



Energy and Climate Change



Greening the Industrial Agenda



UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

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Foreword

Energy is a defining issue of our time. Volatile oil prices, growing energy demand and climate change are shaping today's global energy agenda. The responsible use of energy resources is closely linked with the major challenges facing the world—environmental degradation, poverty alleviation and food security.

In this context, enhancing energy efficiency and increasing the use of renewable energy constitute essential components of global policies to achieve the Millennium Development Goals. UNIDO recognizes sustainable energy as both a precondition and catalyst for economic and social development. This has been a priority in our work for many years. Cost-effective, reliable and widely available sources of energy are direly needed to support and accelerate industrial development in developing countries and economies in transition. Moreover, a significant reduction of the environmental impact of industry can only be achieved if energy is produced in a clean and sustainable way and used more efficiently.

UNIDO, as one of the lead United Nations agencies in the field of energy, is taking up the challenge. It works within an integrated strategic framework to provide technical cooperation services in the energy sector. UNIDO's ultimate aim is to strengthen opportunities for reliable, efficient and affordable energy services, both to urban and rural populations. This is most likely to occur with clear strategies and well-formulated policies, which will allow industrial and commercial enterprises to shift towards an innovative, sustainable and resource-efficient growth trajectory.



Kandeh K. Yumkella
Director-General
UNIDO



UNIDO—Promoting sustainable industrial development

The United Nations Industrial Development Organization is the United Nations' specialized agency with the mandate to promote industrial development in the world's developing and least developed nations. The Organization supports governments, businesses and other stakeholders in their efforts to meet the challenges of, and to remove the barriers to, their industrial development. To do so, UNIDO mobilizes knowledge and information, builds capacity, and facilitates the transfer of technology to enhance competitiveness and advance the adoption of climate change mitigation measures. UNIDO's strategy is built upon three pillars:

Poverty reduction through productive activities

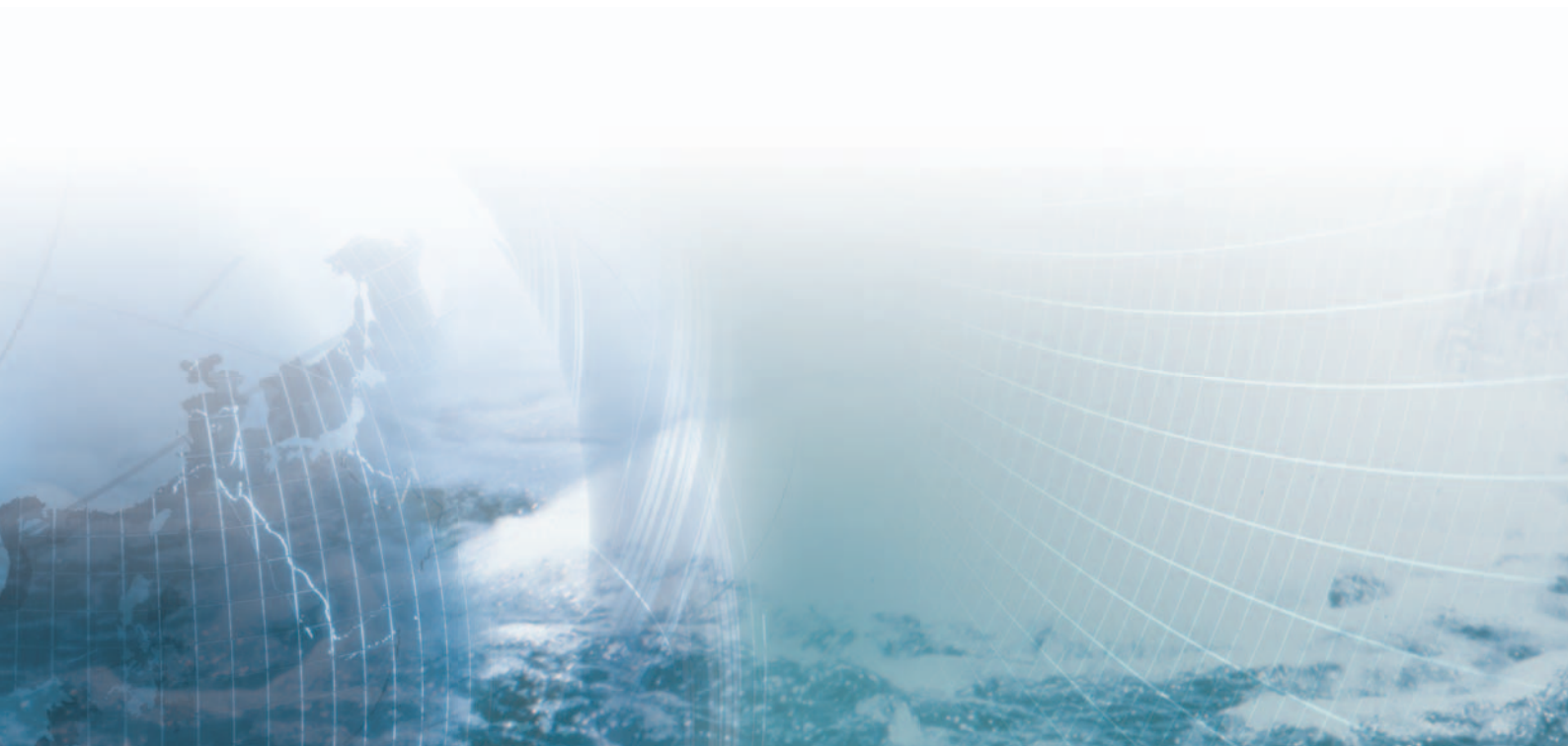
Industrial development plays a significant role in achieving the necessary structural change to set the economies of poor countries on a path of sustained economic growth. Industry provides a seedbed for entrepreneurship, promotes business investment, fosters technological upgrading and dynamism, improves human skills and creates jobs, thus contributing to reduce poverty.

Trade capacity-building

Enhancing the capacity of developing and transition economies to participate in global trade is often a necessary step towards economic growth. In a globalized world, the opportunities for enterprises in these countries to access international markets strongly depend on their ability to enter into global value chains.

Energy and environment

Sustainable industrial development requires measures to permit economic growth whilst minimizing environmental degradation. Such an objective can be attained through improved industrial energy management and efficiency, and a more sustainable use of resources. Access to affordable, reliable and low-carbon energy services also plays a critical role in enhancing productivity, creating business opportunities and reducing poverty.



Integrated action for sustainable industrial development

UNIDO's focus on environmentally sound industrial development translates into integrated action for sustainable energy production and use in industry. The Organization takes a holistic approach to energy issues by addressing both supply and demand sides, and by advocating policies aimed at implementing green energy strategies.

Indeed, growth prospects and enhanced competitiveness are contingent on the availability of affordable and reliable energy supply. At the same time, as industrial energy use is responsible for a major share of anthropogenic greenhouse gas (GHG) emissions, more efficient industrial energy management and use can significantly contribute to mitigating climate change. In addition, unreliable and often unaffordable energy is a major constraint to economic growth for many poor countries. Renewable energy has the potential to support productive activities, while minimizing GHG emissions.


For these reasons, UNIDO supports patterns of energy use that mitigate climate change and are environmentally sustainable, and promotes access to clean energy for productive activities. This effort involves promoting energy efficiency and energy management standards, as well as supporting the adoption of renewable energy sources in the industrial sector. UNIDO's action also aims to enhance energy access in developing countries, primarily in rural areas, as a fundamental means to create value-added and reduce poverty. Furthermore, the Organization is championing industrial energy perspectives in global debates on climate change and other energy-related issues.

UNIDO's unique expertise on sustainable industrial development gives it the ability to effectively carry out specialized demand-driven projects. UNIDO serves as the executing agency of several multilateral agreements and funds for a large number of energy projects. UNIDO operates in the international arena both independently and in cooperation with other development agencies, maintaining its strong network of partner technology institutions, cooperating agencies and experts.





Energy efficiency



Improving energy efficiency in industry is one of the most cost-effective measures to help supply-constrained developing and emerging countries meet their increasing energy demand and loosen the link between economic growth and environmental degradation.

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Based on demonstrated industrial energy efficiency policies and commercially available technologies, industry has the potential to decrease its energy intensity and emissions by 26 per cent and 32 per cent respectively. That would allow for an 8 per cent reduction in total global energy use and 12.4 per cent in global CO₂ emissions (IEA, 2007).

UNIDO takes a comprehensive approach in addressing the barriers to continuous improvement of industrial energy efficiency. It successfully builds on its long-standing experience and unique expertise in sustainable industrial development providing policy support services and capacity-building geared towards market transformation for industrial energy efficiency. UNIDO's approach is based on two core concepts: energy system optimization and energy management standards.

“Improving energy efficiency in industry is one of the most cost-effective measures to loosen the link between economic growth and environmental degradation”



UNIDO's approach

Industrial energy system optimization aims to go beyond the currently prevailing equipment approach to energy efficiency in industry. Energy use in industry is affected by operational practices which can change significantly over the lifetime of a factory. The purchase of energy efficient equipment, while important, provides no assurance that energy savings will be attained if the system of which the equipment is part is not properly designed and operated.



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Energy Management Standards constitute a demonstrated effective policy tool and market-based mechanism to bring about sustainable energy efficiency in industry. UNIDO promotes and supports the establishment of comprehensive policy frameworks for industrial energy efficiency hinged on the promulgation and adoption of energy management standards. These offer a suitable framework for organizations and enterprises to develop energy efficiency goals, plan interventions, prioritize efficiency measures and investments, monitor and document results and ensure continuity and constant improvement of energy performance. Energy management standards establish closer linkage between business practices for the management of energy and core industry values of cost reduction, increased productivity, environmental compliance and global competitiveness.

UNIDO and the International Management System Standard for Energy ISO 50001

Since 2007 UNIDO has been active in promoting and supporting the development of an international management system standard for energy through awareness-raising initiatives and experts group meetings. After the establishment of "Project Committee 242 – Energy Management" by the International Organization for Standardization (ISO), UNIDO has been supporting the development process of ISO 50001 providing technical inputs to the dialogue on the content of the standard and by facilitating the participation of developing and emerging countries in the process through industrial surveys and regional workshops. UNIDO has a Category-A liaison status with ISO/PC 242.



Renewable and rural energy



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Access to clean and affordable energy is one of the main prerequisites for sustainable economic and social development. As part of its thematic priority on energy and environment, UNIDO recognizes the importance of de-coupling economic and social development from resource utilization and environmental degradation. It strives to promote sustainable patterns of energy production and consumption through innovative and clean technologies, using locally available renewable resources—including small hydro-power, bioenergy, solar and wind power.

Renewable energy has become a global success story: According to the 2007 REN21 report the renewable energy sector now accounts for 2.4 million jobs globally, has doubled electric generating capacity since 2004 to 240 gigawatts (2007). Renewable energy represents 18 per cent of the global final energy consumption (2006).

UNIDO assists developing countries and countries in transition to take part in and benefit from those developments by pursuing a multidimensional approach to promote renewable energy for productive uses. UNIDO's services include the implementation of renewable energy demonstration projects, policy support to create a favourable environment for renewable energy technologies, and capacity-building in the form of local training, workshops and targeted publications.

“UNIDO pursues a multidimensional approach to promote renewable energy for productive use, through demonstration projects, policy support and capacity-building”



UNIDO's services

UNIDO's energy services aim at enhancing productive capacities and improving energy access in developing countries. They are based on three main principles:

- 1) UNIDO strives to enhance access of the poor to modern and affordable energy services in rural areas to stimulate income generation activities,
- 2) UNIDO encourage the creation and development of small and medium enterprises (SMEs) by supporting the use of locally available renewable energy sources for productive uses, and
- 3) UNIDO's energy activities are aimed at mitigating climate change by curbing carbon emissions in the industrial sector and decreasing dependency on fossil fuels.



Renewable energy generation—examples from the field:

For many years UNIDO has been active in promoting and supporting the development of renewable energy projects—demonstrating economic and social viability and leading the way for scaling up. Two projects under implementation in Cuba and Zambia showcase UNIDO's integrated approach.

While the project in Cuba has a strong focus on the promotion of renewable energy-based electricity and heat generation for industrial applications (focusing on wind and biomass gasification technologies)—the project in Zambia focuses on demonstrating the viability of renewable energy-powered mini-grids in rural areas to provide energy access for small-scale users including SMEs.



Energy policy and partnership



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Partnerships are essential to the development of successful energy policies. They can create enabling conditions for stakeholders to formulate common and effective strategies. UNIDO is a key player in the international energy debate. It provides tailored policy advice to various stakeholders, working to bridge the gap between high-level policies and implementation, e.g. by promoting technology transfer.

Two major UNIDO partnerships are as follows:

- UNIDO is an active member of UN-Energy, the coordinating body for energy work within the broader United Nations system. Recognizing UNIDO's comparative advantage in linking sustainable energy with productive uses, the group elected Mr. Kandeh K. Yumkella, UNIDO's Director-General, as Chairman of UN-Energy. Additionally, UNIDO was assigned as co-leader of the Energy Efficiency cluster. In order to enhance support and build on UN-Energy work, UNIDO has established an internal Energy Advisory Team to provide the Director-General with high-level advice on strategy, policy and programme priorities in the field of energy.
- UNIDO has a very fruitful cooperation with the Global Environment Facility (GEF) in many developing countries. Drawing on a track record of successful energy projects, UNIDO was designated as lead agency for the energy component of the GEF Strategic Programme for West Africa, which will support the region's efforts to address its lack of access to energy.

In light of its strong leadership in the field of industrial efficiency and other energy-related activities, UNIDO was invited to join the Global Energy Assessment's governing body. The GEA is a major multi-stakeholder initiative to help decision makers deal with the challenges of providing energy services for sustainable development. UNIDO also provides technical support to the GEA in the form of substantive contribution.



Pursuing key alliances in the energy arena

UNIDO strives for strong partnerships with other international and United Nations organizations. Examples include:

- In line with the outcomes of the United Nations Climate Change Conference in Bali in 2007, UNIDO, together with UN-DESA, acts as a co-convenor on technology transfer.
- UNIDO works closely with the United Nations Environment Programme (UNEP) on promoting renewables and clean energy technologies, in particular through the National Cleaner Production Centres.
- UNIDO is a partner of the Global Bioenergy Partnership (GBEP). It is contributing to both the Steering Committee and technical working groups meetings, in particular regarding industrial uses of bioenergy.
- UNIDO hosts the Renewable Energy and Energy Efficiency Partnership (REEEP) in its Headquarters in Vienna. UNIDO is a member of the Governing Board and works with REEEP both at the project level and on Global Forum activities.
- In addition, UNIDO is a member of the Steering Committee of the Renewable Energy Policy Network for the 21st Century (REN21).

Global Forum activities

UNIDO has been organizing a number of successful Global Forum activities over the past years. Such events aim at bringing together policymakers, experts and other key stakeholders in order to review the latest developments in the fields of energy efficiency and renewable energy. They offer a platform to exchange ideas and strengthen partnerships and cooperation between stakeholders.



UNIDO's Energy Technology Centres

Through its Energy and Climate Change Branch, UNIDO established and supports a number of energy technology centres worldwide. The technologies covered include solar energy, hydropower and hydrogen. The objectives of these UNIDO centres of excellence are to strengthen local and regional capacity and to facilitate knowledge transfer as well as South–South cooperation.

The enhancement of indigenous capacity in emerging and developing countries in terms of research and development, as well as the transfer of state-of-the-art technologies, represents the cornerstone of UNIDO's energy strategy. In this regard, UNIDO's technology and knowledge centres play a vital role through:

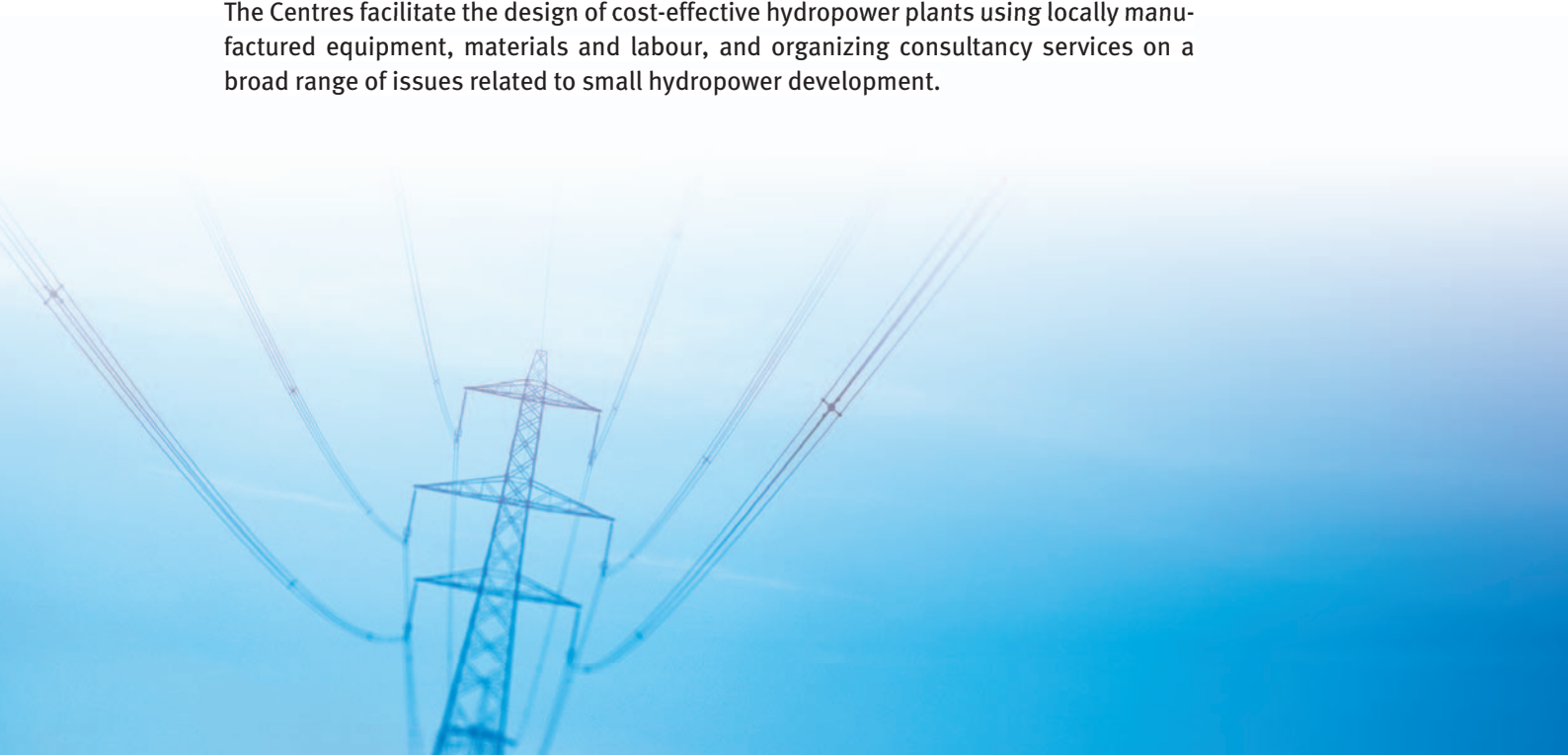
- Linking the application of sustainable energy with local needs for development and poverty alleviation;
- Establishing and maintaining demonstration pilot plants to promote awareness-building so as to stimulate manufacturing and widespread application of sustainable energy technology; and
- Building national and international capacity and exchanging programmes and training activities for emerging and developing country institutions and individuals.

Today, UNIDO is able to make use of an extensive network of technology centres worldwide and is benefiting from a large pool of associated local experts. Some of the most successful and promising institutions include:

Regional Centres for Small Hydropower: India, Nigeria and China

The establishment of the UNIDO Regional Centres for Small Hydropower has enabled the development of several renewable energy-related awareness-building and training programmes aimed at promoting sustainable development through the introduction of small-scale hydropower projects.

The Centres facilitate the design of cost-effective hydropower plants using locally manufactured equipment, materials and labour, and organizing consultancy services on a broad range of issues related to small hydropower development.



International Centre for Promotion and Transfer of Solar Energy (ISEC), China

The International Solar Energy Centre aims at developing applicable solar energy technologies and enhancing the transfer of these to developing countries. Its mandate includes:

- Development and upgrade of solar energy technologies;
- Establishment of standards and labels for solar technologies and products;
- Promotion of international cooperation and technology transfer in developing countries;
- Capacity-building for institutions and individuals from developing countries through training workshops, seminars and pilot installations.

UNIDO International Centre for Hydrogen Energy Technology, Turkey

The International Centre for Hydrogen Energy Technologies (ICHET) is a UNIDO project with the mission of demonstrating viable applications of hydrogen energy technologies. It aims at facilitating their widespread use in the context of developing countries. The Centre pursues its objectives by providing a comprehensive set of services that include:

- Technical and financial support to the development and implementation of hydrogen energy systems demonstration projects;
- Applied R&D for developing countries;
- Training and education programmes;
- Conferences and workshops.



UNIDO Global Coverage

With its headquarters based in Vienna, Austria, UNIDO can rely on an extensive network of Country and Regional Offices, National Cleaner Production Centres, Investment and Technology Promotion Offices. This network ensures widespread presence, greater responsiveness to demand and local support to technical cooperation activities.

List of countries for RE projects:

Albania
Burundi
Cape Verde
Cambodia
Chad
Côte d'Ivoire
Comoros
Cuba
Ecuador
Egypt
The Gambia
Guinea
Iraq
Indonesia
India (3)
Kenya
Liberia
Mali
Maldives
Madagascar
Mozambique (2)
Nigeria (5)
Nicaragua
Pakistan
Romania
Rwanda
Sudan
Sierra Leone (2)
Serbia
United Republic of Tanzania (2)
Uganda
Ukraine
Zambia (2)

43 Projects
Covering 33 countries

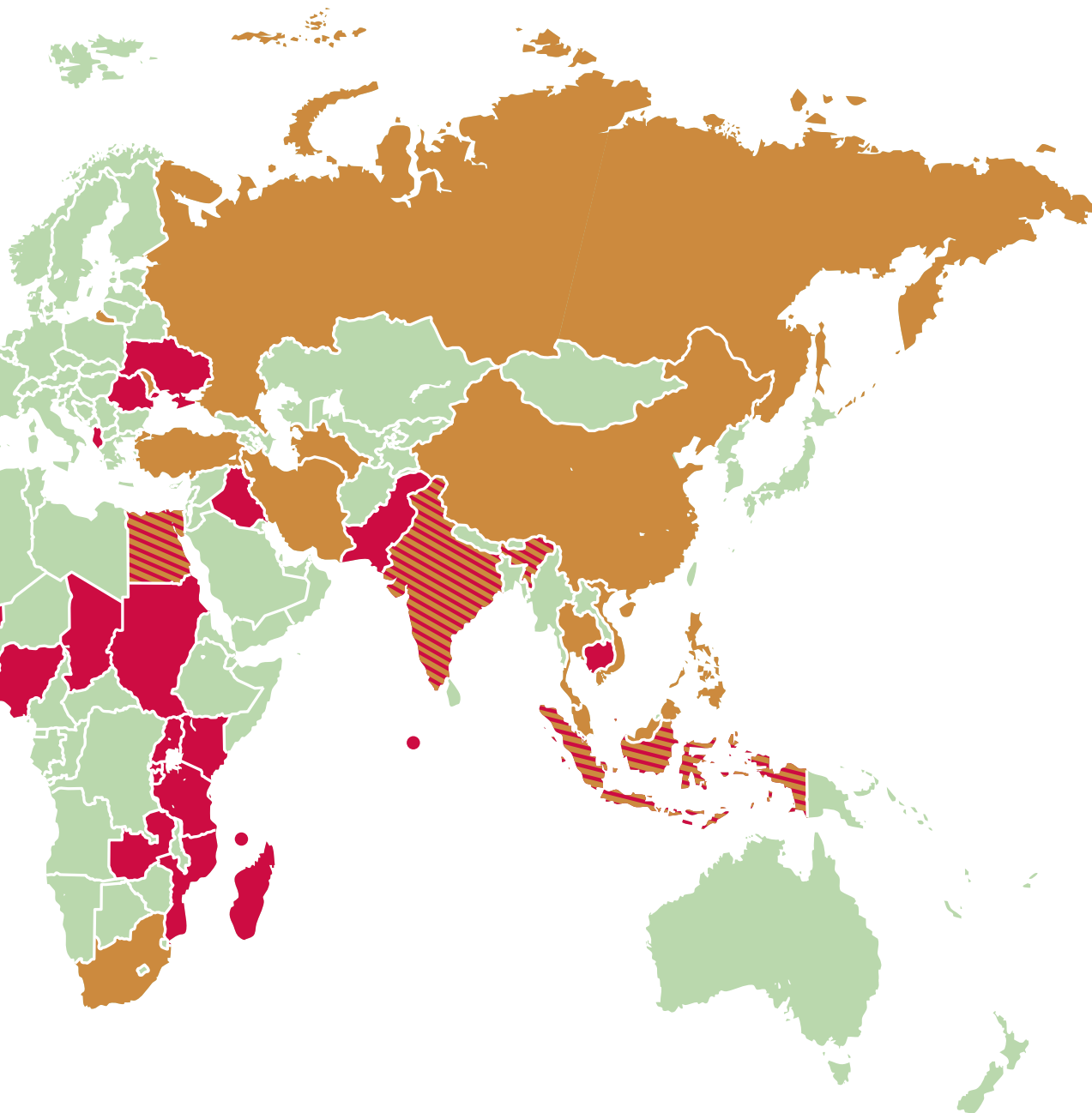
List of countries for Energy Efficiency projects:

Brazil
Dominica
Ecuador
Indonesia
Malaysia
Philippines
Russian Federation
Republic of Moldova
Egypt (2)
South Africa (2)
China (2)
Iran (Islamic Republic of)
Grenada
St. Kitts and Nevis
India
St. Lucia
Thailand
Turkey (3)
Turkmenistan
Viet Nam

25 Projects
Covering 20 countries



The current UNIDO energy portfolio consists of 43 renewable energy and 25 energy efficiency projects covering 49 countries. The total portfolio budget amounts to more than \$US 69 million, with another \$US 85 million in the pipeline for future projects.





UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

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