IFC GREEN Commercial bank framework
IFC China climate finance Development Path

2006
Launched in response to MOF's request

2006
Signed with IB

2007
Signed with BOB

2008
Signed with SPDB, & IB (Phase II)

2012
Explored the field of green building

2013 Jan
Signed with BOJS

2013 Mar
Signed with BON, BOB (Phase II)

2013 Apr
Signed with BOS

2014
Signed with Shenzhen Emissions Exchange

2015
Signed with BOR, BOJS (Phase II), & BOB (Phase III)

2016 Apr
Signed with ABC

2017 Oct
Signed with MRCB

Joint-stock Commercial Bank

City Commercial Bank

State-controlled Commercial Bank

Green Commercial Bank

IB: Industrial Bank
SPDB: Shanghai Pudong Development Bank
BOB: Bank of Beijing
BOJS: Bank of Jiangsu
BON: Bank of Nanjing
BOS: Bank of Shanghai
BOR: Bank of Rizhao
ABC: Agricultural Bank of China
MRCB: Ma’anshan Rural Commercial Bank
IFC Green Commercial Bank Framework

The Standards for building a Green Commercial Bank

- 60% of the total outstanding loans to climate-friendly projects
- 70% of the total bank products are green financial instruments
- 80% of bank employees obtained international green finance certificate
- 100% carbon neutral of the bank
- 100% properties owned by the bank are green building certified
The Implementation Framework of Green Commercial Bank
绿色商业银行实施框架

- Culture (文化)
- Branding (品牌)
- Capacity Building (专业能力建设)
- Green Platform Building (绿色平台打造)
- Financial Product (金融产品)
- Advisory Service (大咨询)
- Internet Platform (互联网平台)
- Green Finance System (绿色金融体系)

- Strategic Planning (战略规划)
- Process Optimization (流程优化)
- Risk Management (风险管理)
- Environmental & Social Risk (环境社会风险)
New Innovations for Green Financing in Urban China

Thursday, July 26 2018

5th Floor
汇聚金融之力
点亮绿色中国

Green Finance Energizing Green China
Two Institutes and One Center as Part of the Green Commercial Bank

Institute for Policy and Standards
政策标准研究所

School of Environment and Natural Resources, Renmin University of China
中国人民大学环境学院

Research and Development Center
产品研发中心

Lawrence Berkeley National Laboratory (LBNL)
美国能源部劳伦斯伯克利国家实验室 (LBNL)

Institute for Market/Industry
市场/行业研究所

International Institute of Green Finance, Central University of Finance and Economics
中央财经大学绿色金融国际研究院
Digital Finance Platform
数字金融平台

WeChat Mini app - Green Commercial Bank
微信小程序——绿色商业银行

Comprehensive green finance information portal
综合性绿色金融信息平台——绿蜂网

www.green-fin.com
MRCB have a total of 155 EVs with 162 more to be delivered. An increasing number of our employees are turning to electric vehicle for transportation.

全行绿色新能源电动车共155辆，另有162辆正在申请，新能源汽车使用占比正不断提高。
Green Mortgage product for individual consumers

Differentiated Interest Rate

A Guide to Green Consumer Loan

How to qualify

Base rate

Purchase Guide for Green Home Appliance/Furniture

Floating rate

( Energy efficiency level of the residence 住房能效水平 )
Green Lending Operations
绿色信贷

- RMB1.28 billion in 25 new green loan disbursements in 2018
  2018年上半年，发放绿色信贷12.76亿元，总计25笔

- RMB 2.17 billion in total outstanding green loan portfolio by end of June, 2018
  截至2018年6月末，全行绿色信贷余额21.70亿元

These green loans have gone to the areas of renewable energy, water pollution prevention, green building, green agriculture, energy efficiency retrofit etc.

绿色信贷投放行业主要有：可再生资源利用、水污染控制、绿色建筑、绿色农业、节能改造等
Maanshan Rural Commercial Bank New Office Complex
Certified by Edge as Green Building
马鞍山农商银行综合办公楼获得EDGE绿色建筑认证

The First Office Building in China to Obtain IFC Edge Certification
中国首家获得IFC EDGE绿色建筑认证的商业银行办公楼建筑
60% of the total outstanding loans to climate-friendly projects

70% of the total bank products are green financial instruments

80% of bank employees obtained international green finance certificate

100% carbon neutral of the bank

100% properties owned by the bank are green building certified
Thank you
Innovative Financing Product to Scale
Building Energy Efficiency

Presented by Carolyn Szum, China Energy Group,
Lawrence Berkeley National Laboratory
Global Context

- The 2015 Paris Agreement aims to keep global surface temperature rise **well below 2°Celsius (C)** above pre-industrial levels by the end of the 21st Century (UNFCCC 2017).

- A critical component of achieving mitigation goals is to **reduce energy usage in buildings**, which account for over one-third of final global energy consumption (IEA 2013).

- The International Energy Agency (IEA) estimates that limiting global temperature rise to 2 °C will require an estimated **77% reduction in total CO₂ emissions in buildings by 2050** compared to a baseline of 2012 (IEA 2013).
What’s the Problem?

• According to IEA, cumulative global investments in building EE must reach $13.4 trillion by 2035 to keep global surface temperature rise below 2° Celsius (C) (Rugova 2016).

• This scale exceeds the capacity of public funding and mobilization of private capital is necessary (IPEEC 2016).

• However, few structures exist in the market today for institutional investors to deploy capital, resulting in the absence of EE as an asset class (EEFIG 2015).

• In other words, EE projects are not “developed, delivered, maintained, verified, and measured in a consistent manner” (ICP 2017).
What is China’s Opportunity?

- According to the Paulson Institute, China will require an investment of **US$250 billion** during 13thFive Year Plan in order to scale building EE (Mo 2016).

- Approximately **80% of the required investment** must come from non-government sources (IPEEC 2016).

- Traditionally, **China has relied heavily on grants and subsidies** to advance its energy goals.

- **Innovative business models and financing mechanisms** to leverage primary and secondary market capital in China are needed.
World’s First Green Commercial Bank

Ma’anshan Rural Commercial Bank (MRCB)

• Manages **US$7.5 billion** in assets.
• The bank has adopted the following targets:
  - 60% of the bank’s total loan value is green;
  - 70% of the financial products are green;
  - 80% of the bank’s staff are certified in green finance;
  - 100% of the bank’s portfolio of buildings are green certified;
  - Bank is **100%** carbon neutral.

Only 9% of 21 major Chinese banks’ total loan portfolio is for green projects (i.e., energy savings, pollution treatment, clean transport) (Xinhua 2018).
### MRCB’s Green Credit by Type

#### Energy Efficiency (EE) Loans:
1. Industrial energy and water conservation projects
2. Green transportation projects
3. Building energy efficiency and green building projects
4. Energy service projects
5. Renewable and clean energy projects
6. Overseas projects using international practices or foreign standards [*not disbursed*]

#### Ecological Cycle Loans:
1. Nature protection, ecological restoration and disaster prevention projects
2. Resource recycling projects
3. Environmental protection service projects
4. Green forestry development projects
5. Green agriculture development projects
6. Refuse disposal and pollution prevention projects
7. Rural and urban water projects [*not disbursed*]
8. Overseas projects using international practices or foreign standards [*not disbursed*]
Barriers to Building EE Lending in China

1. Technical Barriers
   • Lack of information/asymmetric information.
   • Lack of standardized protocols and tools for originating EE projects.
   • Lack of technical capacity for EE.

2. Credit/Market Barriers
   • Balance sheet prioritization (self-finance thresholds).
   • Loan not secured by property or equipment.
   • Inability to “lock-box” or “escrow” future streams of cost-savings.
   • Quality/availability of host credit information.
   • Disconnect between occupancy time horizon in property and contract tenor.
   • Split incentive (landlord/tenant).

3. Impact
   • Three-quarters of Chinese EE project hosts have encountered EE financing difficulty (IFC and EMCA, 98).
Credit/Market Barriers

- **Owner or Tenant**
- **Property (Host) Equipment**

1. **Credit quality and availability**
2. **Loan not secured by property or equipment**
3. **Inability to lock-box or escrow**
4. **Tenant pays utility costs?**
5. **Occupancy time horizon**

Balance sheet prioritization
Length of Contract / Tenor of Loan (X)

\[ X \times Y = \text{Total Costs (Z)} \]

Utility Savings (Y)

Year:
- 2016
- 2017
- 2018
- 2019
- 2020
- 2021
- 2022
- 2023
- 2024
- 2025
- 2026
- 2027

Utility Cost:
- 0
- 20
- 40
- 60
- 80
- 100
Exploratory Solutions to Technical Barriers

- Advancing **data transparency** to expand the market for EE.
- Developing open-source **virtual assessment tools** to target cost-effective EE opportunities.
- Developing **standardized procedures for originating EE projects** which mitigate risk.

1. Processes building and weather data using Python code.
2. Automatically generates five coefficients of building performance with physical meaning.
3. Working with Johnson Controls Inc. (JCI) to augment Python code to identify building technology and performance upgrades and estimate associated cost savings.
Exploratory Solutions to Credit/Market Barriers

• Partnering with banks to develop and scale **innovative EE financial products**.
• Systematically **analyzing the risk profile** of EE loans.
• Working with institutions to create **next-generation credit information products**.

April 2018 Launch: Innovative Green Financial Product

• **Green mortgage product**: MRCB launched low-interest rate mortgage product for green homes and apartments (3-Star or LEED certified).
• **Green building product**: MRCB proposing a derivative product for non-residential green buildings and mid-size corporate energy efficiency upgrades.
MRCB Green Mortgage Product

• **Target client:** Buyers of green residential properties

• **Down payment required:** The same as required for traditional properties, i.e. 20% down payment required for first home purchase and 30% for second. (Whether it’s first or second will be determined by housing loan(s) taken by the borrower)

• **Preferential Terms**

• **1. Preferential interest rate:** A certain preferential rate is provided based on client’s ecological credit.
  
  • Green mortgage interest rate = base rate + floating rate
  
  • **The base rate** will be the same as adopted for traditional properties of the same conditions. **Differentiated interest rates are granted based on the greenness of the certified green property.** Given the going rate at MRCB, the interest rate for a traditional mortgage is 5.39%
# 1. Preferential Interest Rates

<table>
<thead>
<tr>
<th>LEED</th>
<th>Certified level</th>
<th>CGBC</th>
<th>Annual IR Discount</th>
<th>IFC Edge</th>
<th>Certified level</th>
<th>Annual IR Discount</th>
</tr>
</thead>
<tbody>
<tr>
<td>LEED CERTIFIED</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td>Certified level</td>
<td>0.2%</td>
</tr>
<tr>
<td>LEED SILVER</td>
<td>0.1%</td>
<td>1-Star</td>
<td>0.1%</td>
<td></td>
<td>Certified level</td>
<td>0.2%</td>
</tr>
<tr>
<td>LEED GOLD</td>
<td>0.2%</td>
<td>2-Star</td>
<td>0.2%</td>
<td>CERTIFIED</td>
<td>Certified level</td>
<td></td>
</tr>
<tr>
<td>LEED PLATINUM</td>
<td>0.3%</td>
<td>3-Star</td>
<td>0.3%</td>
<td></td>
<td>Certified level</td>
<td></td>
</tr>
</tbody>
</table>
2. Matching Consumer Line of Credit

• Borrowers of the green mortgage loan will be approved a consumer credit line 10% of the total purchase price of the green property for the payment of relevant transaction fees and the purchase of green household items, energy efficient home appliances etc.

• The purchase must be done in compliance with the Purchase Guide for Green Home Appliances and Furniture.

• The loan will be disbursed through entrusted payment as a way of monitoring loan purpose fulfillment.

• The loan amount is capped at RMB 500,000 with a maximum tenor of 3 years and an interest rate the same as adopted for other consumer loans currently available at MRCB.
3. Exemption of Early Repayment Penalty

• Green mortgage borrowers will be exempt from a penalty in case of early repayment.
How Do We Leverage Secondary Market Capital for EE?

Meet the requirements of capital markets:

- Sufficient scale.
- Standardization.
- Ability to efficiently understand credit quality in many market segments.

<table>
<thead>
<tr>
<th>Transaction</th>
<th>Sector</th>
<th>Type</th>
<th>Credit</th>
<th>Size</th>
<th>Aggregation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delaware Sustainable Energy Utility</td>
<td>MUSH</td>
<td>Bond</td>
<td>Public Investment-Grade</td>
<td>$72.5mm</td>
<td>State properties; Multi-agency</td>
</tr>
<tr>
<td>Unilever</td>
<td>Corporate</td>
<td>Bond</td>
<td>Corporate Investment-Grade</td>
<td>$324mm</td>
<td>Corporate facilities; international</td>
</tr>
<tr>
<td>RENOVATE AMERICA</td>
<td>Single-Family</td>
<td>PACE ABS</td>
<td>Tax lien</td>
<td>$232mm (10) $245 million total</td>
<td>Pool</td>
</tr>
<tr>
<td>hero</td>
<td>Single-Family</td>
<td>Unsecured ABS</td>
<td>Unsecured</td>
<td>$12.5mm</td>
<td>Pool</td>
</tr>
<tr>
<td>RENEW FINANCIAL WHEEL</td>
<td>Single-Family</td>
<td>Unsecured ABS</td>
<td>Unsecured</td>
<td>$14mm</td>
<td>Property Management</td>
</tr>
</tbody>
</table>

Secondary Market Examples in the United States (Citi 2017)
Thank You!

Contact information:
Carolyn Szum ccszum@lbl.gov
+1-510-486-4106
Our website: http://china.lbl.gov