



# Smart Policies for a SmartGrid (or, the other way around)

Harvard Electricity Policy Group  
Fifty-Fourth Plenary Session

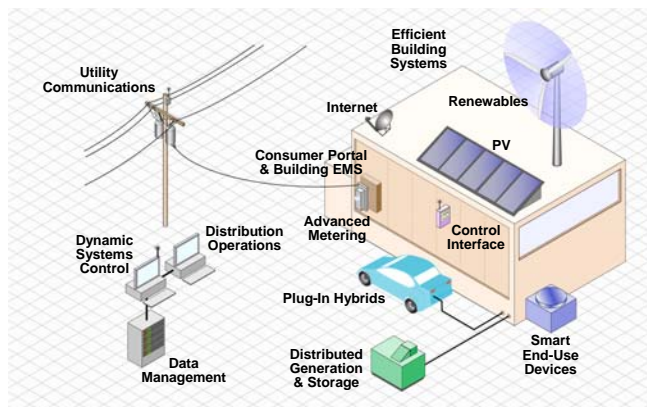
La Jolla, Ca

March 12-13, 2009

Bernie Neenan

Technical Executive

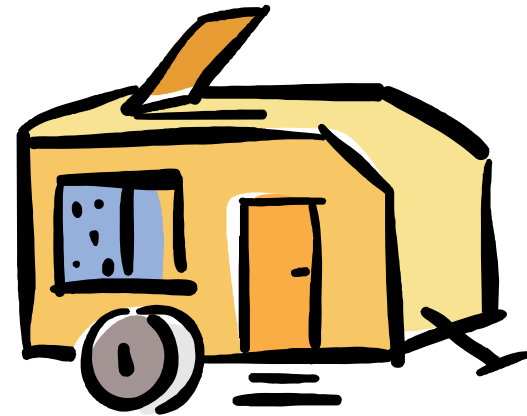
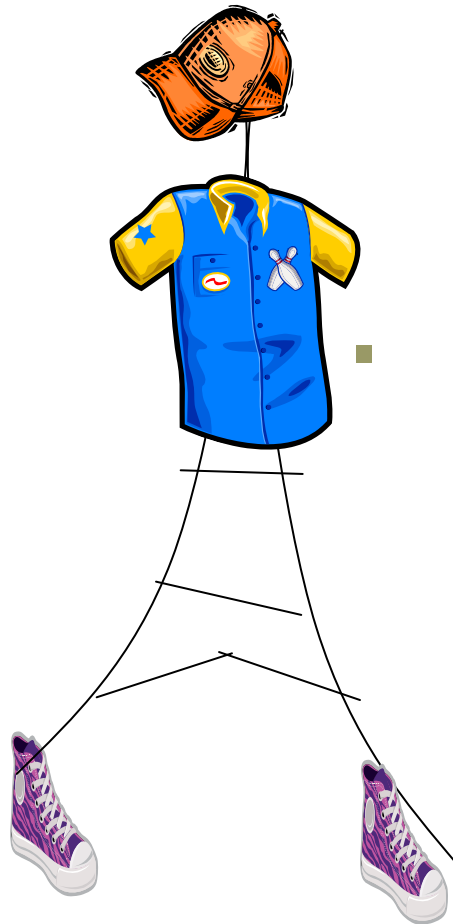
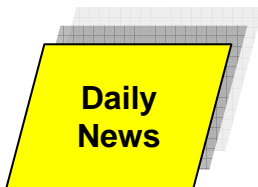
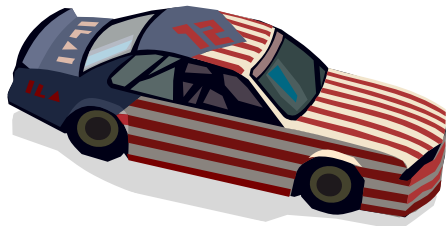
[bneenan@epri.com](mailto:bneenan@epri.com)



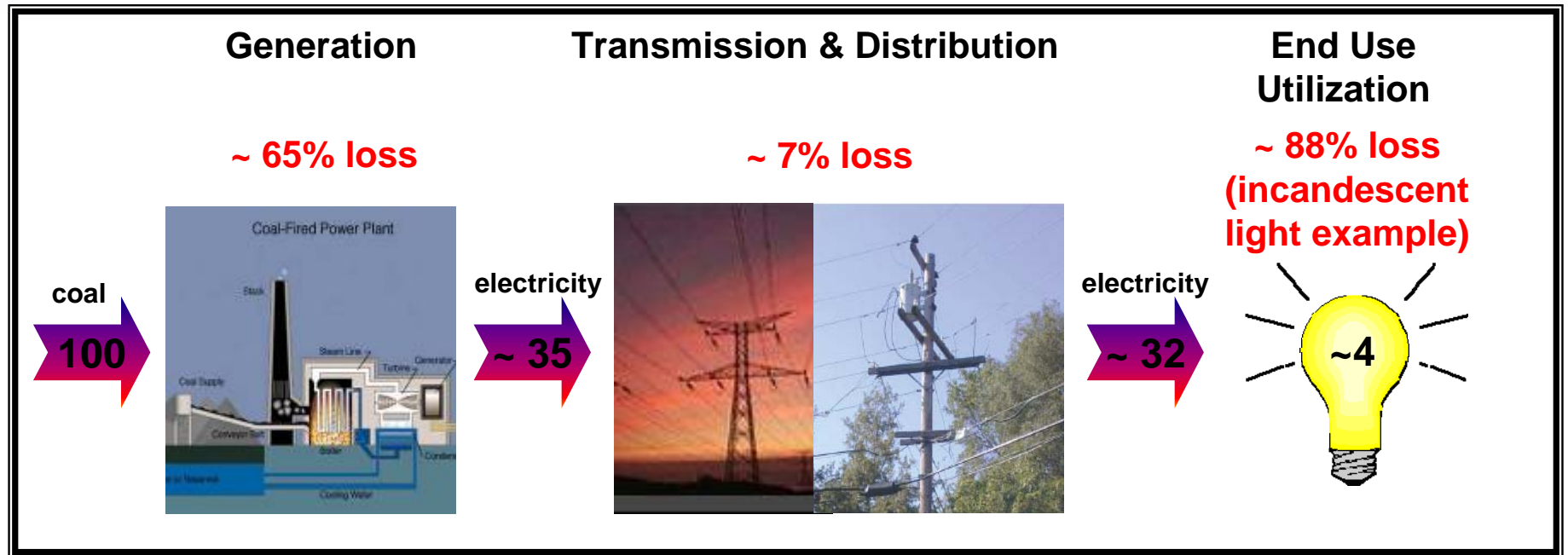
# A SmartGrid



# Dumb Grid



# A SmartGrid would use resources more efficiently



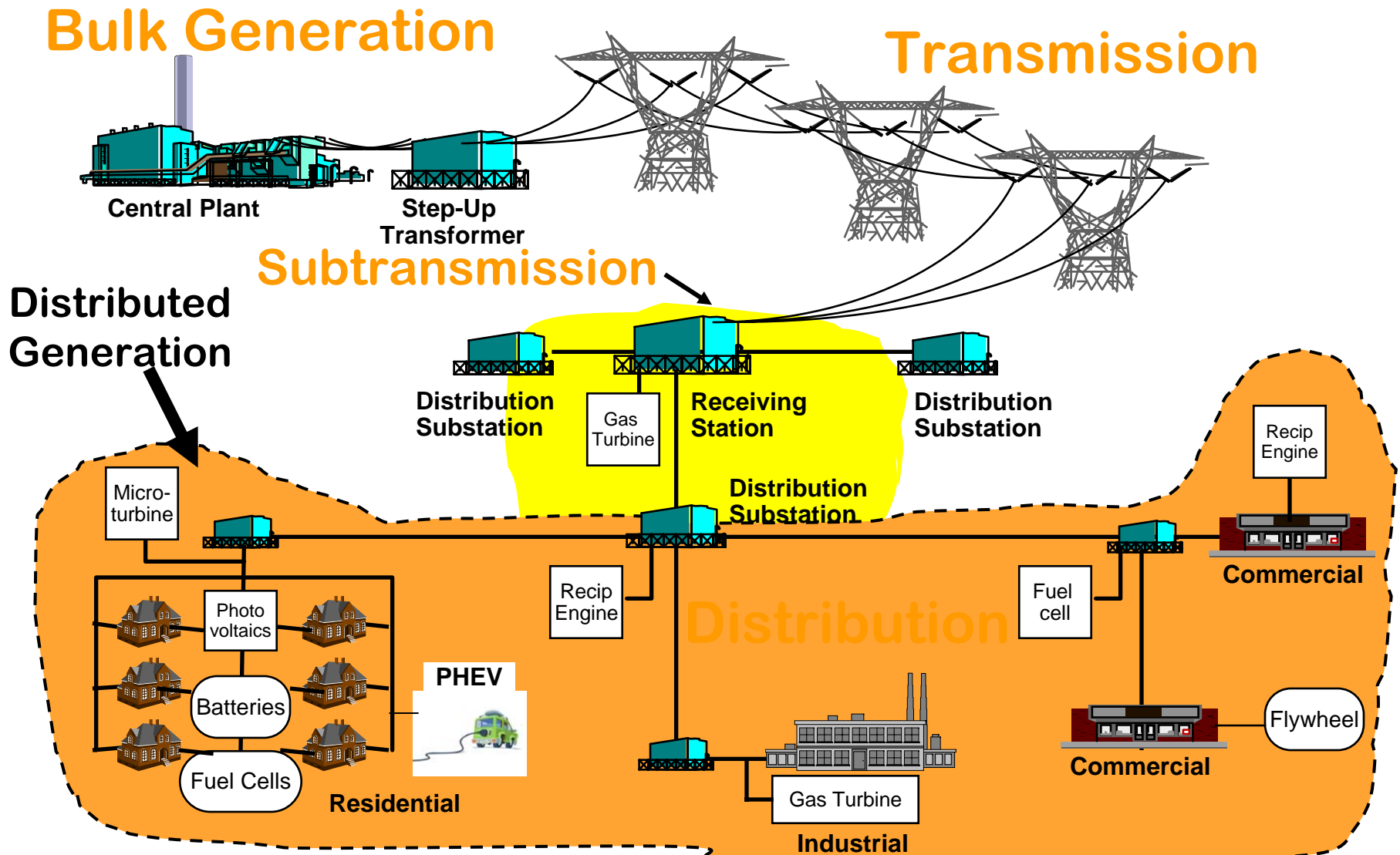
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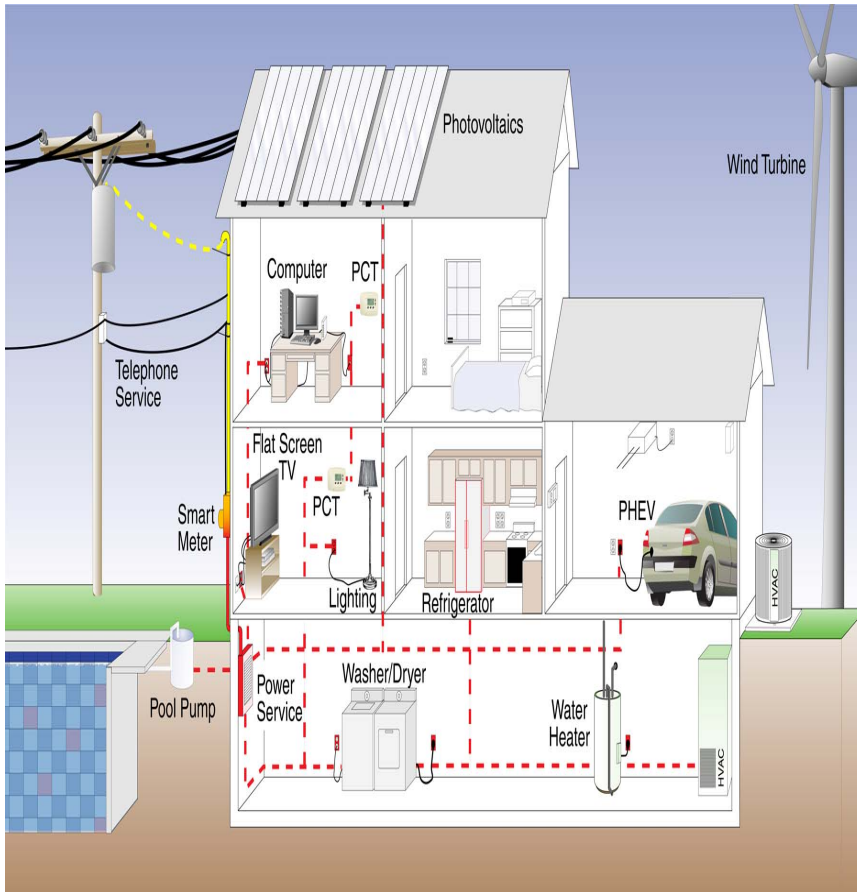
## SmartGrid as an End-to-End Energy Efficiency Initiative

# A SmartGrid accommodates economies for the grid investment- distributed generation






# New technology opportunities abound

## Set it, and forget it homes



## Hyper-Efficient Technologies

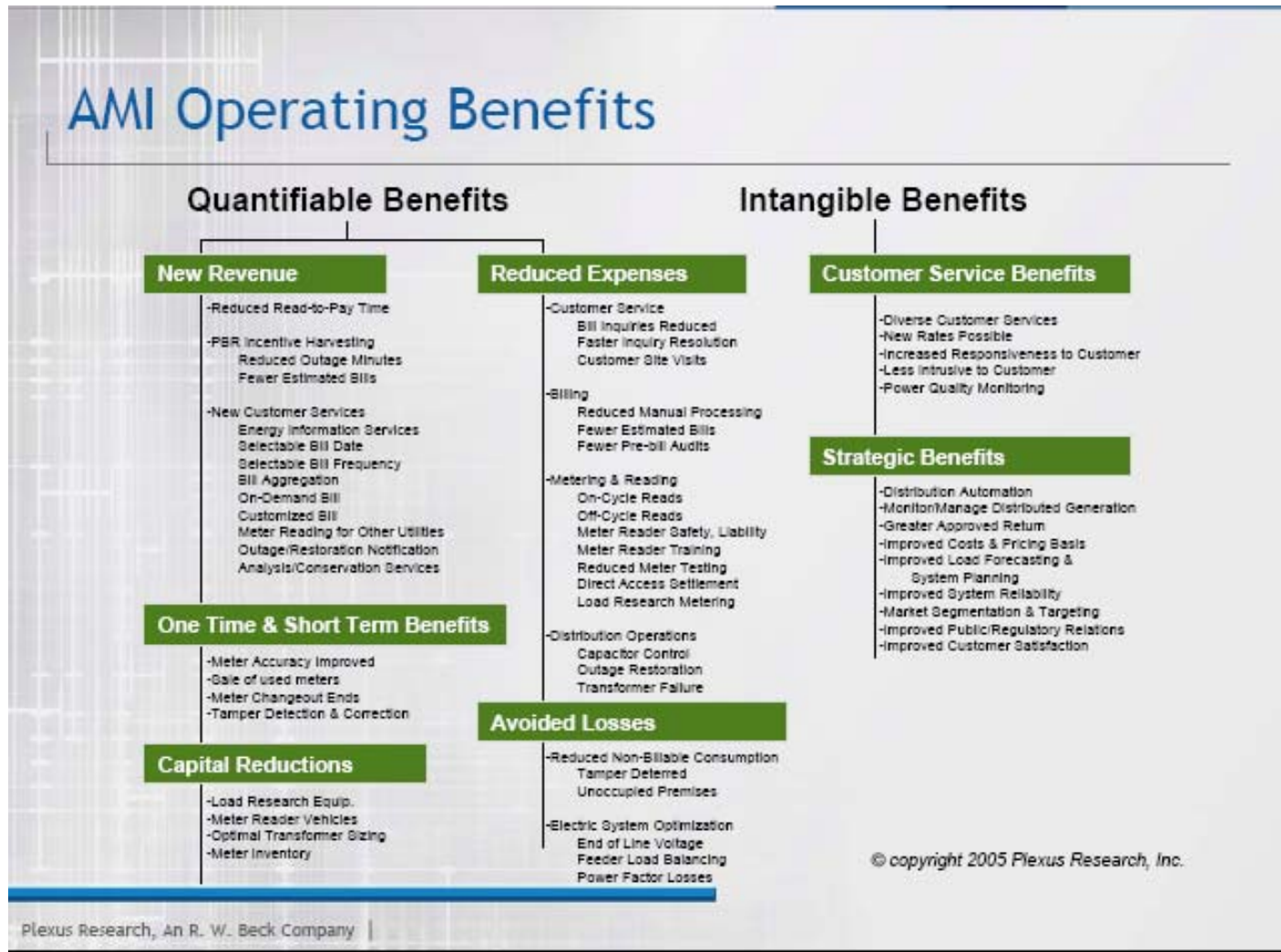
<b>Residential</b>		
		
<b>Heat Pumps</b>	<b>Ductless Cooling</b>	<b>Appliances</b>
<b>Commercial</b>		
		
<b>VFC Cooling</b>	<b>VFC Cooling</b>	<b>Data Centers</b>

# Where's the beef?

- **The SmartGrid infrastructure will be expensive – maybe \$100 billion, maybe a lot more**
- **There will be additional transition or enabling costs to induce behaviors that generate benefits**
- **A truly interoperable grid will break down traditional market drawbridges that protect local interests – can state-level policy survive?**



# Operational benefits (utility cost savings)

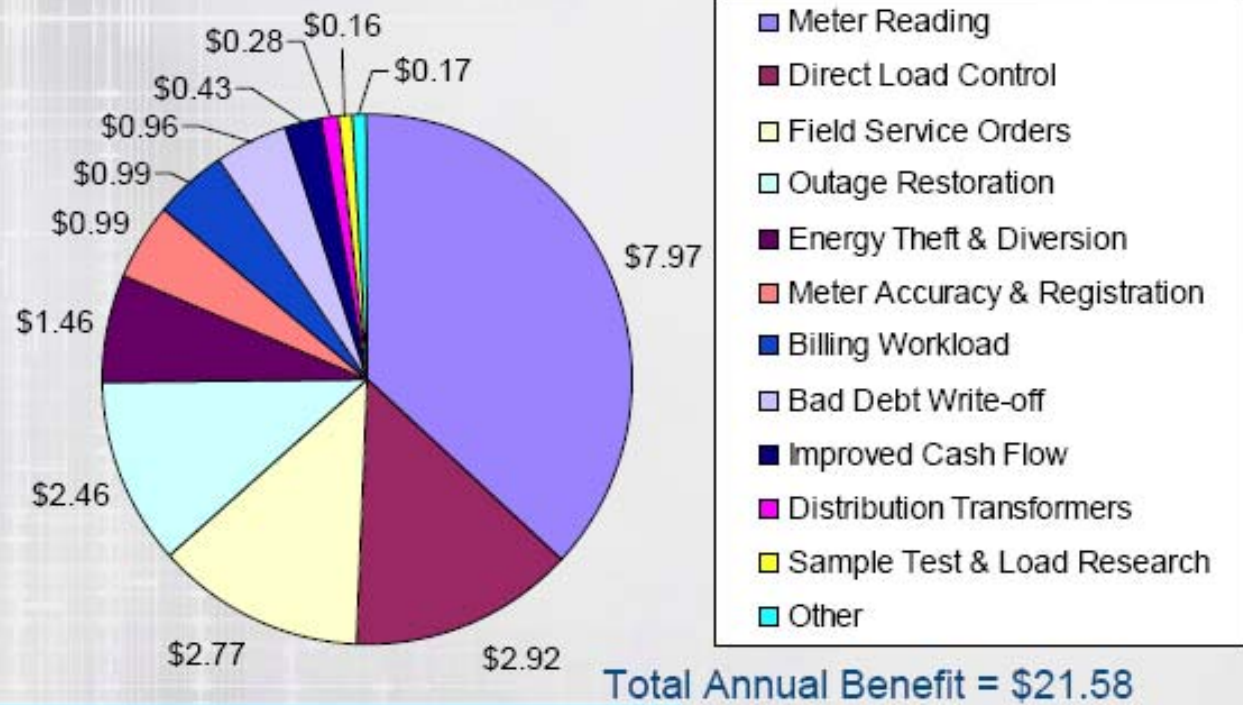




# Sources of operating benefits

## Large Electric Investor Owned Utility

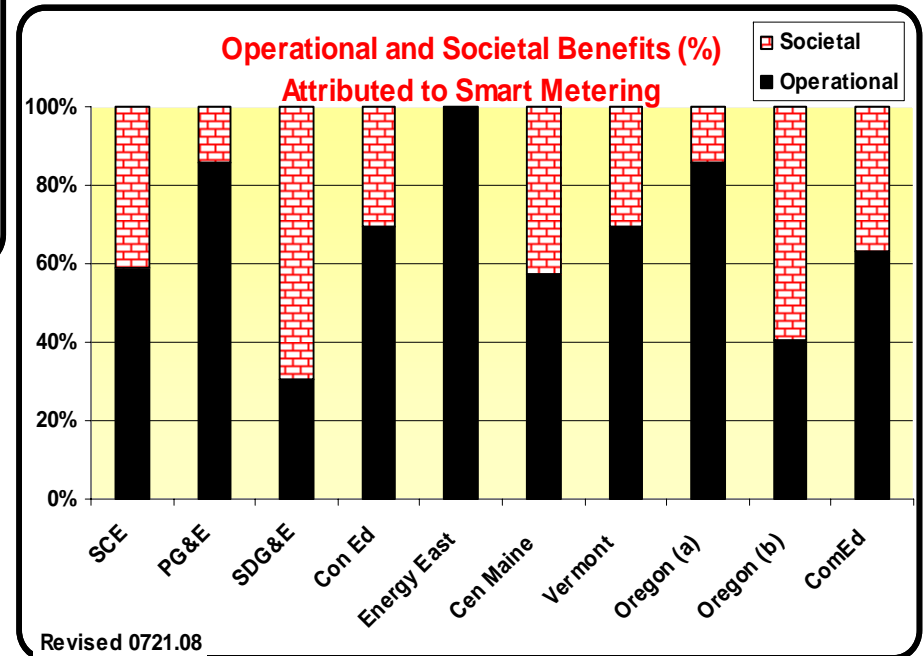
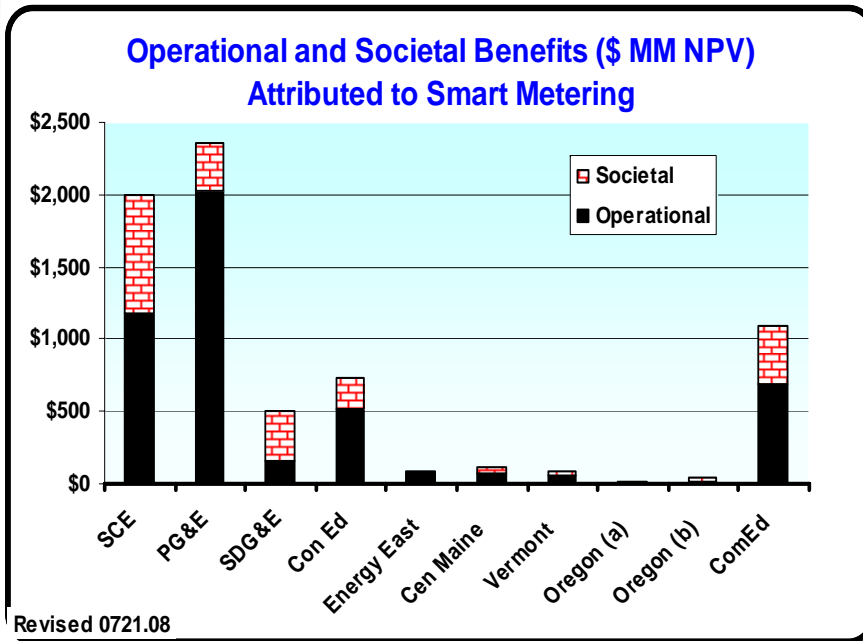
Annual AMI Benefits (\$ per meter)



Plexus Research, An R. W. Beck Company

# Relative Benefits Attributed to Smart Metering

(Revised July 21)

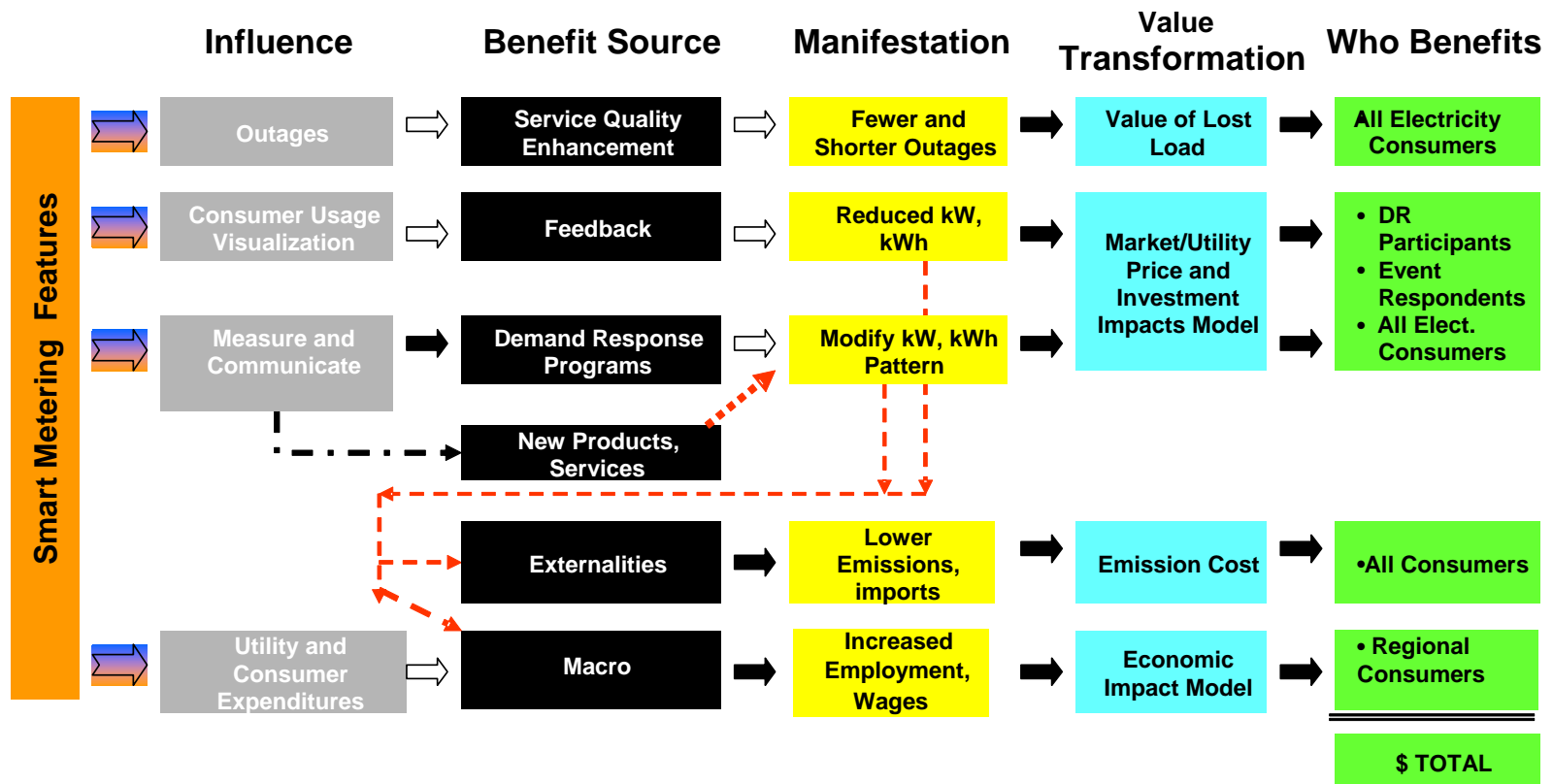


**On Average, 34% of  
Attributed Benefits are  
Societal**

**Who pays for the missing 1/3  
of the investment cost?**

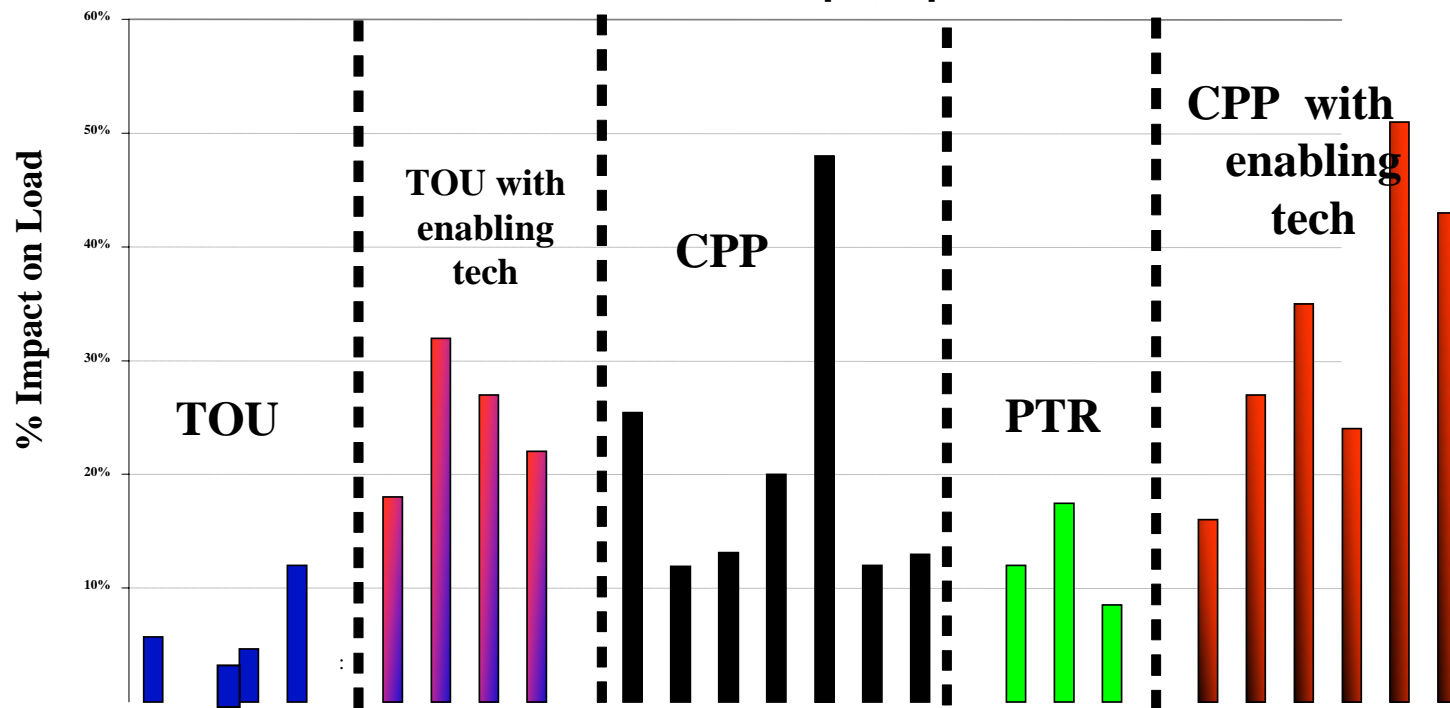
# Source and Measurement of Societal Benefits

## Quantifying the Societal Benefits Attributable to Smart Metering



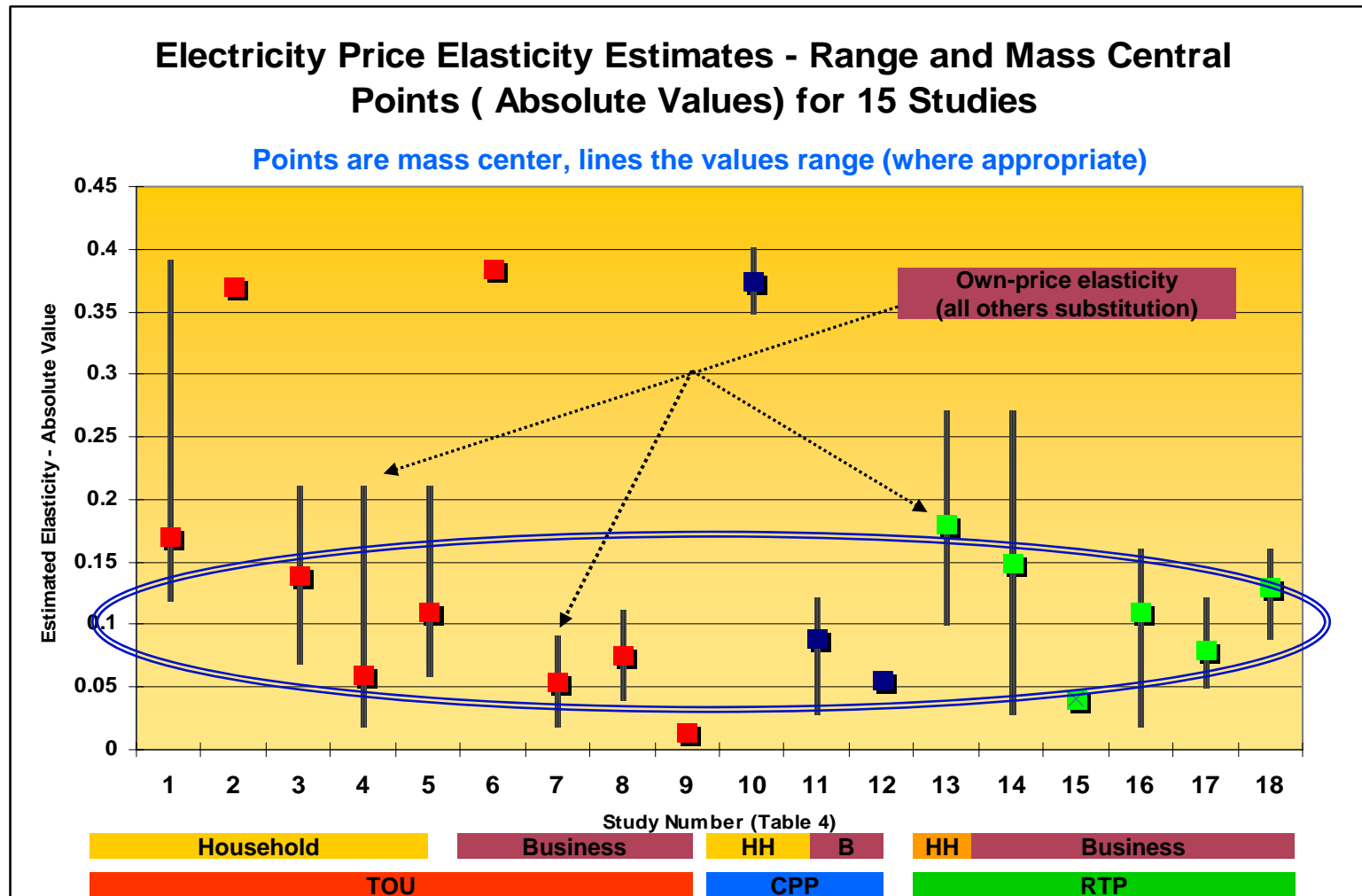
# Comparison of DR Plan Event Impacts

Source: Faruqui, April 2008



- Differences among pricing structures are largely due to event price differences, not elasticity differences
- Technology effect has not been demonstrated to be sustainable except perhaps for AC and water heating control

# Synopsis of Price Elasticity Estimates



## Policy issues

- How do we justify filling the gap?
- How do we socialize or otherwise recover the gap?
- What obligations do utilities have to close the gap through performance clauses?
- Do consumers know what a SmartGrid is, and what it will cost?
- How long can economists milk this issue?



# Questions?

