Asia-Pacific
Economic Cooperation

APEC SYMPOSIUM ON THE IMPLEMENTATION OF GOVERNMENT ENERGY EFFICIENCY PROGRAMS

Kunming, China
2-3 August 2004

Session 1: Introduction to Public Sector Energy Efficiency Programs

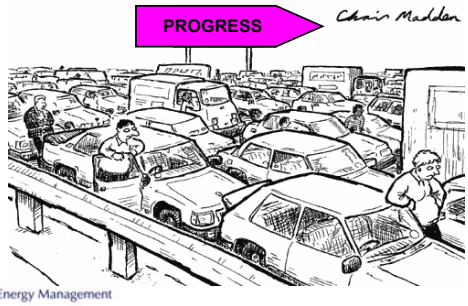
Overview of the Symposium

Peter du Pont, Ph.D.
Danish Energy Management A/S
Symposium Support and Facilitation

APEC Symposium on the Implementation of Government Energy Efficiency Programs
Kunming, China, 2-3 August 2004

Energy Policy Tip of the Day

Be Patient: Sometimes the Road to Progress Has Some Delays



APEC Symposium on the Implementation of Government Energy Efficiency Programs
Kunming, China, 2-3 August 2004

Symposium Objectives

- **Explore Best Practices**
  - Share experience and information on implementation of government energy management programs
  - Procurement, regulatory measures, promotion and incentives in the government building sector;
- **Lessons Learned**
  - How effective are government energy-efficiency programs?
  - What are the barriers? How can they be overcome?
  - What are their impacts on the adoption of third-party energy efficiency services?
- **International cooperation**
  - What level of information-sharing and cooperation is useful?
  - What mechanisms for cooperation?
  - At regional and international levels?

APEC Symposium on the Implementation of Government Energy Efficiency Programs
Kunming, China, 2-3 August 2004

DAY 1

- Introductions
- Foundations of Government-Sector Energy
- Efficiency Programs
- Experience from Specific Economies
- Panel Discussion on Ingredients for Success

APEC Symposium on the Implementation of Government Energy Efficiency Programs
Kunming, China, 2-3 August 2004

Session 1: Introduction to Public Sector Efficiency Programs

- *Jeffrey Harris, Lawrence Berkeley National Laboratory*
- "International Experience with Government Sector Energy Management"
- Foundation Presentation
  - Why the need for EE in the Public Sector?
  - Program strategies and examples
  - Lessons Learned
  - Collaborative program called PePS

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Session 2: Experience and Best Practice in Specific Economies

- **United States**
  - *Beth Shearer, Former Director of FEMP*
  - "Federal Energy Management Program (FEMP)"
    - **Practical overview of strategy and key factors**
    - **Lessons learned from the U.S. program**
- **Mexico**
  - *Gaudencio Ramos-Niembro, National Commission for Energy Conservation (CONAE)*
  - "Main Results of the Mexican Programs for Energy Efficiency in the Public-Sector"
    - **Energy Efficiency programs in public buildings, public vehicles, national oil company, national utilities, and public lighting**

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Session 3: Experience and Best Practice in Specific Economies (Continued)

- **China**
  - *Xu Zhiqiang, National Development and Reform Commission (NDRC)*
  - Energy-Efficiency Initiatives in Chinese Government Agencies and Overview of Current Key Programs
    - **Overview of key initiatives and progress to date**
- **China**
  - *Lin Jiang, Lawrence Berkeley National Laboratory, U.S.*
  - "Funding Public Sector Energy Efficiency Projects in China: Alternative Considerations"
    - **Overview of ESCO development in China**
    - **Potential for alternative financing mechanisms for public sector (incl. Revolving Loan Funds)**
    - **Case studies of Loan Funds from California and Texas**

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Session 3: Experience and Best Practice in Specific Economies (Continued)

- **Chinese Taipei**
  - *Dennis Wen-Bohr Wang, Energy Conservation Technology Development Center, CTCI Foundation*
  - "Execution of Chinese Taipei Government Sector Energy Management Program"
    - **Overview of public-sector EE programs in Chinese Taipei**
    - **Their impact on energy use: govt. sector growing at 1% per year, compared to 5% per rest of economy**

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Session 4: Experience and Best Practice in Specific Economies (Continued)

- **Australia**
  - *Anthony Marker, Australian Greenhouse Office*
  - "Energy Use in the Australian Government's Operations"
    - **Importance of *measuring* what you are doing**
    - **The "Whole-Of-Government Energy Report (WOGER)**
    - **On-Line, Energy Data Gathering And Reporting (EDGAR)**
- **New Zealand**
  - *Dan Coffey, Programme Leader, Energy Efficiency and Conservation Authority*
  - "The New Zealand Energy Wise Government Programme"
    - **Achievement and lessons learned in New Zealand**
    - **Energy management assessment tools; progress reports; program monitoring; and procurement**
    - **Role of the energy services industry**

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END OF DAY 1
Session 5: Panel Discussion on Public Sector Energy Management

- **Topic**
  - **Ingredients for Successful Public-Sector Energy Efficiency Programs**
- **Panelists**
  - *Jeffrey Harris, Lawrence Berkeley National Laboratory, United States*
  - *Li Tienan., China Center for Energy Conservation Products (CECP), China*
  - *Wayne Wescott, International Council for Local Environmental Initiatives, Australia*
- ***Objectives***
  - Review the day's results
  - Share ideas and recommendations
  - Brainstorming on the key lessons learned, success factors

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Day 2

Case Studies of EE Investment

Public Sector Procurement

Breakout Sessions to Discuss Next Steps:

What have we learned?

Where can we go from here? And how?

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DAY 2

- Case Studies of EE Investment
- Public Sector Procurement
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Session 6: Energy Efficiency Investment Case Studies

- **Russia**
  - *Garegin Aslanyan, Vice-President, Center for Energy Policy*
  - Case Study: Energy Efficiency Management in the Russian Public Sector
    - **Potential for EE in the public sector, with case studies on third-party financing in education and research sectors**
- **Australia**
  - *Wayne Wescott, International Council for Local Environmental Initiatives*
  - Case Study: Rolling Funds for Investment in Energy Efficiency Systems in Australia Local Councils
    - **Benefits and mechanics of establishing Revolving Energy Funds at local councils**
    - **How the funds work, with specific case studies and examples**
- **Malaysia**
  - *Abdul Rahim Bin Mahmood, Ministry of Energy, Water and Communications Malaysia*
    - **Case Study: Low-Energy Office Building: Ministry of Energy Communications and Multimedia, Malaysia**
    - **Detailed case study of how to design, construct, and monitor a high-profile, super energy-efficient building**

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Session 7: Energy-Efficient Procurement Practices

- **Europe**
  - *Nils Borg, President of Borgco*
  - "Public Procurement of Energy-Saving Technologies in Europe (PROST)"
    - **Results of a major 2-year study of public procurement. 80 million Euros per year → can save up to 12 billion Euros in energy costs!**
    - **A few Best Practice Examples; overview of the "Public Sector Toolbox"; common European databases and networks; a possible EU Directive**
- **United States**
  - *Susan Wickwire, US EPA*
  - Government Energy Management and Voluntary Approaches: Energy Star and Other Market Transformation Programs in the United States
    - **Overview of the Energy Star and other voluntary programs**
    - **Linkage and coordination with other programs**
    - **Use in government procurement and with FEMP program**

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Session 8: Energy-Efficient Procurement Practices (Continued)

- **Korea**
  - *Chong-Hwan Ann, Director of Material Certification Division, Public Procurement Service, Korea*
  - "Public Procurement System for Energy Saving Commodities in Korea"
    - **Public procurement in Korea; certification scheme for EE products; and GePs (e-Procurement)**
- **China**
  - *Minhong JIN, China Certification Center for Energy Conservation Products*
  - *"Chinese Government Efforts to Promote Energy Efficiency for End Use"*
    - **Technical basis for government procurement efforts: minimum energy performance standards (MEPS) and labeling programs in China**
  - *Zhang Wenbin, Chinese Ministry of Finance*
  - *Li Tienan and Liu Caifeng, China Certification Center for Energy Conservation Products*
  - Endorsement Label and Energy Efficiency Government Procurement in China
    - **The CECP endorsement label; its use as a basis for procurement; and government procurement policy in China**

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END OF DAY 2
Session 9: Breakout Session

- **Topic**
  - Recommendations for Government Energy Efficiency Programs and Procurement
- **Objective**
  - Develop Symposium Communique with specific recommendations on coordination strategy and next steps
    - What did we learn? Where do we go from here? How?

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Welcome … and GOOD LUCK!

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International Experience with Government-Sector Energy Management

Jeffrey Harris
Lawrence Berkeley National Lab

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OVERVIEW OF TALK

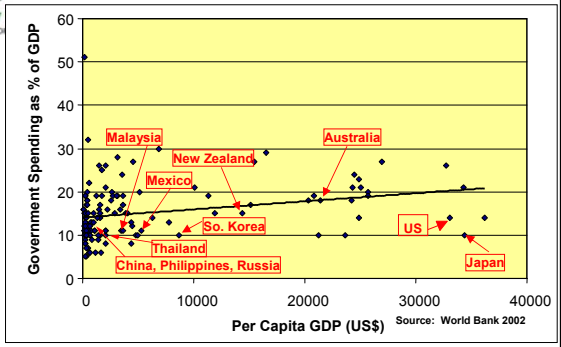
1) Why energy efficiency in the government sector?
2) Program strategies and examples
3) Lessons learned
4) Effective international collaboration
   – a challenge to this workshop

WHY ENERGY EFFICIENCY IN THE PUBLIC SECTOR?

- Large fraction of GDP (10-20%)
- Biggest energy user
- Biggest buyer of energy-using products
- Untapped savings potential
- In the past, energy prices often subsidized ("free"?)

Opportunity to lead the rest of the market!

Government Sector: 10-20% of GDP in both Industrial & Developing Countries



Government as a Market Leader

" (c) Promote public procurement policies that encourage development and diffusion of environmentally sound goods and services..."

—WSSD Johannesburg
Plan of Implementation, Chapter III. "Changing Unsustainable Patterns of Consumption and Production"

Benefits of Public Sector Energy Management

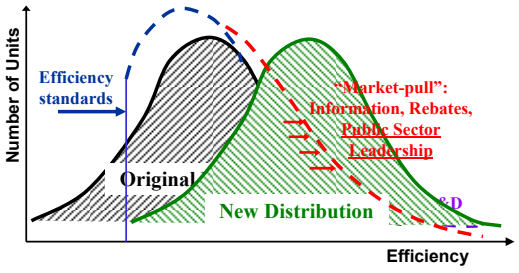
- **Lower government operating costs**
- **Example for consumers and enterprises**
- **Slower energy demand growth**
  - frees capital and electricity capacity for economic growth
  - reduces pollution and greenhouse gases
- **Market response to government demand**
  - volume + competition ⇒ lower prices
- **Job creation** (direct + indirect)
- **"Demand-pull":** new technology, products, and services

Energy and Cost Savings: U.S. Example

- **Energy use in government facilities:**
  - All levels of government spend:
    - US$16 billion/year on *energy*
    - US$60 billion/year for energy-using *products*

  = 10-15% of all energy and product purchases (public and private)
- **Federal programs, led by USDOE/FEMP**
  - 24% energy savings/sq. meter (2000 vs 1985)
  - 35% lower utility costs (buildings and facilities)
- **Energy efficient products save 10%-50%**
  - FEMP purchasing criteria can save US$ 1 billion/ year (all public agencies including state, local)
  - Reduce greenhouse gases: 4+ million tons C/yr.
  - Stimulate market for low-standby products

Government Leadership Helps Transform the Market



PePS: Promoting an Energy-efficient Public Sector

- **Collaboration:**
  - LBNL, Alliance to Save Energy, ICLEI, IIEC …
- **Objectives:**
  - Recognition of government sector energy efficiency as a core element of energy policy (with information, incentives, standards, etc.)
  - Achieve significant, measurable energy and cost savings for government agencies
  - Use public sector buying power and leadership to transform markets
- **Focus on developing countries:**
  - Asia/Pacific, Latin America, E. Europe, Africa/Middle East

PePs (continued)

- **Address opportunities at all levels of government: national, state/provincial, municipal**
  - Government offices and vehicle fleets
  - Hospitals, schools, public housing
  - Public transport, water systems, and infrastructure (street lighting, traffic signals …)
  - Public enterprises
- **Strategy:**
  - Information and decision tools: PePS Guide, Website, savings estimation software
  - Training, workshops, conferences
  - Pilot Projects
  - [International professional exchanges]

PePS International Survey Results

Program Categories:

- **Policies and Targets**
- **Energy-Saving Capital Investments**
- **Facilities Operation and Maintenance**
- **Purchasing Energy-Efficient Products**
- **Technology Demonstrations**

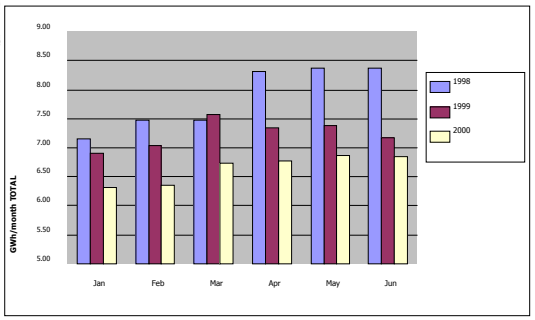
Program Examples: Policies and Targets

Policies and Targets	Country Examples
• Goals and tracking • Government organization • Budget policies	**Argentina** **Ecuador** **India** **Korea** (voluntary target) **Mexico** **Philippines** **U.S., others...**

Program Examples: Energy-Saving Capital Projects

Capital Projects	Country Examples
• Energy audits • Retrofit projects • Financing • Standards + building guidelines • Tools and training • Efficient public services (water supply + treatment, street lighting, LED traffic signals)	**Mexico:** Web-based energy audits, lighting retrofits, oil refinery efficiency **Brazil:** Building + street light retrofits, water systems efficiency **Bulgaria, Hungary, Romania:** Revolving loans, ESCO funds municipal **Canada:** ESCO-funded retrofits, O&M, employee training **Colombia + Argentina:** Street lights **Korea:** efficient new buildings + rail **Ukraine + Russia:** audits/retrofits of hospitals + other buildings **U.S.:** ESCO + utility contracting, sustainable new buildings

Mexico Case Study: Saving Energy in Federal Buildings



Mexico Public Buildings: Monthly Energy Use – 1998, 1999, 2000.

Canada Example: Federal Buildings Initiative (FBI)

Program Highlights

- Performance contracting to save energy and reduce Greenhouse Gas emissions in federal government buildings
- Established 1991 – First project 1993
- 70 energy efficiency contracts in place that cover some 7,000 buildings.
- 200^{+} million private sector investments
- $27 million in annual savings
- 31% GHG reductions; 15-20% to date

Natural Resources Canada | Ressources naturelles Canada — Canada

New Public Buildings: Energy-Efficient and Sustainable

- **U.S. "LEED" rating ("Leadership in Energy and Environmental Design")**
- **Developed by US Green Building Council** (http://www.usgbc.org/Docx/LEEDdocs/LEED_RS_v2-1.pdf)
- **Over 100 buildings certified (35% government)**
- **Over 1,200 buildings registered (55 federal)**
- **10 States, 19 municipalities, 7 federal agencies have sustainable building policies using LEED**
- **Proposed policies: 30% more energy- efficient than building codes**

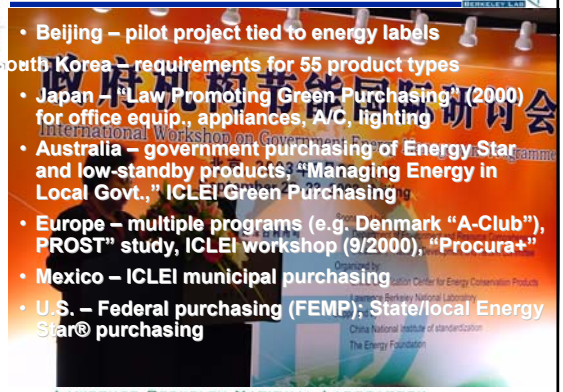
Program Examples: Operation and Maintenance

Facilities O&M	Country Examples
• Building system commissioning • Metering/monitoring, benchmarking • Facility manager training & certification • Incentives and recognition • Employee education • Vehicle fleet operation: tire inflation, ridesharing or transit, teleconferencing	**Dominican Republic:** goals, training, employee awareness **Mexico:** building O&M, operator training, 'Ports of Attention' for outreach, technical assistance **Thailand:** mandatory measures in public buildings **U.S.** + others…

Program Examples: Buying Energy-Efficient Products

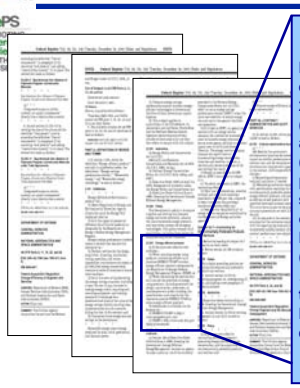
Purchasing	Country Examples
• Efficient appliances + equipment • Based on product testing + labeling • Guide specifications for construction • Government fleets • Link to environmental products + "green power"	***China:*** *pilot project + scale-up* **European Union:** coordinated purchasing (PROST) **Japan, Korea, Philippines** **South Africa:** office equipment pilot **Mexico**: proposed pilot project **U.S.:** federal, state, municipal purchasing (Energy Star labels)

Beijing International Workshop on Government Energy Management



- Beijing – pilot project tied to energy labels
- South Korea – requirements for 55 product types
- Japan – "Law Promoting Green Purchasing" (2000) for office equip., appliances, A/C, lighting
- Australia – government purchasing of Energy Star and low-standby products; "Managing Energy in Local Govt.," ICLEI Green Purchasing
- Europe – multiple programs (e.g. Denmark "A-Club"), PROST" study, ICLEI workshop (9/2000), "Procura+"
- Mexico – ICLEI municipal purchasing
- U.S. – Federal purchasing (FEMP); State/local Energy Star® purchasing

Federal Purchasing Policy



ATTENTION!!! PROCUREMENT OFFICIALS

FAR Part 23.203 now REQUIRES energy efficient purchasing:
23.203 Energy-Efficient products.
(a)If life-cycle cost effective, and available,
(1) When acquiring energy efficient products, contracting officers should purchase ENERGY STAR™ or other energy efficient DOE/FEMP designated products."
(2) When contracting for services … the specification must require that the contractor provide ENERGY STAR™ or other energy efficient products.
http://www.eere.energy.gov/femp/procurement/

Policy Adoption: New York State

Executive Order 111 - June 10, 2001

"…Effective immediately, State agencies and other affected entities shall select ENERGY STAR energy-efficient products when acquiring new energy-using products or replacing existing equipment. NYSERDA shall adopt guidelines designating target energy efficiency levels for those products for which ENERGY STAR labels are not yet available…

Setting Priorities for Government Purchasing

- **Significant energy use**
- **Large government purchasing volume**
- **Potential energy/cost savings**
  - range of efficiencies (lowest to highest)
- **Energy testing and rating method**
- **Product efficiency data available**
  - product lists
  - energy ratings/labels
  - "quality-mark" (e.g., Energy Star™)
- **Several suppliers**
  - price, availability, domestic sources (?)
- **Consistency with other programs**

Lessons Learned: Purchasing Programs

1) Needed:
- clear policy and regulations/laws
- communicated repeatedly to buyers (and sellers)

2) Make the efficient product the *easiest* to buy:
- efficiency as the default choice
- use first-cost to choose *among* efficient products

3) Keep the guidance simple: *levels, lists, labels !*

4) Coordinate purchasing with other programs:

Market transformation requires common technical criteria for energy efficiency.

5) Seek active private sector involvement
- Manufacturers, vendors, ESCOs, architects
- Clear, consistent efficiency requirements (lead-time when updating)

Overcoming Bias to Low First-Cost

Life-Cycle Cost Barriers

- Information (energy savings *vs* price)
- Staff time, effort, expertise
- Procurement rules
  (or "perceived" rules, common practice!)
- Budget constraints
- Safest choices:
  - replace-in-kind or
  - lowest-price
- NIMB (= "Not In My ***Budget****"!*)

Life-Cycle Cost Solutions

1) Clear information, easy to find
2) Make $ savings more obvious;
   simplify LCC calculations
3) Lower the cost of efficient products:
   - volume + competition
   - common technical specs
4) Finance the first-cost; capitalize future savings
5) Reverse the burden of proof!

Needed: A New "Rule of Thumb"

OLD (the "safe" choices):

"Buy the lowest first-cost product."

or

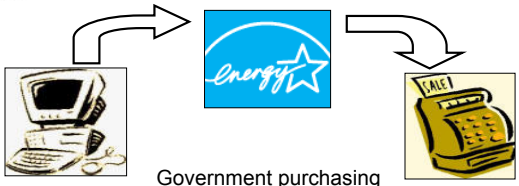
"Replace with the same product."

NEW:

"Buy the efficient product unless you can show that a less efficient product is cheaper on a life-cycle basis!"

Energy-Efficient Purchasing and Energy Labels

Labels make it easier for buyers to select efficient products



Government purchasing encourages private sector support for energy labels (adds value to labeled products!)

Summary of PEPS Results

Most common programs:

- Savings targets/goals
- Designate energy manager (or committee)
- Building energy audits, O&M
- Lighting + equipment retrofits (loans, ESCO funds)

Overlooked opportunities:

- Energy-efficient purchasing
- Energy metering + facility benchmarking
- Energy-efficient new public buildings
- Recognition and financial incentives
- Partner with private enterprise
- *Intergovernmental and international collaboration*

Building-Blocks of Public Sector Energy Efficiency

LESSONS LEARNED

Features of Successful Programs:

- **Policy Adoption**
- **Program Implementation**
- **Continuous Improvement**
- **Market Transformation**

Lessons: Policy Adoption and Program Implementation

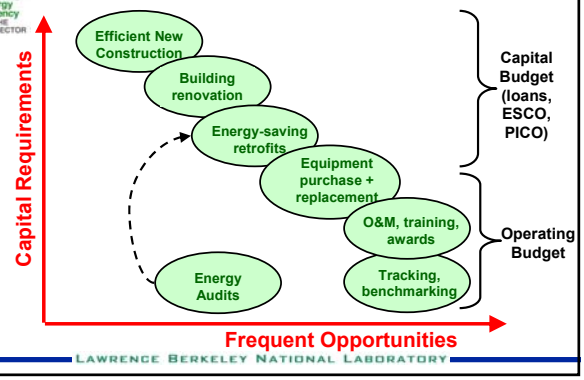
1) Policy Adoption

- Support of top officials
- Clear policy statement (law, Exec. Order, other)
- Regulations/guidelines make policy operational
- Quantified goals: energy, cost savings, CO_2 …

2) Program Implementation

- Assign responsibilities (including lead or coordination role)
- Allocate needed resources (staff & funding)
- Provide information, outreach, staff training
- Linkage: other programs, *non*-energy goals, inter-governmental cooperation

Program Portfolio Includes High-Cost and Low-Cost Measures



Lessons: Continuous Improvement and Market Transformation

3) Continuous Improvement

- Track and report progress against goals
- Create organizational incentives (retained savings) or sanctions
- Recognize "best-practice"
- Regularly review and update program criteria
- Provide for quality control; encourage technology innovation

4) Market Transformation

- Steps to broaden impact beyond public sector
- "Exit strategy"

Government Leadership and Market Transformation

"Good energy management starts from the top.

If the public sector leads, the architects, engineers, manufacturers – and ultimately the public – will follow."

– David Garman, Assistant Secretary
Energy Efficiency and Renewable Energy,
US DOE

INTERNATIONAL COLLABORATION: A Challenge to Workshop Participants

1) Why?

- Share the effort
- Test different approaches
- Share results, lessons learned
- ***Aggregate*** *demand and* ***transform*** *markets!*
  … for efficient products *and* services

2) How? (examples)

- APEC as a forum to share information
- Harmonization of government purchasing criteria to create regional markets
- Regional approach to green buildings, commissioning, designer training & certification
- Other areas where markets span national borders?

For More Information

- **Promoting an Energy-efficient Public Sector**
  www.pepsonline.org
  - Country database: programs, policies, case studies, model policies/laws/ guidelines
  - PePS Program Guide [late 2004]
    "Efficient Energy Use in the Public Sector"
  - Pilot projects: technical assistance + training

Please share program information and contacts

- **Jeffrey Harris, LBNL**
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  +1 202 646 7800 fax
  JPHarris@lbl.gov

COMMENTS AND QUESTIONS ??

Public Leadership to Transform Markets (Can the Tail Really Wag the Dog?)