

GREENING CHINA'S FINANCIAL SYSTEM

AN INITIAL EXPLORATION

Simon Zadek and Zhang Chenghui

JANUARY 2014

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Findings and opinions expressed in this paper are not necessarily shared by those contributing to the work, and any errors and omissions are the responsibility of the authors. As this is part of a longer program of work, comments to the authors are encouraged and should be addressed to Simon Zadek at simon@zadek.net.

EXECUTIVE SUMMARY

The International Institute for Sustainable Development and the Finance Research Institute of the Development Research Centre, State Council of China, are collaborating on an exploration of *policy options to support China in developing a “green financial system,”* and to *encourage such developments internationally.* This paper highlights the findings from the first phase of this partnership.

China and the international community need a financial system that effectively and efficiently supports the timely transition to a sustainable, green economy. According to the United Nations Environment Programme, a “green economy” can be defined as one that is low carbon, resource efficient and socially inclusive. Globally, investment in infrastructure of an estimated US\$6 trillion annually to 2030 is needed to deliver a low-carbon economy. Of this, nearly US\$1 trillion is over and above the business-as-usual trajectory, of which China alone will need to raise an additional US\$243 billion annually to 2020.

To date, policies to advance the green economy have been mainly directed at the “real economy,” for example, through measures to enforce environmental regulations on industry, price resources and pollution and reform subsidies. China is advancing rapidly, for example, in the development of emissions trading schemes, its capacity and will to enforce existing environmental legislation, and its prioritization of industrial sectors that will have a more benign environmental impact. There is no substitute for getting real economy policies right.

Real economy-based, green developments are not catalyzing enough green finance. Positively, green finance has increased dramatically over the last decade. For example, China has taken leadership in delivering large-scale public investment in clean energy and public mobility. Innovations in leveraging private capital using public finance have demonstrated the potential of financial innovation in catalyzing green investment. Despite this progress, green finance flows remain far below what is needed, and carbon- and natural resource-intensive investments continue to rise, in China and elsewhere.

Green economy outcomes need interventions in the financial system. The global financial crisis has highlighted the weaknesses in the financial system that favour capital allocation, increasing both specific and systemic risks. Policy interventions into the workings of financial markets, particularly in Organisation for Economic Co-operation and Development (OECD) economies, to reduce systemic risks, have focused on addressing short-term biases, misaligned incentives and better stewardship of assets, as well as improved transparency, governance and accountability. Such interventions, alongside the growing policy debate about how to generate adequate long-term investment, are closely aligned to arguments for, and interventions in, green the financial system. That is, investing in a green economy at the scale and pace required will need policy interventions in the financial and the real economy.

Policy innovations, mainly from emerging economies, demonstrate the potential for greening the financial system. Policy instruments are available to financial regulators that would allow them to influence the flow of green finance—for example, by altering capital holding requirements, establishing standards and improving disclosure requirements. Experiments by forward-looking financial regulators demonstrate the potential for greening the financial system, such as the guidance on climate risk assessment provided by the U.S. Securities and Exchange Commission. Leadership has come mainly from emerging economies, such as the China Banking Regulatory Commission’s Green Credit Guidelines, South Africa’s revised fiduciary guidance to pension fund trustees allowing them to consider wider environmental and social aspects of investment, and green and inclusive policy objectives taken on by the central banks of Bangladesh and Nigeria.

SUMMARY FINDINGS FROM PHASE ONE

1. China's financial regulators are committed to advancing policies and regulations that will encourage green credit, and also equivalent developments in insurance and securities.
2. Existing policy and regulatory practices in China already demonstrate a will to progress in developing a green financial system, although these practices remain partial, ad hoc and often under-tested for their effectiveness.
3. Such practices need to be further developed in the context of an evolving policy and regulatory framework in the real economy, noting challenges in enforcement of environmental regulation.
4. Drivers in China to develop a green financial system include climate and environmental conservation, and fundamentally respond to economic opportunities and societal concerns, for example about air pollution and food safety.
5. Best practices internationally in greening financial markets are of great interest to China, especially in the context of its likely progress in financial market reform over the coming decade.
6. Specific green financial innovations, such as green bonds and various green urban financing mechanisms, need further exploration and potentially piloting and adoption thereafter in China.
7. Internationally and in China, there is not yet a comprehensive understanding of a green financial system, covering definitions and standards, institutions, policies and sequencing for specific contexts.
8. Policies to develop a green financial system can in many instances be advanced at local and national levels, but in some instances need to be established at regional and international levels.
9. Institutional arrangements, and individual and organizational competencies, are currently inadequate, and so need major upgrading to effectively advance a green financial system.

Financial market policy-makers and regulators in China have shown leadership in advancing their roles in creating a green financial system. China's four financial regulators have all made progress in greening the parts of the financial system for which they are responsible, acknowledging their mandates to ensure that financial markets fulfill their purpose in supporting China's transition to a sustainable economy. Financial regulators in some other countries have a similarly broad view as to their mandate, particularly those in developing economies with maturing financial markets. This is exemplified by the membership of the China Banking Regulatory Commission-hosted Sustainable Banking Network for Regulators, a network focused on advancing green finance, and currently including financial regulators from Bangladesh, India, Indonesia, Nigeria and Vietnam.

There is a need to understand the features of a green financial system. Despite growing appreciation of the need for a financial system that invests effectively in a green economy, there is little understanding of what the features of such a system would be.

- Even the basics are lacking. Existing experiments in green financial regulation have not been subjected to rigorous assessment of their impacts, let alone an analysis of policy alternatives, trade-offs and sequencing issues.
- There has been no stress testing of possible environmental consequences of financial regulation by the Bank of International Settlement, the Financial Stability Board or the relevant working groups of the G20, leading to perverse effects, such as the likely dampening effect of Basel 3 for banking and the European Union's Solvency 2 for insurance on the allocation of capital to green infrastructure.

Beyond the basics, design issues to consider include:

- Institutional barriers, including the scope of financial policy-makers' and regulators' mandates, and their interface with other policy institutions, legal enablers and capabilities.
- For China, and also other countries progressing the development of their financial markets, it is important to investigate how green financial strategies should be sequenced to ensure that they are embedded in these reforms.
- Particularly for developing countries, there is a need to ensure that greening the financial system is consistent and complementary with policies and the overall development pathway of the real economy, which is particularly important for economies in transition such as China.

Policy design challenges such as how best to strike the right balance between real and financial economy regulation are fundamental.

Greening the financial system must deliver economic benefits. Whilst national action is fundamental, complementary international action will also be needed in today's context of highly dynamic, increasingly interconnected global financial markets. Balancing national and international action is particularly important where greening of the financial system has had, or is expected to have, effects on the competitiveness of national financial sectors. In the past, there have been concerns that measures such as increased transparency on key aspects of corporate (including investor) governance (including environmental factors) could impinge on competitiveness. These concerns have not been substantiated. In fact, there is the potential for a new race between leading financial centres to attract business through green innovation. Further reflection and dialogue is required to identify the policy and institutional developments that are needed internationally to support the needs of a global green financial system.

Developing policy options and actions that ultimately shape a green financial system is an essential step in accelerating the effective and timely transition to a green economy, in China and internationally. The Finance Research Institute of the Development Research Centre, State Council of China, in partnership with the International Institute for Sustainable Development, will progress the investigation on design for a green financial system for China. The initial phase of work on which this paper has been based has usefully identified both innovations and gaps in our understanding and practice, and has therefore also served to identify some of the core questions that need addressing in the second phase, which include:

- *Principles:* What would be a core set of principles guiding Chinese and other financial regulators in greening the financial system?
- *Definitions and standards:* What standards are needed, along with underlying definitions, to be able to effectively operationalize "green" as a policy and regulatory objective and activity?
- *Assessment:* What would be the means by which stress testing could be undertaken for existing and potential financial regulations against agreed green policy objectives?
- *Mandates:* What would be the mandates of financial regulators to oversee the green aspects of a financial system, and how could they be enacted in co-operation with other public bodies?
- *Instruments:* What policy and regulatory instruments could be deployed, both by financial regulators and other public bodies, such as those responsible for fiscal measures?
- *Private regulations:* What is the role of private standards, such as credit ratings, and how should public policy and regulatory bodies guide them to act?
- *International:* What is the scope for China and other national regulators to act unilaterally, to develop plurilateral co-operation or/and need international, co-ordinated action?

China's leadership engagement in this initiative and topic can and should benefit it directly in this critical development phase of its own financial system and wider economy. At the same time, this initiative intends to be part of a wider design process that can influence developments in other countries and internationally. In implementing a program aimed at addressing the core design questions raised above and others, the work will therefore continue to draw on national and international experience and expertise, building on and contributing to the work of a growing community of policy-makers and researchers.



1. BACKGROUND

The International Institute for Sustainable Development (IISD) and the Finance Research Institute of the Development Research Centre, State Council of China (DRC), are collaborating in an exploration of *policy options to support China in developing a “green financial system,” and to encourage such developments internationally.*

During the initial exploratory phase over the second half of 2013, the focus has been on establishing whether there is a case for considering more systematically what might be the features of a green financial system for China, and also possibly internationally. Supporting this have been two tracks of work, one to set out the current state of green finance in China and the second to sample relevant international best practices.

- The Finance Research Institute of the DRC, under the leadership and guidance of Zhang Chenghui, director, Finance Research Institute, has prepared a paper highlighting key aspects of China’s experience to date in greening financial markets, drawing on in-house expertise and other China-based policy researchers.
- Under the joint leadership of Mark Halle, executive director, IISD Europe, and Simon Zadek, IISD senior fellow and visiting scholar at Tsinghua School of Economics and Management, IISD commissioned a number of international experts to prepare papers on a selected number of topics.

This second stream of work has benefited from the guidance of Wang Yao, director, Research Center for Climate and Energy Finance and associate professor, Institute of Finance and Economics, Central University of Finance and Economics. Furthermore, the initial drafts presented have been updated to reflect insights gathered during meetings in Beijing in October 2013.

Working paper titles and authoring individuals and institutions are set out in Box 1, and have been published individually in Chinese and English.

BOX 1: GREENING CHINA’S FINANCIAL SYSTEM: PHASE ONE WORKING PAPERS

China’s Green Finance: Status Quo, Issues and Future, Development Research Center of the State Council

Using Innovative Policy and Regulatory Approaches to Incentivize the Alignment of Investment Strategies with Sustainability Considerations, Jessica Robinson, chief executive officer, Association for Sustainable & Responsible Investment in Asia

Integrating Environmental Risks into Asset Valuations: The Potential for Stranded Assets and the Implications for Long-Term Investors, Nick Robins, head, HSBC Climate Change Centre of Excellence

Introduction to Institutional Investor Fiduciary Duties, Keith L. Johnson, chair of Institutional Investor Services Group, Reinhart Boerner Van Deuren s.c.

Governance, Accountability and Transparency: Advancing Green Finance, Mariana H. Silva, Sustainable finance research officer, International Institute for Sustainable Development

Growing a Green Bonds Market in China, Sean Kidney & Pdraig Oliver, Climate Bonds Initiative

This overview paper sets out some of the context, the framing concepts and ideas, and key insights from the initial phase of work. It highlights key aspects of what is known and understood and areas where more research is needed. It draws from the phase one working papers, while not seeking to summarize them, and also from the extensive discussions that took place in October in Beijing between the international experts and Chinese experts, regulators, investors and non-governmental organizations.

2. INVESTING IN THE GREEN ECONOMY

An estimated US\$100 trillion, or about US\$5 trillion annually, is required between now and 2030 globally to invest in much-needed infrastructure, particularly to secure adequate energy, water, agriculture and transport, according to a report by the G20-linked Green Growth Action Alliance that draws on data from the International Energy Agency, the Organisation for Economic Co-operation and Development (OECD), the United Nations and the World Bank. Greening this investment, particularly to mitigate and manage the effects of climate change, will require an additional US\$0.7 trillion annually (Table 1), according to the high-level assessment set out in the Green Investment report released at the World Economic Forum in January 2013.¹ These estimates, it should be noted, are focused exclusively on incremental costs associated with reduction of carbon emissions, not the wider environmental or sustainability agenda.

China alone will need to raise up to US\$243 billion of additional funds per year by 2020 in order to adequately finance action to curb the impacts of climate change and invest in low-carbon development, according to a report commissioned by the Chinese government's powerful National Development and Reform Commission and prepared by The Climate Group (2013) and the Research Center for Climate and Energy Finance at the Central University of Finance and Economics.

TABLE 1: ANNUAL INVESTMENTS NEEDED UNDER BUSINESS-AS-USUAL AND LOW-CARBON SCENARIOS (\$ BILLIONS PER YEAR BETWEEN 2010 AND 2030 – US\$ 2010 EQUIVALENTS)

Sector	BUSINESS-AS-USUAL SCENARIO INVESTMENT NEEDS		2°C SCENARIO INVESTMENT NEEDS		INCREMENTAL INVESTMENT REQUIRED		Sources
	Cumulative 2010-2030	Annual average	Cumulative 2010-2030	Annual average	Cumulative 2010-2030	Annual average	
Power generation	6,933	347	10,136	507	3,203	160	IEA
Power T&D	5,450	272	5,021	251	-428	-21	IEA
Energy total	12,382	619	15,157	758	2,775	139	
Buildings	7,162	358	13,076	654	5,913	296	IEA
Industry	5,100	255	5,840	292	700	35	IEA
Building & Industrial total	12,262	613	18,916	946	6,613	331	
Road	8,000	400	8,000	400	Unknown	Unknown	OECD
Rail	5,000	250	5,000	250	Unknown	Unknown	OECD
Airports	2,200	120	2,200	120	Unknown	Unknown	OECD
Ports	800	40	800	40	Unknown	Unknown	OECD
Transport vehicles	16,908	845	20,640	1,032	3,732	187	IEA
Transportation total	32,900	1,655	36,640	1,842	3,740	187	
Water	26,000	1,300	26,000	1,300	Unknown	Unknown	OECD
Agriculture	2,600	130	2,600	130	Unknown	Unknown	FAO
Telecommunications	12,000	600	12,000	600	Unknown	Unknown	OECD
Forestry	1,280	64	2,080	104	800	40	UNEP
Total investment	\$100 tr	\$5 tr	\$113 tr	\$6 tr	\$14 tr	\$0.7 tr	

Sources: Green Growth Action Alliance (2013).

¹ Note that these are estimates of direct incremental capital costs, and do not take account of total costs (taking account for example of lower direct operating costs and reduced capital costs in other areas rendered unnecessary by the green investment).

Failure to green infrastructure investment and the broader transition to a low-carbon, natural-resource-light economy will lead to further increases in global temperatures, a prediction reinforced most recently with a high degree of certainty in the 5th Assessment of the Intergovernmental Panel on Climate Change (2013). The social and economic impacts of such increases are already affecting many vulnerable communities worldwide and will be increasingly felt with the growth of extreme weather conditions, desertification and other developments.

Climate change is only one of a number of drivers for greening infrastructure and delivering appropriate economic policies and business strategies. Other drivers include:

- For businesses, an increasing view that carbon will be priced in the future, with a recent study by the Carbon Disclosure Project (2013) highlighting the growing number of carbon-intensive businesses in the United States operating in-company carbon pricing in advance of these expected changes.
- Businesses are responding to the reversal of a century of declining commodity prices, with average commodity prices over the two decades leading up to 2012 rising over the period by about 150 per cent (McKinsey, 2012²).
- Increasingly visible negative environmental externalities are encouraging many countries to impose and enforce ever-stricter environmental legislation, such as air pollution in Northern China, for example, which is leading to major health challenges and premature deaths (Zheng, 2013).
- The economic recession has highlighted the unacceptably high public costs of fossil fuel and, more broadly, natural resource subsidies, with the International Monetary Fund (2013) estimating annual post-tax fossil fuel energy subsidies to be about US\$1.9 trillion, or almost 3 per cent of global gross domestic product.
- Social and political unrest, whilst having diverse causes, is without doubt accentuated where environmental stresses drive disruptions, such as higher and more volatile food prices.

Green, then, is not just about climate and is increasingly validated by a compelling set of shorter- and longer-term fiscal, economic, social and political drivers.

2.1 GLOBAL GREEN FINANCE LANDSCAPE

A sustainable, low-carbon economy tends to be more capital-intensive in the short to medium term, with more up-front investment in skills and capacity, resulting in net positive savings in resource use and pollution. This front-loaded investment intensity means that unlocking sufficient volumes of the right quality of capital becomes pivotal in the transition process. Indeed, finance must be channelled into green investment and also away from “brown,” carbon and natural resource-intensive investments, two related but by no means identical sets of activities and outcomes.

Public finance is important. However, it will only ever be a small part of the overall finance needed. For many developing countries, attention is rightly focused on the need for developed countries to fulfill their commitment in Copenhagen in 2009. Developed countries agreed to mobilize and effectively deploy US\$100 billion annually in climate finance by 2020 to fund the incremental costs of mitigating climate change and adaptation by vulnerable communities (Buchner et al., 2013). Such funds will, however, be made up not only of tax dollars from developed country citizens (“climate aid”) but also will be drawn from public proceeds of carbon markets and private capital leveraged by public finance. Even in China, where much of the country’s infrastructure has been financed and is operated by state-owned enterprises, there is an emerging consensus that private capital and enterprise will play a far greater role in the future.

² Note that since the publication of this study, average commodity prices have fallen somewhat.

BOX 2: DEFINITION OF KEY TERMS

There is a lack of robust definitions in this field, and so for the purposes of this paper, the following definitions are proposed:

- *Green investment* refers to the overall capital cost of the transition to a green economy, such as reducing greenhouse gas emissions, increasing resilience, securing food systems and managing of water, forest, transport and waste systems.
- *Green finance* represents a wider lens than green investment. It includes all green investment, but in addition includes operational costs over and above “business-as-usual” costs, such as renewables’ feed-in tariffs.
- *South-originating green finance* is green finance originating broadly in non-OECD countries, including from both private and public sources, and including both cross-border financial flows and domestic finance.
- *Climate finance* is distinguished here from green finance or investment by referring specifically to the financial flows deemed eligible as being counted as part of the discussions under the United National Framework Convention for Climate Change process.

Source: Adapted from S. Zadek & C. Flynn (2013).

With private capital needing to play such a central role, considerable efforts are being made to attract such capital into green financing. There have been positive developments:

- *Climate finance innovation*: Blending scarce public funds to leverage private capital for green investment has achieved ratios of 3 public to 8 private dollars, according to estimates by the Green Growth Action Alliance (2013).
- *Investment in renewables*: In 2011 alone, investments in renewable energy reached record levels—up sixfold from 2004 to US\$257 billion (Bloomberg New Energy Finance, 2013).
- *Carbon pricing*: A recent report by the Carbon Disclosure Project (2013) revealed a growing pattern amongst carbon-intensive U.S. companies (particularly oil and gas) to place a price on carbon in their own internal investment analyses.
- *Sustainable finance*: Finance that has been subjected to one or more environmental, social or governance screens amounted to US\$13.6 trillion of professionally managed funds in 2011 (26 per cent of the assets assessed) (Global Sustainable Finance Alliance, 2012).

The bad news is that the vast bulk of private capital today remains resolutely carbon- and natural-resource intensive. Nicholas Stern, author of the influential Stern Review (2006) on the economics of climate change, has argued that investors’ current practice of zero pricing of carbon in their valuations is effectively betting on, indeed encouraging, the development of a carbon-intensive economy.

Despite some positive developments, then, financial markets in the main are failing to account for systemic risks that endanger private investments and society as a whole. The investor survey effectively means that only about 2 per cent of assets are valued with any carbon price. Furthermore, even those asset managers that do take carbon into account remain driven by short-term performance metrics, and because carbon price signals are currently weak, their influence on asset allocation remains minimal (Global Sustainable Finance Alliance, 2013).

Carbon intensive assets are in fact a growing part of the capital markets. A report by Carbon Tracker and the London School of Economics’ Grantham Research Institute (2013) found that over the past two years, the carbon intensities of the main London and New York stock exchanges increased by 7 per cent and 37 per cent respectively. Spending on exploration and development of new fossil fuel reserves by the 200 largest listed fossil fuel companies totalled US\$674 billion in 2012.

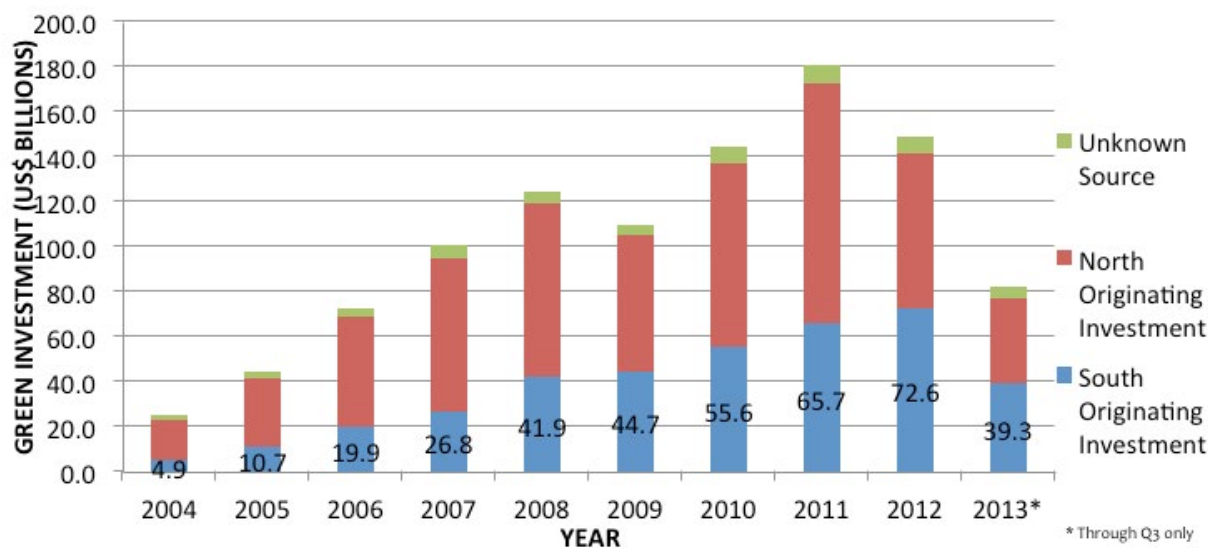
Time, of course, is the complicating factor. A true transition toward a sustainable economy means a rapid and dramatic transformation of policies and perspectives. The International Energy Agency suggests that 80 per cent of projected global carbon emissions to 2020 are already locked in through the world's current infrastructure base. There is a small window of opportunity to implement policies and investments that support sustainable development. Upgrading infrastructure, energy systems and other actions cannot be delayed, either through new builds or, even more difficult, through the early retirement of carbon-intensive assets.

2.2. GROWTH OF DEVELOPING COUNTRY GREEN FINANCE

Scaling up green finance in a timely manner is therefore of critical importance, especially in light of climate change, but also to mitigate the negative effects of other environmental problems, including air pollution and long-term damage to the ecosystems on which we depend, especially water, fisheries and agriculture.

In this context, one of the more positive aspects of the green finance landscape is the rising volume of South-originating green finance. There is a paucity of relevant data on this source of green finance. However, a recent report, *South-originating Green Finance: Exploring its Potential*, sponsored by the Swiss Government, the International Institute of Sustainable Development and the UNEP Finance Initiative, has provided one of the first quantitative and qualitative, global windows onto this increasingly important phenomena (Zadek & Flynn, 2013).

FIGURE 1: SOUTH-ORIGINATING INVESTMENT IN RENEWABLE ENERGY INFRASTRUCTURE AS A PROPORTION OF GLOBAL INVESTMENT, 2004-Q3 2013 (US\$ BILLIONS)



Source: Bloomberg New Energy Finance (2013).

Drawing on data provided by Bloomberg New Energy Finance, the study's quantitative analysis focuses on renewable energy infrastructure investment, the report shows that clean energy investment originating from non-OECD countries for both domestic and cross-border uses grew from US\$4.9 billion in 2004 to US\$72.6 billion in 2012.³ This increase in absolute numbers is matched by an increase in the share of the relevant global green investment segment, with south-originating finance making up 48.8 per cent of global investment in wind, solar, biofuels, biomass and waste, geothermal, marine and small hydro, an increase of nearly 30 per cent since 2004 (Bloomberg New Energy Finance, 2013).

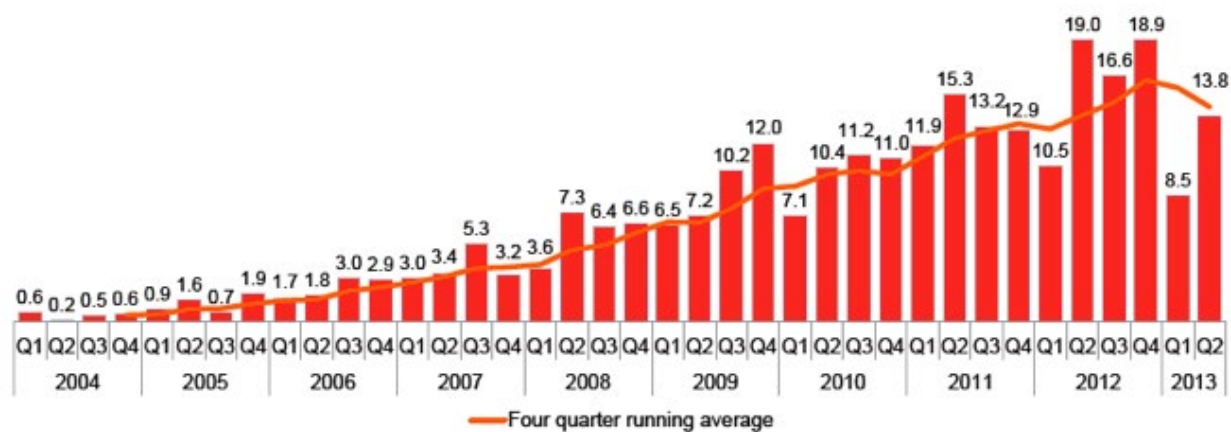
³ The data is largely pulled from Bloomberg New Energy Finance and is based on actual tracked deals for renewable energy project investment. Because it is only a subset (infrastructure investment) of a subset (renewable energy), it is therefore the lower bound of overall South-originating green finance flows which would include additional categories of green finance.

TABLE 2: TOP COUNTRIES FOR SOUTH-ORIGINATING INVESTMENT IN RENEWABLE ENERGY INFRASTRUCTURE, 2004-Q3, 2013

US\$ CUMULATIVE INVESTMENT	
China	233.1
Brazil	47.7
India	44.4
Thailand	5.8
South Africa	5.5
Argentina	2.5

Source: Bloomberg New Energy Finance (2013).

FIGURE 2: NEW INVESTMENT IN CLEAN ENERGY IN CHINA (US\$ BILLION)



Note: Total values include estimates for undisclosed deals. Excludes corporate R&D, government R&D, digital energy asset investment and energy storage asset investment (only available annually)

Source: Bloomberg New Energy Finance

2.3 CHINA LEADS GROWTH IN GREEN FINANCE

China, not surprisingly, is the dominant emerging economy player in the renewable energy investment landscape, largely domestic (McCone, 2013). With US\$233 billion invested in renewable energy since 2004, the country far exceeds green investments from the other top countries, including Brazil, India, Thailand, South Africa and Argentina. Indeed, in 2012, China topped the United States as the largest investor in renewable energy, the first time this has been achieved by a non-OECD country (McCone, 2013; UNEP Finance Initiative, 2012).

Alongside private capital coming from international capital markets, significant volumes of concessionary debt are being made available through development finance institutions. Banks such as the China Development Bank and Brazil's Banco Nacional de Desenvolvimento Economico e Social (BNDES) are playing a critical role in channelling this financing. BNDES has enabled two of the top ten Southern-originating renewable energy deals since 2004, including the largest investment made yet, when they secured US\$760 million in debt for ETH Bioenergia/Odebrecht Agoindustrial SA to expand five bioethanol and power plants (Bloomberg New Energy Finance, 2013).

While renewables provide an important and useful window to green investment, they are a small piece of the overall picture and may underestimate the importance of developing country green finance, and China's green expenditure patterns in particular. As Table 1 highlights, total energy investment requirements to 2030 are only about 12 per cent of the "business-as-usual" US\$100 trillion required, and only about 21 per cent of the estimated incremental costs of going green. Furthermore, as the data below on Chinese "green credit" illustrates, China's public expenditure on environmental conservation and protection is estimated for 2012 at five times its capital expenditure on renewables, an indication of the huge importance of the currently uncounted or at least undervalued green finance numbers from developing countries.

TABLE 3: CHINA TOPS SOUTH-ORIGINATING FINANCE ON RENEWABLES, 2004-Q3 2013 (US \$BILLION)

COMPANY	COUNTRY	CUMULATIVE INVESTMENT OVER PERIOD
China Guodian Corp	China	30.0
China Huaneng Group Corp	China	17.2
Banco Nacional de Desenvolvimento Economico e Social	Brazil	16.9
China Datang Corp	China	16.8
China Power Investment Corp	China	12.2
China Huadian Corp	China	9.4
China General Nuclear Power Holding Corp	China	9.2
Shenhua Group Corp Ltd	China	7.1
China Resources National Corp	China	5.3
China Energy Conservation & Environmental Protection Group	China	5.1

Source: Bloomberg New Energy Finance (2013).

3. GREENING FINANCIAL POLICIES AND REGULATION

Despite some positive developments, all indications are that green finance flows on current trends will remain inadequate, with finance continuing to flow into carbon-intensive infrastructure and business assets, locking in the problem for decades to come. Conventionally, the response to this conclusion is to advocate policy change in the real economy. Effective policy measures in the real economy are now well understood. They include: standards to force out polluting activities and incentivize at least benign technologies and activities, and fiscal and market-based mechanisms such as getting rid of perverse fossil fuel subsidies; establishing an effective carbon price through some combination of carbon and energy taxes and emissions trading schemes (Nelson & Vladeck, 2013); feed-in tariffs and other ways of positively incentivizing green and clean technology; and greening public procurement, valued globally today at between US\$4 trillion and \$5 trillion annually (IISD, n.d.). These and other policy options are of vital importance and must be progressed.

Policy awareness and related actions in the real economy have not been matched, however, by their equivalent in the financial economy. This has not been because policy options have been identified, assessed and rejected on the basis of reasonable arguments. It has been because the topic of how financial policies and regulations affect climate; more broadly, green economy outcomes have not been systematically examined. There have, of course, been many inquiries into the state of financial markets, particularly since the financial crisis in 2008. High-level commissions, particularly in Europe and North America, and at least one United Nations-sponsored commission, have offered analysis and recommendations for improving the health of financial markets, and in particular for stabilizing them, thereby reducing the prospect of future crashes and their damaging effects on the real economy.

BOX 3: CHANGING THE GAME: CHINA DEVELOPMENT BANK

The China Development Bank (CDB) is one of the world's largest lenders for green projects. In renewable energy alone, the bank made US\$26 billion available for renewable energy in 2012, second only to Germany's KfW. In 2012 it lent to projects in the areas of low-carbon cities, the circular economy initiative, watershed management, sewage treatment, environmental protection, technology upgrading for energy saving and renewable resources. The bank's total 2012 outstanding loans to environmental protection and energy efficiency projects stood at US\$139 billion, up 28 per cent from the previous year.

CDB's deals are diverse. It made the world's largest investment in a photovoltaic power project, the Golmud Solar Park, which provided 200 megawatts of installed capacity. To support water supply in central and western Zhucheng, CBD committed US\$100 million in loans to install water purification equipment. The project, which will have a capacity of 200,000 tons per day of sewage processing capacity and 71 kilometres of sewage pipelines, will address the recurring water shortages in the area.

CDB's portfolio also includes international solar projects. In 2012 CDB provided US\$3 billion in financing to Generadora Eolica Argentina del Sur to install 1.35 gigawatts of Chinese wind turbines in Argentina. The wind projects will supply 4 per cent of Argentina's power once fully operational in 2017.

Sources: UNEP Finance Initiative (2012).

None of these inquiries have, however, considered broader environmental issues, either as a systemic risk that might impact financial markets, an unintended consequence of financial market behaviour or as a policy goal of financial regulation. This gap has been sustained despite the growing policy concerns about climate change challenges and the importance of economic transformation in addressing them. Indeed, even the high-level enquiries into the means by which green finance can be secured, including the UN Secretary General's High-Level Advisory Group on Climate Change Financing, have almost entirely ignored the potential of financial market policy regulation (United Nations, 2010). In short, while there has been a growing

appetite on the part of regulators to consider regulatory reform in pursuit of financial market stability, and policy-makers to consider how to catalyze green finance through real economy policy measures and public finance, there has been essentially no work in joining the dots between the two policy arenas.

3.1 SIX REASONS FOR GREENING THE FINANCIAL SYSTEM

There are six reasons why the need to catalyze green finance requires policies and associated regulations targeted at financial market reform, as well as policies focused more directly at the real economy. These six reasons can be separated into four clusters:

- A. Avoiding problems in the financial economy (arguments one and two)
- B. Avoiding negative unintended consequences of financial regulation on non-financial market public policy objectives (argument three)
- C. Addressing specific real economy objectives through financial regulation (arguments four and five)
- D. Addressing the overarching purpose of financial markets (argument six).

A. Avoiding problems in the financial economy

1. *Overcoming financial market failures:* Biases in capital allocation have resulted in short-term profit taking through trading, rather than long-term value creation through investing in the real economy. As a result, capital allocation will remain biased against investments in creating a lasting sustainable economy. This may be true even if real-economy prices take fuller account of negative environmental impacts.
2. *Avoiding systematic biases in risk assessment:* Related to the above is that the regulated incorporation of environmental and social factors into risk assessment will ensure that financial markets are not systematically underestimating risks that would in turn at some stage lead to a major downward adjustment in asset values, the so-called stranded asset argument (Carbon Tracker Initiative, n.d.).

B. Avoiding negative unintended consequences of financial regulation on non-financial market public policy objectives

3. *Avoiding unintended consequences:* Failing to consider environmental and climate impacts could and do lead such regulations to have unintended negative consequences for the allocation of capital to the green economy. There is now widespread agreement, for example, that Basel 3 and Solvency 2 have unintentionally dampened investors' enthusiasm for long-term project investment, and in particular investment in renewables (Spencer & Stephenson, 2013).

C. Addressing specific real economy objectives through financial regulation

4. *Substituting for real economy policy shortfalls:* Inadequate real economy policies are likely to persist for three reasons:
 - Lack of clarity as to which are the right policies (e.g., carbon tax versus carbon trade), resulting in long delays as different policy approaches are piloted and analyzed.
 - Difficulties in getting the right policies into place, sometimes because of resistance from business and other interests that see themselves as losers in a low-carbon economy.
 - Weaknesses in effective execution, whether due to complexity, institutional weaknesses or simply corruption.
5. *Advancing smart policy portfolios:* Even if the above problems were resolved, there are instances where policy optimization would lead one to combine real and financial economy regulation in addressing complex policy objectives, as evidenced by policy-allowed variations in capital holding requirements being used to advance real economy objectives, such as the promotion of home ownership.

D. Addressing the overarching purpose of financial markets

6. There is a higher-level reason, and ultimately the most important, for advancing the role of financial regulators in the channelling of capital to the green economy. It is that the financial system has a public as well as a private purpose, and that it is this public purpose that regulators most diligently need to steward.

3.2 MANDATE OF FINANCIAL REGULATORS

The public purpose of the financial system is, in short, to ensure that capital is allocated in ways that ensure a robust, sustainable real economy into the future that both serves the long term-interests of capital owners with private interests and satisfies the wider public interest.

The public purpose of the financial system establishes the basis for a broader interpretation of the regulators' macro-prudential role, or what has been termed elsewhere as a "public fiduciary" responsibility on the part of its regulators (Zadek, 2012). "Macro-prudential" has been widely interpreted to date as referring to the regulator's role in reducing the risk, and the macroeconomic costs of financial instability. Such an interpretation is, however, only one possible route by which a financial market can pose risk to the wider system within which it exists. Most profoundly, of course, financial market failures create real economy risks if they lead to an under-investment in critical parts of the real economy, and/or an over-investment in assets that are of questionable long-term value and which may in turn do harm to the wider real economy.

Whether there is a need for financial regulators to explicitly embrace this wider mandate is debated. In practice, regulators do often take on many wider, non-financial, real economy and social objectives. Most obviously are growth and inflation targets, but in many cases regulators act in pursuit of very specific real economy effects, such as, in the cases of Bangladesh's and Nigeria's central banks, the benefiting of rural, small and woman-owned enterprises; and in the cases of the Bank of England and elsewhere, the promotion of wider home ownership. It is a fact, certainly, that emerging economy regulators tend to define their roles more broadly than their counterparts across OECD countries. Chinese regulators, certainly in open, public debate, describe their mandates as being to ensure that the financial systems support the balanced development of the Chinese real economy, and indeed China more broadly.

BOX 4: FINANCIAL REGULATORS' MANDATES: EXTENDED MATERIALITY OR SCOPE OF MACRO-PRUDENTIAL RESPONSIBILITIES?

- If weak carbon prices endangered sustainable growth, would financial regulators need to consider whether a floor carbon price in asset valuation should be imposed to avoid the risks to the real economy and the danger of future collapses in carbon-intensive "stranded assets," as highlighted by the Carbon Tracker Initiative?
- If carbon- and natural-resource intensive urbanization was taking place with evidence of widespread failure of environmental building regulations, should financial regulations consider imposing green conditions, such as "green bonds," on lending for urban development, as proposed by for example the Climate Bonds Initiative?
- If rules governing a bank's capital holding requirements resulted in reduced investments in renewable energy, as is the case for Basel 3 and Solvency 2 (for insurance companies), should financial regulators consider specific weighting to offset and indeed incentivize such investments?
- If sovereign credit ratings continue to not take account of natural resource depletion or pollution that, over time, affects solvency through its effects on economic competitiveness, export earnings and underlying citizens' health, could financial regulators insist on measures that captured such developments being included in the methodology of rating agencies, as proposed recently by UNEP's Finance Initiative?

Broadening the interpretation of regulators' mandates may well be necessary, but there is also considerable scope for working within existing mandates. The first and second of the six reasons for greening financial policies and regulations, in particular, should largely be within the scope of existing regulatory mandates.

- The China Banking Regulatory Commission's Green Credit Guidelines, soon to involve a mandatory reporting aspect, highlight environmental risk as being inadequately handled by regulated financial market actors. However, although the guidelines may ultimately be effective in catalyzing more green finance, they sit comfortably as a traditional regulatory instrument focused on ensuring that financial markets are not building up dangerous systemic risks through systematic biases in analysis and valuation.
- When the U.S. Securities and Exchange Commission (SEC), similarly, provided in 2010 interpretive guidance on disclosure on climate-related risks, it was careful to spell out the conventional and limited terms under such guidance was provided: "We are not opining on whether the world's climate is changing, at what pace it might be changing, or due to what causes. Nothing that the Commission does today should be construed as weighing in on those topics," said SEC Chairman Mary Schapiro. "Today's guidance will help to ensure that our disclosure rules are consistently applied".

Extending regulators' mandates would be a complex task that would raise many institutional and legal issues, as well as underlying questions of competencies and relevance of available instruments. That said, there is little doubt that the reach of macro-prudential actions would need to be considered as part of any assessment of whether and, if so, why financial regulators would be required to act in relation to any environmental, climate or more broadly green considerations. The matter of "how" to regulate is certainly important, as is that of accountability. Such concerns must remain second order design considerations rather than the basis on which principles of regulatory stewardship are established.

4. CHINA'S GREENING OF THE FINANCIAL SYSTEM

China has made some progress in greening all three aspects of its financial system, that is, banking, insurance and securities. Highlights in each area are provided in this section.⁴

Since the 1980s China's State Council, its Ministry of Environmental Protection (MEP) and the People's Bank of China (PBC) have released a series of policies related to environment protection and credit. In 2007, MEP, PBC and the China Banking Regulatory Commission (CBRC) jointly released *Opinion on Enforcing Policies and Regulations on Environmental Protection to Prevent Credit Risk* (2010) aimed at strengthening the coordination between environmental protection and credit management, reinforcing environmental supervision and management and avoiding credit risks. It was not until the publication of this opinion that "green credit" officially became a policy component of credit management for banks operating in China.

The green credit balance of banking financial institutions was RMB6.14 trillion in 2012, representing a 16.9 per cent year-on-year growth (China Economic Net, 2013). From 2007 to 2012, furthermore, the number of energy conservation and environmental protection projects enjoying banking institutions' support have increased by three and nine times respectively, while the proportion of loans to support "high-energy consumption, high-pollution and overcapacity" industries in some banks has gradually decreased.

TABLE 4: BANKING INSTITUTION LOANS TO ENERGY CONSERVATION AND ENVIRONMENTAL PROTECTION PROJECTS

YEAR	2007	2008	2009	2010	2011	2012
Number of projects	2,715	2,983	6,412	7,259	9,349	10,874
Loan balance (RMB TN)	0.341	0.371	0.856	1.172	1.468	3.58

Source: Bank of China (2009, 2010, 2011, 2012); China Construction Bank (2009, 2010, 2011, 2012); Industrial and Commercial Bank of China (2009, 2010, 2011, 2012).

TABLE 5: PROPORTION OF LOANS TO HIGH-ENERGY CONSUMPTION (HEC), HIGH-POLLUTION (HP) AND OVERCAPACITY INDUSTRIES BY SOME BANKS

YEAR	2009		2010		2011		2012	
	HEC and HP	Overcapacity	HEC and HP	Overcapacity	HEC and HP	Overcapacity	HEC and HP	Overcapacity
BOC	3.95%		3.94%		3.21%		2.83%	
ICBC	n.a.	3.12%	n.a.	2.78%	n.a.	2.74%	n.a.	
CCB	6.68%	n.a.	5.87%	n.a.	5.45%	n.a.	4.89%	n.a.
China Citic Bank	10.16%	n.a.	9.01%	n.a.	7.88%	n.a.	5.69%	n.a.

Notes: BOC: Bank of China; ICBC: Industrial and Commercial Bank of China, CCB: China Construction Bank

Source: Bank of China (2009, 2010, 2011, 2012); China Construction Bank (2009, 2010, 2011, 2012); Industrial and Commercial Bank of China (2009, 2010, 2011, 2012).

⁴ Section 4 draws from Finance Research Institute of the DRC (n.d.).

Adherence to green credit guidelines varies considerably, however, within the banking community. The *China Annual Green Credit Report* ranks the top 50 banks according to agreed measures of adherence. The most recent edition suggests that only one bank, the Industrial Bank of China, receives the highest rating, only 12 per cent had fully implemented the guidelines, 42 per cent had scored poorly indicating only superficial adoption measures and 18 per cent of the top 50 banks had provided no supporting data whatsoever (Policy Research Center for Environment and Economy, 2013).⁵

Green insurance in China has a narrower meaning than in common international practice, referring to “environmental pollution liability insurance” (EPLI), and generally excluding climate-related risks. EPLI in China has three main applications:

- Provision of compensation when pollution from an accident has occurred
- Bailing out enterprises when pollution accidents have occurred
- Pollution risk management and continuous supervision

At the end of 2007, MEP and the China Insurance Regulatory Commission (CIRC) jointly released the *Guiding Opinion on the Deployment of Environmental Pollution Liability Insurance*, linked to pilot programs in some industries, enterprises and regions. Regions selected were those with large-scale environmental hazards, and those that appeared more pollution-accident prone, including Jiangsu, Hubei, Hunan, Chongqing, Shenyang, Shenzhen, Ningbo and Suzhou. Pilot industries and enterprises were those related with identified hazardous chemicals, petrochemicals, waste disposal, landfills, sewage treatment and industrial park.

Since then, the take up of EPLI has developed quite quickly. In 2008, 700 enterprises bought EPLI and the premium income was RMB12 million. By the end of 2012 enterprises insured amounted to more than 2,000 with the sum insured close to RMB20 billion. On the other hand, the share of EPLI premium income in the total property and casualty insurance premium income has remained very small. In 2009 the share in the whole pilot region was 0.015 per cent. In 2012 the share in Guangdong Province was 0.01 per cent, that in Guangxi Province was 0.012 per cent and that in Suzhou city was 0.018 per cent.

In February 2013 building on the results of these pilots, MEP and CIRC launched a compulsory EPLI system for enterprises and industries with high environmental risks, such as heavy metal, petrochemical and chemical.

Securities regulations affecting investors’ assessments of green risk and opportunities are extensive. They mainly relate to the provision of key information and its relationship to various asset valuation instruments, from credit ratings to indexes and reporting, as well as the capabilities of asset managers and the features of their underlying mandates. While China has made progress on a number of relevant fronts, the focus here is on a particular aspect of financial trading: emissions trading markets.

China’s emission trading market has achieved significant progress over the last two decades in terms of trading scale, pilot demonstrations, basic systems, trading platforms and the diversity and sophistication of objects being traded, with carbon emission trading exhibiting the fastest growth. China’s emissions trading can be divided into three development stages. The initial stage, from 1988 to 2000, involved mainly chemical oxygen demand (COD) and sulfur dioxide (SO₂). In addition, however, in 1988 the former State Bureau of Environmental Protection designated 18 cities to trial water pollutant emission permit systems in 1988, chose 16 cities to carry out pilots on air pollutant emission permit system from 1991, and in 1994 selected six cities as the pilot areas for air pollutant emission trading in 1994.

⁵ According to the survey, in terms of bank type, five large commercial banks overall have good performance and three of them are rated B. There are no distinguishing characteristics for policy banks and joint-stock commercial banks and their ratings are dispersed. Urban and rural commercial banks are underperformers and the majority of them scored less than 30 or rated D or below.

TABLE 6: MAJOR EMISSION EXCHANGES IN CHINA

NAME	TIME OF FOUNDING	LOCATION	FEATURE	OBJECTS OF TRADING
Jiaying Emission Quota Reserves Trading Center	November 10, 2007	Jiaying	The first emission trading centre in China	COD, SO ₂
Beijing Environment Exchange	August 5, 2008	Beijing	Specialized market platform combining various types of environmental rights trading services as a whole	Various types of environmental rights products
Shanghai Environment Energy Exchange	August 5, 2008	Shanghai	Market platform to realize the interface between capital techniques and capital	Trading platform for various types of rights in environment energy sector
Heilongjiang SO ₂ Emission Trading Platform	September 24, 2008	Heilongjiang		SO ₂
Tianjin Climate Exchange	September 25, 2008	Tianjin	The first comprehensive emission trading institution in China	SO ₂ , COD, carbon emission and environmental technology, energy efficiency services etc.
Hubei Environmental Resources Exchange	March 27, 2009	Wuhan	The first environment exchange in Mid China	
Guangzhou Environmental Resources Exchange Services	June 2009	Guangzhou	The first environmental resources trading institution in South China	
Kunming Environment Energy Exchange	August 16, 2009	Kunming	The first environment exchange in West China	
Dalian Environment Exchange	June 3, 2010	Dalian	The first environment exchange in Northeast China	
Guiyang Environmental Resources Exchange	August 2, 2010	Guiyang	The first energy trading institution in Guizhou Province	

The second stage ran from 2001 to 2006, the 10th five-year planning period. The former State Bureau of Environmental Protection increased the scale of the SO₂ emission trading pilots and also extended its pilots on water pollutant emission trading. A range of supporting policies were also enacted by the State Council. In 2002 the State Council approved the execution of *The 10th Five-Year Plan on Prevention and Control of Acid Rain and SO₂ Pollution in Two Control Zones (Acid Rain Control Zone and SO₂ Control Zone)* and the former State Bureau of Environmental Protection released *Notice on Carrying out Demonstration Work on 'Research Program of Promoting China's Total SO₂ Emission Control and Emission Trading Policy Implementation.'* In addition, during this period, Taiyuan released *Management Measures of SO₂ Emission Trading in Taiyuan*, which is the first local regulation on SO₂ emission trading in China.

The third, deepening stage has progressed since 2007. With China attaching more importance to the fundamental role of the market in environmental resources allocation, the development of emissions trading at national and local levels has been emphasized. Notably, in 2011, the General Office of the National Development and Reform Commission released *Notice on Deployment of Pilot on Carbon Emission Trading* (F.G.B.Q.H (2011) No. 2601), approving the four municipalities under direct administration of the central government—Beijing, Tianjian, Shanghai and Chongqing—plus seven other provinces and cities including Hubei (Wuhan), Guangdong (Guangzhou), Shenzhen to carry out pilot carbon emission trading schemes.

5. INTERNATIONAL EXPERIENCE IN GREENING THE FINANCIAL SYSTEM

Appreciating the need to green financial markets, in part through policy and regulatory measures, is the first step. Identifying potential policy instruments and pathways is the second step, alongside evidence that demonstrates, even anecdotally, the potential to turn theory into effective practice. Structuring the use of instruments to optimize a package of interventions is then the third, and arguably most difficult, step to take.

This overview paper is focused on the first and second steps. Authors of the five commissioned papers were asked to set out, for their particular theme, the:

- Policy and/or market failure that constrained the effective allocation of capital towards investing in a green, sustainable economy.
- Theme or instrument proposed, providing evidence, especially good practice, that it offered a practical policy pathway.

The papers, taken together, were not intended to, and do not, provide a comprehensive view of relevant themes and instruments. Rather, they represent a collection of examples that provide sufficient breadth and evidence to demonstrate the range of policy pathways, and their potential or at least implication in practice.

- *Governance, Accountability and Transparency*: The effectiveness of financial markets to fulfil their core function, and in particular to invest in the real economy, requires voluntary and policy-driven effective measures of environmental and social investment risks and impacts, as well as innovative reporting requirements through, for example, stock exchange listings and statutory requirements.
- *Fiduciary Responsibilities*: Investment behaviour is rightly framed by investor intermediaries' "fiduciary" responsibility to the owners of capital, but associated rules have become narrowly defined, delivering suboptimal investment strategies and outcomes. Policy measures to broaden interpretations that enable wider green and sustainability issues to be taken into account are critical to unlock large-scale institutional finance for green investment.
- *Stranded Assets*: Effective asset valuation lies at the heart of financial markets, and failure to price in carbon and other risks results in overvaluation of natural resource and carbon-intensive assets across all asset classes. Policy measures to overcome this bias, itself driven in large part by financialization and associated short-termism, would benefit underlying owners of capital and redirect financial-returns seeking capital towards greener investment opportunities.
- *Incentives*: These initiatives cover policy-driven measures to overcome perverse incentives that drive short-term behaviour, reduce long-term financial returns and distort the financial market's core intermediation role to deliver capital in creating tomorrow's sustainable economy. Financial regulators' policy options are considerable, but, in addition, policy options exist within the control of other parts of government, notably fiscal measures.
- *Green Bonds*: Debt-financed investment is of growing importance, especially for infrastructure investment, and for rapidly growing nations, notably for financing urbanization. Green bonds are an excellent example of a financing approach that can be advanced by private and public investors and can be influenced by policy measures as a means of channelling finance towards green investment.

Each of these themes is actively being advanced internationally through policy and practitioner debate and innovative design and execution. Yet each is at a different stage of development. Some of them are further advanced in the development of instruments, with a considerable body of knowledge and practice, for example, in the fiduciary field. Some are at a stage of instruments having been widely piloted and efforts now being invested in their codification into regulatory measures, such as in the area of sustainability reporting. Others are broadly appreciated but remain underdeveloped. This is the case for stranded assets and incentives, for example.

For China, the five topics covered by the working papers were all of considerable interest, but of varied immediate relevance, raising questions in particular regarding policy priorities and sequencing:

- *Governance, Accountability and Transparency*: This topic is of considerable relevance to China's immediate situation regarding the state of the financial sector, with the governance of financial institutions, especially state-owned banks, remaining opaque, and information flows on basic financial and investor-relevant information remaining incomplete even before broader social and environmental factors are taken into account.

Furthermore, the relatively weak implementation of the CBRC's Green Credit Guidelines to date, as well as the capability-based constraints to leading banks seeking to implement standards such as the Equator Principles, illustrates the challenges posed in advancing more sophisticated regulatory measures focused on specific real economy outcomes, let alone extended risk assessment.

- *Fiduciary Responsibilities*: An integral aspect of the governance of a maturing financial sector, the issue of fiduciary responsibilities was seen as an upcoming (but not current) issue for financial regulation. This muted engagement is explained in large part by the lack of development of the institutional investor community, and its continued dominance by state-owned or at least policy-directed financial institutions.

An alternative perspective is that this is exactly the right time to be working in China on new models of fiduciary responsibility to allow for innovation in the forward trajectory of the relevant legislation as it develops in China (rather than the experience elsewhere, particularly in the United States, of having to retrofit with some difficulty broader, enabling interpretations). In particular, it will enable ways of codifying into a systematic fiduciary approach the current reality of commercial and policy considerations being untransparently and unsystematically blended.

- *Stranded Assets*: While this term remains largely unknown in China, its relevance is by no means unconsidered, with specific cases being highlighted closely linked to policy measures being considered to reduce urban smog by closing down or relocating some iron and steel factories and coal-fired energy-generating facilities. While analyzed internationally mainly in relation to the risk of over-valuation of assets by private investors, stranded assets may also have implications for the largely state-owned Chinese energy and mining companies. It may also be relevant for risk perceptions of current and potential foreign and domestic investors in China's energy sector and carbon-intensive and natural-resource-intensive sectors internationally supplying China, as highlighted in a recent study of the stranded asset dangers of Australian mining houses supplying China (Caldecott, Tilbury, & Ma, 2013).
- *Incentives*: Whereas misaligned incentives have become a focus for many advocates of policy-driven reform in financial markets, there was a far lower concern about this phenomenon at this stage on the part of Chinese financial regulators. Generally, the impression was that the lower complexity of China's financial markets combined with the strength of policy intervention meant that green or real economy investment was not at risk for this reason.

That said, this lower prioritization may be more of a definitional than a substantive conclusion. There is broad consensus, for example, of an over-investment in some forms of physical infrastructure, which may in turn lock in carbon and more broadly natural-resource-intense economic activities. Similarly, there is an under-investment in "sustainable" urban infrastructure, particularly buildings, in pursuit of short-term gain. Poorly aligned incentives, then, may well be a major issue to consider in greening China's financial system, while not necessarily having the same characteristics as elsewhere.

- *Green Bonds*: Green or climate bonds were the only specific class of financial instrument considered through one working paper. This was partly because of the emerging international consensus that green bonds, suitably designed and overseen, offer considerable potential for unlocking private capital to finance long-term green investments, as well as making better use of limited public finance for the same purpose. It is noteworthy that Chinese regulators are actively exploring the potential for green bonds and are likely to take practical steps in the short to medium terms.

Green bonds in China (and elsewhere) could be powerful drivers in greening rapid urbanization, creating attractive financing conditions in return for real economy outcomes in the form of green infrastructure. To make this possible, the relevant standards, information flows and means of oversight are needed, none of which are currently in place. This is an excellent example of where a specific green economy target (e.g., green urbanization) could be addressed through the promotion of a specific category of financial instrument that in turn requires significant developments of financial regulation and oversight.

Each area covered by the expert papers, therefore, proved to be relevant to China, but to differing degrees and by different means, highlighting that there are likely internationally comparable design principles of a green financial system and context-specific applications. Through the policy and practitioner debate in China catalyzed by the initiative—and in particular the working papers—it came to light that the highlighted areas are so far:

- Inadequately codified to understand their relative merits and problems
- Not matured to a point where it can be understood how they fit into a broader program of green financial markets

6. BARRIERS AND LEAPFROGGING

There are considerable barriers to developing a green financial system. At one level, many of the barriers are intensely practical—essentially “how to” challenges, such as those set out in Box 5 regarding the current constraints to the effective implementation of green credit policies in China.

Other barriers are, however, more conceptual, structural or concern institutional special interests, which can be summarized in three major types of objections:

1. *Reform the real economy:* Many point to the need to advance policies in the real economy rather than financial markets. While real economy policies must be pursued, and they are preferable to financial economy measures in specific instances, this argument does not have general applicability, as highlighted above.
2. *Technical challenges:* Some argue that greening the financial system is the wrong approach because it will not work, highlighting in particular the power of financial market innovation as a means to evade any restrictive regulatory measures, or more generally the sheer complexity of financial markets and the dangers of well-intended measures having negative intended consequences.
3. *Corporate resistance:* Many highlight how difficult it has proven in light of the financial crisis to even advance regulation with narrower stability objectives, largely because of the political influence of the financial community, pointing out the very real threat of “regulatory arbitrage,” and the ability of financial market actors to move between regulatory environments to avoid profit-affecting regulations.

These challenges are very real, and without a doubt hard to overcome. To date, they have prevented adequate policy debate as to what it would take to ensure that the financial system delivered on its underlying purpose of financing an economy that can deliver an inclusive, sustainable basis for prosperity. As a result, despite ad hoc innovations and progress being made, there has, in effect, been no serious attempt to define the features of a green financial system or the sequencing and trade-offs to consider in progressing towards such a system.

6.1 POLICY LEAPFROGGING

Until now, green finance in modern financial markets has been almost exclusively a matter for developed country investors and policy-makers. Yet this paper, and the associated work on South-originating green finance, has suggested that this is no longer the case. Although 96 per cent of the US\$13.6 trillion in professionally managed funds in 2011 with some environmental, social or governance criteria and aspects are in Europe and North America, green considerations in some emerging markets are increasing under managed assets. Notably, 20 per cent of South African and 15 per cent of Brazilian managed assets include some environmental, social or governance criteria, according to the International Finance Corporation (2011). Non-OECD financing of clean technology, as earlier sections have highlighted, is also on the rise and may soon eclipse developed-country-originated investments.

BOX 5: ILLUSTRATING THE CHALLENGE: PRACTICAL ISSUES CONSTRAINING CHINA'S GREEN CREDIT

- 1. Green credit-related policies are not highly operable.** To date, relevant policies and guidelines have failed to provide specific standards for accession, technology, emission, energy consumption or recycling use in green industries, which leads to difficulty in execution. In addition, current policies do not consider ex-ante risk prevention but focus only on consequence management for illegal actions taken by enterprises.
- 2. Supervision on green credit is ineffective, with insufficient incentives and deficiencies in overall evaluations of the system.** Green credit is still mainly driven by the “consciousness” and “social responsibility” of banking financial institutions and there is no clear reward and punishment system. However, CBRC has expressed its intention to reinforce offsite regulation and onsite inspection, regularly evaluate green finance implementation by the financial institutions and integrate the evaluation results in regulatory rating of financial institutions and performance evaluation of senior executives.
- 3. Banks fail to execute green credit policy effectively.**
 - Under pressure from local governments, banks are often forced to originate loans to non-green projects, particularly local commercial banks and rural credit cooperatives.
 - Commercial banks are faced with higher pressure to deliver short-term profits, yet green credit projects usually have longer payback periods and the benefits cannot be seen immediately.
 - Skills and expertise of credit administration officers in banks are insufficient, which cannot satisfy the requirements for implementing green credit.
 - There are limited sources for banks to access enterprise information, forcing banks to judge the loan origination based on evidence of punishment from environmental protection departments.
- 4. Green credit products do not have many varieties and there are no tailored financial products.** Though China Industrial Bank, China Merchants Bank and other national banks are actively innovating instruments related to green credit, including clean development mechanisms and carbon emission trading, existing green credit products of banks still mainly focus on loan products and there are fewer or even no tailored green finance products or green finance service design and marketing.
- 5. There is a lack of consistent and clear coverage of disclosed information by banks and enterprises and no national uniform data system.** Banks have different definitions for green industries and HEC, HP and overcapacity industries, which makes information among banks incomparable and the total amount of green credit unavailable. Furthermore, the scope of information disclosure by banks also varies.

Similarly, financial market policy innovation is growing in those emerging economies with rapidly maturing financial markets. Brazil, China and South Africa have all taken leadership roles in specific policy areas that advance the greening of financial markets. Yet financial regulators from less developed economies, including Bangladesh, Indonesia and Nigeria, have also made advances that already take them beyond what is happening in developed markets, often focused on specific national challenges, such as how to unlock rural, small businesses, as well as gendered and ethnic opportunities. These issues are, of course, not new—but what are new are the roles taken, visibly and assertively, by financial regulators in emerging economies.

China, more than any other nation at this point in time, is embarking on a major process of financial market reform. China's challenges are many, and stabilizing and strengthening the basics across financial markets is rightly a priority. China, as always, has looked outwards to learn from the experience of others, especially developed economies with sophisticated financial markets. And there is without doubt much to learn of that experience that can be used, when suitably adapted, in a Chinese context. Useful lessons learned must include what others have not done, or not done well, and the consequences.

This consideration must include an appreciation of the consequences of the rise of short-termism, particularly in Anglo-Saxon-influenced financial markets, catalyzed by deregulation that has negatively affected the real economy while hugely profiting the financial economy.

Failing to green financial markets has been part of this experience. While developed economy governments have at least rhetorically championed the need to transition towards green, low-carbon economies, their financial regulators have done little or nothing to complement or strengthen the effectiveness of such a transition in practice. Short-term gains from this regulatory shortfall by investors profiting from more speculative trading behaviour are completely outweighed by the negative impacts on the real economy. Already apparent is the massive gap in infrastructure resulting from inadequate finance flowing towards long-term investment. Over the longer term, as carbon- and natural-resource intensive assets become ever less profitable, the negative consequences of this regulatory failure for the underlying structure of these economies will be profound and hard to reverse.

Developing countries, especially China, have an opportunity to policy leapfrog by advancing a green financial system that is more robust, profitable over the longer-term and effective in realizing its broader purpose. Broadly, such a competitive opportunity is no different from seeking a leadership role in clean technology or promoting beneficial trade and investment rules.

There is a difference, however, in the case of China, given its size and expected impact on the global economy. Greening China's financial markets will not only benefit China directly, but also create beneficial impacts globally.

- *Greening China's domestic economy will have a global impact, given both its export profile and inward global supply chain.*
- *Greening the financing of China's growing outward investment will affect their host economies and also the longer-term financial performance of China's investments.*
- *Greening China's financial system would create a global impact through its growing role in international policy setting, through demonstration, engagement and negotiation.*
- *Greening China's financial system would support China's carbon emission reductions through an accelerated greening of its economy, especially through the financing of urbanization and energy systems.*

Greening China's financial system might, in short, be one of the greatest global win-win opportunities available at this historic moment.

7. MOVING FORWARD

Greening financial systems is an imperative as well as a challenge. IISD and the Finance Research Institute of the DRC have taken a first step in exploring what this might mean in a Chinese context, drawing on the wealth of work already done by many researchers, policy-makers and regulators, in China and internationally.

This exploration provides a framing of the theme and considerable evidence of the potential for success in advancing work on specific instruments and other policy and regulatory measures. The work to date suggests that greening the financial system through policy and regulatory measures can accelerate and amplify the flow of green finance. Indeed, without such measures, it is unlikely that the current shortfalls in green finance will be overcome, even in countries such as China where considerable public finance is being deployed to green aspects of the economy.

To date, the work has been designed principally to support policy considerations in China. Despite China's unique situation, we believe the work also offers knowledge and possible insights relevant to a broader international agenda for advancing the global green economy by channelling finance to green investment through financial market reform.

Financial regulators have many existing instruments that could be deployed to green financial markets, should they take up their legitimate role in addressing this all-important policy objective. That said, there remains a considerable gap in understanding how best to deploy such instruments, and in particular under what circumstances. For example:

- Would a particular policy intervention in the financial market be altogether preferable to measures applied to the real economy; if not, what combination is optimal?
- Would one financial market measure be preferable to another; if not, what combination and/or sequence is optimal?

In addressing these design questions, it is of particular importance to determine the intended impacts, and how to predict and mitigate unintended and potentially negative impacts, including the impact of measures on:

- Green finance flows, differentiating asset classes, target investments and ultimate impacts on economic and green outcomes.
- Narrow and broader measures of financial capital effectiveness and returns.
- Competitiveness and underlying performance of targeted financial centres, particularly in light of opportunities for domestic and international regulatory arbitrage.

In the above context, especially the latter point, there is an additional need to better understand when to advance national measures, and when international progress is preferable or even a pre-condition for domestic action.

IISD and the Finance Research Institute of the DRC intend to address these questions in a second phase of work during 2014. Centrally, the policy research will address the following questions:

- *Principles:* What would be a core set of principles guiding Chinese and other financial regulators in greening the financial system?
- *Definitions and standards:* What standards are needed, along with underlying definitions, to be able to effectively operationalize "green" as a policy and regulatory objective and activity?
- *Assessment:* What would be the means by which stress testing could be undertaken for existing and potential financial regulations against agreed green policy objectives?
- *Mandates:* What would be the mandates of financial regulators to oversee the green aspects of a financial system, and how could they be enacted in co-operation with other public bodies?

- *Instruments:* What policy and regulatory instruments could be deployed, both by financial regulators and other public bodies, such as those responsible for fiscal measures?
- *Private regulations:* What is the role of private standards, such as credit ratings, and how should public policy and regulatory bodies guide them to act?
- *International:* What is the scope for China and other national regulators to act unilaterally, to develop plurilateral co-operation or/and need international, co-ordinated action?

China's leadership engagement in this initiative and topic can and should benefit it directly in this critical development phase of its own financial system and wider economy. At the same time, this initiative intends to be part of a wider design process that can influence developments in other countries and internationally. In implementing a program aimed at addressing the core design questions raised above and others, the work will continue to draw on national and international experience and expertise, building on and contributing to the work of a growing community of policy-makers and researchers.

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