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Exploring Green Finance Incentives in China

Final Report

pwc

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Executive Summary

The increasing scientific evidence supporting climate change and the role of human activities in greenhouse gas emissions has led to the issue becoming a key item on the international agenda. At the UN Framework Convention on Climate Change (UNFCCC) summit at Copenhagen in 2009, governments agreed to limit global average temperature warming to 2°C (UNFCCC, 2009), the threshold beyond which dangerous climate change is expected.

As the largest emitter in the world, China has been responding to this challenge since the previous Five-Year Plan (FYP), with mandated carbon intensity reduction targets. A more ambitious plan has been set out in the current FYP, that the country will shift its current economic model, which is almost coal-based and resource-intensive, to a more sustainable model for economic development. This transformation will require massive investment, and the banking sector will need to play a key role in facilitating this change, to encourage more environmentally and socially responsible investment and to support the growth of the green sector within China. The regulators such as the China Banking Regulatory Commission (CBRC) have a key role to play in shaping green finance for China.

This project is commissioned by the British Embassy Beijing to *enable Chinese policy makers and major or commercial banks to adopt effective and practical incentives to break the barriers to investment in energy efficiency and low carbon sectors.*

There are three parts that form the study:

- **Analysis of international and domestic green financing policies and activities**, identify international best practices that China could leverage and unique Chinese circumstances, and barriers that need to be overcome. **Business cases** demonstrate the experiences of leading Chinese banks on green finance, and an analysis of the direct link between green finance and profitability;
- A **methodology** is developed to assists domestic banks to start green finance, by developing a series of tools and guidelines to produce the appropriate strategy;
- A set of **policy recommendations/incentives** are provided for policy-makers to promote green finance in the banking sector.

International and domestic green financing policies and activities

The uptake of green finance in the Chinese banking sector is relatively low, as compared to their international counterparts. Most banks choose to focus on issues directly related to government policy, including limiting the growth of “high-pollution, energy-intensive and over capacity” industries, improving energy efficiency of necessary industries and developing renewable energy, as extensively publicised in their CSR reports.

The current practices of green finance in both domestic and international banks are summarised in the table below.

Key Green Credit Guidelines	Progress in domestic banks	Examples of activities in domestic banks	Progress in leading international banks	Examples of activities in international banks
Organisation and governance				
Define clear roles and responsibility at the board of director or supervisory board level	Sustainability issues are not solely overseen under any specific committee at Board of Directors level, but rather they are shared across several committees, each of which is responsible for certain relevant issues.	**CIB** senior management engaged in discussions internally and externally (with international bodies such as IFC and WWF, and regulators) In general, the strategy committee and risk management committee are the common institutions within a bank that may have a role to play in addressing sustainability issues, such as producing an annual plan for green finance activities and policies in E&S risk management.	For most leading banks, e.g. those who adopted the Equator Principles, ultimate responsibility for sustainability issues is held at Board of Directors level i.e. either by the entire Board, one member of the Board, or a Committee that includes Board members. There is less consistency among leading banks on whether senior management are evaluated based on sustainability performance.	**Standard Chartered**'s Brand and Values Committee (which includes the Chairman and the Group Chief Executive) holds overall responsibility for sustainability issues. **Mizuho**'s President holds ultimate responsibility for sustainability **Citi** and **JPMorgan**'s Chief Risk Officer is responsible for approving E&S policies
Establish team or committee to build and promote green credit activities	Some banks have a dedicated green finance team, but the reach into the rest of the bank varies across banks. It is rare for senior management or board assuming responsibility for green finance.	**CIB** established a dedicated 'Sustainable Finance' team at the HQ level with full time staff, and each local branch has at least one fulltime staff responsible for green finance. **SPDB** has a dedicated multidisciplinary team governing E&S issues. **CDB** established a dedicated team for business development and risk assessment in green finance. **CMB** has a dedicated green finance team, but its function is solely policy making, and the extent of actual practice is limited.	Leading international banks have dedicated E&S risk management teams. These teams tend to be centralised and based at the bank's head office. The sizes of the E&S Risk Teams vary between the banks. Some banks also have E&S risk champions, who are trained individuals who provide initial guidance to front office on E&S issues and determine whether additional advice is needed from the E&S Risk Team.	**ING** has E&S Risk Champions who act as the main contact point for E&S issues in specific regions. **HSBC** has over 40 country-level and regional-level Sustainability Risk Managers, who act as conduits between front office Relationship Managers and Group Sustainability based at the head office.
Policy, system and capacity building				
Establish and improve policies, systems and processes for environmental and social risk management	Some banks are responding to national policies on green finance and developing plans or initiatives. This include the adoption of a list of industries highlighted by the Government for loan preference or restriction, such as the 'high pollution, energy intensive' industries.	**CIB** developed internal E&S risk management policies, supplemented by the Equator Principles and the E&S standards of the IFC. **SPDB** has in place a long-term development vision through capacity building and process management, to increase its green finance activities. This helps to implement E&S controls (e.g. monitoring and communication with regulators on environmental	Many leading international banks have established both an overarching E&S risk management policy and sector policies. The most common policies relate to Energy (mainly Oil & Gas and Nuclear Power), Extractives (Mining & Metals), Defence, and Forestry. Policies can be applied uniformly across the group or tailored to business units. Some policies refer to international standards such as the IFC Performance	**Mizuho** embed basic E&S principles directly into its credit management policy, and does not have a standalone E&S policy. **Credit Agricole** established a sector policy to deal with clients operating in the Arms and Defence sector, and is in the process of developing an Energy sector policy. **Standard Bank** E&S policy covers the

Key Green Credit Guidelines	Progress in domestic banks	Examples of activities in domestic banks	Progress in leading international banks	Examples of activities in international banks
		records) in all stages of the entire credit-granting process to create a robust system of green finance. The recent development includes the "Temporary Measures on Environmental and Social Risk Management" (2011), which ensures E&S risks are taken into account during the lending process and are closely monitored.	Standards and EHS Guidelines.	entire Group and both its direct and indirect impacts from transactions. **Itau Unibanco** has developed business unit-specific E&S risk policies.
Establish working mechanisms conducive to green credit innovation to boost innovation of green credit processes, products and services	The portfolio of products across banks in China is diverse, catering to different sectors and regions. This is also reflected in the range of green credit products offered.	**CIB** offers a Green project financing grant for clients investing in energy efficient equipment. **SPDB** formed partnerships with other international financial organisations to promote green technologies in energy efficiency and renewable energy. **CDB** provides significant support to the green sector as part of its remit to advance China's competitiveness and to be aligned with the government's objectives. **SPDB, Everbright Bank** and **Huaxia Bank** introduced energy management contracting (EMC), offering loans for energy-saving technologies.	Most common green or sustainable products being offered by international banks relate to the financing of clean-tech, renewables, energy efficiency, environmentally/ socially responsible investment and social finance (microfinance, impact investments). Some banks made public financial commitments to promote business growth of sustainable financial products and services.	**Citi**, **Standard Chartered**, and **HSBC** made public financial commitments of their green financial products and services. **Mizuho** promotes growth through incentives for front officers who have developed corporate customers with an E&S focus.
Active identification and classification of clients or sectors most at risk	Several banks which have relatively stronger interest in green finance actively identified clients or sectors at risk.	**CIB** requires environmental due diligence to be performed on projects based on E&S risks classifications. CIB also has a list of sectors to be promoted or for limiting funding. **SPDB** explicitly states a preference in its "annual credit granting guidance" for renewable energy and environmental protection, while credit to "high-polluting and energy-intensive" companies would be strictly limited. **ICBC, CMB** and **BoC** have a categorisation system to segregate	Most leading banks place the onus on front office to identify high E&S risk transactions, and to escalate these to E&S Champions/E&S Risk Teams for further review. Tools and checklists are developed to aid this process. Many banks have exclusion criteria in their screening process to identify 'prohibited activities' or 'no-go' clients or countries. Some also have 'restricted' clients where additional approval or conditions may apply.	**Standard Bank**'s transactors are responsible for completing an E&S Risk Screening Tool, which considers the E&S risk of both the transaction and the client. **Mizuho** requires front officers to complete an E&S Screening Form for all project finance transactions that is submitted to the Sustainable Development Department for review. **Standard Chartered** has a list of 'no go' clients, and a 'restricted lists' which require approval from E&S risk team.

Key Green Credit Guidelines	Progress in domestic banks	Examples of activities in domestic banks	Progress in leading international banks	Examples of activities in international banks
		projects. **Huaxia Bank** records E&S information in their internal systems to be shared with other departments.		**ING** has a list of 'ultra-high risk' countries that it will not finance.
Set up appropriate tools to track environmental and social performance of loans	Leading banks tend to devise such system to frequently monitor the E&S compliance of loans throughout the cycle. The majority of banks may just review the issues at pre-loan stage.	**CIB** conducts annual E&S checks on loans by contracting a third party, to ensure compliance with the issues and actions stipulated in the loan contracts. **SPDB** uses E&S risk management as an indicator to assess the performance of local branches in E&S for loans made to clients. **CDB** contracts a third party to verify the actual environmental performance of the projects.	Many international banks have public E&S commitment or strategy, supported by a dedicated sustainability or E&S team. These banks tend to sign up to various E&S initiatives and guidelines. Most banks report their activities and performance through regular CSR reports.	Nearly 80 financial institutions in 29 countries officially adopted the Equator Principles. Over 200 financial institutions worldwide report their E&S performance using or referencing the Global Reporting Initiative (GRI) framework.
Capacity building to improve internal E&S management	Many banks recognise the lack of knowledge and skills internally and seek to improve this through formal (training programs) and informal (meetings with banks with best practices) methods. The relatively low share of green credit compared to the overall loan portfolio means training on E&S issues is not a high priority in many banks.	**CIB** developed an IT system to capture E&S risks for each client accessible to all departments of the bank. Training on E&S issues are also provided to staff in the sustainable team at both HQ and local branches. **CDB** organises annually workshops on sustainability, through external training programmes provided by international organisations. **ICBC** has been actively participating in workshops and forums to increase staff exposure to green finance. **BOC** provides formal internal training courses for staff specifically in selected industries on identification of high risk areas. **CCB** provides formal internal training courses for staff on the Equator Principles. **CMB** holds meetings with international banks on green finance to learn best practices.	Leading banks have in place a combination of online and in-person training methods to raise awareness about E&S issues among their staff. Some banks work with external parties to support them in capacity building initiatives.	**HSBC** offers a diverse range of E&S-related training programmes including a Senior On-boarding Training Programme, Risk Management Programme, and Senior Risk Management Programme, and a climate business learning programme. **Itaú BBA** hosted a two-day-event in partnership with the IFC, where IFC members presented the IFC Performance Standards to potential clients and conducted roundtable discussions.

Key Green Credit Guidelines	Progress in domestic banks	Examples of activities in domestic banks	Progress in leading international banks	Examples of activities in international banks
Process management				
Strengthen due diligence in credit approval, tailored to sector and client, and where necessary independent assessment	Most domestic banks rely on environmental impact assessment (EIA) reports by borrowers to assess risks. The MEP and other national guidance are the primary criteria for evaluation. In rare cases banks have specific E&S policy in place.	The over-arching E&S policy at **CIB** requires EDD to be conducted on E&S issues of each application where EPs is applicable. At **CDB**, the project appraisal department is made up of three teams, and each assesses loan applications from certain industries, including industrial-specific issues, E&S issues and general financial information.	Signatories to the Equator Principles undertake E&S due diligence on project finance transactions. Many leading banks also conduct E&S due diligence on other transaction types. E&S screening is typically initiated by business teams/front office for new transactions or clients, and all project finance transactions are escalated to dedicated E&S risk teams for detailed review.	**Standard Bank**, **HSBC, Mizuho** and **Standard Chartered** have developed specific E&S assessments for initial screening by business teams. **Citi** and **JPMorgan** both apply the Carbon Principles due diligence process to certain transactions in the US that involve financing coal-fired power plants. **Standard Bank**, **Citi** and **JPMorgan** apply the International Hydropower Association Sustainability Guidelines to hydropower transactions.
Develop controls and terms to clients on risk management and ensure compliance and post-loan management	“One-vote veto” is fully implemented across the banking sector, as the compliance with regulations by MEP and PBC. Additional assessment on E&S issues and post-loan monitoring are not common at the moment.	**CIB** uses the results from EDD to discuss with clients and develop action plans to improve E&S performance before moving to the next stage of the application.	When E&S risks are identified, leading banks will implement risk mitigation measures to bring the level of risk exposure down to an acceptable level, for example requiring clients to implement E&S action/management plans, or integrate E&S covenants within loan terms. Leading banks have E&S compliance and performance monitoring mechanisms in transactions, typically undertaken by the portfolio monitoring team, who monitor the covenants and reports from the client. The portfolio monitoring teams tend to be supported by the E&S team, which provides technical review. Compliance and performance monitoring efforts may vary depending on the nature of the transaction.	**Standard Bank** requires some clients to obtain insurance to cover E&S risks. **HSBC** carries out audits to check compliance, and clients deemed to be ‘Near Compliant’ or ‘Non Compliant’ on E&S policies are monitored more closely. **Itau BBA** engage third parties to conduct monitoring and/or site visits for higher risk transactions, and uses the E&S team to monitor lower risk transactions in-house and accept documentary evidence from clients to confirm compliance with E&S covenants.

Key Green Credit Guidelines	Progress in domestic banks	Examples of activities in domestic banks	Progress in leading international banks	Examples of activities in international banks
Internal controls and information disclosure				
Regular review on green credit	Most banks disclose green credit through CSR reports, and the data is collected and reported internally. There is an emerging trend of assurance on this information by a third party.	**CDB** engages a professional third party to verify the environmental benefits of its green projects.	Leading banks report that their E&S risk management performance/systems are audited internally, usually as part of their wider internal auditing programme. This typically comprises of a selective review of transactions to ensure due diligence was conducted appropriately and in compliance with relevant policies. Some also obtain external assurance of their E&S activities, although the scope varies across banks.	**Itau BBA** periodically undertakes internal verification by an auditing team from Itaú Unibanco Holding to evaluate the consistency among the E&S risk policy, the manual for E&S risk analysis, internal controls and activities. **HSBC** engaged an external auditor to review its transactions under the Equator Principles, and the statement from the auditors is published in its annual sustainability report.
Transparent disclosure of green credit strategies and policies	Nearly all banks produce CSR reports, however the contents and qualify differ to a large extent. Big commercial banks tend to adopt global frameworks specifically the GRI, while others use their own reporting structure or that of the Chinese Academy of Social Sciences. They name the relevant strategy and policies in the reports, but the contents are not available publicly. Some banks disclose information about green credit products and practices in their websites, making these easily available to view for potential clients.	**SPDB** produced the first CSR report in the Chinese banking sector. **CIB** and **SPDB** have dedicated web pages with of information about their green credit products.	Equator Principles provide reporting guidelines which are adopted by its signatories, however a significant proportion also goes further beyond these requirement in the reporting of their strategies, policies and compliance.	**JPMorgan** applies Equator Principles reporting requirements to certain non-project finance banking activities, and reports externally on the breakdown by risk categorisation, industry sector and geographic region. **Standard Bank** reports on project finance lending and advisory engagements categorised by industry sector, the number of development finance loans categorised by industry sector and risk level, the number of CDM projects, value of spend on energy efficiency and clean energy projects, and the number of employees attending training on its E&S risk appraisal system.

Although only a few banks are taking the lead to develop green finance, there have been some useful experiences (**Business cases**) available for the other banks to look at and incorporate into their own practices.

As the first Chinese Equator Principles bank, **CIB is now recognised as the "greenest Chinese bank"**, and in general being a game changer to lead the business in the sector. Also, it helps the bank to avoid and mitigate the potential environmental & social risks within from the loans it has issued, as claimed by the bank.

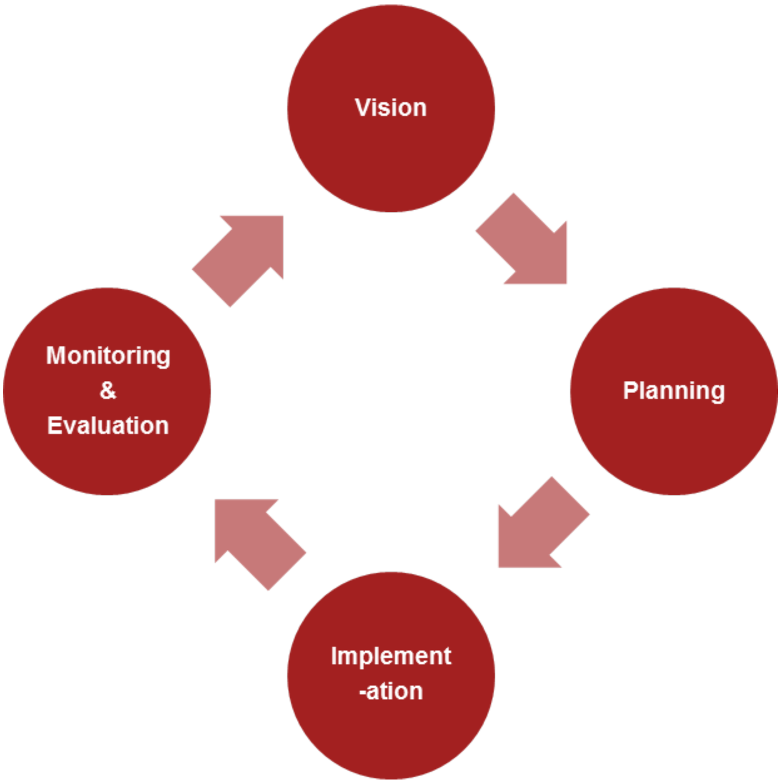
SPDB is publicly recognised as a leader in green finance. A standard methodology has already been developed to enable a certain level of profitability to be maintained from green loans, with a good working relationship between the bank and local government.

The case of **CDB demonstrates how the development bank leverages the tools and capacity to practise green finance,** given the significance of position the bank has in the sector.

For most banks, profitability is a key factor that banks determine whether they should go for further commitment on green finance, since this business is still at an early stage. The study has shown no direct link between profitability and green finance in the selected Chinese banks, and thus concludes that there is a need for additional incentives for banks to conduct green finance.

Methodology

Given the current development of green finance in the Chinese banking sector, most banks have only made limited commitments in this area, and prefer to adopt a "wait-and-see" strategy until a more mature market has evolved. The following methodology is developed as a guide for banks when they decide to officially start green finance.



There are four stages in the methodology:

1. Vision: at this stage, banks would set a target to position themselves relative to their competitors, after an understanding the significance of green finance to the business and possible areas for development in green finance;

2. Planning: based on the vision agreed, senior management should start to develop a strategy for green finance development, and all relevant departments should also ensure that their departmental development plans are consistent with the overall strategy;

3. Implementation: once the strategy and the specific plans are approved, all responsible departments are implementing the corresponding plans;

4. Monitoring: banks should review the performance of year, and incorporate the findings into the consideration for next year's planning

Policy recommendations/incentives

Based on the analysis of domestic and international banks in green finance, a number of gaps are identified against the Green Credit Guideline:

- Lack of board leadership on E&S issues
- Lack of dedicated resources for E&S for all but the leading banks
- Policies on credit screening based on E&S risks to be driven by national policies
- Small number of green products and services
- Lack of capacity, training and knowledge in most banks on E&S issues
- Lack of independent and/or robustness of due diligence process
- Disclosure of green finance limited to positive marketing of banks' activities

To address the issues above, we have developed a set of policy recommendations/incentives summarised below:

Areas	Policy instrument	Who	Timeframe	How
Clear instructions on green finance	Definition of green finance	CBRC PBC	Short	To specify the scope and boundary of green finance: • To identify green finance issues in banks operations and transactions through discussions with relevant government agencies, on the basis of existing national development plans, such as the 12th FYP; • To develop a catalogue of green industries • To initiate discussions with banks to identify problems and eventually define the concept.
	Non-financial information disclosure standard	CBRC PBC	Short/medium	Develop a non-financial information reporting standard, which is comparable to financial reporting, applicable to the banking sector in China.
	Reporting criteria of green finance	CBRC PBC	Short/medium	To define unified and comparable reporting criteria of green finance that enables the regulators to accurately track and assess the performance of banks within a clearly defined scope of green finance business; Develop a series of indicators in the following areas: • Organization and governance • Policy system and capacity building • Process management • Internal controls and information disclosure
Rating and evaluation system	Performance rating of banks	CBRC	Short	To incorporate green finance performance and E&S factors in the regulatory rating of commercial banks.
	Assessment and evaluation of top leadership of banks	CBRC PBC	Short	The areas of evaluation should include: • The performance rating in terms of E&S risk management and green finance operation of banks. • The level of exposure of corporate governance and organizational structures to green finance
Differential risk regulations and monetary policies	Loan-deposit ratio (LTD ratio)	CBRC	Short	To offer preferential LTD ratio requirements to banks with larger proportions of green loans.
	Capital adequacy ratio (CAR)	CBRC	Short	To adjust risk weighting on green loans in risk weighted asset calculations.
	NPL tolerance	CBRC	Short	To extend tolerance of NPL for banks with larger green finance loans.
	Administrative regulations (notice, guidance, etc.)	CBRC PBC	Short	To issue administrative regulations/policies to guide banks investing in green industries.
	Reserve requirement	PBC	Short	To ease reserve requirement of banks with a larger proportion of green loans.
Fiscal policies to restructure the economy	Fiscal appropriations	MoF Financial departments at	Short/medium	Preferential fiscal policies at central and local levels to support green industry.

Areas	Policy instrument	Who	Timeframe	How
and promote sustainable development		provincial level MEP and other relevant government agencies		
	Special fund/subsidy	MoF NDRC NEA MoST MEP and other relevant government agencies Financial departments at provincial level	Short/medium	Based on national policies on strategic emerging industries, economic restructuring strategy and development plans, a fund should be established to support green industries and environmental protection efforts in the following ways: • Investment subsidies and financial awards to encourage technology innovation and deployment in green industry. • To support medium and long term projects with interest subsidized loans.
	Tax break	MoF Financial departments at provincial level	Short/medium	Identify a set of industries in line with national development strategy and prioritized strategic emerging industry planning; To offer the green industries transparent, consistent favorable tax policies, such as deductions in income tax, business tax, property tax, etc. Tailored policies should be targeting each industry depending on the nature of business.
Enhance supervision over environmental issues	Environmental impact review and monitoring of investment activities	CBRC MEP	Short/medium	In addition to environmental impact assessment before project implementation, post-loan environmental review and monitoring should also be addressed to eliminate E&S risks unexpected. To encourage banks to conduct EDD for projects with elevated E&S risks, to promote responsible investment activities.
	Public consultation and public disclosure policies	MEP CBRC	Short/medium	To improve transparency by enlarging the scope of proactive information dissemination. To gradually loosen regulatory restraints on applicants for information disclosure upon request. To provide more available and easy accessible information to the general public and encourage public participation in environmental issues.
Environmental regulations	Environmental legislation and establishment of joint-liability system	MEP People's congress at national and local levels	Medium/long	To establish legal basis for environmental regulations and litigation through identifying responsibilities, litigation qualifications and joint-liability system, etc. This process also brings social attentions and pressures to promote responsible investments.
National plans/industry policies to restructure the economy	National/regional five-year plans and rules for implementation, to promote green industries	State council NDRC MEP	Medium/long	Consistent industry policies to encourage the development of green industry.

Areas	Policy instrument	Who	Timeframe	How
		National Bureau of Statistics, etc.		
	Industry policies to discourage energy intensive, high pollution and over capacity sectors	Relevant government agencies in energy, agriculture, land and resources, transportation, etc.	Medium/long	
Other supporting measures	To assist capacity building in banks on green finance	CBRC MEP NDRC PBC	Short/medium	To share international experience of green finance practice with domestic banks. To establish communication and discussion sessions in banking sector, to identify problems and best practices.
	To encourage banks working with external professional consultants on green finance projects, EDD, etc.	CBRC MEP PBC	Short/medium	Encourage collaboration and pooling of resources in training, capacity buildings and other common objectives for green finance. Every bank will require professional support or training needs on green finance. The regulator can help lower the cost for each bank by encouraging sector level collaboration on common issues such as training.

1. Introduction

1.1. Background and Objectives of this Study

The increasing scientific evidence supporting climate change and the role of human activities in greenhouse gas emissions has led to the issue becoming a key item on the international agenda. At the UN Framework Convention on Climate Change (UNFCCC) summit at Copenhagen in 2009, governments agreed to limit global average temperature warming to 2°C (UNFCCC, 2009), the threshold beyond which dangerous climate change is expected. Many countries, including China, also voluntarily committed to reduce or limit their carbon emissions by 2020.

China has been significantly expanding its green tech and renewable sectors. Between 2004 and 2009, the annual investment increase in these sectors was running at above 50%, which was barely achieved anywhere else in the world. Financing is a core enabler to these often large, capital intensive projects, and therefore banks in China have played and continue to play a critical role in helping China meet its pledges to reduce carbon intensity by 40-45% by 2020.

This study has been commissioned by the British Embassy in Beijing to enable "*Chinese policy makers and major or commercial banks to adopt effective and practical incentives to break the barriers to investment in energy efficiency and low carbon sectors*".

This study aims to conduct a gap analysis between China's banks and their international companions to identify actions and measures taken; understand some of the causes that lead to barriers and problems in green finance; and further discuss possible policy approaches to stimulate green lending in banks.

Our approach was divided into three stages:

- Desktop review of publicly available information on international and domestic green finance policies and practices; to identify 1) international best practices that China could leverage; 2) unique Chinese circumstances, barriers (business and policy) that need to be overcome, and 3) prospects for future development.

- Interviews with domestic green finance practitioners and banking sector regulators, to evaluate the attractiveness of developing low carbon finance solutions for Chinese banks and current operations of green finance in banks.

- The research also draws upon PwC's global network, including but not limited to 1) PwC UK's Sustainability and Climate Change team which has extensive experience in working with leading financial institutions and policy makers on green finance, to introduce the most up-to-date developments from the UK in the field of green finance; and 2) PwC China's financial services team, which has accumulated rich experience in working with Chinese banks, to share their insights on the development of the financial sector in China.

As there is no universally agreed definition for green finance in China's banking sector, this report will adopt the following definition for the purpose of analysis.

Green Finance
For the banking sector, green finance is defined as financial products and services, under the consideration of environmental factors throughout the lending decision making, ex-post monitoring and risk management processes, provided to promote environmentally responsible investments and stimulate low-carbon technologies, projects, industries and businesses.

1.2. Challenges to Mitigate Climate Change

1.2.1. Global Progress

The level of greenhouse gas emissions in many developed countries has been relatively stable or gradually declining, and in 2011 there was an aggregated 0.7% decrease in CO_2 emission in all industrialised countries that are bound to the Kyoto Protocol (BP Statistical Review 2012). On the other hand, the major emerging economies (China and India) are growing their share of the global GHGs emissions. China is now the largest emitter in the world (26% in 2011 from 10% in 2000), which is attributed to both its role as producer of many goods for export and domestic development particularly on infrastructure.

Globally, the last decade has seen the world reduced carbon intensity of an annual average of 0.8% since 2000 (PwC 2012). To limit temperature increase to 2°C will require the world to cut its carbon intensity at 5.1% per year through to 2050. The progress thus far to meet these pledges (Table 1 & 2) demonstrate that the challenge ahead is still significant, and that transformative actions need to occur for the countries to meet them.

Table 1 Targets and Challenges for Developed Countries
Source: PwC, 2012

Country	Targets for 2020		Progress at 2011		Outstanding Commitment
	Target	Required Fossil Fuel Emissions in 2020 ($MtCO_2$)	Progress against the 2020 Target	Actual Fossil Fuel Emissions in 2011 (Mt CO_2e)	Fall in Emissions Required from 2011 ($MtCO_2e$)
US	17% below 2005 Levels	5,390	7% below 2005 Levels	6,017	627
EU-15	20% below 2005 Levels	2,774	5.5% below 1990 Levels	3,277	503
Japan	25% below 1990 Levels	873	12% below 1990 Levels	1,307	435
UK	34% below 1990 Levels	391	18% below 1990 Levels	511	101

Table 2 Targets and Challenges for BRIC Countries
Source: PwC, 2012

Country	Target for 2020	Progress at 2011		Outstanding Commitment	
		Progress against Target	2011 Total Fossil Fuel Emissions ($MtCO_2e$)	Emissions Change Required 2011 – 2020 (%)	Annual Decarbonisation Rate Required (%)
China	40 – 45% below 2005 Carbon Intensity	17% below 2005 Carbon Intensity	8,979	+12%	-4.5%
India	20 – 25% below 2005 Carbon Intensity	3% below 2005 Carbon Intensity	1,798	+31%	-2.8%
Russia	15 – 25% below 1990 Absolute Emissions	5% below 1990 Absolute Emissions	1,675	-19%	-5.8%
Brazil	36 – 39% below BAU Emissions	n/a	482	-25%	-6.8%

To enable transformative actions, large scale deployment of low carbon technology is crucial. Financing these projects is therefore a key enabling factor to unlock these opportunities. Both the UN and World Bank provide various sources of funding to support programmes in adaptation and mitigation for countries in need, and a number of initiatives are also being undertaken by various multilateral parties or donor countries to develop or support financial mechanisms for projects that address GHG reduction (Table 3).

Table 3 Financial Mechanisms under the UNFCCC, World Bank and other Bodies
Sources: Websites of UNFCCC, GEF, Adaptation Fund

Financial mechanisms	Funding body	Description
Least Developed Countries Fund	UN	• Supporting Least Developed Countries Parties in National Adaptation Programmes of Action • GEF as the operating entity $346 million approved for projects, with $537 million pledged to the Fund
Special Climate Change Fund	UN	• Supporting adaptation and technology transfer in all non-Annex 1 countries • GEF as the operating entity $188.88 million approved for projects, with $240.68 million pledged to the Fund
Green Climate Fund	UN	• Supporting adaptation and mitigation activities in non-Annex 1 countries • Money transferred from developed countries to developing countries • $30 billion from developed countries for the period 2010 – 2012, known as "fast-start fund" Mobilisation of $100 billion per year by 2020, known as "long-term finance"
Adaptation Fund	UN	• Supporting concrete adaptation projects in developing countries highly vulnerable to climate change • Funded through the share of proceeds from clean development mechanism project activities and other sources $185.3 million approved for projects funding
Climate Investment Funds (CIF)	World Bank	• Allocated $7.1 billion to mitigation and $4.6 billion to adaptation activities during the financial year 2012 2. Allocated to renewable energy projects worth upwards of $3.6 billion

In addition to activities funded by global initiatives, private investments form an important finance source. In 2011, $257.5bn was invested in renewable energy, up by 17% from 2010, and more than 6 times the investment made in 2004 (UNEP & BNEF, 2012). Renewable energy (excluding hydroelectric) now contributes 6% of global power generation. Most of the investment still originates from developed economies such as Europe and the US, but developing countries have been increasing their financial resources to the area at a faster rate, where the investment has jumped more than 11 times the amount spent in 2004. China accounts for 23% of the global investments in 2011, surpassing the share of the US.

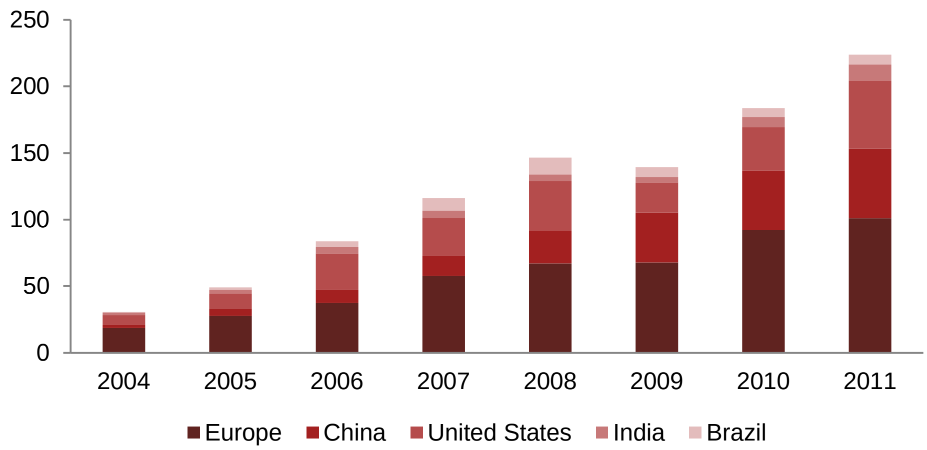


Figure 1 Global New Investment in Renewable Energy, by Region (US$Bn)
Source: UNEP & BNEF, 2012

1.2.2. China's Commitments to Climate Change Mitigation

China's sustained and strong economic growth in the last 30 years was powered by its high consumption of energy. Between 1981 and 2011, its annual energy consumption grew at 5.8% per year, and its carbon emissions increased more than 6 times in the same period (BP, 2012).

In advance of the Copenhagen UNFCCC summit in 2009, China pledged to achieve a 40 – 45% reduction in carbon intensity relative to the 2005 level by 2020 (UNFCCC, 2009).

At the end of the 11th Five Year Plan (FYP), China reported a 19.1% reduction in energy intensity and a 16.2% reduction in carbon intensity, laying the groundwork for further transition into a green and low-carbon economy under the newly introduced 12th FYP. Hailed as the "greenest plan ever" (ACCA, 2012), the 12th FYP describes a more sustainable economic model that aims to maintain the economic and social achievements made over the last three decades.

From an environmental perspective, there are a greater number and more ambitious environmental targets in the 12th FYP than in any previous FYPs. This is supported by a number of policies and actions, including:

- Targets in several key metrics including energy efficiency and carbon intensity (see Table 2).
- The Work Plan for Controlling Greenhouse Gas Emissions which assigns specific carbon intensity reduction targets to all provinces, autonomous regions and municipalities directly under the central government
- Emission trading schemes have been piloted in various provinces and cities, as an exploration of an appropriate market-based instrument to reduce GHGs emissions;
- Guideline Catalogue for Industrial Restructuring (2011) by NDRC which underlines the country's strategic direction towards conserving energy and cutting emissions by optimizing and upgrading its industrial structure.
- Plan for Industrial Transformation and Upgrading (2011-2015) to promote green and low-carbon industrial development, and boost industrial transformation and upgrading in a number of key industries, including iron and steel, non-ferrous metals, building materials, petrochemicals and chemicals, energy-saving and new-energy vehicles, industrial energy conservation, bulk solid waste and clean production.
- Plan for National Strategic Emerging Industries by the State Council charts the road map for seven strategic emerging industries - energy conservation and environmental protection, new-generation information technology, biology, high-end equipment manufacturing, new energy, new materials and new-energy vehicles.
- Development Plan for a Circular Economy to promote circular economy in phases of production, circulation and consumption; and strengthens policy and technology supports to circular economy practice.
- Development Plan for Renewable Energy which sets four specific plans for hydropower, wind power, solar power and biomass energy, and demonstrates the overall roadmap of goals and policies for China's renewable energy development to 2015.

Table 4 Environmental Targets 11th and 12th FYP
Source: 12th FYP, 2010

Targets	11th FYP Proposed	11th FYP Achieved	12th FYP Proposed
Energy Intensity Reduction	20%	19.1%	16%
Carbon Intensity Reduction	n/a	16.2%	17%
Sulphur Dioxide (SO_2) Emissions Reduction	10%	14.29%	8%
Chemical Oxygen Demand Reduction	10%	12.45%	8%
Ammonium Nitrate Reduction	n/a	n/a	10%
Nitrogen Oxide Reduction	n/a	n/a	10%
Five Heavy Metals Reduction	n/a	n/a	15% from 2007
Water Intensity	30%	37%	30%
Non-fossil Fuels Proportion of Primary Energy Mix	n/a	8.3%	11.4%

These targets will be increasingly harder to achieve as the low hanging fruits are being exhausted. Towards the close of 11th FYP, a number of local governments temporarily shut down inefficient power plants to meet the energy intensity target, which resulted in intermittent blackouts in some places. In 2011, the first year of the 12th FYP, many provinces failed to achieve the energy intensity target set for the year. More transformative actions need to be undertaken to meet these targets.

Much of the rise in emissions is attributed to the use of coal, which is relatively abundant in quantity in China (the world's third largest by reserve 13.3%, after the US and Russia) and relatively cheaper as compared to other sources (Figure 2). Despite the investments in other energy sources, coal is expected to continue to dominate the fuel share in the near future. Oil accounts for only 20% of China's energy consumption (BP, 2012), but China is also the second largest net oil importer in the world since 2009, just behind the US.

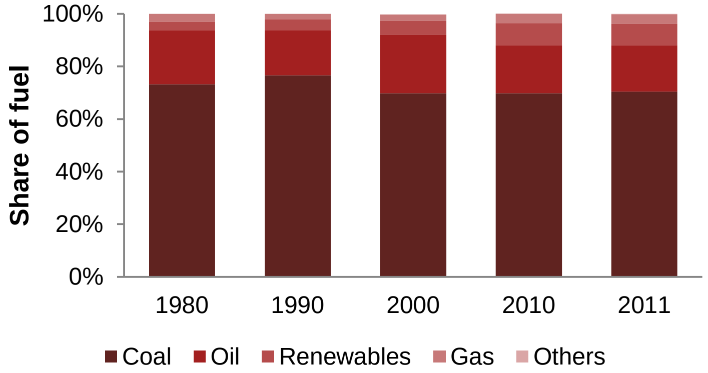


Figure 2 Energy Portfolio in China
Source: BP, 2012

Investment in China into renewable energy has been growing rapidly, at over 50% a year between 2004 and 2009. Wind and solar industries are the main beneficiaries. The country now has the largest installed capacity in the world, although the actual capacity of connection to the national grid is relatively lower. The solar sector is relatively small in terms of scale and installed capacity, but the industry has been expanding rapidly. However, the installed capacities of both wind and solar are still some way behind that generated by the hydroelectric power (Table 5). Nuclear energy is also expected to contribute significantly to China's growth of non-fossil fuel energy, despite current reservations triggered by the nuclear plant accident in Japan.

Table 5 Composition of Renewable Energy in China by 2011
Source: The State Council, 2012

Type	Installed Capacity (GW)
Hydroelectric	230
Nuclear	12.54
Wind	47
Solar	4

The prominence of coal as an abundant and cheap source of fuel means that it is likely to dominate the fuel mix of China for the short to medium term, despite heavy investment in renewable energy. Clean coal is therefore forms an important piece of the strategy to reduce the carbon intensity of China's economy. In the 11th FYP period, China successfully reduced its emissions of SO_2 from coal by 14.29% from the 2005 level, through for example a pilot programme of integrated gasification combined cycle (IGCC) which removes impurities including sulphur from coal, and improves its overall efficiency as compared to conventional pulverised coal (ACCA, 2012). Coal conversion through either gasification or liquefaction into natural gas and methanol was also supported through tariff and tax exemption benefits, demonstration project (one coal gasification), and research programmes. As of now, the capacity of coal to oil under the demonstration programmes has reached 1.88 million tonnes per year (China Greentech Initiative, 2012).

1.3. The Role of China's Banks in Reducing Carbon Intensity

Bank loans are currently the primary source of external finance to enterprises in China, accounting for 2.7 times more than finance from issuing stock or bonds in the capital market (Wind Info, 2012). It is an effective instrument for strengthening and discouraging growth in particular sectors, industries and regions, as well as an important approach to the effective supervision of the real economy (Chan-Fishel, 2007).

The role of bank lending in financing industrial transformations means that promoting green finance is an important lever to ensure that China will meet its carbon intensity reduction target. The role of the Government and regulator such as the CBRC in the banking sector will also be crucial in shaping the lending decisions of commercial banks.

1.4. Structure of this Report

The detailed findings and results of our analysis are presented in 7 separate sections of our report

- Section 2 provides an overview of green finance in China and internationally;
- Section 3 – 7 provides a summary of the existing practices in green finance by domestic and international banks, and the gaps and barriers domestic banks are facing in green finance;
- Section 8 provides business cases of some domestic banks for green finance, demonstrating how they are capturing the benefits and addressing the difficulties in green finance. This is started with an analysis showing the relationship between profitability and green finance in selected Chinese banks;
- Section 10 provides a methodology that assists domestic banks to start green finance, by developing a series of tools and guidelines to produce the appropriate strategy;
- Section 11 provides a set of policy recommendations/incentives for policy-makers to promote green finance in the banking sector.

2. Overview of Green Finance in the Banking Sector

2.1. China's Banking Sector

Bank loans are currently the primary source of external finance to enterprises in China, accounting for 2.7 times more than finance from issuing stock or bonds in the capital market (Wind Info, 2012). A significant portion of banks' lending portfolio consists of loans to State-Owned Enterprises ("SOEs"). SOEs, which are dominant in most traditional industrial sectors such as steel, base metals and chemicals; as well as in the "strategic emerging sectors" such as clean energy and high-tech manufacturing, receive more than 70% of bank lending (Szamosszegi and Kyle, 2011).

The Ministry of Finance and the Central Huijin Investment Ltd. (China's sovereign wealth fund) are influential shareholders in the major development and commercial banks in China. Regulation of the financial institutions forms the responsibilities of the China Banking Regulatory Commission (CBRC) and the People's Bank of China (PBC) to control interest rates and quantitatively manage bank credits by "window guidance[1]".

Table 6 shows the different types of banks in China.

Table 6 Types of Banks in China, as of June 2012
Source: Webiste of CBRC

Types	Characteristics	Example of banks	Number of banks	% of total assets
Policy banks	• Operate according to the policy directions from the central government, each with a specific focus • Established to direct government financing and investments of the four state-owned commercial banks. • Most of the investments are less competitive in profitability, large in scale and are often medium or long term loans.	China Development Bank (CDB) (focus on domestic infrastructure and core industries) Export and Import Bank of China (Chexim) (focus on trade financing) Agricultural Development Bank of China (ADBC) (focus on agriculture and rural development financing)	3	6.5%
State-owned commercial banks	• Undergone a process of reform and commercialization since 1995 • Bank lending covers a wide range of industries and sectors, including "high polluting, energy intensive and over capacity" projects	Industrial Commercial Banks of China (ICBC) Bank of China (BOC) China Construction Bank (CCB) Agriculture Bank of China (ABC) Bank of Communications	5	46.6%
Joint-stock commercial banks	• Tend to be more risk-averse and have much lower non-performing loan (NPL) ratios compared to the Big 5 • Considered as pioneers in innovation in China's banking sector	e.g. Minsheng Bank, CITIC Bank, China Everbright Bank, Shanghai Pudong Development Bank (SPDB), China Industrial Bank (CIB), etc.	12	16.7%
City commercial banks	• Established on the back of the urban credit cooperatives from the 1990s. • Tend to be restricted to their cities	e.g. Bank of Beijing, Shanghai Rural Commercial Bank (SRCB), Tianjin Binhai Rural Commercial Bank, etc.	144	9.1%

[1] Window guidance: PBC's primary tool of monetary policy implementation, which has been used to persuade banks and other financial institutions to keep to official guidelines.

Types	Characteristics	Example of banks	Number of banks	% of total assets
	of origin and closely tied to the local governments • Key source of credit to the SMEs community, and local industrial development and business activities • Banks are small in absolute size, but growing rapidly in recent years			
Rural financial institutions	• Started to transform from rural credit cooperatives into joint-stock companies since 2004; • Over 1000 rural banks has been opened to suffice the increasing demand in rural areas; • Most rural financial institutions only provide services to China's rural population	Rural commercial banks, rural cooperative banks, township banks, rural credit cooperatives	3302	-
Foreign banks	• Restricted in operations by government policies • Generally have a much narrower customer and business base	Foreign bank subsidiaries, foreign bank branches, representative office	343	-

2.2. Drivers of Green Finance in China

National policies and initiatives

As a general trend, national policies – industrial, environmental and financial – are the areas in which banks are implementing green finance. Banks respond to these policies by producing plans to comply or follow the lead of government, for example including a list of industries indicated by government for credit granting or loan restrictions, and the introduction of E&S issues into their risk management consideration. Such initiatives are creating a marked shift in the profile of loan portfolios at banks. A clear policy signal from central government provides banks, which are naturally risk-averse, with the confidence to invest in green finance.

A number of key sectors are the focus of national policies, which are also where many of the banks currently concentrate their E&S risk management activities. The large manufacturing industry and coal-fired power plants are the main targets set by the government for decarbonisation. The focus of national policies are on improving energy efficiency and eliminating the small and outdated technologies, consolidating the relatively efficient ones, developing renewable energies especially in wind and solar. National policies also distinguish 'high-pollution and energy-intensive' industries which provide a strong indication to banks on where credit screening based on E&S risks need to be focused.

Market leadership and opportunities for new products

Leading banks such as CIB and SPDB, which consider green finance as a potential area for profitable growth in the long run, appear to be China's early adopters. They see it as an opportunity to extend the range of services that banks can offer, and feel that a bank that acts first will have a competitive edge on its peers. These banks have been publicly recognised for their green finance efforts and have used this as a differentiating factor from the other banks.

Stakeholder pressure

Failure to effectively identify and control E&S risks could lead to financial, legal or reputational damage for both the company and the bank. For example, during the early days of the World Bank's lending activities, several projects it financed without a proper E&S assessment resulted in damage to the natural environment (Business Ethics, 2011). The organisation later introduced a number of policies and measures to ensure the consideration of potential E&S risks from the projects it supports. Even so, its performance in dealing with E&S issues inherited from some of its early projects is still not yet up to the standard it has set, and has become a target of criticism by some independent non-governmental organisations (NGOs). An example is the Easter Electricity Highway project between Ethiopia and Kenya, which environmentalists worry that it might cause a series of ecological and social disturbances in Ethiopia (Bowman, 2012).

While domestic banks are not directly implicated at present on environmental issues, they are likely to become more exposed to stakeholder pressures to focus on environmentally and socially responsible investments. For example, a toxic spillage in the local river caused by Zijin Mining Group in 2010 caused severe contamination and more than 2,000 tonnes of fish were poisoned. No banks that provided loans to the Group were found liable or asked to share the remedial costs. Nevertheless, the general public is increasingly expressing their views regarding the protection of the local community and its environment. As the environmental legal framework matures along with the economic development of China, businesses will necessarily face a more legally constrained and challenging business environment.

2.3. National Policies and Initiatives

Although China's banking system is gradually transforming from a centralized and government-controlled system to a more diversified and competitive market, it still remains under significant influence from the supervision of the central and local governments. As the major supervisory and regulatory bodies of the banking industry, PBC and CBRC coordinate with macroeconomic control by the State Council and other branches of the central government such as the Ministry of Environmental Protection (MEP) and the NDRC. This allows policies in a targeted industry and in the financial sector to be aligned.

In 1995, the MEP and the PBC launched policies that, for the first time, were directly tied to banks consideration of environmental issues in their lending policies. Between 1995 and 2005 there were very limited new policies on environmental and social issues. Since then, the last two FYPs have seen the proliferation of policies (see Table 7).

Table 7 Green Finance Regulations and Policies in China's Banking Sector
Source: Green Finance Development in China 2010 Report (MEP, 2010)

Time	Policy	Issuing Department/gov. organization
1995.2	Notice on credit policy for environmental protection	PBC
1995.2	Notice on making use of credit policy for promoting environmental protection	SEPA (MEP)
2004.4	Notice on further strengthening industrial policy and credit policy to control credit risks	NDRC PBC CBRC
2005.10	Development Finance Cooperation Framework Agreement	SEPA (MEP) CDB
2006.3	Notice on accelerating adjustment of industrial structure with excess capacity	State Council
2006.12	Notice on Information Sharing about Corporate Environmental Issues	
2007.7	Opinions on preventing credit risks and implementing policy of environmental protection	MEP PBC CBRC
2007.11	Guiding Opinions on the Credit Work for Energy Conservation and Emission Reduction	CBRC
2008.3	Notice on Regulating the People's Bank of China's Credit System and Providing Information about Corporate Environmental Violations	MEP CBRC
2008.3	Opinions on the Financial Support for Accelerating the Development of the Service Sector	PBC CBRC CSRC

Time	Policy	Issuing Department/gov. organization
		CIRC
2009.6	Notice on Further Improvement of Information Sharing for the Full Implementation of the Green Credit Policy	MEP PBC CBRC
2009.12	Notice on Further Doing a Good Job in Supporting the Restructuring and Revitalization of Key Industries and Curbing Overcapacity in Some Industries through Financial Services	PBC CBRC CSRC CIRC
2010.5	Opinions on Further Doing a Good Job in Providing Financial Services for Supporting Energy Conservation, Emission Reduction and Elimination of Backward Production Capacities	PBC CBRC
2012.2	Green Credit Guidelines	CBRC

In the context of green finance, a number of existing plans or policies targeted at a specific sector are also often directly complemented by policies in the banking sector (see Table 8).

Table 8 Links between Policies on Climate Change and Policies in the Banking Sector in China

Source: Analysis based on China's Policies and Actions for Addressing Climate Change (NDRC, 2012), 12th FYP, Green Finance Development in China 2010 Report (MEP, 2010)

Plan/Policy	Target/Contents	Policy in the banking sector that supports the development	
State Council Opinions on Accelerating the Development of the Service Industry; **Guidance of the State Council General Office for Accelerating the Development of Hi-tech Service Industry**	The opinions and later released guidance of the State Council aim to further improve the environment for the development and upgrading of the service sector.	MEP CBRC	Opinions on the Financial Support for Accelerating the Development of the Service Sector
Opinions on Curbing Overcapacity and Redundant Construction in Some Industries and Guiding the Sound Development of Industries; **Notice of Further Strengthening Elimination of Obsolete Production Capacity**	These opinions and notice were followed by a series of implementation guidance and directions to improve the exit mechanism for obsolete production capacity.	PBC CBRC CSRC CIRC	Notice on Further Doing a Good Job in Supporting the Restructuring and Revitalization of Key Industries and Curbing Overcapacity in Some Industries through Financial Services
Work Plan on Energy Conservation and Emission Reduction During the 12th Five-Year Plan Period (2011-2015)	This work plan includes a breakdown of energy-saving objectives during the FYP period. The energy conservation and emission reduction targets will be achieved by comprehensive assessment of regional targets with evaluation of industry goals, implementation of five-year targets with fulfilment of annual targets, assessment of annual targets with progress tracking, and quarterly reports on the completion of energy conservation targets in each region.	PBC CBRC	Opinions on Further Doing a Good Job in Providing Financial Services for Supporting Energy Conservation, Emission Reduction and Elimination of Backward Production Capacities

The Green Credit Guidelines, issued by the CBRC, are the latest set of guidance issued on green finance, which is directly linked into the objectives and work plan of the 12th FYP.

Green Credit Guidelines

The Green Credit Guideline has been formulated "for the purpose of encouraging banking institutions to, by focusing on green credit, actively adjust credit structures, effectively fend off environmental and social risks, better serve the real economy, and boost the transformation to better economic growth and adjustment to economic structures".

Key features:

- Banking institutions encouraged to promote green credit strategically, both in terms of support to the green, low-carbon economy but also to improve their own environmental and social performance
- The effective identification, measurement, monitoring and control of environmental and social (E&S) risks is crucial, through a risk management mechanism, credit policies and process management
- Senior management (board of directors or supervisory board) is encouraged to take ownership of promoting green credit within their organisations
- Process management is core to improving green credit adoption: including active identification of clients at risk, the use of specific and customized credit granting guidelines to certain industries, improvement in the due diligence process and credit approval management, changes to contract clauses and post-loan management.
- Information disclosure and transparency is also promoted.

The guidelines are by definition general in nature and therefore lack specific instructions or protocols. The benefit is that it allows banks to evolve and develop at their own pace and provides space for innovation. The limitations, particularly to banks unfamiliar with green finance, are that they do not provide sufficient clarity to banks on how to proceed.

Source: Notice of the CBRC on Issuing the Green Credit Guidelines (2012)

2.4. International Banks and Green Finance

Internationally, the adoption of green finance by banks varies significantly, and with varying interpretations of 'green finance'. A study in 2009 grouped 100 international banks into four clusters based on the banks' climate change strategies: forerunners, process developers, product innovators and hesitators[1]. The two groups relevant for this study are the forerunners – those judged to have 'most comprehensively integrated climate change into their core business processes over the entire value chain' – and product innovators – those that have focused on the development of specialised products and services. Forerunners make up only 5%, whereas product innovators make up 20% of the sample considered.

Product innovators represent banks that have reacted to the demand for climate change related lending and investment products. This includes 'climate loans' with reduced rates to clients that are reducing their carbon emissions, using renewable energy sources, or showing adaptation to climate change. However, this form of loan only represents a small amount of their total business volumes. Investment banks that fall into this cluster were found to offer project finance, private equity, and venture capital on technologies or projects targeting climate change mitigation and adaptation. Some of the banks with asset management also offer thematic funds, such as a 'green fund' that targets green investments.

The small number of **forerunners** has been taking green issues at the strategic level for many years, by gradually incorporating E&S issues into the overall strategy, making environmentally and socially responsible investments by adopting international standards, such as Equator Principles (EPs) and UNEP FI. Within the context of green finance, banks in this cluster, for example, ask for a higher risk premium for clients with higher carbon exposure or exposed to emission trading schemes. In asset management, climate change considerations

[1] SAM and WWF (2009), Banking and Climate Change- Opportunities and Risks, http://ec.europa.eu/enterprise/policies/sustainable-business/corporate-social-responsibility/reporting-disclosure/swedish-presidency/files/surveys_and_reports/banking_and_climate_change_-_sam_group_en.pdf

are integrated in mainstream analysis for markets, regions, sectors, and companies, and are reflected in the valuation of assets. Climate change-related risks and opportunities are disclosed in prospectuses and investment proposals, and advisory services to clients on climate change issues are being offered.

Examples of Common International Policies

- Equator Principles
- UN Environment Programme Finance Initiative
- UN Principles for Responsible Investment (Asset management only)
- Carbon Principles (US coal financing only)
- Climate Principles

At the time of these studies, green investments are considered by many to be a potential growth avenue in the face of the global economic downturn. The period witnessed high levels of investments into clean energy in many countries. Since 2008/09, the level of investment has slowed, and the banking sector has also evolved in the development of green finance. The increasingly challenging market and regulatory environment means that several banks have emerged more visibly as leaders, while less profitable products or services were discontinued (for example, several large investment banks closed their carbon trading business units).

Another development in recent years is the growth within emerging markets. In India, both local and international banks are active in promoting green investments and financing[2]. Four large privately-owned banks in Brazil were also found to be promoting green finance in various guises, from advanced teams in the analysis of social and environmental risks in credit finance, to offering dedicated green credit financing lines[3]. With continued demand for investments in infrastructure and growth and pledges to the international community on sustainable development (particularly with regards to limiting emissions growth), the growth potential for banks in green finance remains largely unaffected by the global economic downturn.

Most banks (and research in this area) recognise that green finance is an evolving opportunity so gaps remain even in those that are considered 'forerunners'. A general point to note is that banks often focus on areas of which they already have considerable strengths or competitive advantage, e.g. those that invested in carbon trading are banks that already engage in commodity trading whereas offerings such as green mortgages or green credit card are provided by banks with a strong retail presence.

[2] Climate Group (2010), Climate change and Finance in India, http://www.theclimategroup.org/_assets/files/climate-change-and-finance-in-india_2.pdf

[3] UNEP (2011), Privately-owned Banks and Climate Change, An analysis of the strategies and practices of Brazilian privately-owned banks to manage climate change challenges, http://www.gvces.com.br/arquivos/40/PNUMA_2011_ENGLISH_V2.pdf

3. Green Finance Practices

Banks in China appear to have made progress in the area of green finance (Table 12). Due to the lack of comparable data and information, it is difficult to measure this progress, or the benefits or costs to banks in engaging in green finance. However, the trend of increasing lending to ‘green’ sectors and the declining lending to “high-pollution and energy-intensive industries” by Chinese banks suggests that green finance is taking up in China

Leading banks such as CIB and SPDB, which consider green finance as a potential area for profitable growth in the long run, appear to be China’s early adopters. They see it as an opportunity to extend the range of services that banks can offer, and feel that a bank that acts first will have a competitive edge on its peers. These banks actively engage with their international counterparts on discussions around E&S and green finance issues before absorbing and adapting green finance activities into their own business models. Senior management at these banks see E&S not only as issues for the country and the Chinese people, but also as business opportunities to be integrated into their bank’s overall business strategy. Resources at these banks are earmarked to increase the competence of the workforce before gradually adopting a systematic approach to green finance which they believe will deliver benefits to both the environment and to the bank. These banks have been publicly recognised for their green finance efforts (see Business Cases for details).

The ICBC has produced “Opinions on the Promotion of the ‘Green Credit Policy’ Implementation”, “Opinions on Further Promotion of Credit Support to Energy Conservation and Emission Reduction Projects” and “Announcement on the Categorisation and Management of Green Credits to Domestic Companies”, which establishes a database recording the environmental performance of businesses, embeds a green information credit granting process which categorises the level of environmental risks posed by businesses based on national environmental legislations and establishes an accountability system for environmental compliance.

As early as 2006, SPDB, in its “annual credit granting guidance”, explicitly stated that renewable energy and environmental protection, which were the key supporting industries identified by central government, would be given a preference for credit granting, while credit to “high-polluting and energy-intensive” companies would be strictly limited as these fell under the limited and eliminated categories of the national industrial policies. At the same time, SPDB started to produce long-term mechanisms through its credit granting process, management processes and institutional contacts to increase its green finance activities. The recent development of the “Temporary Measures on Environmental and Social Risk Management” in 2011 has further supported the Bank’s progress such that E&S risks are taken into account during the lending process and are closely monitored. The Bank represents that so far they have not suffered any financial losses relating to specific E&S issues on their lending portfolio (SPDB, 2011).

4. Procedures, Organisations and Tools

4.1. E&S Risk Control in Credit Granting Process

International Practices: The credit granting process for a new borrower at most banks starts with "Know Your Client", where basic information is gathered in order to build a customer profile to support a lending decision. As banks verify information and proceed to a specific loan application, further activities e.g. due diligence ("DD") will be performed in order to gather more information for subsequent review and consideration. In the context of green finance, this would mean an E&S DD. As a general rule, international banks have a dedicated team that deals with E&S aspects as part of the bank's credit granting process. Some leading international players might even have E&S champions sitting within the business teams to assist in dealing with E&S issues before the dedicated E&S team provides their professional support. If a borrower is found to demonstrate potentially high E&S risk indicators, international banks would discuss these with their borrowers and ask for action plans to mitigate the risks to an acceptable level. Even with this action plan, this by no means guarantees the final approval of the application. Once all necessary information is ready, the application, along with the DD supporting evidence and mitigation action plans, will be passed to the risk or credit team for final approval or for a recommendation to a higher authority, such as managing director of the credit department or credit committee for the more significant or higher risk borrowers/applications.

After an application is approved, the actual financing process is then commenced and banks will start their post-disbursement activities, including checks of compliance of the borrower with the agreement, and working capital loan management and customer relationship management processes etc. For international banks, post-lending is an extension of *ex-post* risk control during the decision-making process, and monitoring of environmental performance will continue throughout the process. A third party or the E&S team will be responsible for following up with the borrower on its agreed actions regarding E&S mitigation plans.

Domestic Banks Practices: Given its relatively late introduction, E&S DD is not widely practised across domestic banks at the moment. CIB is presently the only bank that follows an international standard, with a dedicated team called "Sustainable Finance" performing the E&S DD work. The procedures adopted largely follow the bank's internal over-arching E&S policy, which is heavily influenced by the Equator Principles, the Environmental and Social standards introduced by the IFC, and national legislation. CMB has a dedicated green finance team, but it functions purely as a policy maker.

In fact, the common approach adopted by domestic banks to assess E&S risks is distinct, and not very similar to the international practices. For the majority of domestic banks, sources of E&S aspects are the reports of environmental impact assessments (EIA) supplied by borrowers, and the information registered in the MEP. The business teams assume responsibilities for assessing these reports to identify potential risks.

While the information obtained from the EIA reports and the MEP does improve the knowledge of banks regarding the E&S issues of the borrower, there is no guarantee that the issues noted by the reviewer are infact the most relevant or critical to the specific loan application. The questionable quality of the EIA reports has been widely reported in the press for many years. In 2010, a survey conducted by the MEP found that more than 40% of the institutions inspected were producing EIA reports which were substandard, and 17% of the reports were deemed "*poor quality*" (MEP, 2010). In January 2013, MEP published an updated report covering 501 organisations, and considered capacity, personnel and quality: 88 entities were either disqualified, or were required to make improvements (Wu, 2013). The deficiencies were attributed to the limited amount of public participation, the mutual interests of EIA companies and their clients, and the limited guidance available to control the environmental impacts following the approval of the report by the approving authority. Furthermore, there might also be some limitations to the usefulness of the information recorded in the MEP if the information is not maintained up-to-date. Taken together, this could result in banks making decisions based on erroneous information. Thus, there is a pressing need for banks to perform an independent environmental due diligence ("EDD") to either complement or support the information gleaned from these other sources.

Although in China there are presently no mandatory requirements for banks to conduct an EDD, it is nevertheless expected that this will come in the future as the nation moves steadily towards a greener regime. Furthermore, such a movement would also better equip banks with the means to acquire the necessary information, both for its own records and as a response to the growing scrutiny of local communities and public interest groups, as the growing protests in recent times (e.g. Dalian PX protest and Guangzhou incinerator protest) has revealed the increasing awareness of the general public on environmental issues. This may come at a high cost (Hamilton, 2009), perhaps imposing a barrier for medium- to small-scale projects, but the role of local and commercial banks could help by providing favourable policies and backed by the government to support these small and medium sized projects.

Unlike their counterparts abroad, not all domestic banks produce specific policies to guide E&S risk assessment processes, and the national policies described above do provide guidance on how banks could or should issue or reject credits to a particular industry. Even if such guidance did exist, the chances are that relevant national policies would be referred to as the final decision-making authority, which would only further restrict a bank's ability to be creative in its green finance activities. For example, the BOC groups all companies of "high-pollution and energy-intensive" together under a control list, which was produced based on the national industry policies that mandates financial limits on these industries, such that loans to these industries are purposefully limited. Likewise, the gradual increase in the green sector loan portfolio, and the higher share of non-fossil fuel in energy mix in recent years, also provide solid evidence of a concerted response to the national policies to support new energy development. The national policies also act as a benchmark for banks to assess the environmental performance of the borrower, and a "one-vote veto" would be exercised if the borrower is deemed to be in breach of any specific environmental legislation. The "Big 5", CDB and the major joint-stock commercial banks (e.g. SPDB, CMB and CMBC) have all employed such methods to show their seriousness about environmental issues.

4.2. Importance of E&S Risk Control

Failure to effectively identify and control E&S risks could lead to financial, legal or reputational damage for both the company and the bank. This became a concern for the World Bank during the early days of its lending activities, which resulted in damage to the natural environment for some of the projects it financed caused by insufficient E&S assessments beforehand (Business Ethics, 2011). The organisation introduced a number of policies and measures to ensure the consideration of potential E&S risks from the projects it supports. Even so, its performance in dealing with E&S issues inherited from some of its earlier projects is not yet up to the standard it has set, and is a target of criticism by some independent non-governmental organisations (NGOs). An example is the Easter Electricity Highway project between Ethiopia and Kenya, which environmentalists worry that it might cause a series of ecological and social disturbances in Ethiopia (Bowman, 2012).

Table 9 Categories of E&S Risk

Category	Issues
Financial	• Loan default by the borrower, due to high cost of environmental compensation • Reduced value of collateral resulted from environmental contamination
Legal	• Direct or indirect liability for the environmental damages caused by loan debtor
Reputational	• Association with polluting companies, and inaction to improve environmental records

At present, domestic banks are not directly implicated in any failings of companies in matters affecting the environment. A breakout of toxic spillage in the local river caused by the Zijin Mining Group in 2010 caused severe contamination and more than 2,000 tonnes of fish were poisoned. No banks that provided loans to the Group were found liable or asked to share the burden of cleaning up the mess. The offender was fined a mere 30 million RMB (ca. $4.82 million), while at the same time reporting its 2009 profits of 5.02 billion RMB ($741 million). Nevertheless, the general public is increasingly expressing their opinions regarding the protection of the local community and its environment so strongly that governments cannot simply sit back and ignore them and need to take actions to address their concerns.

Domestic banks are not directly involved in these issues now, but there will likely come a time in the future when they will encounter more calls for environmental and socially responsible investments, similar to the move in the developed world. No matter whether these calls come from the government, environmental groups or the public at large, banks will need to demonstrate that they are acting in an environmentally sensitive way. As the environmental legal framework matures along with the economic development of China, businesses will necessarily face a more legally constrained and challenging business environment. Given the prominent role of the financial industry and the existence of their clients in almost every single industry, domestic banks are in the fortunate position of being able to leverage their clients to help reduce the negative impacts on the environment and society, whilst at the same time, protecting their investment.

4.3. E&S Risk Control Process

Given the growing importance of E&S risk management in the practice of lending, each step in the lending process requires special attention to ensure that the whole process is robust and effective (Figure 8) and banks, and hopefully nor their clients, take on unmanaged risks.

For international banks, E&S risk assessments are performed according to their specific policies, in addition to the general risk assessments protocols. This gives them a greater understanding of particular E&S issues that banks should be aware of. On top of this, many banks have produced sector-specific policies to give further information relating to specific industries, particularly those that are environmental-sensitive, such as the chemicals, energy and mining industries. Further, international voluntary standards such as the Equator Principles (EP) and UN Environment Programme Finance Initiative provide additional guidance to banks when assessing E&S issues. As a result, coupled with the thorough nature of the EDD process, the quality of E&S information should be high quality and banks should be in a much better position to make optimal decisions. After the analysis of the information, projects will often be categorised based on the level of E&S risks for mitigation activities. If any risks are perceived to be potentially high for a given project, such projects, if approved, will then be subject to continuous monitoring to allows banks to effectively supervise the management of the E&S issues at both different levels and at different stages of the project. Each member of the EPs produces an annual report that details their EPs implementation and experiences, which facilitates knowledge sharing and a feeling of community spirit.

	Identifict-ion	Analysis	Categorisat-ion	Mitigation	Monitoring	Reporting
Domestic Banks	• Questionnaire • Sector-specific information • Public information	National Law Internal Policies Information from Clients	Own Categorisation System	EIA Environmental Action Plan Information Disclosure	Environmental Performance Tracking and Assessment Information Digitisation	Application of Equator Principles Environmental Vetoed Projects
International Banks	• Questionnaire • Sector-specific information • Public information	External Policies National Law Internal Policies Information from Clients	Own Categorisation System Equator Principles or other in-house Categorisation System	EIA Environmental Action Plan Environmental Audit Public Consultation and Information Disclosure	E&S Risk stated in Loan Contracts Standardised System of Loan Origination	Application of Equator Principles

Figure 3 Risk Control Processes

The CIB is currently the only Chinese signatory to the EPs, so its procedures for managing E&S risks is by and large similar to other member banks of the EPs, and follows both its own internal E&S risk management policies, along with the EPs and the Environmental and Social standards set by the IFC. SPDB, although not a member of the EPs, is highly regarded as a leader in green finance in China, and released its own E&S risk management policy (trial version) in 2011, covering both pre- and post-lending processes.

In the rest of the sector, risk management of E&S issues is practiced at many different levels. For those banks with a strong interest in green finance, the EPs offer a good point of reference and provide a lot of valuable information in this emerging area. These banks will adapt the most relevant and useful information into their own E&S procedures. ICBC, CMB and BoCom have all adopted a categorisation system to segregate projects, but each has adopted different criteria (Table 10). At the monitoring stage, many banks have implemented an IT system that tracks the environmental performance of its customers. Again, information gathered and recorded varies considerably, but which, to various extents, is generally stored for future credit consideration. BoCom requires a close watch on its clients under the “red” and “blue” categories (higher E&S risks), gradually removing these clients from their approved list. The risk management team is promptly updated with new information, such that the team has more knowledge on which businesses/customers have a better E&S record, and thus a higher chance of securing a loan. For banks such as ICBC and Huaxia Bank, who do not categorise projects, information is recorded in their systems and later shared with other departments in the bank. In these cases, where there is no specific document guiding E&S risk management, it is likely that such banks will just follow their normal risk management processes.

Table 10 Environmental Categorisations Adopted by Banks
Source: CSR Reports by Both Banks

Banks	Categorisation	Corresponding Measures
Bank of Communication	Green	Good environmental records, and adequate level of cooperation
	Yellow	Closely monitoring required, and gradually reducing lending activities
	Red	Strictly prohibited for lending
CMB	Blue	Credits made to environmentally qualified clients
	Green	Credits made to clients who bring positive results to the environment
	Orange	Credits made to clients who may pose environmental risks
	Red	Credits not to clients who fail to meet environmental regulations

4.3.1. Lack of Guiding Principles for E&S Risk Control

The variation in E&S risk management across the banking sector is largely as a result of a lack of comprehensive and compulsory policies from the regulatory bodies to formalise the process at a detailed level. Most existing policies focus on information sharing, as the policy makers believe that this would facilitate the cooperation between the environmental authorities and banks to exert financial pressures/penalties over the less environmentally-friendly businesses, which explains why most banks prefer the MEP as the source of relevant environmental information of businesses. This leaves a loophole for both banks and businesses. For, without a prescribed process for managing E&S risks, each bank has developed an approach which is as different in terms of breadth and depth as there are banks, and businesses with a poor environmental record will tend to apply for loans in banks with looser measures. Over time, this might result in the development of a vicious cycle, where banks compete with one another and deliberately lower their standards of assessing E&S issues in order to win more clients, which then increases the possibility of environmental damage cause by these businesses because, in the end, even more money will be required to remediate the environmental damage, which could have been avoided if better control had been exercised in the first place.

In acknowledging this fact and coinciding with the introduction of the 12^{th} FYP, the “Green Credit Guideline” introduced in 2012 by the CBRC has given a better picture on what it expects banks should do when undertaking green finance activities. E&S risk management is a key feature of this guideline. Although the policy has emphasised the issues discussed above, the broad content and lack of detailed instructions has made the policy too unclear for implementation at an operational level. For example, in Article 15, it says “*financial institutions should strengthen the due diligence during the credit approval process, and the contents of the environmental due diligence should highlight the characteristics of the industry and location of the client and the project, in order to ensure the task covering all aspects in details at sufficient level…*”. Here, there is no further interpretation as to what should count as the characteristics of an industry or location, and to what extent, both in breadth and depth of a subject, a DD is considered as to give sufficient details. These aspects and others need further clarification to guide and explain the terminology, and more importantly, propose a framework and standard protocols for E&S risk management across the whole lending activities for banks to use.

4.3.2. Knowledge of E&S Issues

Another important issue, if an E&S risk management process is to be truly effective, is that recognition needs to be made that while risk management may be core to a bank's lending process, consideration of E&S issues are a relatively newcomer to the banking sector. E&S issues have been frequently and widely discussed on the global stage during the last decade, whether emanating from concerns about climate change or social unrest arising from environmental damage caused by allegedly "uncaring" companies. In China, expressing concerns about E&S issues has only really become popular in more recent years and therefore, there is probably only a very small number of people with any deep E&H knowledge in China. E&H is an interdisciplinary subject and would need to draw information from a wide range of sources including national and local legislation, industry-specific regulations and standards, and specific E&S concerns raised by local communities. Such a demand for knowledge is more pressing in the field of environmentally sensitive industries, such as heavy manufacturing and chemicals industries, as more thorough and comprehensive analysis is required to assess the likely E&S impacts exerted by such industries, in order to avoid any irreversible damage to the environment or to society.

Regarding the analysis itself, as mentioned above, domestic banks tend to use information from the MEP for E&S risk assessment purposes, with a focus on environmental, health and safety issues, and their likely impacts on operations and financial performance. However, the information contained in the MEP is actually very technical and includes things like emissions and control of pollutants, radioactive substances and safety production, presented in a very qualitative way (The Climate Group, 2011). This promotes quite different assessments and interpretations by different banks, and without a recognised standard set of quantitative criteria, could lead to different conclusions for similar clients by different banks.

5. Reporting and Information Disclosure

5.1. CSR Reporting

There are a number of channels through which banks disclose information regarding their green finance activities. The Corporate Social Responsibility (CSR) report or Sustainability report is by far the most popular medium where information can be found about a range of environmental and social aspects of a company's performance. In these reports, elements of green finance that we commonly come across include specific green credit policies, measures introduced under annual credit work plans, descriptions of lending made under green finance initiatives (mostly a commentary on loans to "high-pollution and energy-intensive" industries, renewable energy industries, energy efficiency and environmental protection projects, and other areas categorised under the green finance umbrella), international cooperation, banks' own actions to reduce environmental impacts and their presence in local communities which make a positive change to the environment. In other words, it is a summary about what banks have done in the area of green finance in that year, and many would compare their performance with that of the previous year.

The idea of CSR reports may have been around for some time, but the first CSR report in the Chinese banking sector was not seen until around 2005, when SPDB took the initiative. This triggered a fever of CSR report publications amongst other banks, and two years later, there were at least 5 banks releasing their first CSR reports. Today, nearly all banks have their own CSR reports, albeit that the contents and quality differ to a large extent.

5.2. Issues with CSR Reporting

At the present time, there is no recognised official standard or requirement for green finance reporting. A reporting framework that is widely adopted for corporate social responsibility reporting is the one developed by the Global Reporting Initiative (GRI). The big commercial banks have shown more interest in this globally recognised voluntary framework to report their CSR performance and include aspects of green finance, while other banks tend to use their own reporting structures or the one developed by the Chinese Academy of Social Sciences.

Although banks are showing a willingness to share and report information in green finance, there is room for improvement. The quality of the reports is a major concern to many readers as they often struggle to reconcile their perceived and general knowledge of a bank and its customers with the quantitative and qualitative statements made by the bank. Due to the lack of a universally agreed reporting framework, banks have a high degree of freedom to include whatever information they feel necessary. This could create a situation where banks avoid reporting information which they feel may be harmful to the reputation of their brand, such as loans provided to polluting companies who have caused significant damage to the local environment. If a balanced picture of green finance practices within a bank is not presented to a reader, they may later question the objectivity of the report.

In fact, most CSR reports are written and read like pamphlets that publicise the social activities that banks have undertaken in the year. As far as green finance is concerned, a bank tends to focus on its lending performance as described above, but with no information about the challenges it faces, nor of the further improvements it needs or plans to make. By disclosing such information, the public would have a better idea of a bank's green finance practices, and more importantly, there would be more external pressures bought to the banks to further improve their green finance practices.

It is common in China that not all national policies have a dedicated chapter which defines each term that appears in the policy. This also holds true for green finance related policies. Hence, there is a difference in understanding and interpretation of green finance policies by each bank, which is later translated into different actions under different scopes, even though the same term is used. For example, the definition of "over-capacity" industries in CMB is different from that in SPDB, where poly-silicon and wind power equipment manufacturing industries are not included. And so it would be erroneous for readers to assume that the definition and scope of an industry is the same at all banks, even though they may use identical words. This essentially makes meaningful comparison of green finance practices between banks a challenging task.

Last, but not least is the credibility of information, especially the quantitative statements presented in the CSR reports. Since there is no mandatory requirement on banks to seek a third-party assurance over the data they present, very few have done so, largely because of the additional cost and the perceived little immediate benefit. Furthermore, there also does not appear to be a broad consensus of the importance of independent assurance of CSR reports amongst bank boards, their shareholders and stakeholders and the banking regulators, so it may be some time before we see many more banks having their CSR reports independently assured. However, those banks that have gone down the independent assurance route tend to see their CSR report as a complementary statement to their financial report.

5.3. Other Channels for Disclosure

Information about green credit products and practices can sometimes be found on a bank's official website. This can be more useful to borrowers, as the information on the website will be specifically about the green financial products banks offer to their clients. Yet, this form of information disclosure is rather rare, because most banks have not designed specific web pages describing their green finance business. So far, only CIB and SPDB have dedicated web pages containing a reasonable amount of information about their green credit products.

What is missing from their websites are the policies and strategies relating to green finance. It has become a common feature in CSR reports that green finance is part of the annual credit granting work plan, and some leading banks in green finance might even have a dedicated team or prescribed E&S risk management protocols. However, the actual documents describing these loan governance practices are never available publicly. This is not to suggest that banks should upload these documents for the public view, but rather a brief introduction to the internal policies might be helpful to give a general picture of how green finance is executed within the bank.

The media is frequently used as banks try to promote its green products. Quite often, leading banks are under the spotlight, whereas average or below-average performers are rarely heard of. On the other hand, some civil organisations generally have a good relationship with all banks, working as an independent party closely monitoring a bank's performance in green finance. For the past three years the local NGO, *Green Watershed*, has published an annual report, tracking the environmental performances of banks from a lending perspective.

6. Capacity Building

6.1. Overview of Capacity Building in Domestic Banks

The discussions in the previous chapters have raised some of the issues and barriers domestic banks are facing when practising green finance. As a response, they have organised various activities to improve their capabilities, such that E&S risk management exists not just because it has to, but is also able to play a real role in influencing the decision-making process.

BOC and CCB are two of the "Big 5" banks that provide formal internal training courses for its staff on E&S issues. BOC covers specific E&S risks relating to a number of industries which enable staff to identify potentially high risk areas and thus alert other internal teams to provide early warnings of the risks for possible mitigation measures. CCB also covers similar aspects with an additional focus on the EPs, and aims to gradually improve its own E&S risk management processes. As a leader in the industry, CIB goes one step further and focuses on continuous improvement to update its sustainable finance staff on emerging E&S issues, both at local branches and at headquarters, so that it can realise a more effective implementation of the EPs and its own internal policies.

Domestic players are keen to learn from their international counterparts and other stakeholders. As a new joiner to the EPs, CIB is still in its learning period and faces the same set of problems and challenges that other EPs members have experienced in the past. So it has engaged with other members for experience sharing. In a broader sense, CCB and CMB have also been holding meetings with international banks and organisations on green finance in order to improve their existing practices and to make it a more attractive business. ICBC has been active in participating in a number of workshops and forums to increase the exposure of green finance to its staff. It has held discussions with industry experts on national energy policies, and recent environmental accidents (e.g. the nuclear crisis in Japan), as well as the opportunities and challenges facing financial institutions.

While many domestic banks devote efforts in understanding E&S risks management issues, some banks also look at social and environmental aspects in other ways. Huaxia Bank, for example, has organised internal workshops for its staff at all levels, from senior management to business and credit teams, to improve their knowledge in energy conservation and emission reduction and possible green-oriented products. Further, it also provides training, in partnership with international organisations (e.g. Agence Française de Développement), on the same topics.

6.2. Areas of Focus on Capacity Building

One area of capacity building around green finance in domestic banks is competent E&S risk management, which is seen as one of the biggest obstacles experienced by most banks in the area of green finance. However, the level of training provided to staff within business departments vary between banks, with leading banks providing more consistency in their training programmes, whereas quite limited resources are generally devoted to train staff in many other banks. This is probably because of the relatively low presence of green finance structured products within a bank's loan portfolio and a relatively light E&S risk management process being applied by the industry. Furthermore, there is uncertainty as to the usefulness that training provides. Which begs the question that if training courses are not up to standard then are they serving any useful purpose. Another important issue that all banks encounter is the large number of staff who need training, and where resources are limited, how this can be delivered to a quality that will benefit all people in need of it. If the green sector is growing as planned and is projected in China, more resources would be required to provide training to not only bank staff, but also customers, regulators and policy makers. Banks have an important role to play in the green sector and a more competent approach to manage E&S risks within banks will be required, which can only be achieved through education, training and experience.

There are other non-E&S issues that also deserve attention when dealing with loans made to the green sector. Given the rapid expansion of the green sector, technology is evolving at such a remarkable pace that, if banks are going to have confidence in the loans they make, awareness of industry developments and trends will be necessary to enhance their pool of knowledge, thus increasing their capability in analysing and controlling E&S risks. From a renewable energy perspective, there are a number of direct risks banks should be aware of (Hamilton, 2009; Gardiner, 2008):

- Technology risk: is the technology going to generate sufficient revenue to pay back the loans, with track record? If so, what warranties can the client give, in order to secure the payments?
- Construction risk: is the project going to be completed on time, within the budget and satisfied quality? What are the possible risks associating with the location where the project is going to be commenced and operated?
- Operation and maintenance risk: is the client equipped with sufficiently competent staff to operate the project once completed within the budget? Is there any potential large expenses expected during the period of lending?
- Policy risk: what are the national industrial policies introduced at the moment, and what are expecting in the near future, which might have an influence on the capability of the clients to pay back? Is there any additional sub-sector policy that would affect the income stream of the project, thus affecting the cash flow to banks? How stable are the policies in the mid- and long-term?

These risks are associated with the more mature and proven technology. For new and emerging technologies, which are still under research and development or demonstration stages, there are more uncertainties as market demand and political support from government may not be in place. Applying the so-called “valley of death” phrase to technology development, international banks are generally reticent to finance such projects because of the high risks involved (Hamilton, 2009). And if domestic banks lack the competency to identify potential risks, there could be catastrophic consequences if a project goes wrong.

Therefore, technical issues are important for domestic banks to consider as part of their risk management process. SPDB, a leader in green finance, has been building up its technical capability, including the assessment of emerging technology and its financial feasibility, and in the area of the quantification of energy savings, to help manage the risks in green projects.

Technical capacity is one thing, and skills in the non-technical aspects such as managerial and senior level engagement, is another important dimension to help drive the expansion of green finance in domestic banks. Unlike many leading international banks, it is rare to see people at senior or board level at domestic banks charged with responsibility for green finance. Furthermore, in most domestic banks, green finance is still seen as an extra product or service line that could offered to clients, rather than as an overriding principal for its overall loan strategy. Given the assertion that China is committed to going green, an early strategic plan for green finance should such grant banks a competitive advantage, with an ability to lead and shape the business within the industry as a whole. In the context of Chinese banks, CIB and SPDB have already shown their peers that through good risk management practices, a green finance strategy is one worth pursuing.

7. Sustainable Financial Products

In addition to a green finance strategy and systems for establishing policies and reporting processes, a set of financial products and services is a natural way for banks to explore new business opportunities in the sustainability field. Currently some leading Chinese banks are making the transition from testing the water programmes to a more systematic sustainable financial products management process; while others appear to be still searching for a suitable approach to cope with existing and potentially new green credit requirements from the government and regulators. Most of the major Chinese banks we have interviewed are well aware that sustainable and responsible investments will be an area of focus of the public and supervisory bodies. Consequently, social and environmental risks are being managed through banks financial products not only because of growing concerns by investors, and increasing attention to environmental issues by the country as a whole, but also because banks foresees potential business opportunities in the field of sustainable development in China.

7.1. Sustainable Financial Products in Banks of Different Types

As discussed above, Chinese banks have quite diverse portfolios of products to serve their equally diverse client base; and those banks who have found their niche in green finance have done so to meet a growing new market. For the Big 5 commercial banks whose lending portfolio covers a wide range of traditional industries and sectors, their approach to green finance is quite conservative in terms of introducing new products or lending models. However, because of their size, their efforts have a significant impact in reducing support to "high pollution, energy intensive and over capacity" industries through ways such as project/sector environmental risk labelling, banned and restricted lists and on-going processes of improving disclosure on environmental matters. These efforts also help to hedge the banks' exposure to clients in carbon intensive sectors and so enabling them to manage the associated risks in the longer term. In addition, as they are much larger in scale and richer in resources, the Big 5 are also capable of undertaking projects requiring longer payback periods and of larger funding scales. In 2011, the Big 5 made substantial loans directly in green projects, ranging between 200 and 450 billion RMB[4]. The lending was mostly used to support the construction of green infrastructure or large scale capital investment, such as wind turbine or power plant technology upgrade.

The joint-stock commercial banks are much more flexible and bolder in product innovation, by taking advantage of their keen sense of market signals and relatively lower costs of promoting new products. The lending scales of joint-stock commercial banks are relatively smaller in size, and the lending amounts varied between 10 to 100 billion RMB in 2011. Apart from direct lending, banks such as CIB and SPDB have taken initiatives to introduce products specifically aimed at the green sector. For example, SPDB, Everbright Bank and Huaxia Bank have all introduced energy management contracting (EMC) to promote energy efficiency, where banks provide loans for energy-saving technologies, and the saving is converted into monetary terms as the repayment. Another common product for green sector is leasing support of green equipment, where banks pay for the initial capital expenditure, and the revenues generated from the equipment are used to repay the bank. These banks are more suited to provide services to SMEs, which are likely to require funding on a smaller scale. More information on business models and product development is discussed in the business cases included in Section 8.

Another potential growth point lies in the particular geographic location of a city commercial bank. Closely related to local economy and SME business activities, the city commercial banks are able to sustain local transitions to a low carbon economy and therefore helping to realise the government's goal of industry restructuring. Their familiarity with SMEs also provides them with a wide client base and their small size provides them with comparative advantages in flexible design and promotion of new financial products. However, the lack of E&S risk management capability, weak credit management processes and flaws in the

[4] Summarized by authors according to annual reports and CSR reports of 12 major commercial banks in China (see Appendix A).

long-term strategic planning processes all pose challenges to the future prospects of green products in city commercial banks. Some attempts by city banks to co-operate with international financial institutions through risk sharing mechanisms, have been effective in improving their overall risk management performance in energy saving projects and environmental protection sectors (see Section 8 for more details).

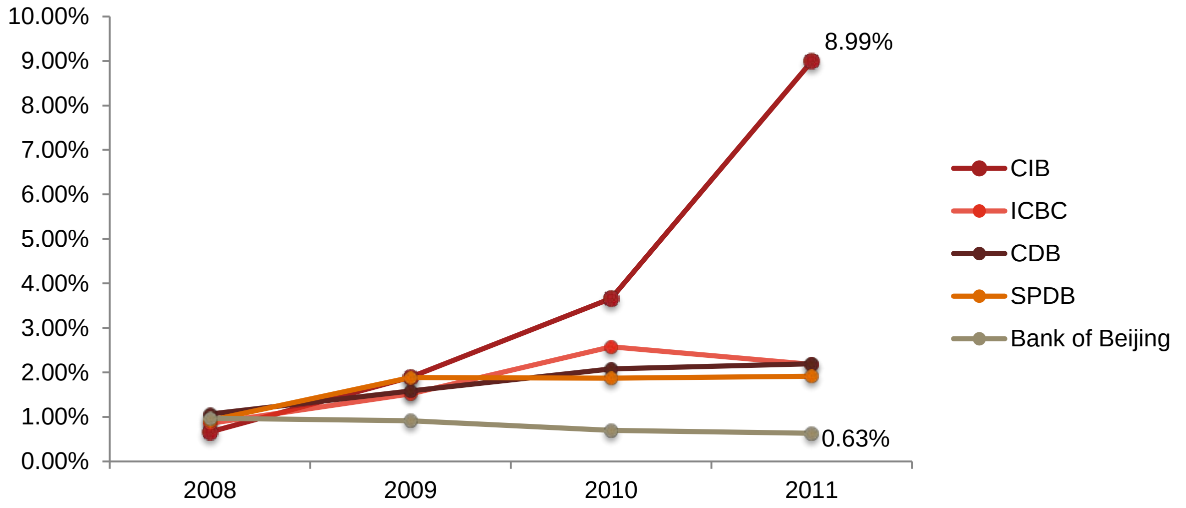


Figure 3 Proportion of Loans in Energy Efficiency and Renewable Energy to Total Loans in Chinese Banks
Source: CSR Reports of the Five Banks (2009 – 2012)

As policies have encouraged banks to green their investment portfolios, the proportion of green loans to total loans in banks have shown a growing trend in recent years. From analysis of the CSR reports of 5 banks in the past four years to identify trends in investments in energy efficiency and renewable energy projects, we see a number of interesting trends. Only five banks are selected here because not all banks disclose their sustainable financial investment data consistently across different years. It is also worth mentioning that although these five banks share the same data category of investments in energy efficiency and renewable energy, the loans included in this category do not precisely indicate the same statistical approach, as there is no unified definition across all banks. As shown in Figure 4, the proportion of investments in energy efficiency and clean energy sector has been growing steadily since 2008 in CDB, CIB and SPDB; and CIB is leading others with a ratio of 8.99% in 2011. The green energy investment proportion in ICBC increased between 2008 and 2010, but then experienced a slight decrease in 2011. The ratio at the Bank of Beijing, as one representative of the city commercial banks, has shown a decrease over the past four years; while the total green energy investments for all these banks have been increasing since 2008. The analysis shows that the leading joint-stock banks such as CIB and SPDB, as well as the policy bank CDB are increasingly focusing on investments in clean energy and energy efficiency sectors; while the city commercial banks may not yet have identified green finance as a major focus for their business.

The evolution process in the development of sustainable financial products also adds weight to the notion that green finance is increasing in importance in the business agendas of leading banks. The concept and understanding of green finance has developed from loose ideas related to environmental management issues, to comprehensive sustainable financial service package to a wide range of industries and sectors. The types of financial product have also been expanding from loans to other forms of credit granting such as leasing and factoring. Taking the evolution of green finance products in SPDB as an example to show how green finance was established in domestic banks, we find that the initial green finance approaches of SPDB date back to 2005, at a time when very limited services were made available in the area of environmental protection and to the energy sector. Later, the bank's green financial services were expanded into four areas of environmental issues and a number of specific green financial products (Figure 5). Recently, the bank launched a new version of its green finance services, with a combination of innovative and conventional products targeting a wide range of areas.

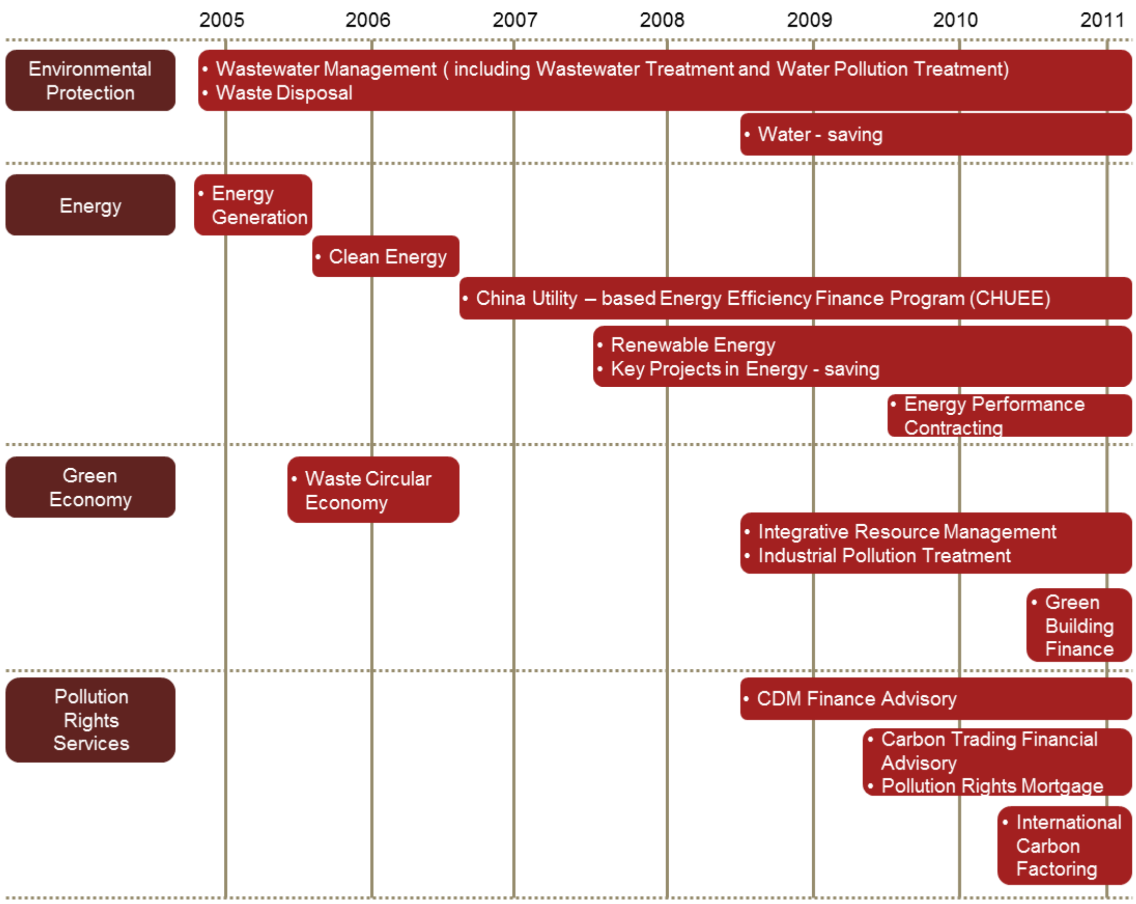


Figure 4 Evolution of Green Finance Products in SPDB (2005-2011)
Source: CSR Reports of SPDB (2005 – 2011)

The issue arising from a lack of unified definition of green finance is highlighted here: the products of different banks may not refer precisely to the same type of financial service. Therefore, we summarize the major green finance products provided by Chinese banks in Table 11 below according to industries/sectors they serve.

Table 11 Sustainable Financial Products by Chinese Banks

Industry/sector	Type of product	Banks providing the product (example)
Energy Efficiency and Clean Energy	Loans to large scale renewable energy facility manufacturing and constructions Utility-based energy efficiency finance program Energy Performance Management future earning pledge finance Loans to green building energy efficiency programs	Minsheng Bank, Shanghai Pudong Development Bank (SPDB), Bank of Communication, Everbright Bank, Agriculture Bank of China (ABC), China Development Bank (CDB)
Carbon-related Products	CDM related projects International carbon factoring Carbon trading financial advisory	China Industrial Bank (CIB), SPDB, China Merchant Bank (CMB)
Pollution Rights Trading	Pollution rights profit mortgage loans	SPDB, CMB, CIB
Clean Coal and Low Carbon Technologies	Investments to clean coal projects Green fixed-income finance/leasing	Minsheng Bank, CDB
Smart Grid	Loans to smart grid projects	Minsheng Bank, Bank of Communication
Green Building	Loans to green building projects	CMB, SPDB

Industry/sector	Type of product	Banks providing the product (example)
Environmental Protection, Pollution Treatment and Forestry	Loans and investments to local pollution treatment infrastructure, natural reserves and forests as carbon sinks	ABC, SPDB, CDB, Bank of Communication, CMB, Bank of China (BOC), China Construction Bank (CCB), Industrial and Commercial Bank of China (ICBC)

7.2. International Experience in Sustainable Financial Products and Services Innovation

The emerging potential of sustainable financial products is encouraging. However, the innovative practices of green finance and more sophisticated management systems of the international banks demonstrate how much more things need to improve. The experiences of international banks provide useful insights for domestic banks on how to develop new products in green finance, for example, how they might go about offering non-loan products to customers. A study by CERES as early as 2008 considers the types of green finance activities undertaken by leading banks, for example:

- Emerging market leaders adopt the Equator Principles to incorporate environmental, social and governance (ESG) factors for development and infrastructure projects;
- Risk management policies or lending procedures are mostly process oriented and focused on due diligence research, and many apply specifically to the power sector;
- Several European banks launched climate-specific funds and index offerings;
- Retail products include preferred rate 'green mortgages' and climate-focused credit card programs and 'green car loans.
- A growing number of banks are formally calculating carbon risks in their portfolio, including Citi, Mitsubishi UFJ Financial Group, Mizuho Financial Group, Royal Bank of Canada, and Wells Fargo;
- Some banks have made active commitment to investments in the renewable and clean tech sectors;
- Carbon trading desks have been set up in several banks with commodities trading and brokerage services.

A few better practices that might be suitable for some Chinese banks include:

- **HSBC Group:** HSBC has established an in-house team that analyses the cost and benefits of climate change, and the likely consequences on the business.
- **ING Groep N.V.:** ING has produced a report "The Third Industrial Revolution", advising its investors and corporate clients of the potential benefits of improving energy and water efficiency and GHGs reductions, with recent reports on the development in sustainable fishing and waste management.
- **Deutsche Bank:** The most renowned advisory service in the banking sector is the DB Climate Change Advisors (DBCCA) at Deutsche Bank, in which a group of experts in the environmental and sustainability field are providing professional insights to interested parties for either research or investment purposes.
- **Itaú Unibanco:** Itaú Unibanco was one of the first institutions to ecourage low carbon projects through giving the Brazilian Development Bank (BNDES) financing line a relatively lower interest rate and longer payment period. The bank also supports projects, goods and services with an emphasis on sustainability by the *Giro Ambiental* product (environment product). Their product of *MaxiConta Ambiental PJ* provides companies who are tackling environmental problems with a differentiated rate package.
- **Santander:** Santander provides financing through their credit line of *Funding for Sustainability* to a wide range of sectors and industries including vehicles, machinery, equipment, projects, construction and services within sustainability. Another main credit line *Gas Kit* supports gas installation in cars by financing the acquisition of gas kit. The Floresta Real Fund was launched in 2008 to offset emissions of CO2 equivalent by assigning financial value to carbon credits from reforestation projects in the Ribeira Valley region.

Previous, albeit limited, experiences and trial approaches to sustainable finance and products are shaping the framework of green lending within Chinese banks; while more opportunities are presently available to those with more comprehensive portfolios of products and services, those niche players who are the first movers in the green finance space are playing an important role in the evolution and development of China's green finance banking system.

Table 12 Summary of International and Domestic Banks in Green Finance

Key Green Credit Guidelines	Progress in domestic banks	Examples of activities in domestic banks	Progress in leading international banks	Examples of activities in international banks
Organisation and governance				
Define clear roles and responsibility at the board of director or supervisory board level	Sustainability issues are not solely overseen under any specific committee at Board of Directors level, but rather they are shared across several committees, each of which is responsible for certain relevant issues.	**CIB** senior management engaged in discussions internally and externally (with international bodies such as IFC and WWF, and regulators) In general, the strategy committee and risk management committee are the common institutions at each bank that may have a role to play in addressing the sustainability issues concerned, such as producing annual plan for green finance activities and policies in E&S risk management.	For most leading banks, e.g. those who adopted the Equator Principles, ultimate responsibility for sustainability issues is held at Board of Directors level i.e. either by the entire Board, one member of the Board, or a Committee that includes Board members. There is less consistency among leading banks on whether senior management are evaluated based on sustainability performance.	**Standard Chartered**'s Brand and Values Committee (which includes the Chairman and the Group Chief Executive) holds overall responsibility for sustainability issues. **Mizuho**'s President holds ultimate responsibility for sustainability **Citi** and **JPMorgan**'s Chief Risk Officer is responsible for approving E&S policies
Establish team or committee to build and promote green credit activities	Some banks have dedicated green finance team, but the reach into the rest of the bank varies across banks. It is rare for senior management or board assuming responsibility for green finance.	**CIB** established dedicated 'Sustainable Finance' team at the HQ level with full time staff, and each local branch has at least one fulltime staff responsible for green finance. **SPDB** has a dedicated multidisciplinary team governing E&S issues. **CDB** established a dedicated team for business development and risk assessment in green finance. **CMB** has a dedicated green finance team, but its function is solely policy making, and the extent of actual practice is limited.	Leading international banks have dedicated E&S risk management teams. These teams tend to be centralised and based at the bank's head office. The sizes of the E&S Risk Teams vary between the banks. Some banks also have E&S risk champions, who are trained individuals who provide initial guidance to front office on E&S issues and determine whether additional advice is needed from the E&S Risk Team.	**ING** has E&S Risk Champions who act as the main contact point for E&S issues in specific regions. **HSBC** has over 40 country-level and regional-level Sustainability Risk Managers, who act as conduits between front office Relationship Managers and Group Sustainability based at the head office.
Policy, system and capacity building				
Establish and improve policies, systems and processes for environmental and social risk management	Some banks are responding to national policies on green finance and developing plans or initiatives. This include the adoption of a list of industries highlighted by the Government for loan preference or restriction, such as the 'high pollution, energy intensive' industries.	**CIB** developed internal E&S risk management policies, supplemented by the Equator Principles and the E&S standards of the IFC. **SPDB** has in place long-term development vision through capacity building and process management, to increase its green finance activities. This helps to implement E&S controls	Many leading international banks have established both an overarching E&S risk management policy and sector policies. The most common policies relate to Energy (mainly Oil & Gas and Nuclear Power), Extractives (Mining & Metals), Defence, and Forestry. Policies can be applied uniformly across the group or tailored to business units.	**Mizuho** embed basic E&S principles directly into its credit management policy, and does not have a standalone E&S policy. **Credit Agricole** established a sector policy to deal with clients operating in the Arms and Defence sector, and is in the process of developing an Energy sector policy.

Key Green Credit Guidelines	Progress in domestic banks	Examples of activities in domestic banks	Progress in leading international banks	Examples of activities in international banks
		(e.g. monitoring and communication with regulators on the environmental records) in all stages of the entire credit-granting process to create a robust system of green finance. The recent development includes the "Temporary Measures on Environmental and Social Risk Management" (2011), which makes sure E&S risks are taken into account during the lending process and are closely monitored.	Some policies refer to international standards such as the IFC Performance Standards and EHS Guidelines.	**Standard Bank** E&S policy covers the entire Group and both its direct and indirect impacts from transactions. **Itau Unibanco** has developed business unit-specific E&S risk policies.
Establish working mechanisms conducive to green credit innovation to boost innovation of green credit processes, products and services	*The portfolio of products across banks in China is diverse, catering to different sectors and regions. This is also reflected in the range of green credit products offered.*	**CIB** offers the Green project financing grant for clients investment in energy efficient equipment. **SPDB** formed partnerships with other international financial organisations to promote green technologies in energy efficiency and renewable energy. **CDB** provides significant support to the green sector as part of its remit to advance China's competitiveness and be aligned with the government's objectives. **SPDB, Everbright Bank** and **Huaxia Bank** introduced energy management contracting (EMC), offering loans for energy-saving technologies.	Most common green or sustainable products being offered by international banks relate to the financing of clean-tech, renewables, energy efficiency, environmentally/ socially responsible investment and social finance (microfinance, impact investments). Some banks made public financial commitments to promote business growth of sustainable financial products and services.	**Citi**, **Standard Chartered**, and **HSBC** made public financial commitments of their green financial products and services. **Mizuho** promotes growth through incentives for front officers who have developed corporate customers with an E&S focus.
Active identification and classification of clients or sectors most at risk	*Several banks which have relatively stronger interest in green finance actively identified clients or sectors at risk.*	**CIB** requires environmental due diligence to be performed on projects to classify based on E&S risks. CIB also has a list of sectors to be promoted or limited for finance. **SPDB** explicitly stated preference in its "annual credit granting guidance" for renewable energy and environmental protection, while credit to "high-polluting and energy-intensive" companies would be strictly limited. **ICBC, CMB** and **BoC** have a	Most leading banks place the onus on front office to identify high E&S risk transactions, and to escalate these to E&S Champions/E&S Risk Teams for further review. Tools and checklists are developed to aid this process. Many banks have exclusion criteria in their screening process to identify 'prohibited activities' or 'no-go' clients or countries. Some also have 'restricted' clients where additional approval or conditions may apply.	**Standard Bank**'s transactors are responsible for completing an E&S Risk Screening Tool, which considers the E&S risk of both the transaction and the client. **Mizuho** requires front officers to complete an E&S Screening Form for all project finance transactions that is submitted to the Sustainable Development Department for review. **Standard Chartered** has a list of 'no go' clients, and a 'restricted lists' which

Key Green Credit Guidelines	Progress in domestic banks	Examples of activities in domestic banks	Progress in leading international banks	Examples of activities in international banks
		categorisation system to segregate projects. **Huaxia Bank** records E&S information in their internal systems to be shared with other departments.		require approval from E&S risk team. **ING** has a list of 'ultra-high risk' countries that it will not finance.
Set up appropriate tools to track environmental and social performance of loans	Leading banks tend to devise such system to frequently monitor the E&S compliance of loans throughout the cycle. The majority of banks may just review the issues at pre-loan stage.	**CIB** conducts annual E&S checks on loans by contracting a third party, to ensure compliance with the issues and actions stated in the loan contracts. **SPDB** uses E&S risk management as an indicator to assess the performance of local branches in the E&S performances of the loans already made to clients. **CDB** contracts a third party to verify the actual environmental performance of the projects.	Many international banks have public E&S commitment or strategy, supported by a dedicated sustainability or E&S team. These banks tend to sign up to various E&S initiatives and guidelines. Most banks report their activities and performance through regular CSR reports.	Nearly 80 financial institutions in 29 countries officially adopted the Equator Principles. Over 200 financial institutions worldwide report their E&S performance using or referencing the GRI framework.
Capacity building to improve internal E&S management	Many banks recognise the lack of knowledge and skills internally and seek to improve this through formal (training programs) and informal (meetings with banks with best practices) methods. The relatively low share of green credit compared to the overall loan portfolio means training on E&S issues is not a high priority in many banks.	**CIB** developed an IT system to capture E&S risks for each client accessible to all departments of the bank. Trainings on E&S issues are also provided to the staff in the sustainable team at both HQ and local branches. **CDB** organises workshops on sustainability annually, through external trainings provided by international organisations. **ICBC** has been actively participating in workshops and forums to increase staff exposure to green finance. **BOC** provides formal internal training courses for staff specifically in selected industries on identification of high risk areas. **CCB** provides formal internal training courses for staff on Equator Principles. **CMB** holds meetings with international banks on green finance to learn best practices.	Leading banks have in place a combination of online and in-person training methods to raise awareness about E&S issues among their staff. Some banks work with external parties to support them in capacity building initiatives.	**HSBC** offers a diverse range of E&S-related training programmes including a Senior On-boarding Training Programme, Risk Management Programme, and Senior Risk Management Programme, and a climate business learning programme. **Itaú BBA** hosted a two-day-event in partnership with the IFC, where IFC members presented the IFC Performance Standards to potential clients and conducted roundtables discussions.

Key Green Credit Guidelines	Progress in domestic banks	Examples of activities in domestic banks	Progress in leading international banks	Examples of activities in international banks
Process management				
Strengthen due diligence in credit approval, tailored to sector and client, and where necessary independent assessment	Most domestic banks rely on environmental impact assessment (EIA) reports by borrowers to assess risks. The MEP and other national guidance are the primary criteria for evaluation. In rare cases banks have specific E&S policy in place.	The over-arching E&S policy at **CIB** requires EDD to be conducted on E&S issues of each application where EPs is applicable. At **CDB**, the project appraisal department is made up of three teams, and each assesses loan applications from certain industries, including industrial-specific issues, E&S issues and general financial information.	Signatories to the Equator Principles undertake E&S due diligence on project finance transactions. Many leading banks also conduct E&S due diligence on other transaction types. E&S screening is typically initiated by business teams/front office for new transactions or clients, and all project finance transactions are escalated to dedicated E&S risk teams for detailed review.	**Standard Bank**, **HSBC, Mizuho** and **Standard Chartered** have developed specific E&S assessments for initial screening by business teams. **Citi** and **JPMorgan** both apply the Carbon Principles due diligence process to certain transactions in the US that involve financing coal-fired power plants. **Standard Bank**, **Citi** and **JPMorgan** apply the International Hydropower Association Sustainability Guidelines to hydropower transactions.
Develop controls and terms to clients on risk management and ensure compliance and post-loan management	"One-vote veto" is fully implemented across the banking sector, as the compliance with regulations by MEP and PBC. Additional assessment on E&S issues and post-loan monitoring are not common at the moment.	**CIB** uses the results from EDD to discuss with clients and develop action plans to improve E&S performance before moving to the next stage of the application.	When E&S risks are identified, leading banks will implement risk mitigation measures to bring the level of risk exposure down to an acceptable level, for example requiring clients to implement E&S action/management plans, or integrate E&S covenants within loan terms. Leading banks have E&S compliance and performance monitoring mechanisms in transactions, typically undertaken by the portfolio monitoring team, who monitor the covenants and reports from the client. The portfolio monitoring teams tend to be supported by the E&S team, which provides technical review. Compliance and performance monitoring efforts may vary depending on the nature of the transaction.	**Standard Bank** requires some clients to obtain insurance to cover E&S risks. **HSBC** carries out audits to check compliance, and clients deemed to be 'Near Compliant' or 'Non Compliant' on E&S policies are monitored more closely. **Itau BBA** engage third parties to conduct monitoring and/or site visits for higher risk transactions, and uses the E&S team to monitor lower risk transactions in-house and accept documentary evidence from clients to confirm compliance with E&S covenants.

Key Green Credit Guidelines	Progress in domestic banks	Examples of activities in domestic banks	Progress in leading international banks	Examples of activities in international banks
Internal controls and information disclosure				
Regular review on green credit	Most banks disclose green credit through CSR reports, and the data is collected and reported internally. There is an emerging trend of assurance on this information by a third party.	**CDB** engages professional third party to verify the environmental benefits of its green projects.	Leading banks report that their E&S risk management performance/systems are audited internally, usually as part of their wider internal auditing programme. This typically comprises of a selective review of transactions to ensure due diligence was conducted appropriately and in compliance with relevant policies. Some also obtain external assurance of their E&S activities, although the scope varies across banks.	**Itau BBA** periodically undertakes internal verification by an auditing team from Itaú Unibanco Holding to evaluate the consistency among the E&S risk policy, the manual for E&S risk analysis, internal controls and activities. **HSBC** engaged an external auditor to review its transactions under the Equator Principles, and the statement from the auditors is published in its annual sustainability report.
Transparent disclosure of green credit strategies and policies	Nearly all banks produce CSR reports, however the contents and qualify differ to a large extent. Big commercial banks tend to adopt global frameworks specifically the GRI, while others use their own reporting structure or that of the Chinese Academy of Social Sciences. They name the relevant strategy and policies in the reports, but the contents are not available publicly. Some banks disclose information about green credit products and practices in their websites, making these easily available to view for potential clients.	**SPDB** produced the first CSR report in the Chinese banking sector. **CIB** and **SPDB** have dedicated web pages with of information about their green credit products.	Equator Principles provide reporting guidelines which are adopted by its signatories, however a significant proportion also goes further beyond these requirement in the reporting of their strategies, policies and compliance.	**JPMorgan** applies Equator Principles reporting requirements to certain non-project finance banking activities, and reports externally on the breakdown by risk categorisation, industry sector and geographic region. **Standard Bank** reports on project finance lending and advisory engagements categorised by industry sector, the number of development finance loans categorised by industry sector and risk level, the number of CDM projects, value of spend on energy efficiency and clean energy projects, and the number of employees attending training on its E&S risk appraisal system.

8. Business Cases

This section presents business cases of two leading domestic banks, China Industrial Bank and Shanghai Pudong Development Bank, in the area of green finance. The case of China Development Bank is also included for its significant involvement in the growth of the sector. The cases aim to show some of the costs and benefits of green finance to banks, which might be useful as a reference for other domestic banks to develop green finance. To start with, we have selected a few Chinese banks to analyse the relationship between profitability and green finance practice at banks.

8.1. Influences of Green Finance on Banks: Financial Performance Analysis

Practices of green finance require additional screening of E&S risks and knowledge on emerging projects such as EMC (also called EPC in China). The new opportunities of green finance are therefore associated with extra costs to banks operation and management. Due to the lack of green finance information and data disclosure, we are not able to find direct quantitative linkages between green finance practices and financial performances in Chinese banks. What follows is an analysis of financial performance conducted on five banks of comparable sizes, to detect the influences of green finance projects on banks.

Bank selection

According to a number of rankings on the green finance performance of Chinese banks[5], two banks, CIB and SPDB, emerged as pioneers in the field of green finance practice. We also selected three other joint-stock commercial banks of similar sizes for comparison with the two leading targets. The other three banks are CMB, CITIC and CMBC. These five banks are the five largest joint-stock banks in China and set a representative sample for analysis. The analysis presents the financial results and operating performance of the five banks in the first half of 2012. Information and data presented in this analysis has been derived from publicly available data from the 5 banks respectively.

Income analysis

Interest income: of the five largest joint-stock banks, SPDB and CIB have received the highest interest income for the first six months of 2012 although their interest expense over the same period has also been the highest in the same period. On further analysis, we noted that interest income from loans and advances for these two banks were one of the lowest amongst the five largest joint-stock commercial banks. This when compared to their loan balance seems to suggest that these two banks did not necessarily charge higher interest rates compared to the other three banks. On the other hand, these two banks also have relatively higher interest expense. This when compared to their relatively lower deposits base also suggest that they pay relatively higher interest rates for their deposits.

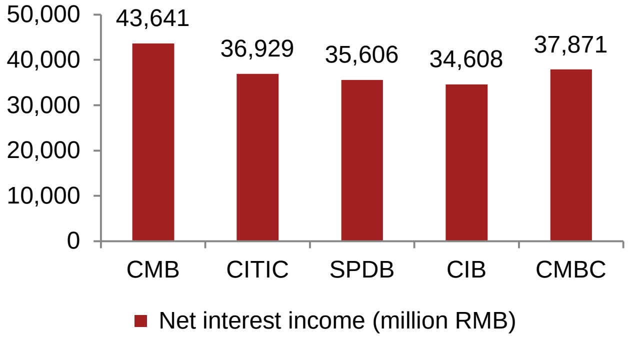


Figure 5 Net Interest Incomes for the 5 Banks in the First Half of 2012

[5] Ranking of green finance performances of China's listed banks, 2008-2011; "Green Medal" campaign by China Business News, Nov 2012.

Fee and commission income: Of the five largest joint-stock banks, SPDB and CIB do not have a clear advantage in terms of both gross and net fee and commission income although they have the lowest fee and commission expenses amongst the five largest joint-stock banks.

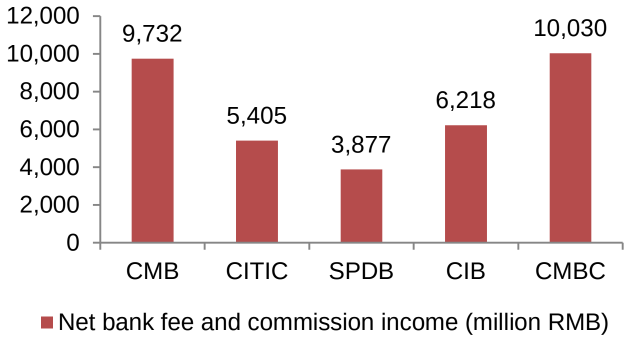


Figure 6 Net Fee and Commission Income for the 5 Banks in the First Half of 2012

Operating expenses: of the five largest joint-stock banks, SPDB and CIB have relatively lower operating expenses. This may be evidence of stronger cost control rather than their role as commercial banks which actively support "Green Finance".

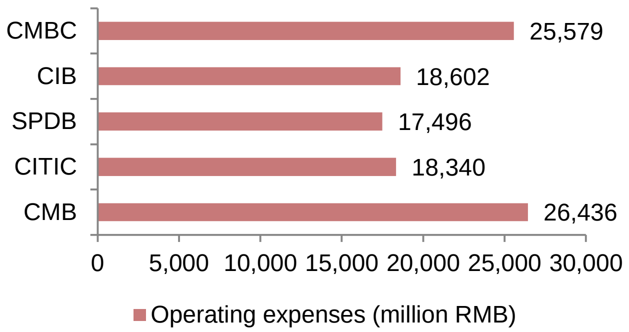


Figure 7 Operating Expenses for the 5 Banks in the First Half of 2012

Profitability analysis

In terms of profitability, SPDB and CIB have the lowest net profits amongst the five largest joint-stock banks although their asset size and loan portfolio are not the smallest amongst the five largest joint-stock banks. This when compared to their relatively lower operating expenses and lower net interest income, seems to suggest that their position as banks which actively support green finance has not necessarily translated into higher profits as it has not helped to attract more loan business or deposits for these banks.

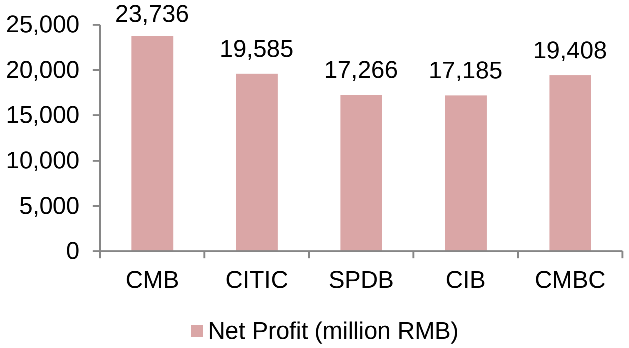
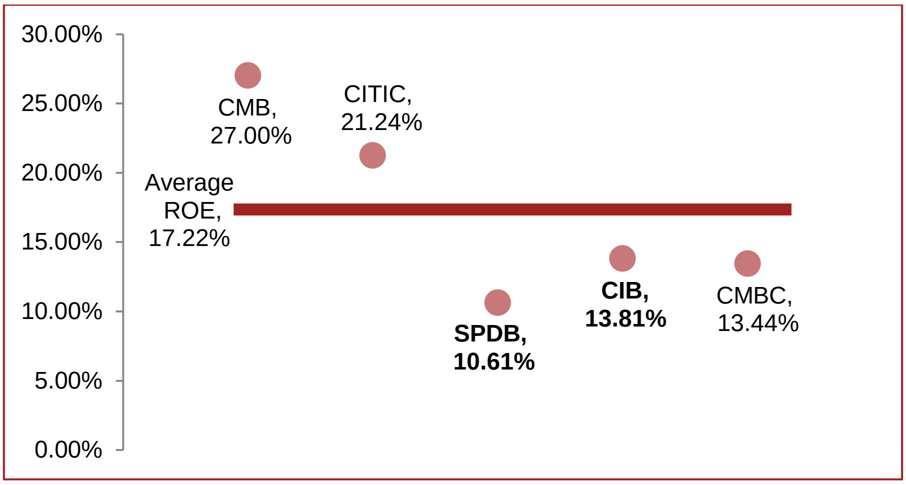


Figure 8 Net Profits for the 5 Banks in the First Half of 2012

In addition, it can also be observed that these two banks have significantly lower ROAs compared to the other five largest joint-stock commercial banks as well as some of the lowest ROEs.



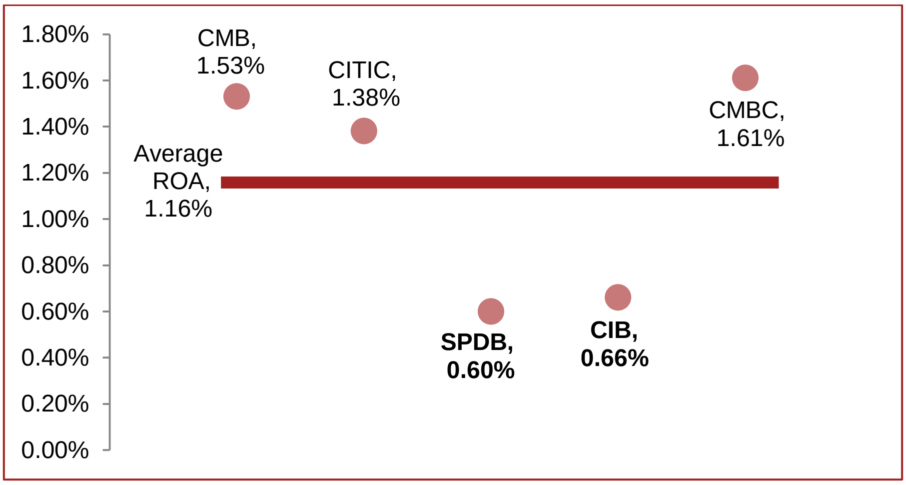


Figure 9 Return on Weighted Average Equity (ROE) and Return on Average Total Assets (ROA) for the 5 Banks in the First Half of 2012

In summary, there is no direct evidence which shows that efforts on green finance projects have been translated into higher profits or benefits. Therefore, additional incentives may be needed to attract other banks to promote green finance.

8.2. China Industrial Bank – the First Equator Principles Bank in China

History of green finance at CIB

CIB began its exploration into green finance through a partnership with IFC to develop energy-efficiency project financing as early as 2005. The products were designed to improve energy efficiency of businesses, as a response to the mandatory energy-efficiency target laid out in the then FYP (11th). The scope of the product was expanded in the second term of the partnership to cover renewable energy and CDM projects financing in addition to energy efficiency. In the meantime, senior management at the bank started to discuss EPs with existing members, international interested parties (e.g. IFC and WWF), and competent authorities (e.g. CBRC, PBC and MEP), supplemented with training and workshops. The issues discussed spanned from agreeing general principles, the implementation of the principles, to the assessments of E&S risks, in order to improve the understanding of the EPs across the bank.

Several changes then followed the membership of the EPs. A dedicated team was established at the headquarters (HQ) level, with fulltime staff working under the guidance of an over-arching E&S risks policy produced on the basis of the EPs. At each local branch, at least one fulltime member of staff is assigned with responsibility for green finance. The team is responsible for assessing the potential E&S risks from all projects applicable to the EPs, as part of the risk control process. As a general rule, EDD is performed as assists the team to collect sufficient information so that it can categorise the project on the basis of the associated E&S risks. Depending on the level of risks, the team may require applicants to produce an action plan to mitigate the risks deemed to be unacceptable, before the general process of loan-granting assessment can proceed. During the post-disbursement phase, the team will meet with the client to discuss its E&S risk management performance, especially those key risks identified in the EDD.

As a complimentary move, an IT system was developed to capture all E&S risks for each client and other departments of the bank involved in the transaction can access. In addition, the bank also maintains a list of sectors that are to be promoted or limited for financing, as ordered by central government, such as the "high-pollution, energy-intensive and over capacity sectors".

As the main green product that CIB offers, the Green project financing grant helps clients in the procurement of energy-efficient equipment. Expected cash flows or energy-savings generated from the project are used instead of the normal collateralised debt financing method. This removes a huge obstacle facing many SMEs applying for loans, as they normally lack sufficient assets to act as collateral. As a result, CIB has become a popular destination for SMEs falling under this category, who are seeking a financing facility (IFC, 2010). A similar mechanism also applies to another product the bank is promoting: pollution rights financing. This product focuses on the CDM market, given the dominance of Chinese vendors in the global market.

Based on the CSR reports the bank releases for the last three years, the amount of loans made to projects in energy efficiency improvement has jumped more than 6 times, and the scale of projects where the EPs is applicable has moved substantially from 7bn RMB to 150bn RMB in the same period.

Our Insights

Benefits

As the first Chinese bank joining the EPs, CIB has earned substantial reputation as the "greenest Chinese bank" in the press. According to the report "Environmental Report on Chinese Banks" jointly published by 8 local NGOs, CIB is ranked top amongst other 15 Chinese banks in a number of 11 indicators, including:

• Environmental information disclosure;

• Formulation and implementation of environmental policies;

• Establishment of specialised departments for environmental affairs;

• Loans to environmentally friendly industries;

• Adoption of relevant international principles

• Criticism from society (least criticism);

• Outreach and training; and

• Internal environmental policies.

In addition, the bank has been awarded with many green-related honours by both local and international banking associations and governmental bodies, and it is automatically linked with green credit or green banking.

Early practice and devotion to green finance has enabled its staff to accumulate significant experience in the area of green finance. Signing up to the EPs has further enhanced the capability of the bank to assess and control E&S risks, rendering the bank a leading position in the green finance market. Staff are now more confident in identifying environmentally-friendly projects, while ensuring that the projects are financially feasible. This helps the bank to reduce its enterprise wide risks. The bank maintains that no green finance transaction has been identified as a bad debt since this business was introduced.

Such advantages also grant CIB more influence in making the rules or shaping the green finance market. It has organised a training session on making loans to energy efficiency and emission curbing projects, on behalf of the CBRC. Following the development of green credit guideline in 2012, CBRC is presently devising a ranking system to evaluate the implementation of green credit policy within all Chinese banks. Most major banks have been invited to contribute and comment on the prototype and CIB, as the most experienced domestic bank in green finance, is expected to share its views on many aspects.

Costs

Given its emerging status in China, to master green finance here is challenging work. This includes assessing E&S issues and risk categorisation etc. When CIB was preparing for its membership of the EPs, it consulted a number of existing EPs financial institutions and international parties about the implementation of the principles. At the beginning of the learning process, CIB sought external assistance (such as IFC) to assist in completing a few green transactions from cradle to grave, in order to be familiar with the procedure and the changes from the Bank's conventional methodology. Such a course of action is expensive, but necessary, as the bank had little experience or the skills desired to perform the work at that time.

Now, as the bank outperforms other competitors in the market, the bank will need to continue its investment to grow its green finance business further, which poses a risk to the bank. New products will need to be developed for the bank to increase its share of the market, but at this experimental stage and with no previous example the Bank could follow, the Bank is taking on risk for there is no guarantee that the product will be popular in the Chinese market, even it is selling well in other countries.

Turning down loan applications to dirty industries might result in a potential loss of high returns from these projects. As green projects are more well-known in terms of purposes and technology, some of which are sufficiently profit-proven, and many businesses in the industries are of comparable sizes with similar financing needs, which shows an acceptable financial capability, and lessens the concern of banks with profitability of these projects. However, there is a higher cost to run green products or loans to environmentally-friendly projects, and the bank has to bear higher risk of losses with these projects. In addition to the conventional credit application process, CIB now employs a dedicated team to look into E&S risks of projects applicable to the EPs, and there is a high chance that those projects which fail to meet the minimum E&S standards will be rejected and the bank will therefore lose the opportunities of enjoying higher returns through higher premiums from these customers. Justification is needed between the higher-return projects from dirty industries and relatively lower-return projects from the cleaner industries.

8.3. Shanghai Pudong Development Bank – One of the Leading Commercial Banks in Green Finance

History of SPDB in green finance

At SPDB, green finance took off as early as 2006, when a number of environmental targets were mandated in the 11th FYP, and loans granted to the identified dirty industries were limited. Later on, various partnerships were formed between SPDB and other international financial organisations (such as AFD and IFC) on a number of green products (energy efficiency and renewable energy financing) and which have significantly improved the capabilities of the bank to provide green financial services to clients. At the same time, the bank started to pay attention to and manage the E&S risks associated with the transaction.

With the business already amounting to 100bn RMB in 2012, the bank has already developed a standard approach (Temporary Measures of E&S Risks Control issued in 2011) to help mitigate the E&S risks within a transaction, released a comprehensive package of green products for its customers, and on top of that, introduced an annual plan for the further development of green finance in the bank.

E&S issues have now become an essential part of the credit-granting process in each transaction, and a dedicated team, comprising professionals in specific areas (industrial, compliance and risk control) is formed to govern them, working under the oversight of the business team. According to this approach, the E&S team is in place throughout the life-cycle of a transaction and constantly monitors the E&S impacts to those funded projects. Sector-specific policies at national level and applicable banking regulations provide the core benchmarks for risk identification and mitigation. E&H risk management is becoming a priority for the bank and has become an indicator used to assess the performance of local branches.

After a few years of doing green finance business, SPDB has built a comprehensive package of green products that support clients in financing their projects for energy efficiency, clean energy, carbon finance, environmental protection and green equipment supply chain. These products are in addition to the traditional products that banks typically offer. Each innovative green finance product that SPDB offers has undergone a series of tests before an official launch, and the pilot projects involved all relevant departments to help them understand the rationale and theory behind the product. The risk team played a crucial role in the pilot, as an effective E&S evaluation process could only really be developed once the risk team understood the issues and a positive feedback from the risk team means a green light for the product to go further in the apporval process.

As a common practice, the bank issues an annual plan for the development of green finance, targeting a number of specific areas of the business for growth. The development process often brings senior management, key business teams and other relevant teams together, to look for the new business opportunities and growth areas. In 2011, the bank brought green finance to a strategic position, with the approval of a five-year plan specifically for the development of green finance.

To ensure that green finance is well managed across the bank, regular training (twice or more times a year) are provided to most managers from product, business relations, compliance and risk management divisions, by experts both inside and outside the bank. For staff to be promoted to manager level in business relations, they are required to pass a test which demonstrates a basic knowledge in green finance. Apart from general education, there are also various knowledge sharing sessions between different departments on practical E&S issues, in order to help remediate any difficulties facing practitioners.

Our Insights

Benefits

SPDB is placed in the top 3 in terms of green finance practice in the banking sector by *Watershed* in the report of *Environmental Report on Chinese Banks*. The bank has improved its performance in many specific indicators from the previous year, demonstrating the efforts it has made to become a leader in this growing business sector. This is recognised in the public as the bank has been frequently linked in the press with the subject of green finance in the domestic banking sector.

The green finance business is already worth more than 100bn RMB for the bank. The approach developed by the bank, where a standard methodology and a dedicated team grouped with professionals from different perspectives are in place, has enabled it to better manage emerging E&S risks. The tailored team for each individual transaction, coupled with the complementary measures implemented by the bank to ensure minimum returns are earned from these projects, has enabled the bank to produce work at the desired quality while at the same time producing an acceptable return for shareholders from its green finance projects. The scale of green finance business in the bank and the relatively satisfactory profitability it earns explains why the bank is committed to investing in this emerging business area.

The profitability that green finance has generated also comes from the good working relationship between SPDB and many organisations. So far, SPDB has co-operated with three international financial organisations (ADB, IFC and AFD) to design products specifically targeting green industries. This gives the bank almost an exclusive opportunity to explore new and leading products and services of international organisations which it can tailor and introduce in the domestic market within China.

At a local level in Shanghai, a win-win situation has been created between SPDB and local government, whereby the local authorities in Shanghai recommend what it regards as profitable and feasible projects to the bank, which helps to further promote business in this area. The success of these projects has not only helped local government to achieve a number of environmental targets mandated by central government, but also helps to increase the confidence of local government to continue the partnership with the bank.

Costs

A solid foundation for green finance needs to be laid and this requires investment to be made in terms of people and technology.

A meaningful E&S risks assessment requires the use of competent skills and the application of a standard methodology, both of which are relatively scarce in banks. Relevant training provided to existing staff in key departments (business and risk control) and recruiting new professionals are no easy tasks, which demand long-term and continuous efforts. Hence, in the meantime, the quality of the work might not be up to standard for the bank to remove or manage all E&S risks. Furthermore, with no sector-specific policies to direct the work, time and effort may be wasted on dealing with common issues arising with similar transactions.

Without a credentialed leader in the development of green finance area either from within the government sector or the market, the bank has little experience to fall back on, and so has had to follow a “trial and error” approach to promoting and delivering green finance services. This approach presents a number of risks to banks and in some areas, where the capability of a bank is stretched or simply incapable of dealing with or unaware of the issues they face, this might lead to additional or unmanaged risks being taken on. Similar to CIB, SPDB also faces the dilemma as to whether it should opt for the guaranteed high profitability projects from dirty industries or relatively smaller profits generated from green industries, even when the returns are guaranteed. As compared to the “Big 5” banks, SPDB has a smaller asset size and resources that could be used to build a robust system to buffer and sustain the bank to the same extent as the “Big 5”. Given that SMEs are a target segment for SPDB, the challenge is even greater as the bank needs to bear the risk of possible losses that might result from the smaller size of collateral offered by SMEs.

8.4. China Development Bank

History of CDB

Established as a policy bank at the first place, CDB was under a direct control of the central government, to strengthen the competitiveness of the country. Due to its special position, the organisation and the structure of the bank also resemble those in the government (Sekine, 2010). As a result, its main responsibility is to facilitate the implementation of national policies, and endowed with rich resources and unrivalled financial capacity for the implementation. Given the top-down approach as a typical way to implement national policies, actions by CDB not only are subject to the regulators (PBC, CBRC, NDRC and Ministry of Finance etc.), but also local governments for indicating appropriate projects that are in line with the regional planning (Qiu, n.d.). Since the ranges the bank supports is mainly from infrastructure, basic industries and pillar ("key") industries, the projects tend to span over a long period of time and demand large of funds for the development. Although existed only for a relatively short period of time, the amount of outstanding loans at the bank has jumped almost five times more in ten years, between 1999 and 2009, from 648.4bn RMB to 3,708.4bn RMB, and the total assets topped at 6,252.3bn RMB. The role of CDB in the country's economic development is crucial.

The mission of CDB was altered to a different course, after a series of state-level meetings and the decision of brining reform on the policy banks in 2007 (Sekine, 2010). Having acknowledged the change in the external environment, in which the then institution of policy banks can no longer competently cope and serve the purposes as firstly intended, one outcome from the political discussion was to reform these policy banks, through commercialisation. The bank would thus operate more like a joint-stock company, pursuing what normal commercial companies do, while seeking its role in supporting policies in new areas and focus more on governance, risk control, incentives and regulations etc.. From then on, the bank has been able to reduce its non-performing loan ratio, down to 0.4% in 2011, from 0.96% in 2008 (CDB Annual Report, 2011). Since the early days, CDB was equipped with a proper risk management system to ensure the investment efficiency, and it has outperformed many other Chinese banks in DD and credit control (Sekine, 2010). Such transformation in status is not without difficulty, and there has been observation of a partial commercialisation of the bank, where influences on business decisions from policy interventions override profitability and risk concerns (Bank Track & FoE, 2012).

CDB and Green Finance

Similar to the implementation of other national policies, CDB provides significant support to the green sector. In 2011, loans made by the bank to support hydro activities were about 30.7bn RMB, accounting for 30% of the total loans made for the industry in the year. Similarly, the power sector received loans worth of 123.4bn RMB from CDB, which contributed to 37.8% of the total lending by all financial institutions in the sector. These happened all in accordance with the introduction of national plans, based on which significant amount of money is poured from CDB.

During the previous FYP period, the bank has tripled the amount of lending made to the field of sustainability, reaching an accumulated figure of 65.83bn RMB in 2011, as the central government has increasingly emphasised the goal of "go green" in the political agenda. The area where lending activities concentrate is largely policy-oriented. In the past, the bank provided more credits to new energy, environmental protection and industrial pollution control, and now it gradually moves the focus to green technology, service and products under the guidance of national strategic emerging industries. Further, the bank has specifically adjusted the structure of the green loans more adaptive to the nature of environment-related projects, such that the loans are tailored according to the areas. The length of loans for wind or biomass projects is up to 15 years, while projects in thermal-related projects tend to receive loans up to 20 years. One privilege that CDB is entitled, as the only policy bank over any other banks, is the ministry status, which grants the bank the authority to facilitate the progress of the projects it finances (Burzynska, 2009). As far as many nuclear power projects are concerned, CDB is able to provide a series of preliminary services to these projects, such as grants of planning, EIA and right of use of land offered to nuclear power projects (Liu, 2012). In other words, it is not just the direct financing to construction of green projects CDB offers, but also the services throughout the entire lending cycle.

In order to support its green finance practise, the CDB has established a dedicated team for business development and risk assessment in the particular area. This team is assisted with other forces across the bank, including professional E&S staff, industrial specialists, and analysts on both profitability and environmental performance of the projects. Although the bank is less concerned with the profits generated from these projects, the environmental benefits to be achieved through the projects are of considerable importance, and the bank recruits professional third parties to carefully verify the progress. Every year, the bank has organised a series of workshops on sustainability and the relationships with banks, and leading experiences in international banks on green finance.

Apart from its frequent communication with governmental authorities, the strategic position of CDB has also allowed the bank to co-operate with these ministries at a high level. In 2009, the bank formed a partnership with the MEP, to support some key environmental protection projects with 100bn RMB credit. Meanwhile, the bank has been frequently involved in discussions with NDRC and other governmental departments on issues such as environment, water, green financing mode and environmental performance analysis, in order to improve the capacity of the banking sector in the field. Such an advantage of high-level exchange also enables the bank receive information early, and to better plan for future business developments.

Issues Concerning the Role of CDB in Implementing National Policies

Coping with national strategic decisions, CDB has been utilizing its massive capital recourses to support the capital intensive and risky projects and sectors that are unattractive to commercial banks, such as large scale infrastructure and renewable energy facility manufacturing (Sekine, 2010). This gives a boost to the development of those industries at the beginning, capturing great attention from the government, providing resources to support the development. However, its role of supporting those nationally encouraged industries has aroused a wide range of controversy, especially in the case of photovoltaic manufacturing. In recent times, the EU referred some major Chinese photovoltaic manufacturers to the WTO for so-called dumping exercises in 2012. The final result is not yet released, but countries such as the US and India are also considering similar measures (Min, 2012). Problems also are experienced at home. A heavy reliance on the export of equipment and the economic downturn have caused a sharp decline in demand within the overseas market, and the low domestic demand and other internal conditions (e.g. connection to the national grid) have rendered the industry over-capacity. As a result, a weak cash flow is generated and the once-celebrated enterprises are left alone, with little likelihood of a return to a healthy state and to repay the banks the substantial loans they have received. Further, local governments who supported the industry are being dragged into economic stagnation, from the once economic boom attributed to the rapid growth of the PV industry. Although CDB has a limited role to play in developing industrial policies, as a major lender in supporting national development, it has to bear the results from the loans it made to support the growth.

9. Methodology for Banks to Promote Green Finance

Given the current development of green finance in the Chinese banking sector, most banks have only made limited commitments in this area, and prefer to adopt a "wait-and-see" strategy until a more mature market has evolved. To support the growth of green finance, we have developed a methodology (Figure 11) to help banks from planning to execution of green finance within their core business operations. The methodology is comprised of four consecutive stages: vision, planning, implementation and monitoring & evaluation. It is presented in a cyclic flow, as it evolves with the change in the environment banks are operating.

This methodology is intended to serve as a guide for banks, and it should be used in conjunction with other appropriate references and information in decision making, rather than a definitive solution or approach to adopting green finance.

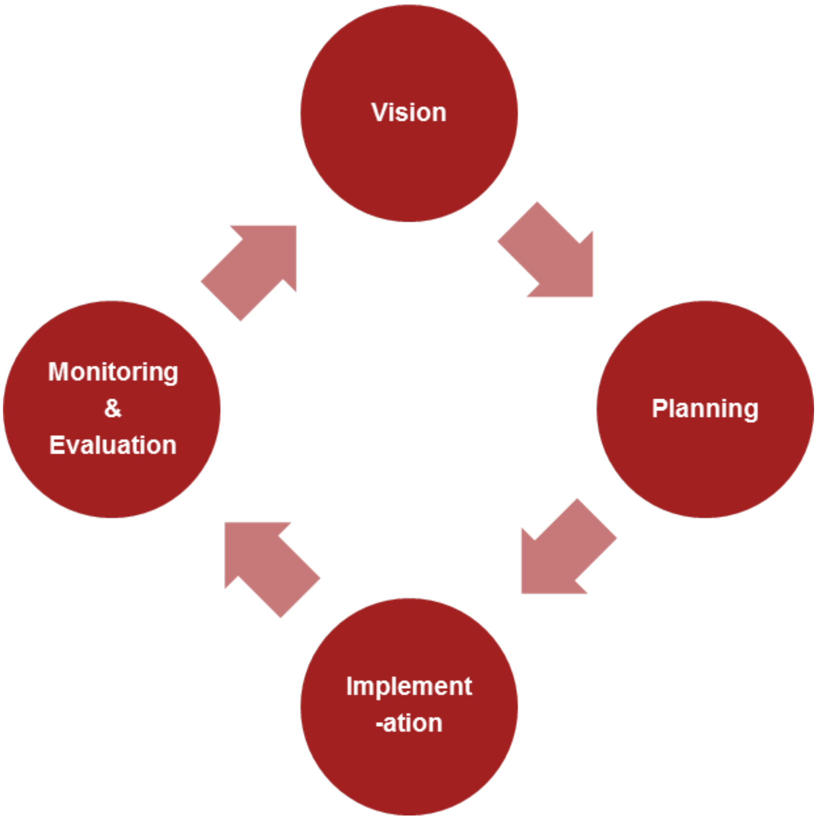


Figure 10 Methodology to Start Green Finance

Our methodology is restricted to the definition of green finance in this paper. Generally, green finance includes two areas: (1) E&S risks control; and (2) services/products specifically offered to green industries. In practical terms, banks would need to consider both areas, but the focus may vary depending on the nature and coverage of the bank.

Vision

A key starting point for banks is to understand their vision on green finance. This would include having a clear understanding for the following:

1. What is the significance of green finance to you, given your existing business model or areas of focus?

2. What specific areas of green finance do you want to focus on? (e.g. strengthening risk controls to lending on the basis of E&S risks, new products or services)

3. Where do you want to position yourself relative to your competitors? (e.g. leaders or followers)

4. What does the above imply in terms of the targets you want to set for the short-, mid- and long-term?

To do so, a bank may need to undertake the following activities to define their vision:

- Undertake research and benchmarking exercise of their positioning relative to their peers;

- Undertake research to identify the demand and interests of their key stakeholders, for example investors, customers and government;

- Conduct internal consultation (at senior management level) to develop a vision for the company, for example through brainstorming workshops or consultation;

- Ensure that the potential targets or vision are achievable and realistic, and meet the demands of stakeholders.

The different types of Chinese banks means that issues can be specific for each type of bank. The range or sector of clients that the banks serve is also a key determinant of the scale and scope of the green finance vision. The policy banks and the equitised banks (namely the "Big 5") are serving the state owned enterprises (SOEs) as their main clients, and are more influenced by policies of the government. For city commercial banks and joint-stock banks, small and medium-sized enterprises (SMEs) form the main client base and these banks largely operate within certain regions. The current level of development in green finance might not require such a level of differentiation amongst banks in the market, but to make the most from the existing resources and capacity will be a crucial factor for banks to win a higher market share.

Planning

Once a vision is identified, banks can then proceed on the planning stage. This could include the following activities.

- Define and agree a strategy for green finance development, including targets for different points in time. The strategy would need to include:

    - The scope of the strategy and activities;

    - Clear assignment of responsibility at the Board level;

    - Targeted resources to support the development of green finance;

    - Potential key policies or issues that need to be addressed, some of which are illustrated in Table 13;

    - A periodic business development plan on specific areas.

- Upon approval at board level, each affected department (e.g. business departments and compliance and risk management departments) would need to ensure that their departmental plans and targets are consistent and compliant with the green finance strategy. This could include, for example:

    - The development and submission to the Board of a departmental level plan on the impact of the strategy on their department, and specific steps that will be undertaken to meet the overall strategy.

    - The identification of gaps in skills and knowledge, and plans to build capacity.

    - The development of a monitoring and evaluation process to feed back on progress, achievements and gaps. For example, this could be a set of key performing indicators (KPIs), both quantitative and qualitative and embed these into the banks general risk management and reporting processes. Some of these could then be periodically (e.g., annually) assessed, ideally independently, for example as part of an annual financial or other audit.

Table 13 Issues to be Considered for Green Finance Strategic Planning

Green Finance Planning	Issues to be Considered
E&S risk management policies development	• International experiences • National legislation • Industry standards • Existing in-house experiences / past lessons • Level of risk management required • Responsibilities of departments
Green financial products development	• Targeting groups (industry or region-specific) • Characteristics of the targeting groups • Level of resources devoted for product and business development • Pilot schemes of the newly-developed products and feedback • Level of product diffusion and compatible marketing plans • Potential partnership to be formed with local authorities to promote the products and business

Implementation

The implementation phase is clearly the most important part of delivering a green finance vision. In this section we highlight a number of potential issues or pitfalls that may emerge, and recommendations to overcome these.

Potential issues during implementation	Recommendations
Lack of clarity in policies and guidance leading to differences or inconsistency in outcomes the due diligence process	• Provide a number of 'worked examples' for some scenarios • Provide a straightforward guidance on how to escalate issues when unclear
New types or risks not covered by policies or guidance leading to confusion by staff carrying out due diligence process	• Provide a straightforward guidance on how to escalate issues when unclear • Review and update policies and guidance periodically to include new or emerging risk issues
High risks in launching new green financial products to market	• Conduct pilot schemes in particular regions or industries before rolling out further • Engage marketing teams early on to maximise success
Specialised technical knowledge may be required by staff, either about sector or risk issues	• Provide training on a formal and regular basis to staff, on new and emerging issues • Engage external providers of information (e.g. consultancies) on E&S or green finance especially for one-off gaps • Assign staff to undertake regular research on targeted green industries, and share with other relevant departments or teams
Staff capacity inadequate to meet demand of high volumes of loan applications that require E&S screening	• Train staff from the risk management and business teams alongside each other • Provide shadowing opportunities to involve more staff to carry out screening process, but potentially limit these to certain activities to ensure overall quality of staff involved in screening

Monitoring & evaluation

Periodically, banks need to monitor its actual performance against the objectives set to review its performance in green finance, re-adjust their strategy where necessary and ensure that their plans continue to be relevant and achievable for the following period. This will include the following activities:

- Go through the KPIs and identify gaps between actual and expected performance. This needs to account for the reasons for falling short if there are any, and confirm the relevance of the indicators and the suitability of the targets;

- Engage with stakeholders, and seek comments on performance in general and appropriateness of the bank's strategy in addressing issues relating to green finance;

- Assess its strengths and weaknesses against competitors, and analyse the major changes in the market during the period, so that these new requirements and issues can be integrated into existing plans and programmes; and

- Obtain feedback from the internal departments that are involved in green finance, to acknowledge issues that concern the activities and performance of green finance, such as corporate structure, business operations and capabilities of personnel.

Guidance on monitoring and reporting on results will normally already be included within the relevant internal policies, and therefore can be extended to include the measurement and reporting of the progress in green finance. Improving monitoring and reporting standards within a bank may include understanding and complying with local and overseas regulatory and exchange reporting requirements, industry standards, and through further engagement with stakeholders.

Potential information to be measured and reported could include the number of loans approved and declined on the ground of E&S issues, the amount of loans made in green industry and the comments made on each E&S risk assessment. The system helps to improve transparency while providing evidence and points of discussion at the annual meeting between Boards of Directors, and identify the areas for improvement in the following year and near future.

10. Recommendations to policy makers

10.1. Key gaps and barriers for domestic banks in green finance

Based on a comparison in the previous section between practices by domestic and leading international banks, and against the Green Credit Guidelines, we have summarised gaps and barriers which could form the focus of activities to drive the take-up of green finance.

10.1.1. Organization and governance

Gap	**Lack of board leadership on E&S issues**
Barrier(s)	The necessity for systematic environmental and social management is less recognised at senior management level; Potential from E&S management is not considered as a strategic priority at the moment; Mandatory government regulations do not specifically address E&S issues; There are concerns as to how shareholders will view the change in business practices; Few banks have adopted international E&S requirements, such as the Equator Principles.

Gap	**Lack of dedicated resources for E&S for all but the leading banks**
Barrier(s)	E&S related activities are not standard practice in the financial sector and many banks lack specialized skills to assess and tackle E&S issues; There is a cost to develop and implement policies on E&S issues, but current benefits from green finance may not yet be sufficient to offset these costs; There is limited availability of qualified environmental consultants who could advise or assist banks with their E&S practices.

10.1.2. Policy, system and capacity building

Gap	**Policies on credit screening based on E&S risks tend to be driven by national policies**
Barrier(s)	Banks do not see any move towards increased customer pressure to conduct credit screening based on E&S risks; E&S issues have widened the type and range of risks that banks have to confront, while banks lack knowledge and in-house capacity to address these risks.

Gap	**Small number of green products and services**
Barrier(s)	Banks lack experience and the expertise to guide and evaluate green financial products; There is a high level of uncertainty and concern over the extra costs of managing risks associated with green products and services; There are inconsistencies within the green sector policies, such as preferential treatment for renewable energy pricing and subsidies; There is volatility in global green markets, e.g. PV manufacturing price decline.

Gap	**Lack of capacity, training and knowledge in most banks on E&S issues**
Barrier(s)	There is a lack of sufficiently qualified E&S consultants; Significant knowledge gaps exist to enable staff to perform E&S activities.

10.1.3. Process management

Gap	Lack of independence and/or robustness of due diligence process
Barrier(s)	There is a lack of external pressure (e.g. government mandatory requirement, international standard, social pressure) to promote E&S due diligence (EDD) in credit screening processes; In most cases, the EDD process needs additional technical resources and extends the time required for project assessment and review; Most banks lack the necessary expertise to conduct a robust EDD, or have experience in working with qualified consultants to advise on EDD matters.

10.1.4. Internal controls and information disclosure

Gap	Disclosure of green finance limited to positive marketing of banks' activities
Barrier(s)	There is no pressing government regulation or social requirement to push the green finance agenda; A bank's corporate sustainability report (CSR) is the main channel for banks to communicate green finance performance with their stakeholders, and the positive information contained within the report will help maintain the banks reputation. As a result, little mention is often included in the report relating to any negative aspects.

10.2. Recommendations to policy makers

Given the gaps and barriers identified earlier in Section 11.1, we have developed a set of policy recommendations to address the issues in the following major areas.

1. Clear guidance on green finance to establish the basis of green finance in the banking sector
2. Incentives to increase the green portfolio in banks
3. Strengthen environmental regulations and supervision for robust E&S risk management
4. Supplementary measures to ensure the development of green finance

Clear guidance on green finance to establish the basis of green finance in the banking sector

Targeting regulators: CBRC and PBC

Time scale for the policy instrument: short (definition of green finance), short/medium (non-financial information disclosure standard and reporting criteria of green finance)

Building on the Green Credit Guidelines, the key regulators in the banking sector should establish the clear policy framework for green finance. This includes three parts: a definition of green finance which is universally agreed amongst banks, a non-financial information disclosure standard and a set of reporting criteria on green finance. Putting together these three elements, the regulators would be able to track systematically the performance of each bank in green finance, as well for the entire sector.

The regulators could clearly explain the scope and boundary of green finance: the banking regulators should hold discussions with relevant government agencies to identify green finance issues in banks operations and transactions, on the basis of existing national development plans (e.g. the 12th FYP) and a catalogue of green industries. In the meantime, discussions should also be initiated with banks to identify the problems and eventually lead to the concept of green finance. The definition provided in this report can act as a starting point.

Clear instructions on categorizations and areas of green finance could help banks to target relevant opportunities in their development strategy, and outline a comparable reporting progress. The earlier the regulators are able to issue a practicable official guideline, the quicker the sector can be properly regulated.

Incentives to increase the green portfolio in banks

Target regulators: CBRC, PBC, MoF (central and local levels), NDRC, NEA, MoST and other relevant government agencies

Time scale for the policy instrument: short (differential risk regulations and monetary policies), short/medium (fiscal policies to restructure the economy and promote sustainable development), medium/long (national plans/industry policies to restructure the economy)

Financing green industries is one major area of green finance, and to stimulate green investments it needs cooperation from various government agencies to make green industries a sounder business opportunity for banks.

Short-term tools could be introduced by the banking regulators to offer banks favourable policies for financing green industries. Banks could have preferential rates to green industries, or rewarded with higher flexibility in their capital arrangement if they engaged more in green finance. In a short- to medium-term, financial departments both at central and local level are providing preferential fiscal policies to help the growth of green industries. Coupled with the national policies in green transformation, this will strengthen the confidence of banks to invest more money in these areas. Importantly, the right financial incentives (listed in Table 14) to banks can complement and reinforce policies directed to green sectors such as tax breaks, to create a stable source of finance.

Strengthen environmental regulations and supervision for robust E&S risk management

Targeting regulators: CBRC, MEP and People's Congress (national and local level)

Time scale for the policy instruments: short/medium (environmental impact review and monitoring of investment activities), medium/long (public consultation and public disclosure policies, and joint-liability system in environmental laws and regulations)

In order to ensure the loans are more environmentally and socially responsible, there are several issues that need to be addressed, and specific policies should be introduced to target each of them. To better utilise the environmental information-sharing platform between the MEP and banks, local EPBs should engage more with the public by encouraging them to participate in environmental issues and providing easy access for more information. This has placed a pressure on banks to closely monitor their investment activities for any potential E&S risks derived. Thus banks are gradually moving from a reliance on EIA to the undertaking of E&S risk management both before and after credits are approved. This is expected to become more common as the litigation mechanism regarding environmental damage is established, and banks are more cautious about the E&S impacts their loans might have.

Information update at a regular basis: According to the opinion jointly issued by the MEP, the CBRC and the PBC in 2007, local EPBs record E&S information only when the businesses have violated the environmental regulations. As technology advances and business model changes, some such businesses have already improved their E&S performance, while some non-listed businesses might be in breach or at risk of breaching regulations. This might result in wrong decisions made by banks in credit approvals. Hence, local EPBs should conduct regular inspections of businesses within their jurisdiction to gain an updated picture of their E&S performance. More regular inspections may incur higher costs, but can ensure robust enforcement of regulations. This also requires cooperation from local government to jointly promote green finance.

Public monitoring: relying on local EPBs to supervise E&S performance is effective, but its limited resources are not able to cover all businesses. As the awareness of the general public in environmental matters is growing, they (especially NGOs) should also act as a strong external force to monitor the E&S performance, and report to local EPBs any accident that might have a serious impact on the local community or environment. This creates a bridge between the public and local government, enabling the public easy access to environmental information, and fulfil the duties of regulators to build up a database for banks to facilitate then making the appropriate choices on credit approvals. To make use of this large pool of resources to monitor the E&S

performance, local EPBs could work with NGOs to provide public lectures for basic knowledge education, and make it easier for the public to report breach of regulations, e.g. by providing a hotline service for complaints.

Joint-liability system in environmental laws and regulations: to avoid severe damage from hazardous environmental incidents caused by bank- supported projects/entities, a system of environmental lender liability should be applied in high risk sectors, such as chemical and petroleum industries. Similar methods could be adopted from the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), in which the joint liability of commercial banks in environmental tort has been identified; and commercial banks are responsible for undertaking the charges of cleaning pollutions caused by their supported projects (Qu, 2010). As the major environmental impact of commercial banks are from their strategic role in allocating capital to business sectors in the economy, the establishment of joint-liability system would create incentives for banks to use their capacity to conduct thorough and integrated due diligence over projects with potential large environmental impacts.

Supplementary measures to ensure the development of green finance

Targeting regulators: CBRC, PBC, MEP and NDRC

Time scale for the policy instruments: short (rating and evaluation system), short/medium (other supporting measures)

These facilities are in place to ensure a healthy development of green finance in the banking sector. With a rating and evaluation system introduced, banks are assessed for their performance in green finance. Although this should not be seen as a mandate for banks to do green finance, it does act as a driver for banks to formally match itself with the green market and identify the appropriate position where its competitive advantages would position itself. Further, transparency and the ability to compare against its peers also provides useful information to a bank to consider the specific areas it should look at to develop its own green business opportunity. The various programmes for capacity building for banks by the regulators have confirmed banks the will of the regulators to develop green finance. More importantly, the communication with international banks and institutions and professional consultants have provided different perspectives for banks to learn and tailor to suit their own needs for the development of green finance. This helps to quickly enhance the capabilities of banks to understand this emerging business and turn the opportunities into real benefits.

Areas	Policy instrument	Who	Timeframe	How
Clear instructions on green finance	Definition of green finance	CBRC PBC	Short	To specify the scope and boundary of green finance: • To identify green finance issues in banks operations and transactions through discussions with relevant government agencies, on the basis of existing national development plans, such as the 12th FYP; • To develop a catalogue of green industries • To initiate discussions with banks to identify problems and eventually define the concept.
	Non-financial information disclosure standard	CBRC PBC	Short/medium	Develop a non-financial information reporting standard, which is comparable to financial reporting, applicable to the banking sector in China.
	Reporting criteria of green finance	CBRC PBC	Short/medium	To define unified and comparable reporting criteria of green finance that enables the regulators to accurately track and assess the performance of banks within a clearly defined scope of green finance business; Develop a series of indicators in the following areas: • Organization and governance • Policy system and capacity building • Process management • Internal controls and information disclosure
Rating and evaluation system	Performance rating of banks	CBRC	Short	To incorporate green finance performance and E&S factors in the regulatory rating of commercial banks.
	Assessment and evaluation of top leadership of banks	CBRC PBC	Short	The areas of evaluation should include: • The performance rating in terms of E&S risk management and green finance operation of banks. • The level of exposure of corporate governance and organizational structures to green finance
Differential risk regulations and monetary policies	Loan-deposit ratio (LTD ratio)	CBRC	Short	To offer preferential LTD ratio requirements to banks with larger proportions of green loans.
	Capital adequacy ratio (CAR)	CBRC	Short	To adjust risk weighting on green loans in risk weighted asset calculations.
	NPL tolerance	CBRC	Short	To extend tolerance of NPL for banks with larger green finance loans.
	Administrative regulations (notice, guidance, etc.)	CBRC PBC	Short	To issue administrative regulations/policies to guide banks investing in green industries.
	Reserve requirement	PBC	Short	To ease reserve requirement of banks with a larger proportion of green loans.
Fiscal policies to restructure the economy	Fiscal appropriations	MoF Financial departments at	Short/medium	Preferential fiscal policies at central and local levels to support green industry.

Areas	Policy instrument	Who	Timeframe	How
and promote sustainable development		provincial level MEP and other relevant government agencies		
	Special fund/subsidy	MoF NDRC NEA MoST MEP and other relevant government agencies Financial departments at provincial level	Short/medium	Based on national policies on strategic emerging industries, economic restructuring strategy and development plans, a fund should be established to support green industries and environmental protection efforts in the following ways: • Investment subsidies and financial awards to encourage technology innovation and deployment in green industry. • To support medium and long term projects with interest subsidized loans.
	Tax break	MoF Financial departments at provincial level	Short/medium	Identify a set of industries in line with national development strategy and prioritized strategic emerging industry planning; To offer the green industries transparent, consistent favorable tax policies, such as deductions in income tax, business tax, property tax, etc. Tailored policies should be targeting each industry depending on the nature of business.
Enhance supervision over environmental issues	Environmental impact review and monitoring of investment activities	CBRC MEP	Short/medium	In addition to environmental impact assessment before project implementation, post-loan environmental review and monitoring should also be addressed to eliminate E&S risks unexpected. To encourage banks to conduct EDD for projects with elevated E&S risks, to promote responsible investment activities.
	Public consultation and public disclosure policies	MEP CBRC	Short/medium	To improve transparency by enlarging the scope of proactive information dissemination. To gradually loosen regulatory restraints on applicants for information disclosure upon request. To provide more available and easy accessible information to the general public and encourage public participation in environmental issues.
Environmental regulations	Environmental legislation and establishment of joint-liability system	MEP People's congress at national and local levels	Medium/long	To establish legal basis for environmental regulations and litigation through identifying responsibilities, litigation qualifications and joint-liability system, etc. This process also brings social attentions and pressures to promote responsible investments.
National plans/industry policies to restructure the economy	National/regional five-year plans and rules for implementation, to promote green industries	State council NDRC MEP	Medium/long	Consistent industry policies to encourage the development of green industry.

Areas	Policy instrument	Who	Timeframe	How
		National Bureau of Statistics, etc.		
	Industry policies to discourage energy intensive, high pollution and over capacity sectors	Relevant government agencies in energy, agriculture, land and resources, transportation, etc.	Medium/long	
Other supporting measures	To assist capacity building in banks on green finance	CBRC MEP NDRC PBC	Short/medium	To share international experience of green finance practice with domestic banks. To establish communication and discussion sessions in banking sector, to identify problems and best practices.
	To encourage banks working with external professional consultants on green finance projects, EDD, etc.	CBRC MEP PBC	Short/medium	Encourage collaboration and pooling of resources in training, capacity buildings and other common objectives for green finance. Every bank will require professional support or training needs on green finance. The regulator can help lower the cost for each bank by encouraging sector level collaboration on common issues such as training.

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Appendix A. - Appendices

A.1. Appendix – Selection of Banks in the Analysis

The banks selected for the purpose of this analysis is summarised as followed:

- Agricultural Bank of China
- Bank of Beijing
- Bank of China
- Bank of Communications
- China Construction Bank
- China Development Bank
- China Everbright Bank
- China Industrial Bank
- China Merchants Bank
- China Minsheng Bank
- Hua Xia Bank
- Industrial and Commercial Bank of China
- Shanghai Pudong Development Bank
- HSBC
- Deutsche Bank

They are chosen based on the fact that they are all listed companies, which are required to disclose information as required by the stock exchanges.

A.2. Abbreviations

ABC: Agriculture Bank of China

ADB: Asian Development Bank

ADBC: Agricultural Development Bank of China

AFD: Agence Française de Développement

BNEF: Bloomberg New Energy Finance

BOC: Bank of China

BRIC: Brazil, Russia, India and China

CAR: Capital adequacy ratio

CBRC: China Banking Regulatory Commission

CCB: China Construction Bank

CDB: China Development Bank

Chexim: Export and Import Bank of China

CIB: China Industrial Bank

CITIC: China CITIC Bank

CMBC: China Minsheng Banking Corporation Limited

DBCCA: Deutsch Bank Climate Change Advisors

DD: Due diligence

E&S: Environmental and social

EDD: Environmental due diligence

EIA: Environmental impact assessment

EMC: Energy management contracting

EPs: Equator Principles

ESG: Environmental, social and governance

FYP: Five-year plan

GHGs: Greenhouse gases

GRI: Global Reporting Initiative

GW: Gigawatts

ICBC: Industrial and Commercial Bank of China

IFC: International Finance Corporations

IGCC: Integrated gasification combined cycle

KP: Kyoto Protocol

LTD: Loan-deposit

MEP: Ministry of Environmental Protection

MoF: Ministry of Finance

MoST: Ministry of Science and Technology

NDRC: National Development and Reform Commission

NGO: Non-governmental organisation

NPL: Non-performing loan

PBC: People's Bank of China

ROA: Return on Weighted Total Assets

ROE: Return on Weighted Average Equity

SMEs: Small and medium enterprises

SOEs: State-owned Enterprises

SPDB: Shanghai Pudong Development Bank

SRCB: Shanghai Rural Commercial Bank

WTO: World Trade Organisation

Contacts

To have a deeper conversation about how this subject may affect your business, please contact:

John Barnes
Sustainability and Climate Change China and Hong Kong Leader
Tel: +852 2289 1919
john.barnes@hk.pwc.com

Tingcun Han
Senior Manager , Sustainability and Climate Change China
Tel: +86 (10) 6533 7307
tingcun.han@cn.pwc.com