

## Application and Mode Establishment of Asset-backed Securitization in Existing Large-scale Public Building Retrofit Financing in China

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**Abstract:** Statistical data for 2005 show that electrical consumption of large-scale public buildings occupying 5 percent of total residential construction area equals 50 percent of the total residential electrical consumption in Beijing. It is necessary to reconstruct existing large-scale public buildings for large-scale public buildings having the characteristics of high-energy consumption and low-energy efficiency. Existing building retrofit is a system engineering involving technology, policy and management. There are fewer large-scale public building retrofit projects and the major funding is from national financial subsidies. There is no expediting financing channel and flexible financing mode. Therefore, this study designs asset-backed securitization (ABS) as the main financing mode according to steady future income of existing large-scale public buildings retrofit. That is, we secure the steady future income of existing large-scale public buildings retrofit, and sell it to special purpose vehicles (SPVs) through a series of asset structure optimizations and reorganizations so as to transfer stagnant assets or unforeseeable future incomes into real cash flow through issuing securities. This liquid cash flow can ensure the funds needed by existing large-scale public buildings retrofit. The ABS financing mode can satisfy the fund requirements of this project and reduce the ratio of liabilities to assets. Because the assets of backed securitization are good assets, it can effectively avoid converse selection risk to ensure economic safety. ABS

also can offer a good financing mode for Energy Management Contract (EMC) and Energy Service Company (Esco) and promote healthy development of an energy-efficient service system.

**Key words:** existing building retrofit, large-scale public building, financing mode, asset-backed securitization, energy efficient service

### 1. INTRODUCTION

In China, large-scale public building refers to such single building, for instance, star hotel, large and middle scale shopping mall, senior office building, cinema, gymnasium, airdrome, station and other buildings offering service to large-scale public building, which construction area exceed 20,000 m<sup>2</sup> and installed central air-conditioning system <sup>[1]</sup>. Many investigating data show that power consumption per m<sup>2</sup> of residential building in Beijing is about from 10 to 20 degree. However, power consumption per m<sup>2</sup> of some large-scale public buildings, for example, office building and hotel, reaches to from 100 to 300 degree. That is, the power consumption of these large-scale public buildings is about 10 to 15 multiple of residential buildings. Therefore, existing large-scale public building has great energy efficient potential ability and it is very necessary to take some energy efficient retrofit measures. The energy efficient retrofit of large-scale public building includes energy auditing, project

retrofit examining and approving, confirming feasible scheme, executing retrofit measures and lastly auditing. If it can reach to 50% energy efficiency rate after retrofit, the incremental cost per m<sup>2</sup> is about 300 to 400 RMB. There are about 0.5 to 0.6 billion m<sup>2</sup> existing large-scale public buildings. According to above proportion, it needs about 150 to 200 billion RMB to finish large-scale public building retrofit. The single building also bears with millions of retrofit expenses. It is significant for large-scale public building owners to seek the rational financing channels and design the feasible financing mode.

Asset-backed securitization (ABS) is one of important finance innovations in international finance field in 20<sup>th</sup> century. It rose up gradually since the middle period of 1980's and rapidly expanded to the world. And ABS is the quickest and most active finance product. Through ABS, the professional bankers invent many complex and innovative finance structures and high efficient carriers to satisfy with changeable demands of different assets, originators and investors. Application with ABS in financing of large-scale public building retrofit project is such financing measure guaranteed by annual steady saving energy expenses, which gets the retrofit capital through issuing middle and long term bonds in capital market after enhancing credit.

This study adopts the canonical research method, introduces the basic principle and operation procedure of ABS, analyzes the feasibility, practical condition and institution restraint conditions of Chinese large-scale public building retrofit project, and finally designs an appropriate financing mode.

## 2. ABS FINANCING MODE

### 2.1 Definition of ABS

Lewis S · Raniner, American investment banker, firstly proposed "ABS" since 1997 and finance innovation becomes popular in finance field. American Securitization Exchange Committee (SEC) defines ABS as such procedures making non-liquid remnant assets or foreseeable future earnings construct and transfer to liquid and salable finance goods<sup>[2]</sup>. During this course, remnant asset is sold to

a Special Purpose Vehicle (SPV) or agency organization and these organizations can get capital through issuing ABS<sup>[3]</sup>. At present, the definition accepted by domestic scholars is that originators (or bargainer) collect the contracted or promising assets, which is absent of current ability but can produce foreseeable cash flow incoming. After capital reorganizations, it can be converted into the salable and current securitization so as to realize raising money.

### 2.2 Principle of ABS

#### 2.2.1 Core principle of ABS

ABS core principle refers to cash analysis principle of securitized assets. ABS is the procedures supported by foreseeable cash flow, which issue securitizations and finance capital. Foreseeable cash flow is the precondition of securitization and it is not important that which asset can produce cash flow. Apparently, securitization is supported by assets. In fact, the foreseeable cash flow is the basis of ABS. That is, securitization of ABS doesn't securitize asset but the cash flow produced by assets<sup>[4]</sup>.

#### 2.2.2 Basic principle of ABS

Three basic principles of ABS are separately capital reorganization principle, risk isolation principle and credit enhancement principle. Three principles are farther analyses to cash flow of basic assets. Capital reorganization principle can realize the capital income re-divide and re-organize through capital recombination. Risk isolation principle can improve capital operation efficiency by dividing the risk of basic assets and other assets. Credit enhancement principle analyzes the cash flow through guaranteeing and improving credit classifying level of total securitization asset using all kinds of credit enhancement methods.

### 2.3 Operation Procedure of ABS

#### 2.3.1 Participants of ABS

ABS is finance engineering and includes the following participants.

(1) Originators: they refer that participants having foreseeable cash flow, namely, original interest entity. Their roles are that confirming and

combining asset, selling securitization or mortgaging ABS.

(2) SPV: they are the carriers of ABS operation. They can not operate other businesses and must be an entity doesn't bankrupt. In common, SPV can realize the bankruptcy risk isolation through establishing new company SPC or trust company SPT.

(3) Rating agencies: they provide rating services for ABS. They mainly evaluate the ABS and risk of ABS. The main rating agencies include Moody, Standard & Poor, Philips and Fisher. Each rating agencies have their own signals and evaluating indexes.

(4) Credit enhancers: they are agencies reducing the total risk and aim at improving the credit rank of ABS and the ability of pricing and issuing so as to reduce issuing cost.

(5) Investors: they are the market bargainer purchasing ABS. they include not only vast organization investors but also many individual investors.

(6) Service agencies: they usually held the post by original interest entities as part-time. They collect the sum from original debtors regularly, and then transfer the cash which is produced through primitive securitization to SPV, and SPV can pay off investors periodically. At the same time, they can get the service fee from SPV periodically.

(7) Commissioned management organization: they are confirmed through SPV. The sum that waiters get from original debtors can be put into the special gathering account of commissioned management organization. Commissioned management organization establishes accumulated capital according to promise and manages this capital, finally hand it in SPV so as to pay off the principal and interest to investors.

### 2.3.2 Flow of ABS

The ABS operation is such financing procedure that multi-agents participates and contacts with each other. The basic operation can be carried out according to following steps. (1) Originators confirm the aim of ABS and establish the asset pools. (2) After SPV is built, originators will sell the asset combination to it. (3) Perfect securitization structure

and evaluate it in interior. (4) Enhancing credit rank. (5) Evaluate the issuing securities, design issuing condition and arrange securities sales. (6) SPV can gain the issuing income and give the purchasing price to originators. (7) ABS will enter into the secondary market. (8) Execute asset management and accumulate cash flow. (9) Pay off the principles and interests and pay money to appointed agencies <sup>[5]</sup>.

## 3. ABS FINANCING MODE ESTABLISHMENT OF CHINA LARGE-SCALE PUBLIC BUILDING RETROFIT

### 3.1 Analysis on Participants of Financing Mode

According to the characteristics of China large-scale public building retrofit project, participants will include the followings.

(1) Original debtors: large-scale public building owners raise money through bank loan or providing money by self.

(2) Originators: large-scale public building owners or financing organization transfers this loan to SPV.

(3) SPV: according to the difference of designed financing channels, it can be established in domestic or overseas.

(4) Rating agencies and credit enhancers: the above-mentioned agencies can be appointed to evaluate credit. It also can realize enhancing credit through bankruptcy isolation, securities classifying and finance assurance.

(5) Service agencies: service agencies of ABS can be appointed to help realize peel off assets and form into asset pools.

(6) Investors: they are the investors of purchasing ABS in security market.

(7) Other agencies: if the abroad mode can be adopted, it is necessary to find overseas special finance organization.

### 3.2 Flow Design of Financing Mode

Large-scale public building owners have the superior property right but the asset liquid ability is not very good. The large-scale public building retrofit

project needs a lot of money. This study designs the financing mode of ABS to solve the capital problem. According to the different object of securitization, this study respectively designs property right securitization, income securitization and abroad securitization.

3.2.1 Property right securitization of large-scale public building retrofit

Design of property right securitization of large-scale public building retrofit can refer to mature housing mortgage loan securitization [6]. For the need capital of large-scale public building retrofit is big, the single project can form into one asset pool. The part property right can be mortgaged through finance organization and get some loan. Then finance organization sells the mortgaged goods to SPV. Issuing ABS can quickly get the need money so as to guarantee the energy efficient retrofit [7]. After the retrofit is over, saving energy expense in every month can be used to pay off the loan. The flow of property right securitization of large-scale public building retrofit can be described in Fig.1.

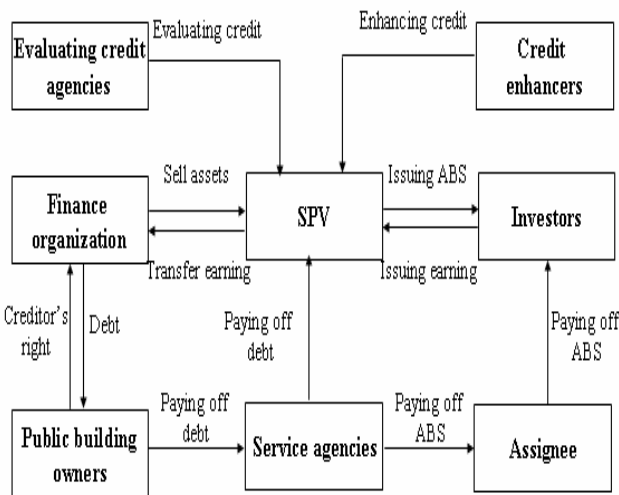


Fig.1 Flow chart of financing mode of property right securitization of large-scale public building retrofit

3.2.2 Income securitization of large-scale public building retrofit

Income securitization of large-scale public building retrofit refers to such financing mode that issue ABS according to the saving energy income flow after retrofit. Large-scale public building owners

are originators and saving energy expenses after retrofit can be formed into asset pool. That is, this part income can be sold to SPV so as to realize issuing ABS and raising money. And this commitment has the future characteristics. It is very important to get national support so as to realize credit enhancement during the course of issuing ABS. The concrete flow can be shown in Fig.2.

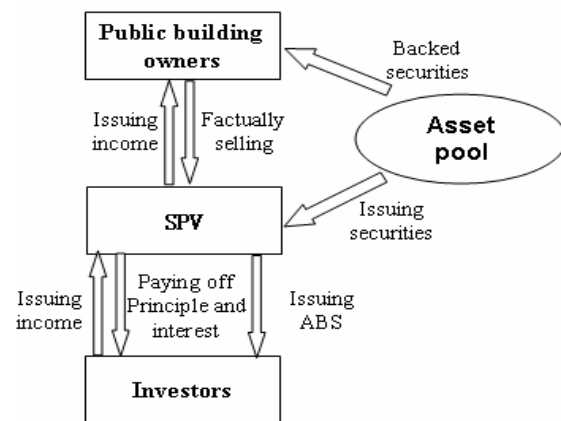


Fig.2 Flow chart of financing mode of income securitization of large-scale public building retrofit

3.2.3 Abroad securitization of large-scale public building retrofit

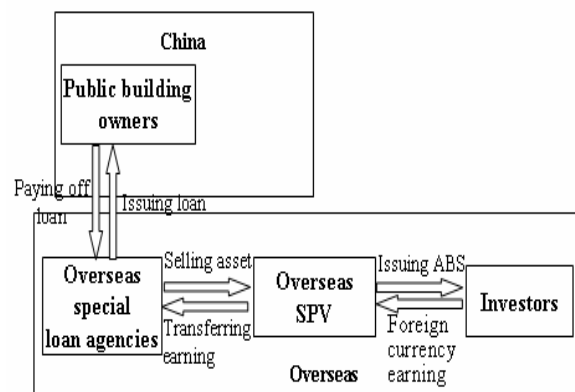


Fig.3 Flow chart of financing mode of abroad securitization of large-scale public building retrofit

This mode is the special mode of ABS. That means issuing ABS through abroad SPV in international capital market. Namely, large-scale public building owner pays off a broad loan organization by means of paying off loans using saving energy expenses after retrofit. And the loan

principle and interest are factually sold to SPV. And SPV disburses the issuing earnings to special loan organization. And on the instant, this capital is offered to the large-scale public building owner in China by means of loan. The flow can be seen in Fig.3.

Abroad securitization can raise money in international capital market. Therefore, it is a new mode attracting overseas capital. However, it is easy to affect by international financial polices.

### 3.3 Cost and Benefit Analysis of Financing Mode

#### 3.3.1 Reducing agent cost

During the course of ABS of large-scale public building retrofit project, issuing ABS technique becomes more professional for different finance organizations having the different task and working in specialized fields and operations. Therefore, it can realize scale economy and quickly absorb unused capital through enhancing credit in order to provide the capital support of all kinds of technique retrofit and reduce agent cost.

#### 3.3.2 Reducing bankruptcy cost

ABS can realize bankruptcy isolation through selling part assets. It can be expressed to lose the ownership of some assets in law and move one asset from asset-liability balance in accounting. And the proportion between the liquid ability and risk of finance asset is inverse rate. Because securitization assets are the fixed assets having poor liquid ability, large-scale public building owners can transfer these part assets to SPV through “factually sell” so as to change the asset structure, reduce the proportion of poor liquid assets, improve the proportion of good liquid assets and alleviate the threat of asset quality declining.

#### 3.3.3 Reducing exchange cost

ABS can construct the combination investment satisfying investor’s expectation, which makes investors spend smaller exchange cost than other securities purchasers through bankruptcy isolation, enhancing credit and other techniques. It can guarantee that investor’s risk is smallest and reduction of exchange cost of combination investment is lowest in the precondition of satisfying

the relatively higher income of investors.

On the basis of analyses, application ABS in large-scale public building energy efficient retrofit can solve the problem of difficult in raising money through skillfully design finance tools.

## 4. CONCLUSIONS

### 4.1 Feasibility Analysis on ABS Financing Mode in Large-scale Public Building Retrofit Project

ABS can fully develop only in appropriate economic conditions. This study analyzes the interior and exterior conditions of applying ABS in large-scale public building retrofit project.

#### 4.1.1 Have some successful cases of implementing ABS

The earliest successful case is Sanya real estate investment securities of Hainan in 1992. Then Zhuhai highway fee realizes securitization in 1996. Zhongyuan completed accounts receivables securitization in 1997 and China International Marine Containers Group also realize accounts receivables securitization in 2000. Chinese government starts to propel the development of ABS and China Banking Regulatory Commission promulgates many regulations and rules to standardize ABS. In 2005, China Development Bank issued ABS in public, Construction Bank issued individual housing mortgage loan securitization goods; China International Capital Corporation issued CDMA network lease expense plan of China Unicom; and Guangfa Securities Corporation issued special plan of income right of Guanshen highway<sup>[8]</sup>.

#### 4.1.2 Support from nation to large-scale public building retrofit can guarantee asset credit enhancement

Large-scale public building is a big energy consumption entity. During the course of China propelling building energy efficiency, nation takes the compelling retrofit measures to large-scale public building retrofit. Therefore, nation will offer the corresponding policy support in successfully raising money so as to realize credit enhancement and easily finish ABS.

#### 4.1.3 ABS is a lower cost financing mode

Although ABS cannot avoid to paying for many expenses as a financing mode, for example, mandatory expense, service expense, marketing expense, lawyer expense and others, the total financing cost is lower than other traditional financing mode. ABS improves the issuing securities condition through using mature exchange structure and credit enhancement measures. Because ABS has higher credit rank, it doesn't need use discount sales or improving interest and other measures to absorb investors. In general, ABS can be issued as the price of higher or equal to book value<sup>[9]</sup>. And the payment interest is more than comparable securities of original interest entity. Thereby, it can reduce the financing cost of original interest entity in some extent.

#### 4.1.4 ABS has wider applicability

Company reaching the certain profit level is the precondition of it issuing stock. And the total income should be shared with investors. Company raising money through bonds base on total credit and satisfy higher issuing conditions. However, raising money through ABS can be realized after some treatment only if company has the steady future cash flow.

#### 4.2 Risk Analysis

There aren't corresponding cases of ABS applying in large-scale public building retrofit project in China. Therefore, it is necessary to design in detail during the course of execution and do well in asset isolation. And laws and regulations on ABS are not wholesome and these will affect naturally propelling ABS. The above-mentioned policy risks should be rationally estimated.

If large-scale public building owners have many kinds of financing channels, the advantage of executing ABS is not very big. Because financing channels are more, the information got by owners is more. At this time owners usually don't want to issue ABS but prefer to take arbitrage activity until the issuing ABS cost tends to other financing modes. To the owners having smaller channels, the effectiveness of ABS will be obvious. And this financing mode is worth with considering and executing.

Avoiding risk measures can adopt combination

with insurance system of housing quality assurance. Through rationally estimating potential bug risk improve the credit rank of ABS.

At present, many overseas large-scale public building retrofit projects introduce Energy Management Contract (EMC) mode or Energy Service Company (Esco) into raising money and taking energy efficient measures<sup>[10]</sup>. It is much simpler and can avoid owners selecting different financing modes. However, the development of Esco is not very mature in China, and it also faced with the difficult problem of raising money and credit assurance. Therefore, it is necessary to apply ABS in large-scale public building retrofit financing at the beginning of retrofit so as to solve the problem of absent of money.

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