

Why Regulators (and everyone else) Should Care About Energy Efficiency

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A little background about the Regulatory Assistance Project

- RAP is a nonprofit organization providing technical and policy assistance to government officials on energy and environmental issues.
- RAP also provides educational assistance to consumer and environmental groups, utilities and business associations.
- RAP principals and senior associates all have extensive regulatory experience.
- We are funded by foundations and federal agencies.
- We have worked in nearly every state and many nations throughout the world.

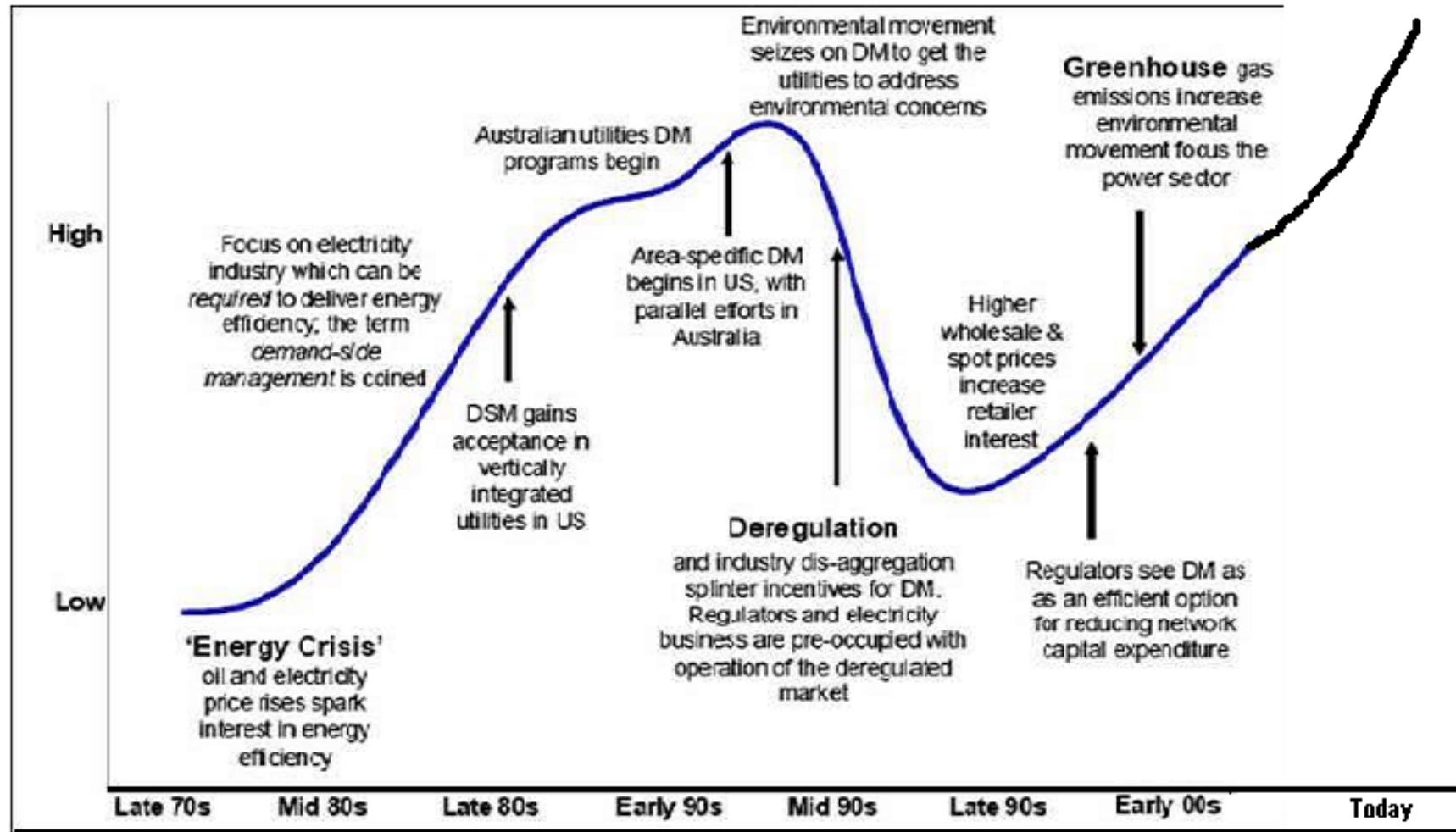
A little background about me . . .

- I have been a principal with the Regulatory Assistance Project for 2 ½ years, working largely in India
- I served five years as a Commissioner for the electricity and natural gas regulator for the State of Illinois, US. During my tenure, we:
 - Implemented the Illinois Smart Grid Collaborative
 - Implemented smart meter pilot programs to understand the benefits and costs of full-scale implementation
 - Launched the first residential real-time pricing program in the United States which now has over 25,000 customers.
 - Implemented an energy efficiency procurement process that will result in 2% of load being met by energy efficiency by 2015
- For ten years before that I created and managed demand and price response and energy efficiency programs in Chicago and suburbs. At its peak, we had nearly 350 MW of commercial, industrial and municipal load under contract.
- One of the programs that I was responsible for developing was the Chicago residential real time pricing pilot program that launched in 2001 and by 2006 – through action of the Illinois General Assembly - was made available to all residential customers throughout the state.

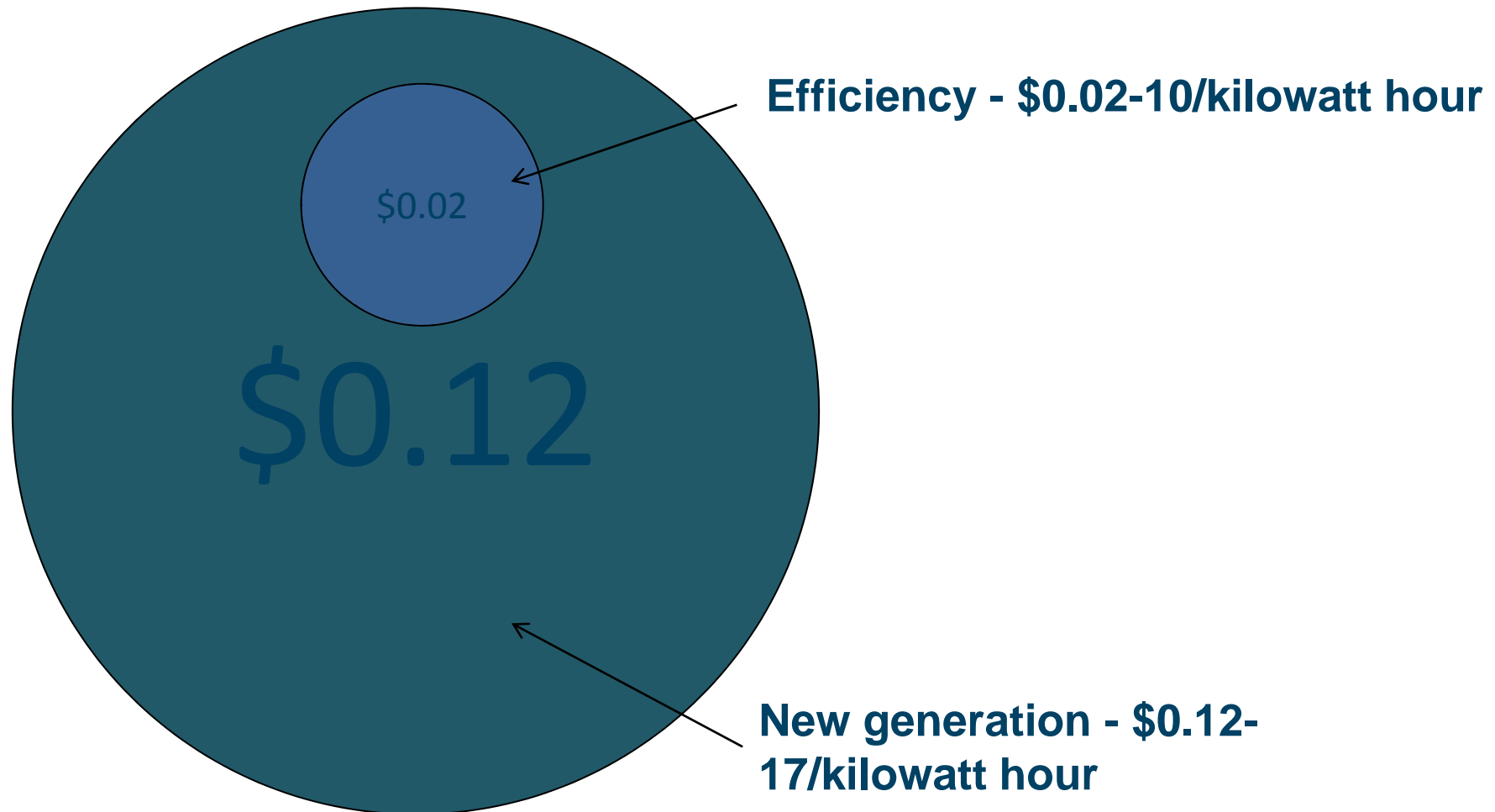
Regulators should care about energy efficiency because...

...the most affordable, reliable kwh is the kwh you don't consume

EE in US and EU: a brief history



An Indian Example: “efficiency” wins



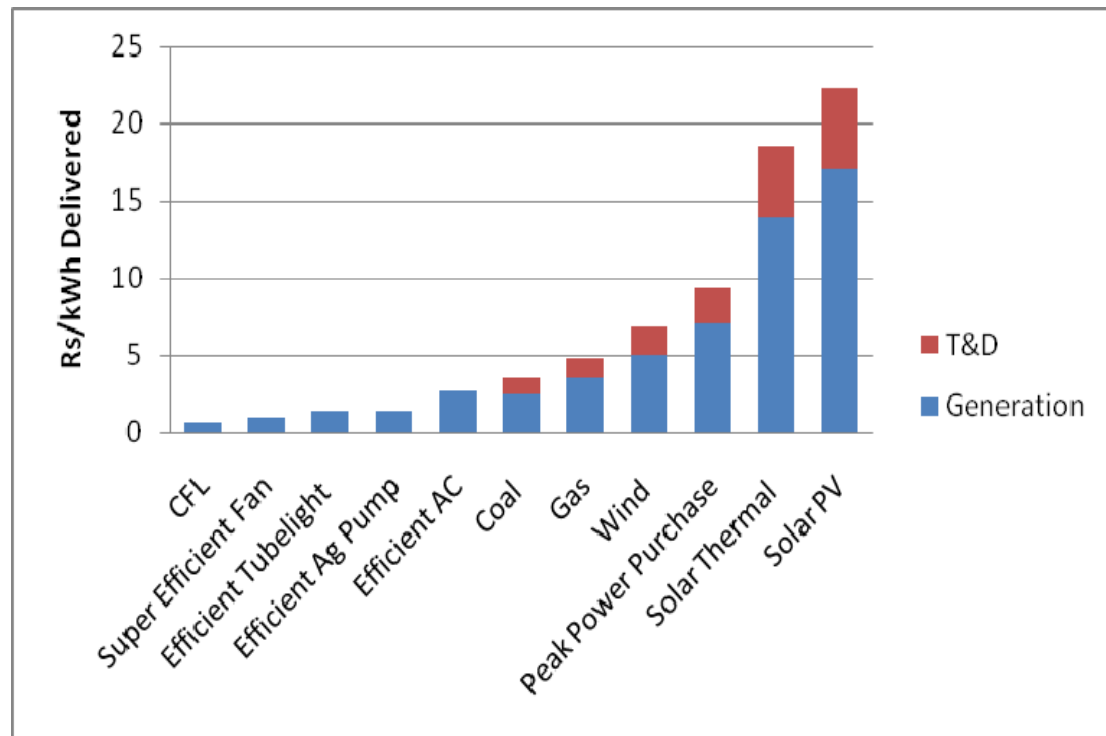
Capacity Building for Sustainable Energy Regulation in Eastern Europe and Central Asia

Cost of conserved energy is less than the cost of energy from new power plants

☐ An aggressive and successful energy efficiency initiative will result in lower bills for customers, lower operating costs for utilities, and lower environmental costs.

☐ This concept is used by governments and regulators in other countries to make resource choices.

Figure 1. Comparing Energy Efficiency with New Supply Side Options

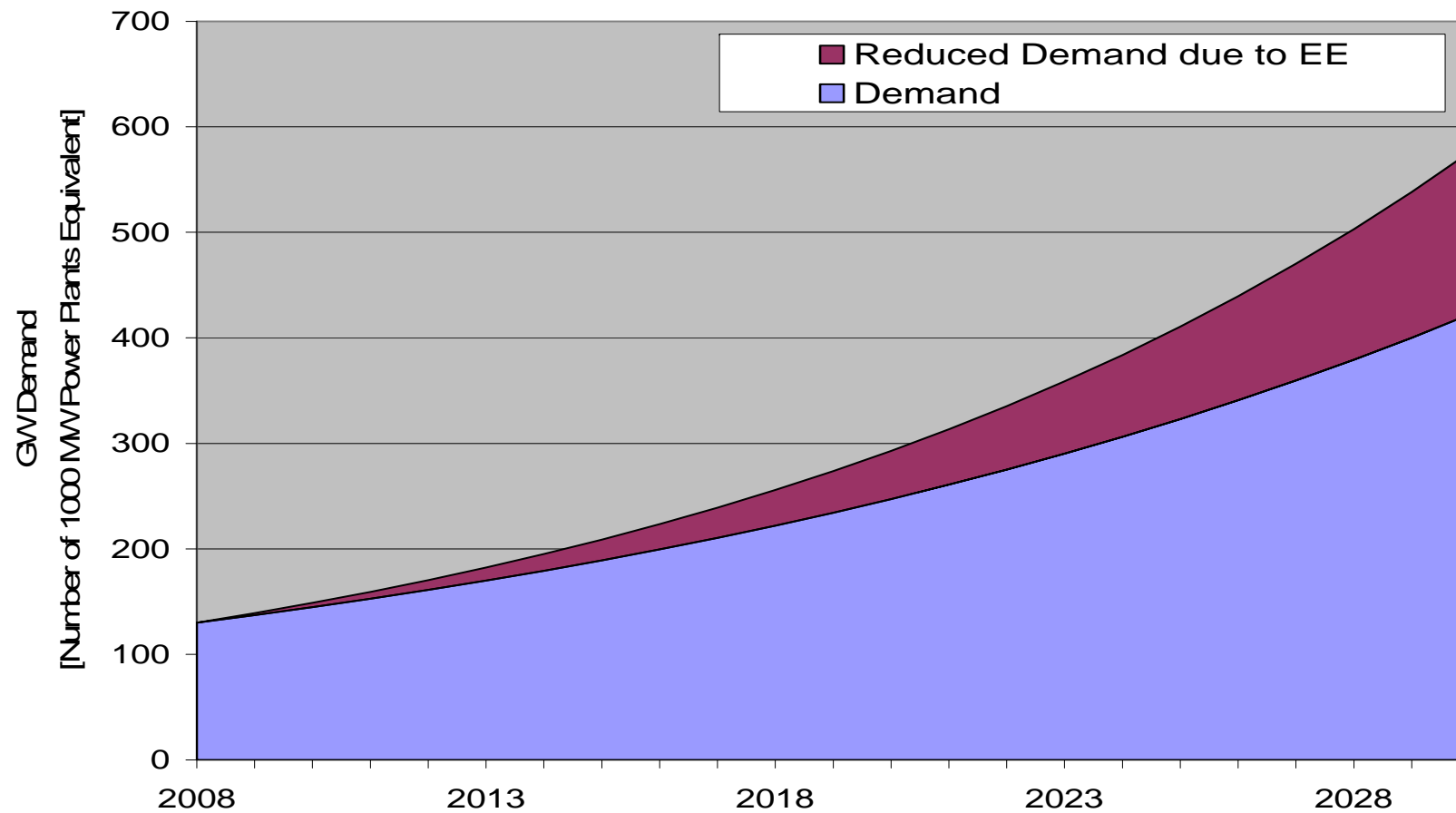


Note: Incremental cost estimates for energy efficiency options are based on typical retail price differences for efficient versus inefficient products, and apply to new purchase decisions and not retrofits. The numbers presented are only indicative. For retrofits, CCE is higher, however, in most instances it is lower than Rs 4/kWh. 7

Think of energy efficiency as a power sector resource.

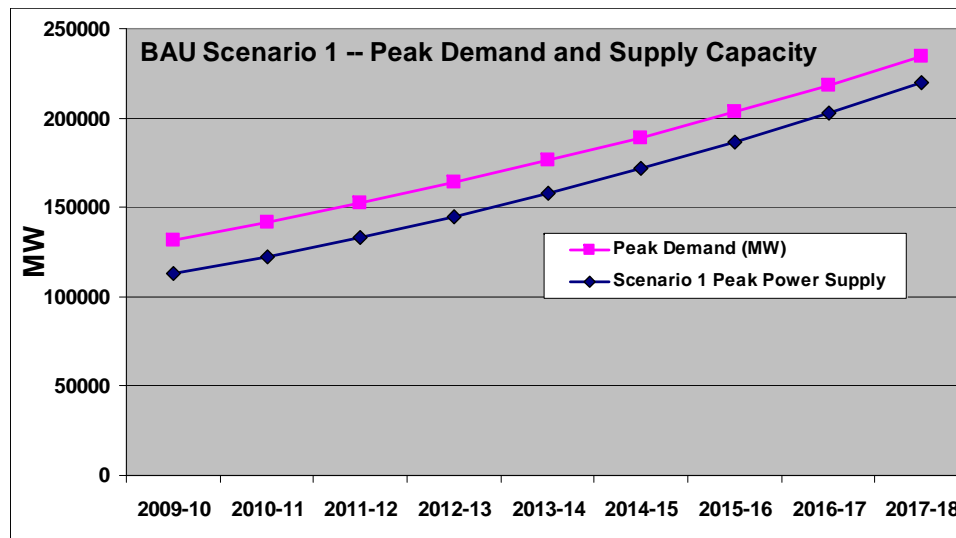
- EE can :
 - Reduce overall demand (or growth in new demand) while still reliably meeting system needs
 - At lower cost to the system, keep customer costs affordable, as compared to the alternatives

An example from recent analysis for India



Indian example, cont.

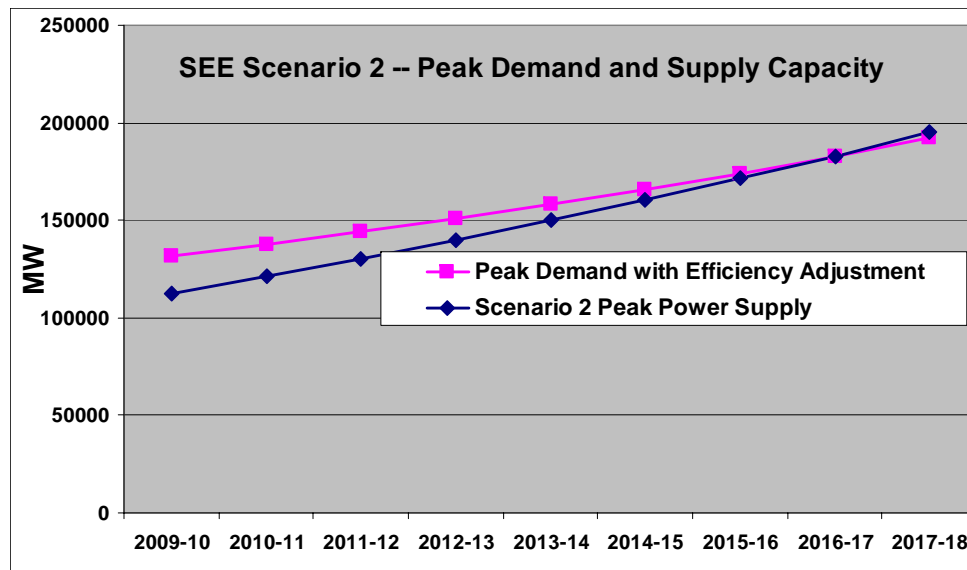
Scenario 1: Invest in supply capacity, but shortage continues



- Capacity addition can lead to decline in supply deficit from 14% in 2009 to 6% in 2017
- Capacity added from 2009-2017 – 141 GW
- Weighted average capital cost of power plants—\$992/kW
- Total capex 2009 to 2017 ~ \$82 billion

Indian example, cont.

Scenario 2: Invest in efficiency, eliminate shortage by 2017 – plus bonus ...



- Capacity addition reduces to 108 GW with \$64 billion investment
- Efficiency options add up to 42 GW with \$12 billion investment
- Total capex 2009 to 2017 ~ \$76B

Why markets alone won't deliver cost-effective energy efficiency measures

Energy efficiency that is cost effective from a societal perspective faces numerous barriers that government policies must work to overcome. Some of the most significant market barriers are:

- ❑ **Higher first cost:** Efficient buildings and equipment save money over their lifetime, but may cost more up front. Consumers generally value cash today over future savings, or just don't have the cash. This higher first cost serves as a major disincentive to customers to invest in energy efficient equipment and buildings.
- ❑ **Artificially low tariffs:** Tariffs often do not reflect the actual cost to the electricity sector of delivering electricity. Some tariffs are subsidized; most do not reflect peak prices. Result: true value of efficiency is not clear and consumers under-invest in EE.
- ❑ **Societal costs not included:** Tariffs also do not directly reflect environmental and social costs (pollution, displacement of people, mining accidents, scarce water use, etc.). Result: efficiency's value to society is understated, again leading to underinvestment in energy efficiency by both utilities and consumers.

Market barriers to cost-effective energy efficiency measures, cont'd.

- ❑ **Split Incentives:** These occur when the actor making the initial purchase or investment is not the same as the person who uses the building or equipment, or who pays the bills or long-term costs. There are many examples:
 - ❑ Builders and developers tend to install low first cost, less-efficient equipment and buildings with higher life cycle cost.
 - ❑ Non-metered tenants = no signal to use installed equipment efficiently or to purchase their own efficient equipment.
 - ❑ Tenants pay the bills = landlord with less incentive to install efficient equipment.
- ❑ **Lack of information:** This barrier may result from inadequate or misleading information presented by the manufacturer or supplier of the equipment, or from a consumer's inability to decipher the available information.
- ❑ **Product Performance:** Consumer uncertainty about product performance is a common cause of reluctance to purchase a new product. Often EE products that are new on the market suffer from lack of trust, limited product warranty or lack of credibility about a warranty. This issue is particularly acute where suppliers are unwilling to take the product back when its performance has been demonstrated to be poor.

Power companies, on their own, generally have no incentive (or capacity) to invest in energy efficiency

- If the companies are vertically integrated, they want to protect the value of their investment in generation and their flow of revenue
- If they are unbundled distribution companies, they generally get paid for delivering electricity, not for reducing the amount of electricity they deliver
- In either case, they probably don't have the staff or institutional knowledge to invest in energy efficiency

So where does that leave us?

- It's a conundrum:
 - Energy efficiency is readily available and is the cheapest and cleanest alternative to traditional power-plants
 - If deployed, it would lower consumer costs, increase system reliability and make regulators' lives easier
 - But customers, on their own, under-invest in it
 - And utilities (unless prompted) won't invest in it
- So what is to be done?

Policy Intervention is needed

- Either or both
 - Regulatory Intervention
 - If new power plants and system expansions are financed through ratepayers, energy efficiency can be an effective regulatory tool to reduce those costs
 - Government Intervention
 - If new power plants and system expansions are financed by tax payers, power ministries need to use energy efficiency as a tool to reduce those costs

Why should regulators be interested?

- In one form or another, regulators are generally charged – at a minimum - with meeting two goals
 - Reliable electricity
 - Affordable service
- Energy efficiency is an important and cost-effective tool to meeting both those goals

The two most common reasons why regulators say they are not interested...

- “Investment in energy efficiency raises customer prices”
 - While it is true that overcoming the “first cost” barrier will raise rates, regulators routinely commit ratepayer money for improved reliability (i.e. new power plants, long-term purchased power agreements, grid expansions and upgrades)
 - If investment in energy efficiency provides those same services at a lower total cost, aren’t customers better off?

The two most common reasons why regulators say they are not interested...cont.

- “Its not my job”
 - If the role of the regulator is to ensure that the power system provides reliable and affordable service, one could argue that making the system more efficient clearly falls within their purview.
 - Whether or not they have the necessary statutory authority is a fair question

Examples of Energy Efficiency Program Institutional Structures

EE Programs Funded thru	Utility Delivered	Government Delivered	NGO/Private Business delivered
Rate-payers	<ul style="list-style-type: none"> • California • Maharashtra 	<ul style="list-style-type: none"> • New York • China • Czech Republic 	<ul style="list-style-type: none"> • Oregon • Vermont
Tax-Payers	?	<ul style="list-style-type: none"> ▪ India Central Govt 	?

Relationship of Policy Proposals to Barriers to Efficiency

Barriers	First Cost	Low Tariffs	Societal Costs not Included	Lack of Info	Product Performance	Split Incentives
Policies						
Labels, Codes & Standards with <u>Incentives</u> (<u>Metering</u>)	X	X	X	X	X	X
Use Pricing Design		X	X			
Require Utility Financed EE	X		X	X	X	
Increase Financial Institution Participation	X			X	X	

- Comments, questions or other inquiries should be addressed to
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 - Bob Lieberman blieberman@raponline.org (who unfortunately only speaks one language)