

# IFC GREEN BUILDING PROGRAM IN CHINA



**WORLD BANK GROUP**

**IFC**

International  
Finance Corporation

# About World Bank Group

A unique global partnership for developing countries

189 member countries

Financing > \$45.9 billion

Offices > 130 locations

IBRD

The International Bank  
for Reconstruction and  
Development

IDA

The International  
Development  
Association

IFC

The International  
Finance Corporation

MIGA

The Multilateral  
Investment Guarantee  
Agency

ICSID

The International  
Centre for Settlement  
of Investment Disputes

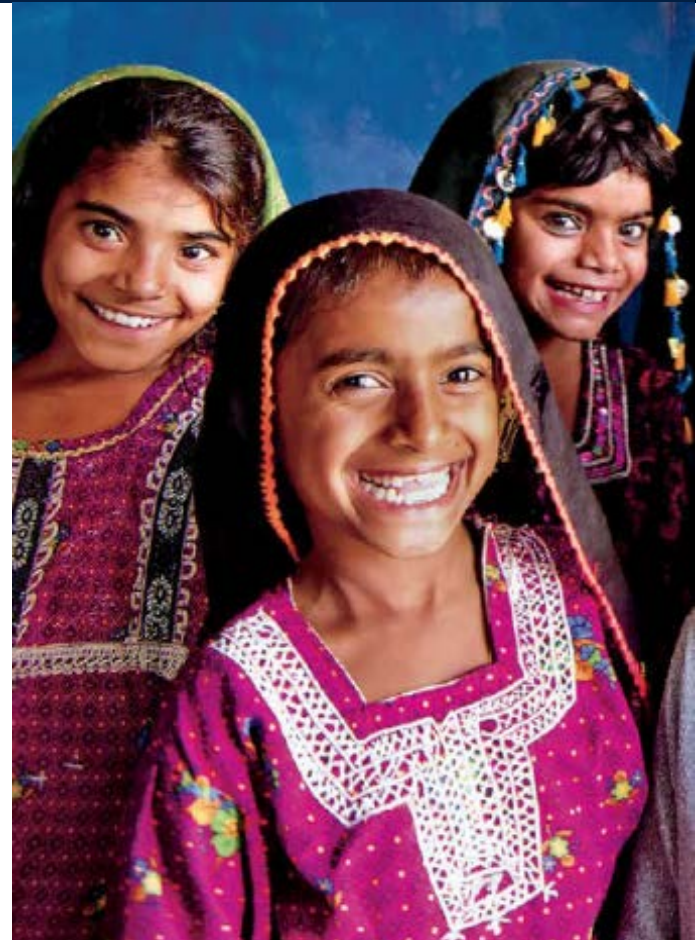


**WORLD BANK GROUP**

Five Institutions, One Group

Since 1956, IFC has leveraged \$2.6 billion in capital to deliver more than \$265 billion in financing for businesses in developing countries

- 184 Member Countries
- Offices in over 100 Countries
- Mobilize Investment and Enhance Capacity
- Climate Investment = 28%
- Target \$91 billion USD per year on Green Buildings with partner FIs by FY
- FY17 GB Investment > \$1B



We work with the **Private Sector** in developing countries to create markets that open up opportunities for all

# Promoting Green Finance with Financial Institutions in China



## Beijing-Tianjin-Hebei Air Pollution Prevention and Financing Innovation

**Project :** WBG \$500 million and co-financing of \$500 from Hua Xia Bank, along with a full fledged capacity building program



**Equator Principles:** IFC introduced the Equator Principles and other international green financial standards, and supported Industrial Bank to become China's first "Equatorial Bank" and leader in the field of green finance



# IFC China Climate Finance Advisory

<b>Features</b>	Supporting service of Risk Sharing Facility (RSF)	Independent advisory service	Market-oriented operation with competitive service quality
<b>Content</b>	Technical assistance for awareness raising and individual project identifying	Capacity building, including training for various departments, project on-site investigation, project appraisal, project recommendation, and market research, etc.	Help partner banks establish green finance system, build internal green channel, and set up market standard
<b>Industries</b>	Energy efficiency, renewable energy	Expanded to water efficiency, distributed energy, carbon finance, etc.	All climate-related industries
<b>Partner Banks</b>	Industrial Bank, Shanghai Pudong Development Bank, Bank of Beijing	Bank of Jiangsu, Bank of Beijing, Bank of Nanjing, Bank of Shanghai	Bank of Jiangsu, Bank of Beijing, Bank of Rizhao, Agricultural Bank of China, Ma'anshan Rural Commercial Bank



# Relevant Policies on Green Financing

Reduce Energy  
Consumption  
60-65% by 2030  
(compared to  
2005)

Carbon  
Peaking  
by 2030

**By 2020, at  
least 50% of  
new buildings  
are GB**



Private capital  
to support  
construction and  
operations

Green  
financing  
facilities

Market-based  
financing for  
Local gov't

# Green Building Financing is Lagging Behind

36% of Energy  
Consumption

GHG Reduction  
Potential: 1.1Gt

23 - 31% of  
Banking Industry  
Assets

GB = 1.9% of green loans



# Financing Need to Building Energy Efficiency During the 13 FYP Period



Financing Need by  
Chinese Cities for  
Building EE US\$ 261 B

Public EE Retrofit  
Need US\$ 123 B

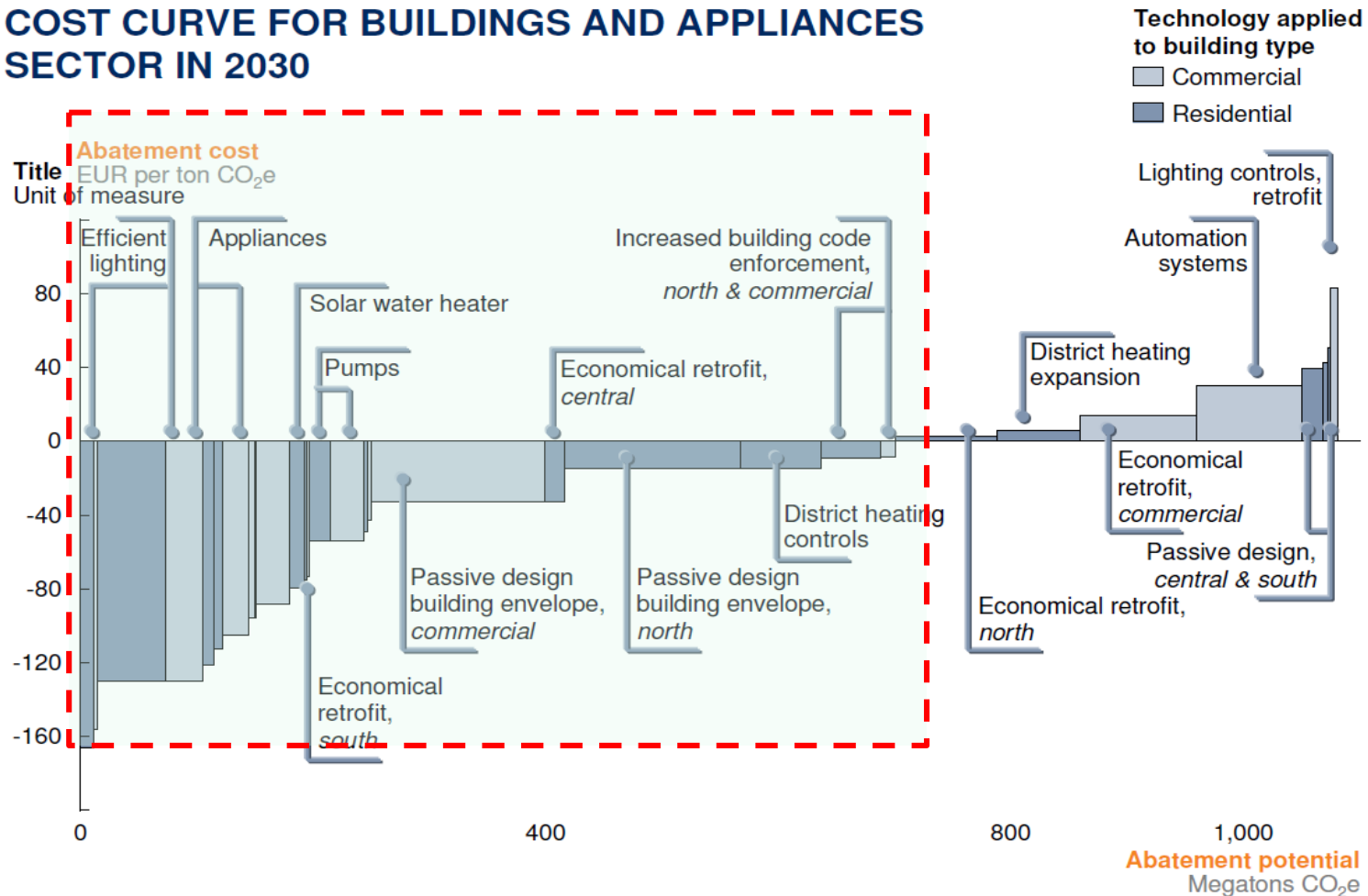
Public Budget  
for Building EE  
US\$ 19 B

Public financing is only able to provide an estimated 7.3% of the total financing demand for investments in building efficiency



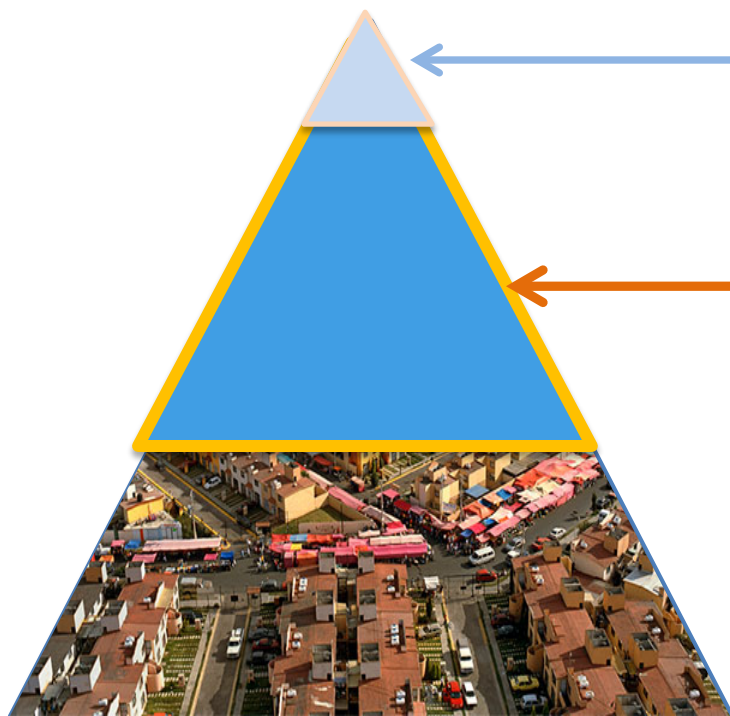
# Green Building Is a Good Bet

## COST CURVE FOR BUILDINGS AND APPLIANCES SECTOR IN 2030



The returns on 70% of all green building measures are greater than their costs

# What will it take to transform the building sector?



Complex rating systems are focused on top-tier clients or public sector and provide solutions for a small segment for the market

China needs a affordable and finance-linked rating system for market transformation – making it accessible to a majority of the building industry

There is a clear opportunity to engage much more of the market to focus on green buildings.

# BUILD A GREEN PORTFOLIO AND BECOME A PART OF A GROWING COMMUNITY OF **GLOBAL LEADERS**.



# IFC's EDGE is Comprised of a Software Application, a Standard, and a Certification System

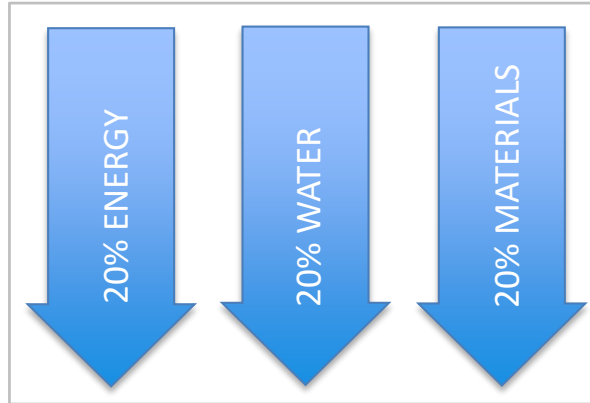
Software

+

Standard

+

Certification



Homes

Hotels

Retail

Offices

Hospitals

Base Case Utility Cost **102,432** \$/Month

Utility Costs Reduction **40,040** \$/Month

Incremental Cost **915,675** \$

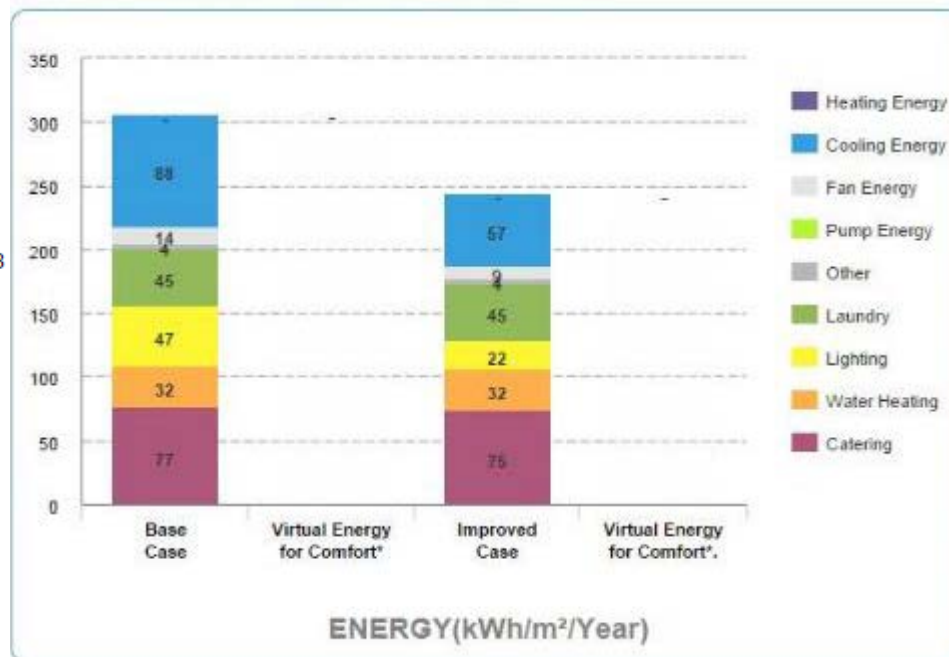
Payback in Years **1.9** Yrs.

## Energy Efficiency Measures

- ☒ Reduced Window to Wall Ratio - WWR of 40%
- ☒ External Shading Devices - Annual Average Shading Factor (AASF) of 0.58
- ☐ Insulation of Roof Surface - U Value of 0.45
- ☐ Insulation of External Walls - U Value of 0.45
- ☐ Low-E Coated Glass - U Value of 3 W/m<sup>2</sup> K and SHGC of 0.45
- ☒ Higher Thermal Performance Glass - U Value of 1.95 W/m<sup>2</sup> K and SHGC of 0.28

- ☐ Natural Ventilation - Corridors
- ☐ Natural Ventilation - Guest Rooms with Auto Controls
- ☐ Variable Refrigerant Volume (VRV) Cooling System - COP of 3.45
- ☐ Air Conditioning with Air Cooled Screw Chiller - COP of 3.2
- ☐ Air Conditioning with Water Cooled Chiller - COP of 5.39
- ☐ Ground Source Heat Pump - COP of 4.65
- ☐ Absorption Chiller Powered by Waste Heat for Space Heating- COP of 0.7
- ☐ Recovery of Waste Heat from the Generator for Space Heating
- ☐ Variable Speed Drives on the Fans of Cooling Towers
- ☐ Variable Speed Drives Pumps
- ☐ Sensible Heat Recovery from Exhaust Air - Efficiency of 60%
- ☐ High Efficiency Condensing Boiler for Space Heating - Efficiency of 90%
- ☐ High Efficiency Boiler for Water Heating - Efficiency of 90%
- ☒ Variable Speed Hoods with Automated Fan Controls

39.3% Meets EDGE Standard





Homes

Hotels

Retail

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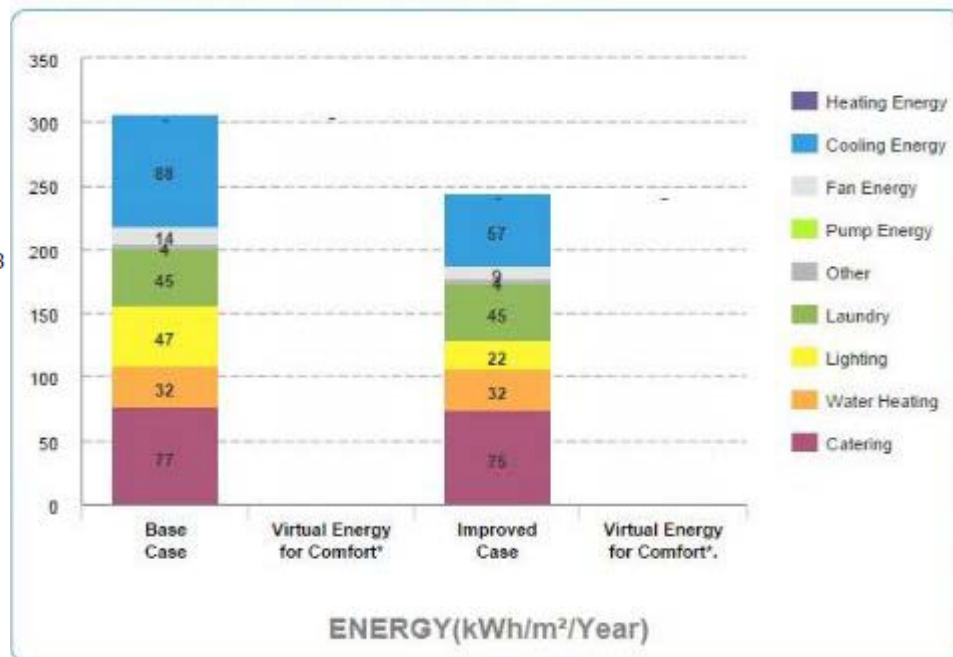
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## Energy Efficiency Measures

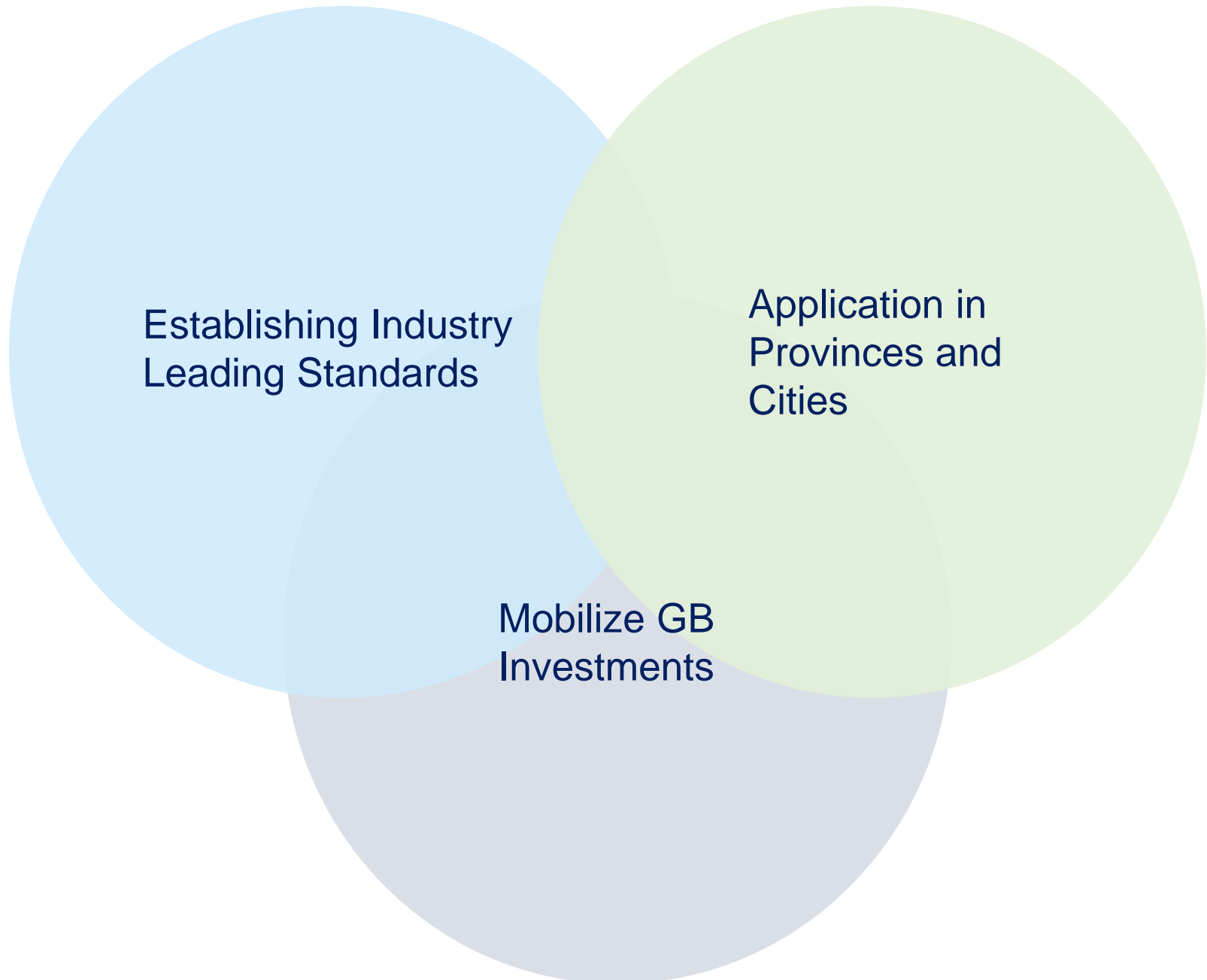
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39.3% Meets EDGE Standard



# Our Multi-Pronged Approach





# Enhancing the Financial Compatibility of China's Standard



## Key Standard Work and Milestones

- 2016 Localization of EDGE Database with extensive collected data from local sources
- 2017 Benchmarking of EDGE system with China's GBL Standard
- 2018 EDGE became first system to fulfill the GBL standard, reducing the time and labor needed to build green, while enhancing the financial compatibility of China's GB standard

# Partnering with Sub-national Governments



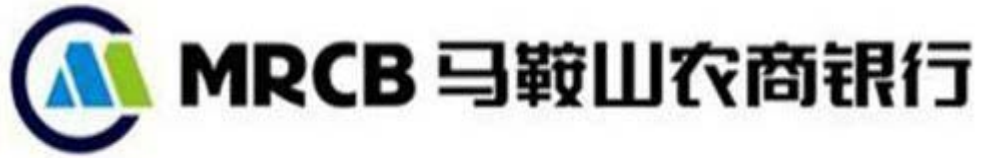
- Shanghai Changning District: EDGE Labels for 100 buildings
- New Green Building and Retrofits in Fuzhou
- Chongqing Nan'an District: Labels and Financial System Application

## Building Retrofits and Near-Zero Buildings in Shanghai

WBG \$100 million and co-financing of \$100 from Bank of Shanghai and SPD Bank

- Project focuses primarily on retrofits, and supporting also near-zero buildings
- Retrofits: Reduction of at least 10% of GHG
- New Buildings: Reduction of 70% of energy consumption relative to 1980 baseline
- Target lendees: ESCOs, Building owners, Management Companies, Developers, Equipment Providers





## 1. Green Mortgage

Interest rate reduction for EDGE certified buildings

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## 2. Consumer Credit for Green Mortgage

Consumer credit line for the payment of relevant transaction fees and the purchase of green household items and energy efficient home appliances

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## 3. Exemption of early repayment penalty

Green mortgage borrowers will be exempt from penalty in case of early repayment.





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*Creating Markets,  
Creating Opportunities*

## Contact Us

edgebuildings.com

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# Annex

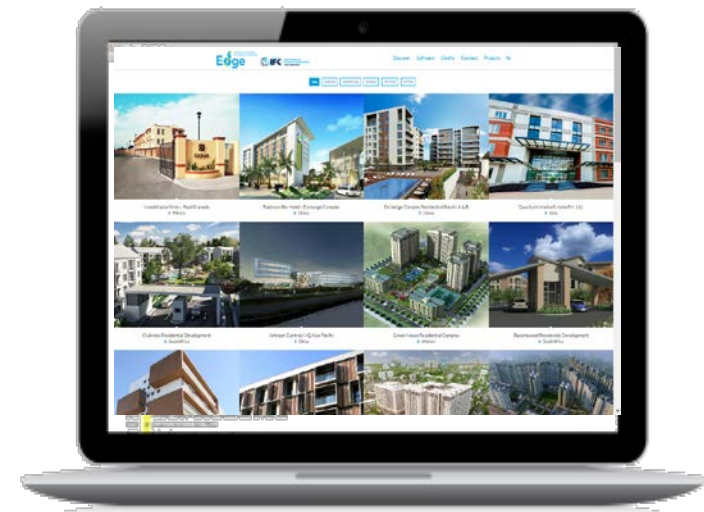


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# EDGE System Consists of :

- Green Building Design
- Green Building Certificate
- Green Portfolio Display





# EDGE Certified Project in China-Johnson Controls HQ Asia Pacific



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## Predicted Savings of EDGE Certification



45%

Energy Savings\*



42%

Water Savings



21%

Less Embodied Energy in Materials

# EDGE Certified Project in China-Bruck Passive House Hotel



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## Predicted Savings of EDGE Certification



47%

Energy Savings\*



42%

Water Savings



34%

Less Embodied Energy in Materials



# IFC China Climate Finance Advisory Program

## Joint-stock Commercial Bank

2006

Signed with IB

2008

Signed with SPDB,  
& IB (Phase II)

2007

Signed with  
BOB

2006

Launched  
in response to  
MOF's request

## City Commercial Bank

2013 Jan

Signed with BOJS

2013 Apr

Signed with BOS

2013 Mar

Signed with BON,  
BOB (Phase II)

2012

Explored the  
field of green  
building

## State-controlled Commercial Bank

2015

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

2014

Signed with  
Shenzhen  
Emissions  
Exchange

2016 Apr

Signed with ABC

## Green Commercial Bank

2017 Oct

Signed with  
MRCB

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

## CHUEE's Green Results

### Green Loans:

- Industrial Bank: **150** billion USD
- Shanghai Pudong Development Bank: **48** billion USD
- Bank of Beijing: **17** billion USD
- Bank of Jiangsu: **7** billion USD (outstanding loans)
- Bank of Nanjing: **2.4** billion USD (outstanding loans)



### GHG Emission Reduction:

CHUEE's total annual GHG emission reduction: **22** million tons of CO<sub>2</sub> equivalent

### System Building

IB, SPDB, BOJS, BON respectively built green finance department after their cooperation with CHUEE

In addition, the ABC project is expected to mobilize **US\$23 billion** in EE/RE projects reducing CO<sub>2</sub> emission by at least **50 million tons** annually.