



Energy Efficiency Resource Acquisition Programs

A market-based approach for effectively
using public funds for energy efficiency

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About this report

This document is a summary of the report *Energy Efficiency Resource Acquisition Program Models in North America* (2012), which was written by Robert P. Taylor, Energy Pathways LLC; Dan Trombley, American Council for an Energy-Efficient Economy; and Julia Reinaud, Institute for Industrial Productivity.¹

This summary was produced primarily for a Chinese audience to demonstrate the effectiveness of resource acquisition models in the US and show how they can be adapted for use in China.

It provides a simple overview; please see the full report for more detailed information, including eight case study programs, and an in-depth comparison of different models. Short factsheets describing each case study also are available on IIP's website.²

This summary is also available in Chinese.³

¹ www.iipnetwork.org/IIP_ResourceAcquisition

² See: www.iipnetwork.org/databases/programs

³ www.iipnetwork.org/cn/How-to-promote-energy-efficiency-resource-acquisition-to-apply-in-China



Introduction

North American states and provinces have developed many different types of institutional delivery models to acquire energy efficiency as a predictable and reliable resource for meeting existing and future energy demands. The models – known as energy efficiency resource acquisition programs – have become a fixture of North American electricity and natural gas markets as they help postpone or eliminate the need for many expensive investments in new generation and transmission systems, and they provide major environmental benefits.

Up to 30 US states and Canadian provinces now operate some type of energy efficiency resource acquisition program. Expenditures on these programs reached at least US\$7 billion by 2011, and many state and provincial governments have been very satisfied with the energy savings results obtained. The programs have grown especially fast during the last five years, and strong growth continues.

Many of the principles and elements of North American energy efficiency resource acquisition programs may be useful in China's ongoing aggressive efforts to promote energy efficiency. Design concepts and implementation experiences are relevant to China's Top 10,000 Enterprise Program, energy-saving investment award system, demand-side management (DSM) pilot city efforts, and possible development of a carbon cap-and-trade system.

About energy efficiency resource acquisition programs

Energy efficiency resource acquisition programs work by buying energy savings ("energy efficiency resources") in the public interest and using public funds, usually collected from energy users. Government entities decide how much energy savings to buy, what funds to use, and the maximum costs per unit of energy savings. They usually contract a third party to deliver the energy savings. The third party provides financial incentives and technical assistance – using the public funds provided – to buy energy savings from industrial, commercial and residential energy users. The actual energy savings achieved using public funds are rigorously monitored and verified, as stipulated in the contracts with third party delivery entities.

For many people, thinking about energy efficiency as a resource that can be purchased is a novel concept. It is true that energy savings resulting from more efficient use of energy is not something that can be seen – as it is energy that is *not* being consumed. However, energy savings can be measured reasonably accurately by comparing the energy used before and after an energy efficiency measure is undertaken. There is a wealth of knowledge available as a result of thirty years of implementation – including on how to define and calculate energy savings from a wide range of energy efficiency projects and measures.

Energy savings resulting from projects can be defined and analyzed in terms of the total that can be relied on per year; the lifespan (number of years) of reliable energy savings delivery; and the investment and levelized average costs per kilowatt (kW), kilowatt-hour (kWh), ton of coal equivalent (tce), or tce per year. Energy efficiency resources can therefore be fairly easily compared with energy supply resources, such as energy from power plants or coal mines. For example, building on the concept of energy efficiency as a resource, it is now popular in some parts of China to focus on the development of "energy efficiency power plants." These are bundles of energy savings projects packaged together to be conveniently compared to electric power plants in terms of their capacity, energy service delivery, and cost.

The attractiveness of energy efficiency as a resource is that unit costs are almost always far less expensive than the cost of new energy supply, and it is environmentally benign. Average levelized costs for acquiring electricity efficiency resources generally range from 2 to 4 US cents/kWh saved (RMB 12-25 fen/kWh).



History and development framework in North America

Although environmental and energy security concerns are also important, the primary driver behind the development of energy efficiency resource acquisition programs in North America has been cost savings for the public as a whole. If energy efficiency resources are less expensive than energy supply, shouldn't they be developed as a matter of priority? Interest in developing less expensive energy efficiency resources underpinned the orders of government regulators for utilities to develop demand-side management programs, beginning decades ago. Many regions began to develop "integrated resource plans", comparing energy efficiency and energy supply resources and planning for the best combinations. Energy efficiency resource acquisition is an outcome of these efforts.

What is new about the best energy efficiency resource acquisition programs is their rigorous insistence on obtaining verified and reliable energy savings results, and their business-like approach for delivering energy savings ordered by government supervisors as efficiently as possible, obtaining maximum value in the use of public funds. It remains common for government entities to task energy supply utilities to implement energy efficiency resource acquisition programs. However, some US states have assigned third-party entities to implement such programs. These may be new "energy efficiency utilities" or other organizations created specifically for the purpose of developing and implementing energy efficiency resource acquisition. Or, they may be other third parties already implementing other government energy programs.

The experience of states in the Pacific Northwest of the US⁴ provides one good example of long-term development of energy efficiency resource acquisition. This region had long enjoyed inexpensive hydropower; however, by the mid-1970s, opportunities for further development of hydropower were becoming exhausted. After some painfully expensive attempts to develop nuclear and other alternative sources of supply, the region decided to focus on obtaining energy efficiency resources to meet new electricity demand, with encouragement from the US federal government. The new program proved very successful – energy efficiency resources were acquired to meet 48 percent of the increase in electricity demand during 1981-2008. Average levelized costs were just over 2 US cents (RMB 13 fen) per kWh. Now the region is planning to use energy efficiency resources to meet 85 percent of new electricity demands from 2009-2030. The region operates its programs within the framework of a unified plan, with implementation being undertaken through a variety of arrangements, including implementation by energy utilities, or, in the state of Oregon, by a specialized third-party "Energy Trust". Programs are now also being implemented to acquire natural gas efficiency resources.

Current status

Energy efficiency resource acquisition programs have grown sharply in recent years. In the US, state expenditures on energy efficiency programs have grown from less than \$2 billion in 2006 to about \$7 billion in 2011, with energy efficiency resource acquisitions accounting for by far the largest share of this figure. Expenditure in Canadian provinces has grown fast too, reaching about \$1 billion in 2011. Programs include efforts to purchase both electricity and natural gas savings.

In both countries, all programs are operated at sub-national levels – there are no national-level energy efficiency resource acquisition programs. This is largely due to the historic relationships between federal and state/provincial governments in both countries, and how government energy industry regulation is managed.

There is great variation in the programs operated in different states and provinces. Institutional

⁴ Washington, Oregon, Idaho and Montana. The Canadian province of British Columbia, immediately to the north, has also faced similar electric power development issues, also resulting in long experience in developing energy efficiency resources.



arrangements and the methods for targeting, financing, program design and operation, and savings verification all vary. Cost and savings accounting methods and even the names used for basic concepts vary, causing considerable confusion to outsiders. However, the variation also provides very rich experience in different ways to design and operate such programs.

The operation of energy efficiency resource acquisition programs by non-utility, “third party” entities began at the turn of the century. The sophisticated third-party programs of the Energy Trust of Oregon, Efficiency Vermont, Wisconsin’s Focus on Energy and the New York State Energy Research and Development Agency (NYSERDA) are all included as case studies in the IIP/ACEEE report. The states of Maine and Delaware, the District of Columbia, and the province of New Brunswick are also operating specialized “energy efficiency utilities”.

Overview of a typical program

Figure 1: Operation of a typical energy efficiency resource acquisition program (with third-party delivery)

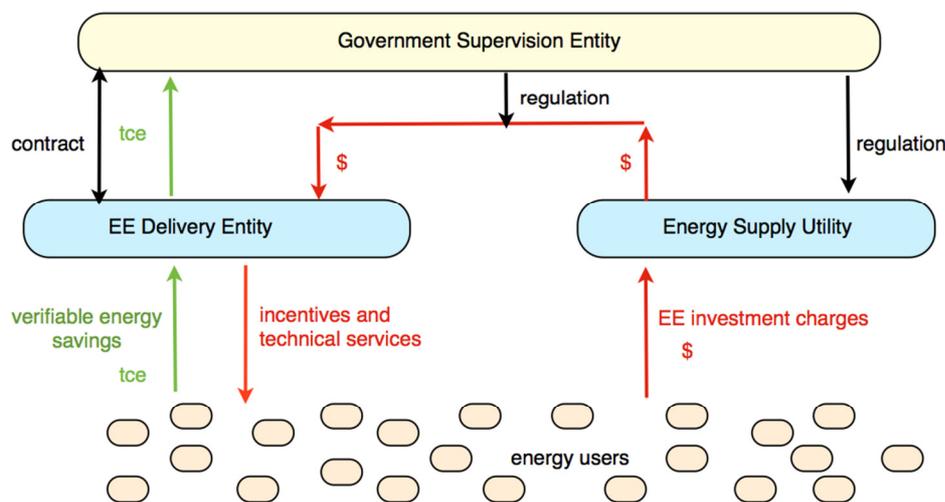


Figure 1 above shows how a typical third-party energy efficiency resource acquisition program works. Financing is provided as part of the energy costs paid by energy users on their bills. These investment funds are collected by the energy distribution utilities and provided to the separate energy efficiency delivery entity according to government regulations.

Step 1. The government supervising entity completes a contractual arrangement with the energy efficiency delivery entity. The contract specifies how much energy savings the delivery entity must deliver over a certain timeframe, using the funds provided. The contract specifies the method and levels of compensation the delivery entity is allowed (possibly also including performance incentives). It may also cover a variety of operating parameters, such as maximum costs per unit of energy savings delivered, energy savings accounting procedures, etc.

Step 2. The delivery entity then proceeds to acquire the energy savings ordered by the supervising entity from industrial, commercial and/or residential energy users. The delivery entity uses whatever mix of project financial incentives and technical support it decides are most efficient for purchasing as much energy savings as it can within the funding envelope and operating framework provided.

Step 3. The delivery entity reports all details of its energy efficiency acquisitions to the supervising entity, with energy savings verified according to the procedures defined in the contract.



If an energy supply utility is used as the energy efficiency delivery entity, the two separate functions shown in the figure above are merged into one.

Energy efficiency delivery entities acquire energy savings from energy users through a number of specific “program offerings”. Typically 2-5 program offerings will be offered to users in different key sectors, such as the industry, large building and residential sectors. Information on program offerings is given to energy users on the delivery entity’s website and through other media. Information will include the specific financial incentives and free or low-cost technical assistance that are being offered, eligibility requirements, procedures and contact details. The details of program offerings will be adjusted by the delivery entity over time as it continually assesses results. Design, implementation and adjustment of program offerings is an innovative and dynamic business as delivery entities continue their search for means to obtain the maximum amounts of verifiable energy savings from energy users within the allocated budget.

Program offerings for industry usually are classified into two categories: “prescriptive” and “customized” programs.

- **Prescriptive programs** support the user implementation of relatively common and simple measures, such as the installation of variable speed motor drives, simple boiler upgrades, or the implementation of operational tune-up programs. The delivery entity provides a fixed financial incentive, payable upon delivery of verifiable evidence of the project’s completion according to required criteria. Energy savings are usually stipulated based on the averages from the implementation of a large number of similar projects.
- In **customized programs**, users work with the delivery entity staff to develop more customized energy efficiency projects, which are usually larger. The delivery entity will provide technical support and a package of financial incentive assistance will be agreed before project implementation, following established guidelines. Project and location specific energy savings monitoring and verification are required.

Some entities purchasing energy efficiency resources from industry are now integrating program offerings that support the implementation of enterprise energy management systems (EnMS). Typically, an assigned staff member oversees a hands-on technical assistance program and may also provide some financial aid. Energy savings acquired from such investments include both cross-cutting operational energy efficiency gains from the application of a holistic EnMS approach and energy savings from a stream of future prescriptive and/or customized projects identified through EnMS implementation. The Bonneville Power Administration (BPA) in the Pacific Northwest of the US offers such assistance as part of a program which includes implementation of EnMS, financial and technical support for an energy manager who covers one or more industrial facilities, and implementation of “Track and Tune” operational improvement measures. The cost of delivered energy savings are attractively low and opportunities for further business are identified.

Key choices in program design

North American states and provinces have many key choices to make in setting up their energy efficiency resource acquisition programs. These are discussed below.

1. What energy efficiency delivery entity should be used?

In principle, there are three basic options for institutions to deliver the energy savings that the government wishes to acquire: government entities, energy supply utilities and third-party entities. In North America, no states or provinces select government departments to directly operate energy



efficiency resource acquisition programs. The business of running such programs is not considered a good function for government. However, in a few cases, including in New York State and New Brunswick Province, public benefit corporations are used to implement programs. These are separate legal entities.

There is much discussion in North America on the advantages and disadvantages of using utilities or using separate third parties to implement energy efficiency resource acquisition programs. To use energy supply utilities, there are incentive problems that must be overcome. Under traditional utility government regulation models (as used in China), utilities generally increase profits along with sales revenue. It is not in their financial interest to reduce their energy sales, as energy sales is how they make money.

Government regulation systems usually must be reformed in order to create lasting incentives for energy utilities to enthusiastically promote measures that cut their energy sales. Many North American localities have successfully undertaken such reforms. Some experts also point to problems of single-fuel programs (involving only electricity or natural gas savings), where utilities supply only one type of energy.

Sometimes energy users need solutions that involve more than one fuel. Nevertheless, there is a long history of using energy utilities to promote energy conservation in both the US and Canada, and many states and provinces choose to continue, given the relationships, experience and consumer familiarity already in place.

Use of third party entities

Third parties can be a good choice to operate energy efficiency resource acquisition programs. However this option requires steady and long-term government commitment. Experience has shown that programs operated by new (or expanded) third party entities can bring sharp and determined focus on the efficient delivery of energy savings, yielding remarkable success. But it takes time to develop effective programs and roll them out. Strong working relationships with project developers, technology providers and especially energy users are essential, and require much time and effort to build. Governments must provide both long-term vision and steady support, as instability in guidance and support can greatly undermine effectiveness. Use of third parties to acquire energy efficiency resources is not a short-term proposition.

Some key considerations for setting up a program with a third party include:

- *Sufficient business scale for specialization and investment in service.* Oregon's successful Energy Trust operation includes 80-85 full-time specialized staff with energy efficiency acquisition expenditures of \$100 million in 2010 in a state of 3.9 million people. Efficiency Vermont budgeted \$33 million for energy efficiency acquisition in 2012 in a state of 626,000 people, and had a large team of specialized staff.
- *Strong customer relations.* The entity must establish strong and effective networks of communications directly with energy users, and become a trusted partner in developing projects.
- *Program and project operational skill.* Staff that are capable in the technical and operational aspects of program and projects are needed. Outsourced experts also can be used, but not exclusively.
- *Incentives for performance.* Contracts need to be carefully constructed to provide incentives for efficient delivery on government targets.

2. What funds should be used?

Many different types of funding sources are possible in principle. However, funding must be sustainable over the medium to long term, and fund-flow needs to be secure and predictable. Stops and starts in funding support make energy efficiency resource acquisition programs inefficient and almost unworkable,



as these programs require a multi-year focus.

North American programs rely mainly on funds collected as part of the energy prices that energy users pay on their energy bills. Just as consumers have always paid the costs of investment in energy supply resources, they are asked to pay the costs of investment in energy efficiency resources. In the long-run, the costs that consumers pay for total investments in their energy bills will be reduced as a result, as the investment costs of energy efficiency are almost always lower than costs of new supply.

Charges for energy efficiency resource acquisition may be imbedded into energy prices, or they may be listed separately on consumer electricity and/or natural gas bills as “energy conservation fees”. These funds are specially earmarked for use in energy efficiency resource acquisition (and also, in some cases, other programs provided by law). In some northeastern US states, funds obtained from the sale of emission allowances under the region’s electric power generation carbon cap-and-trade scheme are also used.

A covenant with energy users

When legislatures approve laws to allow energy conservation investment funds to be collected from energy users, there is an understanding that these funds will be returned to the same energy users in the form of financial and technical assistance for energy conservation projects. For example, over 90 percent of the funds collected from energy users and spent by the energy efficiency utility Efficiency Vermont are given back to energy users in direct energy conservation project support. Financial incentives given to energy users may sometimes appear overly generous, amounting to 50 percent or more of costs. But these incentives are not gifts. Energy users have already paid for them in their energy bills – their money is just being returned in the form of energy efficiency incentives and services. When energy conservation fees are listed specifically on energy bills, energy users may be especially mindful of whether or not they have received benefits that they correctly feel are due to them.

Of course, good energy conservation projects are profitable for energy users over the medium and long term. Energy users also obtain substantial net financial benefits from the energy cost savings achieved from the projects. However, as all energy conservation project developers are aware, payment of high upfront costs for projects is often a problem, even if investments pay off handsomely over the medium term. Lack of information and technical support, or inefficiencies from isolated development of small projects and other barriers, also hamper energy conservation investment. The system of collecting monthly funds on energy bills (or from sale of carbon emission allowances) and then using these funds to provide technical support and help bring down the costs of energy conservation projects contributes towards solving these problems, for big and small energy users alike. In the end, energy users save a substantial amount of money, well above what they pay in fees.

How should acquisition targets be set?

Government supervising entities – usually public utility commissions in North America – typically set both long-term goals and medium-term operating targets for energy efficiency resource acquisition. Plans spanning 15-25 years include assessments of the energy efficiency resource potential and its costs compared to energy supply resources, often using integrated resource planning concepts. Some states and provinces aim to acquire all energy efficiency resources assessed as cost effective in long-term plans.⁵ These broad goals are then broken down into specific operational programs for the immediate future – usually spanning three years. The operational programs include minimum annual energy efficiency acquisition targets, usually further broken down into specific types of programs, as well as unit cost parameters and annual budgets. Draft operational programs are typically proposed to government

⁵ However, because new technologies and approaches continually uncover new cost-effective energy efficiency measures, acquiring all cost-effective energy efficiency is a continually-moving target.



supervisors by delivery entities, and then approved with revisions following considerable discussion. In both the US and Canada, these discussions are normally open to the public, and various outside comments and opinions are registered and taken into account.

Establishing clear definitions and accounting methods for energy savings is needed as part of the targeting process. Some programs require reporting of “net” energy savings, for which there must be some evidence that energy users would not have implemented the reported projects if specific support had not been provided. It is argued that only then can the true value of the energy efficiency resource acquisition programs be assessed. Another issue that needs to be considered is how to account for differences in the lifetime of different energy savings measures. Obviously, a project that yields savings for 10 years is preferable to a project costing the same amount and yielding the same annual savings, but for only five years.

What type of contract should be used?

If energy supply utilities are used as energy efficiency delivery entities, contractual arrangements with government supervisors are imbedded in broader regulatory proceedings. If third parties are used as energy efficiency delivery entities, formal contracts are common. As shown in figure 1, the government is the “buyer” of energy efficiency resources, and the delivery entity is the “seller”.

Contracts include carefully defined energy savings targets, cost-effectiveness requirements and operational details concerning use of funds, reporting, savings, verification, etc. Sometimes additional targets relating to service for low-income households, geographic focus or sector focus are included. Performance incentives can be included to reward over-achievement and/or cause financial consequences for under-performance.

Competitive bidding may be used effectively to select delivery entities at the initial program launch. Experience in several states suggests, however, that stability in delivery entity arrangements is important after programs have been established, as long as performance has been satisfactory. This allows planning, program design and roll-out, and staffing to develop steadily to meet multi-year needs. Frequent change is disruptive to results.

Government supervising entities needs suitable staff and expert assistance to properly guide the energy efficiency resource acquisition business. These entities, and their consultants, need to review plans, reported savings, costs and budgets to ensure that the public interest is being properly met. These supervision requirements, and their costs, should not be underestimated.

How should energy savings results be verified?

Government supervising entities need to be sure that what was paid for was actually delivered, just as in any business transaction. For energy savings, this involves comparing actual or estimated energy use both before and after an energy efficiency measure is adopted. Methodologies to verify savings must be robust and flexible enough to cover a wide variety of energy efficiency measures, facility types and load profiles. At the same time, they must also balance the need for reasonable accuracy with the need to be practical and keep costs within bounds.

Because of the increasingly large financial consequences involved, energy savings measurement and verification has become a major, sophisticated industry in North America. In general, agreed energy savings calculation methodologies fall into two categories: stipulated and site-measured savings.

- **Stipulated savings** involves use of average savings coefficients for fairly simple and common energy efficiency measures, obtained from the experience of many projects.



- **Site-measured savings** involves measuring and assessing energy use on site before and after an energy conservation project, often based on a monitoring and measurement plan agreed prior to project commissioning.

Some well-established state or provincial programs have developed specific monitoring and verification manuals that are agreed between government supervisors and delivery entities. The manuals include all needed methodologies, criteria for their application, indices for stipulation, etc. and are updated every six months or so based on evolving experience.

Possible applications to explore in China

Energy efficiency resource acquisition may have a useful role in China's future as new type of energy efficiency project promotion and support model. However, the North American concepts and practices would require major adjustments to blend effectively into the prevailing energy efficiency promotion and delivery systems in China. In particular, the delivery system would need to work attractively in conjunction with China's system of government-enterprise energy conservation agreements of the Top 10,000 Enterprise Program. Exploratory thoughts on this are provided below.

Even if the full model of energy efficiency resource acquisition proves too difficult to attractively adopt into the Chinese context, many specific aspects of the North American experience are still very relevant for China, providing ideas, methodologies and lessons that should be considered in Chinese programs. A provisional list of specific areas for fruitful exchange of specialized experience is also provided below.

Thoughts on program model adjustment and application in China

The author's tentative thoughts are outlined below. These need to be refined and adjusted through further discussion and analysis.

Advantages of energy efficiency resource acquisitions for China

Several particular advantages that these types of programs can offer in China at this time include:

1. *Use of a specialized non-government entity to deliver energy savings ordered by the government.* Provincial (or other) governments could set targets for the savings they require and a separate entity could be contracted to deliver on that, with full payment contingent upon satisfactory delivery. This eases the government's direct burden but ensures results. The delivery entity can focus on whatever markets the government desires. The entity supports the necessary energy conservation investments using the most efficient mix of financial incentives and technical assistance it can develop.
2. *Reliance on a business culture that focuses on achieving maximum verifiable results at minimum public cost.* If proper performance incentives are included in the contract between the government and the delivery entity, the delivery entity will then seek the most verifiable energy savings it can at the lowest possible cost to the public. North American entities have become highly skilled at this specialized business.
3. *Focus on long-term, continuous results.* Although targets and operational programs are usually set for three-year time allotments, energy efficiency resource acquisition programs aim for long-term continuous results. Programs typically expand and grow as relationships with end-users blossom and delivery entities become more and more adept.



Considerations for application in China

Some provisional thoughts on application in China include the following:

1. *Organization and scope.* Entities with specialized energy efficiency knowledge and programming and project development expertise are required to efficiently acquire energy efficiency resources from end-users. In principle, electric power distribution companies in China could be obligated to pursue such programs and they could engage specialized entities for delivery. In the current Chinese context, however, it may be best for government departments to directly engage third party entities without going through energy distribution companies. This could also offer the advantage of including savings of all types of energy, and not just electricity and/or gas. Provincial and possibly prefecture government levels would offer the most appropriate scale. Government departments could select a trusted third party entity (for-profit or not-for-profit), and assist it to develop appropriate capacity. The government can target whatever markets it wants. Just a few well-defined markets could be targeted for the acquisition of energy efficiency resources in the beginning (for example, urban water and/or heating companies, residential customers, or public buildings such as hospitals or schools). Alternatively, broad market penetration could be targeted.
2. *Sources of financing.* Many financing sources are possible in principle. For initial piloting, use of government budget funds, from energy conservation special funds or pilot DSM city development, for example, may be a way to start. Over the longer term, however, it is best to develop core funding independent from the annual government budgeting process. Options for securing funding through the energy price collection system may include (1) setting aside a portion of the future development investment funds already collected through electricity prices, (2) using a portion of existing and/or future resource or coal surcharge revenues, or (3) specific new surcharges. Another option for the future that deserves special attention is the possibility for using allowance sale revenue from a future carbon cap-and-trade system. Well-designed carbon cap-and-trade systems should eventually generate revenue from the sale of allowances for emissions or incremental emissions. Where these revenues are “recycled” for energy efficiency resource acquisition, there is the attraction of “returning funds” to those who pay for the allowances in the form of project concessional financing and support services. This may make the entire cap-and-trade system more palatable to energy users. In addition, research has shown that the additional carbon emissions reduction benefits of effectively “recycling” allowance funds through support for energy efficiency programs can greatly exceed the benefits from a cap-and-trade system alone.⁶
3. *Coordination with the government-enterprise energy efficiency agreement system.* Taking a medium-term view, a provincial-based energy efficiency resource acquisition program could work wonderfully in support of existing government-key enterprise energy efficiency agreements or similar agreements in the 13th Five-Year Plan and beyond. An energy efficiency resource acquisition program could be an especially efficient means to help enterprises identify and implement energy efficiency measures. For example, in North America, support for enterprise development of energy management systems (EnMS) has become a productive mechanism used by some delivery entities to acquire savings from the industrial sector. This could be even more attractively developed for key enterprises in China. However, provinces would need to develop a road map for possible future use of an energy efficiency resource acquisition program in coordination with other current service activities. What specific aspects of support work would the program assume for which types of consumers? How might the service work for other entities

⁶ See the Chinese and English language website of the Regulatory Assistance Project (RAP) at www.raponline.org



– such as energy conservation supervision troops or energy conservation technical centers – be fine-tuned or used in the program to make the best overall, complementary system? Alternatively, at least at the start, a provincial or municipal energy efficiency resource acquisition program could focus on markets not covered by government-enterprise agreements. Local governments are often looking for mechanisms to ensure energy efficiency delivery from the non-covered markets, and energy efficiency resource acquisition programs could be developed as such a mechanism.

4. *Interplay with China's energy efficiency investment award system.* China's government currently provides grant financial awards for the completion of certain qualifying energy efficiency investments, using annually appropriated state budget funds. The current system is different from energy efficiency resource acquisition programs. It is implemented by the government rather than a third-party delivery entity. It is based on the application of uniform financing amounts per unit saved rather than a dynamic, changing mix of financial incentives and no-cost technical assistance designed to achieve the greatest verifiable energy savings with the least amount of money. Modification of China's well-established system would be quite difficult, especially over the short term. However, there may be scope to explore ways to use energy efficiency resource acquisition concepts to further improve the energy savings results achieved with public funds by experimenting with pilots. Alternatively, it is also possible to implement pilot energy efficiency resource acquisition programs for the types of projects that are not covered under the current investment award system.

Development of pilot projects

Perhaps the best step towards the application of energy efficiency resource acquisition program concepts in China would be to launch several provincial and/or municipal pilots during 2013-2015. This would allow experimentation in adapting to China's situation and gaining practical experience.

Pilot energy efficiency resource acquisition programs could be constructed for any cases where the local government aims to develop packages of energy efficiency projects using some measure of government financial support. The primary focus of the pilots should be placed on the development of a specialized and capable third-party delivery entity, and the contractual arrangement between the entity and the government. The goal would be the demonstration of the efficient delivery of verified energy savings by the third-part delivery entity, providing maximum verified savings per unit of government expenditure. If the mechanism proves successful and highly cost-effective, steps towards further scaling up would include efforts to secure sustainable sources of funding. Some possible areas that could be considered for pilots include the delivery of:

- electricity load reduction and savings projects under pilot DSM city programs
- energy savings among small and medium enterprises not covered under Top 10,000 Program-type agreements
- electricity savings from municipal water utilities
- electricity savings from program packages developed for residential electricity consumers
- energy savings from public buildings (government offices, schools, hospitals, etc.).

Additional specific North American experience to consider

Aside from experience in full program design and implementation, the North American energy efficiency resource acquisition experience also offers a wealth of insights and lessons about energy conservation that would be useful in China.



Three examples include:

1. *Planning exploitation of low-cost energy efficiency resources as part of long-term electric power planning.* Many years of experience across different electric power systems have yielded much practical skill among government regulators, utilities and consultants in how to assess, model, cost, plan and schedule investment in energy efficiency resource development, enabling these resources to be readily compared with supply resources. Just one of the many good examples is the planning work by the Northwest Power and Conservation Council (NWPCC), which has over 30 years of experience. Application of some of the methodologies developed for a regional power system in China could provide much insight as to just how cost-effective energy efficiency resources could be developed to meet electric loads at least as reliably as new supply resources, and how much money this would save consumers and the country at large.
2. *Focusing on cost effectiveness in energy conservation targeting and program planning.* North American energy efficiency resource acquisition planning is often founded on an assessment of achievable long-term cost-effective energy efficiency potential. Shorter term operational programs focus very intently on which markets and programs can deliver least-cost results. Chinese practitioners could learn much from the business process and methods used by various experienced delivery entities – for assessing specific markets for the lowest cost yet most verifiable energy efficiency opportunities, and for designing operational programs to capture them.
3. *Measurement and verification of energy savings.* In the main North American programs, energy savings only count as “delivered” if they are verified using agreed methodologies. Accordingly, there is a wealth of experience in developing verification methods that are both reasonably reliable and practical. The system of preparing, reaching agreement, and periodically revising monitoring and verification manuals used in some programs – such as those of the Bonneville Power Administration, the New York State Energy Research and Development Authority or Efficiency Vermont – is worth further exploration by Chinese practitioners.