The Public Sector:
A Catalyst for Energy Efficiency

PEPS at CSD-15
U.N. Headquarters – New York City
May 3, 2007

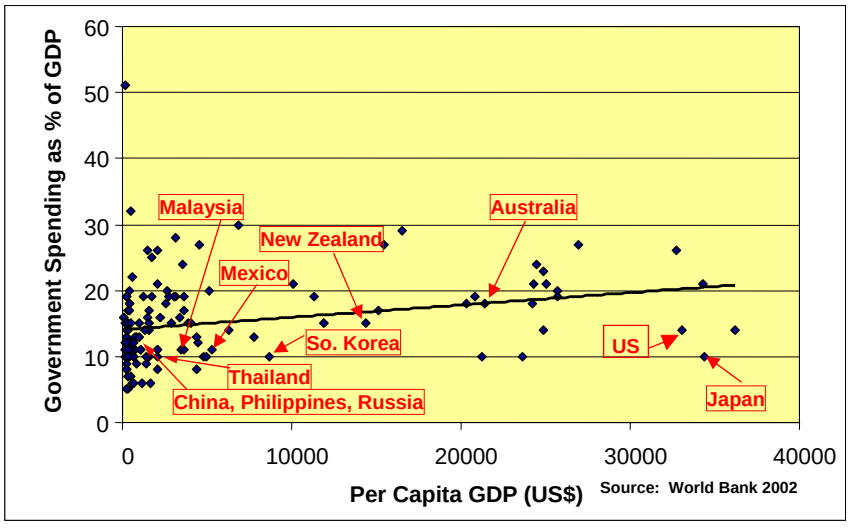
OUTLINE

- **Why the public sector?**
- **Potential initiatives for a public sector program**
- **Examples of initiatives (most from North America)**
- **Indicators of success**
- **What is PEPS ("Promoting an Energy-Efficient Public Sector")?**

Why the Public Sector?

1) Save energy, money, pollution, and carbon
   - Large, cost-effective savings potential (>20%)
   - Longer time horizon
2) Market presence
   - Government is a large % of GDP
   - Biggest energy user in most countries
   - Biggest buyer of energy-using products
3) Market leadership (influence buyers & sellers)
   - Implied endorsement of EE products & services
   - Example for others

Government: 10-20% of GDP



Building Blocks of Public Sector EE Program

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Candidate Initiatives

- Retrofits of existing buildings
- Operations and maintenance
- New construction
- Energy-efficient government purchasing*
- Water/wastewater*
- Public (esp. street) lighting
- Public transit and fleets
- Parastatal industries

* Separate workshop segments dedicated to these topics

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Existing Building Retrofits

- **Mexico: Administración Pública Federal (APF)**
  - Finding: lighting alone constitutes over 50% of energy use in Mexican gov't. buildings
  - Solution: Guided lighting audits by in-house facility staff with analysis by CONAE
  - Result: 2,300 buildings (6.6 million m^2) retrofitted; 200 GWh/yr. (~ US$30 million/yr.) savings
- **Canada's Federal Building Initiative (FBI)**
  - Problem: program had insufficient resources to address the opportunities in gov't. buildings
  - Solution: performance contracting with financing
  - Unique contribution: building operator training and employee awareness are urged, so projects are more comprehensive
  - Result: 7,500 buildings retrofitted; ~ US$25 million/yr. savings

Existing Building Retrofits

- **U.S.: FEMP "Save Energy" audits**
  - Problem: Some agencies prefer to pay for projects directly (without outside financing), but still want help identifying them
  - Solution: FEMP provides cursory audits at subsidized rates (or free) to federal facilities
  - Lesson learned: Make sure to screen candidates to determine likelihood that identified EE measures will get installed; then follow up with facility to help move project forward
  - Result: Screening and follow-up activities raised "hit" rate (% of audits leading to projects) from about 25% to over 50%

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Operations & Maintenance

- U.S. FEMP
  - Primarily an information program
    - "Best Practices" guide, web site, training course
  - Big emphasis on adding metering
    - "If you can't measure it, you can't manage it."
  - Big emphasis on *commissioning* – testing systems to make sure they operate the way they are supposed to
    - Required element in federal performance contracts also
  - Free O&M audits to identify "low-cost/no-cost" measures
- Canada: Federal Building Initiative (FBI)
  - Integration of building operator training into ESCO contracts
  - FBI partnered with Canadian community colleges to develop a building operator certification program
    - federal facility operators are strongly encouraged to participate

New Construction

- U.S. FEMP
  - Design assistance from national labs
    - ~ 30 buildings/yr. (out of ~ 200 requests)
    - Includes building simulation, technology analysis, etc.
  - "Whole Building Design Guide" – web-based information portal
    - funded by Dept. of Energy, Dept. of Defense, and the General Services Administration (landlord agency)
  - LEED (Leadership in Energy and Environmental Design) certification requirement at some agencies
    - LEED is "green" rating scheme that includes many facets besides energy: materials use, siting (e.g., proximity to public transit), indoor env. quality, water use

EE Product Purchasing

- **U.S. FEMP**
  - Energy Policy Act of 2005 requires agencies to buy ENERGY STAR® or FEMP-designated products
    - ENERGY STAR® is "endorsement" label for models in top 25% of efficiency
    - FEMP issues efficiency "specifications" for products not covered by ENERGY STAR®
    - Two programs cover about 65 different products
- **Mexico**
  - PEPS-initiated program
  - Municipal focus: started with 8 cities, now 40 (+ 4 states)
  - 11 products currently (adding 2-3 per year)
  - Early results impressive: 15 cities buying EE prdcts.
    - 11 cities reported 2006 savings: total > US$1 million

Water / Wastewater

- **Most activity is at municipal level**
- **Large unrealized savings opportunities**
  - Leak detection and repair (and decrease pressure)
  - "Right-size" pumps, couple with EE motors
  - Apply variable speed drives, multi-speed motors, or multiple staged pumps to match variable flow
  - Cost assignment – add metering and institute increasing block pricing or pay-as-you-go system
- **ASE Watergy program is leader**

Public Lighting

- Street and other public lighting
  - mercury vapor (~ 40 lumens/watt) to high pressure sodium or metal halide (~ 70-100 lumens/watt)
  - "cut-off" fixtures to avoid wasteful lighting of sky ("light pollution")
  - time clocks, light sensor controls (inc. dimming)
- Traffic lights
  - incandescent → LED
  - win-win-win: increased efficacy, longevity, and brightness
- Easy, and paybacks usually quick
  - so good fit with purchasing programs

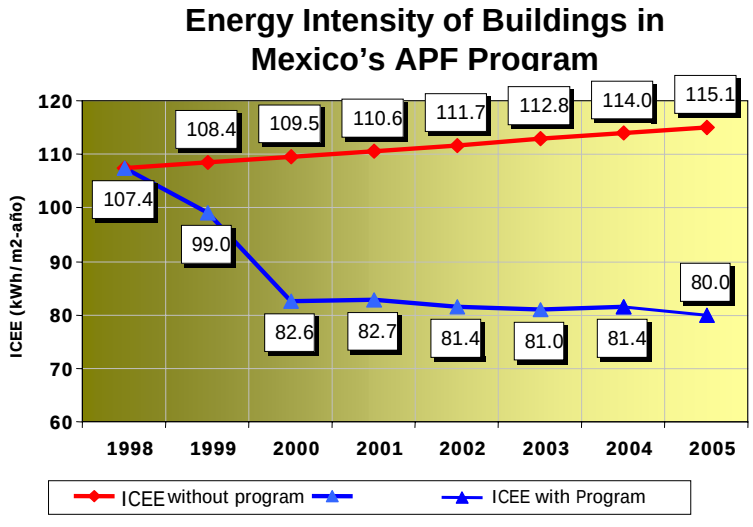
Public Transport: BRT

- Bus rapid transit systems can include:
  - dedicated bus lanes or streets
  - preference at traffic lights
  - easy boarding infrastructure (e.g., turnouts and raised platforms)
  - longer distance between stops
  - alternative to on-board fare collection
- Cheap to implement (relative to light rail)
- Typical results:
  - ridership up
  - travel time, congestion, and pollution down
- Good examples: Bogota, Colombia and Curitiba, Brazil

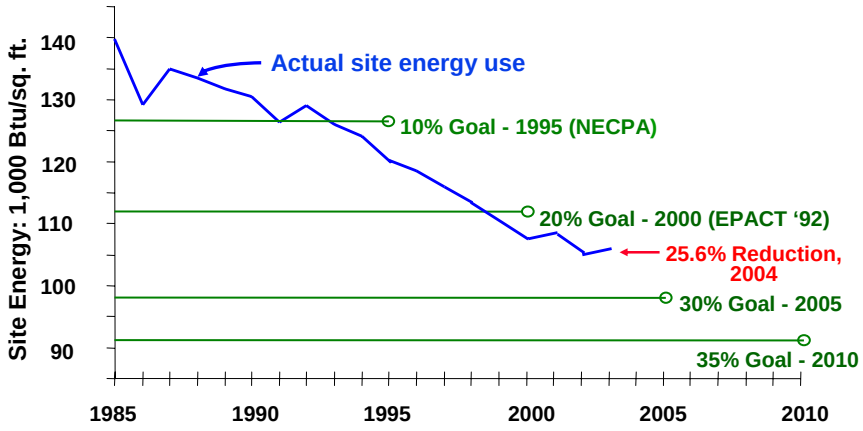
Public Transport: Fleets

- Procurement of fuel-efficient or alternative fuel vehicles
  - Also: “Low rolling-resistance” replacement tires
- Maintenance regimens that keep engines in tune and tires fully inflated
- Driver training programs: CONAE asserts proper driving behavior can raise fuel economy 30% over poor practice
  - Capital city of Kerala, India saw 12% increase in fuel efficiency from bus drivers who participated in 3-day training program

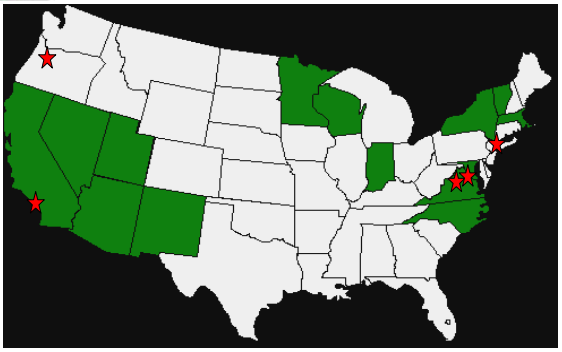
But Is P.S. Approach Working?



US FEMP: Goals & Achievements



Leverage: States & Cities Using Federal Procurement Criteria



80% of government spending in U.S is at state and local levels

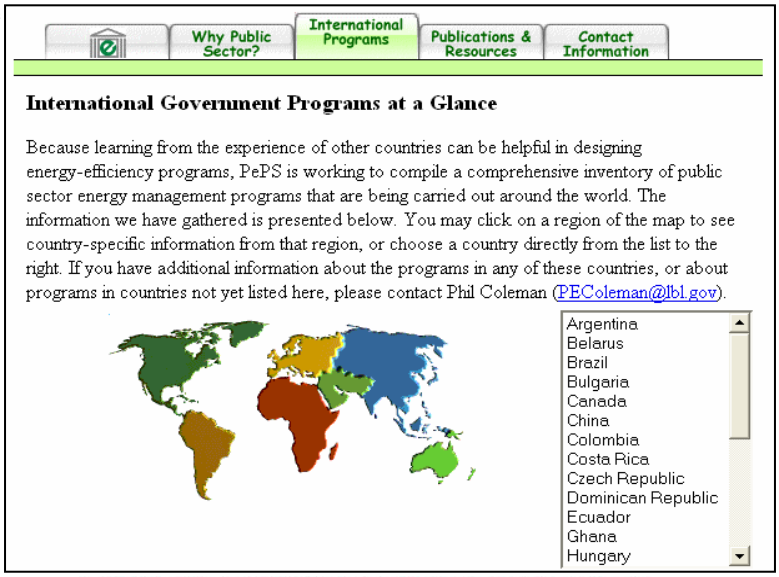
- Federal purchasing requirements: **ENERGY STAR** or FEMP-designated products (top 25th %ile)
- These 15+ states and 6 cities – serving 40% of US population – now use the same federal criteria

What is PEPS?

- **LBNL collaboration with:**
  - Alliance to Save Energy; ICLEI - Local Governments for Sustainability; IIEC
  - In-country partners: CSC (China), CONAE (Mexico), PPEE (Chile)
- **Goals:**
  - Help governments achieve direct energy and cost savings, with societal benefits (pollution prevention and reduced pressure on energy supply systems)
  - Mobilize public buying power and leadership to move the market toward energy-efficient products and services
- **Strategy:**
  - Promotion of policy adoption and voluntary programs
  - Tools and information
  - Pilot projects, capacity-building

Guidebook and EST

Website: www.pepsonline.org



Key Takeaways

- **Public sector EE saves energy**
  - **Which saves money, cuts pollution, and decreases strain on energy supply**
- **It can also catalyze EE policies, and stimulate EE products and services in whole economy**
  - **Leadership → market transformation**
- **There are numerous program areas**
  - **Purchasing, existing buildings, water supply, transit, new construction, public lighting …**
- **Funding is often the missing link, but several alternatives for project (and even program) finance are possible**

What is responsible for success?

- **Individual programs have demonstrated impressive savings in some cases …**
  - **Clear successes where measurement of savings is simple (e.g., building retrofit programs like CONAE's APF and FEMP's Super ESPC)**
  - **Success in other cases (e.g., purchasing program) is inferred from limited measurement and proxies, e.g.:**
    - **Number of visits to web sites**
    - **Awareness/adoption rates shown in surveys**
    - **Spillover: states and cities adopting federal program**
- **… but many think intangibles are the key**
  - **Required reporting, newsletters, training courses, reduction goals, annual awards program and conference, etc. – "the FEMP movement"**

How to Get Started

- **Seek high-level support**
- **Pursue written policy (e.g., law or executive order)**
  - **Should establish objectives (general and specific) and strategies, and assign responsibilities**
- **Set Goals**
  - **Re savings, investments, and means (e.g., audit 5% of floor space each year)**
- **Keep in mind leveraging possibilities**
  - **E.g., external financing, but also:**
  - **Piggybacking on non-energy initiatives, environmental policies, utility programs, etc.**
- **Start small**
  - **One or two initiatives done well will make way for more acceptance (and funding)**
- **Evaluate – both quantitatively and qualitatively**
  - **This will assist in honing the programs, but also help in obtaining the funding to continue and expand**