

Two Paths to Transforming Markets through Public Sector Energy Efficiency: Bottom Up vs. Top Down

*Laura Van Wie McGrory, Philip Coleman, David Fridley, and Jeffrey Harris,
Lawrence Berkeley National Laboratory
Edgar Villaseñor Franco, Promoting an Energy-Efficient Public Sector*

ABSTRACT

The evolution of government purchasing initiatives in Mexico and China, part of the PEPS (Promoting an Energy-efficient Public Sector) program, demonstrates the need for flexibility in designing energy-efficiency strategies in the public sector. Several years of pursuing a top-down (federally led) strategy in Mexico produced few results, and it was not until the program was restructured in 2004 to focus on municipal-level purchasing that the program gained momentum. Today, a new partnership with the Mexican federal government is leading to an intergovernmental initiative with strong support at the federal level. By contrast, the PEPS purchasing initiative in China was successfully initiated and led at the central government level with strategic support from international experts.

The very different success trajectories in these two countries provide valuable lessons for designing country-specific public sector energy-efficiency initiatives. Enabling conditions for any successful public sector purchasing initiative include the existence of mandatory energy-efficiency performance standards, an effective energy-efficiency endorsement labeling program, an immediate need for energy conservation, a simple pilot phase (focusing on a limited number of strategically chosen products), and specialized technical assistance. Top-down purchasing programs are likely to be more successful where there is high-level political endorsement and a national procurement law in place, supported by a network of trained purchasers. Bottom-up (municipally led) purchasing programs require that municipalities have the authority to set their own purchasing policies, and also benefit from existing networks of cities, supported by motivated municipal leaders and trained purchasing officials.

Introduction

In every country, there are opportunities for more efficient energy management of government's own facilities and operations. Improving efficiency at all levels of government can result in lower energy costs to public agencies, reduced demand on capacity-constrained electric utility systems, increased energy system reliability, and reduced emissions of greenhouse gases and local air pollutants. In addition, the government sector's buying power and visible leadership offer a powerful, non-regulatory means to stimulate market demand for energy-efficient products and services. Increased buyer demand for these products and services can trigger a positive response from domestic suppliers, encouraging them to introduce more energy-efficient products at competitive prices once the public sector has established a reliable entry market.

Despite these benefits of government sector leadership in energy efficiency, many countries—particularly developing and transitional economies—have only recently begun to focus on energy-efficiency policies in this sector. Barriers that historically have constrained

public sector energy-efficiency efforts include a lack of awareness and technical expertise, bias toward buying lowest-price products, budget constraints and disincentives, periodic changes of leadership and political will, and competing policy priorities from various levels of government.

PEPS (Promoting an Energy-efficient Public Sector) was established in 2000 to help government agencies worldwide identify and overcome these barriers. PEPS is a partnership of Lawrence Berkeley National Laboratory (LBNL), ICLEI/Local Governments for Sustainability, the Alliance to Save Energy (ASE), and the International Institute for Energy Conservation (IIEC). With funding support from the U.S. Agency for International Development (USAID), U.S. Department of Energy (U.S. DOE), U.S. Environmental Protection Agency (USEPA), and the Energy Foundation, the PEPS partners develop and disseminate global outreach tools (e.g., a website, guidebook, and energy savings estimation spreadsheet) and work with developing country partners to implement government sector energy-efficiency programs at the municipal, state, and national levels. The partners draw on their experience in public sector energy management from the U.S. Federal Energy Management Program (FEMP), as well as programs in many other countries.

PEPS has initiated technical assistance projects in Mexico, China, and India. The most established PEPS projects are in Mexico (since 2000) and China (since 2003). The program in Mexico, which struggled to gain traction as a strictly federal initiative, has now evolved into a successful municipal-level program with excellent prospects for expanding to state and federal government agencies. Conversely, the China program, which began at the central government, achieved significant success in a short period and now promises to deliver benefits to the municipalities. This paper describes the background and history of these two distinct programs, discusses the factors leading to their successes and the barriers confronting each, and concludes with several lessons and “enabling conditions” for designing and implementing successful, country-specific initiatives in public sector energy efficiency.

PEPS in China

Background

Reflecting its organization under China’s formerly centrally planned system, China’s public sector extends beyond government organs to include schools and hospitals, and it represents a large and growing energy-consuming sector. Between 1990 and 2002, public sector electricity demand grew at an average annual rate of 11.2 percent—compared to 8.3 percent for the whole economy. By 2002, public sector electricity consumption nearly equaled that of all 800 million Chinese rural residents, accounting for 5 percent of the national total (NBS 2004). As a result, China’s public sector expenditures on energy are significant. In 2000, public sector energy spending reached roughly US\$10 billion and that figure has been rising as total built space and use of air conditioning have increased.

Not until 2001, however, did public sector energy use become a focus of central government attention. Then, during “National Energy Conservation Week,” the former China State Economic and Trade Commission (SETC),¹ along with the Ministry of Finance (MOF) and Government Offices Administration of the State Council (GOASC), called on all government agencies to reduce their energy consumption.

¹ As part of the reorganization of Chinese government agencies in March 2003, the SETC responsibilities for energy efficiency management were moved to the National Development and Reform Commission (NDRC).

In 2002, China began to experience a multi-year energy shortage as generation capacity failed to keep pace with the growth in electricity demand. By 2004, nearly every province reported shortfalls, rolling blackouts, mandated closures of production facilities, rationing, and controls on the use of air-conditioning equipment. As a result, China undertook a massive program to build power plants, adding an astounding 40 GW of new capacity in 2004 and an additional 60 GW of new capacity in 2005. In short, China had built the equivalent of two Italian national grids in just two years.

In addition to the need for increased energy supply, the energy shortage focused the government's policies on energy use. In 2002, the SETC commissioned the China Center for the Certification of Energy Conservation Products (then CECP, now the China Standards Certification Center, or CSC) to survey selected public sector buildings in four provinces to develop a baseline of equipment usage and energy consumption; a second, larger survey was taken in 2003.² The results of these surveys—which found a technical potential of 23 percent for savings in existing equipment—were summarized in a report to the State Council. On reading the report, Premier Wen Jiabao noted that energy efficiency in government agencies should be considered a priority. The State Council issued a directive in 2004 that further stated the government's position:

“Government sectors should set themselves as resource-saving examples. They should prepare an implementation action plan for energy saving and water saving, reform the government purchasing system, reduce expenses and save resources. All finance sectors should support resource conservation activities and comprehensive utilization, and adopt energy-efficient products into the guidebook of government purchasing.” (SC 2004)

Developing an Energy-Efficiency Procurement Program in China

Synchronous with this policy statement was the goal of environmental protection. As part of the conditions of accession to the World Trade Organization (WTO), China had enacted a new government Procurement Law on 1 January 2004. Although energy efficiency was not included as a criterion for government procurement, the law did outline its goal of “environmental protection.” Additionally, this new law required that any product appearing on the “Procurement List” (commonly procured items such as computers, printers, and air conditioners, as well as boilers, motor vehicles, telephones, and network equipment) be procured centrally, thereby depriving public sector agencies of the ability to procure directly. This meant that the PEPS initiative had to be administered from the central level.

At the same time, the National Development and Reform Commission (NDRC) and the Ministry of Finance charged CSC and the Research Institute of Fiscal Science (RIFS) with developing a proposal for an energy-efficient procurement policy. CSC's main goal in designing this policy was to link it to China's energy-efficiency endorsement labeling program, which China had recently developed with support from the US-based Collaborative Labeling and Appliance Standards Program (CLASP).³ Similar to ENERGY STAR, the Chinese endorsement labeling initiative certifies and labels products meeting certain efficiency criteria—usually the 25 percent most efficient models of a given product type (e.g., mid-sized room air conditioners). Since CSC was aware of the PEPS program from its relationship with CLASP, CSC asked PEPS

² Both of these surveys made use of a previous survey instrument, developed by PEPS for use in Mexican government buildings and later shared with the CECP.

³ For details see www.clasponline.org

for assistance in gathering information on energy-efficient procurement programs in the United States and other countries, and in designing a procurement policy for China.

With support from the Energy Foundation and the US EPA, PEPS experts began working with CSC and RIFS to help shape the program. Ultimately, CSC and PEPS experts decided to model elements of China's procurement policy after the U.S. government's, which is administered by the U.S. Federal Energy Management Program in close cooperation with the EPA/DOE ENERGY STAR labeling program.

The next step was the selection of the products to be included in the energy-efficiency procurement list. One goal was to overlap with the existing mandatory list of centrally procured products under the Procurement Law, in order to make compliance easier and more enforceable. The team compiled a list of 62 potential products, with primary consideration given to those products that were both certified and labeled in China and already on the mandatory government procurement list. All products were reviewed for inclusion according to a number of criteria, including the volume of current stock and annual procurement, primary fuel use, potential annual energy savings, incremental costs for efficient models, the existence of three or more suppliers, and the market presence of domestic suppliers.

During this process, concern was expressed over the issue of the price of efficient products. (The initial policy was not addressing issues of agency budgets, savings retention, or other financial mechanisms to manage the first-cost/life-cycle-cost issue for purchasers—important because life-cycle costs are not traditionally employed as a basis for purchasing decisions in China.) As a result, the final selection of products included a number of products for which the incremental cost of an efficient model ranged from zero to very little, products for which the incremental cost was fairly small but the savings were potentially quite large, and products with potentially high incremental costs but very large energy consumption (and thus substantial savings potential). In addition to these energy-using products, the list also included toilets and faucets (two water-saving products under the national water efficiency certification and labeling program)—for a total of nine products.

The scope of the program and timeline for implementation were initially fairly modest, and the plan called originally for pilot implementation only in the central government buildings in Beijing. As the energy crisis grew in intensity during 2003–2004, however, the government became more aggressive regarding both the scope and the timing of the initiative, deciding that the first year should include the entire central government and the provincial capital governments. The plan was to extend the program to the county and regional governments of the provinces in the second year and, in the third year, to include all remaining public sector agencies and organizations.

Major work on a draft policy was completed by the middle of 2004, at which time NDRC and the Ministry of Finance began preparations for the launch of the program. On December 17, 2004, NDRC and the Ministry of Finance jointly released a *Notice from the Ministry of Finance and the National Development and Reform Commission on the Issuance of "Implementation of Government Energy Efficiency Procurement"* (Procurement Law of 2004), announcing the commencement of government efficiency procurement in early 2005.

In support of the new policy, PEPS and CSC developed "purchasing guides"—two-pagers on each product detailing the lifetime benefit of purchasing an efficient model. CSC assembled a complete list of all qualifying models, which was posted on its website as well as that of the NDRC and the Ministry of Finance's E-Procurement web. The program has been underway for only a little over a year, so no review has yet been made of the actual volume of procurement

that has been handled under the new guidelines. However, a PEPS analysis carried out by LBNL of the technical potential for savings from China's government efficiency procurement program estimated that, for the seven energy-efficient products currently on the Ministry of Finance procurement list, avoided electricity consumption in year 10 of the program could reach 4.65 terawatt-hours (TWh), resulting in monetary savings of ¥2.9 billion (US\$353 million)—primarily from the use of energy-efficient lighting (Fridley 2005).

Future of the Program

China's energy efficiency procurement list is expected to expand in 2006 to include a wider range of products. Also, the current low level of authority at which the Procurement Law was passed (it was passed as a "notification"—which carries the lowest level of policy authority in China) will be raised to the level of a "regulation" after the program is modified to respond to the challenges of the first years of implementation. This change will mean that agencies are *required* to purchase efficient products, not just to give them "preferential consideration." As has been the case with many new, untested policy initiatives in China, full national implementation will likely require several years, but the potential for savings in a system the size of China's could result in both significant savings and market impact nationwide.

PEPS in Mexico

Background

Mexico's large public sector—representing around 10 percent of the country's total demand for goods and services—is also a very large energy consumer. As a result, since its creation in 1989, Mexico's National Commission for Energy Conservation (Comision Nacional para el Ahorro del Energía, CONAE), the energy conservation arm of the Energy Secretariat (SENER), has had a governmental mandate to provide technical assistance on energy efficiency to the public sector.

Driven largely by budget considerations (electricity prices for the public sector in Mexico, at roughly US\$0.15/kWh, are almost double the prices paid by private customers), as well as concerns about energy security and the environment, Mexico's federal government energy conservation activities began in the early 1990s. The most significant effort is the *Administración Pública Federal (APF)* initiative, which began in the early 1990s as the "100 Public Buildings" pilot program, aimed at reducing electricity consumption in Mexico's federal government buildings. In 1998, the Treasury Secretariat asked SENER to suggest an energy savings program that could contribute to the Agreement on Budget Austerity for the Federal Administration. CONAE proposed to extend the pilot program to the entire federal government, and in 1999 all federal agencies were directed to participate in the CONAE program. To date, APF has resulted in energy audits and retrofits (mainly for lighting) in almost one thousand Mexican government buildings.

Since the mid-1990s, various PEPS partners had been collaborating with CONAE on energy-efficiency projects in Mexico. This close relationship with CONAE, combined with the Mexican government's long-standing interest in public sector energy efficiency, resulted in a natural partnership between PEPS and CONAE, aimed at replicating the success of the US FEMP program in Mexico's federal agencies.

Developing an Energy-Efficiency Procurement Program in Mexico

In 2000, PEPS and CONAE began a program to promote energy-efficient purchasing by national government agencies in Mexico. The idea was to take advantage of the momentum of the APF program, which was demonstrating considerable success in generating audits and lighting retrofits in large government buildings. PEPS aimed to get APF-participating agencies and facilities to institute procurement policies that, as a complement to the retrofit projects, would commit them to buy energy-efficient products in their day-to-day purchasing.

However, despite the close cooperation between PEPS and CONAE, the effort to launch a full-blown initiative at the federal level was not successful. The original program was very ambitious, covering many products and counting on substantial resources from CONAE for market research and program promotion. This, combined with some untimely staff turnover and severe budget pressures within CONAE, delayed and ultimately halted efforts to launch the initiative at the federal level.

Subsequently, the decision was made to shift to a more decentralized, bottom-up strategy targeting municipal government purchasing. In 2003, PEPS coordinated with ICLEI's Cities for Climate Protection (CCP) campaign and embarked with ICLEI on implementing the PEPS program within the CCP network of cities.

The pilot phase of the municipal program focused on cities' purchases of a limited set of energy-efficient products (lighting and office equipment) that qualified for either the Sello FIDE (Mexican) endorsement label or the US-based ENERGY STAR label. During 2004, PEPS developed procurement specifications for the pilot-phase products and provided eight pilot municipalities with training and technical assistance on buying energy-efficient products.

In 2005, PEPS continued to work through ICLEI and a Mexican municipal association, AMMAC (Asociación de Municipios de México AC), to provide individualized technical assistance to the pilot municipalities. The specific objectives were to ensure that each municipality adopted procurement policies that included the energy-efficient specifications, and to assist in their initial purchases of energy-efficient products.

Tangible benefits from the program were almost immediate. By September of 2005, \$1 million in estimated PEPS-related purchases had been made by four municipalities. The estimated annual savings from these purchases exceeded 5,000 MWh, saving taxpayers in these communities about US\$726,000 annually and reducing power plant emissions equal to 3,300 metric tons of CO₂. By early 2006, seven of the eight PEPS pilot cities had begun buying energy-efficient products according to the PEPS recommendations. Furthermore, two of the cities had adopted new purchasing policies and policies were nearing completion in five other cities.

Future of the Program

Based on the success of the municipal-level pilot phase, the PEPS program identified three promising avenues for extending the initiative and establishing a buyer-led market transformation in Mexico. PEPS is focusing the next phase of the program on expanding training to new cities that have expressed interest; adding products to the PEPS specifications, based on priorities set by the participating cities; and extending the program to the Mexican federal government by helping federal agencies voluntarily adopt the PEPS purchasing specifications. When positive results have been achieved by these early adopters, PEPS hopes to

work with CONAE to transform the energy-efficient procurement program into a mandatory policy for all federal agencies.

Lessons Learned from PEPS in China and Mexico

The China purchasing program was established within a fairly short time frame, with the bulk of development effort taking place in 2003 and 2004. Compared to other new policies, such as China's Energy Conservation Law and Renewable Energy Law (which took many years to finalize), the energy-efficient procurement policy proceeded at a rapid pace. In contrast, in Mexico, after several unproductive years trying to implement a federal-level purchasing policy, PEPS achieved demonstrable success with its municipal procurement project after just one year, and the project seems poised to expand rapidly. In addition, there is now renewed interest at the federal level and some state governments have asked to participate.

Factors Leading to Success

Factors that contributed to the rapid adoption of the new policy in China were:

1. *An existing enabling policy*, in the form of the national Procurement Law, developed in the 1990s and revised in the early 2000s. The revised law was pilot-tested in Beijing in 2003 and applied nationwide the following year. Because the law had detailed guidelines on procurement, and already included a list of products subject to mandatory central procurement, it required very little modification to add an energy-efficiency requirement.
2. *Existing structures on which to build*, including a national procurement system—extending in a network of vertical authority from the central government in Beijing to each of China's 5000 counties—and a corps of trained purchasing officials throughout the country.
3. *Immediate need*. The nationwide electricity shortage that began in 2002 spurred the development of measures to curb energy consumption growth quickly, and put the spotlight on the government's own energy consumption behavior.
4. *Reliance on existing policy mechanisms*. China's mandatory minimum efficiency standards program and energy-efficiency endorsement labeling program provide key infrastructure for a successful energy-efficient procurement program. The minimum standards eliminate products on the low end of efficiency, and the labeling program—managed by the CSC in close coordination with the standards program—enables purchasers to easily identify efficient products. The new procurement program relies on these mechanisms by tying qualified products to the existing national energy-efficiency endorsement labeling program.
5. *A simple beginning*, focusing on energy-efficient purchasing of only seven energy-using products—all of which were commonly procured products with multiple vendors and many complying product models.
6. *High-level political endorsement*. Premier Wen Jiabao's prioritizing of energy-efficient procurement reduced inter-ministerial conflicts over the development and implementation of the policy.

Factors that have led to success in Mexico are:

1. *Existing network of cities.* When PEPS began working with Mexican municipalities, it was able to tap into a network of cities that was already active on climate/environment issues through their participation in ICLEI's CCP campaign. Key personnel and communication lines were thus already well established.
2. *Motivated municipal actors.* The pilot cities were motivated by environmental concerns and their commitment to CCP; all were already carrying out climate change-related actions, to which it was relatively simple to add an energy-efficiency purchasing component. Many participating cities also had other reasons for embracing PEPS, including energy cost savings (particularly considering high energy costs in the public sector), and the potential to eventually participate in a carbon trading regime.
3. *A simple beginning.* The Mexican municipal initiative began with a pilot phase in a small number of cities that focused on purchasing a limited set of lighting products and office equipment, clearly labeled as energy-efficient. This small scale enabled the PEPS partners and staff to provide direct technical assistance to each municipality in the use of PEPS tools and guidelines, the adoption of new procurement policies, and the actual purchase of energy-efficient products. This level of assistance helped ensure the program's initial successes, which rekindled the interest of the federal government.
4. *Strategic choice of pilot products.* The benefits of choosing lighting and office equipment as pilot products were twofold: a) Both types of products were simple for purchasers to identify because they carry endorsement labels (Sello FIDE for lighting products and ENERGY STAR for office equipment), and b) the generally small difference in costs between conventional and energy-efficient products permitted the municipalities to buy the efficient ones, despite their budget constraints and historical preference for selecting products with lowest first cost.
5. *Conducive administrative structure.* Beginning at the municipal level was possible because Mexico's federal and state procurement laws allow the municipalities to create or modify their own procurement policies.

Challenges

Although the energy-efficient procurement program has only been in effect for a little over one year in China, a number of challenges and shortcomings already are apparent, and CSC has begun responding to these issues with plans to reformulate and revise the policy. Among the problems encountered in the first year were:

1. *Tradeoff between speed of implementation and level of authority.* By issuing the procurement policy as a "notification" instead of a "regulation" or "law," China increased the speed of the policy's implementation, but made enforcement more difficult. The initial policy stops short of requiring agencies to purchase efficient products, instead making it mandatory for them to give "preferential consideration" to efficient products—leaving little recourse to deal with agencies that do not immediately comply. China's intent is to substitute the notification with a more robust regulation after a few years.
2. *Insufficient training.* With just months between the issuance of the policy and implementation, there was little time to provide clarification and guidance on

uncertainties in the policy's interpretation. According to CSC staff, this has led to some confusion during the first year of operation.

3. *Insufficient information materials.* China has instituted an electronic "Government Procurement Network" to provide detailed information about products, pricing, specifications, and suppliers. In the case of the energy-efficient product list, however, this information is not yet complete and it has not been linked electronically to the purchasing processes found elsewhere in the network. Moreover, no guidance has been posted to help users understand the benefits of purchasing higher priced products that are still economically preferable on a life-cycle basis.

Through the course of its evolution, from top-down to bottom-up, and finally to a combination of the two, the PEPS program in Mexico also has met with a variety of challenges—some of which were surmounted through program flexibility, and others that the program still faces:

1. *An over-ambitious beginning.* The original federal-level program covered a broad range of products and relied on substantial resources from CONAE for market research and program promotion.
2. *Lack of a single endorsement label* to allow government buyers to easily identify complying energy-efficient products. Mexico's endorsement label—the Sello FIDE, administered by the national trust fund Fideicomiso para el Ahorro de Energía Eléctrica (FIDE)—covers a limited number of product types and does not have a transparent (nor, in some cases, sufficiently stringent) set of efficiency criteria.⁴ In addition, since manufacturers must pay to participate in the labeling program, incorporating the Sello FIDE into the PEPS program could lead to unfair market preference for those manufacturers willing to pay. In the pilot phase of the program, PEPS specified lighting products with the Sello FIDE label and office products with the US-based ENERGY STAR label. PEPS is working with FIDE to find a solution that will both support the FIDE labeling program and result in maximum energy savings in Mexico.
3. *Lack of readily available information on the Mexican market.* Without detailed information on products (at various efficiencies and sizes) that are for sale in Mexico, it is difficult to set purchasing specifications that are reasonable for the Mexican market.
4. *Lack of resources at the municipal level.* Despite the short payback periods from purchasing energy-efficient products, the higher first cost is prohibitive to some municipalities. This barrier can be institutional (municipal procurement policies often favor the purchase of the least expensive equipment), budgetary, or political—recognizing that benefits will be reaped by the next administration, some city officials prefer to invest in visible public works rather than less tangible energy-efficiency upgrades.

Conclusions

The PEPS initiatives in Mexico and China demonstrate the need for flexibility in designing and implementing procurement programs. In China, the federal-level, top-down

⁴ In the past, some FIDE-labeled products appeared to be barely more efficient than the minimum levels required by mandatory energy-efficiency standards in Mexico, although there is some indication that the labeling criteria may be raised in the future.

approach has proven very successful in a short period, whereas in Mexico, the top-down approach stalled, and it was a municipal-level, bottom-up approach that ultimately was better suited for success.

There are several reasons why the top-down approach, attempted in the two countries, met with more success in China than it did in Mexico. A number of conditions exist in China that enabled the rapid implementation of a national energy-efficient purchasing program. These conditions are: 1) a national law already in place with detailed guidelines on procurement, making it easy to add an energy-efficiency requirement; 2) an historical national purchasing system, enabling the rapid percolation of a new policy to all levels of government; 3) a national product-labeling program run by the CSC—which has connections to the top government planning and policy agency (NDRC)—allowing close coordination between the labeling and procurement programs; and 4) political endorsement of public sector energy-efficient procurement at the highest levels.

The top-down strategy did not succeed in Mexico because these same conditions did not exist; there was no national law, existing policy mechanism, or political endorsement from the country's top office on which the PEPS initiative could build. Although both partners were committed to the program, the initiative did not have the same priority it had in China, where the program was initiated by high-level officials, with the support of the Premier. However, by shifting the initial policy focus from the federal government to the local level, the PEPS program has gained traction in Mexico.

Despite their differences, the two countries illustrate many of the same lessons about the conditions necessary for an energy-efficient purchasing program to succeed. Table 1 summarizes the factors that have led to the success of the public purchasing programs in China and Mexico, and can serve as a checklist of enabling conditions for other governments considering similar programs.

Finally, the PEPS experience in both China and Mexico shows that, even when these key enabling conditions are present, purchasing initiatives still face challenges. To maximize the chances for success in purchasing initiatives, project designers should: 1) allow time and resources for sufficient training of purchasing officials and clarification of policy details before implementation; and 2) provide purchasers with easily accessible (e.g., internet-based), detailed information about products, pricing, specifications, and suppliers.

Table 1. Enabling Conditions for PEPS Success in China and Mexico

Enabling condition	China	Mexico
General		
Mandatory energy-efficiency standards	✓	✓
Energy-efficiency endorsement labeling program: <ul style="list-style-type: none"> • Broad product coverage • Significantly more stringent than minimum energy-efficiency standard • No required manufacturer fee 	✓	
Immediate need—e.g., energy shortage, high energy prices	✓	✓
Simple pilot phase: Small number of commonly procured initial products	✓	✓
Strategic choice of pilot products: <ul style="list-style-type: none"> • Labeled with endorsement label • Multiple vendors • Many complying product models • Difference in price between conventional and high-efficiency products not prohibitive 	✓	✓
Specialized technical assistance (e.g., PEPS) for planning and implementation	✓	✓
Top-down (centrally led) purchasing program		
National procurement law in place	✓	
National procurement system (vertical network)	✓	
Trained purchasing officials at federal level	✓	✓
High-level political endorsement	✓	
Bottom-up purchasing program		
Existing networks of cities (especially if connected by environmental concern/action)		✓
Trained purchasing officials at municipal level	✓	✓
Motivated municipal actors		✓
Ability of municipalities to create/modify their own procurement policies		✓

References

- China State Council (SC). 2004. *Notice about Resources-saving Activities*. Notice #30. Beijing, China: China State Council.
- Fridley, D. 2005. *Potential for Savings in China's Government Energy Efficiency Procurement Program: Preliminary Finding*. Project report to US EPA, August 2005.
- National Bureau of Statistics (NBS). 2004. *China Energy Statistical Yearbook 2004*. Beijing, China: Statistical Press.
- Romo, A., and J. González. 2002. *Energy Efficiency in Federal Public Buildings in Mexico: The APF Program*. PEPS Case Study. <http://www.pepsonline.org/countries/mexico.html>
- Van Wie McGrory, L., J. Harris, M. Breceda Lapeyre, S. Campbell, M. della Cava, J. González Martínez, S. Meyer, and A. Romo. 2002. "Market Leadership by Example: Government Sector Energy Efficiency in Developing Countries." In *Proceedings: 2002 ACEEE Summer Study on Energy Efficiency in Buildings*. Washington, D.C.: American Council for an Energy-Efficient Economy.