these cars and promoting clean energy and sustainability.

> More than **40 of the world's** most influential companies committed to actions **through RE100**

Spotlight on innovation

Sustainable Prayer

Making places of worship more environmentally friendly

Long before modern air-conditioning, mosques used the technology of their day to make the faithful comfortable at prayer with the mashrabiyya – intricate window carvings that allow light through, whilst keeping heat out. Today, mosques are again leading the technological field through their use of green standards. The Khalifa Al Tajer Mosque in Port Saeed in Dubai is the first environmentally friendly mosque in the Islamic world, opening its doors in 2014.

With a total capacity of 3,500 worshippers in an area of over 9,500 square metres, the Khalifa Al Tajer Mosque is not just environmentally friendly, but also meets the guidelines set out by the US Green Building Council Standards and Specifications organisation, as well as recent laws in Dubai that require all new buildings to include green standards in their design, construction and operation.

The mosque uses solar energy to power its LED lightning; has a battery storage system for heating water; moderates water flow in ablution areas; and recycles used water, using it in washrooms and to irrigate plants. It also uses a climate-control system that regulates all of its air-conditioning units.

Sustainability is reflected in Islamic culture and belief, as humanity is the custodian of the earth and is responsible for its upkeep and husbandry. The Khalifa Al Tajer Mosque is a leader in supporting the latest incentives to adopt and expand innovative green practices in places of worship, simultaneously upholding UAE Vision 2021, the UAE Green Growth Strategy and the Islamic culture and practices of the UAE – practices that in time, all mosques will follow.

GREEN BONDS: MOBILISING THE 100-TRILLION US DOLLAR BOND MARKET FOR CLIMATE-FRIENDLY INFRASTRUCTURE

By Sean Kidney and Beate Sonerud

WHILE THE CLIMATE-ALIGNED BOND MARKET HAS REACHED USD 597 BILLION, THIS IS ONLY THE BEGINNING

A key missing piece of the puzzle that is the world's investment requirement for low-carbon and climate-resilient investment, is the bond market. Worth around USD 100 trillion, the world's public bond markets are the dominant source of capital, but tapping into them means attracting institutional investors who manage an estimated 93 trillion in OECD countries alone.

Green infrastructure investments offer opportunities for institutional investors that are a good fit with their long-term liabilities. The increased maturity of low-carbon technologies, business models and companies, means risk is falling, and is therefore becoming more suitable to the risk-return profiles of institutional investors. Institutional investors are themselves also increasingly concerned about climate change and broader sustainability issues, so they are now looking for ways to address these issues.

Markets are increasingly aware of the issues involved. As of June of this year, bonds valued at USD 597.7 billion were identified as being used in climate-change initiatives in the Climate Bonds Initiative's annual State of the Market report. 65.9 billion of these bonds have been marketed as green bonds, where the proceeds have been earmarked for green projects. They have to meet certain reporting requirements over the use of the proceeds, but otherwise green bonds are structured no differently from normal ones. A key point is that the green credentials of a bond are based on the projects or assets linked to its issuance, not the green credentials of the entity issuing the bond. This means that a wide range of issuers can issue green bonds, whether they are a national government, a city or municipality, a multinational development bank, a commercial bank, or a corporation.

Green bonds finance a wider variety of green projects, with the majority allocated to renewable energy (38.3%), energy-efficient buildings (27.5%), low-carbon transport (10.2%) and water (9.7%), and the green bond market itself has grown fast, too, with issuance up from USD 11 billion in 2013 to over 37 billion in 2014 and 50 billion expected in 2015. The market has also started to diversify in currencies and ratings, signs of a maturing market. Green bonds have now been issued in 23 currencies and several high-yield green bonds have come to market.

An exciting development this year, however, has been where several of the largest emerging economies have started up their own green bond markets. India's commercial bank, Yes Bank, issued the first green bond in India's domestic bond market in February to massive investor demand. The first Brazilian green bond issuer also came to market in July, with a EUR 500 million green bond issued in the European markets. China is the latest of the emerging market giants to join the green bond market. The first officially recognised RMB-denominated green bond from a Chinese issuer was issued in October 2015 in the London markets. The scale of the expected Chinese green bond market will be revolutionary for the global green bond markets. The growth of these bonds in emerging markets is an important development, as these economies are where most of the low-carbon and climate-resilient infrastructure must be built in the coming decades to meet global climate targets.

All this means exciting climate-aligned investment opportunities are available for investors right now in the bond markets – and at scale, but there is also substantial room for the growth to continue going forward. Green bonds are still relatively small compared to the overall USD 100 trillion bond market, and very small indeed compared to the trillions of dollars in annual investment needed for low-carbon and climate-resilient infrastructure globally. There is a role for the public sector to support the growth of the green bond market to the scale required that will facilitate sufficient investments in low-carbon and climate-resilient infrastructure.

To do this, the public sector should look to other areas where financial policies, tools and instruments – such as tax incentives and credit enhancement mechanisms – have successfully mobilised large-scale private sector investment, notably in infrastructure. The majority of low-carbon investment green bonds issued for low-carbon transport and renewable energy is actually infrastructure investment that is coincidentally green. The green bond concept and the green infrastructure narrative allow the public sector to better marry the agendas of climate action and infrastructure development, and tap into their existing toolkit to mobilise private finance for infrastructure projects. As policymakers step in to support further growth of the global green bond market for low-carbon and climate-resilient infrastructure, what we have seen so far is only the beginning of what is a 'green bond adventure'. *end*

FACT BOX

International bond market value in 2014: USD **100 trillion**

Green Bonds in 2014: USD **37 billion**

Green Bonds (estimated value) in 2015: USD **50 billion**

About
SEAN KIDNEY

He is CEO of the London-based Climate Bonds Initiative, a non-governmental organisation working to mobilise the debt capital markets for climate change solutions.

About
BEATE SONERUD

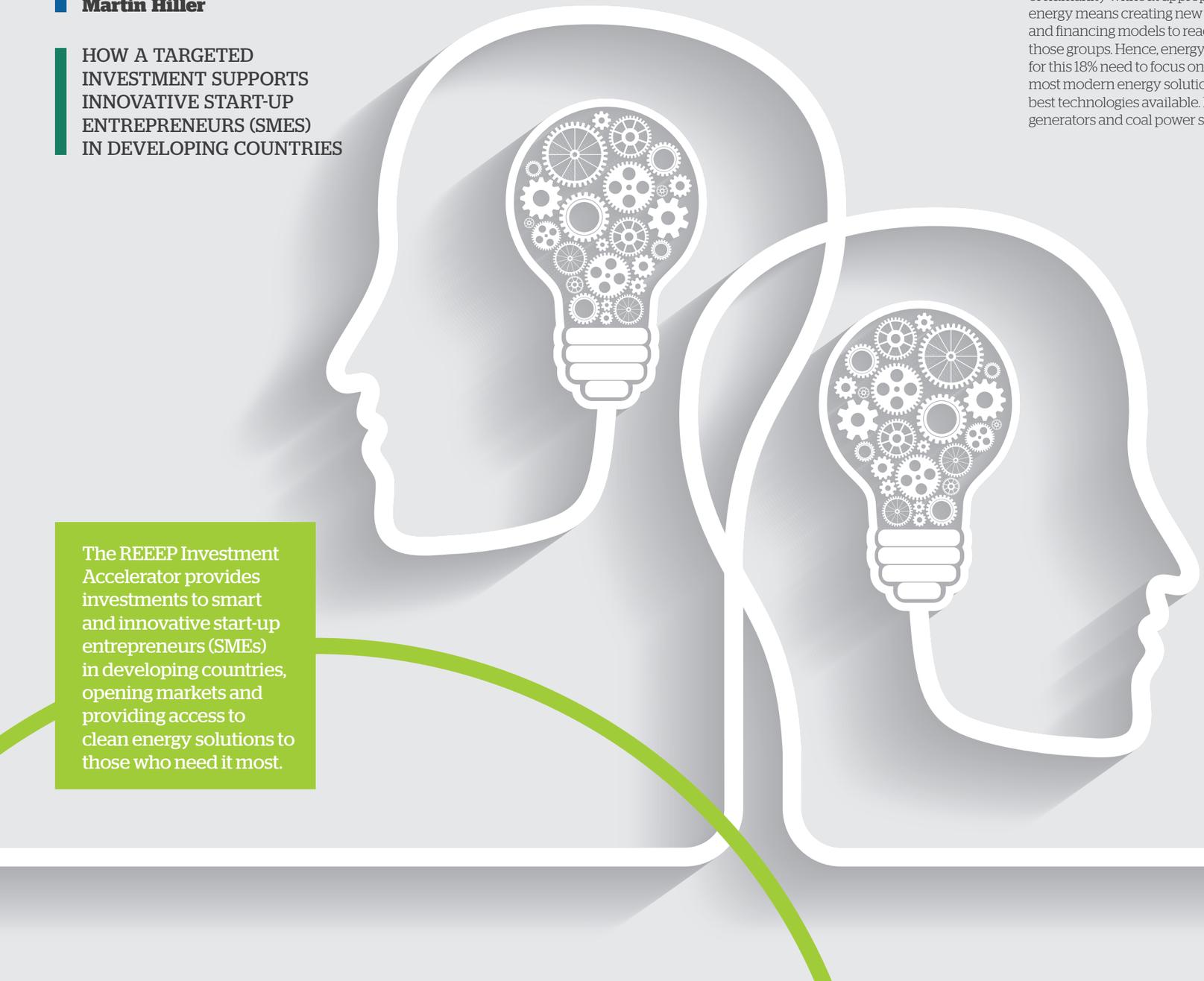
She is responsible for undertaking public policy related research projects at Climate Bonds Initiative, as well as contributing to the blog. She has previously worked in Climate Change Research at HSBC, and at the low-carbon consultancy Xyntéo.

INNOVATIVE FINANCING:

THE KEY FOR UNLOCKING CLEAN ENERGY MARKETS

By
Martin Hiller

HOW A TARGETED INVESTMENT SUPPORTS INNOVATIVE START-UP ENTREPRENEURS (SMES) IN DEVELOPING COUNTRIES



The REEEP Investment Accelerator provides investments to smart and innovative start-up entrepreneurs (SMEs) in developing countries, opening markets and providing access to clean energy solutions to those who need it most.

SUSTAINABLE ENERGY ACCESS

Energy poverty is one of the key challenges for development in the 21st century. Although some progress has been made, 1.3 billion people (18%) have no access to energy and 2.6 billion people have no clean cooking faclities; almost all of them living in the developing world[1].

Access to energy needs to go hand in hand with the fight against climate change; energy solutions for the fifth of humanity without appropriate energy means creating new business and financing models to reach out to those groups. Hence, energy solutions for this 18% need to focus on the most modern energy solutions and best technologies available. Diesel generators and coal power stations are simply not sustainable options anymore – neither economically, socially, nor environmentally.

At the same time, new energy solutions need to adhere to the principle of the Sustainable Energy for All campaign – namely, that energy is an enabler, not a purpose in itself. The focus is therefore more on providing energy services than on producing more energy – although both in the end are needed. But focusing on energy services alone means that other development factors, be it livelihood issues such as health and education, or simply easier ways of irrigating, cooling or cooking, can be brought into the equation.

SMES ARE STUCK IN THE "MISSING MIDDLE"

The SME layer of the economy is a major player in powering green growth; SMEs produce about two thirds of GDP across developing countries and generate up to 85% of jobs. Entrepreneurs at the SME level represent the backbone of developing countries' economies and can be central to unlocking diversified market development. Climate finance and clean-energy investments have grown massively as larger sums are being deployed by donors and investors.

In fact, even development investors are desperately searching for good pipelines. In the wide space of development and climate aid, financial support exists for pilot projects that still need to develop their business model – mainly through grants. There is of course intense appetite for those projects and companies that are approaching maturity and are almost bankable, and therefore, will forseeably render financial returns. However, many entrepreneurs are stuck in what the IFC calls the 'Missing Middle' – a stage where businesses have a proven concept, a clear product, initial commercial successes, are set to launch off from their starter blocks – but have no access to finance.

THE REEEP INVESTMENT ACCELERATOR

REEEP has taken up this challenge and brought in a strategic partner, CTI PFAN, a network of private investors active in the clean-energy sector. Together, we are running a multi-stage investment acclerator: entrepreneurs selected for the REEEP portfolio are brought into a multi-year incubator programme, including seed-level grants of up to EUR 250,000 and access to the REEEP network.

Entrepreneurs are provided with business training and mentoring by CTI PFAN, and best-practice consulting by REEEP drawn from our portfolio. Projects are vetted by project development and investment professionals, and receive targeted "de-risking" support to ensure bankability. Finally, we facilitate exposure to selected private investors who are interested in early stage companies and projects and in an investment volume between USD 0.5 and 20 million.

The funding for the initial grant that REEEP makes comes mostly from bilateral government funds. REEEP has started to use a revolving fund concept that may provide a critical instrument to access space for people and projects that, so far, have been 'unbankable'. We are currently in the process of rolling this out in Cambodia and Eastern Africa.

Well-functioning clean-energy markets require policy frameworks that support entrepreneurs and the deployment of clean technologies. To this end, REEEP actively works with our company partners and gathers data and insights to monitor and evaluate our portfolio, enabling us to identify barriers and opportunities for growth. We work from the top-down and bottom-up to instigate policy change that stimulates an environment for growth.

THE RIGHT MIX OF PUBLIC AND PRIVATE FUNDING

Only a small part of annual energy infrastructure investments comes from the public purse. Public money should, therefore, be deployed where it can leverage the most benefit – by supporting new commercial companies that provide cost-effective, sustainable energy services to new market participants. Seeing the energy-poor as future players in markets, with a right to their own prosperity and economic future, needs to go hand in hand with low-carbon and environmentally sound approaches. Only these two factors guarantee long-term economic development, and therefore, true progress towards a green economy. *end*

About
MARTIN HILLER

He is the Director General of REEEP. He has over 20 years of experience in environmental issues and sustainability, policy, specialised policy communications and campaigns, and in-depth knowledge of climate change and energy policy. Under his leadership, REEEP has sharpened its focus as a catalyst for up-scaling clean-energy business models.

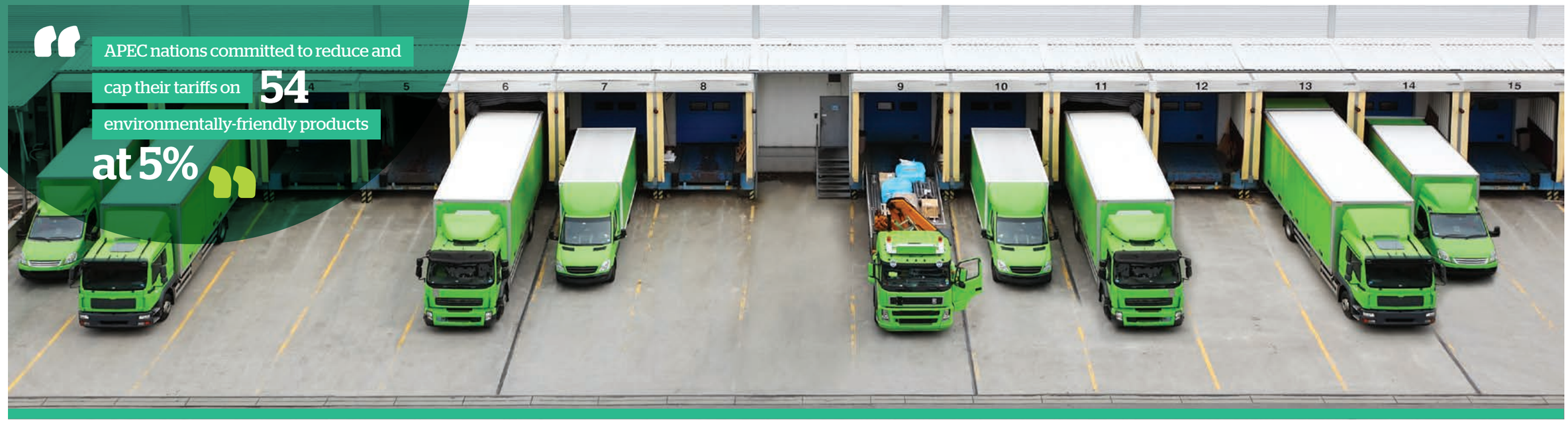
> How a targeted investment supports **innovative** start-up entrepreneurs **(SMEs)** in developing countries

CATALYSING THE LOW-CARBON ECONOMY THROUGH INVESTMENT AND TRADE

By Timothy J. Richards and Sandra Winkler

EXISTING AND NEW TECHNOLOGIES ARE NEEDED TO MEET POST-2015 CLIMATE AND DEVELOPMENT GOALS, AND AT THE LOWEST POSSIBLE ECONOMIC COST

Sustainable energy represents an opportunity to transform societies and grow economies. It is also a prerequisite to meet growing energy demand and reduce the world's carbon footprint. That is why it is so important to balance what the World Energy Council defines as the 'Energy Trilemma'. The trilemma is a 21st-century policy framework for evaluating the degree to which energy options are (1) secure; (2) affordable; and (3) environmentally sensitive.



> APEC nations committed to reduce and cap their tariffs on **54** environmentally-friendly products **at 5%**

Addressing the energy trilemma presents extraordinary environmental, social, and economic challenges requiring national and international action by not only governments, but also the private sector and civil society.

Many countries struggle to balance the three competing dimensions of the energy trilemma and most policy decisions have to strike compromises between these objectives. For instance, in many countries, using domestic coal for power provides energy security at a low cost, but at an environmental price. There are a few measures that help achieve all three. One is energy efficiency.

Another – the subject of this article – is removing costly barriers to trade in environmentally friendly energy goods and services. Eliminating government imposed trade barriers can immediately reduce the cost of equipment and services. This will spur their utilisation, contributing to international GHG reduction objectives, increasing energy access in developing and emerging economies, and thus reducing the cost of technology and energy itself, as well as enhancing energy security.

The majority of governments have targets for increasing the share of renewable energy, reducing GHG emissions or increasing energy efficiency. Yet at the same time, many are taxing all clean-energy equipment that crosses their national borders. Those barriers add to the cost challenge and make it harder, and in some instances impossible, to deliver on the targets set. Tariff and non-tariff barriers not only raise the cost of any project that uses imported products, they also drive up the cost of production by making it harder to achieve scale, and ultimately, by reducing the size of a potential renewable market, they undermine incentives for innovation in the clean-energy space.

Global trade in environmental goods is estimated to be around USD 1 trillion annually, and growing quickly. The importance of reducing or eliminating tariff and non-tariff barriers to environmental goods was recognised in the Doha WTO Ministerial Declaration of 2001. With the Doha round of trade negotiations largely inactive since 2009/2010, countries have turned to plurilateral, bilateral, and regional free-trade agreements.

The Asia Pacific Economic Partnership (APEC) acted first to create a trade programme designed to facilitate environmentally friendly projects. In fact, at its leaders meeting in 2012, APEC nations committed to reduce and cap their tariffs on 54 environmentally friendly products at 5%. Over half of these items are energy-related. This action by APEC members, which represents 54% of world GDP and 44% of global trade, is a tangible international endorsement of the principle that trade liberalisation can contribute simultaneously to economic growth and environmental sustainability.

Even though it is limited, the APEC's action set an important precedent. In January 2014, 14 WTO members, which together account for 86% of global environmental goods trade, came together in Davos and announced their commitment to explore opportunities in the WTO to build on the APEC's ground-breaking commitment. Representatives from Australia, Canada, China, Costa Rica, the European Union, Hong Kong (China), Japan, Korea, New Zealand, Norway, Singapore, Switzerland, Chinese Taipei and the United States, pledged "...to work together, and with other WTO members similarly committed to liberalisation, to begin preparing for negotiations in order to advance this shared goal." – in this case fully eliminating their tariffs on a set of environmental goods.

Signatories of the Davos joint-statement, which were later joined by Turkey, Israel, and Iceland, "...anticipate a structure for an environmental goods agreement (EGA) that would reinforce the rules-based multilateral trading system and benefit all WTO members, including the involvement of all major traders and the application of the principle of Most Favoured Nation. Such a "plurilateral" agreement would take effect once a critical mass of WTO members participates." The agreement under negotiation is envisioned to be future-oriented and include a revision clause on products to address technological change as well as address other issues in the sector such as non-tariff barriers and services.

More recently, at the G7 Summit in Elmau, Germany, global leaders agreed that reducing barriers to trade remains imperative and that they are committed to fighting all forms of protectionism in order to protect and promote investment and maintain a level playing field for all investors. Thus far, the APEC and WTO plurilateral approaches have focussed on customs tariffs, as this is highly valuable in its own right. There are, however, many non-tariff trade barriers to trade in environmental goods and services, which, if eliminated, will produce benefits even greater than the removal of tariffs. The World Energy Council is currently developing a white paper on this next-generation matter.

The elimination of tariff and non-tariff barriers on environmental goods and services matters; it makes it easier to have a greater total energy supply than under the status quo. It reduces energy costs and it promotes projects that reduce emissions. In addition, it provides countries that are at the forefront of driving technological innovation with an opportunity to diversify and change their economic profiles. In short, tariff elimination positively impacts all three aspects of the energy trilemma. Moreover, it reduces the cost of clean-energy technology, increases deployment, and enables the development of industries in the countries that eliminate their tariffs. *end*

About
TIMOTHY J. RICHARDS

He is the Managing Director for Government Affairs and Policy for General Electric (GE) in the Middle East, North Africa, Turkey region. He chairs the World Energy Council Knowledge Network on energy trade and investment. Prior to his current role, he was GE's Managing Director for Energy Policy and served as a US trade official in the Office of the United States Trade Representative.

About
SANDRA WINKLER

She is the Director for Policies and Member Services at the World Energy Council (WEC). She is one of the lead authors of the annual World Energy Trilemma report and is responsible for the Council's work on energy trade and investment. Moreover, she is a member of the advisory board of the World Bank's RISE initiative.

PARTNERS AND ENABLERS

CREATING A NEW COMMUNITY OF COLLABORATION FOR THE UAE'S GREEN ECONOMY

Developing Dubai's green economy and ensuring a sustainable future is a responsibility shared by all residents of the UAE, as collaborations, partnerships, and strategic tie-ups all have a significant role to play in making the green economy work. Governments and the private sector in particular need to work together to enable a smooth transition to a green and low-carbon world.

> While the transition to a green economy will require a fundamental shift in the way we think about sustainable growth and development, there is potential to unlock new growth engines and create business opportunities.

POINT OF VIEW

MARWAN ABDULAZIZ JANAHI

Executive Director of Dubai Science Park

DUBAI SCIENCE PARK

> A major factor in support of PPPs is that **they avoid limitations** on public-sector spending - a major **restraining factor** for many developing economies

Similarly, collaboration is at the heart of everything we do at Dubai Science Park.

We support more than 250 companies in our community by facilitating conversations about partnerships and providing a platform for open discussion about investment opportunities and the latest industry trends. We have built strong relationships with government organisations, ensuring a constant dialogue between the public and private sector. We have also worked tirelessly with Dubai Electricity and Water Authority (DEWA), the Supreme Energy Council and the Executive Office, amongst others, to promote and drive forward the sustainability agenda.

The Dubai Green Economy Partnership (Dubai GEP), of which Dubai Science Park is a founding member, is one example of successful collaboration. Launched in 2012, the Dubai GEP is a multi-stakeholder organisation that has hosted a number of events to promote the creation of a green, low-carbon economy in the Middle East. These programmes have enabled green trade and investment, and accelerated the adoption of green technology, products, and services across regional and global markets.

Marwan Abdualziz Janahi is the Executive Director of Dubai Science Park (DSP), formerly known and EnPark and DuBiotech. DSP is the first business community dedicated to pioneering the growth of the region's sciences sector.

Marwan is responsible for building the portfolio of companies within DSP, and engaging closely with peers, government authorities and other key stakeholders to ensure the continued development of the industry.

In June this year, Dubai Science Park hosted the fourth Green Leadership Series event in partnership with Dubai GEP. Attended by over 150 delegates, panelist at the gathering discussed the role of innovation in the green economy, highlighting cutting-edge clean technologies, best business practices and relevant government policies. By aligning the objectives of organisations, residents, and government entities, we can ensure sustainable results that will help to achieve the vision of Vice President and Prime Minister of the United Arab Emirates and Ruler of Dubai, H.H. Mohammed bin Rashid Al Maktoum, and the Dubai Government to become leaders in the green economy. This will not only protect our environment but will also spur economic growth.

Another area where greater collaboration can enhance Dubai's green credentials is through public-private partnerships (PPPs). Interest in PPPs has been growing in recent years and private-sector financing has become a popular method of procuring public-sector infrastructure. A major factor in support of PPPs is that they avoid limitations on public-sector spending – a major restraining factor for many developing economies. By introducing private-sector efficiencies, there is also scope for enabling significant improvements in the levels of service and technology delivered to the public.

In Dubai, one area where PPPs can thrive is in the solar industry. Dubai's Integrated Energy Strategy 2030 aims to increase the Emirate's solar consumption to 5% of all power consumed. In 2014, DEWA opened the tender for the second phase of the Mohammed bin Rashid Al Maktoum Solar Park, a 1000MW development worth AED 1 billion, and a great example of where the public and private sectors can share in the development and the success of a project.

At Dubai Science Park, we are committed to creating an environment where our business partners operating in the solar industry, such as First Solar, PTL Solar and SolarReserve, can thrive and develop the technology required for them to meet the challenges their industry faces head on. This will ultimately help to make solar power a more viable energy option in the Middle East in the years to come.

While the transition to a green economy will require a fundamental shift in the way we think about sustainable growth and development, there is potential to unlock new growth engines and create business opportunities. If we are serious about securing a long-term future for the green economy, we must use our remaining resources wisely and limit waste, especially as we lay the groundwork for a very different world in the years to come. To make this adjustment, it is important that the key enablers for this – collaboration, smart policy and innovative technologies – are all effectively deployed. Only then, will our goal of a green, sustainable economy and society for the UAE, become a reality. *end*

INNOVATION AT HEART

By H.E. Ahmed Buti Al Muhairbi

THE DUBAI GREEN ECONOMY PARTNERSHIP IS BUILT ON THE PRINCIPLE OF BRINGING ENTITIES AND PEOPLE TOGETHER THROUGH CREATIVITY

In 2015, the Dubai Green Economy Partnership (Dubai GEP) has centred its efforts on innovation and smart technologies that support the Dubai Plan 2021. The green economy is the largest movement of its kind in the world, which together with the IT sector, is effective in advancing innovation. The Dubai GEP is therefore pioneering a comprehensive strategy that links the green economy with clean technologies, while also promoting green trade and investment in Dubai.

Launched at WETEX 2015, the Dubai GEP strategy was endorsed by H.E. Saeed Al Tayer, Managing Director and CEO of Dubai Electricity and Water Authority (DEWA); H.E. Sami Al Qamzi, Director General of the Department of Economic Development; H.E. Ahmed Buti Al Muhairbi, Secretary General of the Dubai Supreme Council of Energy; Chairman of Dubai GEP, H.E. Fahad Al Gergawi, CEO of Dubai FDI and Secretary General of Dubai GEP; H.E. Waleed Salman, Executive Vice President of DEWA Strategy and Business Development ; Marwan Abdulaziz Janahi, Executive Director of Dubai Science Park, and Ivano Iannelli, CEO of Dubai Carbon.

About H.E. AHMED BUTI AL MUHAIRBI

H.E. is the Secretary General of Dubai Supreme Council of Energy (DSCE). With overall 25 years of experience in oil and gas, Ahmed Al Muhairbi used his comprehensive knowledge of well technology as well as his petroleum engineering education, focusing on operational and technical recommendations on field development and drilling plans. He has gained experience in the management of gas storage for power generation in existing fields in the Emirate of Dubai

FACT BOX

"Innovation is a must; it is not an option to look at normal consumption and production the same way that we have in the last 50 years. These are different times. We are looking at different practices; we are intrigued by a new way of life where people can do more and consume less"

H.E. Fahad Al Gergawi,
Secretary General of Dubai GEP and CEO of Dubai FDI

In this context, a number of initiatives were put in place to foster forward-looking approaches:

- Dubai GEP partnered with CleanTech San Diego. This partnership will give green technology innovators in Dubai privileged access to the companies and service providers under the CleanTech umbrella. This cluster of companies, based in California, has led the tech boom and now, as its innovations transcend borders, green technologies are one of the major benefactors. Furthermore, Dubai GEP is encouraging US-based companies to come and expand within the Emirate as demand for green technologies increases.
- Dubai GEP launched the Green Deal, a crowd-sourcing platform dedicated to green initiatives. The Green Deal uses an innovative model that allows a smooth green product-adoption transition for UAE residents. This platform allows end users to review and purchase environmentally friendly products or services from a single point, eliminating the challenges that discourage consumers from transitioning to green products and services.
- Dubai GEP held a new event within the Green Leadership Series (GLS) focusing on innovation. The GLS is a series of events aimed to deliver green-economy best practice to the market, and also acts as a forum for discussion and knowledge-sharing. Moreover, it serves as common ground for industry, allowing leaders to share their knowledge with others during the event. Also. the Dubai Supreme Council of Energy presented the Dubai Sustainable Energy Model; Dubai Municipality presented its initiatives regarding green concrete, and a 3D software platform was developed to allow an easy understanding of green building regulations. Additionally, the United Nations Industrial Development Organization (UNIDO) presented a Global CleanTech Innovation Programme, and DEWA, for its part, spoke about the smart grid and Electric Vehicle (EV) charging stations. Finally, ABB presented a solar plane initiative which enabled the recent, history-making solar-powered around-the-world flight to take off from Abu Dhabi.
- Dubai GEP conducted a research project on green technologies for investors. The resulting report is likely to facilitate the decision by multinationals to set up their headquarters and regional offices in Dubai, by providing an overview of the regulatory system, statistics and sector gaps in terms of investment opportunities.
- Dubai GEP created a Green Dubai Map that will help users locate sites, businesses and establishments of interest for the green economy. The aim is to put the spotlight on green activities in Dubai and help both residents and visitors get the most out of their Dubai experience while keeping the eco-footprint small.

In 2016, the Dubai GEP will continue working on enabling change to transform Dubai into a green city through the active engagement of its members, which will involve frontline public and private-sector organisations such as the Dubai Supreme Council of Energy, the Dubai Department of Economic Development, Dubai Electricity and Water Authority, the Roads and Transport Authority, Dubai Municipality, Dubai FDI, Dubai Science Park, Pacific Controls, Dubai Carbon Centre of Excellence, Etihad ESCO, Emirates Global Aluminium and the Emirates National Oil Company.

To become a member, check www.greeneconomy.ae *end*

المجلس الأعلى للطاقة
Supreme Council of Energy

DUBAI GREEN ECONOMY PARTNERSHIP

INTERVIEW
H.E. FAHAD AL GERGAWI

STIMULATING DIRECT FOREIGN INVESTMENTS TO INCREASE ECONOMIC DIVERSIFICATION

Q1: WHERE DO YOU SEE DUBAI'S ECONOMY GOING IN THE NEXT FIVE YEARS? ARE THERE ANY NOTEWORTHY TRENDS? WHERE IS ECONOMIC DIVERSIFICATION TAKING DUBAI?

H.E. F.G.: Dubai is moving to the next level of growth, where it aims to be a knowledge-based economy. This is evident in the special emphasis given to economic diversification, investment and innovation in the leadership's vision and government policy. Infrastructure improvement aimed at sustaining economic activity and Dubai's attractiveness as a hub to live and do business will remain the core concepts, driving development in the Emirate. While Dubai's open economy will depend, as in previous years, on the international environment, various initiatives are being launched and partnerships created to ensure the economy is resilient against external shocks. The high level of diversification achieved, both in terms of economic activity and markets, has helped Dubai withstand the impact of unprecedented developments, like the recent Eurozone crisis and falling oil prices, to a great extent.

Logistics, tourism and retail, which have remained the chief growth engines for Dubai, have consistently performed well in recent years, contributing to an overall GDP growth of over 4%. The construction sector has registered a slow yet steady recovery since the beginning of the decade and given the scale of ongoing projects and preparations for the Expo 2020, the momentum will pick up further. Sensing the right time to build the foundations of a robust knowledge economy, Dubai is focusing on investment in innovative sectors such as clean technology, smart services and Islamic banking. The next few years will see Dubai evolving into a hub for specialised services in new and emerging sectors.

Q2: DUBAI FDI PROVIDES PROGRAMMES TO HELP FOREIGN COMPANIES SETTING UP IN DUBAI. HAVE YOU NOTICED INCREASED INTEREST FROM ANY PARTICULAR SECTORS IN 2015?

H.E. F.G.: A growing number of investors and multinationals are moving to Dubai, convinced by the stability and sustainability of business in Dubai and the Government's commitment to diversifying the economy. In 2014, Dubai attracted AED 29 billion (USD 7.8 billion) in foreign direct investment, mainly in the infrastructure and services sectors.

Business services, financial services and IT services remain remarkably attractive for investors. The main economic pillars continue to witness steady inflows of investment, such as logistics, trade and tourism, while further growth in investment is seen in emerging sectors such as education, healthcare and green technology.

Q3: THE INTERNATIONAL RENEWABLE ENERGY AGENCY (IRENA) ESTIMATED IN ITS ANNUAL REVIEW ON RENEWABLE ENERGY AND JOBS THAT RENEWABLE ENERGY EMPLOYED 7.7 MILLION PEOPLE AROUND THE WORLD IN 2014, AN 18% INCREASE FROM THE NUMBER REPORTED THE PREVIOUS YEAR. HAVE YOU NOTICED MORE COMPANIES FROM THE RENEWABLE ENERGY SECTOR SETTING UP IN THE GULF IN GENERAL AND THE UAE IN PARTICULAR?

H.E. F.G.: Dubai has been at the forefront of the movement to promote renewable energy and clean technologies in the Middle East. Dubai seeks to attract clean technologies by highlighting facilities for companies and investors to develop and deploy clean technologies to meet potentially strong demand and successfully exporting them through Dubai.

Dubai FDI is a founding member of the Dubai Green Economy Partnership (Dubai GEP), established to co-ordinate efforts towards making Dubai a global gateway for green investment and trade. We have seen a remarkable response to Dubai's value proposition from clean technology companies as evidenced in companies like Rubenius, a leading provider of energy-efficient utilities, and Neutral Fuels, now a reputed name in recycling waste oil, working with us to establish their global headquarters in Dubai as early as 2011. Our frequent interactions with the investor community in different countries worldwide across various roadshows and networking sessions prove that there is strong interest in advancing clean technologies through Dubai, which we believe will translate into innovative projects in the coming years.

Q4: THE UAE ANNOUNCED AN INNOVATION POLICY IN 2014 AND THE UAE NATIONAL AGENDA/VISION 2021 SET TARGETS FOR INCREASED BUDGETARY SPENDING ON RESEARCH AND DEVELOPMENT (0.5% TO 1.5% BY 2021) AND AN INCREASED SHARE OF KNOWLEDGE WORKERS IN THE WORKFORCE. WHAT STIMULI ARE IN PLACE TO ATTRACT COMPANIES FROM THIS SECTOR TO DUBAI AND WHAT ELSE COULD BE DONE IN YOUR OPINION?

H.E. F.G.: Dubai has revealed its long-term plans in research and development (R&D) with initiatives such as Technopark, Dubiotech and Dubai Silicon Oasis over the last two decades. Projects and initiatives in critical sectors such as healthcare, education and renewable energies – Dubai Harvard Foundation for Medical Research, Mohammed Bin Rashid University of Medicine and Health Sciences and Enpark, to name a few – have R&D as their strongest component and focus.

The launch of a new innovation initiative by TECOM, with a total investment of AED 4.5 billion, is one of the landmark initiatives that speaks of Dubai's plans to tap innovation. The fund will support the Innovation Hub of Dubai Internet City and the newly launched Dubai Design District (D3). The Innovation Hub will provide 1.6 million square feet of dedicated space to around 15,000 knowledge and creative workers, while D3 will provide an inspiring and dynamic destination with over one million square feet for emerging designers and artists, thereby attracting designers and entrepreneurs to set up in Dubai as a gateway to the region.

The launch of MENA's first Google for Entrepreneurs Tech Hub, AstroLabs Dubai, is also meant to boost IT innovation and entrepreneurship in Dubai by enabling tech entrepreneurs from across the globe to gain access to high-growth emerging markets.

Meanwhile, Dubai is on course to become one of the smartest cities in the world, where end-users can have access to innovative smart services. The Smart City initiative will allow 24/7 access to various government and private services remotely, which in turn offers infinite opportunities for service innovations.

The leadership in Dubai has a progressive vision, rooted in tradition yet incorporating worldwide changes, which is reflected in the initiatives the city has been launching to attract people and skills. Moving forward, Dubai can successfully leverage its dynamism and flexibility to offer innovative solutions for sustainable growth.

مؤسسة دبي لتنمية الاستثمار
DUBAI FDI

> **IN 2014,** DUBAI ATTRACTED **AED 29 BILLION (USD 7.8 BILLION)** IN FOREIGN DIRECT INVESTMENT, MAINLY IN THE **INFRASTRUCTURE AND SERVICES SECTORS**

Q5: ACCORDING TO THE AGENDA, DUBAI WILL BECOME THE FIRST KNOWLEDGE ECONOMY IN THE GULF. WHAT COULD A KNOWLEDGE ECONOMY MADE IN THE GULF LOOK LIKE AND HOW WOULD IT BE DIFFERENT FROM EXISTING MODELS?

H.E. F.G.: Dubai has unique advantages in terms of geography, demography and approach to development. The city is almost equidistant from the renowned centres of learning and research across Asia and Europe. Further, it has a growing, predominantly young population. Internet access and mobile phone penetration in Dubai matches the most developed cities in the world. Infrastructure in Dubai is tailored to facilitate the seamless movement of business and people within and beyond its borders. The city is home to people of 200 nationalities and has daily air connections to almost all major cities worldwide – over 8,000 weekly flights operated by 140 airlines connect Dubai International Airport to over 270 destinations across all six inhabited continents. A unique city like Dubai provides the ideal opportunity for developing a unique model of a knowledge economy.

Q6: 2015 WAS ANNOUNCED AS "THE YEAR OF INNOVATION" – WHAT IS INNOVATIVE IN YOUR WORK AT DUBAI FDI?

H.E. F.G.: As the investment development agency of the Dubai Department of Economic Development, Dubai FDI's strategic goal is to attract knowledge-intensive, high value-added international companies to Dubai. We have been witnessing consistent improvements in investor confidence in Dubai over recent years and Dubai encourages this through unique project announcements in innovative sectors such as smart services and IT, green technology, aviation services, education and healthcare.

Dubai FDI is enhancing its outreach and connecting with investors capable of further diversifying Dubai's enterprise population and advancing the knowledge capital in the city. We were in the US and Canada recently, addressing reputed companies and executives and have some important follow-up visits lined up in Europe in the coming months.

Q7: THE MOST IMPORTANT QUESTION IN THE END: DUBAI WINNING ITS BID TO HOST THE WORLD EXPO IN 2020 WAS A MUCH CELEBRATED SUCCESS STORY. HOW COULD THIS EVENT STIMULATE THE ECONOMY IN A SUSTAINABLE WAY?

H.E. F.G.: Expo 2020 is one of the projects Dubai has incorporated into its strategic development initiatives, which demands world-class expertise and an unprecedented level of investment. Dubai expects AED 25 billion in total investment in expo-related infrastructure to materialise and work on various landmark initiatives is in full swing already.

Hosting Expo 2020 will also enhance Dubai's status as a competent hub among businesses and investors, locally, regionally and internationally. In the next few years, as Dubai moves closer to Expo 2020, we expect to see strong demand for a range of goods and services, mainly driven by the requirements of event-related infrastructure and affiliated activities such as tourism, hospitality and retail. Obviously, this will attract a large number of investors to Dubai. As visitors and businesses will have first-hand experience of staying or conducting business in Dubai, the city will receive wider global attention, which is likely to enhance its appeal beyond the exhibition period. *end*

About
H.E. FAHAD AL GERGAWI

H.E. is the Chief Executive Officer of the Foreign Investment Office and agency of the Department of Economic Development. With over 15 years experience, H.E. has held senior posts with the Dubai World Trade Center and the Dubai Chamber of Commerce, where he led trade and industrial development amongst business groups and business councils based in Dubai.

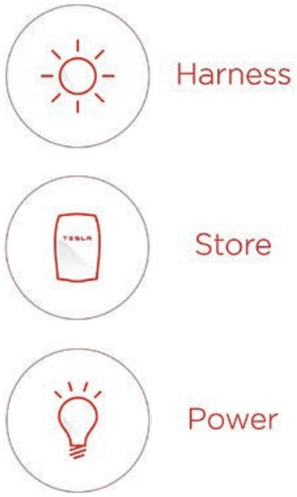
Prior to joining the Foreign Investment Office, H.E. was Executive Director of International Business Development at Dubai Holding where he contributed more than AED 6 billion of foreign investment into Dubai.

H.E. holds a Bachelor of Communication from the UAE University and is an inaugural graduate of the elite Mohammed Bin Rashid Al Maktoum Programme for Young Business Leaders and a member of the young Arab Leaders Foundation UAE chapter.

SHAMS DUBAI ON BATTERY?

By
Claudio Palmieri

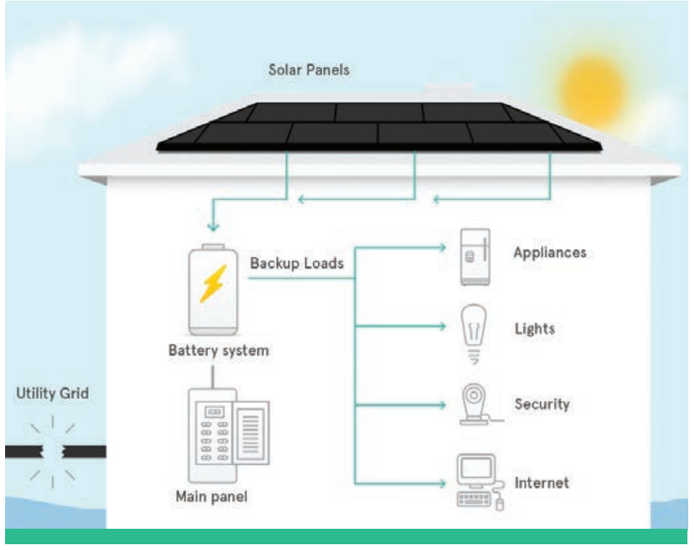
BREAKTHROUGH IN ENERGY STORAGE AND ITS RELEVANCE FOR DUBAI



Elon Musk recently made headlines with the public launch of the Powerwall battery system, declaring that the Powerwall is designed to "fundamentally change the way the world uses energy". The Powerwall launch received a lot of attention in the press and has been praised as the "energy solution" of the future or as "the energy solution that makes conventional base-load power generation obsolete". What makes the Powerwall special and what is its relevance to Dubai's renewable-energy programme?

The Powerwall is essentially a Lithium Ion battery pack, primarily designed for small and mid-scale behind-the-meter applications in combination with PV solar systems. Besides the sleek design and aggressive marketing, what distinguishes the Powerwall is the efficient DC integration and significant cost reduction through large-scale production. Apart from this, the Powerwall is more or less similar to other battery packs on the market.

From today's perspective, it is difficult to see applications for the behind-the-meter Powerwall concept as part of the Shams Dubai net metering programme, as it does not offer any incentives to store energy. While batteries may serve a valuable purpose is in grid-connected applications, the instantaneous nature of PV solar-power generation can result in fast, weather-related power fluctuations. In the case of Dubai, where the bulk of the installed PV solar-power capacity will be situated at one specific location, one cloud could reduce the power production of the Mohammed Bin Rashid Al Maktoum Solar Park (at completion of Phase 3) by more than 50% or the equivalent of several hundred MW in less than one minute. Using a grid-connected battery system for ramp rate management is a well-proven application and might be a solution to improve the grid integrity at times when the weather conditions may impact PV solar-based power generation. *end*



About
CLAUDIO PALMIERI

He is the CEO of CLS Energy Consultants DMCC and Technical Director at Clean Energy Business Council. He has worked in management, commissioning, engineering, project management, service, sales, project development and business development in the power, renewable energy and oil and gas industries for companies like ABB, MTU and Kharafi National, which included a position on the board of directors of a solar PV EPC company registered at Masdar, Abu Dhabi.

CAPITAL CLUB

By Christian Robert Horvath

Situated in DIFC, the heart of Dubai's financial district, Capital Club is a private city club that opened its doors in 2008. Since then, it has drawn in over 1500 members. The members-only club provides a contemporary setting for professional and social networking.

About
CHRISTIAN ROBERT HORVATH

He is the General Manager at Capital Club Dubai. He oversees all aspects of the 45,000-square-foot property. He ensures that both the Club's vision and the needs and expectations of members and guests are consistently met to the highest standard.

The club also participates in projects that promote environmental sustainability, the most recent being with Liquid of Life LLC. Dispensers have been installed to provide fresh filtered water, reducing the need for bottled water and decreasing the club's carbon footprint. Producing bottled water uses as much as 2,000 times more energy than tap-water production. Creating, transporting and disposing of plastic bottles also contributes to this carbon footprint.

From eliminating the use of paper cups to implementing controlled printing activities, saving water and electricity is the key focus of the Green Committee, a group of employees who have an interest in helping the club go green.

On a larger scale, the club worked with Skylume last year, replacing standard bulbs with energy-saving lights. Member surveys, newsletters, acceptance forms and other paperwork is all electronic, reducing paper waste, and soon members will be able to pay subscriptions online.

This year, Capital Club supported INJAZ UAE, a partnership between the business community, educators and volunteers. These parties link corporate volunteers to youth to prepare them in areas such as work readiness, entrepreneurial efforts and financial literacy skills. The Capital Club donates funds and aims to host annual awareness seminars featuring prominent international, regional and local corporate figures.

Recently, Capital Club has partnered with Dubai Carbon to help create awareness within the membership, with a series of events to cover topics such as how the public can support the Government's aim for Dubai to be a city that demonstrably cares about the environment. *end*

SOLAR REVOLUTIONS IN THE GULF

By
Dr. Raed Bkayrat

THE COMPARISON OF EMERGING COST-COMPETITIVENESS OF SOLAR TO CONVENTIONAL POWER MAKES THE FOSSIL-FUEL-PRODUCING REGION RETHINK ITS ENERGY MIX

"With a low cost of only **USD 0.054** per kilowatt hour (kWh), DEWA decided to **DOUBLE** the capacity of the project to **200MW**"

Despite the fact that the Gulf region is home to some of the world's largest hydrocarbon reserves built up over millennia, countries here are now beginning to tap into the power of sunlight. Leveraging the abundant solar radiance in the Gulf, the well-developed electrical grid infrastructure, access to low-cost finance, and an engineering, procurement and construction (EPC) industry that has matured in the conventional power sector, the region is arguably, ready to develop its expertise and capacity in the solar power generation sector – which, for an oil and gas-rich region, is a remarkable shift, setting new benchmarks in the cost of electricity generated from solar energy, as well as the size of projects – both of which are capturing the world's attention.

> Solar is, today, comparable to the in-country average cost of electricity generated from DEWA's current fossil-fuel-heavy mix of resources

A number of recent solar projects in the Gulf have been breaking records: In the United Arab Emirates, Dubai Water and Electricity Authority (DEWA) commissioned the largest ground-mounted solar PV plant in the Middle East in 2013. At 13MW, this facility may seem small in comparison to some of the large-scale solar PV plants being built in Europe and North America, yet, it does seem to be only the first step in larger ambitions. In 2015, DEWA broke records when it managed to secure the world's lowest levelised cost of solar energy for a large-scale solar PV plant, with its ambitious 100MW second phase to be built in the H.H. Sheikh Mohammed bin Rashid Al Maktoum Solar Park. With a low cost of only of USD 0.054 per kilowatt hour (kWh), DEWA decided to double the capacity of the project to 200MW, placing it in the same category as the world's largest solar power plants, and providing the cheapest cost for electrical energy generation from solar energy ever achieved without government support. Building on an already impressive track record, DEWA has announced the next solar phase, to be tendered later in 2015, which will generate an astonishing 800MW, making it one of the largest solar power projects to ever be tendered in a single phase.

In neighbouring Abu Dhabi, the Abu Dhabi Water and Electricity Authority (ADWEA) has announced a large 320MW solar PV project to be tendered soon on a power purchase agreement (PPA) basis, ushering in the era of large-scale solar power plants in an Emirate that is already home to Masdar's 10MW solar PV plant and the 100MW Shams 1 concentrated solar thermal power plant (CSP). Recently, both Dubai and Abu Dhabi have begun a distributed solar PV programme for rooftops in residential, industrial and commercial buildings..

Kuwait and Qatar are also taking notice of the current market pricing of solar energy and for good reason: solar is, today, comparable to the in-country average cost of electricity generated from current fossil-fuel-heavy resource mixes. Likewise, the Kingdom of Saudi Arabia is reportedly revamping its solar plans that were initially announced in 2010 for an ambitious increase in capacity of 41GW. Saudi Arabia is already home to the world's largest solar car park (around 10MW) and is actively working on projects that integrate solar energy into conventional power plants. Neighbouring Bahrain completed the Middle East's largest smart solar power plant (5MW) in 2014 and Oman, meanwhile, has announced the world's largest solar thermal power plant, named Miraah, which will generate around 1GW of capacity to support its operations in enhanced oil recovery, which would significantly reduce the carbon footprint of its oil and gas industry.

These large-scale initiatives and projects are developing local expertise across the solar industry value chain, from technology development and manufacturing, to operations and maintenance. The Gulf is also home to advanced research institutions that are already working on groundbreaking solar technologies, such as the King Abdullah University of Science and Technology (KAUST) and Masdar Institute.

The Gulf region is likely to see further integration of solar technologies to satisfy the region's three largest demand areas: electrical power generation, seawater desalination and cooling. We are likely to see more groundbreaking projects such as hybrid power plants where solar PV or CSP are co-located and integrated with conventional power plants, and the integration of solar technologies for sustainable water treatment and desalination.

It has been remarkable to witness and be part of the beginning of the new solar era in the Gulf. There is no doubt that this strong momentum will grow, and that the Gulf region will demonstrate leadership that will have positive impacts on a global scale. *end*

About
DR. RAED BKAYRAT

He is the Research Director and Board Member of the Middle East Solar Industry Association (MESIA). He is an expert on the technical and commercial values of integrated hybrid plants for power generation and water desalination. In parallel with his work for MESIA, he serves as the Vice President of Business Development for the Middle East at First Solar, a leading global provider of solar energy solutions.

SPOTLIGHT ON INNOVATION

GOING OFF-GRID
TESLA'S LATEST INNOVATION IN ENERGY STORAGE MAKES POWER-AUTONOMOUS HOMES A GROWING REALITY

Reducing reliance on fossil fuels to generate electricity in the UAE was only a dream a few, years ago. Yet today, the UAE stands not just on the threshold of offering power generation from solar energy, but with advances in battery technology, it is now looking to offer increased autonomy to consumers, and considerable reductions in generation costs to power suppliers.

In April 2015, Tesla announced its new Tesla Powerwall home battery, which charges using the solar panels affixed to private dwellings. In theory, this could eventually mean being able to take one's house completely off-grid. More realistically, given that the two battery-types Tesla is bringing to market (there are 7Kwh and 10Kwh models), means that there is reduced centralised energy demand.

Priced at around 3,000 to 3,500 US dollars, depending on the model, they are not enough in themselves to allow for full power autonomy. They are in fact, designed to be a backup supply for unexpected outages and to help a homeowner cut the cost of supply, by sourcing it from a cheaper, and more sustainable source.

The benefits, even in the short term are immense for both the UAE and its people. Given the high levels of sunlight available in the UAE, the technology would bring welcome relief to power companies, and motivate innovators in green economy policy – which the UAE is keen to develop, and would allow ordinary citizens to assume ownership of their consumption.

حكومة دبي
GOVERNMENT OF DUBAI

هيئة كهرباء ومياه دبي
Dubai Electricity & Water Authority

Under the Patronage of His Highness Sheikh Hamdan bin Rashid Al Maktoum,
Deputy Ruler of Dubai, Finance Minister of the UAE and President of DEWA

As part of Dubai Electricity and Water Authority's Green Week Initiative

WETEX 2016

WATER, ENERGY, TECHNOLOGY AND ENVIRONMENT EXHIBITION

At The Forefront of Sustainability

4-6 October 2016 | Zabeel Hall & Halls 1-8

Dubai International Convention and Exhibition Centre

JOIN US IN THE 18TH EXHIBITION AND BE PART OF A SUSTAINABLE FUTURE.

WETEX 2016 is the global platform that brings national and international companies closer to the latest technology and resource-management solutions. Experience all the latest developments in the Water, Energy, Technology and Environment sectors by visiting the biggest international exhibition on sustainability.

BOOK YOUR SPACE NOW @ WWW.WETEX.AE

WATER
ENERGY
TECHNOLOGY
ENVIRONMENT

REGISTER NOW AT: WWW.WETEX.AE

#WETEX 2016
#GREENWEEK

WetexDubai

EXPO 2020
DUBAI, UNITED ARAB EMIRATES

Wetex website

SMARTECH is the platform to promote eco-friendly products and appliances that save electricity and water.

SMARTECH 2016
Think Green. Live Green.

4 -6 October 2016
Dubai International Convention and Exhibition Centre

DUBAI

For General Sales Enquiries
Tel: +971 4 515 1460
Email: sales_general@wetex.ae

For Water Enquiries
Tel: +971 4 322 0607 +971 4 322 0665
+971 4 322 0604
Email: water@wetex.ae

For Smartech Enquiries
Tel: +971 4 515 1426
Email: contracts@dewa.gov.ae

For Energy & Renewable Enquiries
Tel: +971 4 515 0698
Email: renewable.energy@wetex.ae

For Media & Marketing Enquiries
Tel: +971 4 515 1784
Email: media@wetex.ae

For Arab Oil & Gas Enquiries
Tel: +971 4 335 5001 Fax: +971 4 335 5141
Email: info@icedxb.com
Website: www.ogsonline.com

AL AMAL PROBE TO MARS

THE ENDEAVOUR OF HOPE

When Dubai Expo 2020 is in full swing in five years' time, we will all be looking to the heavens to celebrate another first for the UAE: The UAE Mars Mission. Although it will not reach Mars for another seven months, the launch itself will be the signal that the UAE has reached the pinnacle of human endeavour, shared by a handful of the world's most developed nations.

What the Mars Mission aims to do is to assemble a fully global picture of Mars and its atmosphere. It will be a first, in that it will create an overall picture of the climate of Mars and the make-up of its atmosphere. What is even more spectacular is that the UAE Mission will be planned, developed and created wholly by a team of 150 Emirati engineers and scientists. It is perhaps the finest example so far of what the UAE can achieve in its determined desire to innovate and excel.

By examining the atmosphere of the Red Planet, it is hoped that the science we gather will help us to project the future of Earth's atmosphere. Huge amounts of data will be sent back by the probe and in line with the directives of His Highness Sheikh Mohammed Bin Rashid Al Maktoum, this information will be shared globally with over 200 universities and research institutes. This is the future that the UAE looks to create, where countries work tirelessly to contribute to the advancement of the whole of humanity.

The UAE Space Agency, has been formed to oversee this monumental task executed by the MBRSC. Over the last few years, UAE space technology has moved forward in leaps and bounds, with satellites successfully launched into Earth's orbit. The Mars Mission is the next logical step in the UAE's goal to innovate in space technology, making the UAE the ninth country to send probes to Mars.

The probe is to be named 'Hope', which reflects our view for the future and the new generations of talent from the UAE who will be its bearer. H.H. Sheikh Mohammed bin Rashid Al Maktoum himself said: "There is no future, no achievement, no life without hope." As the first mission from the Arab world, it also represents hope for millions of young Arabs who are seeking a better future for themselves and their families.

Despite all the missions that have been sent so far, Mars remains a place of mystery. The new knowledge that our innovation will bring should help to answer some of the fundamental questions we still have about Mars: namely, why its atmosphere has decayed sufficiently that water does not exist on the surface.

The Emirates Mars Mission aims to examine daily changes in Mars' atmosphere and the progression through its seasons. With instruments that have been developed specifically for the purpose of understanding the Martian climate and its peculiarities, scientists will be able to examine data culled from the observation of Martian clouds and dust storms, as well as other geophysical phenomena. The Emirates Mars Mission will send a vital message to the world that Arab civilisation once again is set to play a central role in contributing to human knowledge through determined struggle and hope.

H.E. YOUSEF HAMAD AL SHAIBANI

Director General of EIAST: the Emirates Institute for Advanced Science and Technology / MBRSC

H.E. has been vocal about the MBRSC's mission to develop local human capital in space science, in direct alignment with the UAE Vision 2021, which states the clear goal of developing the UAE into a knowledge-based society and economy. It also aligns with the national strategy of innovation, which aims to make the UAE one of the most innovative countries in the world in terms of the space industry over the coming seven years.

H.E. DR MOHAMMED NASSER AL AHBABI

Director General
UAE Space Agency

Dr. Al Ahbabi believes that the UAE is well-placed to become a pioneer in the field with billions of dollars of investment in space-related industries, two satellites in orbit above Dubai and a third planned for South Korea, and work is well under way for its 'Hope Probe' mission to Mars in 2021.

وكالة الإمارات للفضاء
UAE SPACE AGENCY

مركز محمد بن راشد للفضاء
MOHAMMED BIN RASHID SPACE CENTRE

CREATIVITY & RESEARCH

IBRD
GREEN GROWTH Knowledge Platform

THE UAE SPACE AGENCY:

SAFEGUARDING THE HEALTH OF OUR PRECIOUS PLANET

By H.E. Dr. Mohammed Nasser Al Ahbabi

INCREASE AWARENESS OF THE IMPORTANCE OF THE AEROSPACE INDUSTRY

In July 2014, the President of the UAE, H.H. Sheikh Khalifa Bin Zayed Al Nahyan, announced a decree to set up the UAE Space Agency (UAESA) that will report directly to the cabinet and enjoy complete financial and administrative independence.

> "The UAE **Space Agency STRONGLY BELIEVES** in the **value** of a **SUSTAINABLE GREEN ECONOMY**"

UAESA's primary mandate is to develop, organise, support, guide and coordinate a growing aerospace sector in the UAE that contributes to a diversified national economy and which supports sustainable development, as well as the expansion and use of aerospace science and technology to provide support and advice. It is intended to help develop the necessary aerospace policy and regulation and support their enforcement, enhancing the UAE's position as a global player in the industry.

Moreover, there is also a desire to establish international partnerships in the sector and support knowledge transfer, as well as raise awareness of the importance of the aerospace industry and its key role in the development of UAE expertise, through the training of qualified UAE nationals in aerospace science positions.

UAESA will also be responsible for facilitating, supporting and supervising all UAE national space programmes – such as the "Hope" UAE Mars Mission. The UAE's investment in space technology has already exceeded USD 5 billion, which includes satellite-data communications and television broadcasting facilities such as YahSat, mobile satellite communication and Thuraya, Earth-mapping and observation systems. These are projects successfully launched by the Mohammed Bin Rashid Space Centre (MBRSC) in Dubai, as part of the DubaiSat series. It is therefore the responsibility of the UAESA to facilitate future similar investment in the aerospace sector helping the UAE achieve its national economic growth targets.

Many governmental and commercial entities within the UAE have already demonstrated the importance of Earth-observation satellite-data analysis services, which also utilise satellite communications and global satellite navigation systems, such as GPS, in helping provide consolidated and systematic global monitoring of the land, sea and atmosphere of Earth. Space assets are now an essential and indispensable resource for monitoring the health of our planet and helping to manage the development of a green economy through the ability to observe important changes as – or even before – they happen.

Space-based Earth-observation satellite-system data is now routinely used to support weather monitoring, including the distribution of aerosols, the status of the ozone layer and CO_2 emissions. This data is also used to make assessments of air quality and to help monitor and manage pollution and solar radiation levels to identify the most suitable areas for solar-energy farms and their efficient management. These are some examples of how space-based assets can contribute to the development of a sustainable green economy and a cleaner environment.

With the establishment of a national space agency, the UAE can now consolidate and build on its existing involvement in various international and collaborative GSI and environmental monitoring activities. It is the agency's mandate to further demonstrate the county's capabilities and commitments as an effective member and contributor to the range of global Earth-health monitoring initiatives.

UAESA will draw support from the successful family of UAE-owned Earth-observation satellites developed and operated by MBRSC and already in orbit – namely, DubaiSat 1 and 2 – to be followed by the state-of-the-art, UAE-built, KhalifaSat in 2017. It will also take advantage of the expertise that exists within UAE universities and organisations, such as UAEU, Zayed University and Masdar Institute, as well as the National Centre of Meteorology and Seismology (NCMS) and the Abu Dhabi Environment Agency (EAD).

> THE UAE CAN NOW **CONSOLIDATE AND BUILD** ON ITS EXISTING INVOLVEMENT IN VARIOUS **INTERNATIONAL AND COLLABORATIVE GSI** AND **ENVIRONMENTAL MONITORING ACTIVITIES**

Together, these UAE organisations are processing large volumes of vital data that has been generated from the UAE's space programmes and is helping governments around the region tackle the challenges associated with achieving a sustainable green economy and environment.

There are, however, even more advantages in using space-based assets, which can help achieve a future where sustainability and a clean, safe environment are paramount.

1. WATER-RESOURCE MANAGEMENT:

- Surface-water management – including flood management to maximise the utilisation of flood water and minimise the risk of flood damage
- Underwater resource management – the exploration and management of underwater resources, including efficient identification of potential underwater well sites
- Marine-water management – includes accurate scheduling of tides, monitoring changes in sea levels, the examination of the effect of tidal and wave movement on shore corrosion and land losses and the monitoring of water pollution

2. OIL, GAS AND OTHER MINERAL-RESOURCE MONITORING AND MANAGEMENT

- Eco-management and assessment of the impact of the oil and gas industry and mining on the environment
- Supporting the identification of new oil, gas and mineral reserves through the use of new Earth-observation techniques
- Monitoring land and sea industrial and mining pollution

3. TERRESTRIAL NATURAL-RESOURCE MANAGEMENT:

- Monitoring and managing desertification and dune movement
- Monitoring natural vegetation through seasonal and environmental changes, including an assessment of the impact of environmental changes on oases
- Monitoring and management of wild animal and bird populations and movements – especially regarding endangered and protected species
- Monitoring illegal fishing, hunting and other damage to protected vegetation and habitats

4. AIR QUALITY AND POLLUTION:

- Monitoring air quality affected by natural particles such as sand and pollen
- Monitoring air quality and the impact of industrial operations resulting in dangerous or damaging gases – such as CO and CO_2 emissions, carcinogens, aerosols and others

In summary, space-based assets capable of performing Earth-observation that have global navigation satellite system (GNSS) and Earth-space communication abilities are indispensable tools for environmental monitoring and management as they help pave the way for a sustainable green economy.

The UAE Space Agency strongly believes in the value of a sustainable green economy and aerospace activities not only benefit the UAE, but all humankind, whether for us living now or for future generations to come, by safeguarding the health of our precious planet, Earth. *end*

About
H.E. DR. ENG. MOHAMMED NASSER AL AHBABI

H.E. is the Director General of the UAE Space Agency (UAESA). He is recognised globally as a space industry expert and is known for his leadership and strategic planning skills. He, together with the UAESA chairman H.E. Dr. Khalifa Al Romaithi, was instrumental in highlighting the benefits of a space agency for the UAE and in setting it up in record time. He also helped establish strategic projects, including the innovation and development centre for the UAE Armed Forces, CoE, as well as the Yahsat project, for which he was the project manager of its military division. He is a board member for the ICT fund and Yahsat.

"HOPE"
FOR A KNOWLEDGE ECONOMY

THE UAE SPACE PROGRAMME AND ITS FLAGSHIP PROJECT, THE AMAL (HOPE) PROBE TO MARS, WILL OPEN A NEW CHAPTER OF HIGH TECH AND R&D INNOVATION IN THE GULF

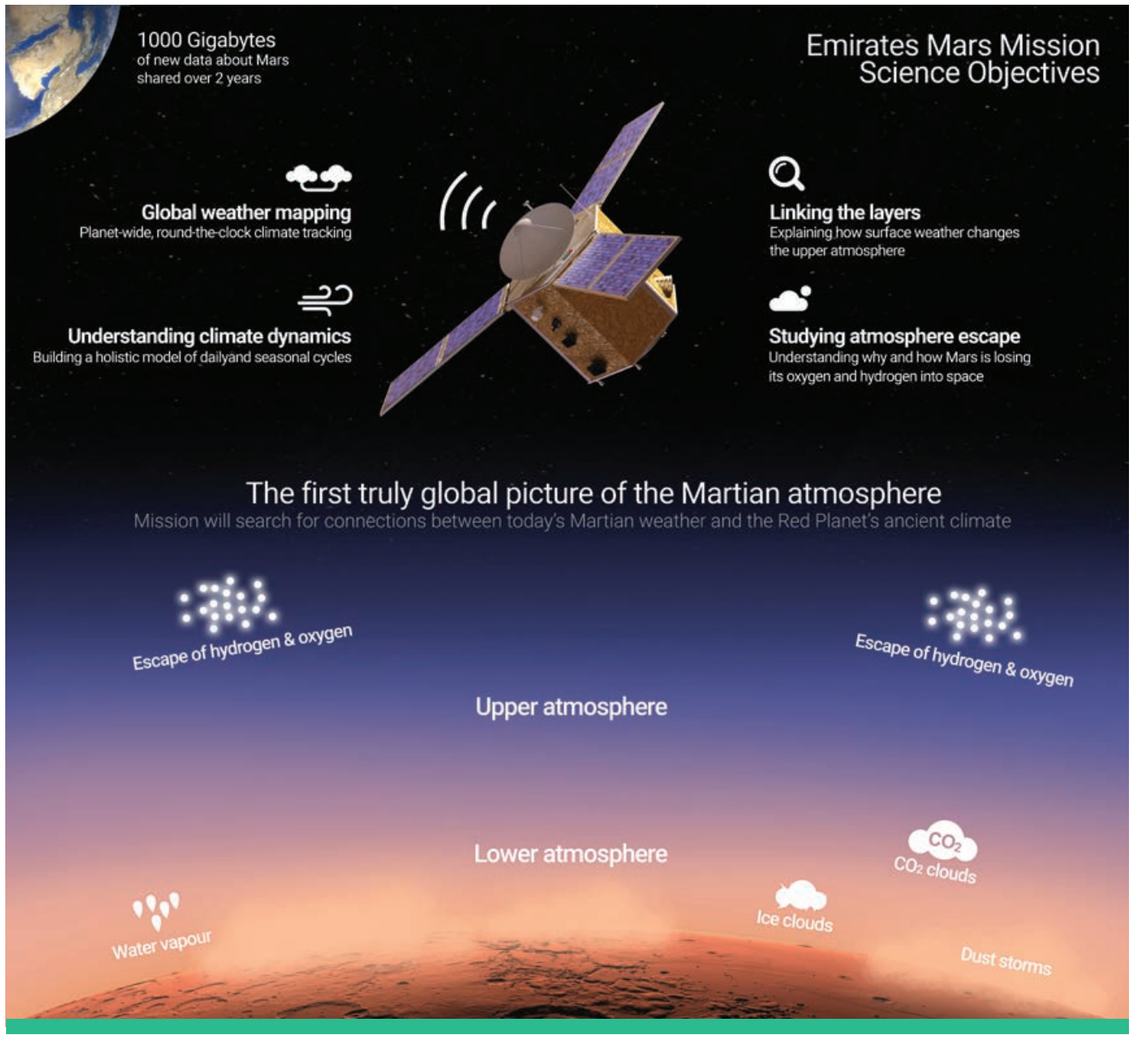
There is no question that the role of the space sector will be significant in the future of the UAE. For this reason, the establishment of a fully fledged space industry, with all of the necessary human resources, infrastructure and associated scientific research, is a primary national objective for the UAE and is set to make a valuable contribution to serving humanity.

Space science, with all its scientific and technical applications and innovations, is a vital part of the economies of all major countries that seek to develop telecommunications technology, as well as an informed and knowledgeable economy. To date, research in this field has inspired hundreds of the inventions we use today, including robots, GPS, computer memory and micro-manufacturing. Given this, the UAE took steps to enter the global race to explore outer space, with the formulation of the UAE Space Agency in mid-July 2014. Work has now begun on sending the first Arabic-Islamic probe to Mars, under the supervision of a national team, on a scientific voyage of discovery by 2021.

> "THIS PROBE REPRESENTS **HOPE FOR MILLIONS OF YOUNG ARABS** LOOKING FOR A **BETTER FUTURE**. THERE IS NO FUTURE, NO ACHIEVEMENT, NO LIFE WITHOUT HOPE. **THE EMIRATES MARS MISSION** WILL BE A **GREAT CONTRIBUTION TO HUMAN KNOWLEDGE,** A MILESTONE FOR ARAB CIVILISATION, AND **A REAL INVESTMENT FOR FUTURE GENERATIONS,**" said
>
> **H.H. Sheikh Mohammed bin Rashid Al Maktoum,**
> UAE Vice President, Prime Minister and Ruler of Dubai.

The goals of this epic mission are to enter the space industry and benefit from space technology in a way that enhances the country's development plans and to build Emirati technical and intellectual capabilities in the fields of aerospace and space exploration. This will enhance the UAE's position as a global player in aerospace and maximise the contribution of space-related industries to the national economy.

In a vital step towards establishing the space industry, the Mohammed bin Rashid Space Centre (MBRSC) was established earlier in 2015, incorporating the Emirates Institution for Advanced Science and Technology (EIAST), and marking a new era for UAE space exploration and endeavour. The centre will support the UAE's drive for advancing the sector and building national capabilities related to space knowledge and science. Additionally, it will oversee all preparations and the implementation of all phases of the UAE probe exploration mission to Mars.



> The rocket will travel more than **600 million** kilometres in a journey that will last between **7-9 months**

The mission to the Red Planet is far more than simple space exploration. The UAE's Mars probe mission is a strategic investment in human capital, science and knowledge, with the idea that future generations will reap the rewards of this investment. The name Hope is an accurate reflection of the goals the mission embodies at its core. Amongst other elements, the project will address questions including why Mars' atmosphere has been decaying into space to the point that it is too thin for water to exist on its surface. It will also study dynamic changes in the Martian climate and atmosphere throughout its daily and seasonal cycles.

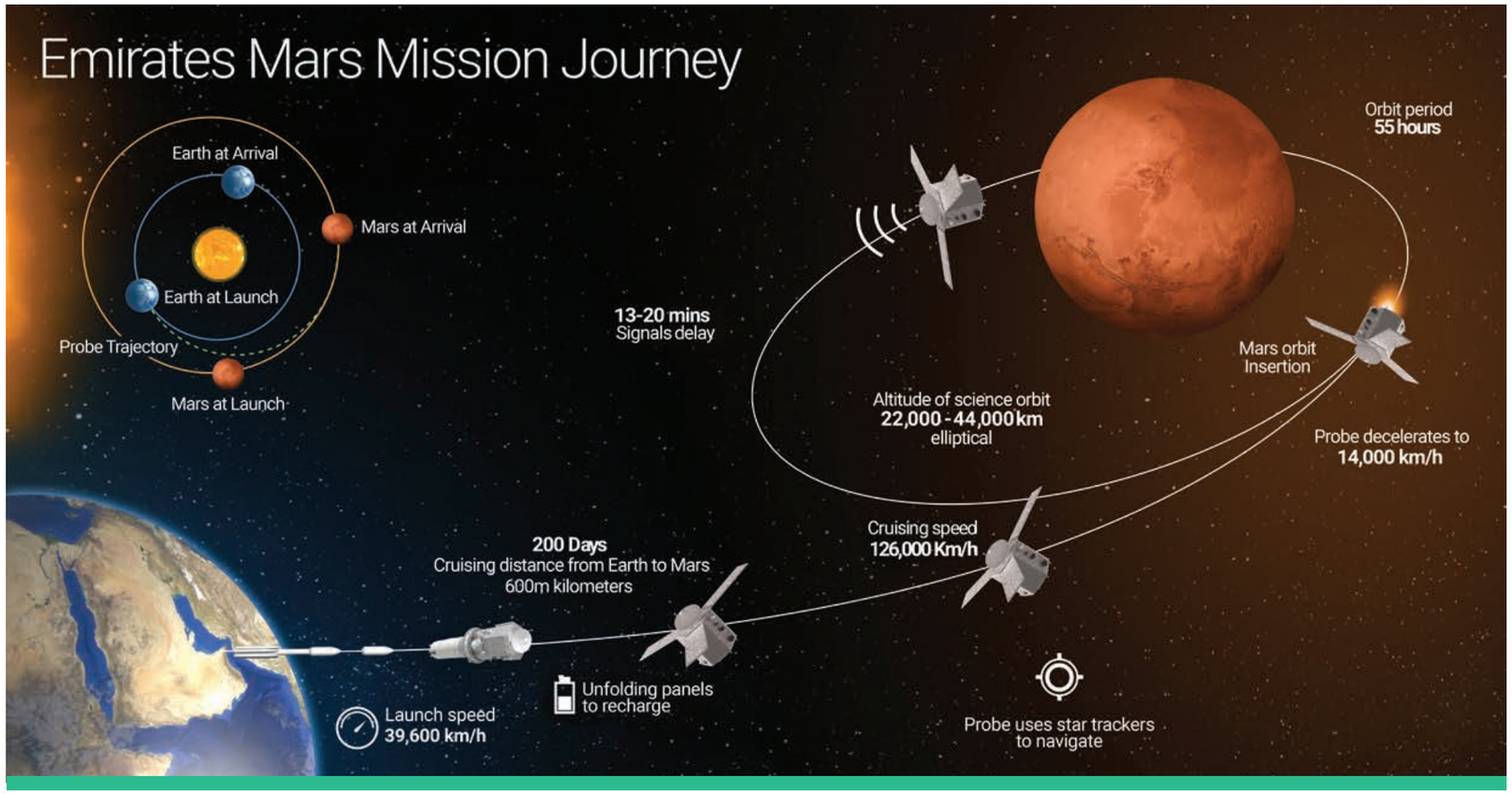
The practical steps to start designing, building and launching the UAE Mars probe have been commissioned to the Mohammed bin Rashid Space Centre under an agreement with the UAE Space Agency. Under this agreement, the implementation of all stages of the UAE Mars probe mission and its launch will be carried out under the supervision of, and with direct funding from, the UAE Space Agency for a period of seven years. As well as stipulating the financial and legal framework and the timeframe of the Mars probe project, which will be carried out by a team of 150, primarily Emirati, engineers and scientists, the agreement emphasises the importance of building a national base of research and developing specialised national organisations over the next few years. The benefits of the scientific and technical knowhow created by the Mars team of engineers will be shared with other sectors, such as the telecommunications, aerospace and satellite industries, ensuring nationwide benefits.

FACT BOX

The Mohammed bin Rashid Space Centre

The centre was established in 2015 with the aim of advancing sustainable development, and driving the dream of a UAE knowledge economy. Integrating the Emirates Institution for Advanced Science and Technology (EIAST), which has been operating since 2006, the centre comprises a team of leading UAE engineers, analysts and experts all working towards positioning the UAE as an internationally renowned leader within the field of science and technology. By developing new technology, expertise and intellectual property, it is hoped that the UAE can emerge as a global frontrunner within the industry. The centre will oversee preparations for, and the implementation of, all phases of the UAE probe exploration mission to Mars. Find out more at http://mbrsc.ae/en/page/mars-probe

On the technical side, the Mars probe will be launched in the nose cone of a rocket. The rocket must exceed 40,000 kilometres per hour to break out of Earth's atmosphere, with the first stage rocket detaching a minute after launch. After that, three rocket-propelled platforms will operate sequentially to break out of the atmosphere and release the probe into space to navigate its journey towards Mars. The spacecraft will unfold its solar panels and direct them towards the sun to charge the batteries that operate the technology onboard. Once the probe hits its maximum speed, it will not need any additional energy to reach outer space where there is no gravity or atmosphere to slow it down. In 2021, the probe will reach the closest point to Mars and use its impulse engine in order to decelerate in preparation for entering orbit around Mars. When it reaches its predetermined scientific orbit, it will operate its trackers, start collecting data and send it back to Earth. It will travel more than 600 million kilometres in a journey that will last between 7-9 months.



Adnan Al Rais | Ibrahim Hamza | Nour Al Teneiji | Mohammad Abdulrahim | Omran Sharaf | Khulood Al Harmoodi | Suhail Al Dafri | Sarah Amiri | Zakareyya Al Shamsi

The Mars probe is set to send three important messages, according to H.H. Sheikh Mohammed bin Rashid Al Maktoum. "The first message is for the world: that Arab civilisation once played a great role in contributing to human knowledge, and will play that role again. The second message is to our Arab brethren: that nothing is impossible, and that we can compete with the greatest of nations in the race for knowledge. The third message is for those who strive to reach the highest of peaks: set no limits to your ambitions and you can reach even into space." *end*

FACT BOX

The UAE Space Agency

The Agency was established in 2015 with the mandate to lead, regulate and coordinate the UAE's growing space industry that contributes to a diversified national economy and supports sustainable development. This includes developing legislation, policies and regulation and directing national space programmes. The agency encourages Emiratis to enter the space sector and has therefore developed a range of plans that will help raise awareness in Emirati and Arab youth to become pioneers in the industry in the future, along with learning and training programmes aimed at youth including a partnership with Airbus Group for the "Little Engineers" workshops.

THE DUBAI PLAN 2021: TRANSFORMING ECONOMY

Dubai is set to transform its economy over the next five years, with the Dubai Plan 2021 providing guidance on government priorities. "This ambitious plan will mark a milestone for the future development journey of our Emirate," said His Highness Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai.

خطة دبي 2021
DUBAI PLAN

The plan aims to propel Dubai forward, to place it among the world's greatest cities and to reinforce its position as a pivotal hub in the global economy and the preferred place to live and work. The development of the Dubai Plan 2021 was a significant undertaking that involved people both from inside and external to the Government, engaging Dubai's people and society. It includes targets for aspects of social and economic sustainability, as well as economic diversification, and incorporates a focus on innovation and excellence, with the ultimate aim of steering Dubai firmly towards becoming the world capital of the green economy. Dubai has become a key player in the global economy and it aims to reinforce its position through continual innovation and forward-thinking. But it's important that this is more than words and this is where the Dubai Plan 2021 comes into play.

Within Dubai Plan 2021, the future of the Emirate is described through holistic and complementary perspectives, starting with the people and the society who are the bedrock of the city. This perspective describes what Dubai's people need to deliver on these aspirations and examines the society needed to support and empower individuals to achieve their goals. The plan also addresses the urban environment, including both natural and built assets, and looks at the living experience of the population and its visitors as a result of their interaction with this environment and the economic and social services provided. In addition, the plan focuses on the economy, which is the city's development engine and the fuel for its march forward. Finally, the plan addresses the Government as the driver of development in all aspects.

These perspectives are clearly divided into six themes, each highlighting a group of strategic developmental aims for Dubai, and together forming the city's vision for 2021.
The themes are:

THE PEOPLE
a city of happy, creative and empowered people

THE SOCIETY
an inclusive and cohesive society

THE EXPERIENCE
the preferred place to live, work and visit

THE PLACE
a smart and sustainable city

THE ECONOMY
a pivotal hub in the global economy

THE GOVERNMENT
a pioneering and excellent government

Each of these themes has a corresponding set of key performance indicators, which provide a roadmap for ensuring Dubai stays on track to become a green, sustainable economy, with a happy, healthy and socio-economically prosperous residential population. *end*

INNOVATION AS A NATIONAL PRIORITY

TO BECOME A KNOWLEDGE ECONOMY, THE UAE INCREASES SPENDING ON R&D, MODERNISES GOVERNMENTAL INSTITUTIONS AND EMPOWERS NATIONALS TO CHOOSE CAREERS ACCORDINGLY

Already one of the Middle East's thought leaders, the UAE is now aiming higher and wants to be among the most innovative nations globally. The country is marking 2015 as the 'Year of Innovation' and implementing a strategy, announced last year, which aims to modernise government institutions, increase the number of scientists and entrepreneurs, create new high-tech industries and raise spending on research and development.

"THE VISION HOPES TO RAISE THE UAE'S EXPENDITURE OF RESEARCH AND DEVELOPMENT TO **1.5% OF GROSS** DOMESTIC PRODUCT (GDP)"

"The government will be using **16 different indicators,** such as levels of R&D investment for the private sector and the knowledge profile of its workforce"

The National Innovation Strategy was launched in October 2014 by H.H. Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai. The strategy sees innovation as the key to future prosperity for the nation. It focuses on innovation in seven vital sectors – renewable energy, transport, education, health, technology, water and space. To speed up progress in each of these areas, a number of practical steps will be taken soon.

Amongst them is the establishment of a new organisation to promote decentralised clean-power generation, especially through solar technologies. Establishing labs and other research facilities in schools and universities, as well as promoting the growth of biotechnology and other advanced technologies with healthcare applications, are other important future steps.

Four parallel tracks of action have been defined by the strategy. First, it will aim to create an enabling environment by developing institutions and laws that support innovation. It will also adopt innovative practices within government institutions. The private sector is very important in this regard, and the country will aim to convince companies to develop innovative products, either by attracting proven global players or encouraging home-grown research and development activities. The strategy will also focus on capacity building in the fields of mathematics, science and engineering so that a skilled workforce is available for the new knowledge economy.

The strategy will be rolled out in phases. The first phase should be completed within three years and includes 30 national initiatives, such as passing new legislation, creating innovation incubators, investing in specialised skills and providing incentives for the private sector.

Important as the objectives of the strategy are, they need to be accompanied by benchmarks to measure implementation success. This is why the government will be using 16 different indicators, such as levels of R&D investment for the private sector and the knowledge profile of its workforce. When it comes to public institutions, the percentage of their budget spent on innovation will be tracked. The country will also compare itself to others on the global scene in areas such as intellectual property protection and the registration of patents.

At the time of the strategy's launch, H.H. Sheikh Mohammed bin Rashid Al Maktoum explained that fostering innovation will help the country in its efforts to diversify its economy and promote further prosperity for all its citizens: "Innovation today is driven by effective institutions, strong policies, specialised skills and an economy where all sectors work together to discover new ways to conduct business," local media quoted him as saying. "A flexible and creative economy based on a national culture of innovation is the fastest and most sustainable way to reinforce the UAE's competitiveness on a global level."

FACT BOX

Indexing Global Innovation

The Global Innovation Index (GII) is an annual report issued collaboratively by Cornell University, INSEAD, and the World Intellectual Property Organisation (WIPO) as co-publishers, and their knowledge partners. The 7th edition in 2014 was themed the 'Human Factor in Innovation'. The GII recognises the key role of innovation as a driver of economic growth and well-being. It aims to capture the multi-dimensional facets of innovation and to be applicable to developed and emerging economies alike. In doing so, it helps policy-makers and business leaders move beyond one-dimensional innovation metrics towards a more holistic analysis of innovation drivers and outcomes.

In 2014, Switzerland, the United Kingdom and Sweden topped the Index, while the UAE ranked as the second-highest country in the Northern Africa and Western Asia region at number 36.

The strategy is in line with the UAE Vision 2021, which aims to place the country among the world's leading nations in terms of overall development. This vision already contains important goals related to innovation to be achieved by 2021, the UAE's golden jubilee of 50 years of statehood in its current form. It hopes to raise the UAE's expenditure in research and development to 1.5% of gross domestic product (GDP), as opposed to 0.5% in 2012. The leadership also aims for non-oil related real GDP growth of 5% as opposed to 3.5% and the share of knowledge workers in the UAE labour force to jump to 40% from 22.76% in 2014 . Furthermore, it has set a target for the country to be among the top 10 countries in the Global Innovation Index by 2021. In 2014, the UAE ranked 36th.

Steps are already being taken to make the new strategy a reality. The Government issued law number 15 of 2014, regarding the establishment of two new innovation free zones – Innovation Hub and Creative Community – within the Dubai Creative Clusters Authority, formerly known as the Dubai Technology and Media Free Zone. The new clusters will provide opportunities for full ownership to companies that specialise in media, technology, education, life sciences, energy and design.

From November 22 to 28 2015, the country hosted UAE Innovation Week – an occasion for the public and private sectors to showcase their achievements. The event will also feature seminars and sessions designed to help participants generate new ideas.

The Government has also passed laws to enable a number of agencies to charge an innovation fee, with the funds generated used to support innovative projects. Another important initiative is the establishment of the Museum of the Future, a centre to foster innovative ideas and strategies. Amongst the museum's goals will be to set up research centres in a number of areas. *end*

FACT BOX

What counts as expenditure in research and development?

According to the UNESCO, expenditure for Research & Development (R&D) is current and capital expenditure (both public and private) on creative work undertaken systematically to increase knowledge, including knowledge of humanity, culture and society, and the use of knowledge for new applications. R&D covers basic research, applied research and experimental development.

The worldwide average expenditure for R&D was 2.1% of GDP in 2011, the most recent year, including only countries for which sufficient data is available.

Source: The Worldbank Data Centre, United Nations Educational, Scientific, and Cultural Organisation (UNESCO) Institute for Statistics

THE INNOVATION CENTRE AND R&D

DEWA EXPANDS ON ITS WORK TO PROMOTE DUBAI AS A SUSTAINABILITY HUB

By Eng. Waleed Salman

Innovation is the driving force for sustainable growth at Dubai Electricity and Water Authority (DEWA). Using innovative new practices, DEWA has been able to transform its operations into world-class services that promote Dubai's position as a global hub for sustainability and the green economy.

With the announcement of H.H. Sheikh Mohammed Bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai, that 2015 is the Year of Innovation for the UAE, DEWA has adopted innovation as a key component of its strategy and vision to become a sustainable innovative world-class utility. DEWA has made significant progress in promoting innovation as a culture. DEWA's Innovation Centre and the Research and Development Centre are examples of its commitment to the future.

The Innovation Centre will be located at the Mohammed bin Rashid Al Maktoum Solar Park and will be the focal point for dissemination of DEWA's strategic initiatives and developments. The centre will further develop national skills in energy efficiency, promote competition in Dubai, develop renewable energy technologies, and support the region's energy industry. It will play an important role in spreading awareness on climate change and sustainability, through interactive presentations and educational events for visitors. The Innovation Centre will promote education on renewable-energy technologies used at the solar park and will also support research on solar power.

The R&D Centre will become a centre of excellence on solar power, smart grids, energy efficiency and water technologies. We have already identified a range of projects in these fields. The centre will include indoor and outdoor laboratories, a facility for drone development, which is currently under construction, and an outdoor testing facility which is already operational.

R&D efforts will focus on the reliability and durability of photovoltaic solar modules for prolonged periods under extreme weather conditions. The data gathered from the tests on these modules is also being used to improve their efficiency in the region.

Another area for study is utility-scale open spaces and urban settings in Dubai. This research helps to minimise risk, improve reliability in the future and promote the uptake of solar power in the region. DEWA's R&D team is working on a series of international and regional initiatives to develop cutting-edge research projects.

DEWA's outdoor testing facility, a part of the R&D Centre, includes both photovoltaic (PV) and concentrated solar power (CSP) testing programmes. The PV testing facility studies and evaluates the performance of the long-term stability and reliability of both commercially available and prototype PV technologies in local weather conditions. This facility is for innovative technology demonstrations with key companies in renewable energy and for international collaboration on soiling and dust mitigation on PV equipment. The tests currently being performed will set a baseline for development of specifications, tests and standards for PV equipment in the region. The current test programme involves 32 commercial type modules from more than 20 manufacturers. Future technology deployment, operation and maintenance strategies are other fields of research.

Other technologies tested include a CSP site with a total power capacity of 110KW of Stirling dishes. Plans for other innovative technology testing on site are underway, with projects on solar desalination, concentrated PV and resource assessment technologies being implemented. *end*

About ENG. WALEED SALMAN

هيئة كهرباء ومياه دبي
Dubai Electricity & Water Authority

He is the Vice Chairman of the World Green Economy Summit and the EVP of Strategy and Business Development at Dubai Electricity and Water Authority. He is also in charge of corporate strategy and business development and oversees new business ventures in areas such as product diversification (e.g. Mai Dubai), energy efficiency (e.g. Etihad Energy) and low-carbon development (e.g. Dubai Carbon). He is a leading figure in the Emirate's quest for green economic development through his involvement as a member of Dubai Supreme Council of Energy, the World Green Economy Summit, the Green Economy Partnership and internationally in the 'De-carbonise Energy' Global Agenda Council of the World Economic Forum.

VISION ON DISPLAY

SEE THE FUTURE,
CREATE THE FUTURE

> "The future belongs to those who can imagine it, design it, and execute it"

According to His Highness Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai, "The future belongs to those who can imagine it, design it, and execute it...It isn't something you await, but rather create." In line with this statement, in August 2015, H.H. Sheikh Mohammed bin Rashid Al Maktoum issued a law establishing the Dubai Foundation for the Museum of the Future. The Museum of the Future will be a one-stop research institution dedicated to science and the future of innovation and exploring the next generation of technology.

The role of the Foundation is to oversee the establishment of several research centres, in addition to the Museum of the Future, which will attract researchers to the Emirate. In recognition that design-led and future-orientated experimentation is an increasingly important capability for governments and the private sector, the goal of the museum is to develop scientific and innovative solutions to address the developmental challenges of cities of the future and contribute to stimulating innovation.

Construction of the AED 500 million Museum of the Future is close to starting, with the groundbreaking structure – situated close to Emirates Towers near Sheikh Zayed Road – due to open in 2017. It is intended to be a collaboration between the UAE government and the world's leading futurists, academics and designers, operating under the motto "See the future, create the future". Designed to inspire, educate and provoke questions, the museum recognises that the future is uncertain, but highlights a positive vision, with governments and society working together to create a more hopeful world. "The Museum of the Future will be an incubator for ideas, a driver for innovation, and a destination for inventors and entrepreneurs from around the world," said H.H. Sheikh Mohammed bin Rashid Al Maktoum.

The Museum of the Future is in fact, more than a museum. While many may associate the concept of a museum with stories of the past, the word museum comes from "musea", meaning inspiration. The Dubai Museum of the Future is therefore a place of inspiration. It is part venture fund, part design lab and part think tank, designed to become a global centre for creating the future through design, science and technology. It will be an integrated environment that empowers creative minds to test, fund and market ideas for futuristic prototypes and services. Rather than just displaying exhibits or publishing reports, the new institution will use design, technology prototyping and foresight to create real examples of change.

> Visitors will be able to **experience the future** through cutting-edge simulations and interactive demonstrations within a structure that **incorporates bespoke technology,** including major sections built using 3D printing construction techniques

As a platform for demonstrating and testing the latest inventions and prototypes from around the world, the Museum of the Future will host innovation facilities and design studios in partnership with universities, companies and research centres. Slated as a major tourist destination, it will also offer advanced courses, specialised workshops and public talks and events. Visitors will be able to experience the future through cutting-edge simulations and interactive demonstrations within a structure that incorporates bespoke technology, including major sections built using 3D printing construction techniques. Naturally, the exhibitions will change over time to reflect the latest advancements.

The elliptical structure will feature poetry by H.H. Sheikh Mohammed Bin Rashid Al Maktoum across its shiny steel-panel-clad exterior, while the innovation labs within will focus on health, education, smart cities, energy and transport, in addition to a permanent section on future innovations in all fields. The initial exhibits will include innovations such as a holographic wall, robot technology and self-driving concept cars that were created in Dubai as part of a working lab.

Once operational, the museum will become a major centre for anticipating future trends in scientific and technological fields, collaborating with governments from all over the world to develop solutions for both current and future work and service challenges. "The world is entering a new era of accelerated knowledge and great technological revolutions. We aim to lead in that era, not to follow and lag behind. The 'Museum of the Future' is the first step of many to come, marking the beginning of great achievements," said H.H. Sheikh Mohammed bin Rashid Al Maktoum. *end*

THINK-TANKS, WORKSHOPS, AND ACTION-BASED RESEARCH

By Buti Saeed Al Ghandi

HOW THE CENTRE OF EXCELLENCE FOR INNOVATION AND CREATIVITY AND CANADIAN UNIVERSITY DUBAI APPROACH THE GREEN ECONOMY FROM A KNOWLEDGE PERSPECTIVE

Knowledge and innovation lie at the heart of a smart, green economy. At the Government summit in February last year, the UAE declared 2015 the 'Year of Innovation'. UAE Vision 2021, the country's seven-year national agenda document, puts a 'competitive knowledge economy' at the heart of the Government's efforts for the years to come. This is reflected in targets for research and development expenditure as a percentage of GDP (triple the current level); performance in indices for innovation (amongst the top 20 countries), and entrepreneurship and development (amongst the top 10 countries); and increasing the proportion of knowledge workers in the labour force (to double the current share).

For Dubai Education LLC, bringing forward creative, research-driven solutions to the challenges of sustainable development is an important part of its contribution to UAE society and its alignment with the development ambition of the UAE.

In 2013, Dubai Education LLC established the Centre of Excellence for Innovation and Creativity (CEIC) to drive forward its mission to support UAE Vision 2021. Working alongside another Dubai Education subsidiary, Canadian University Dubai (CUD), the centre has developed a platform for academic and industry collaboration on the creation of a sustainable and diversified economy through green development.

Since its inception, the centre has taken a leading role in research and development, acting as a forum for discussion and dissemination of ideas. In February 2014, CEIC hosted an international conclave that brought together industry managers, scholars and researchers to discuss solutions to some of the biggest challenges in the power and energy sectors.

In November 2014, CEIC organised an International Workshop on smart-city learning in the context of Dubai 2020. This collaborative forum brought forward recommendations that were subsequently presented to Engineer Muammar Al Katheeri, Executive Vice President of Engineering Management and Chairman of the Smart City Project Committee of the Dubai Silicon Oasis Authority, who in turn, directly endorsed many of the key proposals.

As a knowledge hub, CEIC has also been active in facilitating partnerships that promote collaboration between industry and academia and establishing agreements with municipal organisations in order to promote a greener future across society. The organisation has also worked to foster collaborations that promote innovation in research, including a recent agreement between CEIC and the Dubai Carbon Centre of Excellence.

> "AT THE GOVERNMENT SUMMIT IN FEBRUARY 2015, THE UAE DECLARED 2015 THE 'YEAR OF INNOVATION'"

CEIC will continue to bring together organisations to discuss and deliberate on issues covering a broad range of fields related to the sustainability agenda. Having now established a knowledge-based platform for green development, the agenda for Dubai Education LLC is to work through CEIC and CUD to foster new collaborations, promote action-based research and develop strategic initiatives that will accelerate the move towards a smart, green economy. *end*

About BUTI SAEED AL GHANDI

He is the Chairman of the Board of Dubai Education LLC and Chancellor of Canadian University Dubai. He is an entrepreneur, business visionary and philanthropist, heading one of the most prominent groups of companies in Dubai, UAE. As founder and Chairman of Dubai Education LLC, he sought to apply his business acumen to make a meaningful and lasting contribution to the educational landscape of the UAE, and in doing so, established Canadian University Dubai.

FACT BOX

دبي التعليم
Dubai Education

The International Conclave on Data Analytics, Business Intelligence, Action Research and Cases in Power and Energy marked the launch of the Centre's program of initiatives to stimulate multidisciplinary debate. Members of the Ministry of Environment and Water in the UAE were among those who met with delegates from global power companies, such as NTPC Ltd – a public sector company owned by the Government of India – to discuss a broad range of environmental projects ranging from Dubai's initiatives to phase out inefficient light bulbs, to how businesses can improve their LEED (Leadership in Energy and Environmental Design) rating. The event facilitated knowledge-sharing between countries, to help encourage best practices here in Dubai.

The international workshop – Dubai 2020: Smart City Learning – generated a series of recommendations to support the advancement of the Dubai Smart City Vision. They included:

- Stimulating public engagement
- Developing community service infrastructure
- Harnessing mobile technology infrastructure
- Embedding education and training
- Utilising smart data analysis
- Promoting corporate engagement
- Facilitating tourist involvement

THINK TANKS IN THE UAE

The Emirates Centre for Strategic Studies and Research (ECSSR)

In a rapidly changing world, with new horizons and challenges expanding the scope of human activity at every turn, the leadership of the UAE envisioned the creation of an advanced and independent research institution that would not only keep abreast with new developments at the political, economic and social spheres of human endeavour, but would also formulate the most suitable responses and strategies for keeping UAE society ahead in the race towards modernity.

At the heart of the centre's mission is its adoption of a strategic and rational approach in addressing today's and tomorrow's pivotal and pressing issues. It also places a premium on rigorous discipline in the triumph of academic and scientific enterprise. In addition, the ECSSR's core research group involves a cadre of well-educated nationals that derive a qualitative benefit from a specially designed program.

www.ecssr.com

The Mohammad Bin Rashid School of Government (MBRSG)

The MBRSG (previously Dubai School of Government) is a research and teaching institution focusing on public policy in the Arab world. Established in 2005 under the patronage of His Highness Sheikh Mohammad bin Rashid Al Maktoum, Vice-President and Prime Minister of the UAE and Ruler of Dubai, MBRSG aims to promote good governance through enhancing the region's capacity for effective public policy.

Towards this goal, the Mohammad Bin Rashid School of Government also collaborates with regional and global institutions in its research and training programmes. The school organises policy forums and international conferences to facilitate the exchange of ideas and promote critical debate on public policy in the Arab world. The school is committed to the creation of knowledge, the dissemination of best practices and the training of policymakers in the Arab world. To achieve this mission, the school is developing strong capabilities to support research and teaching programmes, including applied research in public policy and; master's degrees in public administration; executive education for senior officials and executives; and knowledge forums for scholars and policy makers.

www.mbrsg.ae

The Institute for Near East and Gulf Military Analysis (INEGMA)

INEGMA is a strategy and security consultancy, research house and leading conference organiser in defence, security, and risk areas, headquartered in Dubai, and with offices in Washington DC, Brussels and Beirut. It brings together the reach of a strong international network with specialist expertise and proven competence across a spectrum of advisory areas including political security, risk mitigation, strategic communication and defence trade.

Since its founding in 2001, it has built a reputation for supporting the flow of specialist insight, knowledge and information into the region from the outside and from within the region to partners as far as Washington DC and Tokyo. It advises clients in government and industry on political and security risks, security policy and capability development and strategic communication. It also offers bespoke wargaming and red-teaming services, and is an experienced organiser of high-level conferences, along with business growth and development strategies in Middle East defence, aerospace,and homeland security markets.

http://www.inegma.com

The Emirates Policy Centre (EPC)

The EPC is an independent think tank with a primary focus on the United Arab Emirates and its foreign relations, as well as those of the larger Arabian Gulf. It provides strategic analysis, policy papers, studies and research to serve decision-makers of any institution or country in the region, with a priority given to the UAE to help reach an accurate and realistic understanding of its interests and security and that of other Arab Gulf states.

EPC also prepares risk assessment papers in all fields and provides them to local, regional and international partners, holding strategic debates to foresee policy trends, the effects of regional and international geopolitical projects and the extent of their impact on the Arabian Gulf.

www.epc.ae

The Delma Institute

The Delma Institute is an interdisciplinary research house that aims to advance the quality of knowledge and data analysis linked to the United Arab Emirates and, by extension, the Middle East and the world. Its research covers politics, examines dynamics and detects patterns in the local, regional and global political sphere. It also studies the potential and sustainability of the UAE's economic model. In sociology, the Delma Institute identifies key social issues and trends in the UAE and the wider Gulf. In defence and security areas, it analyses threats and opportunities relating to regional and global security.

The Delma Institute is technically not a think tank, hence its role is not only policy-relevant, but also scholarly-relevant. This tension between ideas and policy usually seen in traditional arguments on the role of think tanks in the world is approached differently by Delma's model of advisory and public research.

http://beta.delmainstitute.com

Trends Research and Advisory (TRENDS)

Trends Research and Advisory is an independent and progressive research centre based in Abu Dhabi, in the UAE, building a global network of research associates. TRENDS aims to help improve policies and decision-making processes through rigorous research and analysis. It explores beyond-news agendas and delves into the underlying variables influencing policymakers to predict future opportunities and challenges, through a network of international experts.

Its analysis, which serves as a primary resource for leaders and policymakers in governments and organisations, covers vital global, regional and country-specific matters. Their experts work to create innovative solutions to confront crucial regional and international trajectories by analysing and advancing trends. TRENDS aims to serve as a leading institute for future studies in the region and to be regarded as an important contributor to the development of innovative solutions worldwide.

http://trendsinstitution.org *end*

Advertisement

حكومة دبي
GOVERNMENT OF DUBAI

جائزة الإمارات للطاقة
EMIRATES ENERGY AWARD

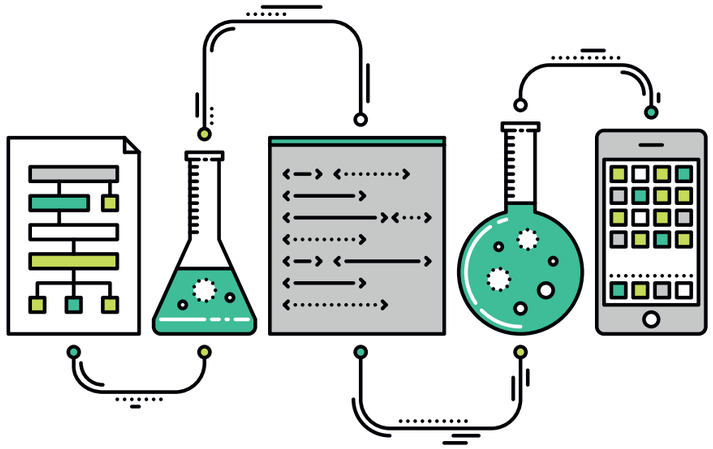
المجلس الأعلى للطاقة
Supreme Council of Energy

The Emirates Energy Award
For a Sustainable Future

THE DUBAI CENTRAL LABORATORY

By Eng. Hawa Abdullah Al Bastaki

INTRODUCING NEW GREEN-MATERIAL TESTING METHODS



Dubai Central Laboratory is a department of Dubai Municipality, and was established in 1997 with the goal of integrating all the municipality's laboratories under one single authority. Thanks to this standardisation decision, DCL has forged major advances in product conformity over the last few years. And as we head towards climate action after Paris, DCL is an important facet of environmental policy that deserves to be more widely known.

With the establishment of a new facility to test the latest in environmentally-friendly materials, DCL is able to better assess the physical, chemical, mechanical, thermal and fire-properties, aging, solar and light properties of green materials against internationally approved standards. With DCL's investment in staff training, and the latest technology and training methods, DCL has proved to be extremely useful in setting the municipality's green benchmarks.

DCL conducts 62 tests on green building-materials and products, which are all accredited under ISO 17025 by the Dubai Accreditation Department. In a new move, Dubai Central Laboratory has signed a service level agreement (SLA) with the Emirates Green Building Council (EGBC) to perform specific tests that work towards product and material certification. The goal of this initiative is for the enhancement of green-building specifications and the promotion of more highly-efficient implementation across Dubai.

بلدية دبي
DUBAI MUNICIPALITY

At the heart of the new initiative is the plan to include increasing amounts of renewable solar-sourced energy within the municipality's standards, which follows the line taken by H.H. Sheikh Mohammed Bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE, and Ruler of Dubai, when he called for "A Green Economy for Sustainable Development", and the promotion of renewable energy in all government sectors. It was decided that Dubai Central Laboratory's Engineering Materials Section, which is responsible for green-material testing would begin the process by, in the first stage, changing over the energy source for all laboratory equipment to renewable solar energy, starting with the sample preparation equipment. A 1kW roof-mounted solar generation system with O/P 230VAc was installed, along with a battery back-up.

This resulted in a net offset of 138kg of CO_2 per month, or approximately nine trees per year. This step was the first of several that would eventually lead to a zero emission figure for testing of green building material testing. What was just as important for DCL, however, was not just the environmental benefit accrued from the new power unit, but that also, the life expectancy of the equipment was enhanced, and that there was a notable saving in electricity costs, which helps to preserve the nation's natural resources.

This extension of accreditation into green materials, and the increasing use of renewable solar power all help DCL to satisfy the latest requirements for the most sophisticated types of testing that are in operation worldwide. These changes are milestones that point the way to the eventual goal of a world-class reference laboratory that uniquely offers all its green materials testing with zero emissions, and that is run entirely by renewable energy. This approach not only puts Dubai firmly on the map regarding the quality of its testing, but also takes Dubai another step forward in its green policy implementation, and its support of UAE government policy. *end*

About
ENG. HAWA ABDULLAH AL BASTAKI

She is the Executive Director Of Dubai Central Laboratories Department at Dubai Municipality. Dubai Central Laboratories which is under the aegis of Dubai Municipality's Engineering Materials Section. She has worked for more than 20 years in his field, acting as Director and Head of Strategic Planning and the Quality Management Department at Dubai Municipality. She has also been Chairman of the Supervisory and Regulation Bureau office, and Quality Control Engineer for the Building Research Department. She has also headed a number of the higher control committees, and excellence and quality programmes.

Spotlight on innovation

A Scientific Crystal Ball

Masdar has created a new model that helps conserve the country's natural resources

If you're looking to know the future, it's science that gives answers. In 2015 Masdar Institute of Research and Technology finalised a new a model that can accurately predict climatic variables such as temperature, precipitation and soil moisture.

In water-stressed countries like the UAE, understanding climate and weather are essential for allocating scant resources, so allowing for more accurate planning and policy development. The hydro-climate model allows scientists and policymakers to be more efficient in water resource management, agricultural development, renewable energy deployment and public health and safety. Each sector is vital to the UAE's future success.

Forecasting is done through examination of soil moisture and precipitation in order to determine where to plant crops for optimal growth. As populations rise and more pressure is placed upon national infrastructure to supply more food, the ability to maximise food production is vital – especially if it can be done with sustainable levels of water use.

Forecasting is also useful regarding solar radiation levels, as it helps to determine how much benefit can be accrued from using solar energy in agriculture, water reclamation and other areas. Also, by through government and private investment in climate science, the benefits for the country also include anticipation of weather extremes so any negative change has a minimal impact on the economy and society at large.

ENABLING ACTION WITH GREEN GROWTH KNOWLEDGE

By
Benjamin Simmons

THE GGKP STRIVES TO CLOSE KNOWLEDGE GAPS IN GREEN GROWTH THEORY AND PRACTICE, AND BY DOING SO SPUR GREATER AND MORE EFFECTIVE CHANGE

In order to mobilise the transition to a green economy, it is crucial that policy-makers and practitioners have the latest knowledge at their disposal. Knowledge enables action, allowing countries to implement the appropriate environmental, economic and social policies to meet their development needs.

However, the reality is that there are still many unanswered questions when it comes to the greening of our economies and what impacts these policies will have on jobs, growth and competitiveness; how we can ensure that green growth is inclusive and equitable; and how we should measure our progress towards a green economy.

The Green Growth Knowledge Platform (GGKP) aims to fill existing knowledge gaps and share the best research and solutions to these and many other questions. Established in January 2012 by the Global Green Growth Institute (GGGI), the Organisation for Economic Co-operation and Development (OECD), the United Nations Environment Programme (UNEP) and the World Bank, the GGKP has since expanded to become a global partnership of over 40 international organisations, research institutes and think tanks.

At the heart of the GGKP is the belief that knowledge leads to lasting impact and that investing in its generation and dissemination leads to better, more concrete results. By catalysing collaborative research, facilitating access to key knowledge products and stimulating the creation of a dynamic green-growth community of practice, the GGKP, together with its partners, aims to empower green-growth action on the ground.

CLOSING KNOWLEDGE GAPS THROUGH COLLABORATIVE RESEARCH

Through research committees formed around key green-growth topics, the GGKP draws together leading global experts to drive forward the green-growth knowledge agenda. These committees work to assess the state of knowledge, prioritise gaps and catalyse broader research efforts in order to ensure practitioners and policy-makers have the required knowledge to support a green-economy transition.

In 2015, the GGKP convened four research committees on the topics of fiscal instruments, trade and competitiveness, metrics and indicators, and technology and innovation. Together these research committees brought together over 60 global experts from more than 40 organisations, spanning a wide range of developed and developing countries, to collaborate in identifying and responding to knowledge gaps. By encouraging widespread collaboration and coordinated research, the GGKP helps to expand the reach and impact of its partner institutions.

Additional research committees will be formed as the need arises. Future research priorities that have been identified include: the topics of inclusiveness (i.e. equity and green jobs) and behavioural economics.

THE HOME OF GREEN GROWTH KNOWLEDGE

The effective management of, and improved access to, green-growth knowledge is essential for the green-economy transition. With this in mind, the GGKP launched a state-of-the-art web platform (www.greengrowthknowledge.org) in January 2014, to ensure that new learning and best practices can be easily exchanged across borders and disciplines. The platform includes, among other things, a global library of over 1000 technical and policy resources from leading institutions and experts, a repository of key green growth data, policies and projects for 193 countries, and a data visualisation tool to explore historical data trends across countries and indicators.

In addition, the web-based platform is used to communicate upcoming events; highlight recently released research, tools and data; and share green growth expert opinions through the GGKP "Insights" blog.

GREEN GROWTH
Knowledge Platform

"In 2015, the GGKP convened four research committees, bringing together **over 60 global experts** from more than **40 organisations**"

About
BENJAMIN SIMMONS

He is the Head of the Green Growth Knowledge Platform. Prior to his current role, he coordinated the establishment and implementation of The Economics of Ecosystems and Biodiversity (TEEB) initiative, a groundbreaking effort involving over 500 experts to draw attention to the global economic benefits of biodiversity and the costs associated with continued biodiversity loss. He was also formerly Head of the UNEP Trade, Policy and Planning Unit, where he managed UNEP's trade and environment programme and served as the principal UNEP delegate to the World Trade Organisation.

FROM CONCEPT TO PRACTICE – LINKING ACADEMICS AND POLICY-MAKERS

Finally, in an effort to facilitate the growth of – and engagement with – the wider green-growth community of practice, the GGKP convenes a global conference every year. The GGKP's most recent annual conference was held in January 2015, on "Fiscal Policies and the Green Economy Transition: Generating Knowledge – Creating Impact". In particular, the conference was successful in its ability to stimulate interaction and debate across disciplines. A hybrid between a policy forum and an academic conference, the gathering represented a new and innovative setting to exchange ideas between top researchers and green-growth policy-makers.

The conference was hosted in partnership with Ca' Foscari University of Venice, The Energy and Resources Institute (TERI) of India and the United Nations Environment Programme (UNEP). The GGKP is already actively planning its next annual conference, which will be held in 2016 and organised by the Global Green Growth Institute (GGGI).

In the few short years since its founding, the GGKP has worked to push the frontier of green-growth knowledge generation and management. It is also working to draw together a robust green-growth community committed to answering the vital and challenging questions on how to sustain our livelihoods on a healthy planet. *end*

> "The platform includes a global library of **over 1,000** technical and policy resources [...], a repository of key green growth data, policies and projects for **193 countries,** and a data visualisation tool"

THE GREEN BUILDING PROGRAMME MADE IN DUBAI

By
Nasser Al Shaiba

THE POTENTIAL SAVINGS FROM RUNNING BUILDINGS MORE ENERGY EFFICIENTLY

المجلس الأعلى للطاقة
Supreme Council of Energy

Improving the efficiency of buildings is a key factor in Dubai's energy strategy. Overall, the Emirate is aiming for savings of energy and water consumption of 30% by 2030. Mandated by the Dubai Supreme Council of Energy and approved at the highest political level, this goal reflects the existing opportunities for savings in the Emirate and also its ambition to be among the sustainability leaders of tomorrow.

About
NASSER AL SHAIBA

He is the Director of Health and Safety of the Environment and Quality Management at the Dubai Supreme Council of Energy

His main role is to develop an HSEQ smart governance framework and HSE strategy for Dubai for the energy sector and to support Dubai Energy Strategy 2030. His background is in science and he specialises in HSEQ, sustainability, smart districts and innovation in HSEQ.

In any city, buildings account for a large share of the natural resource consumption, including the use of energy and water. Dubai is no exception. With over 130,000 buildings of various types and sizes, the sector consumes approximately 80% of all energy and water produced in the Emirate.

The trend is likely to continue, considering the high rates of economic growth, leading to increased construction activity. Due to factors such as old technology, pressure to build quickly and previously low rates for energy and water efficiency, many existing buildings in the Emirate are not performing at optimum efficiency. All these factors make the emphasis on building efficiency a key part of any comprehensive efficiency strategy.

The Dubai Supreme Council of Energy recognises the tremendous economic opportunities associated with building efficiency. Of the eight programmes in the Dubai Integrated Energy Strategy 2030 and the Dubai Demand Side Management Strategy, two programmes target buildings.

The first initiative has been implemented by Dubai Municipality and concerns building regulations. Mandated in 2015, the Dubai Green Building Regulations contain requirements on insulation, efficient air-conditioning equipment, sustainable design and the use of solar-heated water within new buildings. The regulations are publically available and can be downloaded from the municipality's website. They are the first step towards improving the energy performance of buildings by 28% and reducing water usage by 32%. This translates into expected savings of 5.3TWh of electricity and 15.2 billion imperial gallons of water. Further contributing to these goals is a new programme, the Building Labelling Initiative, which is currently being developed in partnership with the Regulation and Supervision Bureau.

The second strategic programme targeting the building sector is aimed at existing buildings. The building retrofit programme is implemented by Etihad ESCO. It aims to create rules and benchmarks for the sector so that private players can enter the retrofit market, to provide financing and create a new business model around energy and water performance improvements. The government is also leading by example by placing new performance requirements on public buildings. To assist the retrofit programme, the Dubai Supreme Council of Energy issued a directive on energy and water audits for government entities, mandating savings for all entities by 2021. Within that timeframe, government entities must improve their energy and water efficiency by at least 20% compared to the 2014 benchmark. Throughout 2015, government entities are conducting energy audits and detailing plans to achieve the required savings.

In addition to increasing popular support for efficient buildings, these programmes also result in lower operational costs. When it comes to the Emirate of Dubai, one of the biggest benefits in raising building energy efficiency is the ability to generate monetary savings.

At the Emirate level, these actions free up resources for investment in new endeavours instead of paying for energy and water inefficiencies. Overall, if the Emirate's 30% energy target by 2030 is reached, an estimated AED 9 billion will be freed up for reinvestment in the economy. *end*

MORE ACCURATE THAN AN ADDRESS

THE **MAKANI** SMART MAP SYSTEM

Dubai's rapid growth has not always allowed for technology to keep pace. With fast-paced infrastructure development, the introduction of postal addresses and mapping and navigation technology has been an issue – an issue that Dubai Government, as part of the Smart City Initiative, has been keen to resolve.

"**Dubai** is **THE FIRST CITY IN THE WORLD to use numbers** to locate places with **high accuracy** through an interactive map"

The solution is called Makani, meaning "my location" in Arabic. Officially launched in April 2015, this state-of-the-art application is based on a geo-address system, which pins each of Dubai's buildings to a GPS coordinate via a 10-digit smart code.

Dubai is the first city in the world to use numbers to locate places with high accuracy through an interactive map. The simple addressing system uses 10 numbers to uniquely identify building entrances, with a precision level of one square metre. This is so precise that it can be used to pinpoint the specific locations of multiple entrances to a building. The common addressing system makes finding locations around the city significantly simpler for both residents and visitors, as well as for security and emergency services.

The simple-to-use Makani system has been hailed as the smartest map-system in the world. Users can download the Makani app, available on iOS, Android and Blackberry devices, as well as online, and search for locations using the unique Makani codes. Dubai has already indexed 130,000+ buildings, outlining each building's plot and assigning Makani numbers to the entrances. Address plaques with the numbers are being placed on the entrance of buildings for visual reference and, in the interim, buildings have been provided with Makani number stickers and guides to build awareness.

The application shows each building's outline and main entrances specified as points on the interactive map viewer. Within the app, users can share locations and a voice-navigation feature similar to Google Maps is available on smartphones and devices to guide users from their current location to the target site.

The Makani app has seen a high adoption rate to date – downloaded more than 10,000 times on Google Play and gaining a 5-star rating in the Apple store. Future development will see Makani addresses also traceable on Google and HERE maps, which is anticipated to boost user numbers and help Makani gain currency for everyday use. *end*

TESTING THE LIMITS

THE ABU DHABI SOLAR CHALLENGE

SHOWCASING THE INGENUITY OF YOUNG SCIENTISTS IN GREEN TECHNOLOGY

The UAE is a world-renowned nucleus for sustainability and green innovation. Spurring universities to push the boundaries of green technology and testing the ingenuity of the next generation of engineers and green-technology advocates, the Abu Dhabi Solar Challenge was the first International Solarcar Federation sanctioned event to be held in the Middle East, launched during Abu Dhabi Sustainability Week in January 2015.

Abu Dhabi welcomed university teams from Australia, Europe, America, the Middle East and Asia to compete in a cross-Emirate road event spanning 1,200 kilometres of city and desert terrain using fully solar-powered cars.

The four-day event started off from Yas Marina Circuit, from where the teams drove across Saadiyat road and along the corniche, before driving out a checkpoint at UAE University in Al Ain. Stopping overnight at Masdar City, the teams then continued the challenge on day two with a 325-kilometre drive to Hameem in the desert, finishing at Shams 1 concentrated solar power plant. On day three, the teams drove down to Liwa desert and back west via Ghayathi towards the finish line at Shams 1.

The challenge presents future scientists with the opportunity to demonstrate their solar cars under real driving conditions and thoroughly test the reliability of the technology. Of course, this extends beyond the physical limits of solar technology, as teams had to consider energy management and driving strategy when navigating varying and challenging landscapes.

With safety in mind, support vehicles, including a lead vehicle to identify and address any on-road problems and a mission-control vehicle from which the pace was controlled, shadowed the solar cars. Other vehicles carrying replacement drivers, spare parts maintenance experts, as well as supplies and camping equipment for the team, were also available as support.

The Michigan University team was awarded first place in the Abu Dhabi Solar Challenge, while second place went to the UAE's own Petroleum Institute.

The UAE has been a forerunner in the region through its various renewable-energy investments and challenges like these set the nation in a good position to encourage creativity and innovation in sustainable transportation among future technology pioneers. *end*

REVOLUTIONARY STATIONARY BATTERIES

SUSTAINABLE DEVELOPMENT SOLUTIONS NETWORK
A GLOBAL INITIATIVE FOR THE UNITED NATIONS

IATA

A VISION TO SUSTAIN

Elon Musk is a man who is hard to pin down at the best of times. Famous for his SpaceX rockets, which cost only two percent of those that previously existed, he single-handedly revolutionised the space business. Not content to rest on his laurels, Musk has moved on to new, and to his mind, better things. Having a dream to make humanity and interplanetary species is one thing, but making us sustainably efficient in the creation of energy is another.

With his revolutionary battery technology, Musk went on to create electric cars that defied the old rules that governed charging. Even this was not enough for a man who has innovation running through his veins. Tesla Motors announced the formation of Tesla Energy and with Musk's usual élan and optimism, he promised that it was within the power of humanity to change the way we produce and use power – entirely.

With stored solar energy and a new line of state-of-the-art batteries, the old world of unsustainability was about to be consigned to the dustbin of history. The Tesla Powerwall is a zero-carbon, sustainable lithium-ion battery that can be attached to any wall of a flat or house, whether interior or exterior. The size of a small refrigerator, the Powerwall comprises an integrated heat-management system and runs on software that is operated only by a solar inverter, with the battery charged from photoelectric solar panels.

Common sense tells us that a system needs to work intelligently; that there needs to be storage for times when consumption is nil or very low and discharge capabilities when it is high. This is what it does. What's more, the Powerpack has also managed to overcome the old problem of 'no sun; no power', which has made a great difference, indeed.

What this means is that fuels that have heavy and dirty carbon footprints are taken out of the energy equation. Musk believes, though, that the bigger picture is just as important – if not more so. What a system of Powerpacks would achieve, he argues, is a full system that would be able to share power internally and wean us off our fossil-fuel additions. Eventually, rather than being a way of reducing the carbon footprint, he thinks that Powerpack-type systems will replace all other forms of power – unless, of course, you happen to live near a dam for hydroelectric power, or in Iceland, where all national power is created thermally, thanks to the volcanoes that litter the island.

Ever one for aesthetics, Musk intends the home batteries Tesla design to look beautiful and be inconspicuous, and be as cost-effective as his SpaceX projects. To this end, he and his partners have begun to build what he calls a 'Gigafactory', located in Nevada. By 2020, he anticipates that the gigafactory will produce more lithium-ion cells than the world's combined output in 2013. With mass use, the electrical grid can be optimised and costs will plummet. Musk is certainly a man on a mission, and he appears to be succeeding in it.

ELON MUSK

CEO and Product Architect Tesla Energy

He is a Canadian-American entrepreneur, investor and inventor, who is the CEO and CTO of SpaceX, Tesla Motors, Tesla Energy, and chairman of SolarCity. He is also the founder of SpaceX and a cofounder of Zip2, and PayPal.

TESLA

SOCIAL CAPITAL AND WELL-BEING

By Professor Jeffrey D. Sachs

TRUST, HONESTY AND MUTUAL SUPPORT AS A BASIS FOR A BETTER QUALITY OF LIFE

> Social capital is a measure of the quality of **interpersonal relations,** involving trust, honesty and mutual support

Well-being depends heavily on the pro-social behaviour of members of society. Being pro-social entails individuals making decisions for the common good that may conflict with short-run egoistical incentives, thereby fostering a high level of social capital – generalised trust, good governance and mutual support by individuals within the society.

Social capital probably raises well-being in two ways: one that might be considered intrinsic and the other instrumental. The intrinsic benefit of social capital is the human yearning for love, friendship and community. "Man" as Aristotle famously said, "is a social animal" Social capital is a measure of the quality of itnterpersonal relations, involving trust, honesty and mutual support, and these in turn increase mental and physical well-being.

The instrumental benefit of social capital arises because of the contributions of social capital to improved economic performance and social insurance. Social capital facilitates economic cooperation, efficient contracting, the division of labour and the provision of social insurance against shocks. When social capital is high, individuals are more prepared to incur individual costs for the greater societal good; and when most people in society behave in that manner, society as a whole benefits in higher economic productivity, stronger social insurance, greater societal resilience to natural hazards and greater mutual care.

The growing body of evidence on the importance of social capital to well-being and economic success is leading again to the question of how best to forge the virtues of the citizenry to achieve desirable society-wide outcomes. I believe that we can expect many different approaches to this challenge in the years ahead, each of which provides a different way of investing in social capital.

About
PROFESSOR JEFFREY D. SACHS

He is the Director of UNSDSN. He is a world-renowned Professor of economics, leader in sustainable development, senior UN advisor, bestselling author and syndicated columnist. He serves as the Director of The Earth Institute, Quetelet Professor of Sustainable Development, and Professor of Health Policy and Management at Columbia University. He is special advisor to United Nations Secretary-General Ban Ki-moon on Millennium Development Goals and is the Director of the UN Sustainable Development Solutions Network.

Spotlight on innovation

Making a Date with Dubai's New Smart Palms

Dubai Municipality introduces new, smart, solar-powered 'palm trees'

If you told someone that you charged your phone on the beach, they might look at you a little oddly. If you told them you used a tree that also had wifi, they would be right to wonder if you hadn't got a touch of the sun. And yet, Dubai Municipality's new Smart Palm project is providing all the above.

Using solar-powered Smart Palm trees, which offer Wi-Fi, act as charging points and offer the latest weather forecast reports, sea conditions, weather warning announcements, government notices, local news, public transport information and city information in multiple languages. With a 360-degree infrared CCTV camera and a emergency button, they also offer the community important security protection. And, while these 'trees' are the new focal point for Dubai beachgoers, just as importantly, these new attractions also offer the passerby welcome seating and a shady place to escape the worst of the heat.

Dubai Municipality launched the first of these Smart Palm trees in April 2015 at Zabeel Park with the help of the D IDEA media, and the second two months later, at Jumeira public beach close to Burj Al Arab. Seven metres tall, and able to deal with up to 50 users, these smart palms work tirelessly 24/7 and serve to showcase Dubai municipality's commitment to sustainability, renewable energy and green economy policymaking.

SOCIAL CAPITAL & WELL-BEING

1

As per Aristotle, society should pay attention to moral training in schools

2

Universal access to education, more generally, is likely to promote social capital in many additional ways: by raising awareness of social dilemmas; reducing social and economic inequalities; fostering a better understanding of public policy debates; raising individual skill levels; and creating an educated citizenry that can keep government in check

3

Specialised training in compassion and in traditional techniques, such as meditation, to develop mindfulness, may be effective pathways at the individual level to greater compassion and thereby to social capital

4

Professions should establish codes of ethics that emphasise pro-social behaviours.

5

More effective regulation by the state against dangerous anti-social behaviour (e.g. financial fraud, and pollution) could help promote interpersonal trust

6

A focused effort to reduce public-sector corruption could help rebuild social capital. High-trust societies are also low-corruption societies. Rothstein et al and others, have argued that causation runs from the rule of law to interpersonal trust

7

Public policies to narrow income and wealth inequalities could raise social capital on the grounds that class inequalities are a major detriment to interpersonal trust

8

The adoption of universal social benefits and strong social safety nets (as in Scandinavia) rather than only means testing, can have the effect of raising social trust

9

The recovery of moral discourse in society more generally – calling out illegal and immoral behaviour by powerful companies and individuals – can increase the reputational benefits of pro-social behaviour

10

The strengthening of deliberative democracy, in which individuals meet face-to-face or in virtual online groups to discuss and debate public policy issues in detail, may well foster generalised trust, reputational benefits of pro-social behaviours and more ethical framing of policy issues. The consistent evidence that effective democracy fosters generalised trust is a powerful indication that good governance not only reduces transaction costs in the economic sphere (i.e. lowers the costs of doing business), but also produces social capital with myriad direct and indirect benefits

11

The accurate reporting of pro-social behaviour may build social trust. For example, the actual rate of return of cash-bearing wallets found by strangers in downtown Toronto has been found to be three times as great as people believe

We are at an early stage of testing effective approaches to building social trust and pro-social behaviour, especially in societies driven by distrust, corruption and anti-social activities. This challenge is of paramount importance for achieving sustainable development and a high level of well-being. *end*

RETROFITTING DUBAI'S AIR-CONDITIONING WITH WORLD-CLASS COOLING TECHNOLOGIES

By H.E. Ahmad Bin Shafar

OVER 1 MILLION REFRIGERATION TONS, GENERATED THROUGH 62 COOLING PLANTS, AND BACKED BY 225 KMS OF PIPELINES ACROSS DUBAI, IS THE WORLD'S LARGEST DISTRICT-COOLING ACHIEVEMENT TO DATE

District cooling refers to the centralised production and distribution of cooling energy. Chilled water is delivered via an underground insulated pipeline to offices and industrial and residential buildings to cool the internal air of the buildings within a district. Specially-designed units in each building then use this water to lower the temperature of air passing through the building's air-conditioning system.

By centralising cool-air production for large-scale real estate developments instead of installing lower efficiency individual units in each building, district cooling provides energy-efficient cooling. The centralised system has lower unit operating costs, thus reducing air-conditioning set-up and energy costs per building. In short, district-cooling generates economies of scale.

The output of one cooling plant is enough to meet the cooling-energy demand of dozens of buildings. District-cooling can be run on electricity or natural gas, and can use regular water, seawater or treated grey water (TSE) innovated by Empower.

EMPOWER
ENERGY SOLUTIONS

"Empower's Command Control Centre in Dubai provides a birds-eye view of all activities in its 62 plants"

EMPOWER LEADS BY EXAMPLE

The UAE is an ideal location to utilise district cooling since it continuously seeks urban-scale solutions for water conservation and energy efficiency. Specifically, the scale of district cooling in Dubai provides valuable best practice insights to help accelerate the pace of industry growth, setting new benchmarks and developing more advanced techniques.

The concept of district cooling was brought to the UAE as the ideal green replacement for traditional cooling methods. For many, it was not obvious in the beginning, but soon Empower succeeded in making it relevant to Dubai's initiatives in sustainability and green economy.

Recently, Empower recorded a milestone achievement in power-saving by using district cooling instead of traditional air-conditioning systems. The saving in terms of power reached 837MW in 2014. This could be equal to eliminating the CO_2 emissions of more than 380,000 cars on UAE roads.

When it comes to water, the other essential element of the district cooling production cycle, Empower has made significant progress in switching to treated water. The company uses the technology of Treated Sewage Effluent (TSE) coupled with reverse osmosis, a water-purification system where applied pressure is used to overcome osmotic pressure and remove many types of molecules and ions from solutions. Empower applied this technology to recycle treated water in line with Dubai Government's long-term strategy, designed to conserve water and reduce fresh water consumption. Recently, the company achieved savings of 194 million imperial gallons of fresh water, enough to fill 354 Olympic-sized swimming pools.

MORE GREEN BENEFITS

The key advantage of district cooling is that it is environmentally friendly. The use of treated wastewater enhances the environmental role of this technology, compared to conventional methods. District cooling is also far more efficient than a conventional system, using half the energy consumed, while at the same time meeting the growing demand for cooling services in Dubai. The company achieved emission reductions of 891,607.5 tons of carbon dioxide (CO_2) in 2014. For 11 years, the company's strategy has proven its effectiveness in reducing electricity use and reducing CO_2 emissions. This says much about the company's approach towards sustainability in its operations.

THIS IS BIG! HOW DO WE MANAGE?

Our services are backed with an 'always-on' culture, meaning our systems are always consistent, safe, secure and reliable. In 2014, Empower began construction of a state-of-the-art Command Control Centre (CCC) in Dubai, UAE – a project that integrates all operations for the company.

With this centre, Empower has a birds-eye view of all activities in 62 plants including operations concerning the efficiency of its cooling towers and consumer consumption patterns. This investment represents a global first: more than one million parameter tags on a virtualised IT platform for the district cooling industry.

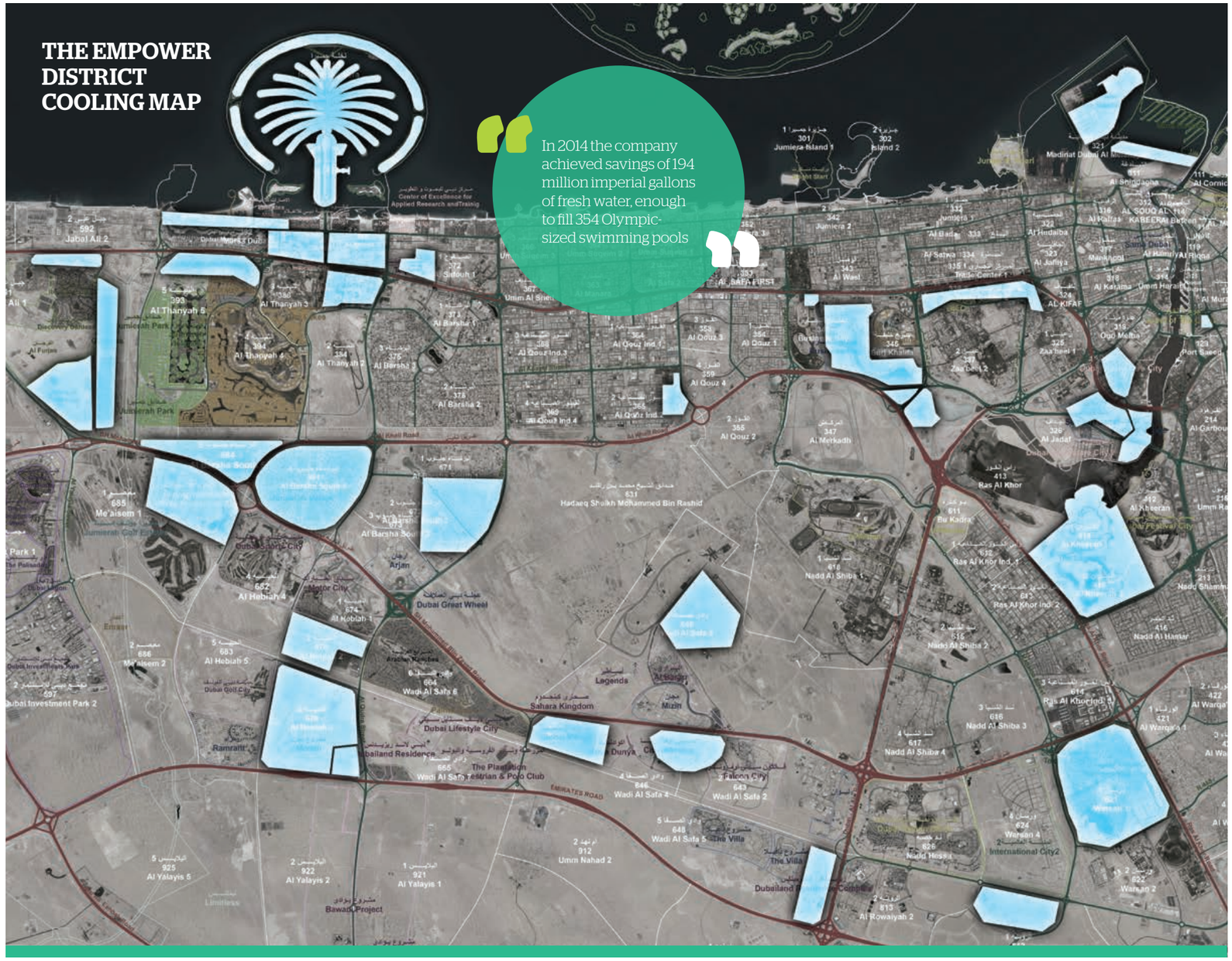
The technology, which is the first of its kind in the world, enables Empower to track operations and use the world-class telecommunications network in the UAE to connect Empower plants with the CCC.

This systems integration plan enhances overall operational efficiency. For example, leveraging the off-peak winter months, Empower has developed systems to ensure a consistent level of service to around 50,000 customers and 781 buildings, no matter what the time of day or temperature range. The company is now able to update operations across its over one Million RT district-cooling network for the period from June to September, when temperatures have normally led to peak demand for such services. *end*

FACT BOX

Since its inception in 2004, Emirates Central Cooling Systems Corporation (EMPOWER) has emerged as the world's largest district-cooling services provider, generating over one million refrigeration tons (RT) of total cooling capacity across the Emirate of Dubai.

The company took on the responsibility of retrofitting Dubai's cooling service, bringing world-class technologies and all within the framework of sustainability. The increasing focus on energy-efficient and environmentally friendly cooling solutions has resulted in widespread adoption and implementation of district cooling services (DCS) in the region, as DCS is the most preferred and eco-efficient alternative compared to the traditional systems of providing air-conditioning. Empower was established to meet this need in Dubai and the region. Empower is determined to satisfy the essential needs of its customers, as well as further develop its own distinctive competencies.


THE EMPOWER DISTRICT COOLING MAP
Jumeirah Park
Al Barsha 1
Al Barsha 2
Al Barsha 3
Al Barsha South
Al Qouz 1
Al Qouz 2
Al Qouz 3
Al Qouz 4
Al Qouz Ind 1
Al Qouz Ind 2
Al Qouz Ind 3
Al Qouz Ind 4
Al Quoz Ind 2
Al Meteedh
Hadaeq Sheikh Mohammed Bin Rashid
Ras Al Khor
Al Khaleej Road
Al Khail Road
Dubai Golf City
Dubai Lifestyle City
Dubai Investment Park 2
Dubai Motor City
Dubai Sports City
Dubai Great Wheel
Arjan
Al Hebiah 4
Al Hebiah 5
Al Hebiah 1
Me'aisem 1
Me'aisem 2
Wadi Al Safa 6
Wadi Al Safa 4
Wadi Al Safa 2
Wadi Al Safa 5
Sahara Kingdom
Legends
Mizhar
Dunya
Falcon City
The Villa
Ramraam
Al Yalayis 1
Al Yalayis 2
Al Yalayis 5
Umm Nahad 2
Bawabat Project
Nadd Al Shiba 1
Nadd Al Shiba 2
Nadd Al Shiba 3
Nadd Al Shiba 4
Nadd Hessa
Al Rowaiyah 2
Warsan 4
Warsan 2
International City2
Al Warqa'a 1
Al Warqa'a
Nadd Al Hamar
Al Khyeran
Al Jadaf
Al Kifaf
Al Karama
Al Hudaiba
Al Safa
Al Wasl
Jumeira 1
Jumeira 2
Jumeira Island 1
Jumeira Island 2
Al Sufouh 1
Jabal Ali 2
Al Thanyah 5
Al Thanyah 4
Al Thanyah 3
Al Thanyah 2
Al Furjan
Discovery Gardens
Emirates Road
Sheikh Zayed Road
Al Khail Road
Al Qudra Road
Al Ittihad Road
Al Maktoum Road
Al Rebat Road
Al Ittihad Road
Al Khaleej Road
Al Qudra

Advertisement

EMPOWER
ENERGY
SOLUTIONS

The World's Largest District Cooling Provider

EMPOWER, Emirates Central Cooling Systems Corporation, is created with the objective of providing world class District Cooling Services to Dubai and the region. Empower is determined to satisfy the critical needs of its customers and in the process develop its own distinctive competencies.

billing@empower.ae | Tel: +971 4 375 5300 | www.empower.ae

VEHICLE EMISSIONS IN A GREEN ECONOMY?

By Dr. Eng. Waddah S. Ghanem Al Hashemi & Eng. P. Radhakrishnan

THE STATUS OF FUEL EFFICIENCY, CARBON AND POLLUTANT EMISSIONS FROM PETROL VEHICLES IN DUBAI

While science marches on to higher levels and new technology seems to appear every day, sadly, we still remain the slaves of one constant in our lives: the combustion engine. Even as we seek to reduce emissions from the essential vehicles of our world, we know that the battle will be long and there is far to go before we reach the goals of a truly green economy.

> None of the manufacturers met this figure – exceeding it by between **30%** and **160%**, and averaging **80%** above the standard

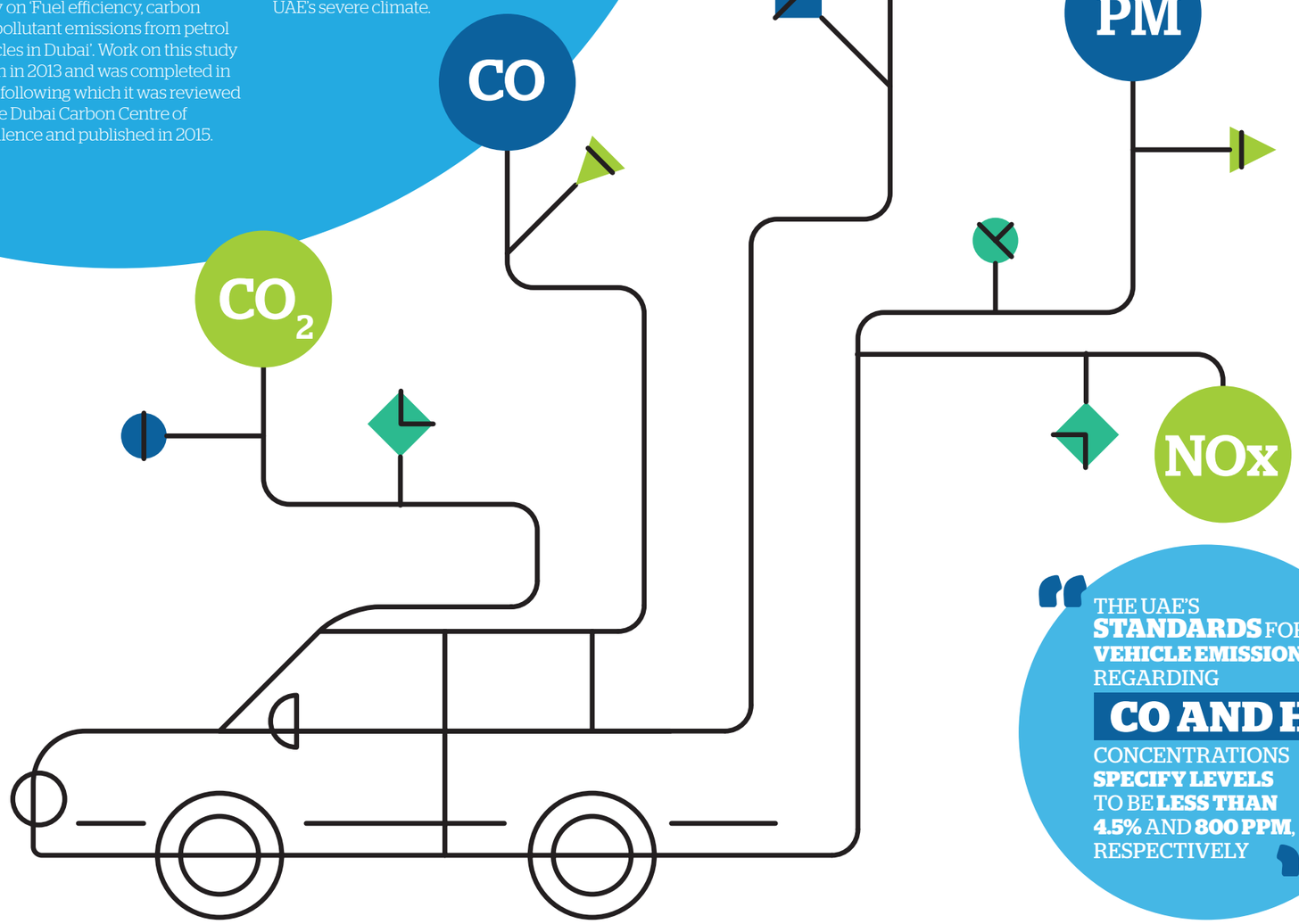
اينوك
ENOC

Carbon dioxide (CO_2) is the only pollutant responsible for global warming. Others are having adverse effects on human health as well as causing serious impacts on the environment, such as acid rain and photochemical smog.

At the Emirates National Oil Company (ENOC), we undertake regular research on these matters and share the results with concerned parties. This is because part of our remit is the safeguarding of the UAE environment and the reduction of worldwide emissions. Some of the studies such as EIA, ESA are conducted for internal stakeholders, other such as exhaust emissions from vehicles for DIA/Dnata and a study on vehicle emissions in Dubai and Sharjah conducted in 2005 and 2008 respectively are intended for external stakeholders. In order to promote the reduction of emissions from vehicles and improve fuel efficiency, we commissioned a new study on 'Fuel efficiency, carbon and pollutant emissions from petrol vehicles in Dubai'. Work on this study began in 2013 and was completed in 2014, following which it was reviewed by the Dubai Carbon Centre of Excellence and published in 2015.

The UAE's standards for vehicle emissions regarding CO and HC concentrations specify levels to be less than 4.5% and 800ppm, respectively – but there are no standards for CO_2, NOx and PM at present. The report looked into EU and US emission levels as benchmarks with which to compare the UAE situation. We found that UAE vehicle emission levels are much higher.

CO_2 emissions from each car manufacturer were compared to a benchmark based on the EU standard. Perhaps unsurprisingly, none of the manufacturers met this figure exceeding it by between 30% and 160% and the average was 80% above the standard. This indicated a fuel efficiency of about half that of the EU. Given the newness of the UAE market and the proportion of larger vehicles (4X4s) and larger engine sizes, this is not unexpected. There is a high prevalence of sports and luxury-car ownership, as well as cars with larger engine sizes, necessary to provide adequate air-conditioning, given the UAE's severe climate.



"THE UAE'S **STANDARDS** FOR **VEHICLE EMISSIONS** REGARDING **CO AND HC** CONCENTRATIONS **SPECIFY LEVELS** TO BE **LESS THAN 4.5%** AND **800 PPM**, RESPECTIVELY"

Moreover, average CO emissions in the report were around 8,000mg/km (four times the benchmark and eight times the EU limit of 1,000mg/km). HC emissions were lower, with more than half the vehicles meeting the US limit of 250mg/km, though not the EU limit of 60mg/km. All Korean and almost all European manufacturers were under the limit. The average emission rate for HC was, however, 30% above the benchmark.

The report's conclusion was that low fuel prices (compared with Europe and the US) and the absence of incentives for fuel-efficient vehicles, hybrids and alternatively fuelled cars, were to blame and that the high emission rates of CO_2, CO and HC are understandable and will continue to rise unless changes are made to vehicle emission standards and how vehicles are tested and priced. As things stand, there is little to encourage manufacturers to sell smaller, more fuel-efficient or fuel-alternative vehicles due to smaller profit margins.

The report recommends that the UAE works towards reductions in vehicle emissions, the conservation of fuel and the reduction of pollution levels as part of a green-economy initiative. This should be achieved through vehicle-emission testing enhancements and should include NOx and PM tests; the introduction of a UAE-wide fuel-efficiency labelling system for vehicles similar to those that exist for electric vehicles; and making available new centralised incentives for efficiency, with price disincentives for their absence – essentially a 'Green Tax'. These taxes could be raised through varying registration fees according to a car's environmental impact, its registration fees, or through parking and toll charges.

Evidently, the UAE still has a long journey before its emission levels come down to European levels. This is a goal ENOC and our partners are working passionately towards. As part of the UAE's desire to see green initiatives develop, we are looking to improve well-being and social equity for all and reduce environmental risks and ecological scarcity. Our goal is for the UAE to be low-carbon, resource efficient and socially inclusive. *end*

About
DR. ENG. WADDAH S. GHANEM AL HASHEMI

He is Executive Director – EHSSQ & Corporate Affairs at ENOC. He has a bachelor's degree in Environmental Engineering, a MSc in Environmental Science from UAE University and an executive MBA and later a DBA from the Bradford School of Management in the UK. He has co-authored three books on organisational management, and holds senior roles in numerous corporate affairs, EHSQ and organisational committees.

About
ENG. P. RADHAKRISHNAN

He is the Chief EHS Compliance Officer (Environment & Energy) at ENOC

He has a BTech and MSc in Chemical Engineering, and has over 30 years' experience in research and development, operations, QHSE and energy, in the manufacturing, chemical, petroleum and power industries.

WAITING FOR GREEN

By
Pradeep Karunakaran

HOW THE REGION IS SET TO **BENEFIT** FROM **NEW ENGINE TECHNOLOGY** CURRENTLY **IN DEVELOPMENT**

At the heart of transportation sustainability is the vital component of engine technology. The region is currently looking towards innovations in the field of vehicle greenhouse-gas emissions (GHG), as the sheer number of vehicles that are used on today's roads is staggering, making the need for action immediate.

With the deregulation of UAE fuel market in August 2015, there is no better opportunity for consumers to reduce fuel consumption in their vehicles. Fortunately, engine innovation is proving a useful ally in assisting this process.

Cummins Inc., an American engine manufacturing company, is one of the many companies working at the forefront of engine design. In 2014, US President Barack Obama called for new fuel-efficiency standards for medium and heavy duty commercial vehicles in front of the Cummins-Peterbilt SuperTruck, powered by an ISX15 that achieved 10.7 miles per gallon under real world driving conditions. Cummins' QSX15 15-litre engine, designed for John Deere Tractors, meets both EPA Tier 4 Final and European Union Stage IV emissions standards. The ISX15 Adept technology has helped create a 3% reduction in fuel-economy for customers.

Diesel engines have an intrinsic advantage over their petrol counterparts, with fuel consumption up to 40% lower. New smart diesel engines are starting to play an increasingly important role in the region's efforts to reach figures that seek to approach the European 2020 target of 95 grammes of CO_2 per kilometre.

Cummins' latest innovation is the powerhouse of the new Nissan Titan XD pick-up truck. An optimised 5.0L V8 turbo-diesel engine with sophisticated turbocharger technology and state-of-the-art filters delivers precise fuel control, effective combustion and fuel efficiency, leading to reduced emissions at both low and high engine speeds, while still meeting international emission regulations.

What is clear is that the industry is attempting to tackle the thorny issue of greenhouse gas emissions (GHG) . Given the region's heavy reliance on the traditional combustion engine, it stands to benefit greatly from these technological changes. *end*

About
PRADEEP KARUNAKARAN

Leader of the Cummins Middle East Power Generation Business Unit, he is responsible for the Genset, G-Drive, and Alternator businesses, along with the Engineering and Segments organizations.

FOREVER GREEN

By
Nabil Battal

DP WORLD'S ENERGY MANAGEMENT INITIATIVE

The drive for a green economy is picking up pace in the Middle East and when major opinion leaders of the region's fastest-growing economies start making strides, you know the concept has arrived.

DP World has launched an energy management programme across its global portfolio of 65 marine terminals to communicate the value of a greener approach to business. The goal is to raise awareness and change behaviour in a family of 36,000 employees and across a global business that impacts millions more through the global supply chain.

The programme kicked off with a 'Transition from CO_2e to Energy' and since 2008, the company has been working towards a 27% reduction target of normalised CO_2e over a five-year period. Some 98% of carbon emissions at terminals are generated from diesel combustion and electricity consumption, so the approach aims to complement energy reduction strategies that cut operational spending and also slash CO_2e levels.

> WHEN MAJOR **OPINION LEADERS** OF THE REGION'S **FASTEST-GROWING ECONOMIES** START MAKING **STRIDES,** YOU KNOW THE CONCEPT **HAS ARRIVED.**

DP World realised the benefits of energy efficiency and management and to keep track, an energy reporting tool was introduced across business units. It measures diesel and electricity consumption levels and also allows for comparisons between terminals and their individual environmental impact.

It resolves a dilemma head-on - using the same energy-reduction elements allows a big multinational like DP World to side-step complications of variances in the regulatory frameworks between countries in which it operates. There is now one consistent approach that provides a clear picture of its global carbon footprint.

An added bonus was the normalisation of all emission reporting against total modified TEU volume. However, this resulted in a very broad account of energy use at terminals rather than identifying where and how waste occurs, so that priorities can be set.

The Global Safety and Environment department soon realised that if energy consumption was compared against total terminal moves (TTM) instead, then a clearer picture would be available. The findings were detailed further by including another value in the mix by comparing those terminals that have the same mode of operation.

Additionally, an energy assessment programme was launched with desktop and on-site energy assessments of all business units. On-site assessments focus on the inspection and analysis of energy flows, while looking for improvements to reduce energy use without impacting productivity.

> Social capital is a measure of the quality of **interpersonal relations,** involving trust, honesty, and mutual support

ENERGY EXPERTS

The project is led by a dedicated energy management team and supported by highly-skilled environmental and operational specialists. The initial phase saw business units across the network commit to sharing best-practice initiatives in order to obtain savings. In 2014, two thirds of business units were given targeted energy reduction plans.

To compare energy-saving programmes, an opportunity evaluation matrix was also initiated, where each opportunity to save energy is scored according to savings that can be realised. Metrics include potential savings, cost, simple payback, the estimated time to implement and the level of project management required to deliver the opportunity. The five scores are added to provide a total value, which is then plugged into the matrix, grading each opportunity as to its viability.

ENERGY SAVING OPPORTUNITY EVALUATION MATRIX

Immediate:
department level signoff, typically smaller savings at little or no cost

Prioritise:
terminal level sign-off, typically good savings with favourable returns on investment (ROIs)

Plan and Budget:
a good project with acceptable return on investment that requires a level of planning and budgeting and should be scheduled for completion in the medium term

Monitor:
a project that has potential if certain variables change; this could be an increase in volumes or reduction in costs as technology develops

Not Viable:
a project that is unsuitable for a specific terminal due to a multitude of constraints

1	3	6	10	15
2	5	9	14	19
4	8	13	18	22
7	12	17	21	24
11	16	20	23	25

> ENERGY MANAGEMENT RESULTED IN **FURTHER REDUCTION** OF OUR **CO_2e INTENSITY TARGET** **BY 3% IN 2014**

ENERGY EFFICIENCY AND RENEWABLE ENERGY

Throughout 2014, we made substantial progress in developing state-of-the-art equipment and upgrading terminals across our global portfolio with unique technology.

In Australia, we established the country's most advanced semi-automated terminal at the Port of Brisbane, improving safety and productivity while reducing energy use. In the UK, we launched new berths at DP World London Gateway and Southampton, designed to handle the world's largest and deepest vessels more quickly and efficiently than ever seen before. Meanwhile, Terminal 3 in Jebel Ali will be amongst the world's largest semi-automated terminals, with 19 of the largest and most energy-efficient quay cranes operated remotely from a sophisticated control room.

In 2014, we also conducted six feasibility studies into alternative energy options, exploring the potential use of alternative fuels across our operational fleet. In Pusan, South Korea, we conducted a trial of converting an existing diesel-yard tractor to LNG (Liquefied Natural Gas) which resulted in significant savings and a cut in CO_2e emission. Following this success, the Pusan terminal will install an LNG fuel station and also plans to convert the 35-yard-tractor diesel fleet to LNG by the end of the year.

All these processes have enabled DP World to better communicate the value of sustainable growth to its family of 36,000 employees. Our focus on energy management and the drive to cut energy use has resulted in further reduction of our CO_2e intensity target by 3% in 2014 (against a base year of 2013). This is the result of measures that can be applied across geographical and cultural boundaries – instilling a culture of sustainability across borders. *end*

About
NABIL BATTAL

He is the Director of Global Safety and Environment at DP World.

He has multi-sector experience in implementing safety and environment policies that attempt to standardise a culture of continuous improvement. His key skills are the design and implementation of corporate strategy, supported by behavioural leadership programmes and governance systems.

SPOTLIGHT ON INNOVATION

THE FULL TREATMENT
A NEW SUSTAINABLE APPROACH TO WASTEWATER MANAGEMENT

Traditional methods of water reclamation from waste has always consumed energy voraciously. The UAE requires comparatively large amounts of water every day – 550 litres a day, compared to the global average of 250. And, these figures are expected to double by 2030. Before the UAE pledged to reduce its water use by 20% by 2030 in April 2015.

'Khansaheb Bioneist' is the new name inan example for wastewater treatment and management that is able to produce high-quality, crystal-clear, and reusable water at source. The technology has been awarded at the 2015 Emirates Green Building Council (EGBC) Awards.

Today, even with oil prices at record lows, there is the vital matter of the UAE's carbon footprint, and the need to cut back on fossil fuel use to lower emissions. The Khansaheb Bionist system is a boon to the country in that it uses low power and minimal equipment, resulting in low energy consumption and very little maintenance. The Bioneist also does not need the use of In hazardous chemicals to be used – with, in fact, chlorine tablets for final disinfection, the only chemical used across the whole process.

Thanks to the quality of water that can be used for drinking, it reduces the strain on aquifers, and pressure on sewage networks by treating sewage at source. This system has been developed to be flexible, and so can be employed in diverse locations like labour camps, and hotels, as well as on construction sites.

Find out more from EGBC:
http://emiratesgbc.org/awards/2015-awards-home-page/

GREEN BUSINESS NETWORKS AND THE PAPERLESS ERA

By
Jonas Edlund

PAPER CONSUMPTION IS COMING UNDER SCRUTINY AS NEW EFFICIENT TECHNOLOGIES EMERGE

GREEN BUSINESS TRANSACTIONS

While green initiatives are gaining momentum in the UAE, many require long timeframes and large investments. One initiative that can quickly benefit the environment and deliver positive operational results has not yet been fully utilised, yet is accessible by organisations of any size. This is the avoidance of all paper in business-to-business (B2B) transactions.

In the average sales and purchase transaction, several documents are passed between customer and vendor. Each may have multiple pages and be printed several times. Quickly, one transaction can consume a large quantity of paper. Multiply this by hundreds of transactions and thousands of businesses and you have an idea of the opportunity for green savings.

For example, as of May 2015, 85% of the Dubai Electricity and Water Authority's customers have unsubscribed from monthly paper bills, opting instead for a paperless email equivalent. This move alone has helped DEWA reduce their carbon footprint by over 330 tonnes and attain significant savings in paper, printing and postage costs.

Can the same be achieved from making business-to-business transactions electronic? The answer is a resounding YES!

PAGERO
your financial supply chain network

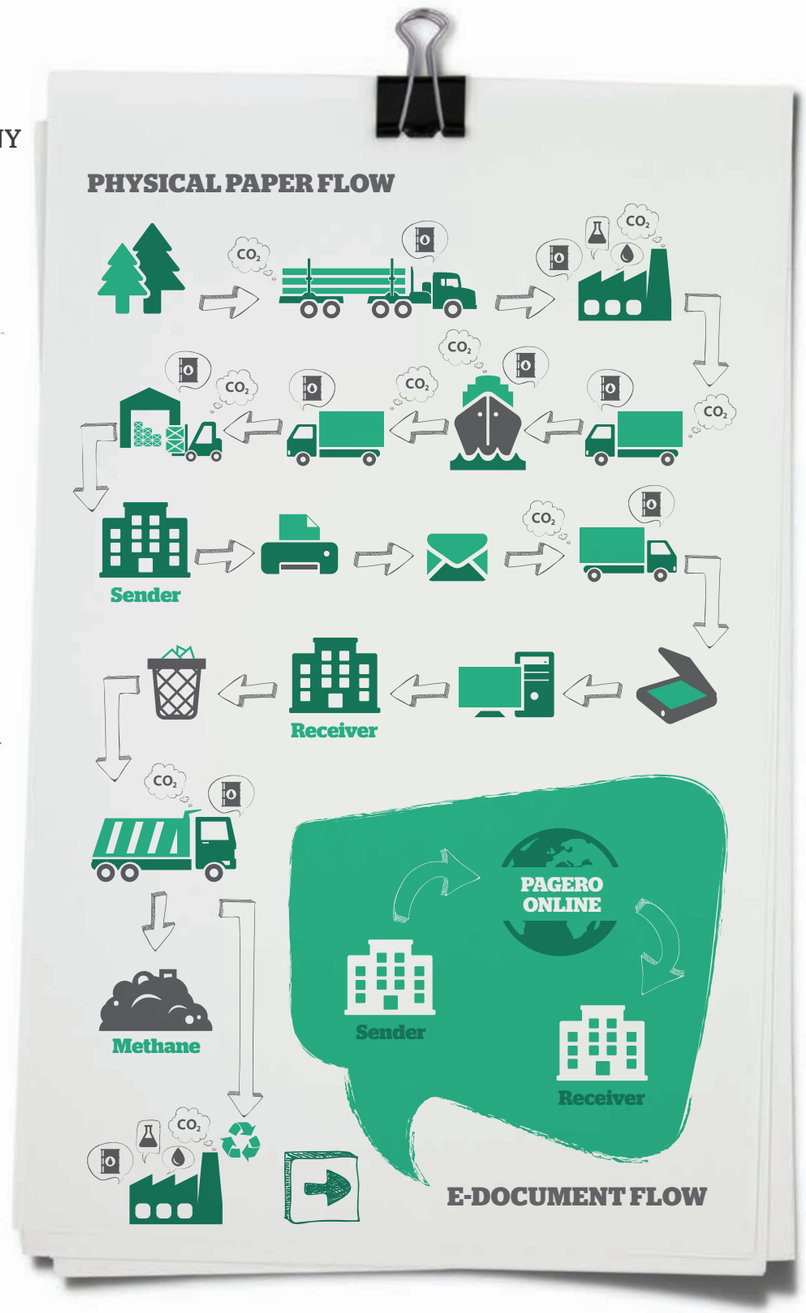


Figure 1: paper flows versus electronic flows

E-TRANSACTION NETWORKS

Pagero, a Scandinavian company, has connected over 15,000 customers across 50 countries to its online network and is able to reach over 750,000 organisations through its extended partner network. Pagero's clients range from the largest global companies, such as Hewlett-Packard, to individual traders. Pagero is also active in the Middle East and has established a partnership with Dubai Carbon to share its expertise and support a wider knowledge-exchange programme.

Organisations may connect to the Pagero online network by using one of a variety of simple methods, with different levels of automation, depending on the nature and volume of transactions. Most connections can be completed in a matter of hours. Once connected the organisation can conduct transactions with everyone within the network.

BUSINESS BENEFITS OF E-TRANSACTION

It's not often that the 'greening' of a business can also deliver many operational and economic benefits. In this case, the use of a 'touchless' electronic transaction process delivers efficiencies in many areas, including:

- Labour
- Transactions
- Consumables
- Transportation
- Cash cycles
- Storage space

PAGERO SERVING HEWLETT-PACKARD ACROSS EMEA

Hewlett-Packard is an example of a leading organisation for whom Pagero has improved sustainability and efficiency by eliminating paper from transactions with their partners. HP relies on Pagero to send e-documents across 23 EMEA countries. Implementing Pagero's services has, for HP, contributed to extensive time-savings, a strong increase in cash flow and has helped them gain a much higher degree of flexibility in a diverse market.

In addition, successful results for HP have included:

- Increased control over, and security of, all outbound invoices
- All legal requirements fulfilled in every country
- A strong and positive increase in cash cycle
- A strengthening of HP's offerings to the market

FACT BOX

Did you know?

According to the Indonesian Pulp and Paper Association, the per capita annual consumption of paper in the UAE is 200kg, against the global average consumption of 60kg in 2011. The WWF estimates that worldwide 40% of the annual industrial wood harvest is processed to make paper and paperboard. A significant contributor is the sheer volume of A4 and letter-size paper still used in business correspondence, such as orders and invoices. While paper recycling is growing, eliminating the need for paper in the first place is clearly a superior solution. Innovative technologies that enable secure and efficient electronic transactions are now available to organisations of all sizes.

> "The environmental aspect of e-invoicing is extremely important to HP and we have devoted our organisation to reducing our environmental impact in any way we can. With Pagero the invoice turnaround has been reduced. We know if an invoice has been successfully submitted or rejected. In the paper world, this process would take seven days or more, in comparison."
>
> **Thomas Bonwetsch,**
> Program Manager, EMEA e-Invoicing
> Program Direct Accounts, HP

ELECTRONIC TRANSACTION LEGISLATION

In many global markets, electronic transactions are defined by government legislation. The level of legislation varies, from the simple mandate that government organisations themselves support electronic trade, through to laws that all transactions over a certain value or within certain industries must be transacted electronically. Interestingly, developing countries such as those in Latin America are among the nations that have the highest level of adoption. This is heavily influenced by the more stringent legislation in those markets. Among world leaders are Brazil, Chile and Mexico, which have similar adoption levels to Nordic countries who have been pioneers of the technology.

FACT BOX

Do you want to take part in reducing paper consumption? Receive your DEWA utility bills paperless via email and portal via the "Green Bill". Find out more on: http://www.dewa.gov.ae/consumers/customerguide/greenbill.aspx

> In many global markets, electronic transactions are defined by **government legislation**

SUPPORTING DUBAI'S SUSTAINABLE DEVELOPMENT INITIATIVE

In 2012, H.H. Sheikh Mohammed bin Rashid Al Maktoum, Vice-President and Prime Minister of the UAE and Ruler of Dubai, launched the Green Economy for Sustainable Development initiative. The fifth track of the initiative is the "green life track", which involves a set of policies and programmes aimed at rationalising the use of natural resources as well as projects to recycle waste generated from commercial or individual use. It also includes awareness-raising initiatives and environmental education. The avoidance of paper-use sits squarely within this track and over the coming years business in the UAE is likely to see continued steps, whether by initiative or legislation, to encourage businesses and governmental departments to eradicate paper from as many processes as possible. The Dubai Plan 2021 also emphasises the need to reduce both CO2 consumption and solid waste levels. *end*

> Pagero has connected over 15,000 customers across 50 countries to its online network and is able to reach over 750,000 organisations through its extended partner network

FACT BOX

The average office worker is said to consume 10,000 sheets of A4/letter-size paper annually (20 reams or four boxes). Producing this paper and transporting it to the end customer consumes roughly one tree, 1,200 litres of water, consumes energy, and generates over 60kgs of CO_2.

About JONAS EDLUND

He is the Co-founder and Chief Marketing Officer (CMO) of Pagero Group. His previous positions have included being Senior Advisor at IFS Group, a leading global ERP vendor and CEO of IT companies Diamo AB and Vendimo AB. He has a master's degree in Computer Science and Engineering from Chalmers University of Technology (CTH) in Gothenburg, Sweden.

CREATIVE ACTIVE URBAN SPACE

By Eng. Dawoud AbdelRahman Al Hajri

TOWARDS A PEDESTRIAN-CENTRED URBAN LANDSCAPE

In recent years, Dubai has rapidly transformed itself from a regional centre into a global hub. The city is creating some of the most ambitious development projects in the world and, as part of this ongoing development, Dubai Municipality has shifted its strategic focus towards people-friendly places and the development of public-transport infrastructure.

Until recently, the car was king in Dubai, but with the introduction of the Dubai Metro in 2009 and the Dubai Tram in 2014, public transport is playing an increasingly significant role in how both residents and visitors navigate the city. With growing numbers of pedestrians and public-transport commuters, the demand for urban space is on the rise.

In years past, the climate has been a decisive factor in the design and use of urban spaces – there is no denying that from June to September, outside temperatures in the UAE are extreme, but for the remainder of the year, the climate is conducive to outdoor activity. This, along with the ongoing development of the public-transport system, has led to changes in the way urban spaces are being both designed and utilised.

بلدية دبي
DUBAI MUNICIPALITY

> The multitude of sustainability outcomes anticipated from this initiative include increasing transit share of trips from **10%-25% BY 2030**

Recognising this, Dubai Municipality is focusing on Transit-Oriented Development (TOD) as an indispensable planning tool for achieving urban sustainability, adopting a strategic initiative to develop areas within walking distance – 400 metres – of Dubai Metro stations. The concept of TOD is based around a type of community development that includes a mixture of housing, office, retail and other amenities integrated into a walkable neighbourhood, designed to maximise access to quality public transportation. To this end, over 700 hectares of vacant land has been dedicated for development as pedestrian-friendly and mixed-used communities. A TOD zoning ordinance is currently under study to induce retrofitting existing communities according to TOD principles. The various sustainability outcomes anticipated from this initiative include increasing the transit share of trips from 10% to 25% by 2030, reducing car dependency and pollution and increasing affordable housing opportunities.

In addition to the development of these communities, solar-powered cooled walkways, dubbed ECO-WALK are in development. This unique design concept of shaded and climatically controlled sidewalks aims to promote walkability during the hot summer season. In this system, the ECO-WALK prototype shading unit (3 X 20 metres in length) is integrated with a misting system to secure a cooler microclimate, 5 to 10 degrees Celsius lower than the ambient temperature level.

Pedestrian amenities such as drinking fountains, ATMs and vending machines are accommodated to make the pedestrian journey more comfortable. The unit is fully powered by solar photovoltaic panels fixed on top. Dubai Municipality won one of the 2011 Arab Achievement Awards organised by I Global for the environmentally friendly pedestrian corridors design project.

These projects are part of Dubai Municipality's initiatives to promote sustainable development using alternative and clean energy and also promote sustainable transport by facilitating pedestrian movement to Dubai Metro stations through pedestrian-friendly zones close to the metro system and via the ECO-WALK corridors. *end*

About
ENG. DAWOUD ABDELRAHMAN AL HAJRI

Dawoud Al Hajri, CEO of the Planning Department at Dubai Municipality, is specialized in the field of urban planning and development including major urban projects. His career began in 1993 as a town planner in the Planning Department, few years later he has been assigned as a Head of the Planning Execution Section. In 2014, as a result of the extensive experience in urban planning and city development he holds, he was promoted to be the CEO of the Planning Department.

GREEN SOUKS AND EVEN GREENER PARKS

By Mohamed Noor Mashroum

THE MAKEOVER OF AL KHAZZAN PARK AND AL FAHIDI SOUK

About
MOHAMED NOOR MASHROUM

He is the Head of General Projects Department, Dubai Municipality, he is also a member of the Municipality's Technical Committee. Through his work as Head of general projects since 2008, Mohamed oversaw, designed, and executed more than 170 projects, including Birwaz Dubai, Dubai Safari, and Hamdan bin Mohamed Sports Complex Centre, as well as Al Fahidi Market (Souk Al Fahidi), the birds and pets market and a number of public parks.

Al Khazzan Park has undergone a facelift, with the park now entirely powered by solar energy systems. Located just before City Walk shopping centre, between the first interchange on Sheikh Zayed Road and Al Wasl Road, the family park aims to promote green city planning and urban development. The entire park uses sustainable natural and artistic elements that echo Dubai's approach to preserving nature. Brand Dubai, a subsidiary of the Government of Dubai's Media Office, in collaboration with Dubai Municipality, gave the park a makeover as part of the "Dubai Speaks to you" initiative that aims to highlight the unique characteristics of Dubai as a culturally diverse city. By converting to LED lighting, the park has reduced its annual energy consumption by 50% and the implementation of an off-grid solar PV system has resulted in annual savings of 43,100 kg of CO_2, the equivalent of 1,960 trees.[1]

At the same time, Al Fahidi Souk has achieved full compliance with green building regulations in preparation for its grand opening. The souk, located at Al-Souk Al-Kabeer area in Bur Dubai, hosts 230 commercial shops, 32 outdoor and indoor kiosks, 15 cafeterias, a hotel, and a hypermarket, in addition to children's play areas and prayer rooms. Its energy-saving systems, natural lighting arrangements, eco-friendly building materials and insulation methods make it an exemplary green development. Some of the techniques used to reduce energy and water consumption include a solar water-heating system and skylights, which allow natural daylight to penetrate the structure. These are projected to result in 45% energy savings and 20% water savings compared to conventional systems. In addition, pale colours on the structure's exterior decrease heat absorption, thereby reducing cooling demand, and native species of flora have been used in landscaping. *end*

بلدية دبي
DUBAI MUNICIPALITY

1 http://www.ncsu.edu/project/treesofstrength/treefact.htm

THE CUSTOMER IN FOCUS

By Eng. Amal Yahya Koshak

DEWA'S CONSUMER CAMPAIGNS HELP CONSERVE POWER AND WATER

Dubai Electricity and Water Authority (DEWA) organises consumer-focused awareness initiatives and conservation programmes to achieve the vision of H.H. Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai, to establish the Emirate as a global hub for sustainability, to support the goals of the Dubai Plan 2021 and achieve the Dubai Integrated Energy Strategy 2030 to reduce energy demand by 30% by 2030.

About
ENG. AMAL YAHYA KOSHAK

She is the Senior Manager of Marketing Communications at DEWA. As a Senior Manager, Ms. Koshak is heading the Marketing Communication Department of DEWA with her responsibilities closely related to drive DEWA's vision as a world-class sustainable utility. Her contributions to the society is noteworthy and diverse, where she facilitated the reduction of millions of KWh of electricity and millions of Imperial Gallons of water providing reduced levels of carbon emissions.

At DEWA, we adopt the best international practices in energy and water conservation, which are based on extensive studies as well as plans that have proven effective in various countries. This not only reflects our corporate social responsibility but also our commitment to our future generations by optimising the use of natural resources and conserving the environment.

The first step in achieving and promoting rational consumption of natural resources is to raise awareness in the community. It is vital to provide people with all the information they need on how to conserve energy and water.

Over the past few years, we have organised several conservation campaigns and programmes covering the public and private sectors and the community, highlighting the importance of the rational use of water and energy.

DEWA's conservation messages were well-received by consumers and has helped encourage society to use natural resources responsibly and sustainably. These messages highlight simple practices that individuals can adopt in their daily lives to reduce electricity and water use and save these precious resources, from tips on washing cars, watering gardens, taking showers, switching to energy-efficient light bulbs and promoting eco-friendly home appliances. All in all, the comprehensive approach to conservation has led to tangible savings.

Between 2009 and 2014, DEWA's campaigns helped save over 1,163 GWh of electricity, over 5.4 billion imperial gallons of water and avoided the emission of 536,000 tonnes of carbon dioxide. This helped achieve a saving of about AED 752 million.

These promising results inspire us and strengthen our resolve to continue launching innovative customer campaigns and adopt global best practices in energy and water conservation to ensure a sustainable future for generations to come. *end*

THE UAE ENERGY-EFFICIENCY MARKET

By Hercu Viljoen

A PARADOX OF POTENTIAL

Ask your CFO if 25% ROI is a good idea for your company? This return could be available in your existing building and you could comply with the request from H.H. Sheikh Hamdan Bin Mohammed Al Maktoum, Crown Prince of Dubai, and chairman of the Dubai Executive Council and you can make a big difference to be environmentally sustainable.

Energy costs are increasing. Energy efficiency is one of the most attractive investments a company can make nowadays. It will lower operating expenses, improve environmental impact and gain positive engagement with stakeholders. Did you know? Data from over 70 Energy audits conducted by Smart4Power indicate that companies in Dubai can save an average of 25% of their utility bills with an investment that can be paid back in just 22 months. Financing is becoming less of a burden as ESCOs are offering to take the upfront investment onto their own balance sheets. There has never been more of a business case to go green.

Despite the advantages, the value of energy efficiency is often lost within companies' organizational hierarchies. Here are the main reasons why companies often do not fully understand the benefits:

- Companies often underestimate the scale and practicality of the energy efficiency business opportunity. Just a few energy audits of their business, will highlight the potential savings
- Facilities engineers tend to resist implementing energy efficiency improvements. Facilities engineers often greet the idea of energy-efficiency with scepticism. They can feel threatened when energy management consultants offer ways to cost-effectively reduce energy consumption because it may supplant their own job responsibilities. In addition, unfamiliar new strategies and solutions can be mistakenly perceived as risky and as an unwelcome source of additional work
- There is a wide lack of knowledge on the guaranteed return that energy efficiency brings. It is a reliable and safe investment, which has been demonstrated across many global markets
- Implementing energy efficiency makes sense. When paired with ESCO energy savings performance contracting tools. It allows companies to guarantee savings or offset the burden of associated capital expenditure (CAPEX)

Part of the solution is for companies to rethink their approach to energy savings:

- Clearly define energy savings as a priority by writing it into company policy and corporate mandates
- Recruit or cultivate sustainability champions
- Set up an energy management steering committee to facilitate effective communication between executive management, finance, facilities engineering and external consultants

The market potential for energy-efficiency solutions is enormous. As Dubai focuses on the Dubai Integrated Energy Strategy 2030, service providers and companies will soon overcome these hurdles and tap into the full market potential that the green economy can offer.

'ALEC decided to make this easier for companies by offering an integrated one-stop solution. We can audit your building, make the energy saving suggestions and implement the proposed measures. We can design and install solar on your roof or carports and continue to monitor the efficiency of the system through our control room. *end*

"Companies often **underestimate** the scale of ROI that being energy efficient can bring to a business"

"Part of the solution is for **companies** to **rethink** their approach to **energy savings**"

FACT BOX

ALEC is one of the largest, most awarded contractors in the GCC. It has evolved, from its inception in 1999, to establishing a project portfolio consisting of high-end complex construction projects, predominately in airports, retail and themed hospitality and commercial sectors. With over 10,000 staff, it has expanded to operate multiple related businesses which have a significant focus on reducing energy consumption and renewable energy alternatives.

ALEC ENERGY - ALEC ENERGY is a provider of financially sound green energy solutions which provides an efficient turnkey solar solution for commercial and industrial rooftops.

ALEMCO - ALEMCO is a provider of fully engineered electromechanical and building service solutions to construction projects. It provides clients with turnkey electromechanical construction services and planning, which helps to reduce operational costs and prolong plant life. This is achieved through a mixture of energy audits and advanced energy-saving methods.

S4P - Smart4Power is an engineering and Project Finance (ESCO) company that provides specialised energy-efficiency solutions for existing buildings. Its services include Energy audits and consultancy, energy savings implementation and ESCO.

About HERCU VILJOEN

He is the Managing Director ALEC Related Businesses. He holds a BSc in Civil Engineering. He joined ALEC in July 2006, and has over 20 years experience in a diverse range of construction projects in varied geographical regions. He oversees the ALEMCO, Fit-out, Precast, Smart4Power and ALEC Energy business units. Hercu likes to develop mutually rewarding relationships and long-term strategic business growth.

FLY MORE, BURN LESS

By Michael Gill

THE INTERNATIONAL AVIATION INDUSTRY STEPS UP ITS GAME TO MAKE AIR TRANSPORTATION MORE ENVIRONMENTALLY FRIENDLY FOR ITS CONSUMERS

International civil aviation has become an essential feature of the modern world. Every year, over 25,000 aircraft fly across 50,000 routes, bringing invaluable economic and social benefits to people and businesses all over the world. We estimate that global aviation supports over 58 million jobs and USD 2.4 trillion in global economic activity[1]. Aviation connects people like no other form of transport can.

> We are in the middle of a wave of new technologies with all the major players bringing efficient new aircraft to market

> The global civil-aviation sector is responsible for producing around **700 million tonnes of CO_2** or 2% of global emissions, every year

While the many benefits of aviation are clear, we also recognise and take responsibility for the environmental impact of air travel. The global civil-aviation sector is responsible for producing around 700 million tonnes of CO_2, or 2% of global emissions, every year. However, the global aviation industry is well aware of its environmental responsibilities and is determined to reduce emissions through a wide range of robust policies.

Six years ago, the Air Transport Action Group (ATAG), a pan-aviation industry group campaigning on economic and environmental sustainability issues) convened industry leaders representing airlines, airports, air-navigation service providers and aerospace manufacturers, and presented a shared strategic vision for aviation's response to the climate challenge, centred around three ambitious goals:

1. an average annual 1.5% improvement in the fuel efficiency of the world fleet (a goal which the industry is currently meeting with around 2.9% annual fuel efficiency improvement)
2. stabilising net aviation CO_2 emissions at 2020 levels through carbon-neutral growth
3. halving aviation's net CO_2 emissions by 2050 (when compared with a 2005 baseline)

The industry has been approaching the challenge of meeting those goals through a four-pillar strategy.

The first pillar is the development and operation of new technology, such as lightweight composite materials and more fuel-efficient engines. We are in the middle of a wave of new technologies with all the major players bringing efficient new aircraft to market. With each new model of aircraft being around 12-25% more efficient than the one it replaces, the current wave of new-generation aircraft – 8,000 new planes have entered the fleet since 2009 – has helped meet the efficiency goal. It is worthwhile noting that the International Civil Aviation Organization (ICAO) is also working right now on a CO_2 Certification Standard for new aircraft types that will require manufacturers to meet emissions standards. That is a significant process that the industry is fully supporting.

Also included in the first pillar is the development of sustainable alternative fuel, which could decrease the carbon intensity of jet fuel by up to 80%. Sustainable alternative fuels have, in a very short period of time, moved on from being a theoretical possibility to a real, tangible solution to aircraft emissions. This year is actually a very important one in this area as we will see regular alternative fuel flights taking place from Los Angeles and Oslo Airports, with others to follow. With over 1,700 commercial alternative fuel flights already having flown, sustainable alternative fuel2 works from a technical standpoint. But we need to achieve commercial viability and for that we have to be able to rely on a favourable regulatory environment and policy support to ensure that aviation is not disadvantaged when compared with other transport modes.

The second of the four pillars is related to improved airline operations, ensuring that all possible efficiency measures are undertaken. For example, reducing the weight of cabin equipment, seats and the amount of water carried on board can substantially cut fuel (and CO_2) burn. The adoption of new landing procedures, such as continuous (rather than staggered) descents has a significant impact. Also, recently entering development are sustainable taxiing systems such as the 'EGTS' and 'Taxibots' which use electricity to move the aircraft from the terminal to the runway, thereby limiting the use of jet fuel.

The third pillar focuses on infrastructure, driving air navigation authorities and airports to improve airspace design and operations and achieve optimal efficiency. Much is already being done in this area by industry partners, but to really optimise the possibilities we need to make air traffic management improvements a priority in all parts of the world. Air traffic congestion is no longer just an issue in Europe and North America, but also in the Middle East and parts of Asia.

ATAG plays a central role in representing the industry at ICAO, to secure an agreement on a global market-based measure (MBM) for aviation emissions. This is the fourth pillar of our strategy; necessary, because despite the progress in other areas, we cannot achieve carbon-neutral growth without a measure such as a global-offsetting scheme. Like the global negotiations on climate change taking place in Paris at the end of this year, the discussions around a global MBM for aviation need to reconcile the desire of parts of the world to develop their aviation sector as a means of economic and social growth, whilst balancing important climate-change objectives.

The political process at ICAO has shown encouraging momentum and industry is confident that a comprehensive agreement on an MBM will play an important role in the sustainable development of aviation. It is vital that this agreement is global in nature and preserves fair competition across the industry.

For an MBM to be possible, it requires the agreement of all 191 ICAO member states, some of which are not regularly involved in the two ICAO sub-groups that deal with the technical and political aspects of its development. So, in April of this year, ICAO, with support from industry, took to the road to raise awareness of the MBM process. To ensure that all states are well-informed on this issue, ICAO held five 'Global Aviation Dialogues' in Lima, Nairobi, Cairo, Singapore and Madrid, respectively. These dialogues proved extremely useful as a means of sharing information and prompted many productive discussions, paving the way for a consensus-driven agreement in 2016.

The commitment of the global aviation industry to reducing emissions is not in doubt. I am confident that we will be able to reduce aviation's climate impact, whilst retaining the invaluable benefits air travel brings for all. *end*

About
MICHAEL GILL

He is the Director of Aviation Environment, International Air Transport Association (IATA). He is also the Executive Director of the Air Transport Action Group (ATAG) the only global association that represents all sectors of the air transport industry.

FOOTNOTES

1 IATA Annual Review 2014
http://www.flygreenfund.se/wp-content/uploads/2015/05/iata-annual-review-2014-en.pdf

2 Sustainable Alternative Fuel:
http://aviationbenefits.org/environmental-efficiency/sustainable-fuels/

STRATEGY PILLARS FOR AVIATION SUSTAINBILITY

1 THE DEVELOPMENT OF SUSTAINABLE ALTERNATIVE FUEL.

2 IMPROVED AIRLINE OPERATIONS TO ENSURE THAT ALL POSSIBLE EFFICIENCY MEASURES ARE UNDERTAKEN.

3 DRIVING AIR NAVIGATION AUTHORITIES AND AIRPORTS TO IMPROVE AIRSPACE DESIGN AND OPERATIONS AND ACHIEVE OPTIMAL EFFICIENCY.

4 SECURE AN AGREEMENT ON A GLOBAL MARKET-BASED MEASURE (MBM) FOR AVIATION EMISSIONS.

ACKNOWLEDGEMENTS

MEET THE PEOPLE THAT BROUGHT THIS REPORT TO LIFE

H.E. SAEED AL TAYER,
Chairman of the World Green Economy Summit, Vice Chairman of the Dubai Supreme Council, MD & CEO of the Dubai Electricity and Water Authority (DEWA)

ENG. WALEED SALMAN,
Secretary General and Vice-Chairman of the World Green Economy Summit, Chairman of Dubai Carbon, Executive Vice President Strategy and Business Development of the Dubai Electricity and Water Authority

UNDP COUNTRY OFFICE: **FRODE MAURING, MANAR YAZBECK**
UNDP TECHNICAL EDITOR: **FRANK PINTO**

As well as the International Air Transport Association (IATA), the International Bank for Reconstruction and Development (IBRD), the International Renewable Energy Agency (IRENA), the United Nations Development Programme (UNDP), the United Nations Environment Programme (UNEP), The United Nations Industrial Development Organization (UNIDO), the United Nations Office for South-South Cooperation (UNOSSC), and the United Nations Sustainable Development Solutions Network (UNSDSN).

OUR PARTNERS FROM THE WORLD GREEN ECONOMY SUMMIT TEAM

Julia Leny, Sophie Hansen, Jens Nielsen, Andre Schneider

OUR EDITORS

Editor in Chief: Michaela Neukirch

Second Editor: Mohamed Elimam

Head Technical Editor: Thomas Bosse

Contributing Editors: Nigel Holt, Sultan Mollov, Praseeda Nair, Suraiya Tasnim, Vesela Toderova, Giselle Whiteaker

Quality Assurance: Frank Pinto

Technical Sub-editors: Fazil Abdul Rahiman, Shahda Al Taie, Moamen Younis

Proofreading: Nigel Holt, Giselle Whiteaker

Printing: International Printing Press

OUR PRODUCTION

Creative Director: Josiane Sadaka, The Brand District

Design: Hratch Derhagopian

Artwork: Hratch Derhagopian, Assia Merazi

OUR SPECIAL THANKS TO

Khawla Al Mehairi, Mohammad Sultan Bindemaithan, Saoud Aziz A. Ghalib, Ribal Dayekh, Jonathan Paul Howell Jones, Julia Leny, Omar Ahmed Al Qurashi, Moamen Mowafak M.A. Younis and Mira Al Falas for her support.

NOTE: We listed in alphabetical order.

Disclaimer:

United Nations Development Programme. The analysis and policy recommendations o this Report do not necessarily reflect the views of the United Nations Development Programme, its Executive Board or its Member States. The Report is produced in cooperation with the United Nations Development Programme (UNDP) Country Office UAE.

COMPANY PROFILES

DUBAI ELECTRICITY AND WATER AUTHORITY

A CONTINUOUS SUCCESS STORY

Dubai Electricity and Water Authority (DEWA) was formed on 1 January, 1992, following a decree issued by the late Sheikh Maktoum bin Rashid Al Maktoum to merge Dubai Electricity Company and Dubai Water Department, which had been operating independently until then.

Both these organisations were established by the late Sheikh Rashid bin Saeed Al Maktoum in 1959 to provide Dubai's citizens and residents with continuous and reliable supplies of electricity and water.

As of 30 June 30, 2015, this has grown to 692,255 electricity customers of DEWA. Based on its considerable achievements, it is one of the best utilities in the world.

DEWA's achievements include the Mohammed bin Rashid Al Maktoum Solar Park, which it is currently expanding. It is one of the largest strategic renewable-energy projects in the world based on the independent power producer (IPP) model, with a planned total capacity of 1,000MW by 2019 and 3,000MW by 2030. It was launched in 2012 and the 13MW first phase became operational on 22 October 2013. The IPP-based 200MW second phase will be operational by 2017. The Solar Park includes a Research and Development Centre (R&D), a solar-testing facility, an innovation centre, a university and a training centre. DEWA has increased the share of renewable energy in Dubai's energy mix to 7% by 2020 and 15% by 2030.

DEWA has awarded a contract to expand its M-Station power production and desalination plant. The expansion project will add 700MW to the current capacity of the station to eventually produce 2,700MW by 2018.

DEWA works continually to enhance its installed capacity, which is currently 9,656MW of electricity and 470 million imperial gallons of desalinated water per day. After completing the expansion, DEWA's installed capacity will be 10,356MW. DEWA has also has begun work on the Hassyan Clean-Coal Power Plant based on the IPP model, with an installed capacity of 1,200MW. The first phase is expected to be operational by 2020.

DEWA has started implementing its smart initiatives to make Dubai the smartest city in the world. The first initiative, Shams Dubai, encourages tenants and building owners to install photovoltaic (PV) solar panels to generate electricity. The electricity generated is used within the premises and the surplus is exported to DEWA's grid. This encourages the use of renewable energy, increases its share in the energy mix and diversifies energy sources. The second initiative, Smart Applications and Meters, contributes to fast-service connection, fast response and rationalising energy and water use. The third initiative, Green Charger is about building the infrastructure for 100 electric vehicle charging stations. DEWA has already established 16 Green Charger stations and will install 84 more stations this year.

In terms of benchmarking, DEWA has achieved outstanding results that excel over even the private sector. DEWA has surpassed leading European and American companies by reducing losses in power transmission and distribution networks to 3.26%, compared to 6-7% in Europe and the USA. Water network losses decreased to 9.1%, compared to 15% in North America, achieving global results in reducing water losses. DEWA's results are among the best internationally for customer minutes lost per year. It reached 4.9 minutes, compared to 15 minutes recorded by leading utilities in the European Union. The UAE, represented by DEWA, has been ranked fourth globally and first in the Middle East and North Africa for the second consecutive year for ease of access to electricity as per the World Bank's Doing Business 2015 report.

DUBAI SUPREME COUNCIL OF ENERGY

The Dubai Supreme Council of Energy (DSCE) was formed in August 2009 under Law 19 of 2009, issued by His Highness Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai.

His Highness Sheikh Ahmed bin Saeed Al Maktoum was appointed as Chairman for the Council, His Excellency Saeed Mohammed Al Tayer, as Vice Chairman and His Excellency Ahmad Al Muhairbi as Secretary General.

The Council consists of the following members: the Director General of the Department of Petroleum Affairs, the President and Chief Executive Officer of Dubai Aluminium Company (DUBAL), the Chief Executive Officer of Emirates National Oil Company (ENOC) and one representative each from the Dubai Supply Authority (DUSUP), Dubai Petroleum (DPE), Dubai Municipality (DM), RTA and Dubai Nuclear Energy Committee (DNEC).

The Council has an Advisory Committee from a competent and specialised workforce.

The new Governing body seeks to ensure that the Emirate's growing economy will have sustainable energy while preserving the environment. The Authority is developing alternative and renewable-energy sources for the Emirate, while increasing energy efficiency to reduce demand. Under the visionary guidance of His Highness Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai, the Dubai Integrated Energy Strategy 2030 (DIES) was developed in 2010 and deployed in 2011 to set the strategic direction of Dubai towards securing sustainable supply of energy and enhancing demand efficiency (water, power and transportation fuel).

The Dubai Supreme Council of Energy is the governing body tasked with policy development, planning and coordinating with concerned authorities and energy bodies to deliver new energy sources while employing a balanced approach to protecting the environment.

Vision: Dubai to be a role model to the world in energy and efficiency.

Mission: Support Dubai's economic growth through secure energy supply and efficient energy use while meeting the following environmental and sustainability objectives:

- Effective planning of the energy sector.
- Develop an integrated approach to securing energy supply and employing efficient energy practices for the sustainable growth of Dubai.
- Ensure sustainability of energy supply while preserving environment.
- Rationalise the use of energy and ensure environmental sustainability.
- Plan and facilitate the execution of strategic initiatives, demand management and supply options with view of diversifying energy sources.
- Set a governance framework to streamline existing energy practices across the DSCE entities to optimise synergy and energy efficiency.

For more information, please visit our website: www.dubaisce.gov.ae

COMPANY PROFILES

EMPOWER

Emirates Central Cooling Systems Corporation (Empower) is a joint venture between Dubai Electricity and Water Authority (DEWA) and Dubai Technology and Media Free Zone (TECOM) Investments providing cooling services to large-scale real estate developments in Dubai. Established in 2003 by a decree,, Empower has grown its facilities from a single temporary plant to the world's largest district cooling services provider, operating a one million refrigeration tons (RT) portfolio across 62 plants. Empower currently provides its services to world class projects such as Business Bay, Jumeirah Beach Residence, Dubai Health Care City, Palm Jumeirah, Jumeirah Lake Towers, International Media Production Zone, Discovery Garden and Dubai Design District with several developments in the pipeline.

Empower is a member of the International District energy Association (IDEA) and has won several international awards including two IDEA Innovation Awards for its ground breaking treated sewage effluent technology and centralised data management system. Empower acquired Palm Utilities, Dubai's second-largest district cooling company in 2013, and is now the world's largest district cooling services provider.

DUBAI MUNICIPALITY

Dubai Municipality was established in 1954, starting its activities with only seven employees and undertaking simple tasks aimed at keeping the city clean.

The first decree establishing the municipality was issued on February 28, 1957. Based on this decree, 23 individuals – senior citizens and traders in the Emirate – were appointed as members of the municipal council, with limited powers such as taking care of the affairs of health, construction and beautification of the city, as well as to provide constructive suggestions to the government.

Dubai Municipality has passed through a series of evolutionary stages in its proud history of development. Its development and growth coincided with the growth of the Emirate of Dubai. Currently it has 13,000 employees in 33 departments.

The civic body encompasses six major sectors, namely: Institutional Support, International Affairs & Partnerships, Engineering & Planning, Environment & Public Health Services, and Environment & Public Health Monitoring.

Thus Dubai Municipality is one of the largest government institutions in terms of its services, projects and activities, leading the growth and evolution of the Emirate of Dubai.

ACWA POWER

We make power and desalinated water available to entire communities in the regions we serve, at the lowest possible cost, to support their social development and economic growth.

We do so by being an investor, developer, co-owner and operator of a portfolio of plants with a capacity to generate 18 GW of power and produce 2.5 million m3/day of desalinated water. ACWA POWER uses traditional fuels and renewable energy in the most reliable manner and operates to the highest ethical standards.

From our base in Saudi Arabia, we have already expanded into the Gulf and further afield, with regional offices in Dubai, Istanbul, Cairo, Rabat, Johannesburg, Hanoi and Beijing. We serve our customers across three continents and currently have an investment portfolio of more than 32 plants around the world.

We are the developer of some of the world's largest projects, demonstrating a track record of developing and managing the construction of multibillion dollar capital projects on time and within budget. We are constantly setting new international benchmarks and underlining why we have such a strong reputation for innovation.

(Source: Acwa Power website http://acwapower.com/about-acwa-power/introduction/)

COMPANY PROFILES

DUBAL HOLDING

Dubal Holding (DH), established in 2013, is wholly owned by Dubai's sovereign wealth fund, Investment Corporation of Dubai (ICD), and is an investment arm for the Dubai Government in the power, commodities, mining and industrial sectors. The subsidiary manages ICD's 50% shareholding in Emirates Global Aluminium (EGA), which is the owner of Dubai Aluminium (DUBAL), Emirates Aluminium (EMAL) and the alumina refinery under construction in Abu Dhabi.

DH is active in the Dubai power sector and is part of the developer consortium working on the 200MW Mohammed Bin Rashid Solar Power Plant, as well as the original 13MW pilot plant. DH is also active in the upstream alumina refinery and other related businesses, as well as evaluating a number of investments in the commodities and manufacturing sectors, which will assist in broadening the Emirate's industrial base and which could also support the continued competitiveness of the aluminium business.

In addition, DH's primary objectives include supporting the Dubai 2030 Integrated Energy Strategy as part of the Dubai Supreme Council of Energy and to be at the forefront of Dubai's investments in commodities and other related industrial projects. To this end, DH looks to deploy capital in ways that support the Dubai 2030 Integrated Energy Strategy, notably in clean-energy projects in the Emirate. On the industrial side, DH has a broad remit to invest in industrial businesses and infrastructure, which serves to broaden Dubai's manufacturing base in both new and established technologies.

Positioned at the forefront of Dubai's investments in commodities and other industrial projects, DH is responsible for maintaining standards of quality, efficiency, safety and environmental regulations in its operating companies and helping advance local and international energy and industrial infrastructure, along with commodities supply, which contribute to the economic development and social progress of the Emirate of Dubai.

DUBAI SCIENCE PARK

Dubai Science Park (DSP), part of TECOM Group, is a dynamic business community that provides a home to companies of all sizes across the science industry value chain.

DSP, formerly DuBiotech and EnPark, boasts world-class infrastructure and cutting-edge research and development facilities and provides its business partners with a full set of services that include; regulatory affairs management, partner development, registration and licensing and leasing and government services.

DSP can support both start-ups and international firms looking for a regional base for their Middle East or global operations and the community is now home to over 250 science companies across the health, technology, cleantech and renewable sectors.

DSP's innovative and vibrant science-specific community creates collaboration and partnership opportunities throughout the industry, underpinning Dubai's drive to become one of the most innovative economies in the world.

DP WORLD

DP World has a portfolio of more than 65 marine terminals across six continents, including new developments underway in India, Africa, Europe and the Middle East.

Container handling is the company's core business and generates more than three quarters of its revenue. In 2014, DP World handled 60 million TEU (twenty-foot equivalent container units). With its committed pipeline of developments and expansions, capacity is expected to rise to more than 100.

DP World has a dedicated, experienced and professional team of over 36,000 people serving its customers around the world and the company constantly invests in terminal infrastructure, facilities and people to provide quality services today and tomorrow, when and where customers need them.

In taking this customer-centric approach, DP World is building on the established relationships and superior level of service demonstrated at its flagship Jebel Ali facility in Dubai, which has been voted "Best Seaport in the Middle East" for 20 consecutive years.

COMPANY PROFILES

ENGIE GROUP

ENGIE is a global energy player and an expert operator in the three key sectors of electricity, natural gas and energy services. The Group puts responsible growth at the heart of all its businesses in order to rise successfully to today's major energy and environmental challenges: responding to the demand for energy, ensuring security of supply, combating climate change and making optimum use of resources.

The Group offers high-performance, innovative solutions to personal customers, urban authorities and companies, with a diverse portfolio of gas supply options, a flexible low-CO_2 emissions power generating base and unique expertise in four key sectors: independent power generation, liquefied natural gas, renewable energy and energy efficiency.

PAGERO

Pagero is a global business network for the exchange of electronic documents. The Pagero Online platform enables organisations of any type, size or location to transact electronically with their existing customers and vendors, along with hundreds of thousands of potential new trading partners globally. One secure connection to the Pagero Online business network is all that is required.

The Pagero Group

Headquartered in Sweden, Pagero has offices across Europe and the Middle East, supporting 15,000 customers in over 50 countries. Through interoperability agreements, Pagero connects over 750,000 organisations worldwide. Pagero's clients range from the largest global public, private and governmental organisations, through to sole traders.

Improving Sustainability

By using the Pagero Online business network, a company's environmental footprint can be substantially and immediately reduced. Pagero removes virtually all pollutants and consumables from transactions. It is not often that the 'greening' of a business can also deliver many operational and economic benefits.

DUBAI FDI

The Dubai Investment Development Agency (Dubai FDI), an agency of the Department of Economic Development in Dubai, works to promote investment opportunities in Dubai and support international investors to establish a presence here whilst taking advantage of Dubai's strategic location to access the MENASA region. Dubai FDI assists in the identification of sector-specific opportunities, provides connections to a network of both government and non-government partners and provides support throughout the investment lifecycle from setup to growth.

ALEC ENERGY

ALEC is one of the largest most awarded contractors in the GCC. They have evolved from their inception in 1999, to establishing a project portfolio consisting of high-end complex construction projects, predominately in airports, retail, themed hospitality and commercial sectors. With over 10,000 staff, they have expanded to operate multiple related businesses which have a significant focus on reducing energy consumption and renewable-energy alternatives.

ALEC ENERGY is a provider of financially sound green-energy solutions. They provide an efficient turnkey solar solution for commercial and industrial rooftops.

ALEMCO is a provider of fully engineered electromechanical and building service solutions to construction projects. It provides clients with turnkey electromechanical construction services and planning; which helps to reduce operational costs and prolong plant life. This is achieved through a mixture of energy audits and advanced energy saving methods.

S4P- Smart4Power is an engineering and Project Finance (ESCO) company that provides specialised energy-efficiency solutions for existing buildings. Their services include energy audits and consultancy, energy savings implementation and ESCO.

DUBAI EDUCATION LLC

Dubai Education LLC was founded as an initiative of Emirates Investment Development PSC (EMIVEST) to contribute to the educational landscape and intellectual capacity of the UAE. As an organisation that supports initiatives to empower economic and social progress within the UAE, EMIVEST established four entities under the umbrella of Dubai Education LLC – Canadian University Dubai, the Centre of Excellence for Innovation and Creativity, the Oasis School and D1 TV. These organisations interconnect, with a shared mission to provide a pathway for education from early childhood to doctoral studies, guided by the highest international standards and ethics. The synergy between these organisations allows for the sharing of resources and expertise, helping to empower individuals, corporations and governments by supporting the sustained development of the UAE's knowledge base.

AL BARARI

Al Barari is the flagship development of the family-run Zaal Group of Companies. Literally meaning "wilderness", Al Barari was designed to be a true desert oasis. Eighty percent of the development's 18.42 million square feet is made up of abundant greenery that envelopes the 217 palatial-villas. Beautiful themed gardens, with over 16.4 kilometres of naturally landscaped lakes, freshwater streams, cascades and waterways make Al Barari the lowest density development in the UAE and more akin to a botanical garden than a residential community. Al Barari has succeeded in its vision to create one of the most desirable, environmentally-conscious developments in the UAE.

CUMMINS MIDDLE EAST

Cummins Inc., a global power leader, is headquartered in Columbus Indiana, USA. It serves customers in more than 190 countries through its network of more than 600 company-owned and independent distributor facilities and approximately 7,200 dealer locations.

Cummins manufactures and markets a complete line of diesel and natural gas-powered engines for on-highway (e.g. automotive) and off-highway (e.g. construction) use. Its subsidiary, Cummins Power Generation delivers innovative solutions for any power need-commercial, industrial, recreational, emergency and residential. Products include alternators, generator-drive engines and pre-integrated power systems, combining generator sets and power control and transfer technologies.

Cummins's presence in the Middle East began in 1956. Some key achievements are the High Horsepower Master Rebuild Centre, Genset Projects Business, Certified Training Centre, and LEED Gold certification for the facility in addition to the ISO 9001:2008 certification.

YOUGOV

YouGov is one of the world's leading market research companies. From the very beginning, we have been driven by a simple idea: the more people are able to participate in the decisions made by the businesses that serve them, the better those decisions will be.

At the heart of our company is a global online community, where millions of people and thousands of commercial and cultural organisations engage in a continuous conversation about their beliefs, behaviours and brands.

We combine this continuous stream of data with our deep research expertise and broad industry experience, to develop the technologies and methodologies that will enable more collaborative decision-making.

In the Middle East and North Africa region, YouGov has the largest pure research online panel where thousands of people participate in surveys across 19 countries. We pride ourselves on providing first-class qualitative and quantitative analysis, which offers unparalleled regional insight across the Arab world from our offices in Dubai, Saudi Arabia, Egypt and Iraq.

We have a culturally diverse team of passionate and forward-thinking researchers who are specialists across a range of industry sectors including energy, government, education, consumer, media, automotive, real estate, travel and tourism, leisure and entertainment, financial services and telecommunications.

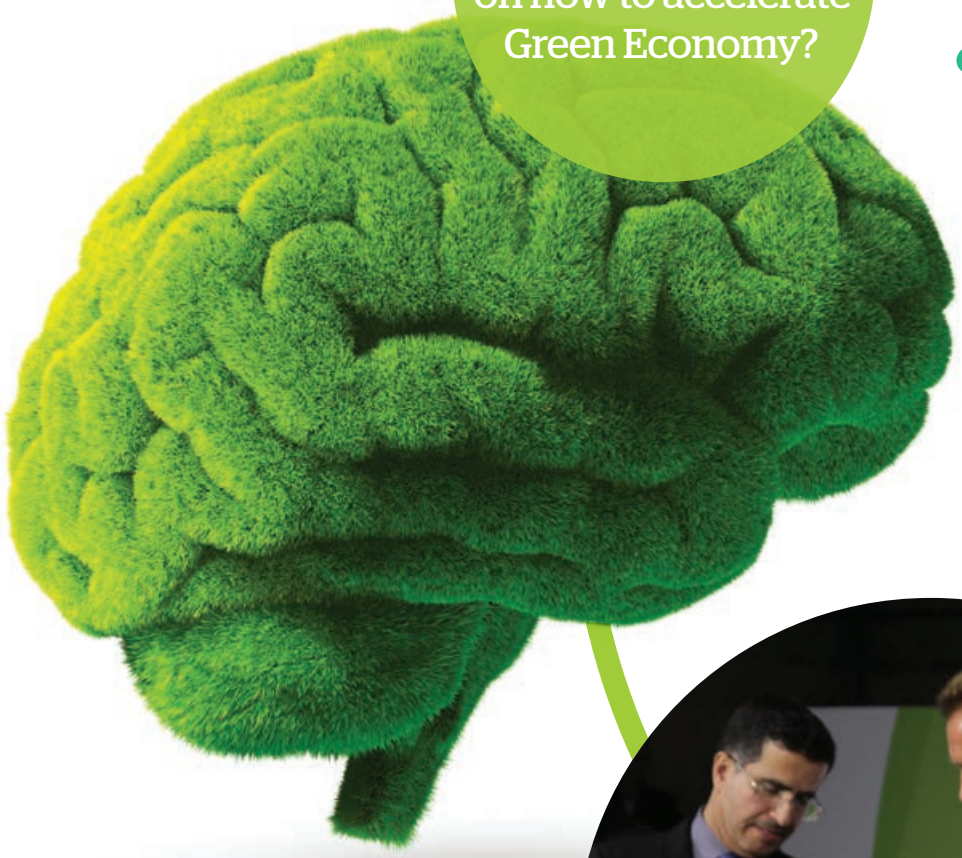
Every day leading brands, businesses and the media trust us to offer a more accurate, more actionable portrait of what the world thinks.

research.mena.yougov.com

SEE YOU AGAIN IN 2017

NOT SATISFIED YET?

Do you have **BETTER IDEAS** on how to accelerate Green Economy?



... THEN SHOW US HOW IT'S BEEN DONE IN THE NEXT EDITION OF THE STATE OF GREEN ECONOMY REPORT.

Every year we publish this report in cooperation with the World Green Economy Summit. Your stories might be the ones we are missing.

Get in touch with our partnership team on hello@dcce.ae or contact the editor directly via email on tellmeyourstory@dcce.ae.

See you next year.
You will find our media rates and more information online on http://dcce.ae/#publications.

With Contributions from:

This publication has been created with the kind support of:

PLATINUM

GOLD

SILVER

In partnership with:

Do you prefer soft copies? Download the full report from http://dcce.ae/#publications or scan this QR code:

ISBN978-9948-18-776-9