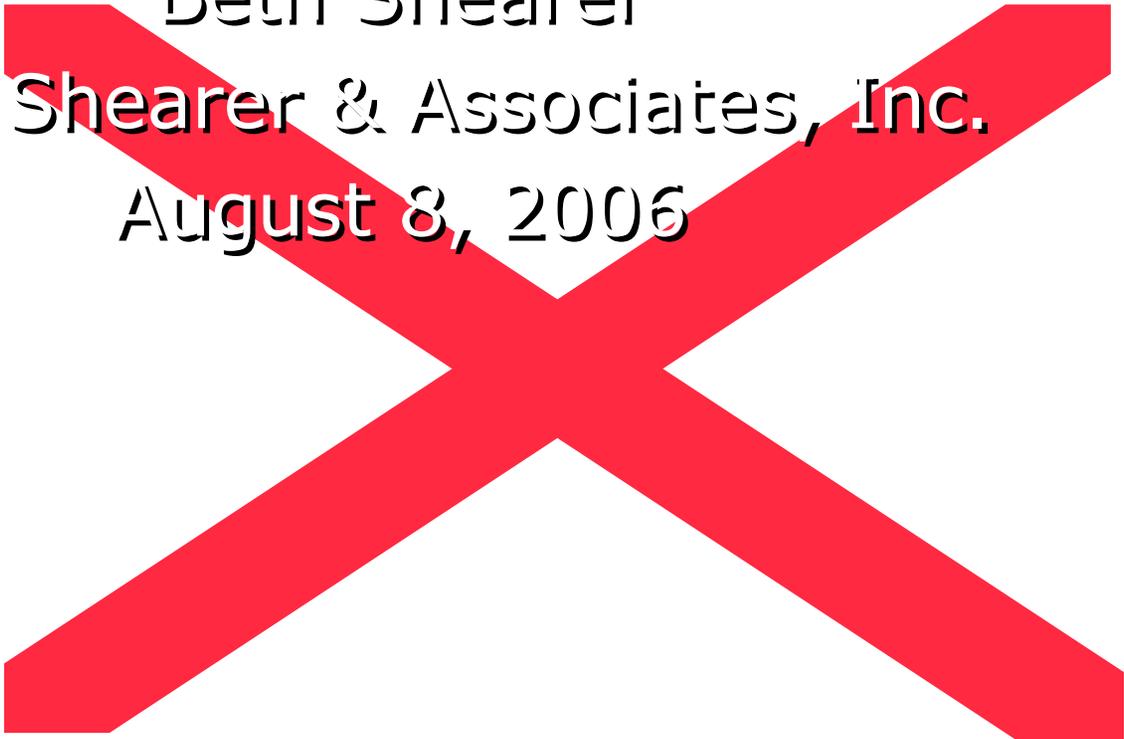

Market Transformation: How the Public Sector Helps

Beth Shearer

Beth Shearer & Associates, Inc.

August 8, 2006





WHY ENERGY EFFICIENCY IN THE PUBLIC SECTOR?



Pit Stop:
Timely
Procurement
Topics

- Large fraction of GDP (10-20%)
- Biggest energy user
- Biggest buyer of energy-using products
- Untapped savings potential

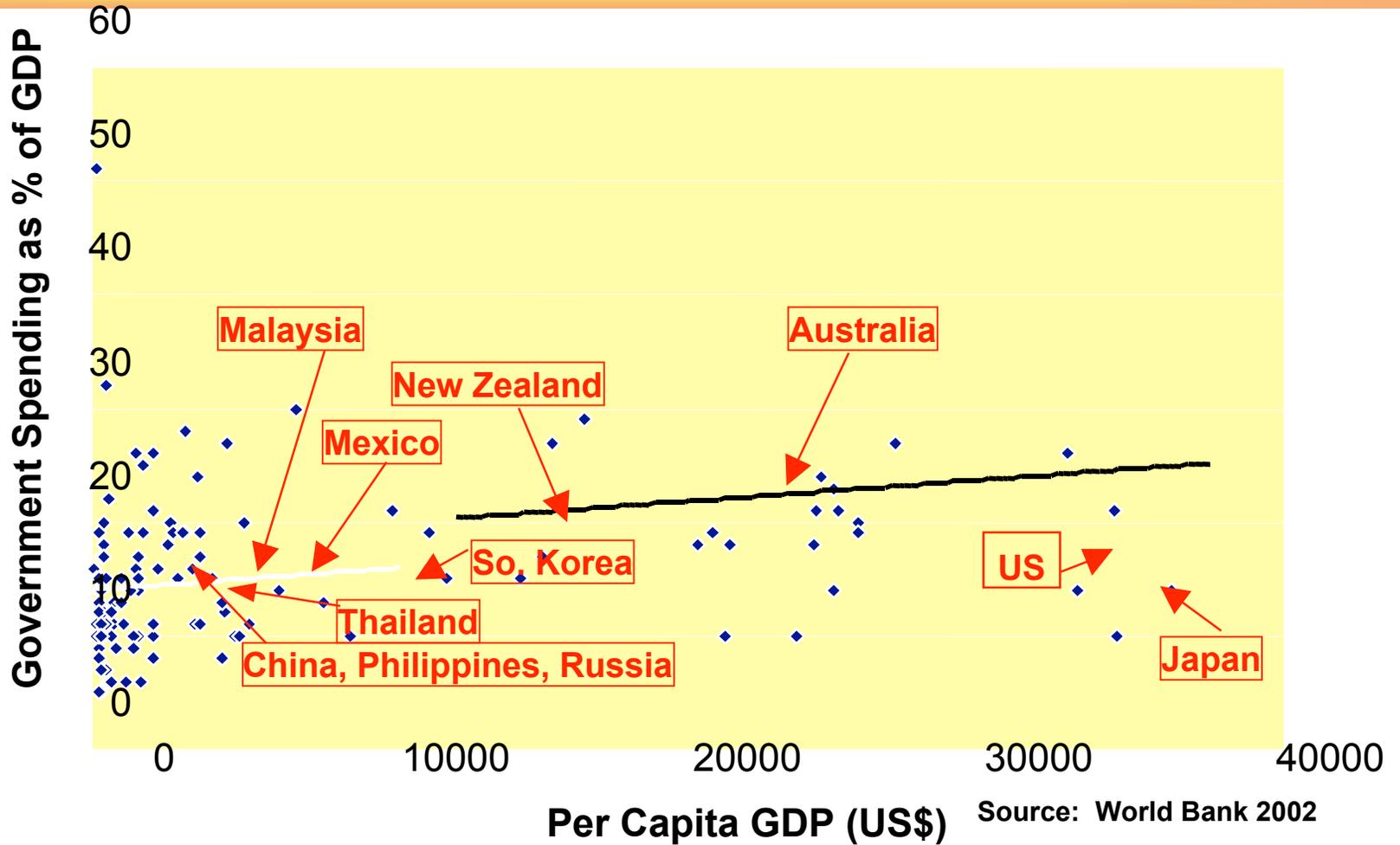


Opportunity to lead the rest of the market!

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



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Time
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Topi





The U.S. Federal Energy Management Program



Pit Stop:
Timely
Procurement
Topics

The U.S. Federal government is the largest energy user in the U.S.:

\$11.3 billion Federal annual energy bill

- 500,000 facilities
 - Buildings: \$4.0 billion
 - Energy Intensive Operations: \$0.7 billion
 - Exempt Buildings: \$0.4 billion
- Vehicles & Equipment: \$6.2 billion
- Federal floor space 1.4% of national residential, commercial, and industrial space



Government Leadership Helps Transform the Market



Pit Stop:
Timely,
Procurement
Topics

Number of Units

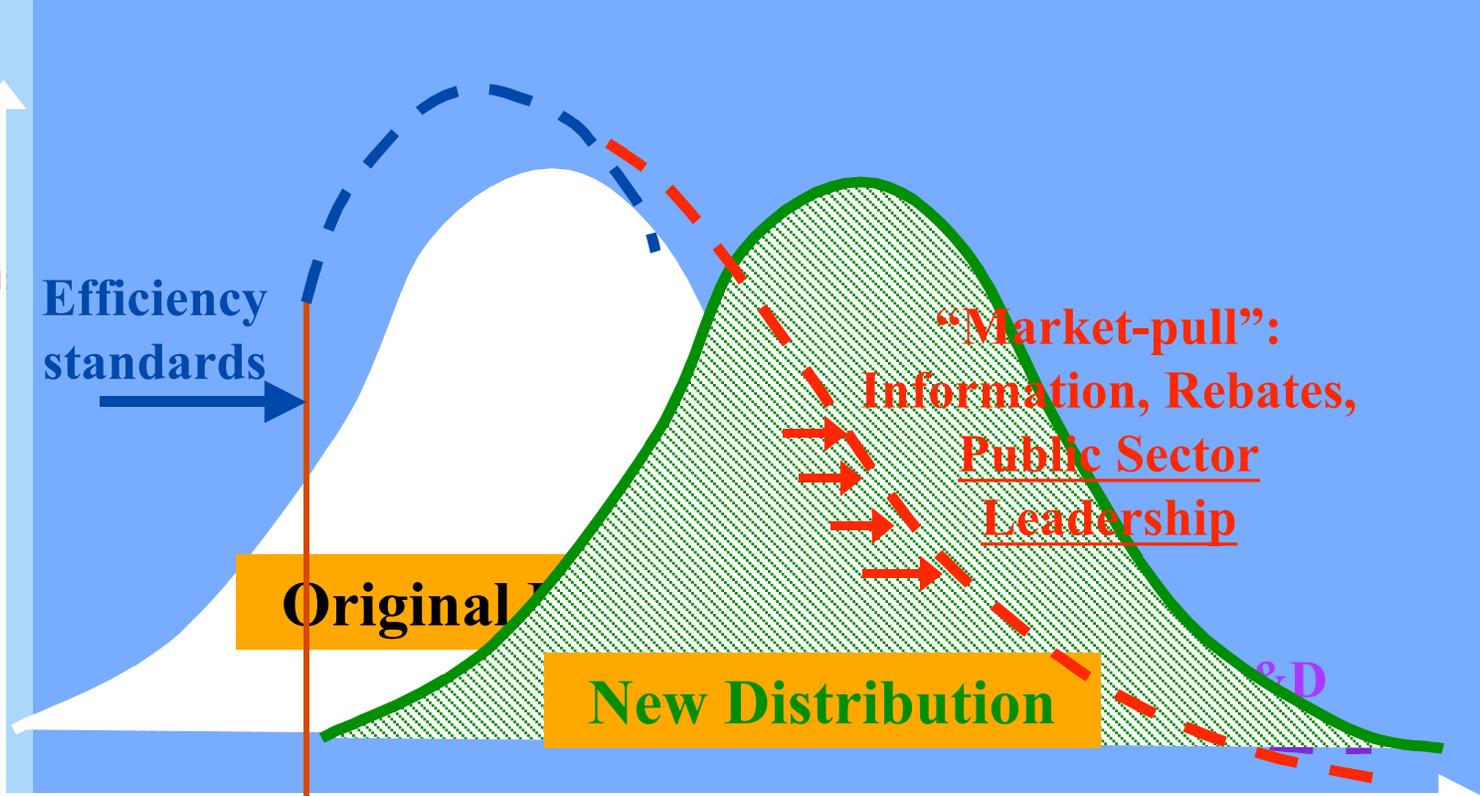
Efficiency standards

Original Distribution

New Distribution

“Market-pull”:
Information, Rebates,
Public Sector
Leadership

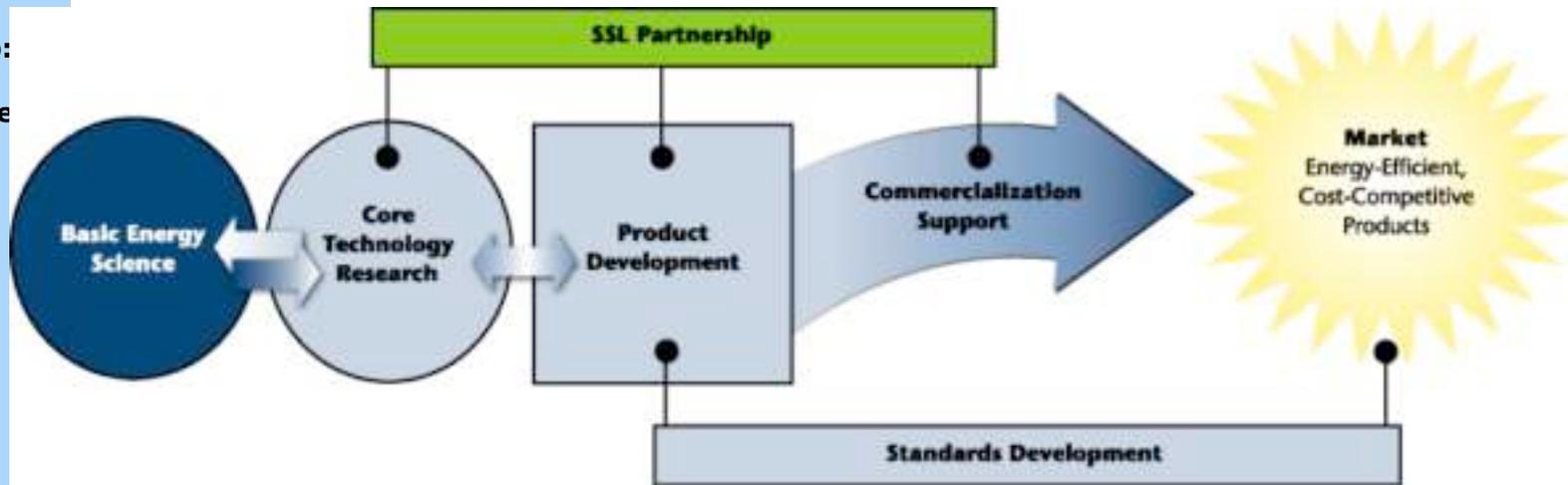
Efficiency



DOE Solid-State Lighting 5 Thrust – Total Program



**Pit Stop:
Timely
Procurement
Topics**



Guiding technology advances from laboratory to marketplace



Public Sector Market Transformation Tools



**Pit Stop:
Timely
Procurement
Topics**

- Research and development
- Laboratory and field testing
- Codes and standards
- Product recommendations and labeling
- Technical information and best practices guides
- Analytical software tools and data bases
- Financing assistance



**Pit Stop:
Timely
Procurement
Topics**

DOE's Building Energy Codes Program (BECP)

- Promotes stronger building energy codes through work with Federal agencies, national code organizations, the building industry, and state and local officials
- Provides financial assistance, technical assistance, and training to support state energy code activities
- Free compliance software: *COMcheck*, *REScheck* at <http://www.energycodes.gov/>
- Since 1991, BECP has delivered cumulative energy cost savings exceeding \$4.7 billion



Appliances and Commercial Equipment Standards



**Pit Stop:
Timely
Procurement
Topics**

DOE Program

- Develops test procedures
- Develops minimum efficiency standards for residential and commercial appliances by rulemaking
- Uniform Federal standards preferable to a variety of state standards
- http://www.eere.energy.gov/buildings/appliance_standards/



Labeling: ENERGY STAR®



**Pit Stop:
Timely
Procurement
Topics**

- Voluntary labeling program
- Sponsored by the U.S. Department of Energy (DOE) and the U.S. Environmental Protection Agency (EPA).
- In 2001 alone, ENERGY STAR saved
 - 80 billion kilowatt hours and
 - More than 10,000 megawatts of peak power
 - Enough to power 10 million homes in the United States for one year.
- The cumulative energy savings of all ENERGY STAR qualified appliances sold to date could light all the homes in Washington, DC, for 40 years.



Energy-Efficient Purchasing and Energy Labels

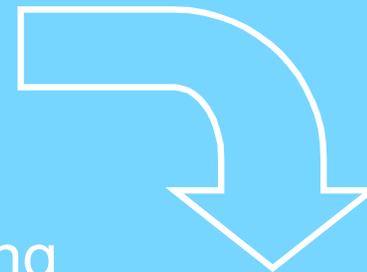
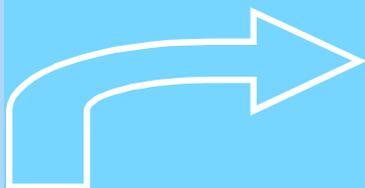


**Pit Stop:
Timely
Procurement
Topics**

Labels make it easier for buyers to select efficient products



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





USDOE FEMP and ENERGY STAR: 45+ Product Types



**Pit Stop:
Timely
Procurement
Topics**

Lighting

- Fluorescent fixtures, ballasts, tubes
- Industrial fixtures (HID)
- Exit signs, CFLs

- Office Equipment (ENERGY STAR®)
- Non-residential heating and cooling equipment
- Commercial refrigeration, cooking, dishwashing
- Electric motors and transformers
- Residential HVAC, appliances, lighting
- Water-saving devices
- Roofing and windows
- Low standby power products





Public Sector Market Transformation Tools



**Pit Stop:
Timely
Procurement
Topics**

- Research and development
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- **Technical information and best practices guides**
- Analytical software tools and data bases
- Financing assistance



Technical Assistance provided by FEMP



**Pit Stop:
Timely
Procurement
Topics**

- Design Assistance
- DER/CHP
- Renewable Energy /Green Power
- Labs21
- Industrial Facilities
- ALERT Assessments
- Commissioning
- Operations and maintenance
- Metering
- Water management best practices



Technical Information: Training



**Pit Stop:
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Topics**

- Federal Energy Management Program (FEMP)
 - On-line and instructor-led courses
 - Training locator:
http://www1.eere.energy.gov/femp/services/training_locator.html
- Department of Defense
- Association of Energy Engineers
- Universities and colleges



**Pit Stop:
Timely
Procurement
Topics**

- For energy managers
 - Basics of building energy systems
 - Building energy codes and applicable professional standards
 - Energy accounting and analysis
 - Life-cycle cost methodology **
 - Fuel supply and pricing
 - Instrumentation for energy surveys and audits

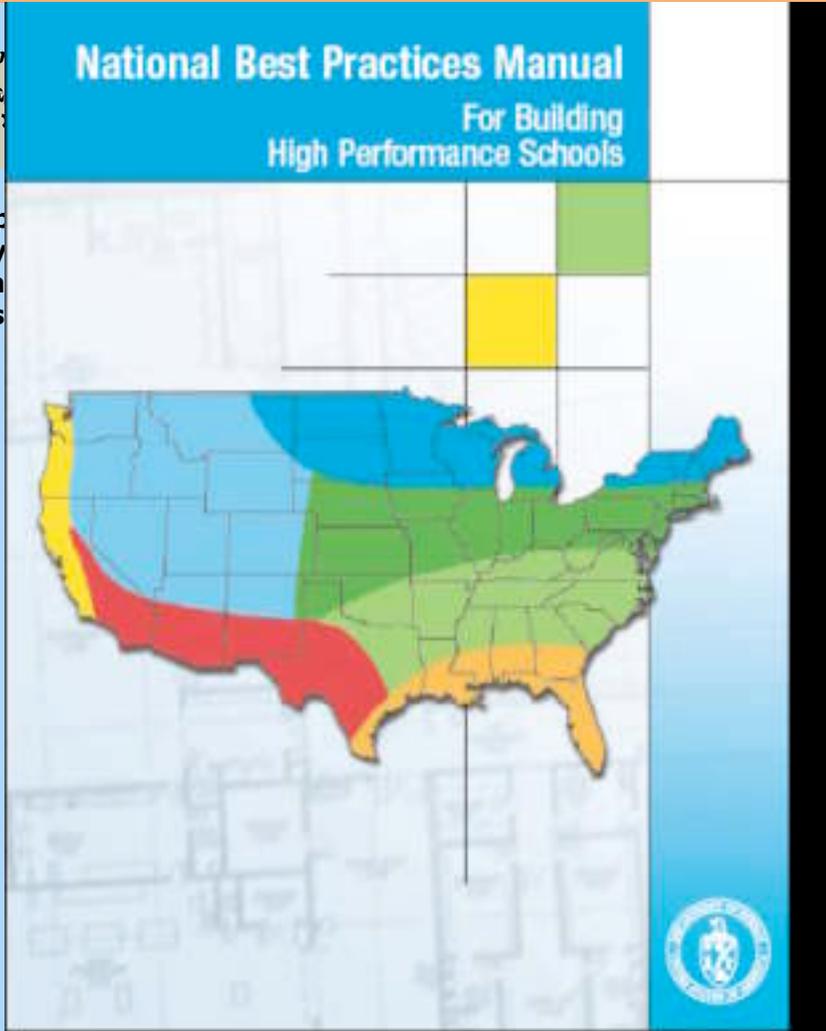
http://www1.eere.energy.gov/femp/services/training_sugcurricula.html



Technical Information and Best Practices Guides



Pit Stop
Timely
Procurement
Topics





Technical Information and Best Practices Guides



**Pit Stop:
Timely
Procurement
Topics**



Go to the web:

- <http://www.energy.gov/>
- <http://www.epa.gov/>
- <http://techval-energy.nfesc.navy.mil/>



Public Sector Market Transformation Tools



**Pit Stop:
Timely
Procurement
Topics**

- Research and development
- Laboratory and field testing
- Codes and standards
- Product recommendations and labeling
- Technical information and best practices guides
- Analytical software tools and data bases
- Financing assistance



Analytical Software Tools and Data Bases



**Pit Stop:
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Topics**

- **Building Life Cycle Costing (BLCC)** –
www.eere.doe.gov/femp/information/register_blcc.cfm
- **Energy Plus** -
www.eere.energy.gov/buildings/energyplus/
- **FEDS 5.0** -
www.eere.energy.gov/femp/information/download_feds.cfm
- **FRESSA 2.55** -
www.eere.energy.gov/femp/technologies/renewable_software.cfm
- **Watergy 3.0** -
www.eere.energy.gov/femp/information/download_watergy.cfm



Analytical Software Tools and Data Bases



**Pit Stop:
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Procurement
Topics**

- Building Energy Software Directory:
http://www.eere.energy.gov/buildings/tools_directory
- High Performance Buildings Data Base:
<http://www.eere.energy.gov/buildings/highperformance/>



Public Sector Market Transformation Tools



Pit Stop:
Timely
Procurement
Topics

- Research and development
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- Codes and standards
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- Technical information and best practices guides
- Analytical software tools and data bases
- **Financing assistance**



Financing Assistance



**Pit Stop:
Timely
Procurement
Topics**

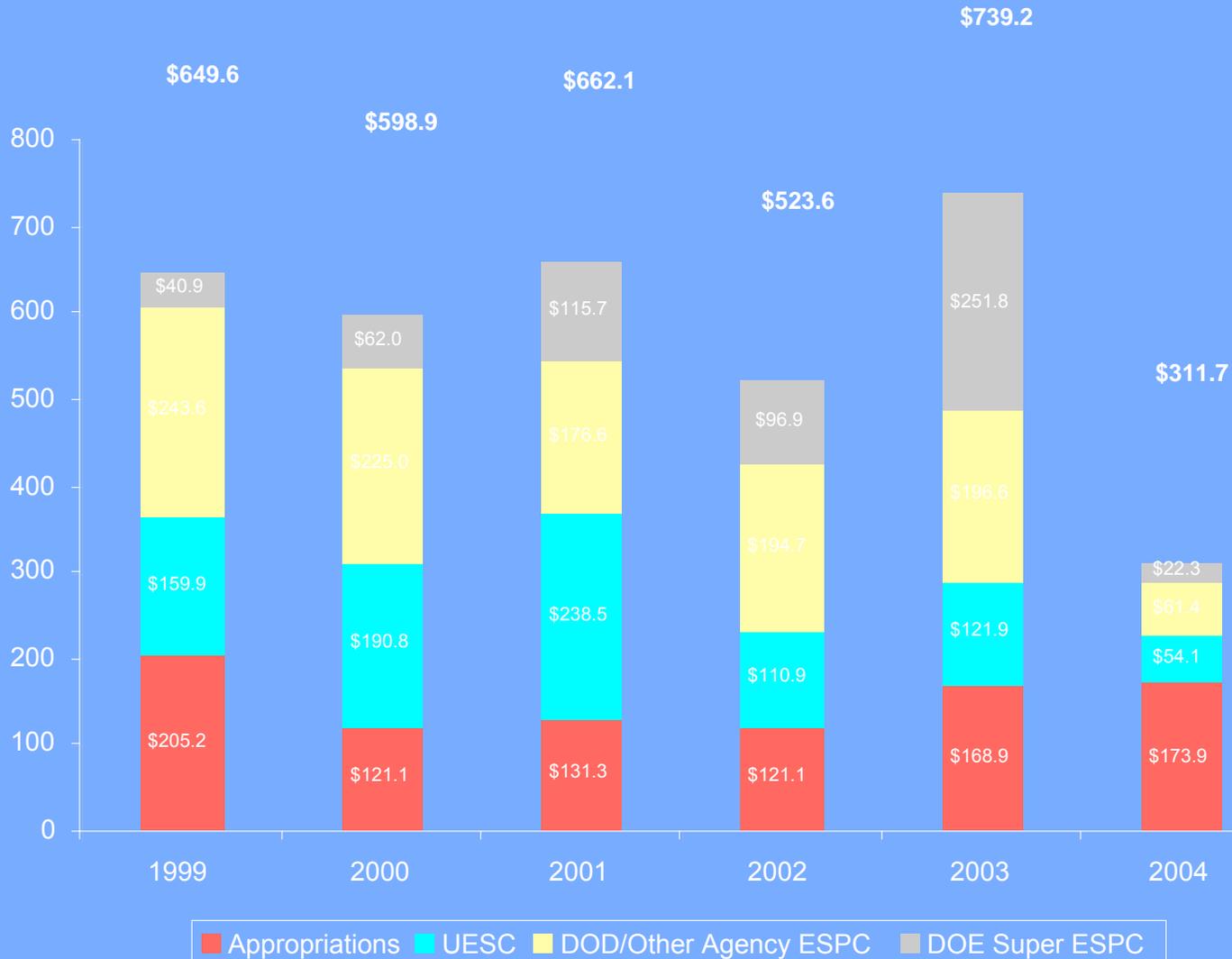
- Energy Savings Performance Contracts (ESPCs)
- Utility Energy Savings Contracts (UESCs)
- Appropriations
- Public Benefits Funds



Alternative Financing Funds 74% of Efficiency Improvements in US Federal Buildings



**Pit Stop:
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Procurement
Topics**



Source: FEMP



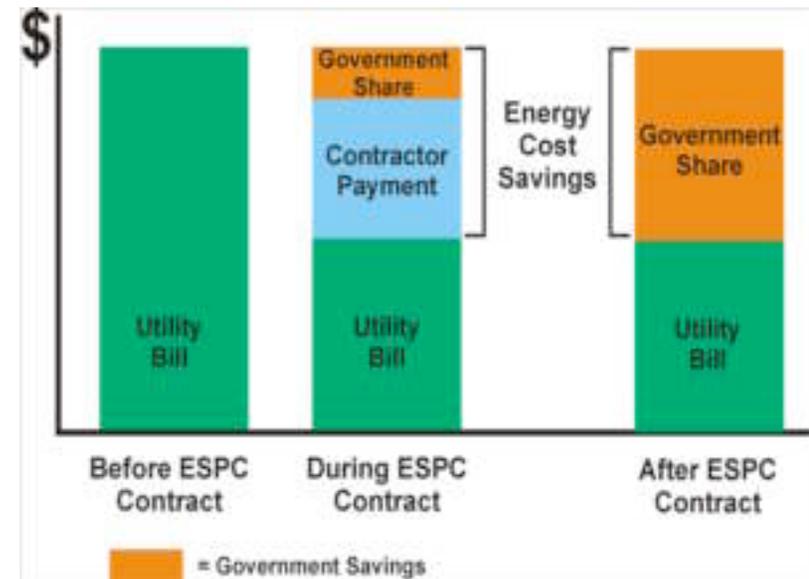
**Pit Stop:
Timely
Procurement
Topics**

- ESPCs reallocate the Government's utility bill

- Pay a lower utility bill
- Pay the contractor
- Achieve cost savings for the government

- Benefits of ESPCs:

- Sites reduce their energy use/\$
- Improves the environment
- Saves taxpayer dollars





**Pit Stop:
Timely
Procurement
Topics**

- Regulated utility is the preferred provider
- Utility pays upfront costs
- Utility warrants equipment performance
- Utility is paid from the savings



Market Transformation: An Example Putting the Tools to Work

GHP retrofit of 4000 homes at Fort Polk, LA, 1996. Reduce kWh use 33%, eliminate natural gas use altogether. FEMP roles included:

- 1) Validate field performance and savings (ORNL);
- 2) Promulgate results - Federal Energy Showcase Award 1997.

Issue GHP Construction guide specifications 1999

Outcome: More than \$100M investment in GHPs in Fed facilities 2001-2002, > than total investment in previous 10 years

Geothermal Heat Pump



Initial Information: Federal Tech Alert 1995

Alternative Financing. FEMP issues Technology-Specific Super ESPC in 1998 for GHP. Utilities offer GHP financing.

Emerging Technologies

Whole Building Diag., Fume Hood, Residential Heat Pump Water Heater

Electrochromic Windows



Solid State Lighting



1990

2000

2010



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



**Pit Stop:
Timely
Procurement
Topics**





**Pit Stop:
Timely
Procurement
Topics**

Questions?