

# Energy Efficiency as a Resource

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# Energy efficiency as a resource: Not a radical, theoretical or untested idea

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- Quite the opposite: “Demand-side management” (DSM) originated in the 70s and 80s—and has a long record of success
- Still in place in many states and practiced by many utilities
- Most extreme test of its value and capability came during California’s 2001 energy crisis—kept the lights on and helped avert massive outages (customer response reduced energy (kWh) sales by over 6%; peak demands by 10%--about 3700 MW)—much of this through energy efficiency

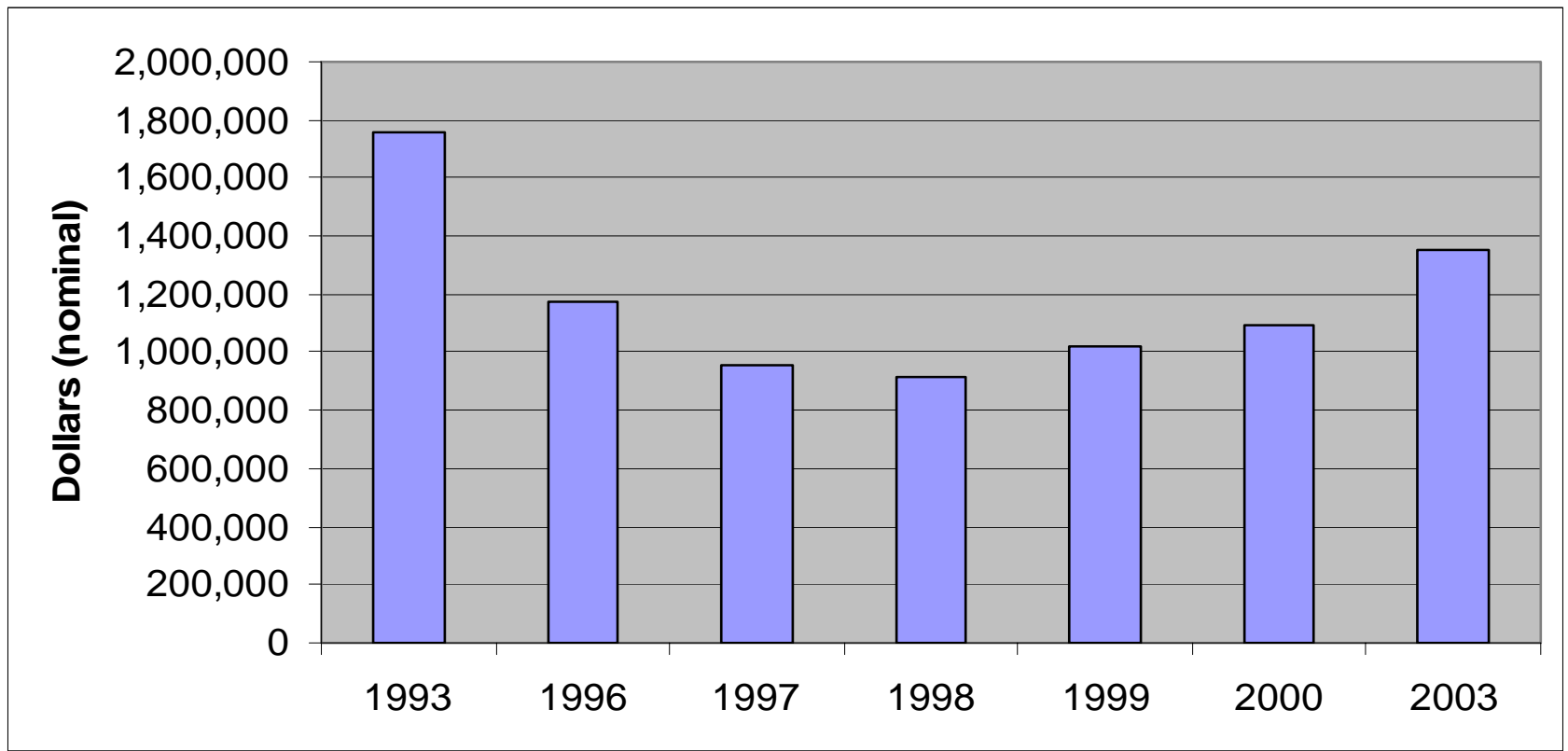
# So if it's so great, why isn't it universal?

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- “Market mania” (movement toward deregulated/restructured markets) seemed to doom DSM—let the “wisdom” of the market guide energy decisions on both the supply and demand sides
- Support for DSM was a casualty: earlier tracking of program spending and activity showed precipitous drop from early to late 1990s—from \$1.7 billion to \$900 million/year nationwide
- Are also numerous states that have never established DSM and/or other utility-sector energy efficiency programs

# Annual Spending on Utility Sector Energy Efficiency Programs 1992-2003 [nominal dollars]



# The emergence of “public benefits” programs

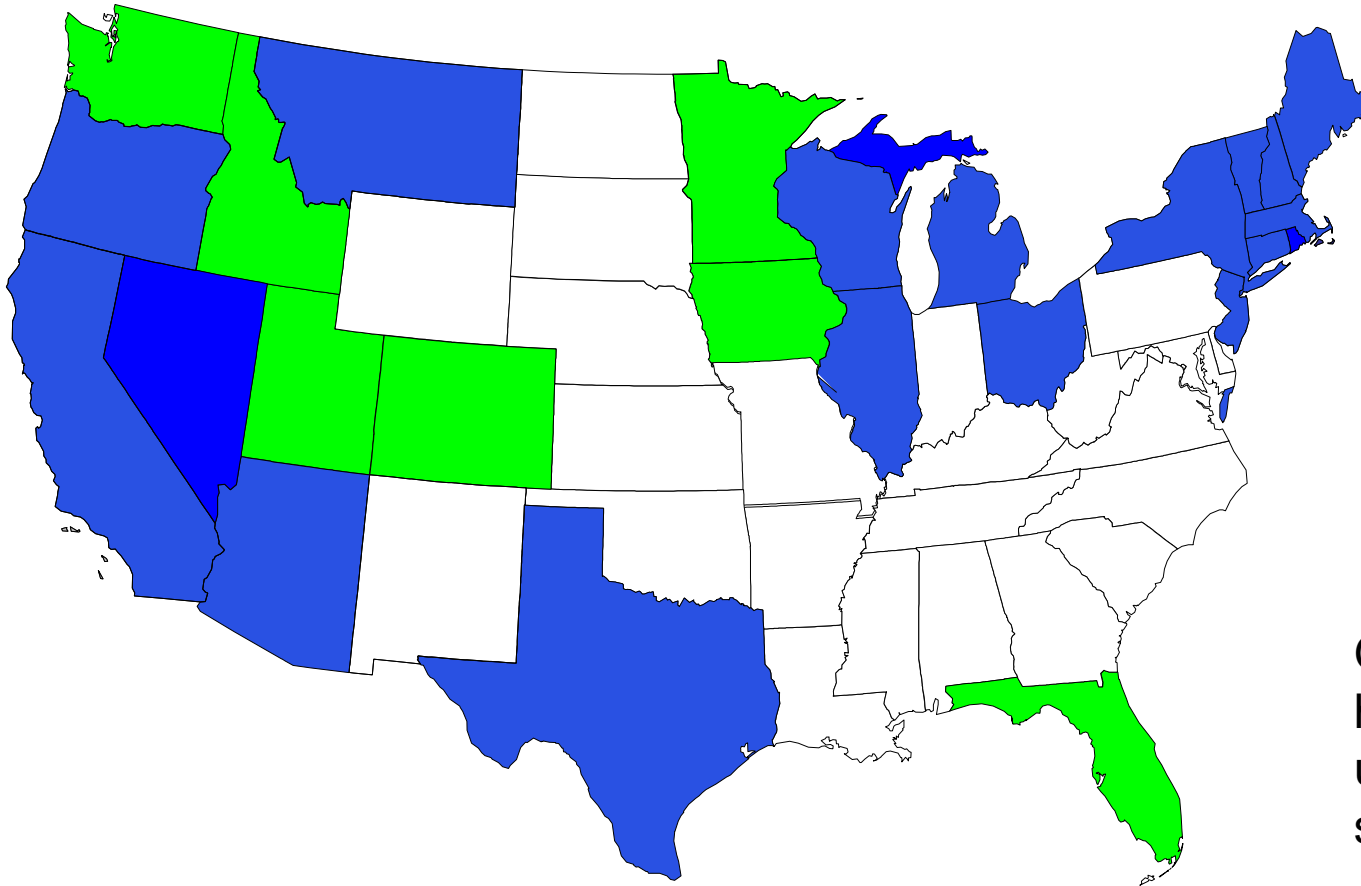
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- In recognition of the adverse effects of restructuring on various societal services provided by regulated utilities, many states created “public benefits” programs to support energy efficiency, renewable energy, etc.
- As a result, energy efficiency spending began to rebound from its low point in 1998—and in 2003 was about \$1.35 billion (both utility DSM and public benefits programs)
- Now we have a patchwork of programs....



# States with utility sector energy efficiency programs—public benefits or DSM



Blue states have public benefit funds that support EE

Green states have utility DSM under regulated structure

# Structure and delivery of energy efficiency programs and services

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- Utilities are still the primary providers of energy efficiency programs—including public benefits programs. But “non-utility” segment is growing.
- ACEEE research shows that numerous structures are possible for administration and delivery of services—no single “best model”

# Examples of non-utility public benefits programs

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- Efficiency Vermont—the statewide “energy efficiency” utility
- Energy Trust of Oregon
- Focus on Energy [Wisconsin]
- New York Energy \$mart
- Efficiency Maine

## 2002/3 Public Benefits Energy Efficiency Program Spending

	Annual Budgets (\$ Millions)	% of revenues
<b>AZ</b>	<b>2.0</b>	<b>0.1%</b>
<b>CA</b>	<b>240.0</b>	<b>1.5%</b>
<b>CT</b>	<b>89.0</b>	<b>3.1%</b>
<b>DC</b>	<b>2.2</b>	<b>0.3%</b>
<b>DE</b>	----	----
<b>IL</b>	<b>2.0</b>	<b>0.02%</b>
<b>ME</b>	<b>2.9</b>	<b>0.3%</b>
<b>MD</b>	----	----
<b>MA</b>	<b>135.0</b>	<b>3.0%</b>
<b>MI</b>	<b>7.8</b>	<b>0.1%</b>
<b>MT</b>	<b>14.3</b>	<b>2.0%</b>



## 2002/3 Public Benefits Energy Efficiency Program Spending

	Annual Budgets (\$ Millions)	% of revenues
NH	5.2	0.5%
NJ	99.6	1.5%
NY	129.0	1.3%
NV	11.2	0.5%
OH	14.3	0.1%
OR	19.1	0.9%
PA	----	----
RI	16.4	2.7%
TX	69.0	0.4%
VT	16.8	3.3%
WI	49.7	1.4%
<b>Total</b>	<b>925.5</b>	



# Okay, so what's this money buying us?

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- Total cumulative annual energy savings from utility sector programs in 2003 were over 67,198 GWH—or about 1.9% of total annual retail energy sales
- Top 10 states by % savings/sales: CT (7.8%), CA (7.5%), WA (6.9%), MN (6.7) RI (6.2%), MA (5.8%), OR (5.7%), VT (4.8%), WI (4.4 %) and UT (4.1%)
- But are energy efficiency programs cost effective?



# Public Benefits Energy Efficiency Program Cost-effectiveness

State	Benefit/Cost All programs	B/C Comm/Ind programs	B/C Residential programs	Cost of saved energy (\$/kWh)
California	2.0 – 2.4			0.03
Connecticut	NA	2.4 to 2.6	1.5 to 1.7	0.023
Maine	1.3 – 7.0			
Massachusetts	2.1	2.4 to 2.7	1.3 to 2.1	0.04
New Jersey				0.03
New York				0.044
Rhode Island	2.5	3.3	1.5	
Vermont	2.5	2.9	1.8	0.03
Wisconsin	3.0	2.0	4.3	
<b>Median</b>	<b>2.1 to 2.5</b>	<b>2.5 to 2.6</b>	<b>1.6 to 1.7</b>	<b>0.03</b>



# Energy efficiency as a resource?

## Have we exhausted the well?

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- In 2004 ACEEE recently completed a “meta-analysis” of energy efficiency potential studies
- Median economic potential of 21.5% for electricity; 22% for natural gas
- Lesson: Still a lot we haven’t drawn out yet—and at the same time the well is replenished and even expanded with new technologies

# Renewed commitments to energy efficiency as a resource

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- California:
  - CPUC new EE savings targets will double savings over the next decade—to ~5000 MW peak demand and ~23,000 GWh by 2013
  - Budgets for programs have been almost doubled accordingly (from ~\$240 million in 2003 to ~\$400 million in 2004—with a long-term commitment to this level of funding or higher)
- Illinois: Implementing an “Energy Efficiency Portfolio Standard”—will require utilities to meet 10% of annual load growth by 2008; 25% by 2017
- Texas: Regulated distribution utilities must meet 10% of new demand growth through energy efficiency



# Renewed commitments: Northwest Power Planning Council's 2005 Long-Range Plan

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- *“The primary message of the power plan is a familiar one from the Council: energy conservation is the lowest-cost, lowest-impact resource to meet our future demand for electricity,” Council Chair Judi Danielson of Idaho said. “In fact, our plan shows that the Northwest can meet almost half of the predicted growth in demand for power over the next 20 years by using electricity more efficiently.”*
- *The plan calls for securing 700 average megawatts of conservation over the next five years. “This amount of conservation is optimistic, but achievable,” Danielson said. “It is less than the annual conservation achievements in the Northwest between 1991 and 2002, and about two-thirds of it is in new measures or applications.”*



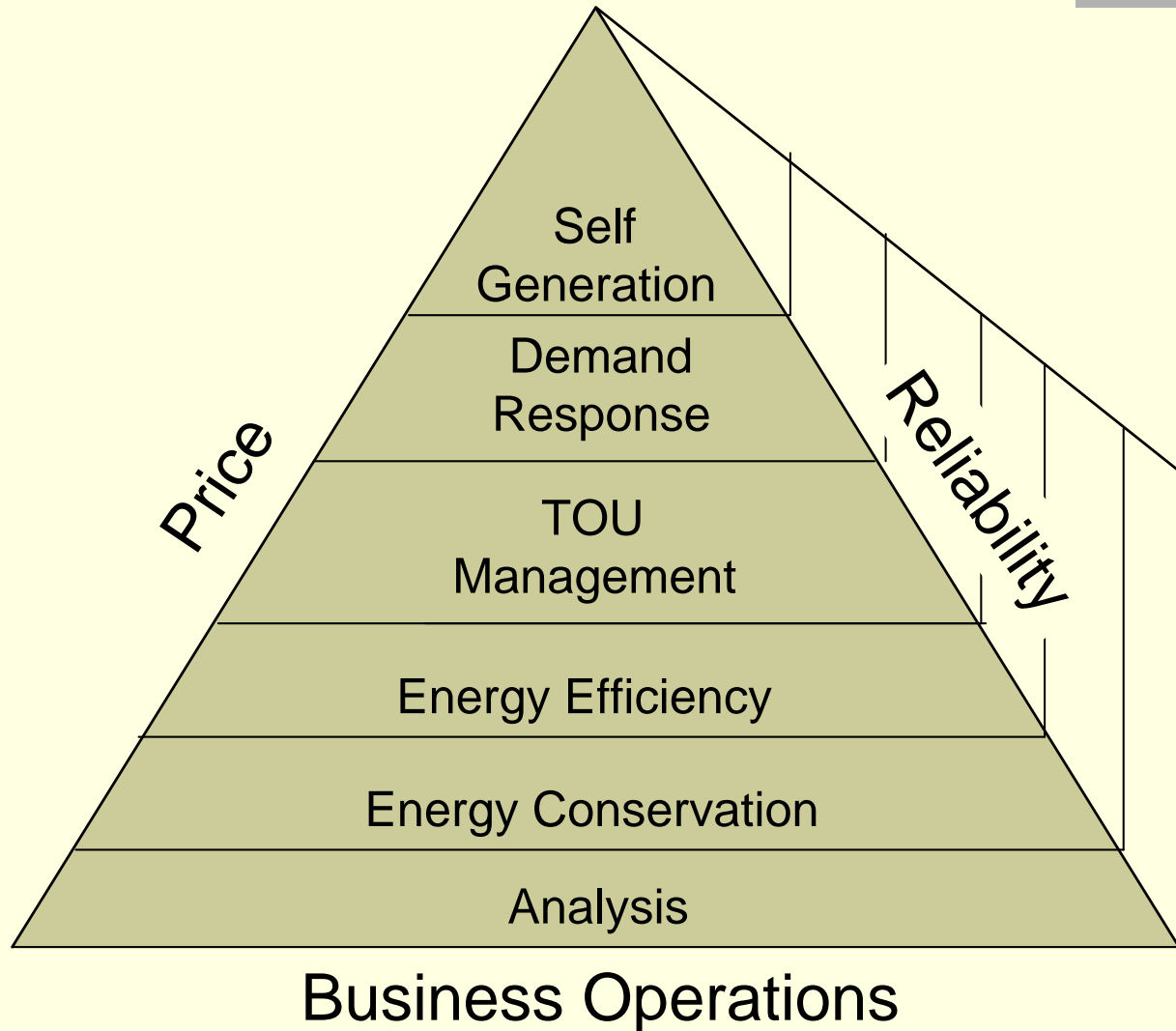
# “Balanced portfolios” of demand resources—the age of enlightenment?

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- “Demand response”—there’s a lot of interest in pricing and market mechanisms
- “Resource acquisition”—was—and is—still a good thing
- “Market transformation”—yes, it’s important to change products and consumer demand for them (regional groups especially helpful here—MEEA, NEEP, NEEA, SWEEP—along with national programs like ENERGY STAR®)
- All fit within a broad spectrum....

# Pacific Gas & Electric Company's Integrated DSM Model



# Why energy efficiency is even more important today

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- Energy efficiency is still the least-cost resource
- Growing risks associated with new power plant construction
  - Construction costs
  - Fuel price risks
  - Future environmental costs
- Increasing evidence of climate change; energy efficiency is a proven, cost-effective means to reduce emissions of green house gases (along with other pollutants)

# Why energy efficiency is even more important today

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- Energy efficiency can provide T&D system reliability benefits—reduce overall and targeted loads to reduce system stress—reduce scale or delay need for expansions and upgrades
- Energy efficiency can provide broader economic benefits—create jobs and help reduce overall energy prices



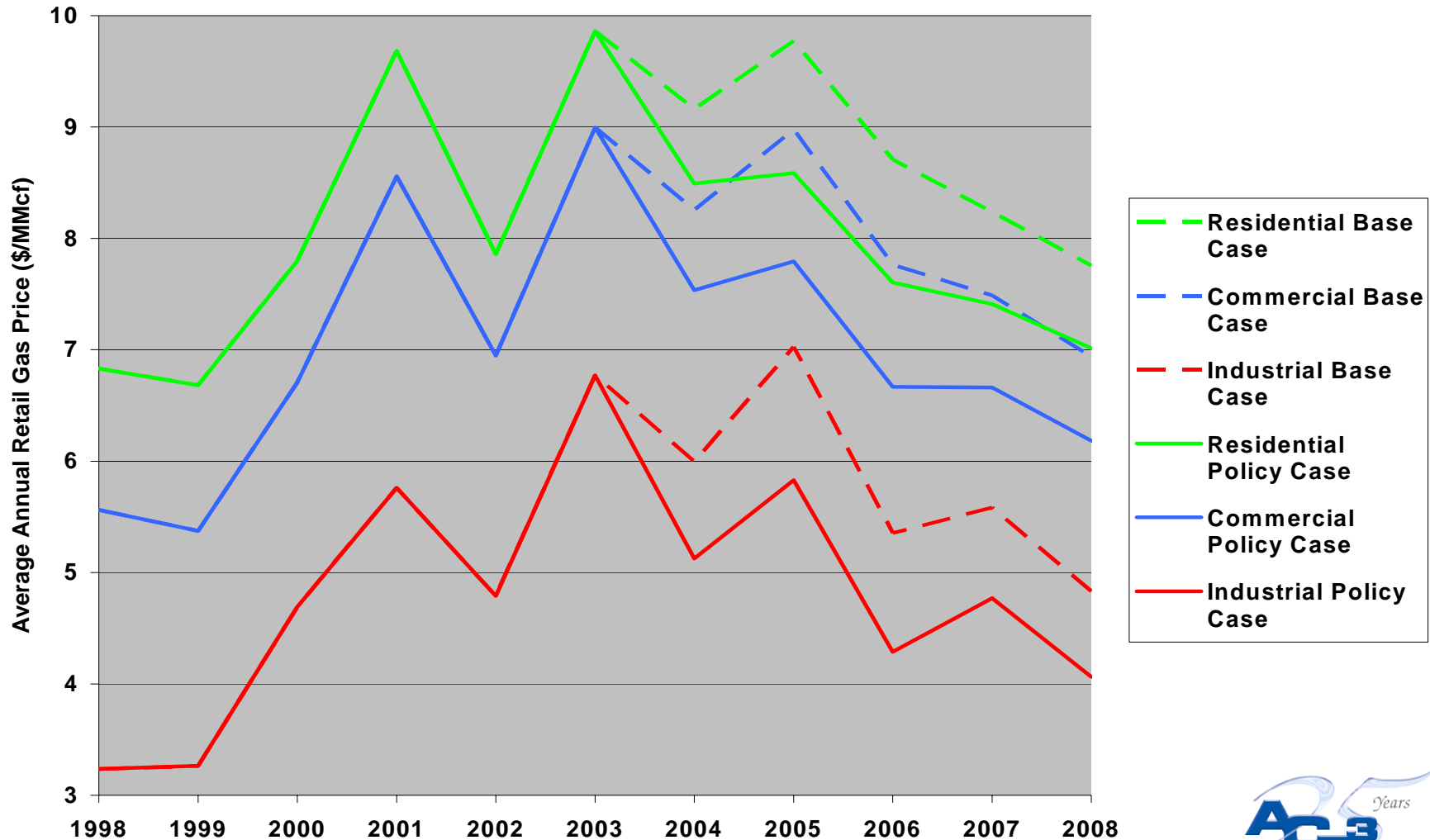
# Broader economic benefits of increased levels of energy efficiency

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- ACEEE's recent analysis of market impacts of increased levels of energy efficiency and renewables shows that natural gas costs could be decreased by about 20% by relatively modest energy efficiency savings of about 1% per year
- Nothing startling about this, just Econ 101: Reduced demand=reduced price (flip side of what happens when supplies are constrained and prices “spike!”)

# Impacts of EE & RE on Annual Retail Natural Gas Prices (from Elliott et al. 2003, ACEEE)



# Harvesting the resource: What energy efficiency programs need to grow and thrive

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- Stable, adequate funding
- An effective administrative and delivery structure
- Programs that demonstrate success—  
effective evaluation in place to monitor and report results
- Support from customers, regulators, utilities and other key stakeholders



# What regulators can do

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- Cost recovery through rates or other mechanism is a minimum threshold for programs to occur
- Performance incentives for utilities have been effective in many states
- “Decoupling” profits from sales volume receiving renewed interest, especially on natural gas side

# Summary and conclusions

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- Lots of positive signs for expanded role for energy efficiency in the Midwest—a region that historically has been very mixed in terms of leading/lagging states
- Kernels of a “Midwest Natural Gas Initiative” forming to take a regional approach for energy efficiency



# Summary and conclusions

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- Energy efficiency has proven its worth now for over 20 years as a viable resource. After “market mania” has diminished, states are coming back to *integrated resource planning* (if not in name--in concept)
- *Portfolios* of resources have emerged as the key for system planning and operation—including portfolios on the demand side

