Inquiry: Design of a Sustainable Financial System

UNEP

ALIGNING

THE FINANCIAL SYSTEM WITH SUSTAINABLE DEVELOPMENT

THE COMING FINANCIAL CLIMATE

THE INQUIRY'S 4TH PROGRESS REPORT

MAY 2015

The Inquiry

The Inquiry into the Design of a Sustainable Financial System has been initiated by the United Nations Environment Programme to advance policy options to deliver a step change in the financial system's effectiveness in mobilizing capital towards a green and inclusive economy – in other words, sustainable development. Established in January 2014, it will publish its final report in October 2015.

More information on the Inquiry is at: www.unep.org/inquiry/ or from:

Mahenau Agha, Director of Outreach mahenau.agha@unep.org

This Progress Report

This briefing is the fourth progress report by the Inquiry. It draws on the Inquiry's partnerships across the world, notably at the country level. We would like to thank the Bangladesh Bank and the Council on Economic Priorities; the Brazilian Federation of Banks (FEBRABAN); in China,the Development Research Centre of the State Council and the International Institute for Sustainable Development, as well as the Research Bureau of the People's Bank of China; at the European Union level, the 2 Degrees Initiative; in India, the Federation of Indian Chambers of Commerce and Industry (FICCI); in Indonesia, Otoritas Jasa Keuangan (OJK); in Kenya, the Kenyan Bankers Association; in South Africa, the Global Green Growth Institute; in Switzerland, the Federal Office for the Environment and the wider 'Swiss Team for the Inquiry'; and in the UK, the Bank of England.

We would also like to thank our partners at the international level, including the Association of Sustainable and Responsible Investment in Asia, CalPERS, the Cambridge Institute for Sustainability Leadership, the Climate Bonds Initiative, the Institute for Human Rights and Business, the Institutional Investors Group on Climate Change, the Organisation for Economic Cooperation and Development, the Network for Sustainable Financial Markets, the Principles for Responsible Investment, SwissRe, the UNEP Finance Initiative and the World Bank Group (including the International Finance Corporation).

The Inquiry recognises the contributions made to its work by many individuals and institutions. In particular, the Inquiry would like to acknowledge the support provided by the Government of Norway, the Government of Switzerland and the Government of the United Kingdom of Great Britain and Northern Ireland to its core and country specific work. Furthermore, the Inquiry is most appreciative of the contributions made by the members of our Advisory Council and our colleagues throughout UNEP.

Errors and omissions remain the responsibility of the Inquiry.

Comments or questions about the paper, or general enquiries, can be addressed to:

Nick Robins, Co-Director nick.robins@unep.org

Simon Zadek, Co-Director simon.zadek@unep.org

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Transitioning to a green economy opens us to many opportunities as well as posing many challenges. Climate change is one of the most multifaceted of these challenges, requiring us to build more resilient societies by reducing and managing risks, and also to stimulate and take advantage of a new generation of opportunities for business and the economy. Finance is a keystone in meeting these challenges and opportunities. The financial system exists to support our choices to save, consume and invest. When it works efficiently and effectively, it deploys finance in ways that creates dynamic, inclusive and sustainable economies that in turn reward the owners of capital. If and when the system proves defective, economies and societies are weakened by the misallocation of capital, and capital owners suffer from low and uncertain returns. Recent experience amply demonstrates how much damage can be done if there are deficiencies in the financial system as well as the real economy.

Going forward, failure of the financial system to take adequate account of climate change could result in extensive damage to financial assets globally, may well threaten the stability of the financial system itself, and most importantly could impose irreversible damage to the underlying state of the real economy and the quality of life for those who depend on it for their livelihoods. Fortunately, we can avoid these effects by correcting the system. The ways in which the financial system prices risks and invests in opportunities can be, and is, shaped by the capabilities and entrepreneurship of market actors and those responsible for the stewardship of the system, including central banks, financial regulators, standard setters and, ultimately, governments.

The UNEP Inquiry into the Design of a Sustainable Financial System was established in early 2014 with a mandate to explore practical policy options for better aligning the system with sustainable development. Supported by a high-level Advisory Council of financial market actors and institutions responsible for governing the financial system, the Inquiry has identified an emerging body of country-level practice in setting rules and norms that increase the relevance of aspects of sustainable development in decision-making. Such leadership practices provide inspiration and guidance as to how the wider financial system can be placed more effectively in the service of sustainable development, and so also in supporting the transition to a low-carbon, climate resilient world.

2015 is a milestone year in progressing sustainable development, particularly the financing aspects. Many approaches and instruments will be needed to deliver the financing needed for sustainable development, including that part addressing the climate challenges. Public finance, funded by tax revenues, will provide part of the solution, domestically and internationally, as well as through public investment vehicles such as development finance institutions. Such finance will alone, however, be inadequate. Private capital will be needed to scale up investments, particularly in financing long-term, low-carbon, resilient infrastructure needs. Financial innovations that blend private and public institutions and resources will take us further in closing the gap, as of course will improved economic and industrial policies that, for example, more effectively price carbon.

Reshaping key rules governing the financial system can and indeed must complement such sources, tools and processes in ensuring adequate and timely financing for sustainable development. The Inquiry, together with its growing number of national and international partners, is providing a map, grounded in experience, that locates which rules can be changed, by whom and with what expected consequences. This briefing focuses on such measures that can support collective efforts in addressing the climate challenge as a key aspect of sustainable development. We hope that it will encourage greater focus on what we believe to be a promising and to date under-explored set of complementary actions that could be deployed going forward to considerable effect.

Achim Steiner
Under-Secretary-General
Executive Director, UNEP

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THE COMING FINANCIAL CLIMATE

HIGHLIGHTS

Across the world, a growing number of governments, regulators, standard-setters and market actors are starting to incorporate sustainability factors into the rules that govern the financial system. The Inquiry was established in January 2014 to understand this fast-moving trend and to produce a set of policy options to advance good practice. Our work with a range of partners including central banks, financial institutions and international organisations has highlighted a diversity of catalysts and approaches across banking, capital markets, insurance and investment. In Brazil, integrating environmental and social factors into risk management is becoming viewed as a way of strengthening the resilience of the financial system. Better disclosure of environmental and social performance - for example through stock market and securities' requirements in Singapore and South Africa - is now seen as necessary to deliver market efficiency. And to serve lasting value creation in the real economy, work is underway to upgrade the effectiveness of the financial system, exemplified in the emergence of new principles, standards and incentives for the fast-moving 'green bond' market.

2015 looks set to intensify this process as governments converge to agree a global framework for financing sustainable development. Critical steps include the Financing for Development conference in July, the launch of the new UN Sustainable Development Goals in September and the UN Climate Change Conference in Paris in December. Across the Inquiry's work at both the country and international levels, harnessing the financial system to deliver climate security has emerged as a key cross-cutting issue. As a result, we are focusing this document – the Inquiry's fourth progress report – on financial reforms that can reduce the risks of high carbon assets, scale up capital for the low-carbon transition and invest in protecting economies from natural disasters and climate shocks.

The costs of high carbon growth include severe health impacts and disruption to infrastructure, water and food security, all contributing to increasing market volatility, as well as livelihood and economic impacts, particularly in developing countries. In Kenya, for example, existing climate variability is already costing 2.4 per cent of GDP per year. In essence, market and policy failures have resulted in the structural mispricing of climate risks, exacerbated by short-termism, misaligned incentives and information asymmetries. This damage is expected to deepen and risks becoming unmanageable if emissions of greenhouse gases are not reduced to net zero levels between 2055 and 2070.

A comprehensive approach to financing this transition is required. Stronger action is needed to drive the demand for green finance – for example, through carbon pricing and incentives for clean energy. Public finance will also be crucial but can only provide a portion of the capital required nationally and internationally. In China, annual investment in green industry could reach US$320 billion in the next five years, with public finance estimated to provide no more than 10 to 15% of the total. To address this challenge, a task force, co-convened by the People's Bank of China and the Inquiry, has recently published a comprehensive set of recommendations for establishing China's 'green financial system'.

Our findings point to a new way of thinking and practice that is taking shape. The task for those charged with governing the financial system is to enable the orderly transition from high- to low-carbon investments and also from vulnerable to resilient assets. This transition is already underway – for example, with global investments in renewable energy growing 17% in 2014, so that clean energy now makes up nearly half of net power capacity added worldwide. But the financial needs of low-carbon and resilient economy go far beyond renewables and require a system-wide response. As with all financial shifts, this is generating a set of transition risks for incumbent assets – risks that are not reflected in conventional models for delivering financial stability and so hold out the prospect of stranded assets.

PLACING THE FINANCING CHALLENGE AROUND CLIMATE CHANGE WITHIN THE BROADER CONTEXT OF THE GREEN ECONOMY AND SUSTAINABLE DEVELOPMENT IS ESSENTIAL TO MOBILISE THE TRILLIONS THAT ARE NEEDED. Drawing from the array of policy innovations at the country level, we have identified a set of measures that can make climate security part of the overall performance framework of a sustainable financial system. These covers risk, capital mobilization, transparency and culture. Each country will need to decide how these options relate to its financial system and the priorities for action.

A. EXPAND THE SCOPE OF RISK MANAGEMENT

1. **BANKING:** Place long-term sustainability and climate factors in risk management systems and prudential approaches for lending and capital market operations ('green credit')
2. **INVESTMENT:** Ensure that institutional investors (including pension funds) manage long-term climate factors as part of core risk, fiduciary and other investment obligations
3. **INSURANCE:** Integrate long-term climate factors into wider insurance frameworks for inclusion, solvency, underwriting and investment
4. **STRESS TESTING:** Across financial sectors and markets, develop scenario based tools to enable a better understanding of the impacts of future climate shocks on assets, institutions and systems

B. ENABLE THE ORDERLY REALLOCATION OF CAPITAL

5. **CAPITAL MARKETS:** Upgrade debt and equity capital markets through standards, regulatory refinement, indices, enhanced analysis and fiscal incentives
6. **GREEN BANKS:** Establish green investment banks to strengthen the structure of the financial system and crowd in private capital
7. **CENTRAL BANKS:** Review monetary operations including collateral, refinancing, asset purchases and others to incorporate green finance and climate assets

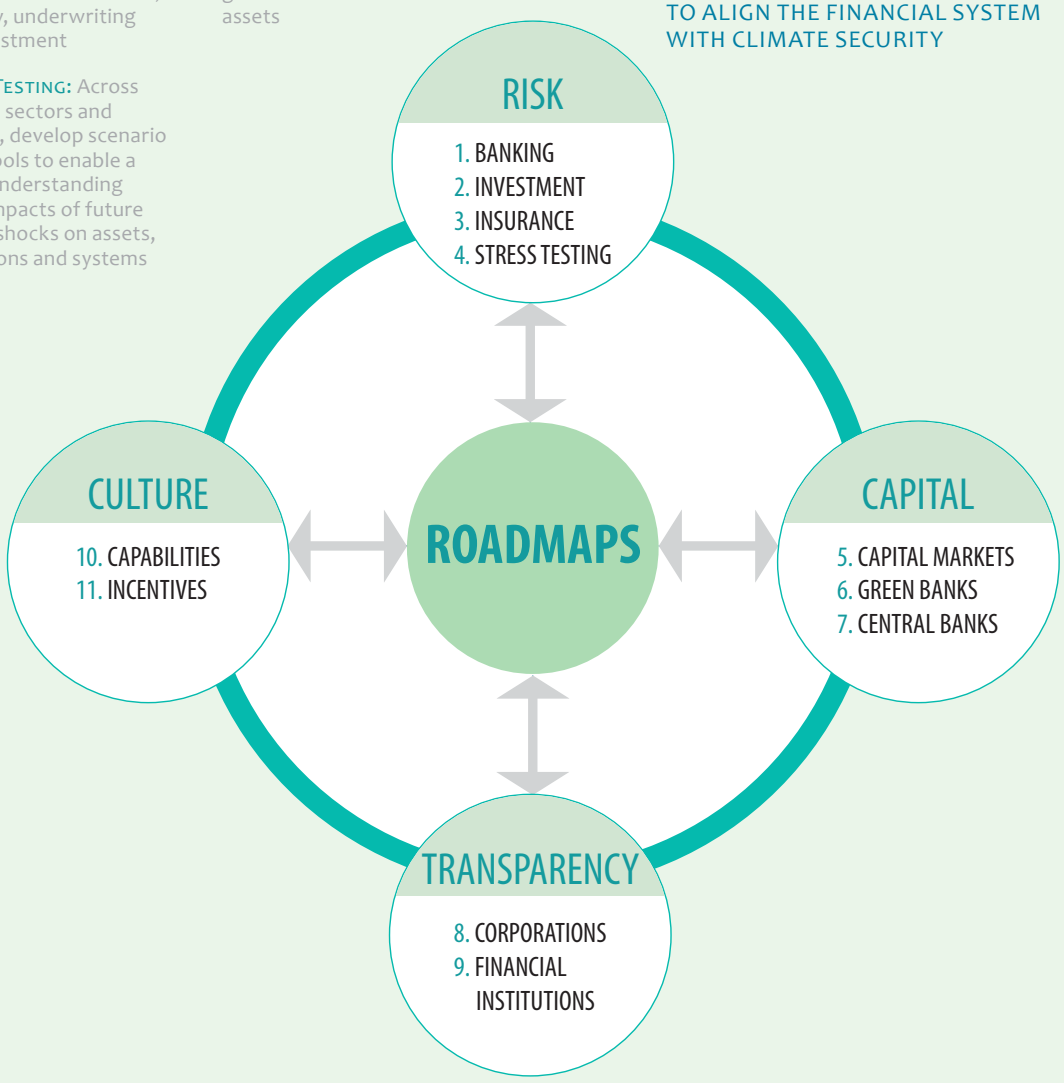
C. MAKE TRANSPARENCY SYSTEMIC

8. **CORPORATIONS:** Ensure that corporations and issuers of securities publicly report on critical sustainability and climate factors to investors and other stakeholders
9. **FINANCIAL INSTITUTIONS:** Enhance disclosure by financial institutions on allocations to green assets, climate performance and exposure to risk, as well as integration in investment analysis

D. STRENGTHEN FINANCIAL CULTURE

10. **CAPABILITIES:** Build capabilities among financial professionals and regulators on sustainability and climate factors
11. **INCENTIVES:** Link remuneration, compensation and broader incentive structures with sustainable value creation over the long-term

FIGURE 1: AN EMERGING FRAMEWORK TO ALIGN THE FINANCIAL SYSTEM WITH CLIMATE SECURITY



Policies to improve risk management and prudential approaches by banks, insurance companies and institutional investors are key. Examples include work by state insurance commissioners in the US to improve disclosure of climate factors and a review of climate implications for the insurance sector being conducted by the Bank of England's Prudential Regulatory Authority. A range of policy tools is also available to mobilise capital. Beyond 'green bonds', the Inquiry's work in India has highlighted considerable scope for listed investment trusts (or 'yieldcos') for clean energy finance. Central banks can also target their monetary operations at the green economy, as the Bangladesh Bank is doing with its refinancing mechanisms.

Improved reporting frameworks of sustainability and climate factors are also critical to ensure accountability. Market forces on their own have proved insufficient to deliver the necessary breadth, depth or consistency of corporate disclosure, prompting a proposal for a 'model reporting convention' in a submission to the Inquiry from the Climate Disclosure Standards Board (CDSB). Greater disclosure by financial institutions on green finance flows, carbon footprints and climate risk is also needed. To make this all happen, financial culture will need to be strengthened through improved skills and capabilities as well as by aligning incentives to sustainable value creation – both priorities that were highlighted in Switzerland's contribution to the Inquiry.

Reinforcing the financial system in these ways is a strategic exercise that will involve sustained effort. At the national level, the introduction of long-term strategies, roadmaps and national coordination mechanisms can have important signalling effects, building market confidence in long-term policy direction. Indonesia's financial regulator, OJK, for example, has developed a comprehensive Roadmap for Sustainable Finance, containing a package of measures to be sequenced over the next decade.

Based on this bottom-up experimentation at the country level, a number of promising avenues for international cooperation are now opening up. This could help to evaluate the impacts of existing initiatives, share good practice and ensure coherence with international regimes. Beyond the formal negotiations under the UN Framework Convention on Climate Change (UNFCCC), discussions are now underway on how to reflect climate factors in the global financial architecture. For example, the G20 Finance Ministers and Central Bank governors have asked the Financial Stability Board to explore how the financial sector could address climate issues. Other opportunities include the potential for collaborative research among central banks, efforts to link national innovations with the Basel banking accords and coordination among securities' regulators and accounting standards bodies to bring coherence to climate reporting.

Actions such as these will not just strengthen climate security – they will also contribute to a more efficient, effective and resilient financial system. Initial efforts both to remove barriers in the financial system that could hold back the transition, as well as leverage its innovative potential are underway. The outlines of a financial system that contributes to keeping global warming to below 2°C are becoming clear and are set to be deepened in the years ahead. At a time of weak global growth, low interest rates and unmet needs, a concerted approach to channeling capital to the next wave of infrastructure and innovation makes strategic sense. This is the coming financial climate.

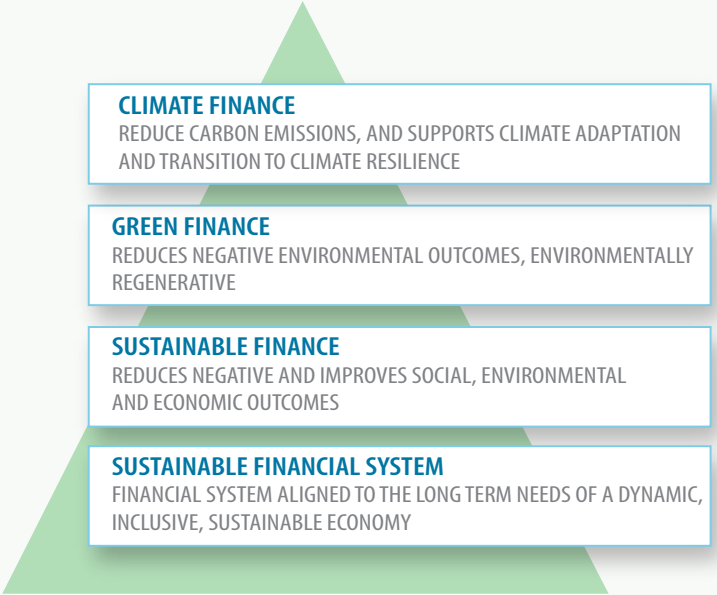
1. FINANCING THE TRANSITION

Across the world, a growing number of finance ministries, central banks and other rule-makers for the financial system are exploring the linkages between the financial system and long-term sustainable development. These actions complement policies to reform markets, allocate public finance and strengthen real economy policy frameworks in pursuit of sustainable development. In many cases, local environmental and social disruptions are providing the prompt for action. International threats such as climate change are also becoming a prominent catalyst for change. All of this is resulting in a range of overlapping actions to scale up climate, green and sustainable finance as illustrated in Figure 2.

2015 is providing added impetus to this fast-moving trend, with a series of interconnected steps seeking to develop a long-term framework for financing sustainable development. The first of these was the Sendai conference on disaster risk reduction, which highlighted the importance of investing in resilience to natural disasters and explicitly pointed to the role of financial regulators and accounting bodies.[1] The negotiations leading into the Financing for Development (FFD) conference in Addis Ababa in July have also highlighted a range of promising measures, including the potential for capital market regulations to ensure that incentives along the investment chain are fully aligned with long-term performance and sustainability.[2] In the Inquiry's work, notably in Africa and Asia, we have found considerable interest in fresh approaches to mobilizing capital as part of the FFD process[3]. The Addis Ababa meeting will produce a global framework for financing sustainable development, underpinning the new Sustainable Development Goals, which will be launched in September. Finally, the UNFCCC will meet in Paris in December to finalise a new climate change agreement.

In the Inquiry's work at both the country and international levels, harnessing the financial system to deliver climate security has emerged as a key cross-cutting issue. As a result, we are focusing this document – the Inquiry's fourth progress report – on financial reforms that can reduce the risks of

FIGURE 2: THE LINKS BETWEEN CLIMATE, GREEN AND SUSTAINABLE FINANCE



high carbon assets, scale up capital for the low-carbon transition and invest in protecting economies from natural disasters and climate shock.

Placing the financing challenge around climate change within the broader context of the green economy and sustainable development is essential to mobilise the capital that is required. The costs of high carbon growth include severe health impacts and disruption to infrastructure, water and food security, all contributing to increasing market volatility, as well as livelihood and economic impacts, particularly in developing countries. Critical dimensions of this nexus include:

- ***Air pollution:*** Urban air pollution is predominantly caused by the burning of fossil fuels, which also release greenhouse gases (GHGs). The World Health Organisation (WHO) estimates that 7 million premature deaths annually are linked to air pollution exposure – more than double previous assessments – and that death rates are increasing.[4] Tackling urban pollution has been one of the major drivers of green financial policy initiatives in China, such as the green credit guidelines in the banking sector.

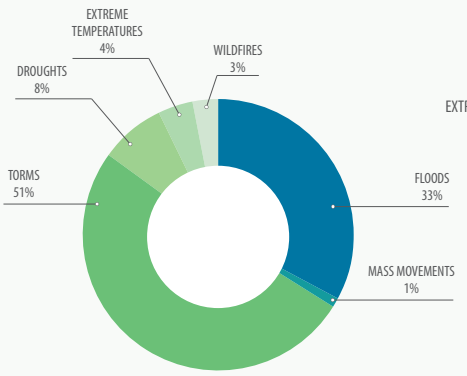
- ***Natural Disasters:*** More people were displaced by natural disasters than war in 2013.[6] During the past decade, 80% of natural disasters were climate related,[7] and climate change is predicted to increase the frequency and intensity of extreme weather events such as floods and storms.[8] According to Munich Re, climate-related natural disasters are increasing in frequency and scale,[9] resulting in significant economic impacts.[10] The UNISDR has estimated the annual global costs of natural disasters to be in the range of US$250-300 billion USD, with global average annual losses estimated to increase to US$415 billion USD by 2030 – based on investments in built infrastructure alone.[11] In a soon-to-be released study commissioned by UNISDR, AIR Worldwide suggest little prospect for reducing annual economic losses from natural disasters, which are projected to triple to $750 billion by 2030.[12]

"Since the beginning of the 21st century, China's financial policies have gradually imposed restrictions on certain high-pollution and energy intensive industries [...] A wide range of measures including control of total emissions, lending restrictions, and environment-related veto powers have been introduced to restrict polluting loans and financing and support energy conservation, emission abatement and phase out of obsolete capacities."

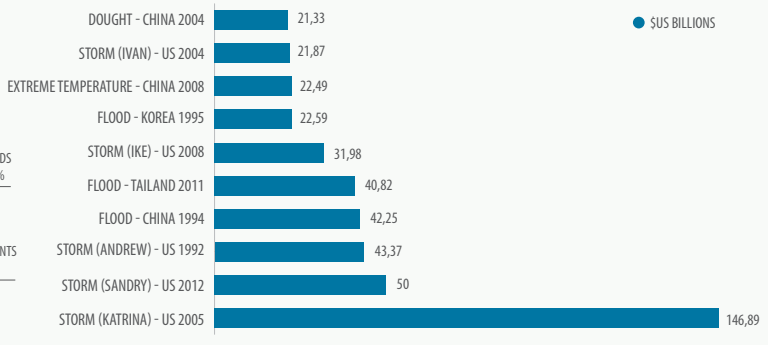
Pan Gongsheng,
Deputy Governor of the People's Bank of China [5]

FIGURE 3: THE COST OF NATURAL DISASTERS

Global economic losses by hazard type
1970 - 2012



Top 10 costliest natural disasters,
1970 - 2012



Source: WMO, 2014

- ***Water Stress:*** By 2050, 45% of global GDP is forecast to be at risk due to water stress.[13] Climate change exacerbates the underlying imbalance between rising demand and falling supply of water, intensifying extreme events, such as floods and droughts. The Intergovernmental Panel on Climate Change (IPCC) finds robust evidence and high agreement that freshwater related risks of climate change will increase with GHG concentrations, that the impacts of climate change will intensify competition for water among agriculture, ecosystems, settlements, industry, and energy production, affecting regional water, energy, and food security.[14] 2015 marked the first year that water risks were recognised by the World Economic Forum as the single greatest social and economic global risk in terms of impact over the next 10 years.[15]

- ***Food security:*** Through impacts on temperature, rainfall patterns, water availability, and extreme weather, climate change[16] is impacting agricultural systems, livestock production, and fisheries stocks.[17] The combined effects of temperature and rainfall patterns are set to decrease crop yields, which could fall by up to 25% from 2050 onwards.[18] Increases in airborne pollutants, including ground-level ozone, are also predicted to negatively impact yields.[19] The IPCC has estimated that the impacts of climate change on agriculture could increase food prices by up to 84% by 2050. These disruptions are taking place against a backdrop of rising demand for food and depleting natural capital, notably in terms of soil quality. Already the impacts of extreme weather and water availability on food security have been recognized as drivers of food price shocks and social unrest.

The combined impact of these challenges is increasingly recognized as a clear and present threat to the economy and the financial system. The Inquiry's work in Kenya, for example, highlighted Kenyan government estimates which conclude that *existing* climate variability alone is costing 2.4 per cent of GDP per year,[20] with models suggesting that this economic cost will only increase in the future. Moreover, many of the economic models which guide decision-making may be significantly underestimating the risks and costs of climate inaction,[21].[22] Looking longer term, irreversible climate events – such as Greenland ice sheet melt, Amazon rainforest dieback, and shifts in ocean circulations – could individually cost 10% of global GDP over 50 years.[23] A smart approach that confronts these threats in a systematic way will generate a package of interlocking benefits.

Governments have agreed to keep global warming below 2°C, which means cutting global GHG emissions to net zero levels between 2055 and 2070.[24] To date, the bulk of emissions have been generated by industrialised countries, with the most severe impacts affecting the developing world. According to preliminary data from the International Energy Agency (IEA), global CO2 emissions from the energy sector flattened in 2014 – the first time in 40 years when a halt to rising emissions was not linked to a significant economic downturn.[25] This suggests the possible arrival of an absolute decoupling of emissions from global economic growth. But to stay within the carbon budget that keeps warming below 2°C, a peak in emissions is insufficient; deep cuts are also needed to build a successful zero carbon economy this century. The long-lived nature of critical infrastructure – cities, energy and transport – means that new investments will need to consistent with this global goal long before. The implications are far-reaching. Globally, one recent estimate argues that a third of oil reserves, half of gas reserves and over 80% of current coal reserves need to remain unused from 2010 to 2050 in order to meet the target of 2°C.[26] Cutting emissions, however, is only one part of this complex challenge. The other critical dimension is to protect economies and communities from slow onset and extreme events through adaptation and deal with residual costs.[27]

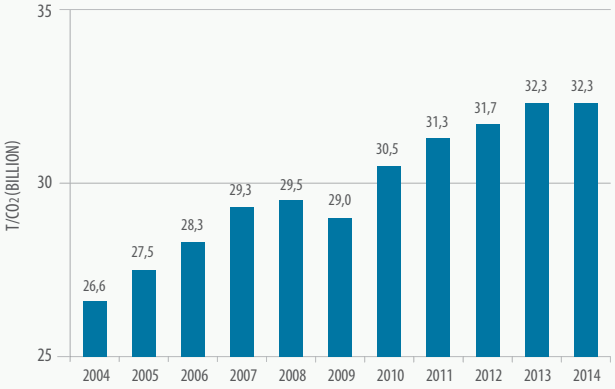
"It is essential that the financial system as a whole takes climate risk into account, anticipates ambitious targets and integrates this into its investment decisions."

Laurent Fabius,
Foreign Minister, France

A sustainable financial system plays three key roles to enable this transition a low-carbon, climate resilient economy:

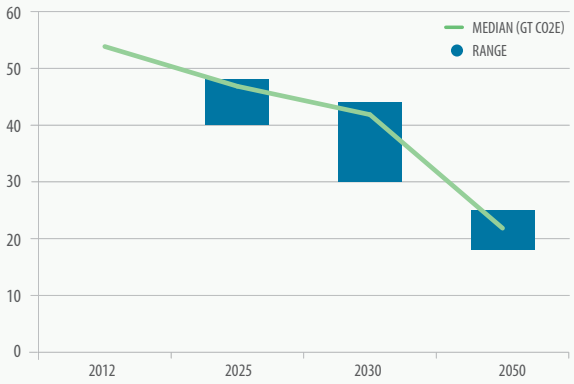
FIGURE 4: AFTER PEAKING, GLOBAL EMISSIONS MUST FALL RAPIDLY

Global energy-sector CO2 Emissions, 2004-2014



Source: IEA (2015 in press)

Required GHG emissions levels for staying within the 2°C limit



Source: UNEP, 2014

- first, it effectively recognizes the costs and risks of high-carbon and resource intensive assets;
- second, it allocates sufficient attractively priced capital to low-carbon, resource-efficient assets; and
- third, it ensures that financial institutions and consumers are resilient to climate shocks, including natural disasters.

To achieve this, an unprecedented capital reallocation is required, measured in trillions of dollars a year. At the international level, developed countries have committed to mobilise US$100 billion in annual financial flows to developing countries by 2020. Yet this is just one part of a wider shift. Looking at the switch from high-carbon to low-carbon assets, the IPCC estimate that global investments in low-carbon generation, energy efficiency across sectors, and additional energy-related R&D need to increase by as much as US$1.1 trillion per year between 2010 and 2029.[28] Over the same time, annual investments in fossil fuel power generation (without carbon capture and storage) and fossil fuel extraction will need to decrease by over US$530 billion in constant 2010 USD. The New Climate Economy report estimates that additional investment of US$4.1 trillion will be required by 2030 to align global infrastructure investment with low-carbon trajectory on top of an existing US$89 trillion.

FIGURE 5: THE THREE-FOLD ROLE OF THE FINANCIAL SYSTEM IN DELIVERING CLIMATE SECURITY

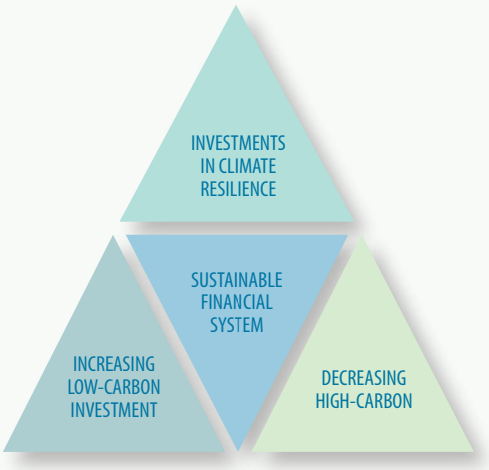
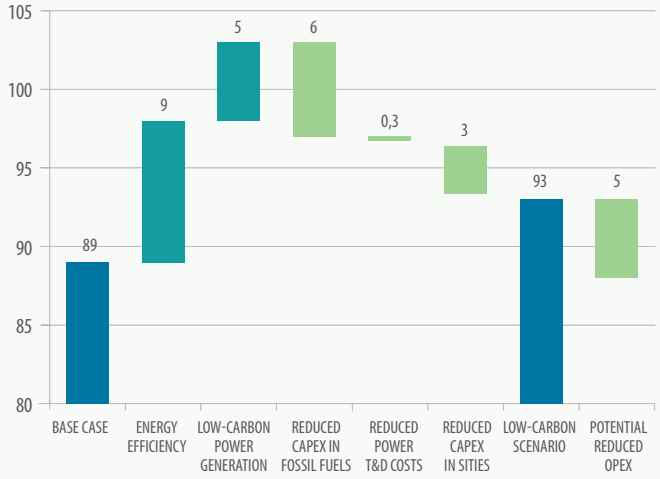


FIGURE 6: GLOBAL INFRASTRUCTURE INVESTMENT REQUIREMENTS (US$ TRILLION 2010 VALUES)



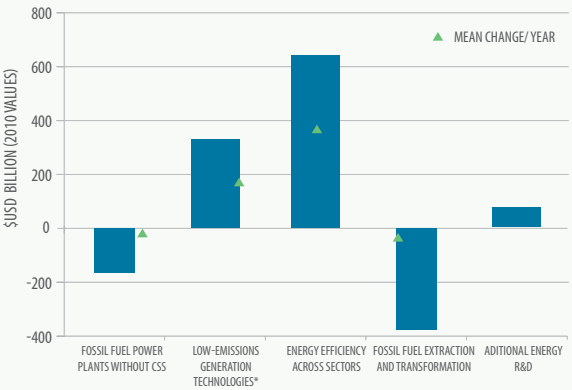
Source: Global Commission for the Economy and Climate[29]

Substantial finance will also be required to ensure that the global economy is climate resilient – not just low-carbon. Even a 2°C rise will require significant investments in adaptation in order to avoid disruptive impacts. The IPCC recently published estimated annual costs of adaptation in developing countries at between US$70 billion and US$100 billion by 2050. However, the IPCC noted that there is "little confidence" in these estimates.[30] The recent 'Adaptation Gap' report from UNEP concludes that current evaluations of global adaptation costs are likely to be significant underestimates. Extrapolating the estimates put forward in detailed national-level and sectoral studies, UNEP suggests plausible adaptation costs for 2°C of warming to be US$150 billion/year by 2025/2030, and US$250-500 billion/year by 2050.[31] At five times higher than the IPCC estimate, these figures illustrate the considerable level of uncertainty – and potential risk of far higher adaptation costs associated with warming beyond 2 degrees.

This financial transition is already underway – but the next phase will involve a profound shift in focus and strategy. In 2014 at the Lima climate change conference, the UNFCCC's Standing Committee on Finance estimated that global flows of climate finance were US$340 billion a year at the lower end for the period 2011-12, with the up-

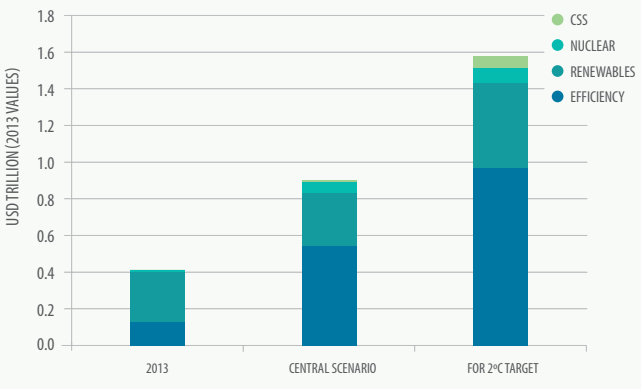
FIGURE 7: THE SCALE OF THE CAPITAL SHIFT

Changes annual investment flows, 2010-2029 ($USD b/yr)



Source: IPCC (2014), based on various studies.
** Low-emissiones technologies renewables, nuclear, and fossil with CCS.*

Annual low-carbon investment, 2014-40 ($USD t/yr)



Source: IEA (2014).

per end at US$650 billion, and possibly higher.[32] One part of this is financing the deployment of renewable energy. In 2014, global investments in renewable energy rebounded strongly, registering a solid 17% increase after two years of declines, according to a recent assessment from the Frankfurt School of Finance, Bloomberg and UNEP. As a result, renewables made up nearly half of the net power capacity added worldwide.[33] Looking ahead, annual investments in renewables will need to double, according to the International Energy Agency. But annual investments in energy efficiency in buildings, industry and transport will need to expand over 7.5 times from 2013 levels to achieve a 2°C scenario by 2040.[34] The G20 is now focusing on closing this gap through a new Energy Efficiency & Finance Task Force Group, which held its initial meeting in March 2015.

These allocations need to be recognised as investments yielding positive returns. According to the Climate Policy Initiative, for example, "transitioning to a low-carbon electricity system could actually increase the capacity of the global financial system by as much as US$1.8 trillion between 2015 and 2035".[35] Just as important is reallocating capital away from the risks associated with high carbon assets – notably coal – from the convergence of economic and environmental arguments. According to Carbon Tracker, over US$1.1trillion in fossil fuel capital expenditure through 2025 would become uneconomic in a carbon-constrained world.[36] As a result of these material risks, a growing number of financial institutions are cutting exposure to coal companies – with increasing pressure from citizens and civil society for divestment from fossil fuel assets.

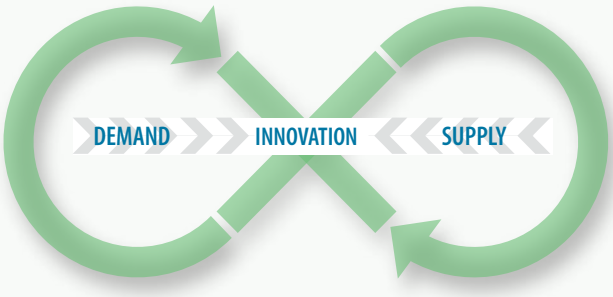
Public finance is crucial, but can only provide a portion of the capital required. At the country level, China estimates that the annual investment in green industry should reach RMB2 trillion during the Thirteenth Five Year Plan period (US$320 billion), with public finance estimated to provide no more than 10 to 15 % of the total. To address this challenge, a task force, co-convened by the People's Bank of China and the Inquiry, has recently published a comprehensive set of recommendations for establishing China's 'green financial system'. The task force concluded that: "without an efficient green financial system, the investment required to improve China's environment will either put an unbearable amount of fiscal pressure on the government, or will not accomplish China's intended goals in cleaning up pollution".[37]

Pricing carbon is essential along with measures to remove fossil fuel subsidies and reflect other externalities in market values. The risk: reward ratio for climate finance is steadily improving – but capital markets often still regard low-carbon options as the high-risk option, reflecting this in elevated discount rates for the cost of capital. A necessary step to close this gap is the use of carbon pricing. According to the World Bank, almost 40 countries and more than 20 cities, states and provinces already use carbon pricing mechanisms or are planning to implement them.[38] Removing fossil fuel subsidies, which primarily benefit the wealthy, and implementing carbon taxes or cap-and-trade systems are two ways to free up or generate revenue that can lower costs of education, health care, and infrastructure and provide direct support for the poor while also reducing carbon emissions.[39] Getting the prices right also needs to be matched by strategic policies for energy efficiency and clean energy and planning frameworks that deliver resilience to create the fundamental demand for green financial services.

The financial system itself will also need to evolve, thereby creating a dynamic relationship between the demand and supply for low-carbon, resilient finance depicted in Figure 8. From its work with partners across the world, the Inquiry has identified five key reasons for action within the financial system to deliver climate security.

a) **Financial market weaknesses can exacerbate capital misallocation:** Market failures within the real economy create economic and social costs now and in the future. These can be exacerbated by structures and practices within the financial system, such as short-termism, inadequate transparency, ill-defined responsibilities and misaligned incentives. A core role for financial policy and regulation is to tackle these externalities and spillovers, especially

FIGURE 8: THE DYNAMIC BETWEEN THE DEMAND AND SUPPLY FOR LOW-CARBON, RESILIENT FINANCE



where they have potentially systemic implications as is the case with climate change.

"The central bank time horizon is relatively short - 1.5-2 years – but the real challenges to prosperity and economic resilience from climate change will manifest well beyond this. We face a 'tragedy of horizon."

Mark Carney, Governor,
Bank of England

b) **Climate change itself poses novel risks to financial assets:** These risks include both the intensification of physical disruption as well as transition risks for high-carbon assets ('stranded assets'). Existing frameworks are particularly ill-prepared for risks such as climate change which are not included in historical models, are poorly priced and aggregate over time to produce irreversible impacts. For example, in the banking arena, Professor Kern Alexander has concluded that "by failing to address systemic environmental risks, Basel III is arguably overlooking an important source of risk to the financial system".[40] If an orderly transition is not delivered, then the financial system as a whole could be exposed to shocks that threaten its structure and function – both through direct physical impacts and the transitional disruption to high-carbon assets.

c) **Access to green finance needs to be improved, particularly in developing countries:** Financial markets tend to undersupply capital for long-term infrastructure as well as small and medium-sized enterprises (SMEs). Here, regulatory reforms can support market-led green financial innovation. The growth of 'green bonds' is a case in point, where a package of policy measures can facilitate growth (see page 14).

d) **Action in the financial system can be more effective to mobilise finance at scale:** Classic climate policy tools such as carbon pricing are essential. But they have limitations. According to France Stratégie, for example, "by affecting the returns of past and future investments, carbon pricing directly hurts installed capital and existing patterns of consumption" creating social and political opposition.[41] Measures to reflect externalities in the cost of capital within the financial system may prove more effective.

e) **Coherence between financial rules and climate policy goals is needed:** The rules that govern the financial system have an array of goals, including supporting growth and employment, ensuring system stability and integrity as well as promoting financial inclusion and access. Long-term imperatives such as climate change have rarely been consciously incorporated into the design of financial regulation, raising the risk of unintended consequences as well as overlooking opportunities for positive synergies. Responding to this, institutional investors with combined assets of US$ 24 trillion have called on governments to "consider the effect of unintended constraints from financial regulations on investments in low carbon technologies and in climate resilience."[42]

2. TOOLS TO ALIGN THE FINANCIAL SYSTEM WITH CLIMATE SECURITY

The task for those charged with governing the financial system is to enable the orderly transition from high- to low-carbon investments and also from vulnerable to resilient assets. Our work with a range of partners including central banks, financial institutions and international organisations has highlighted a diversity of catalysts and approaches across banking, capital markets, insurance and investment. These include:

- Expanding access to green finance to strengthen economic development (Bangladesh)
- Strengthening the resilience of the banking system to environmental and social risks (Brazil)
- Responding to major environmental pollution problems (China)
- Mobilizing finance for the ecological transition (France)
- Strengthening the alignment of investors with the green economy (South Africa)
- Assessing the links between climate risks and prudential regulation (UK)
- Improving the functioning of securities markets on climate change (US)

Importantly, there are strong links between climate security and the underlying mandate of financial policy and regulatory institutions. Table 1 sets out our current understanding of the linkages.

> *"In the face of fundamental threats such as climate change, central banks can play a key role in delivering inclusive, sustainable development. For the Bangladesh Bank, green finance is a strategic tool to reduce risks, support productive investment in clean energy and build a more resilient financial system."*
>
> **Dr Atiur Rahman,**
> Governor, Bangladesh Bank and Inquiry Advisory Council Member

Drawing from the array of policy innovations at the country level, this section details a set of 11 measures that can make climate security part of the overall performance framework of a sustainable financial system. These covers risk, capital mobilization, transparency and culture. Clearly, each country will need to decide how these options relate to its financial system and the priorities for action. In each case, we draw on existing practice and emerging thinking.

TABLE 1: HOW CLIMATE CHANGE FITS WITH FINANCIAL MANDATES

AGENT/MANDATE	LINKS TO SUSTAINABILITY & CLIMATE	EXAMPLES FROM PRACTICE
CENTRAL BANK *Financial Stability*	Central banks assess vulnerabilities affecting the financial system, and risks arising from these vulnerabilities. Climate impacts may pose significant costs to the real and financial economies, creating volatility and disorderly market transitions.	**UK:** the Bank of England's Financial Policy Committee is monitoring climate risks[43] alongside a Prudential Regulatory Authority review of insurance & climate.
CENTRAL BANK *Monetary Policy*	Central banks seek price stability through regulation of the money supply and interest rates. Monetary policy operations can impact on the deployment of capital for the low-carbon economy.	**Bangladesh:** The Central Bank is using monetary policy instruments (including concessional refinancing) to promote climate resilience and sustainability objectives.
BANKING REGULATOR *Banking regulation and supervision*	Prudential banking regulations and supervisory activities aim to control a range of risks facing banks (e.g. credit, market, operational, reputational). Socio-environmental and climate factors can influence these risks at the asset, institutional and market levels.	**Brazil:** In 2014, the Brazilian Central Bank introduced requirements for all banks to have environmental and social risk management systems in place.
INSURANCE REGULATOR *Prudential regulation and supervision*	Prudential insurance regulations are aimed at ensuring the solvency and soundness of insurance companies. Natural disasters and the physical impacts of climate change are having increasing impacts on the re/insurance industry. Insurance sector investments could also be impacted by the low-carbon transition.	**US:** In 2012, state regulators, working through the National Association of Insurance Commissioners provided guidance on questions to ask insurers regarding any potential impact of climate change on solvency.
PENSION REGULATOR *Fiduciary duty and other obligations*	Pension and other investment regulations are designed to protect savers' interests and ensure prudent management. Climate change can impact this in multiple ways, particularly over the long-term.	**South Africa:** The South African Pensions Act has clarified that prudent investors must consider environment factors that may materially affect long-term performance.
SECURITIES REGULATOR *Investor protection and market efficiency*	A central role of securities regulators is to facilitate transparency in markets through disclosure requirements. If companies do not appropriately disclose risks posed by climate change, market failures may arise.	**Singapore:** In 2012 the Singapore exchange released guidance on sustainability reporting for listed companies, promoting climate disclosures relating to mitigation and adaptation.[44]
STANDARDS BODIES *Accounting and financial reporting standards*	National and international accounting and reporting standards (including IFRS and GAAP) provide common frameworks for reporting business performance and accounting for risk. Climate change may pose material risks to business value through multiple channels, and traditional standards may not adequately reflect how these risks may impact the firm.	**Global:** The Climate Disclosure Standards Board (CDSB), Sustainability Accounting Standards Board (SASB), and others are developing new frameworks for sustainability and climate accounting and disclosure.

A. EXPAND THE SCOPE OF RISK MANAGEMENT

1. BANKING: Place long-term sustainability and climate factors in risk management systems and prudential approaches for lending and capital market operations ('green credit')

2. INVESTMENT: Ensure that institutional investors (including pension funds) manage long-term climate factors as part of core risk, fiduciary and other investment obligations

3. INSURANCE: Integrate long-term climate factors into wider insurance frameworks for inclusion, solvency, underwriting and investment

4. STRESS TESTING: Across financial sectors and markets, develop scenario based tools to enable a better understanding of the impacts of future climate shocks on assets, institutions and systems

Climate change is a strategic challenge for risk management in the financial system – poorly priced, uncertain in its impacts, with consequences over timeframes that extend beyond the normal horizons of both financial institutions and regulators. Cutting across different financial sectors, key features of effective action by financial system decision-makers include:

- Clarifying that sustainability and climate factors are part of prudent financial practice (for example, through fiduciary duty and other responsibilities)
- Making sure that core prudential regulations do not put unintended barriers in the way of financial institutions responding to long-term challenges
- Placing these factors as part of core risk systems and the risk appetite of financial institutions
- Checking that sustainability and climate risks are managed as part of due diligence at the operational level, including discount and hurdle rates
- Matching the responsibilities of financial institutions with appropriate legal frameworks for liability
- Monitoring potential systemic risks to financial institutions as a whole flowing from environmental stress

> *"In a plausible worst case for climate damage, the value at risk in 2030 may be equivalent to a permanent reduction of between 5% and 20% in portfolio value compared to what it would have been without warming. This risk can be substantially lowered by a rapid energy transition to reduce greenhouse gas emissions."*
>
> **Howard Covington & Raj Thamotheram**[45]

We have identified four priorities for policy to bring a convergence of risk management and prudential approaches with climate factors.

1 **Banking:** Bank lending and capital market activities can both contribute to climate change and other environmental impacts – and in turn be impacted by climate disruption and the transition to a low-carbon economy. A growing number of countries are introducing environmental and social risk factors into routine banking policy and regulation, notably Bangladesh, Brazil, China, Indonesia and, most recently, Peru. These policies are designed to strengthen compliance, due diligence and risk management within the banking sector across the sustainability agenda.

In Brazil, the central bank (BACEN) has issued a number of resolutions on socio-environmental risk to strengthen the efficiency and soundness of the financial system, including on forestry and low-carbon agriculture. Following a voluntary Green Protocol from the banking sector and considerable dialogue in 2014, BACEN introduced requirements for all banks to establish socio-environmental risk systems based on the principles of relevance and

proportionately.[46] The Brazilian Federation of Banks (Febraban) has introduced a self-regulation framework to aid implementation, and climate change is among the risks that individual banks are identifying.[47] BACEN has also asked banks to monitor environmental losses as part of the Internal Review for Capital Adequacy (ICAAP). In Indonesia, as part of the recently launched Sustainable Finance Roadmap, the financial regulator OJK will be exploring the provision of prudential incentives, such as a certain level of risk-based balanced asset (ATMR) in consideration of a risk mitigation mechanism in 2015-16.[48]

2 **Investment:** Recognition is growing among leading investment institutions and policymakers that sustainability and climate factors are a material part of prudent long-term asset management on behalf of savers and beneficiaries. However, there is often a gap in both perceptions and practice in the investment chain. As a result, it can be necessary for policymakers to make it explicit in law and guidance that these factors need to be mainstreamed in routine investment practice.

In over 10 countries, there are now explicit legal requirements of various types on institutional investors to take account of environmental, social and governance factors. Examples include:

- In South Africa, the 2011 amendment to the Pensions Act (Regulation 28) requires funds to take account of factors that materially affect sustainable long-term performance, including ESG elements.[49]

- In the Netherlands, the Dutch Pensions Act requires funds to report on 'how their investment policy takes account of the environment and the climate' as part of delivery of prudent investment.[50]

- The proposed European Union directive on Institutions for Occupational Retirement Provision (IORP) highlights the need to inform members of the fund of 'how environmental, climate, social and corporate governance issues are considered in the investment approach.'[51]

Specific guidance on the links between climate risk and the responsibilities of institutional investors would help to accelerate the integration process.[52] At an international level, the UN Global Compact, the PRI, the UNEP Finance Initiative and the Inquiry are developing a roadmap for the integration of environmental, social and governance factors into investment practice as part of fiduciary duty.[53] The results will be published in September.

3 **Insurance:** Insurance policy has long been focused on risk management with regard to natural hazards such as earthquakes, cyclones and floods – and ensuring that the market provides affordable insurance for households and enterprises. Climate change profoundly reinforces the long-standing policy imperative of ensuring access to insurance to reduce vulnerability, particularly in developing countries. Internationally, the Access to Insurance Initiative is working to extend risk-based cover to low-income and vulnerable communities, as well as regional initiatives such as the Regulatory Framework Promotion of Pro-poor Insurance Markets in Asia.

Insurance regulators are also starting to explore the implications of climate risks for the insurance sector, both in terms of underwriting and investment management. In the US, numerous key states with significant market share, including California, Connecticut, Minnesota, New York and Washington, are implementing an annual *Insurer Climate Risk Disclosure Survey*, initially designed by the National Association of Insurance Commissioners. In 2013, the NAIC adopted revisions to the Financial Condition Examiners Handbook to provide examiners with guidance on what questions to ask insurers regarding any potential impact of climate change on solvency and to provide a framework for them when examining such

risks and their impact on how an insurer invests its assets and prices its products. A recent analysis of the disclosures made by 330 of the largest insurers concluded that most of the company responses show a "lack of preparedness in addressing climate-related risks and opportunities".[54]

"Climate change is an obvious physical threat to all of us, but increasingly it also poses a serious financial threat to the insurance industry, which could impact the affordability of insurance products. In order to maintain available and affordable insurance, the insurance industry and regulators can and should play a role in addressing this challenge by working with other industry sectors, policymakers and the general public."

Dave Jones,
Insurance Commissioner,
State of California, US

In the UK, the Prudential Regulation Authority (PRA), part of the Bank of England, is undertaking a review of the implications of climate change for the PRA's mandate to ensure the 'safety and soundness' of insurance companies and the protection of policyholders. The review flows from the UK's 2008 Climate Change Act and a request from the Department for Environment, Food and Rural Affairs (Defra) to submit a Climate Change Adaptation Report, which will be completed in July 2015.[55]

4 **Stress Testing:** To overcome the 'tragedy of horizon', the impacts of future environmental shocks need to be considered and included in today's asset values and capital allocation decisions. This is particularly important for climate change which is not included in traditional models.[56] One response is the development of 'environmental stress tests' (ESTs) as a tool to evaluate the financial impacts of plausible environmental scenarios on assets, portfolios, institutions and financial system as a whole.[57]

Many parts of the financial system—banks, insurance and pension funds—are used to a scenarios-based approach to stress testing for conventional risk factors.[58] The task is now to apply and adapt these approaches for environmental risks such as urban air pollution, natural disasters, water insecurity and climate policy.

The re/insurance sector has the longest history of incorporating environmental factors such as extreme weather events into their annual solvency assessments, testing their resilience against the worst combination of 1 in 200 year events. Importantly, progress has been achieved not through a single measure, but a series of interlinked regulatory metrics, financial regulation and reporting, credit ratings, accounting standards and investor analysis and accountability. The '1 in 100 Initiative' is exploring how to extend this approach in the wider financial system, which could be done through new requirements for key public and private organisations to report their financial exposure to extreme weather and a minimum of 1 in 100 (1%) per year risk.[59] For the Initiative, the experience of the insurance sector shows that "encoding natural hazard into capital has had a transformational impact", concluding that "without this reform, it is impossible to imagine how we could have achieved a sustainable insurance system in the face of sharply increasing losses".

In the case of exposure to climate policy risk (or so called 'carbon exposure'), the work to date has included equity analysis of the discounted cash flow (DCF) implications of a low-carbon transition for fossil fuels companies.[60] Some fossil fuel companies are stress testing their own business models against a 2°C scenario, but as yet have not published the results.[61] This agenda is at an early stage of evolution. In the banking sector, one proposal has been to include 'environmental stress tests' in Basel's 'Pillar 2 – Supervisory Review' process.[62] Critical next steps could include the construction of shared scenarios to address different environmental factors through ESTs and the development of market guidelines for assessing different assets by financial institutions such as banks, insurance companies and pension funds.

"We cannot be sure that capital markets will deliver socially optimal outcomes, particularly for long-term assets. This problem is exacerbated in the case of low-carbon investment, because of the market failures represented by climate change. So it is worth exploring how to reflect this externality in the cost of capital as well as in energy markets, for example by adjusting risk weightings for high carbon assets or using publicly sponsored banks to provide lower cost finance"

Adair Turner,
Senior fellow, INET and Inquiry Advisory Council Member

B. SUPPORT THE ORDERLY REAL LOCATION OF CAPITAL

5. CAPITAL MARKETS: Upgrade debt and equity capital markets through standards, regulatory refinement, indices, enhanced analysis and fiscal incentives

6. GREEN BANKS: Establish green investment banks to strengthen the structure of the financial system and crowd in private capital

7. CENTRAL BANKS: Review monetary operations including collateral regimes, refinancing, asset purchases and others to incorporate green finance and climate assets

Policy reform on the supply side of the financial system can help to close gaps in the deployment of capital for a low-carbon, climate resilient economy. Support is particularly valuable where it:

- Responds to financial market failures, such as short-termism and excessive risk aversion towards new technologies
- Removes bottlenecks to the assessment of climate risks and opportunities by key market intermediaries
- Improves the functioning of the system by 'fixing the holes in financial plumbing' to enable improved access to finance
- Upgrades existing financial market regulation to respond to the new needs of mobilizing low-carbon, resilient finance
- Enables new investment vehicles for channeling capital into green assets
- Encourages innovation in market tools such as indices and benchmarks to respond to emerging demands

Turning to the three specific policy options:

5 **Capital Markets:** Over the past decade, there has been considerable innovation in both debt and equity capital markets to channel capital to low-carbon opportunities, such as clean energy, climate and fossil-fuel free funds and indices, as well as investment research incorporating climate factors. Policy can help to scale up these innovations and also address misaligned conventional practice, such as traditional equity benchmarks and indices, which are "significantly over-weight high carbon sectors relative to the real economy."[63]

A high priority area is the US$100 trillion bond market – both to scale up capital through 'green bonds' and effectively price climate risk in credit ratings. Growing the 'green bond' market has emerged as a priority theme in number of jurisdictions where the Inquiry is working, notably in Brazil, China, the European Union and India. In China, the Green Finance Task Force has published a set of policy recommendations to promote the issuance of green bonds, including clarification of definitions, provision of incentives and introducing a follow-up evaluation system.[64] Internationally, the Inquiry is working with the Climate Bonds Initiative, the OECD and the World Bank to develop a strategic guide for policymakers on how to scale up green bonds – and initial ideas are contained in the box page 14.

In the bond market, policy action can go beyond providing support for 'green bonds' to ensure that material climate factors are routinely incorporated in the criteria for credit ratings. A number of positive steps have been taken by leading credit rating agencies, such

POLICY TOOLS TO SCALE UP THE GREEN BONDS MARKET

Policymakers have a range of levers they can use - often in combination - to ensure that green debt capital markets grow with integrity and efficiency.[65] These could include:

i Principles and standards to ensure market integrity – with consequences for failure to allocate proceeds as published.

ii Strategic issuance by cities, development banks and other public agencies – a key step in market creation.

iii Reducing the cost of green bond issuance through simplification of the issuance process.

iv Supporting aggregation and securitization through market reforms – for example, within the European Union's Capital Markets Union process.

v Improving the risk: return profile of green bonds through credit enhancement.

vi Expanding the investor base via fiscal incentives – such as the Clean Renewable Energy Bonds (CREBs) in the US.

vii Developing green bond 'purchase' mandates for public investment institutions such as state investment and sovereign wealth funds.

viii Boosting demand through central bank balance sheet and asset purchase programmes.

ix Adjusting regulations facing institutional investors to remove unnecessary restrictions (e.g. constraints on purchasing securitized assets) or prudential requirements which penalize green bond holdings.

x Promoting international financial cooperation on green bonds – for example through the Green Climate Fund, a fund within the framework of the UNFCCC that will assist developing countries in adaptation and mitigation practices to counter climate change.[66]

as Standard & Poor's. For example, S&P concludes in a recent report that "if, as scientific evidence suggests, we experience more frequent and extreme climatic events, companies' existing insurance and overall disaster risk management measures could become considerably less effective".[67] UNEPFI's Environmental Risk in Sovereign Credit analysis (E-RISC) methodology is developing metrics and methods for integrating natural resource and environmental risks into sovereign credit ratings.[68] Yet environmental and social issues are still not being addressed in a systematic way. A key next step is to incorporate sustainability factors into the routine criteria for credit ratings. The Inquiry is working with the Principles for Responsible Investment, a coalition representing US$45 trillion of assets under management, to take forward ways of integrating environmental, social and governance factors such as climate change into credit ratings.

Alongside 'green bonds', there is also a need for investment vehicles for equity investment in long-term green infrastructure. According to SwissRe in an input to the Inquiry's work, "at this stage, there is a lack of a tradable asset class for institutional investors to easily access (low-carbon) infrastructure investments.[69] Linked to new structures, capital standards could need to be adjusted to more accurately reflect the risk characteristics of infrastructure.

One option is quoted vehicles such as investment trust, both for green real estate and also renewable infrastructure – know in the US as 'yieldcos'. According to the OECD, in the last 2 years, clean energy 'yieldcos' have raised more than US$6 billion dollars in investment.[70] Policy action can support this trend by establishing the regulatory basis for infrastructure investment trusts as has recently taken place in Brazil and India, which can then be tailored for sustainable infrastructure. Finally, rapid techno-

logical innovation is offering new lower cost ways of intermediating capita through peer to peer finance platforms that hold out considerable potential for the green economy if appropriately regulated at the national and international levels.[71]

"Finance for clean energy is about much more than climate change: it's about energy access, resource efficiency and cutting pollution. We need fresh policy approaches that do not just price carbon, but also recognise the fundamental value of water."

Naina Lal Kidwai, Chair,
FICCI Water Mission & past president, Federation of Indian Chambers of Commerce and Industry and Inquiry Advisory Council Member

6 **Green Banks:** Development banks provide vital finance for the climate transition – some US$126 billion in 2013 according to the Climate Policy Initiative.[72] In addition, they can pioneer key practices, such as carbon pricing in project appraisal, setting portfolio emission reduction targets and reporting on allocations to green finance priorities.[73] In this area, the Inquiry's interest is in the growth of national-level, green banks, which are being established specifically to fill gaps in the institutional architecture in key countries, usually where development banks are not established. Here, the key added value of green banks and funds can rest in "their capacity to foster institutional innovations and partner with other financial and regulatory institutions to increase the diversity and depth of local financial markets in order to enhance the domestic supply of green finance."[74] Over 10 green banks are now in operation, with notable examples including:

- In 2012, the UK government established the new Green Investment Bank (GIB) to address market failures within the financing of low-carbon investments. In spite of a carbon price and incentives for low-carbon investments, private investors remained excessively risk averse. The GIB was designed to overcome this problem by working on a commercial basis to crowd in private capital through co-investments.[75] With initial capital of £3.8 billion, the GIB has backed over 40 green infrastructure projects, committing £2 billion as part of transactions valued a c£7 billion. Importantly, the GIB has been pivotal in not just funding individual projects but also in creating 'missing markets', such as the launch of a new category of renewable energy infrastructure trusts. One next step would be for the GIB to be given the freedom to access capital markets by issuing green bonds.

- In China, one of the key recommendations of the Green Finance Task Force co-sponsored by the People's Bank of China and the Inquiry is for the government "to sponsor the creation of the China Ecological Development Bank, in which the government does not have to have a controlling interest". At the regional level, this would be matched by local green banks, funded mostly by private capital. These 'green banks' could have several channels to raise funds, including issuing green bonds and entering re-lending agreements with the central bank.[76]

7 **Central Banking:** For critical dimensions of the financial system, central banks offer a range of monetary operations to promote investment and liquidity. As with all central bank operations, such measures would need to meet core objectives of price and monetary stability on a risk-controlled basis.

In Europe, central banks have introduced specific mechanisms to encourage funding for small and medium-sized enterprises, including the Bank of England's Funding for Lending and the European Central Bank's Targeted Long Term Refinancing Operation (TLTRO). In a number of Asian countries, banks have specific lending targets for priority sectors, overseen by the central bank. In India, the Inquiry's work has identified the need to align priority sector requirements with the green economy: 40% of banking lending needs to be channeled to priority sectors, including agriculture, exports and SMEs.[77]

These tools are now being adjusted to support the green economy. In India, a Reserve Bank of India working group has recently recommended including loans to sanitation, drinking water

BANGLADESH BANK'S STRATEGY FOR MOBILIZING GREEN FINANCE

As part of its core mandate to support development, the central bank of Bangladesh (Bangladesh Bank) has introduced a strategy for green finance, including specific targets for bank lending.[79] By 2016, all banks need to allocate 5% of loans to green projects, across 47 products in 10 green categories, including renewables, energy efficiency and waste management. Banks finance these products from their own balance sheet or through BB refinancing. If green finance is provided from their own balance sheet, these loans are treated as high quality assets in terms of CAMELS (Capital adequacy, Asset quality, Management quality, Earnings, Liquidity and Sensitivity to Market Risk) and enjoy lower provisioning requirements. If banks use the BB's refinancing arrangements, they can charge a maximum interest rate of 9%, compared with the market rate of 12-15%; the BB refinance rate is 5%.

facilities and renewable energy under the priority sector ambit.[78] Bangladesh's central bank has also developed a comprehensive approach to green finance.

France Stratégie, the government's think-tank, has also proposed to make private low-carbon assets eligible for the ECB asset purchase programme. The carbon impact of these assets would benefit from a public guarantee that would value their carbon externality at a level sufficient to compensate the absence of an adequate carbon price. This mechanism would immediately impact the investment decisions of private actors with a positive effect on growth. It would also strongly incentivise governments to progressively implement carbon pricing tools to ensure that the public backing of the value of the carbon assets remains neutral with respect to public budgets.[80]

C. MAKE MARKET TRANSPARENCY SYSTEMIC

8. **Corporations:** Ensure that corporations and issuers of securities publicly report on critical sustainability and climate factors to investors and other stakeholders

9. **Financial institutions:** Enhance disclosure by financial institutions on allocations to green assets, climate performance & exposure to risk, as well integration in investment enhanced analysis

Transparency is essential for efficient and effective financial markets – in the area of climate change as well as traditional financial factors. For regulators, transparency provides 'market discipline' to encourage the right behaviours in financial institutions. For investors, transparency provides the foundations for accurate asset valuation and accountability to owners. And for society, transparency is vital for accountability and assessing the contribution that finance is making to resolving climate change.

Over the past decade, corporate disclosure of information on climate performance, policies and risks has grown substantially, largely on the back of voluntary initiatives such as the Carbon Disclosure Project – and the pressure from investors for key data to inform decision-making. Three critical challenges remain. First, market forces on their own have proved insufficient: only 39% of the world's large listed companies (defined as companies with a market capitalization in excess of US$2 billion – a total of 4,609 companies) currently disclose their GHG emissions.[81] Second, there is considerable duplication between the current patchwork of reporting requirements. In a submission to the Inquiry, the Climate Disclosure Standards Board (CDSB) suggests that there are almost 400 different provisions that directly or indirectly affect reporting of complementary information, such as climate requirements.[82] And third, there is scope for significant improvement in the way in which companies report on key climate-related risks, such as the impact of natural disasters or the potential for asset stranding in high carbon sectors.

Policy and regulatory action is particularly important to:

- Broaden the number of institutions reporting on climate change.

- Make disclosure a routine part of market operations, including on stock exchanges.

- Deepen the disclosure to ensure that critical risks are reported, including transition risks that could result in stranded assets.
- Ensure that disclosures are reliable, consistent and comparable, including at an international level.

- Monitor and enforce disclosure requirements.

In this action area, we focus on two policy options: disclosure for corporations and disclosure from financial institutions.

8 **Corporations:** A range of policy levers can be used to improve climate reporting by corporations and issuers of securities: company law, securities regulation and stock exchange listing requirements. Examples include:

- **Securities Regulation:** Of the International Organization of Securities Commissions' (IOSCO) 32 participating bodies, around a third have introduced a sustainability reporting initiative.[83] In the US, the SEC published binding interpretative guidance requiring companies to analyze climate change-related risks and opportunities. If material, the SEC requires them to report in their annual 10-K filings on how climate change could potentially affect their businesses. A recent review concluded that "by fully implementing its 2010 Interpretive Guidance on climate change disclosure, the SEC can help investors and companies mitigate" the material risks of climate change.[84]

- Stock Exchanges: In response to calls from shareholders and regulators, a number of stock exchanges already require or encourage their registrants to disclose material sustainability, environmental and climate change information. These include the exchanges in Johannesburg, Kuala Lumpur, Mumbai, Sao Paulo[85] and Toronto. Overall, however, there remans insufficient disclosure and a fragmented reporting landscape. To fill this gap, the CDSB has drafted proposed climate change reporting requirements for companies listed on stock exchanges.[86]

9 **Financial institutions:** Financial institutions themselves are an increasing focus for disclosure to ensure that they play their critical intermediary role effectively and transparently. Within the institutional investment arena, leading initiatives include the Asset Owners Disclosure Project, the Portfolio Carbon Initiative, the Portfolio Decarbonisation Coalition and the Montreal Carbon Pledge.[87] From the Inquiry's work with its partners, three specific priorities for financial transparency have emerged:

- **Tracking green financial flows:** Considerable progress has been made by development banks to agree a common methodology for tracking financial flows to low-carbon, climate resilient projects.[88] Promising private sector initiatives are also underway, such as the low-carbon investment registry established by the Global Investor Coalition[89]. But the Inquiry's work with country partners – for example in Colombia and Brazil – has highlighted the need for a common tracking system for financial flows and the low-carbon, resilient green economy that could eventually be equivalent to the Global Industrial Classification System and equivalent approaches. This would considerably enable market liquidity and asset allocation by financial institutions.

- **Carbon footprinting:** Carbon reporting by financial institutions reinforces disclosure by corporations. There have recently been calls from within the investment industry – including by the CEOs of the French and Swedish public pension funds ERAFP and AP4 – for mandatory carbon risk reporting by pension funds.[90] In addition, assessment is underway in France and Sweden for ways in which the sustainability performance of investment funds can be made visible for consumers, using labeling techniques. Critically important here is to distinguish between disclosure (including the

use of metrics) that illuminates a financial institution's carbon performance and disclosure that examines risk and vulnerabilities.

- **Investment analysis:** Like credit rating agencies in bond markets, sell-side investment analysts play an influential intermediary role in assessing risk and pricing assets in stock markets. Some progress has been made to integrate sustainability and climate factors, but this is not routine practice. To drive good practice, Aviva, the UK-based insurance group has proposed that "investment banks should be required to include a view on a company's performance on corporate governance, corporate sustainability, culture and ethics when they make their Buy, Sell and Hold recommendations".[91]

At a more strategic level, there is scope to link transparency on climate change and sustainability with the broader agenda better for reporting following the financial crisis. For example, the Financial Stability Board facilitated the establishment of the Enhanced Disclosure Task Force in May 2012 to promote "useful disclosure by financial institutions of their risk exposures and risk management practices."[92]

D. STRENGTHEN FINANCIAL CULTURE

10. CAPABILITIES: Build capabilities among financial professionals and regulators on sustainability and climate factors

11. INCENTIVES: Link remuneration, compensation and broader incentive structures with sustainable value creation

To realise a financial system that is more risk aware, effective at capital mobilization and transparent in terms of climate change will necessitate a supportive financial culture within both institutions and markets. Looking back, it is clear that failures in financial culture – in terms governance, incentives and behaviour – were central to the global financial crisis.[93] A range of policy measures has since been taken to strengthen financial culture, particularly in terms of risk.[94]

The relationship between financial culture, sustainable development and policy reform is a new area – but one that has emerged during the Inquiry's country level convenings. Two policy priorities stand out: capabilities and incentives.

10 **Capabilities:** A clear skills gap exists among financial professionals and regulators in the appreciation and understanding of climate and sustainability factors. The final report of Switzerland's input to the Inquiry concluded that "an indispensable and transversal requirement for facilitating the alignment of the financial system with sustainable development is a paradigm shift in business, economics and finance education".[95] Internationally, efforts are starting to incorporate sustainability factors into professional qualifications and continuing education. For example, the CFA Institute is planning to hold consultations and conferences with a range of firms and institutions on how to expand coverage of climate risk and impacts within the CFA curriculum, building on existing consideration of ESG issues. Policy can also encourage financial institutions to have the right board skills and capabilities related to sustainable development, including those who are not financial professionals (such as member representatives of pension funds).

In addition to financial practitioners, it is important that financial regulators, policy-makers, and other non-industry stakeholders have the capacities and capabilities to understand and manage climate and sustainability issues in a finance context. This was highlighted as a priority in Indonesia's Roadmap for Sustainable Finance, which specifically notes "the provision of environmental analysts trainings" as an implementation priority. Lack of regulator capacity and skills has been cited as a contributing factor to weak implementation of financial regulations focusing on climate. Internationally, agencies such as GIZ and IFC have focused on building capabilities within financial regulators.

11 **Incentives:** Incentive mechanisms, including remuneration and institutional fees, have profound effects on financial behaviour – and

have yet to include sustainability and climate factors at their core. Indeed, there is evidence that current systems of corporate remuneration have negative implications for long-term growth and returns.[96] In addition, the IMF has recently concluded that executive pay structures (including earnings and performance fees) are a key contributing factor in price bubbles and market volatility[97]. Again, the Swiss contribution to the Inquiry underscored that in spite of post-crisis reforms, "compensation schemes often remain complex" so that "it is not yet clear whether the recent improvements are sufficient to give due account to long term risk/performance factors".[98]

At the international level, guidelines from the Financial Stability Board (FSB) on compensation practices have lead to implementation of malus and clawback provisions in many countries as a way to align long-term compensation with prudent risk management[99]. These policy efforts have yet to include sustainability or climate factors. Some corporations and financial institutions are making progress towards aligning remuneration and incentive structures with climate and sustainability objectives – including linking components of variable compensation to sustainability factors, and the introduction specific quantitative performance targets[100]. However, this so far remains the exception rather than the rule across the financial system.

Remuneration, however, is only one part of a broader regime of incentives. The impacts of asset manager incentives on risk and stability within the financial system are becoming an increasingly important issue for financial regulators at national and international levels. In its most recent Global Financial Stability Report, the IMF has pushed for stress testing of asset managers, call for a "hands-on supervisory model" which could monitor how risk management practices and incentives affecting behavior[101]. To be sustainable, these incentive regimes need to include how they drive behaviour in ways that protect assets from climate shocks.

3. PATHWAYS TO A 2°C FINANCIAL SYSTEM

This emerging framework provides a foundation for strengthening the alignment between the financial system and climate security. It is, however, still new and incomplete. Action is limited to a relatively small number of countries – and the effectiveness of the measures that we have profiled has yet to be evaluated. A critical focus in 2015 is therefore to identify practical pathways that build on the emerging innovations at the national level – and advance an agenda for international cooperation.

Here, there is a converging set of processes that are putting in place a forward-looking financing framework, including the recent Sendai conference on disaster risk reduction, the financing for development conference (July), the launch of the Sustainable Development Goals (September) and the finalization of a new, universal climate change agreement in Paris (December). Opportunities exist elsewhere to promote this convergence. For example, within the G20, finance ministers and central bank governors in April called on the Financial Stability Board to convene public- and private-sector participants to review how the financial sector can take account of climate-related issues.[102] The G7 is also focusing on expanding access to climate risk insurance in developing countries.

At the national level, capital markets need confidence in the strategic intent of policymakers towards climate action and sustainable development. Long-term strategies, roadmaps and national coordination mechanisms can have important signalling effects.

In 2013, the French Treasury and Ministry of Sustainable Development jointly produced a White Paper on Financing the Ecological Transition,[103] containing 63 measures across four areas:

- Improving the predictability of signals sent to financial markets
- Completing the tool-kit of instruments to leverage private capital
- Reinforcing the integration of sustainability factors by financial institutions
- Reorienting financial behaviour around the ecological transition.

Action has subsequently focused on specific measures to promote financing for energy efficient building renovation, labelling for financial products as well as mandatory disclosure by asset owners of sustainability performance such as climate change.

"Wearing my dual hats as a central banker and regulator, let me underscore that sustainability lies at the heart of our decision making. It is not in doubt that there is a case for sustainable finance in Kenya. Kenya has ambitious plans to transition to a green economy. This comes with tremendous financing opportunities for both domestic and foreign financiers. Working in silos will not scale up sustainable finance. We should therefore come up with a holistic roadmap that incorporates the financial sector players, regulators, development partners and the Government."

Professor Njugana Ndung'u,
Governor of the Central Bank of Kenya [104]

As part of these roadmaps, national coordination mechanisms can be a critical enabler for advancing a sustainable financial system. China's recently established Green Finance Committee, overseen by the People's Bank of China, is a case in point.[105] Perhaps the most comprehensive roadmap has

been developed in Indonesia, which is detailed in the Inquiry's recent country report produced in partnership with ASRIA and the IFC.

At the international level, discussions are now underway on how to make the material aspects of climate change become a routine part of the governance architecture for the global financial system.[107] Alongside the formal negotiations on finance under the UNFCCC,[108] other promising avenues for international cooperation include:

- Launching collaborative research among central banks on how to manage systemic environmental risks such as climate change.[109]
- Promoting financial policy frameworks for mobilizing energy efficiency finance within the G20.
- Exploring the links between climate change and the governance of risk within the Financial Stability Board.[110]
- Bringing coherence between climate reporting standards and wider disclosure requirements, for example, through a 'model convention' process, a proposal made in a submission to the Inquiry from the Climate Disclosure Standards Board (CDSB).[111]
- Incorporating sustainability factors (including climate) into the Basel Accords, notably into pillars two and three: supervisory review and market discipline.[112]
- Developing guidance on how to apply Insurance Core Principles produced by International Association of Insurance Supervisors to the challenge of climate change, building on the successful work on financial inclusion.
- Sharing best practice on the links between climate change and investor governance within the International Organisation of Pension Supervisors.

These efforts and more would only be the start. It will take many years to build a financial system whose fundamental performance is aligned with climate security.

THE ROADMAP FOR SUSTAINABLE FINANCE IN INDONESIA [106]

In December 2014, Indonesia's financial regulator, OJK, released its roadmap for sustainable finance, with three key goals:

- To improve the resilience and competitiveness of financial service institutions and enable them to grow and develop in a sustainable manner through improved risk management and an ability to innovate and produce environmentally friendly products and services.
- To unleash financing resources that will be required to achieve Indonesia's pro-growth, pro-job, pro-poor and pro-environment developmental goals.
- To contribute to the national commitments regarding climate change mitigation and adaptation and support the transition toward a competitive low carbon economy.

The Roadmap's implementation plan comprises no less than 19 activities that are envisaged for the period 2015-2024, ranging from the introduction of new regulatory provisions relating to sustainable finance; refining policies for risk management to include environmental and social aspects; developing prudential, fiscal and non-fiscal incentives for financial institutions to enhance sustainable finance; developing green lending models for priority sectors; demanding mandatory sustainability reports from financial institutions; introducing sustainable finance awards; to fostering the development of green product both for banking and nonbanking industries.

The opportunity is two-fold: first, ensuring that the financial system does not impede the transition process; and second, harnessing the financial system to achieve the transition as efficiently and securely as possible.

Indeed, work from a number of the Inquiry's country partnerships suggests that sustainability factors such as climate are increasingly core to the under efficiency, effectiveness and resilience of the financial system.

The result will be a 2°C financial system – which would have some of the following key characteristics

"Greening a country's financial system is not an "additional" performance requirement but concerns the efficiency and effectiveness of the whole system. A lack of green financing, after all, delivers poor allocation of capital, mispriced risks and weaker long-term economic growth, creating stresses that ultimately lead to financial market instability and under performance."

Development Research Council of the State Council, China & International Institute for Sustainable Development [113]

KEY CHARACTERISTICS OF A 2°C FINANCIAL SYSTEM

- Achieving universal access to financial services both for protection from climate disruption and mobilization of low-carbon investment.
- Allocating capital within the framework of the global carbon budget – and pricing assets accordingly.
- Ensuring that climate risks and threats of natural disasters are routinely measured, reported and acted upon to protect households, communities and enterprises.
- Fully aligning the responsibilities and duties of financial institutions, markets and regulators with climate security.
- Delivering governance mechanisms that ensure the accountability of financial institutions for climate performance to supervisors, investors, savers and citizens.
- Driving a culture of long-term sustainable value creation and stewardship through aligned incentives and strong risk management capabilities.

APPENDIX – ABOUT THE INQUIRY

The Inquiry into the Design of a Sustainable Financial System aims to advance policy options that would improve financial system's effectiveness in mobilizing capital towards a green and inclusive economy—in other words, sustainable development.

The Inquiry's approach is to crystallize relevant experience into a coherent framework to support action by those responsible for setting the rules governing the financial system. This includes central banks, financial regulators, finance ministries and financial market standard setters, such as accounting standards, credit rating and indexes and voluntary initiatives.

The Inquiry was launched in January 2014 and is running over two years. Its programme includes intensive research and engagement at the country level.

The Inquiry works with and through a growing network of partners in the public, private and civil society sectors.

Three Core Questions

Why and under what circumstances should the rules governing the financial system be deployed in pursuit of sustainable development outcomes?

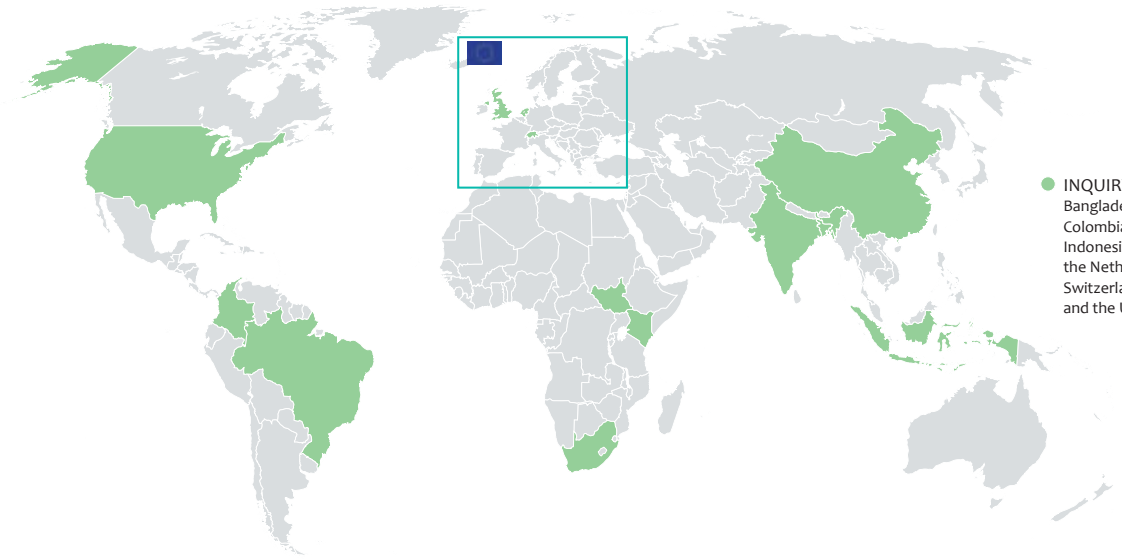
What rules governing the financial system have been, or could be, deployed for achieving sustainable development?

How can rules be most effectively deployed for sustainable development, given the complexities and competitiveness concerns of financial actors?

The Inquiry's Advisory Council oversees its activities and champions many aspects of its work. The Advisory Council comprises leading financial system experts, policy makers and regulators, and practitioners from around the world. Several country engagements are being championed by specific members, notably in Bangladesh, Brazil, India, South Africa, Uganda, Europe and the US.

THE INQUIRY'S EMERGING KNOWLEDGE NETWORKS

THE INQUIRY'S COUNTRY ENGAGEMENTS



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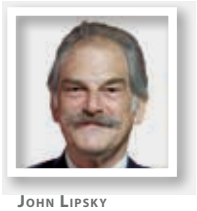

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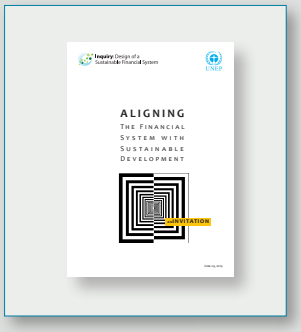

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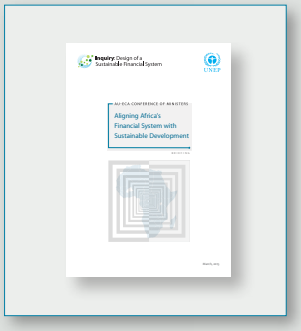

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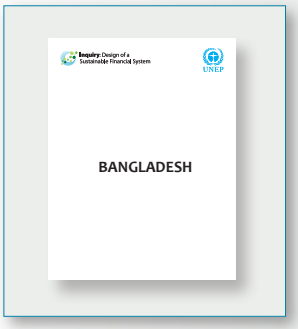

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- Design of the Sustainable Financial System
  Swiss Team Input into the UNEP Inquiry

Inquiry: Design of a Sustainable Financial System

International Environment House
Chemin des Anémones 11-13
Geneva,
Switzerland
Tel.: +41 (0) 229178995
Email: inquiry@unep.org - Twitter: @FinInquiry
Website: *www.unep.org/inquiry/*

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www.unep.org/inquiry
or from:
mahenau.agha@unep.org