

# Cracking the Energy Efficiency Market in China

*A Look at the Tantalizing Opportunities  
and Challenges of EE Financing*



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*Strategic Partner*



## SYNOPSIS

By 2020, China's market for energy efficiency (EE) products and services is projected to reach as much as \$320 billion, with \$30 billion in the building sector alone. With ambitious national policies, China continues to promote energy efficiency as a vital tool to cut its carbon emissions and reduce air pollution. How can American companies tap into China's potentially lucrative market? Our research has found that financing is still considered one of the biggest hurdles to deploying energy efficiency technology in China, whether a company is China-based or foreign. This report examines the structural challenges to secure EE financing in China and proposes possible solutions. We interviewed companies with deep experience in China, including Honeywell, and leading experts in the field so your company can learn from them. "Cracking the Energy Efficiency Market in China" is your guide to China's growing EE market, its banking system and where to find help to grow your business there.

## INTRODUCTION

Is your company a small or medium-sized U.S. enterprise focused on energy efficiency? Eyeing the tantalizing Chinese market? Not sure what challenges you'll face trying to crack the Chinese market or how to finance energy efficiency projects there? We are here to help through this report. With information synthesized from a wide range of sources, "Cracking the Chinese Market" examines the challenges and opportunities that the Chinese market holds for American companies in energy efficiency. We interviewed many experts for this report, including bankers, investors, government officials, academic researchers, and company executives who have worked on energy efficiency-related projects. (A list of these sources can be found in the appendix.)

The opportunities in China are highly promising for a host of reasons:

- China has set very ambitious goals for EE over the next 15 years. Consider this: Annual investment in energy efficiency projects in China is expected to reach at least \$320 billion during the 13th Five-Year Plan period (2016-20).<sup>1</sup> Estimates for China's annual investment in energy efficiency projects are \$30 billion for the building sector alone under the 13th Five-Year Plan.<sup>2</sup>
- China's annual output of energy efficiency technology is estimated at \$110 billion.<sup>3</sup> The World Bank has introduced market-based solutions to support this. These include providing guarantees to ESCOs and mainstreaming EE lending in the banking sector.<sup>4</sup> (See page 11 for more details).
- Energy efficiency investment is in line with capital spending for building construction in China. According to the latest figures, in 2014--a boom year for building construction--China invested \$18 billion in energy efficiency for buildings. More than \$11 billion of this was invested in the residential sector.<sup>5</sup>
- China topped the United States as the world's biggest issuer of green bonds in Q1 2016. It issued \$7.9 billion of green bonds, a majority allocated for energy efficiency projects.<sup>6</sup>
- Honeywell, an Alliance partner, has witnessed a surge in demand for building retrofits in China. Building owners are replacing obsolete equipment to become more efficient. Also, interest rates in China have fallen dramatically, a situation that is spurring the EE market.<sup>7</sup>

- Energy efficiency technologies will be increasingly in demand in China as energy consumption continues to increase. According to a recent report by the U.S. Department of Energy on China's economic and emissions growth, the country's building stock has increased by 40 percent since 1990. The report says "The trend is expected to continue, as China's building energy use is projected to rise by 40 percent between 2009 and 2030 to accommodate the 1.7 billion square meters of new floor space being built annually."<sup>8</sup>

That said, American energy efficiency companies often face a tough time closing deals in China because project owners often face significant hurdles to secure financing. We describe these challenges below.

This report will provide you with information and resources to help you and your company navigate these challenges so you can--we hope--better evaluate the pros and cons of entering China's burgeoning market in energy efficiency.

## **OVERVIEW OF CHINA'S ENERGY EFFICIENCY MARKET**

Commercial and residential building construction is catalyzing most of the energy efficiency (EE) investment in China, whether it's for new structures or retrofits. As millions of Chinese migrate to cities and the middle class grows, demand for new housing has grown. Though it's slowed recently, "[d]emand will rise by 175 million homes by 2030, opening the door to new construction of around 150 million new properties," according to the Financial Times.<sup>9</sup>

Spurred in part by horrendous air pollution caused by coal burning, China has set national policies and regulations to boost energy efficiency in a range of areas, including the housing market.

- In the 13th Five-Year Plan--from 2016-2020, the Chinese government makes clear that it intends to cut its carbon emissions through a range of broad-reaching policies, including the promotion of energy efficiency. It aims to reduce energy intensity by 15% and carbon intensity by 18% by 2020.<sup>10</sup> (These goals represent a slight weakening of previous targets because China actually surpassed its earlier goals).
- The 13th Five-Year Plan, for the first time, sets a numerical goal to cap its energy consumption--5 billion tons of standard coal equivalent (tsce) for 2020.<sup>11</sup> Energy experts believe that China can maintain its overall energy consumption below that--to 4.7 billion tons tsce--through energy efficiency and economic restructuring.<sup>12</sup> In 2016 electricity consumption is expected to rise to 5.7 trillion kilowatt-hours and coal consumption will hit 3.96 billion tons.<sup>13</sup> While these figures are enormous, it's important to note that overall growth in energy consumption in 2016 is 0.9 percent, the lowest expansion since 1998.<sup>14</sup>
- China has the Green Building Design Label, or "Three-Star" system, which shares some aspects with the Leadership in Energy and Environmental Design (LEED) certification widely adopted in the United States and other Western countries.

- China’s “Three-Star” system differs in important ways. Unlike the U.S. LEED system that requires recertification every five years, China’s Three-Star rating is valid for only three years. Under the Three-Star program, buildings must be re-certified to maintain the rating status, according to the U.S. Department of Energy.<sup>15</sup> The China Business Review noted that while the Chinese government requires specific buildings to receive a star rating, the Three-Star system is still a voluntary program for most commercial and residential buildings. Christina Nelson of the China Business Review says that specific buildings required to have a star rating include “new government-owned and large public buildings, existing government-owned office buildings, and large public buildings that apply for government energy retrofit subsidies.”<sup>16</sup>
- Leading energy efficiency experts assert that if China enforced the rating systems, building codes and standards, and financial incentives for retrofits in existing buildings, the country could achieve a 14 – 22 percent reduction in energy use and cut its carbon dioxide emissions.<sup>17</sup>

## China’s New Green Financing

China has embraced green finance as a “strategic imperative,” according to Henry Paulson, chairman of the Paulson Institute and former Treasury secretary of the United States. Paulson, in an op-ed piece this year in the New York Times, reported that China “needs \$1 trillion over the next five years to make investments in efficient buildings, low-carbon transportation and clean energy in its cities, but can only afford to finance 15 percent of that.” The Chinese government has issued guidelines that will help expand green finance opportunities through, “creating green lending, environmental stress tests, benchmarks to ensure credibility of green investments, disclosure requirements and innovative public private partnerships,” Paulson said.<sup>18</sup>

In the past year, several Chinese institutions have launched new ways to finance green projects.

- In 2016, the Building Efficiency and Green Development Fund was launched to “provide financing to use new technologies from American companies in China to make building more energy-efficient,” according to Paulson.<sup>19</sup>
- In 2015, the People’s Bank of China introduced the Green Financial Bond Directive. This measure, for the first time, allows the use of bonds to finance new and existing green infrastructure projects. This should significantly help to speed up development of low-carbon projects.<sup>20</sup>
  - In addition, China’s Central Bank is expanding its green bond market to finance big projects. In October 2015, Agricultural Bank of China issued green bonds equivalent to \$1 billion at the London Stock Exchange. That was the first time a mainland Chinese financial institution issued an RMB-denominated green bond. With the release of the Green Financial Bond Directive (see page 18) and the Green Bond-Endorsed Project Catalogue by China’s central bank, the country will offer the most green bonds it ever has.<sup>21</sup> The Catalogue, for example, provides for the first time criteria for China’s green bonds so they conform to classification methods used by international capital markets.

- In 2015, the China Banking Regulatory Commission and the Chinese National Development and Reform Commission issued a joint plan to promote loans through banks and other financial institutions to fund EE projects.<sup>22</sup>
- China designed a “Strategic Action Plan for Energy Development, 2014-2020”. The plan “aims to reduce China’s high energy consumption per unit GDP ratio through a set of measures and mandatory targets, promoting a more efficient, self-sufficient, green and innovative energy production and consumption,” according to a publication by the London School of Economics and Political Science.<sup>23</sup>

## **International Efforts to Boost EE in China**

A range of binding and non-binding international agreements struck over the past three years also promote energy efficiency in China.

### **China- U.S. Memoranda of Understanding (MOU) on low-carbon development**

- The Chinese government has increased its bilateral cooperation with the United States government in the following areas: “pilot program establishment, environmental policies/standard setting, personnel training and technology imports”, according to the U.S. State Department.<sup>24</sup> Deployment of private sector energy efficiency technology is critical to implementing these bilateral cooperative goals. For a full list of recent cooperative agreements, see <http://chinau-seealliance.org/mous/>. MOUs are non-binding.

### **Paris Agreement**

- China and the United States signed the international treaty hammered out at COP21 in Paris in 2015 to fight climate change. The Paris agreement is binding for 4 years among signatories. It made significant pledges that will encourage energy efficiency investment. In its Intended Nationally Determined Contribution (INDC), China supports the decoupling of economic growth from increased energy consumption. China’s INDC major goals include:
  - Capping CO2 emissions by 2030 or sooner;
  - Reducing the greenhouse gas emissions intensity—the ratio of greenhouse gas emissions to GDP--by 60% to 65% from 2005 levels by 2030. This augments China’s goal to cut its energy intensity;<sup>25</sup>
  - Promoting EE financing by increasing financial and policy support, including financing mechanisms, green government procurement systems and green credit mechanisms;<sup>26</sup>
  - Requiring new buildings in China to achieve a 50 percent reduction in energy use compared to the 1980s.<sup>27</sup>
- China’s INDC includes a measure that aims to promote the development of low-carbon technologies. In a recent World Resources Institute article, Western experts recommend that China “cooperate with both domestic and international manufacturers, financial institutions and government agencies.” This, in turn, will “support and expedite the commercialization and distribution of new efficient building technologies.”<sup>28</sup>

## Opportunities for American Companies

With these ambitious initiatives, China's market for energy efficiency, especially in the housing sector, seems ripe with opportunities for American companies. China also has many inefficient buildings built before recent strict codes and standards were introduced. This creates market opportunities related to retrofits.<sup>29</sup> Consider these trends, according to a 2014 report by the U.S. Department of Energy (DOE):

- Local governments in China set targets on a number of buildings to retrofit each year, and will provide financial assistance for the projects.<sup>30</sup>
- In recent years the Chinese government has increased the amount of retrofits of state-owned properties. The DOE report said the goal is to achieve “large-scale changes through energy service contracts, which creates an opportunity for energy service companies.”<sup>31</sup>
- Energy service contracts for large commercial and residential buildings are increasingly in demand. A majority of these contracts target “low-hanging fruit” technologies, such as LED lighting, but government pressure and growing market opportunities should expand these retrofits.<sup>32</sup>

However, the Chinese market can be very challenging for American firms to navigate in general due to multiple factors, including significant cultural and social differences in the way business is done, as well as legal considerations such as intellectual property protection. The literature addressing these challenges is vast, and so they are not addressed in depth here. But we dive into the financing hurdles next.

## FREQUENTLY ASKED QUESTIONS

### *Why is EE financing challenging in China?*

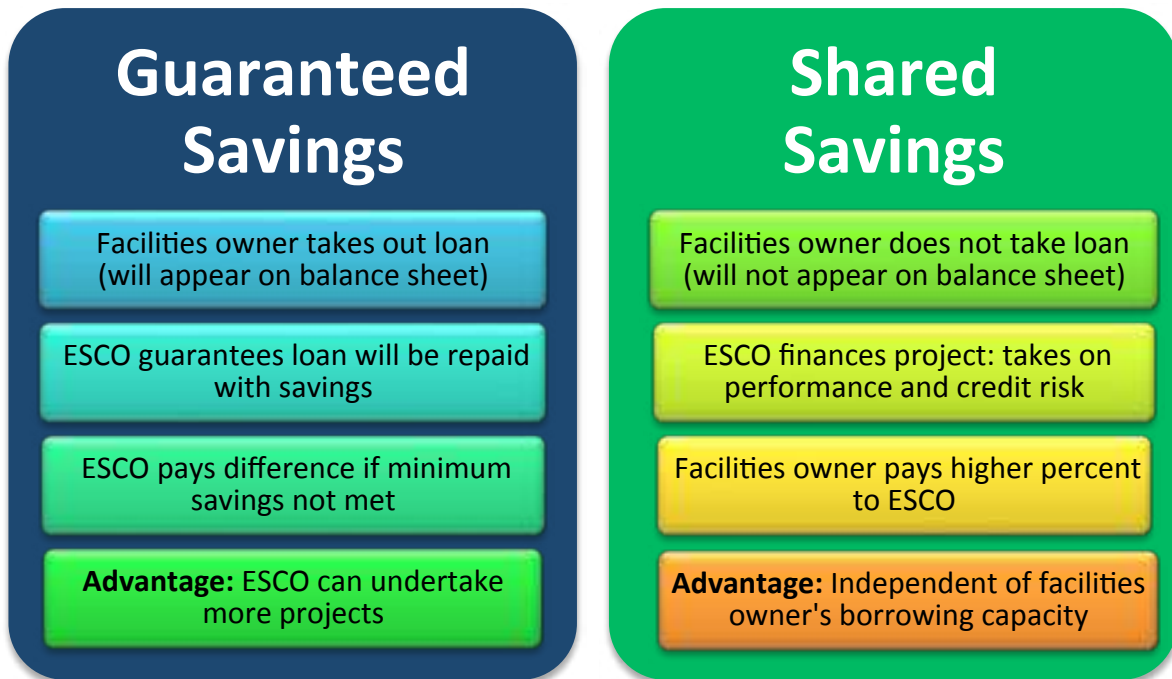
Here are some of the problems:

#### **Finance Models Unattractive to Investors**

- Banks in China finance energy efficiency projects by using a “shared savings” model in which an Energy Service Company (ESCO) takes on most if not all the financial risk. This limits the attractiveness of projects to foreign investors. In the United States, banks use a “guaranteed savings” model whereby an ESCO takes on the technology risk and financiers assume the credit risk. Under China's shared savings model, the savings in energy cost are then split between the project host and the ESCO. Most companies do not want to take on this kind of debt on their balance sheet. So unless they can find a solution where they can offload the debt to a third-party financier, ESCOs avoid the shared savings model.<sup>33</sup> (See Box 1.1 on how Honeywell mitigates the problems of the shared savings model).



## Guaranteed Savings vs. Shared Savings



(Source: Wahab, Zaini Abdul)<sup>34</sup>

## Hurdles with Chinese Banks

- Chinese banks lack information on energy efficiency financing and the returns associated with these projects. For example, China's commercial banks consider construction of energy-efficient buildings a higher financial risk than a conventional building project.<sup>35</sup>
- Banks in China are unfamiliar with energy efficiency technologies and services, so they find it difficult to assess risk and potential cash flows.
- A chicken-and-egg dilemma: Chinese investors and banks favor projects with a quick payback, usually less than 3 years. Quick payback projects often deal with small-scale retrofits that use simple measures or single products. Regardless of their size, EE projects take a lot of work to finance, resulting in high transaction costs. So funding multiple small EE projects is more costly than funding a single big project. Several experts have suggested that bundling the small projects—say for large-scale lighting upgrades--could make them more attractive to banks or ESCOS.<sup>36</sup>
- The Chinese banking sector is highly risk averse and liquid. Banks usually require large collateral and fixed asset guarantees to lend, sometimes necessitating 200 percent or more of loan value. This puts a big damper on EE financing, particularly for commercial building projects.<sup>37</sup>

## Other Factors

- Building owners and operators lack the information resources to evaluate adequately the benefits of retrofitting. Moreover, the economic interests of building owners, operators, and residents may not be aligned, further complicating projects.<sup>38</sup>
- Energy experts said in a recent World Resources Institute article that China’s public funds are not enough to help make its buildings efficient. They said that “bringing in external financial institutions is essential to bridge the gap between capital and projects. Utilizing new financial mechanisms is essential to accelerating building efficiency in China, especially for retrofitting existing buildings.”<sup>39</sup>

## Differences in Business Culture

- Jason Lo of Honeywell said in an interview with the Alliance that measuring savings from energy efficiency projects in China and collecting money from customers there are challenging. That’s even if the parties involved have agreed beforehand on the method and formula to calculate savings, Lo explained.<sup>40</sup> See the following box for more lessons from Lo and Honeywell’s experience in China.

### **Honeywell’s Lessons from China**

When China created new national energy efficiency targets in the mid-2000s, it didn’t have regulations governing the financing of EE projects. Honeywell, which has been doing business in China since 1993, saw a potentially big business opportunity to shape the EE market, according to an interview this year with Jason Lo, Senior Director of Strategy & Business Development at Honeywell.

To accomplish its EE goals, Honeywell tried to apply the financial model that it had successfully used in the United States that guaranteed savings to a third party lender. This proved to be difficult in China because banks there commonly use a “shared savings model” in which an energy-saving company takes on the financial risk. And Honeywell is not in the business of project financing.

Overall, here are the major challenges that Honeywell experienced in China:

- Business practices are different from the United States. In the U.S., many of Honeywell’s customers are public buildings that banks deem as creditworthy. In China, the demand is from the private sector, so the banks are much more cautious.
- EE financing is new to financial institutions in China. Banks were unfamiliar with the risk of this type of project (asset class). So they tend to price financing on the safe side by setting higher interest rates, for example, and asking for collateral.
- New experience for ESCOs like Honeywell. It took Honeywell a lot of effort to sort through the financing mechanism and legal documents.

Ultimately, Honeywell decided to focus its efforts on selling its energy efficiency technology in China instead of financing projects.

***What are lessons for small or medium-size U.S. companies in EE based on Honeywell's experience?***

Jason Lo, Honeywell's Senior Director of Strategy & Business Development, recommends U.S. firms:

- Bring proven technologies or products to solve specific problems, backed up with case studies.
- Sell the value of both energy savings and environmental protection (for example, reduction of CO<sub>2</sub>, NO<sub>x</sub>, SO<sub>2</sub>, VOC, etc.)
- Partner with a Chinese ESCO as the sales and financing vehicle. However, with thousands of unqualified ESCOs in China, be sure to do due diligence before deciding which company to partner with.
- Take operational control of the solution and be ready to staff your own people on site if you want to sell a solution based on value (i.e. sharing the upside and downside of the energy saving).
- He said Chinese customers frequently try to renegotiate the terms of a contract, especially when project ownership changes hands on the customer side.

According to several leading experts, there is no evidence that Chinese banks favor Chinese companies over U.S. firms in funding energy efficiency technologies and services.<sup>41</sup> Chinese banks are willing to support projects that provide a strong return on investments and are considered safe investments. However, there seems to be a difference in how banks treat Chinese public and private companies:

**State-owned enterprises**

- Chinese banks often lend to state-owned enterprises because they know the SOEs are backed by the government. Private companies in China have a tougher time obtaining credit.<sup>42</sup>
- There are thousands of Chinese ESCOs. But they tend to be relatively small enterprises with weaker credit profiles and thinner track records in project execution compared to their larger counterparts. So banks are cautious about making loans to the smaller ESCOs.<sup>43</sup>

***How do Chinese banks and investors identify EE projects in China?***

Chinese banks usually work with ESCOs and their resources to identify EE projects. Banks often have personnel who have built close relations with local business owners and developers. This is a huge disadvantage for foreign competitors without a presence in China unless they take on a Chinese partner.<sup>44</sup>

***Where can an American firm get more information to help mobilize financing for EE projects in China?***

**World Bank's China Energy Efficiency Financing Program**

The International Finance Corporation (IFC) of the World Bank, through its China Utility Energy Efficiency (CHUEE) project, has successfully introduced new programs at several Chinese banks to issue loans to large and small-medium enterprises for *industrial* energy efficiency projects.<sup>45</sup>

CHUEE has several initiatives to foster EE financing:

- IFC takes on part of the risk of the loans related to EE.
- The project helps Chinese banks assess risks and evaluate potential cash flows from EE projects. It also works with banks to develop a pipeline of strong EE projects for financing. With IFC's support, Chinese banks are offering new financial products. CHUEE also helps banks increase sales, diversify their credit portfolio, and obtain funding from other sources, all to improve energy efficiency. But again, this program is focused on industrial EE projects, not the building sector.<sup>46</sup>

### **World Bank Expands EE Financing in China**

The World Bank's China energy efficiency financing program previously focused on large and medium sized industrial enterprises. But no money from this World Bank program is available to foreign firms. The funding is solely for Chinese firms, according to Xiaodong Wang, who is a Senior Energy Specialist at the World Bank.

Recently the World Bank launched new initiatives to promote the use of ESCOS and boost energy efficiency in buildings:

#### **World Bank provides new loan guarantees to ESCOs.**

- A Global Environment Facility grant of \$22 million leveraged \$140 million worth of investments by 42 ESCOs. This helps banks learn more about EE policy and EE lending structures.
- With World Bank support, many ESCOs received bank loans for the first time.

#### **It boosts EE lending in the banking sector.**

- The World Bank is providing a \$400 million credit line to three Chinese banks for EE investment.

#### **Bank's financing leads to carbon cuts.**

- Energy savings of 4.5 Mton of coal equivalent and greenhouse gas emission reductions of 11 Mton in one year. This is equivalent of taking about 2 million cars off the road.

## **Asian Development Bank**

In an innovative program, the Asian Development Bank (ADB) is working with Hebei Province on several energy efficiency projects. Under the terms of the program, Hebei will repay the ADB over 20 years at 2 percent interest. Hebei makes loans for EE projects, charging 5 percent interest to customers and, as an incentive, offers to return 3 percent if the customer meets the energy reduction goal. These terms are sanctioned by ADB, the provincial government, and the Ministry of Finance.<sup>47</sup>

## Success Story: American-Chinese Partnership Helps To Light Up China, Save Energy

### The Backstory

Silver Spring acquired French software control company Street-light Vision in 2014 in part because of its existing partnerships with ESCOs such as DL Rongwen. At that time, DL Rongwen had already deployed 38 large-scale smart lighting projects in 16 cities throughout China, connecting over 250,000 smart LED street lights. Rongwen was hunting for technology to help it transition from basic streetlight control solutions to more advanced smart city networks. So it decided to partner with Silver Spring technology to power its next-generation offerings in China's tantalizingly enormous market. According to DL Rongwen, China has installed over 35 million street lights, but so far only about 1.5 million have been upgraded to LEDs with controls.



**Bright Lights, Big City.** A conventional street light in Beijing. Changing street light technology and software systems can save energy. Photo By Marjorie Sun

### Financing through the EPC Model

The Energy Performance Contracting (EPC) financing model, also known as “Energy Management Contracting”, is critical to help smart city solution providers succeed in China, says Xiaolan Wang, overseas business director for DL Rongwen. She says the EPC model has significant advantages over conventional infrastructure financing in China. Usually when Chinese cities invest in infrastructure projects, they generally award the project to the lowest bidder. The problem is that few firms among the low bidders actually have the best technology for the job.

The EPC model, however, helps to maximize the likelihood that the project uses the best technology to save energy. And it allows for additional revenue streams in the future. Also, the companies participating shoulder the risk and cost rather than burden a utility or a city government.

In this case, DL Rongwen provides services and technology including energy auditing, project design, lighting upgrades to LEDs and management of the street light network for ten years to a city. During the ten-year contract, the city and DL Rongwen share the energy savings. A city would receive a return of 10 to 15 percent and the rest of the savings would go to the ESCO. The percentage of return varies depending on the potential energy savings after a third-party energy audit report. (This is how the EPC model works in the street lighting business in China; it may not apply to other technologies.)

DL Rongwen has financed the projects through different Chinese banks and through its own reserves. Specifically, each EPC project in China stipulates that a company obtains 70 percent of the contract value from a bank, and the remaining 30 percent from its own cash flow. The EPC model requires ESCOs to have a strong cash flow, especially when funding large-scale projects.

The EPC model also works well in China because electricity prices there can be up to three times higher than in the United States.\* Chinese street lights are commonly higher wattage and energy-intensive, so replacing them with LEDs saves electricity and money despite the initial high cost of LEDs. Together, the electricity savings from installing a more modern street lighting system could generate more profit in China than in other leading global markets.

*(Continued on the next page)*

## Success Story

*Continued from previous page*

### Challenges to Consider in China

- Many Chinese companies vie for large energy efficiency projects, so competition is strong.
- Chinese participants prefer local vendors, technologies and products, including data housed in China.
- Lack of proven local technologies creates risk, and limited success stories in smart city technology in the Chinese market make it hard to know what solutions are best.

### Advice from Silver Spring and DL Rongwen

- Find a corporate partner that emphasizes open standards. Doing business in China may depend on including local Chinese companies. Leveraging open standard technologies ensures interoperability. “Standards-based platforms enable the most choices to connect a wide range technologies and products,” said Brandon Davito, Vice President of Smart Cities and Street Lights, Silver Spring Networks.
- If larger firms seek to secure project finance via sources external to China, it’s important that the financial agency has a full understanding of the business culture in China. “China is unique in many aspects, including introducing foreign funds for infrastructure projects,” says Wang. “There is a massive decision-making structure within a Chinese authority for infrastructure projects using foreign funds, involving central, provincial, city, and even district levels, and each level’s opinion should be respected.”

She says even though high level Chinese authorities may approve a project, international financing institutions tend to neglect the importance of communicating with city governments or even district authorities who generally have the ultimate authority to approve street lighting projects.

Wang said, “To be frank, often times, cities don’t want to use foreign funds because international funding agencies play favoritism in bidding requirements that favor companies from the loaner’s country. That shuts out many local Chinese companies who can contribute to the city’s GDP, and also have strong relationship with the city. In the end, what it is going to happen is cities will try to stop these projects because their interest is damaged.”

- It’s important to identify markets with strong potential where both companies can provide proven solutions. In this case, Rongwen had a solid track record of funding street lighting. Silver Spring supplies smart network technology to improve energy savings not only with street lighting, but other smart city applications. The companies are now considering whether to expand their partnership to include traffic monitoring, electric vehicle charging stations, and environmental sensors.

\* Industrial electricity prices in 2015 were higher in China compared to the United States, according to a 2016 report by the consulting firm Biggins, Lacy and Shapiro. See: <http://bit.ly/1Nlt22N>

## HOW CHINA'S URBANIZATION IS DRIVING ENERGY EFFICIENCY SOLUTIONS

The International Energy Agency (IEA) reports that China's urbanization is expected to rise from around 50 percent today to around a whopping 70 percent in 2025.<sup>48</sup> This is making green building and transportation top priorities in China.

According to industry forecasts, China will spend in 2020 alone between \$25 billion to \$30 billion for energy efficiency in buildings.<sup>49</sup> (Estimates for the global market in 2020 for this category—energy efficiency in buildings—range from \$125 billion to \$150 billion.)

The IEA estimates that by 2035 China will be among the top three regions for EE investment in the world. China's projected share is 20 percent; North America, also 20 percent; and the European Union, 27 percent.<sup>50</sup>



### **Migration to Cities to Boost Energy Efficiency**

As more Chinese move to cities, China is expected to spend up to \$30 billion in 2020 alone to boost EE in buildings. Central Beijing in heavy smog, October, 2016. The apartment buildings shrouded in green netting were said to be undergoing energy efficiency upgrades.

Photo by Marjorie Sun

## **FUTURE SOLUTIONS**

Structural constraints on project finance pose significant hurdles for American companies trying to crack China's energy efficiency market. But the following changes in policy or practice could help solve some of these problems.

### **Bundle Projects**

- By and large, Chinese banks consider most energy efficiency projects too small to offer a loan. But if ESCOS were able to bundle small projects, then banks would have a greater incentive to lend. There is insufficient consistency in project definition, so costs and payback cannot be adequately compared. Bundling will help achieve economies of scale and reduce transaction costs.

### **Standardize Projects**

- Establishing a standardized process to evaluate energy efficiency projects would allow banks and other investors, building owners, and energy service companies to deploy innovative financing tools at scale. This would entail training banks, in particular, about energy efficiency technologies and services and educating them on how to assess risks and predict cash flows from EE projects.<sup>51</sup>

### **Introduce Bank Reforms**

- According to Carolyn Szum, Program Manager with the China Group at Lawrence Berkeley National Laboratory, the Chinese banking sector would benefit from increased information about best practices and innovations in financing in the United States and Europe through workshops or examining case studies.<sup>52</sup>
- Szum also suggests that Chinese banks would likely profit from phasing out the shared savings model for lending and adopt a guaranteed savings model instead. That way, an ESCO takes on the technology risk and financiers assumes the credit risk.<sup>53</sup>
- Additionally, Szum says risk-sharing programs could be explored. Large state-owned banks or multilateral lending institutions could guarantee smaller banks making loans for energy efficiency improvements.<sup>54</sup>



## The Investor Confidence Project

By Victor Rojas

EDF Senior Manager, Clean Energy Finance, Investor Confidence Project

The Investor Confidence Project (ICP) is an initiative of the Environmental Defense Fund (EDF), a global non-profit bringing the disciplines of science, economics, law and finance to bear to help address the climate change imperative. ICP was designed to bridge the gap between energy efficiency projects and private capital, addressing a threshold market impediment of performance risk through the standardization of energy efficiency projects and how those projects are conceived, designed, developed, measured and verified and brought to market.

ICP notes that a major impediment within energy efficiency markets is performance risk and the perceived unpredictability of energy savings, undermining the confidence of “investors” – anyone with an interest in the cash flows generated by an energy efficiency project - that projected financial returns will be realized. By addressing threshold market issues of performance risk, the core, long-term objective of ICP is to create a standard class of investable assets designated as Investor Ready Energy Efficiency™ (IREE) projects. This is achieved through standardized toolkit of industry protocols and a credentialing (Project Developer and Quality Assurance Provider) system.

Investor Ready Energy Efficiency™ (IREE) is a certification that creates confidence in projected savings on EE projects at the time of underwriting. The IREE™ projects that flow from this certification results in the creation of a standard class of investable assets into which capital can be deployed at scale. When a project is credentialed it creates confidence in the reliability of projected savings, ultimately boosting the project’s potential to attract private investment. The result is a commercial building sector with lower energy costs and an enhanced sustainability profile. More importantly, the standardization of project development, execution and measurement/verification is an essential predicate for asset class creation, aggregation and securitization.

For more information, please visit: [www.eepformance.org/](http://www.eepformance.org/)

## RESOURCES

### A. INFORMATION SOURCES ON EE FINANCING

Here are some of the key Chinese, U.S. and multilateral organizations involved in energy efficiency financing in China.

- China's Ministry of Finance and the National Development and Reform Commission provide guidelines & measures to evaluate energy savings.
  - <http://bit.ly/1zVHiJc>
- China Banking Regulatory Commission's "Guidance for Green Loans"
  - <http://bit.ly/2e6Oz9R>
  - The Green Financial Bond Directive and the Green Bond-Endorsed Project Catalogue 2015. They spell out the type of projects eligible for green bonds.
  - <http://bit.ly/2eHNEsv>
- Building Efficiency and Green Development Fund. It aims to "provide financing to use new technologies from American companies in China to make building more energy-efficient."<sup>55</sup>
  - <http://bit.ly/2fhpmZU>
- "Guidance for Energy Efficiency Loans." Issued in 2015 by China's National Development and Reform Commission and the China Banking Regulatory Commission.
  - <http://bit.ly/2fhxFVt>
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- ESCO Committee of China Energy Conservation Association (EMCA) China Energy Services Financing and Investment Platform for third-party financing resources
  - <http://bit.ly/1li3iD0>
- China Beijing Environment Exchange & EMCA launches "Chinese Energy Management Contract Investment and Financing Trading Platform"
  - <http://bit.ly/2esZKlc>

- World Bank's China Energy Efficiency Financing Project (CHEEF)
  - <http://bit.ly/2fhsyVm>
- Asian Development Bank's Guarantee Program & China Energy Efficiency Multi-project Financing Program
  - <http://bit.ly/2eZQigg>

## **B. KEY PLAYERS IN ENERGY EFFICIENCY FINANCING IN CHINA**

- [Asian Development Bank](#)
- [Global Buildings Performance Network](#)
- [International Finance Corporation](#)
- [Lawrence Berkeley National Laboratory's China Energy Group](#)
- [Paulson Institute](#)
- [US-China Clean Energy Research Center Building EE Consortium](#)
- [US-China Energy Cooperation Program](#)
- [World Bank](#)

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