

The Role of Energy Efficiency in the Northwest

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Background for State Clean Energy-Environment Technical Forum

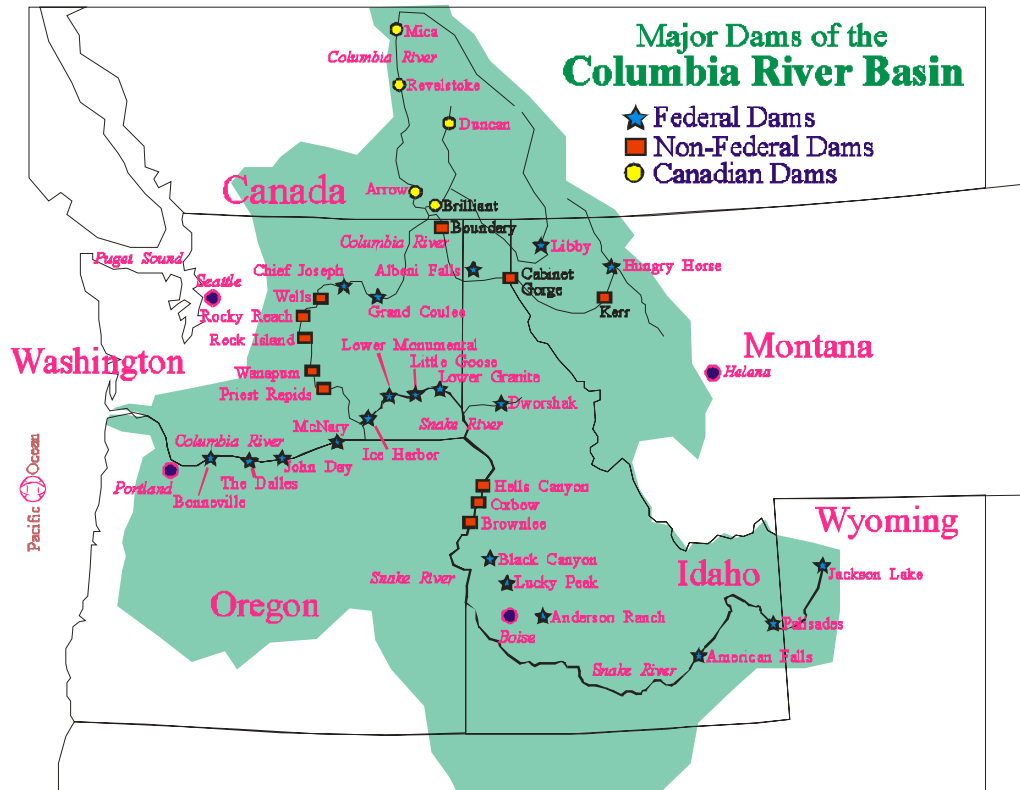
State and Regional Energy Planning Teleconference

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To Understand the Present, You Need to Know Our Past

What Happened After Lewis and Clark Left?



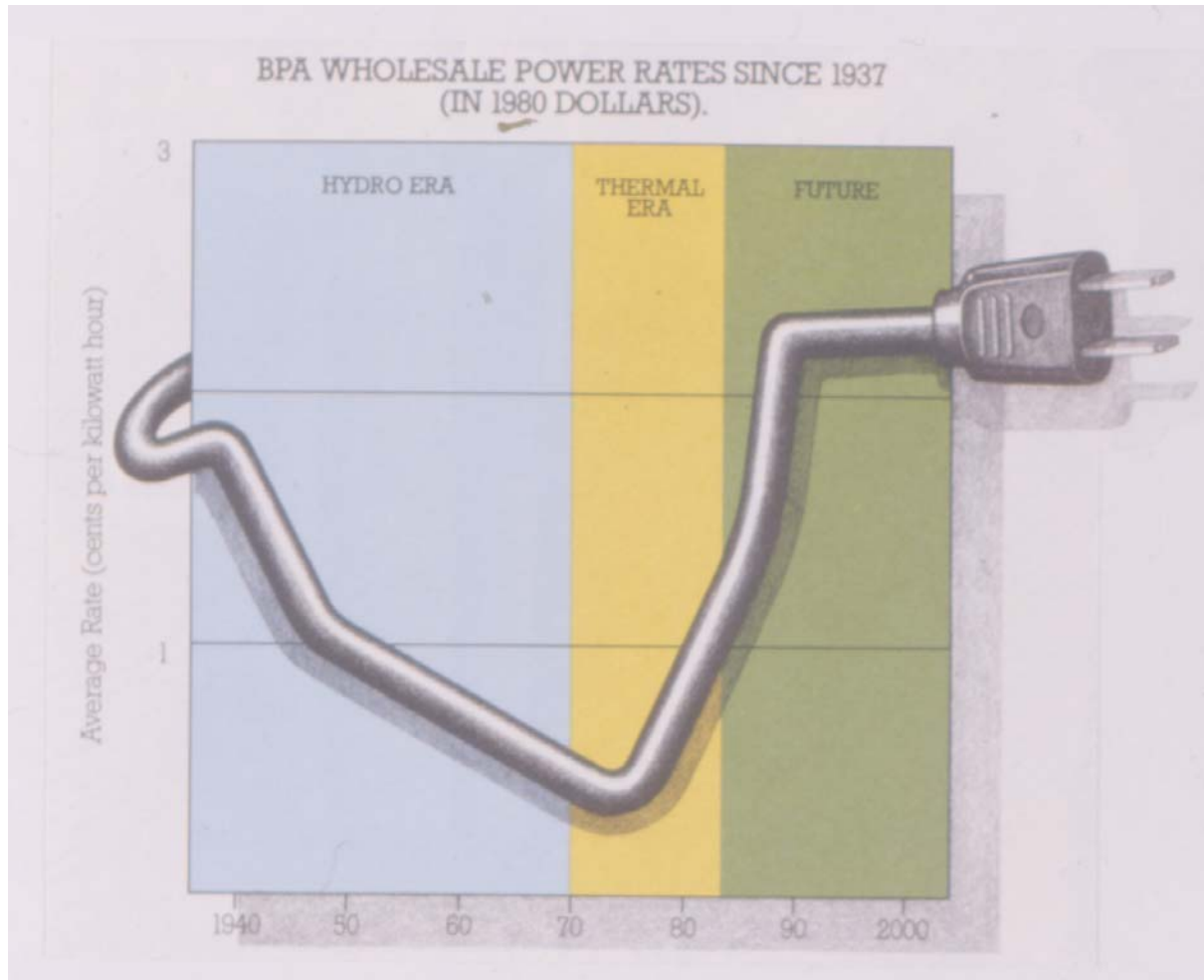
The First Three “Eras” of Power Planning in the PNW

- “New Deal” Mysticism (1930-1950)
 - Politicians plan using “chicken entrails and crystal balls” legislate what’s needed and when
- Engineering Determinism (1950- 1970)
 - Engineers, using graph paper and rulers schedule the next power plants
- Economic Determinism (1970 to April 27, 1983)
 - Economist, using price elasticity's slow the engineer’s construction schedules

Actions Taken in Response to “Engineering and Economic Determinist’s” Forecasts

- Utilities planned and/or started construction on 28 coal and nuclear power plants to be completed over a 20-year period.
- Native American tribes sued the state and federal government over loss of salmon
- Environmental groups sued Bonneville Power Administration over plans to turn the Columbia River into “Wave World”

Impact of Actions Taken in Response to “Engineering and Economic Determinist’s Forecasts and Plans



Reaction to Impact of Actions Taken in Response to “Engineering and Economic Determinist’s Forecasts and Plans



Terminate or mothball 9 nuclear and 5 coal plants at a cost to the region’s consumers of more than \$7 billion.

Motivate the region’s politicians, utilities, larger industries and public interest groups to accept the “deals” embodied in the *Northwest Power and Conservation Planning Act of 1980*

The Fourth Era - *Northwest Power and Conservation Planning Act of 1980 (PL96-501)*

- Authorized States of ID, OR, MT and WA to form an “interstate compact” (aka, the “Council”)
- Directed the Council to develop 20-year load forecast and resource plan (“The Plan”) and update it every 5 - years
 - To assure the region of an adequate, efficient and reliable power system
 - To provide for the development of the least cost mix of resources*
 - Conservation (energy efficiency) deemed highest priority resource equivalent to generation with a 10% cost advantage over power generating resources (2nd priority > renewable resources, 3rd>Co-gen, 4th>conventional generation)
- Mandated public involvement in Council’s planning process.

**Federally mandated “least cost integrated resource planning” on regional basis*

Council Planning Process and Plans

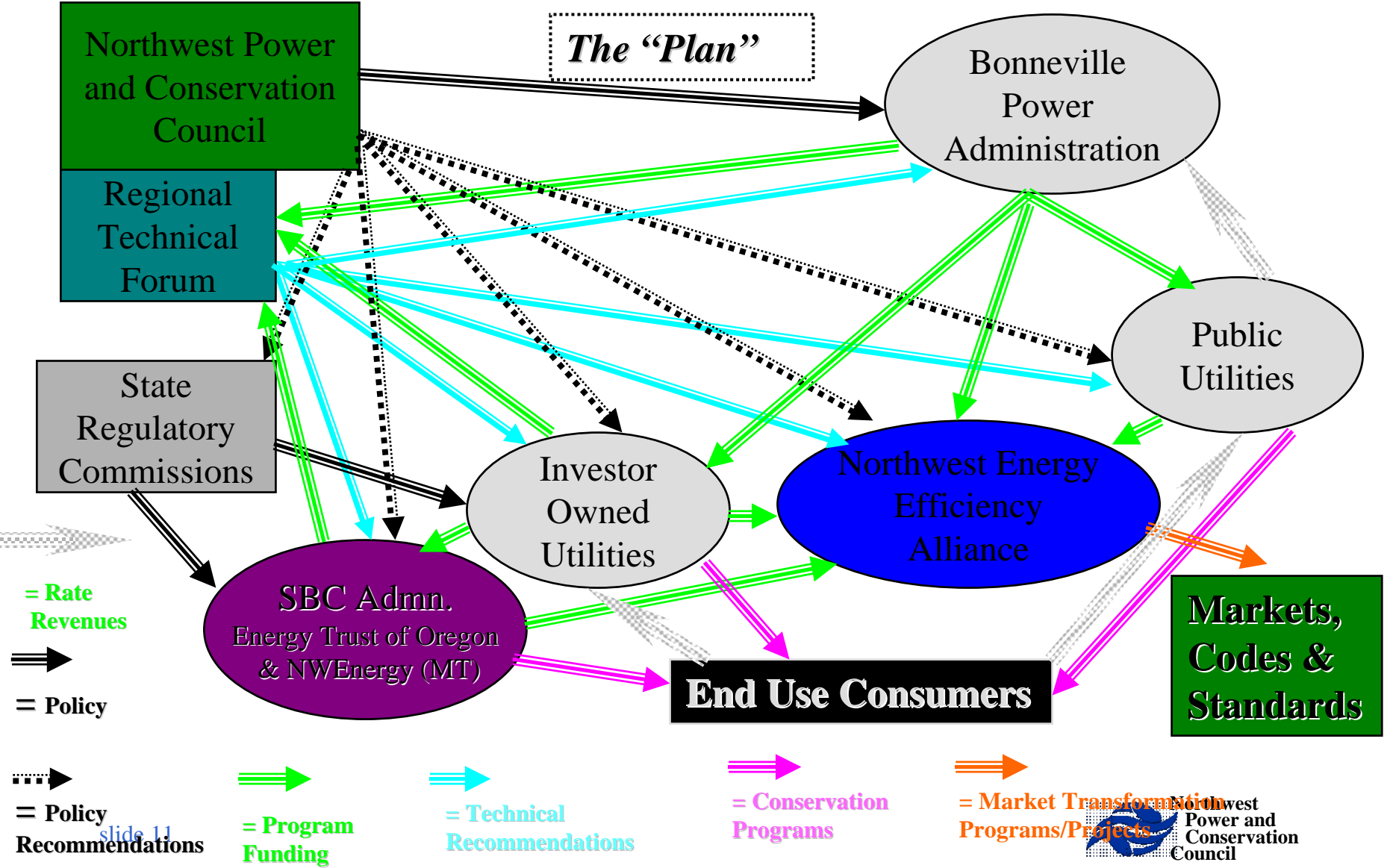
- Longest Running “Integrated Resource Planning Process” in the Country
- Serves as “Regional Lens” through which state Commissions view utility IRPs (and other resource development)
 - Regional resource adequacy
 - Resource cost-effectiveness
 - Conservation/Efficiency goals

How Has It Worked?

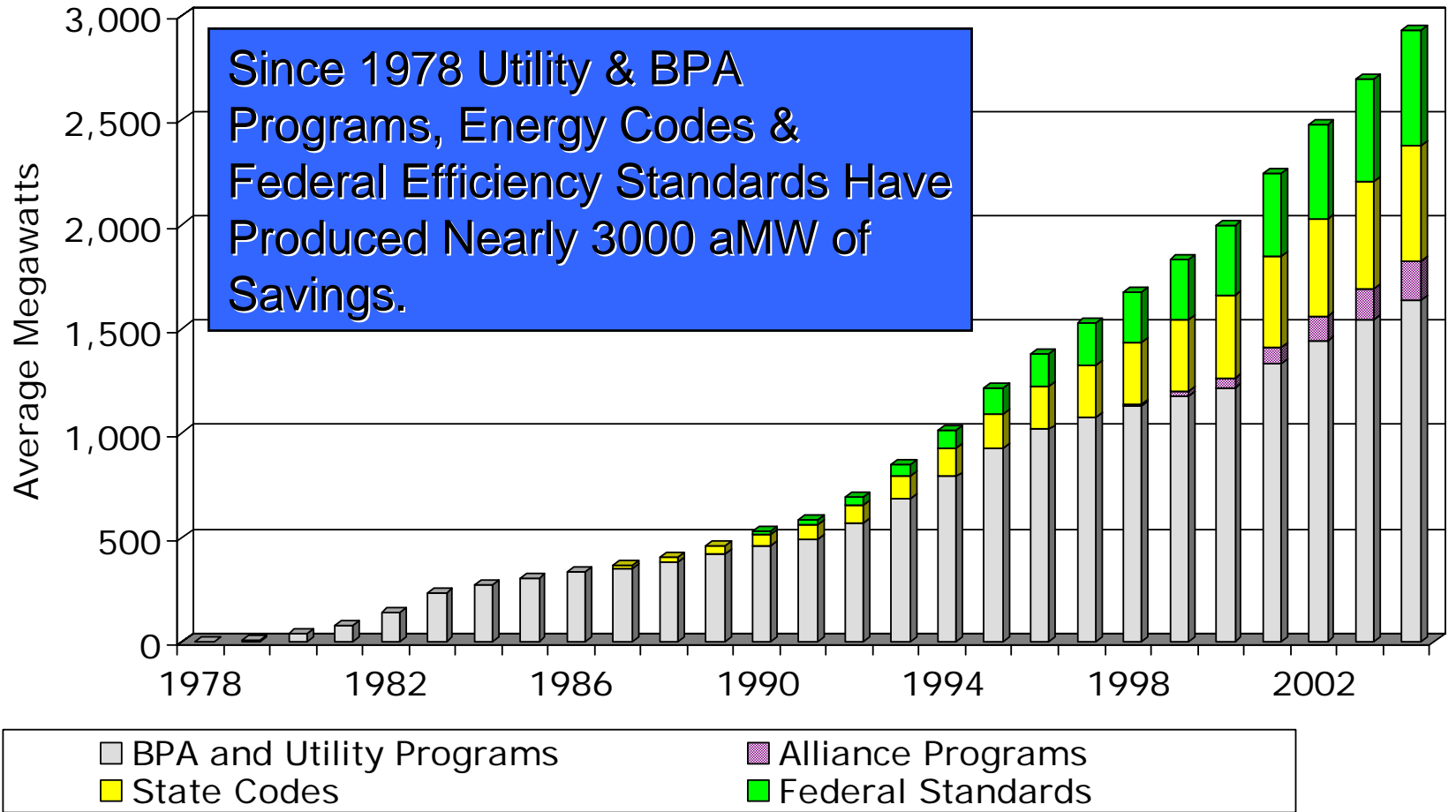
- Fundamentally changed utility resource planning
 - Council’s independent view of resource adequacy in first Plan led Bonneville and the region’s utilities terminate WNP 4&5, Skagit 1&2 and defer and ultimately cancel WNP 1&3, Creston 1&2, etc.
 - Oregon and Washington Commissions adopted “least-cost” planning requirements for investor-owned utilities, Idaho and Montana have since followed
 - First Council “Action Plan” Called on Bonneville and the Region’s Utilities to Develop Conservation to Reduce Year 2002 Loads by Between 5 – 17%

» *Let’s See How This Worked*

How a PNW Kilowatt-Hour Gets Saved



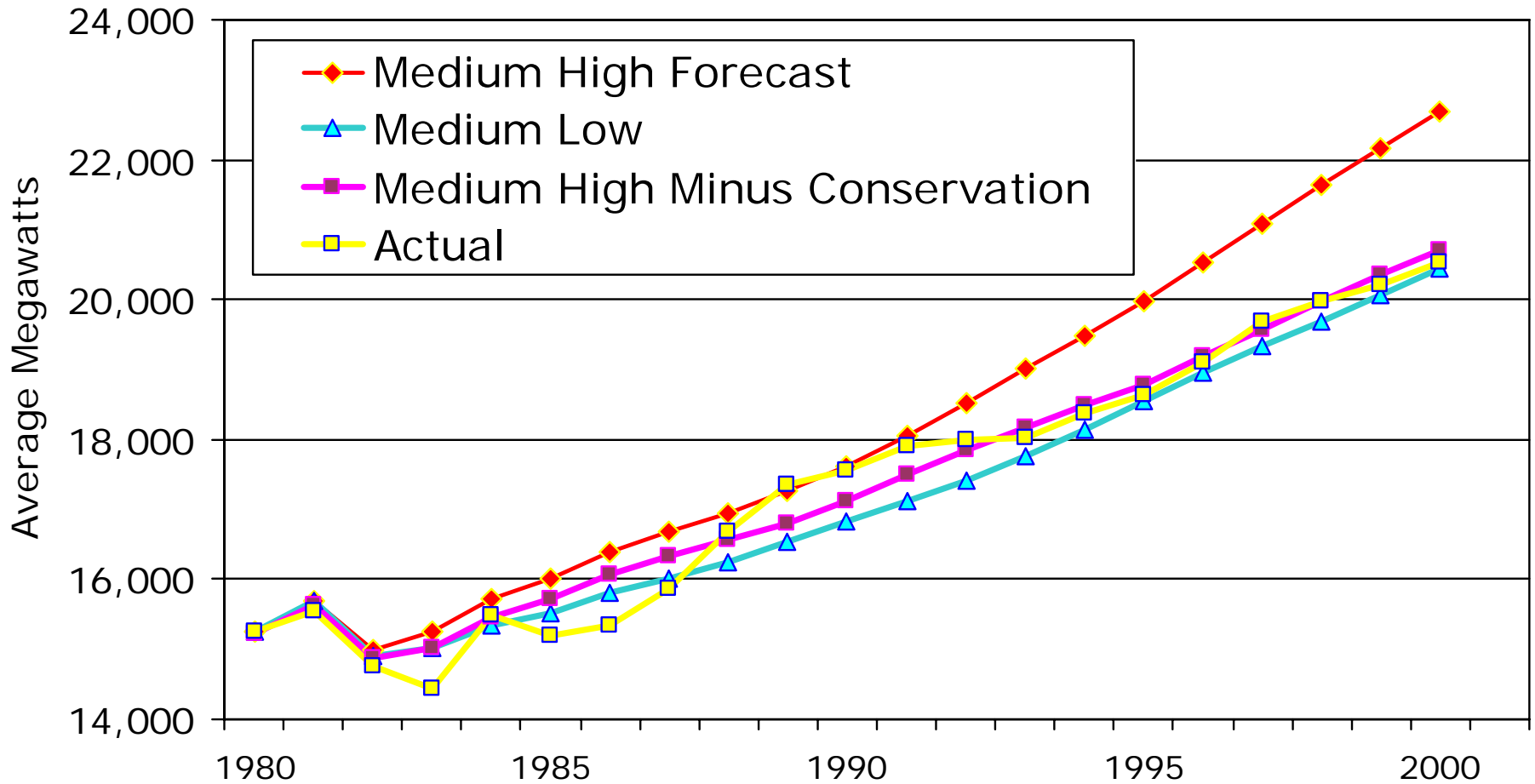
PNW Energy Efficiency Achievements 1978 - 2004



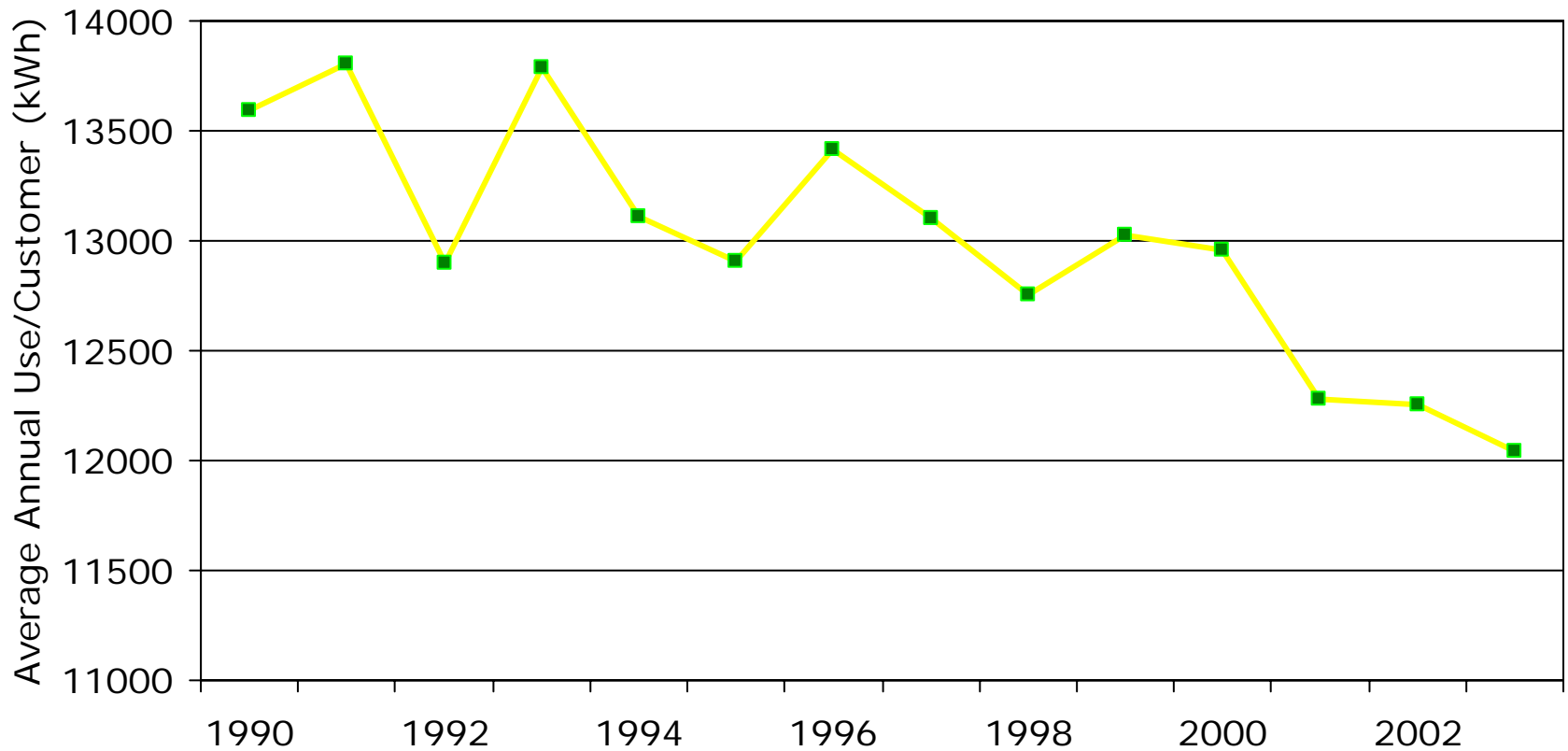
So What's 3000 aMW?

- It's enough electricity to serve the entire state of Idaho and all of Western Montana
- It Saved the PNW Region's Consumers Nearly \$1.25 billion in 2004

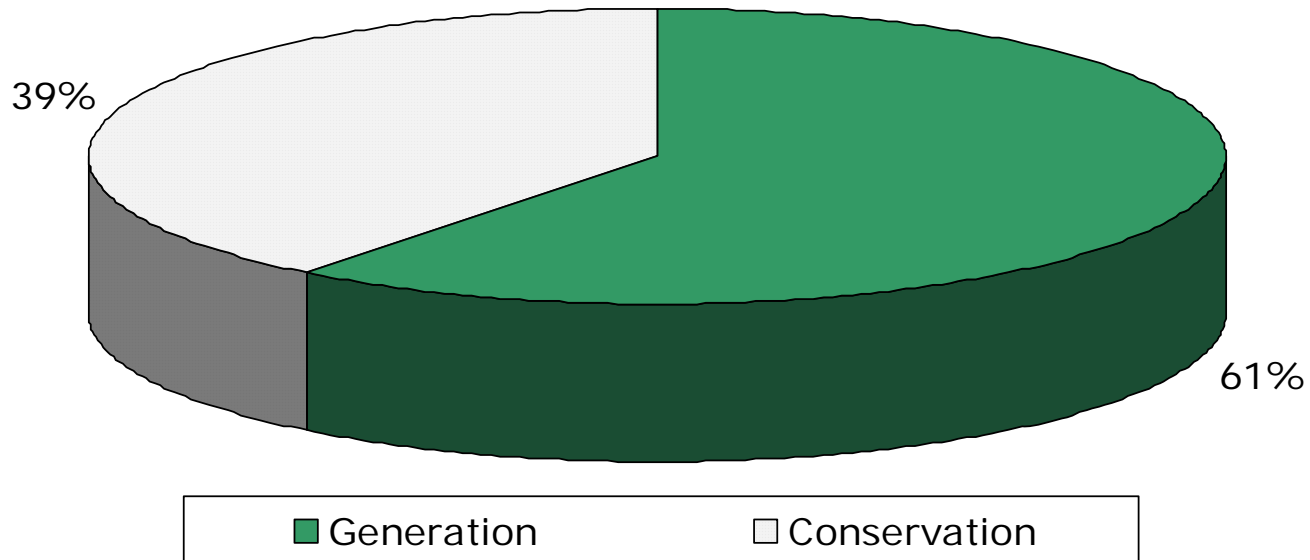
Energy Efficiency Resources Significantly Reduced Projected PNW Electricity Sales



PNW Average Residential Electricity Use/Customer

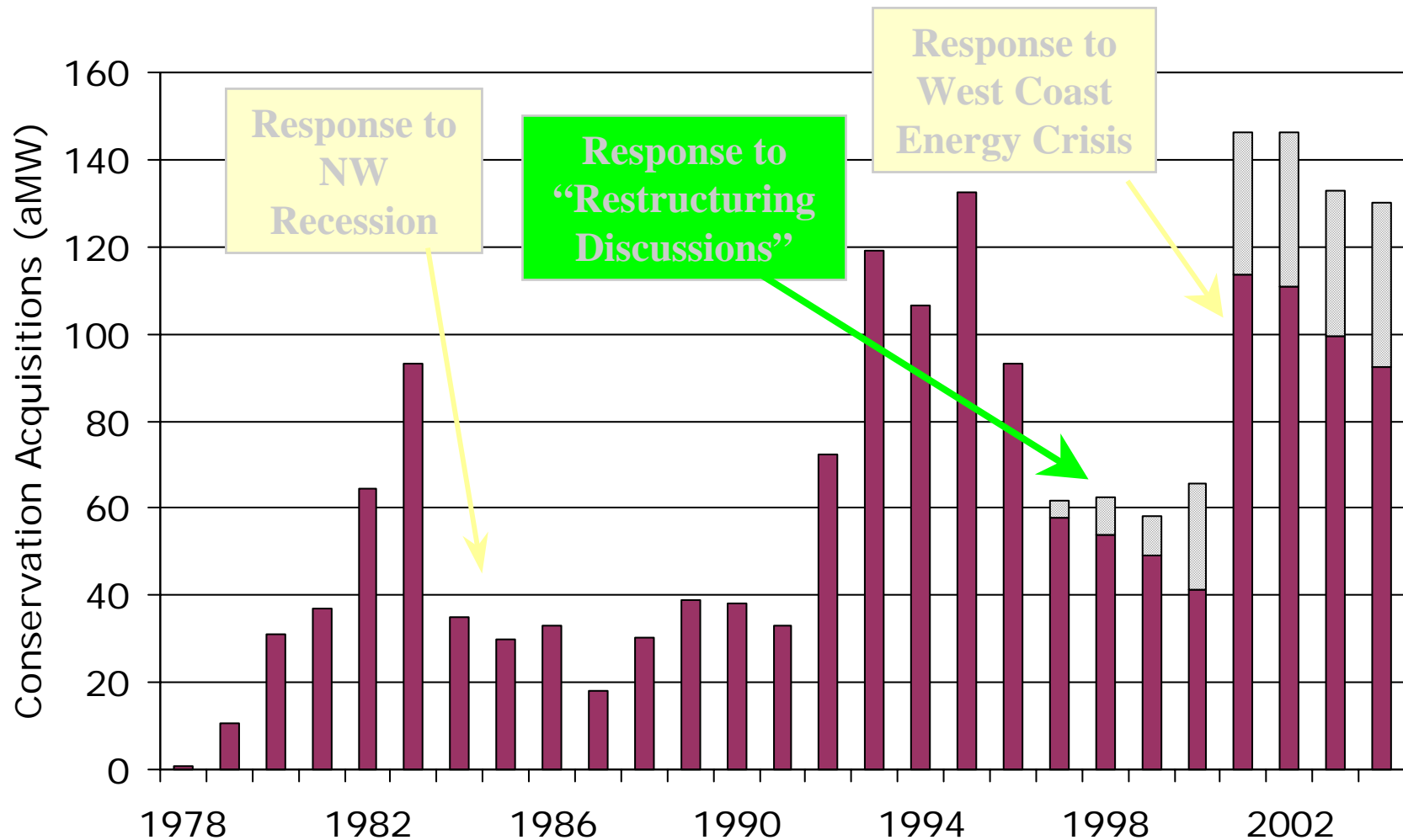


Energy Efficiency Met Nearly 40% of PNW Regional Firm Sales Growth Between 1980 - 2003

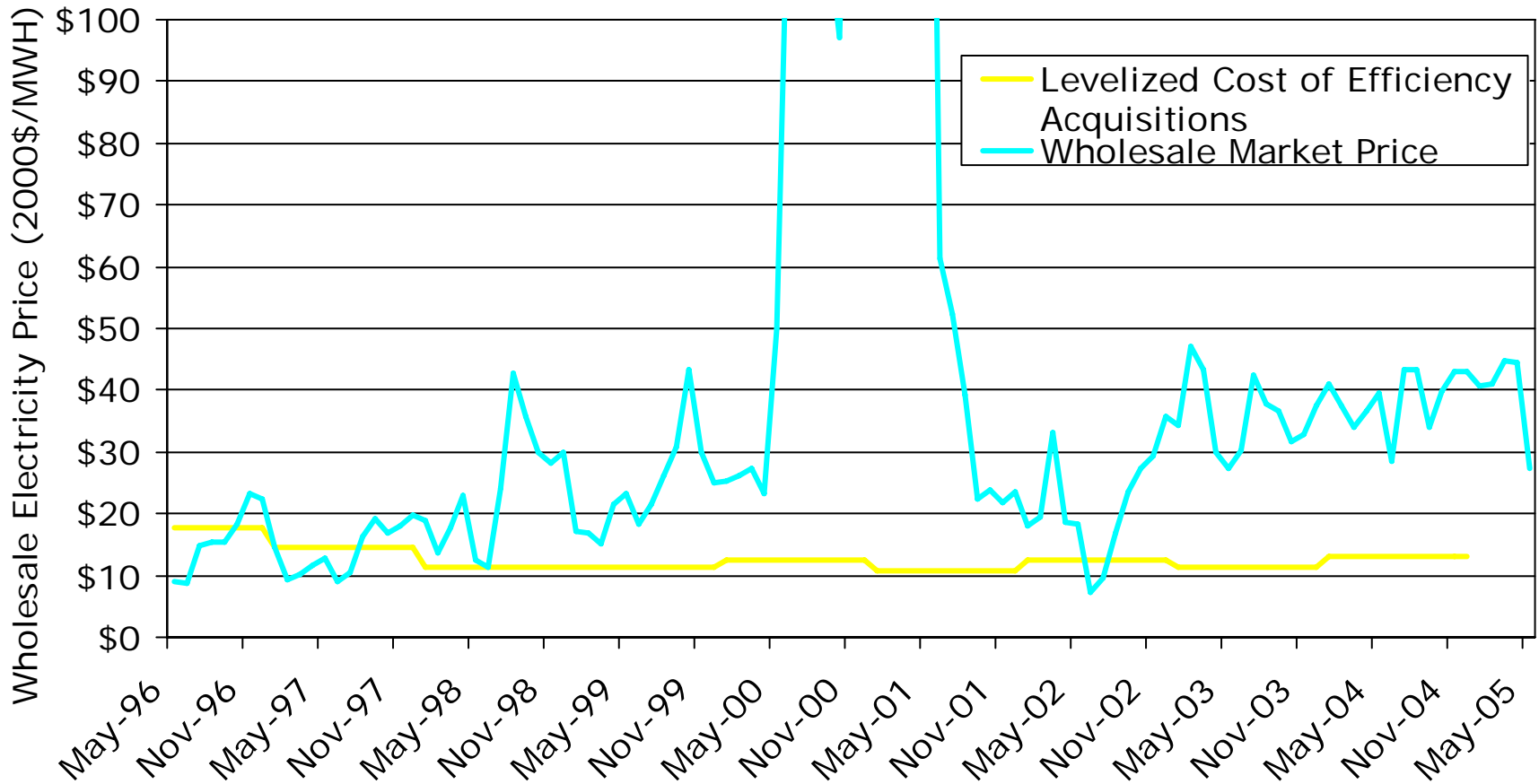


Regional Utility Energy Efficiency Acquisitions Have Helped Balance Loads & Resources

Creating Mr. Toad's Wild Ride for the PNW's Energy Efficiency Industry

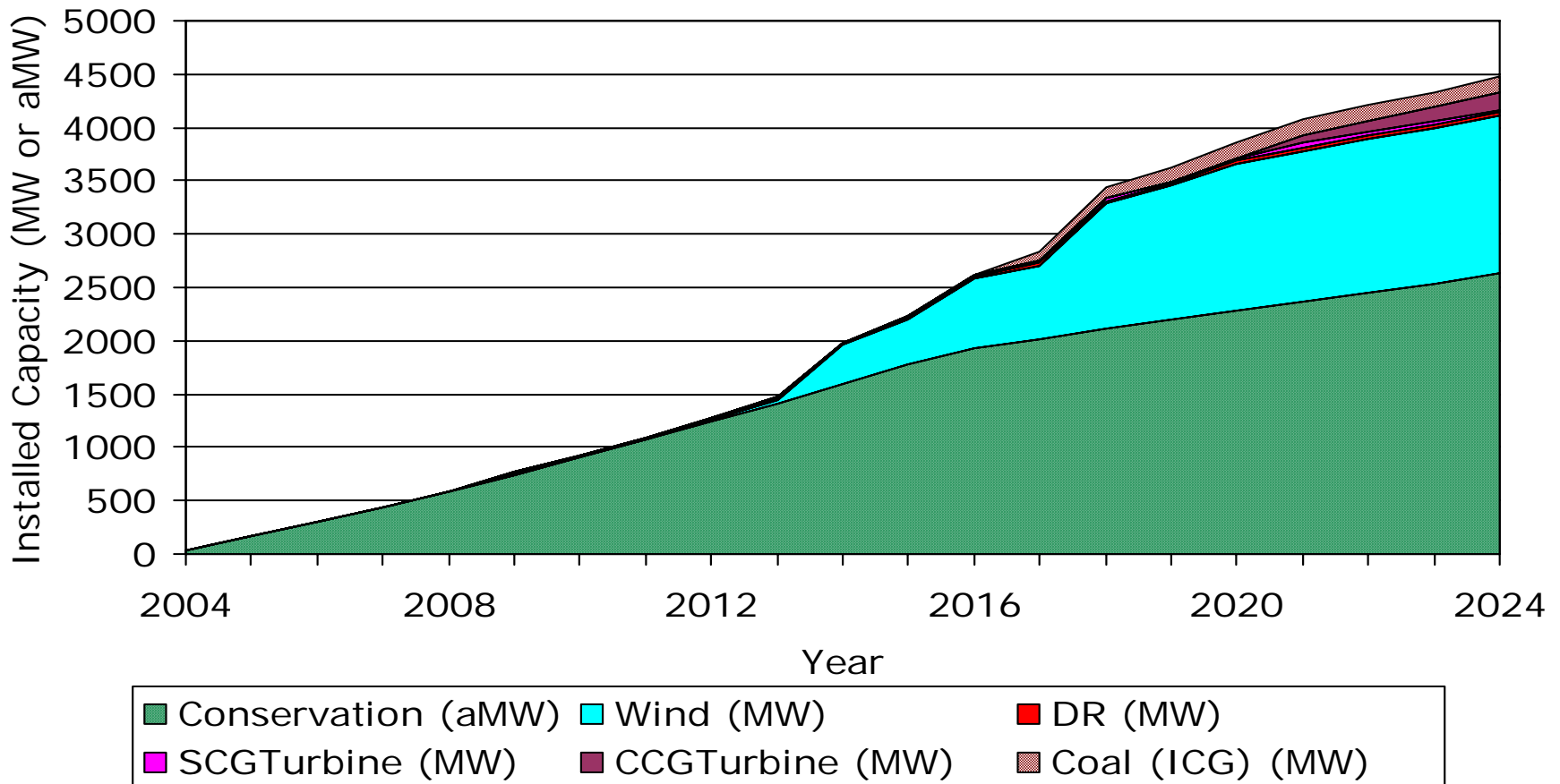


Utility Acquired Energy Efficiency Has Been **A BARGAIN!**



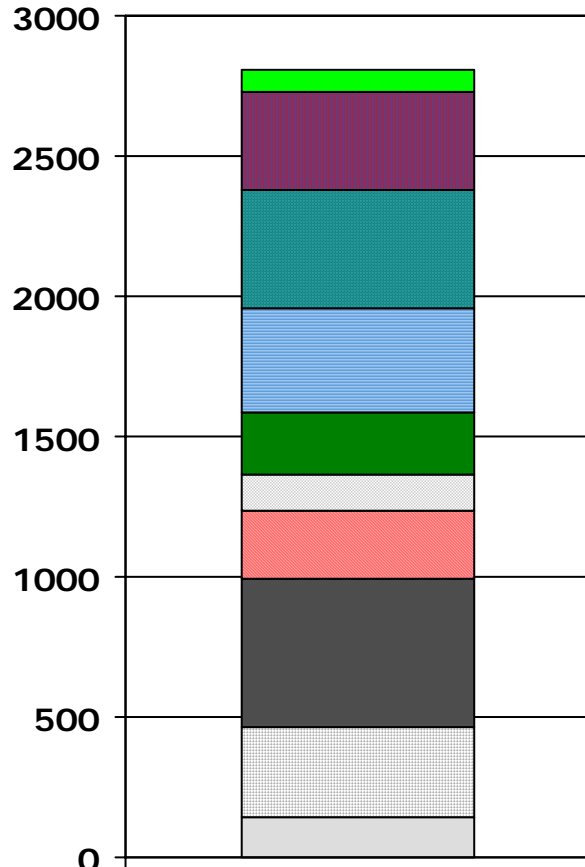
So Much for the Past, What's Ahead

5th Plan Relies on Conservation and Renewable Resources to Meet Load Growth *



*Actual future conditions (gas prices, CO2 control, conservation accomplishments) will change resource development schedule

Cost-Effective and Achievable Conservation Should Meet Over 45% of PNW Load Growth from 2005-2025*



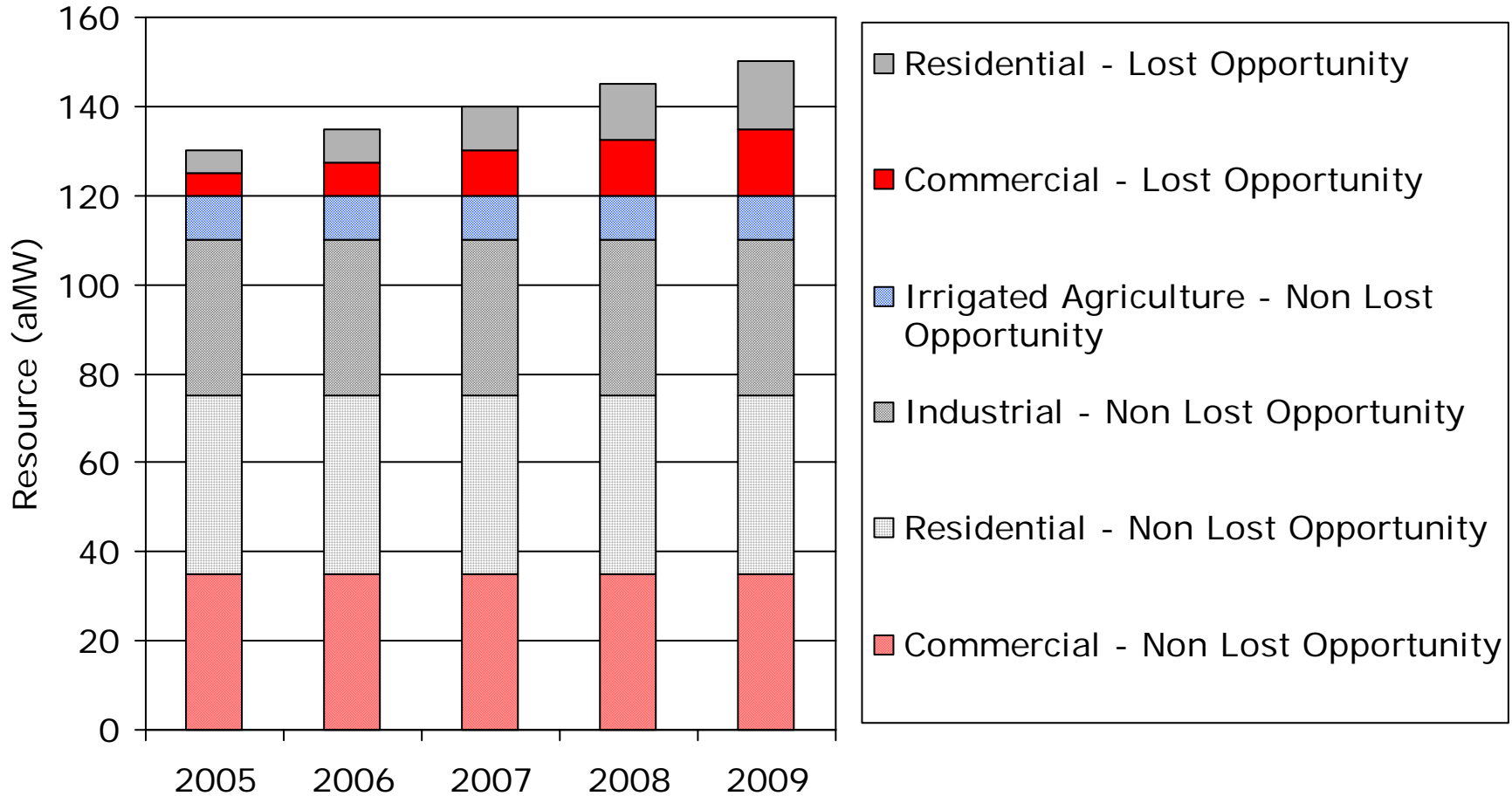
Cost-Effective Potential
(aMW in 2025)

- Agricultural Sector - 80 aMW
- Non-DSI Industrial Sector - 350 aMW
- Commercial Sector Non-Building Measures - 420 aMW
- HVAC, Envelope & Refrigeration - 375 aMW
- New Commercial Building Lighting - 220 aMW
- Existing Commercial Buildings Lighting - 130 aMW
- Residential Space Conditioning - 240 aMW
- Residential Lighting - 530 aMW
- Residential Water Heating - 325 aMW
- Residential Appliances - 140 aMW

*Medium Load Forecast
Loads & Market Prices



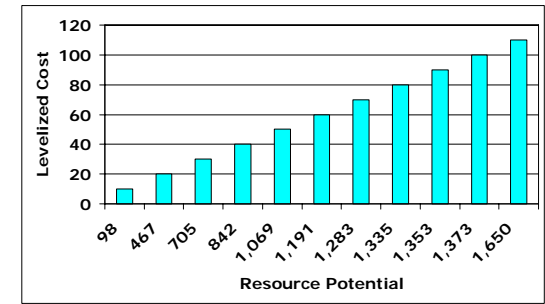
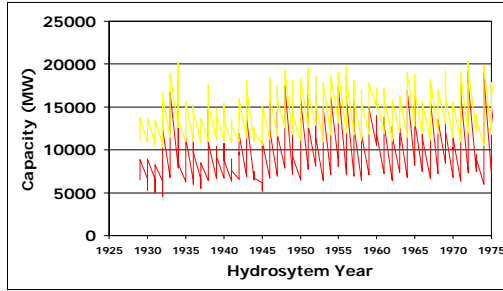
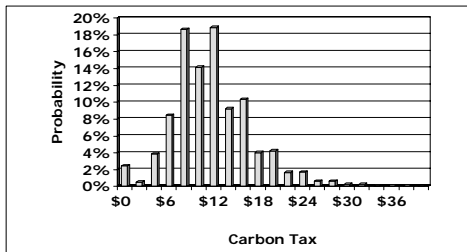
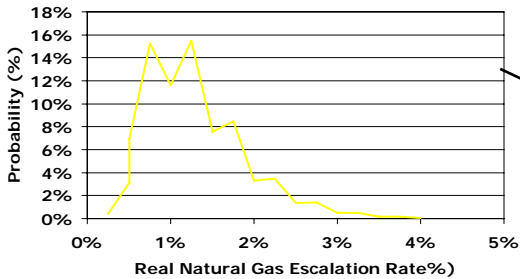
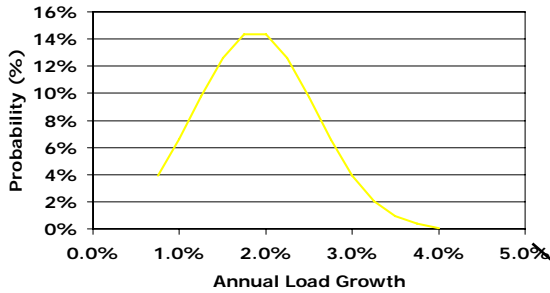
Regional Near-Term Conservation Targets (2005-2009) = 700 aMW



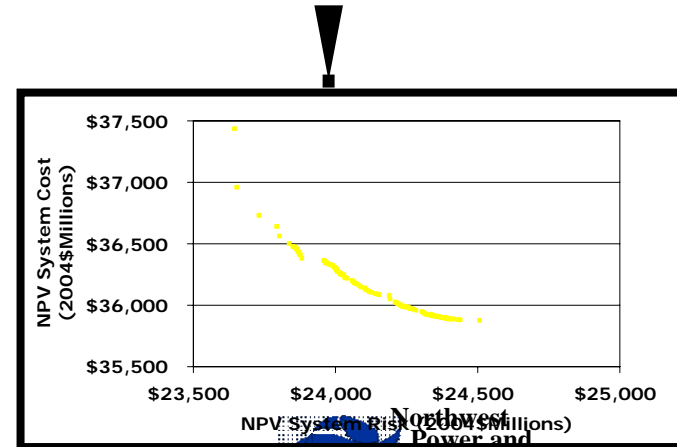
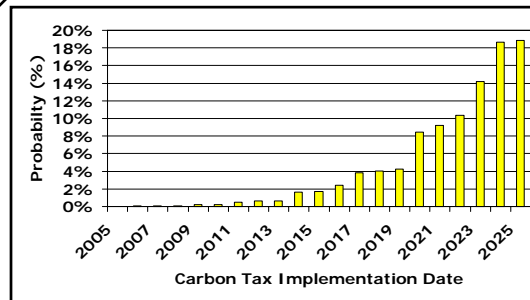
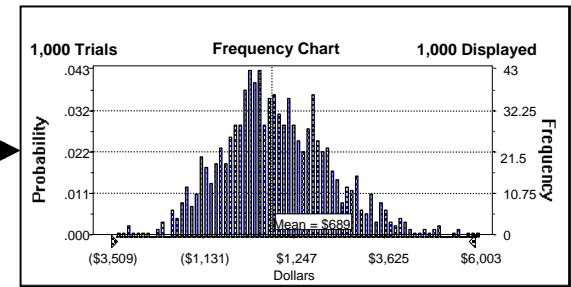
Why Should We?

What's Behind the 5th Plan's Conservation Targets?

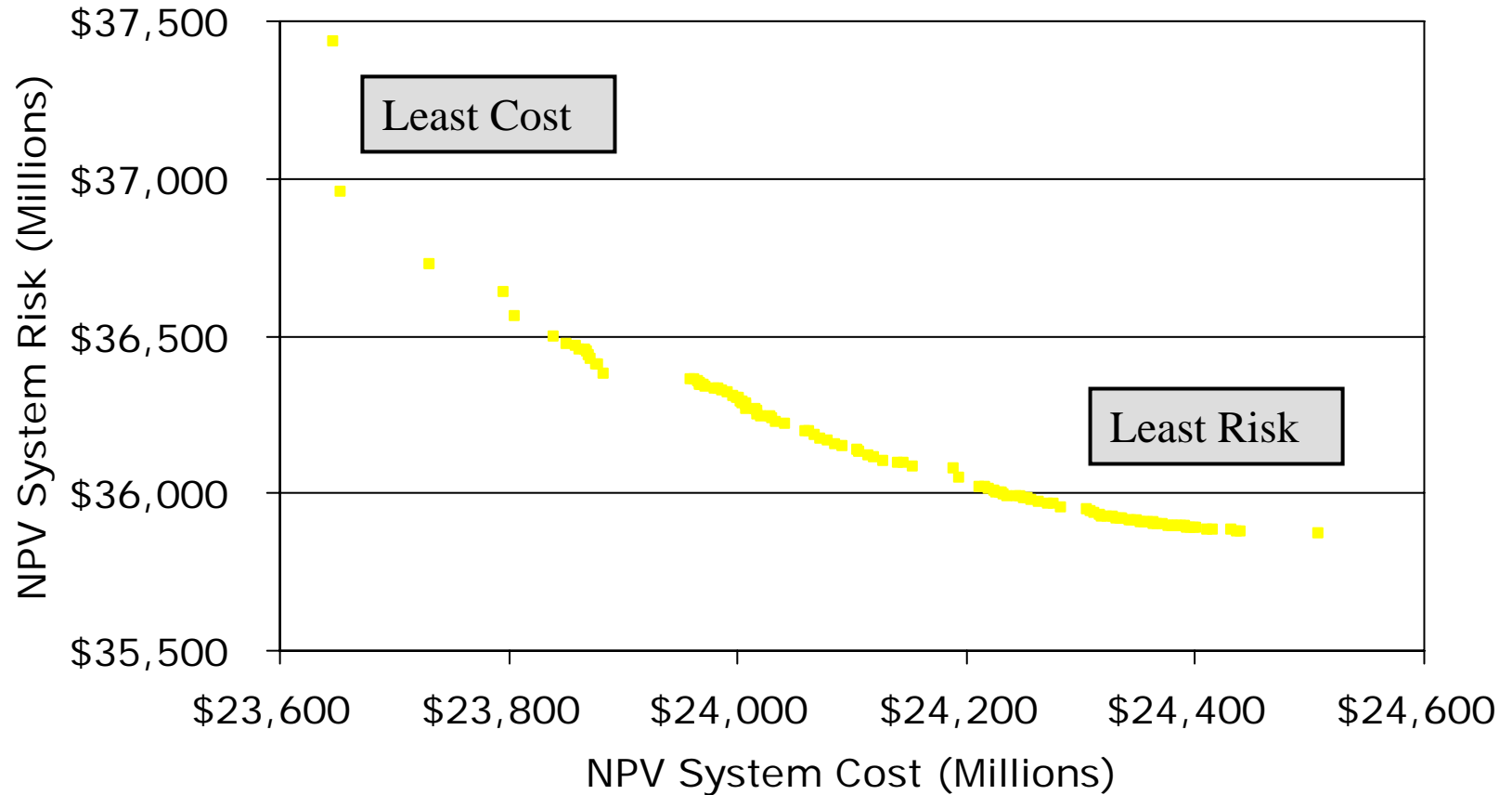
PNW Portfolio Planning – Scenario Analysis on Steroids



Portfolio Analysis Model



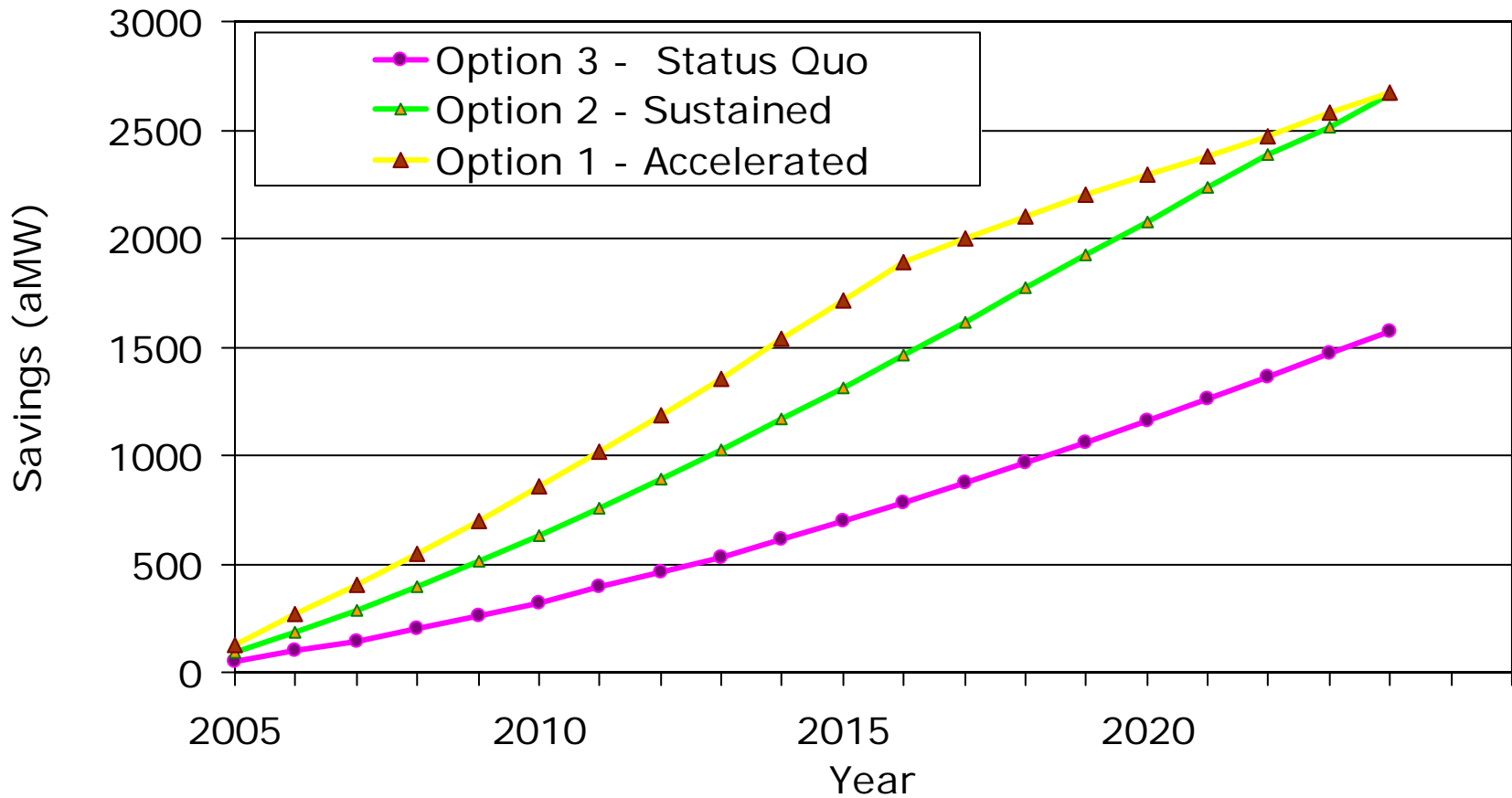
Plans Along the Efficient Frontier Permit Trade-Offs of Costs Against Risk



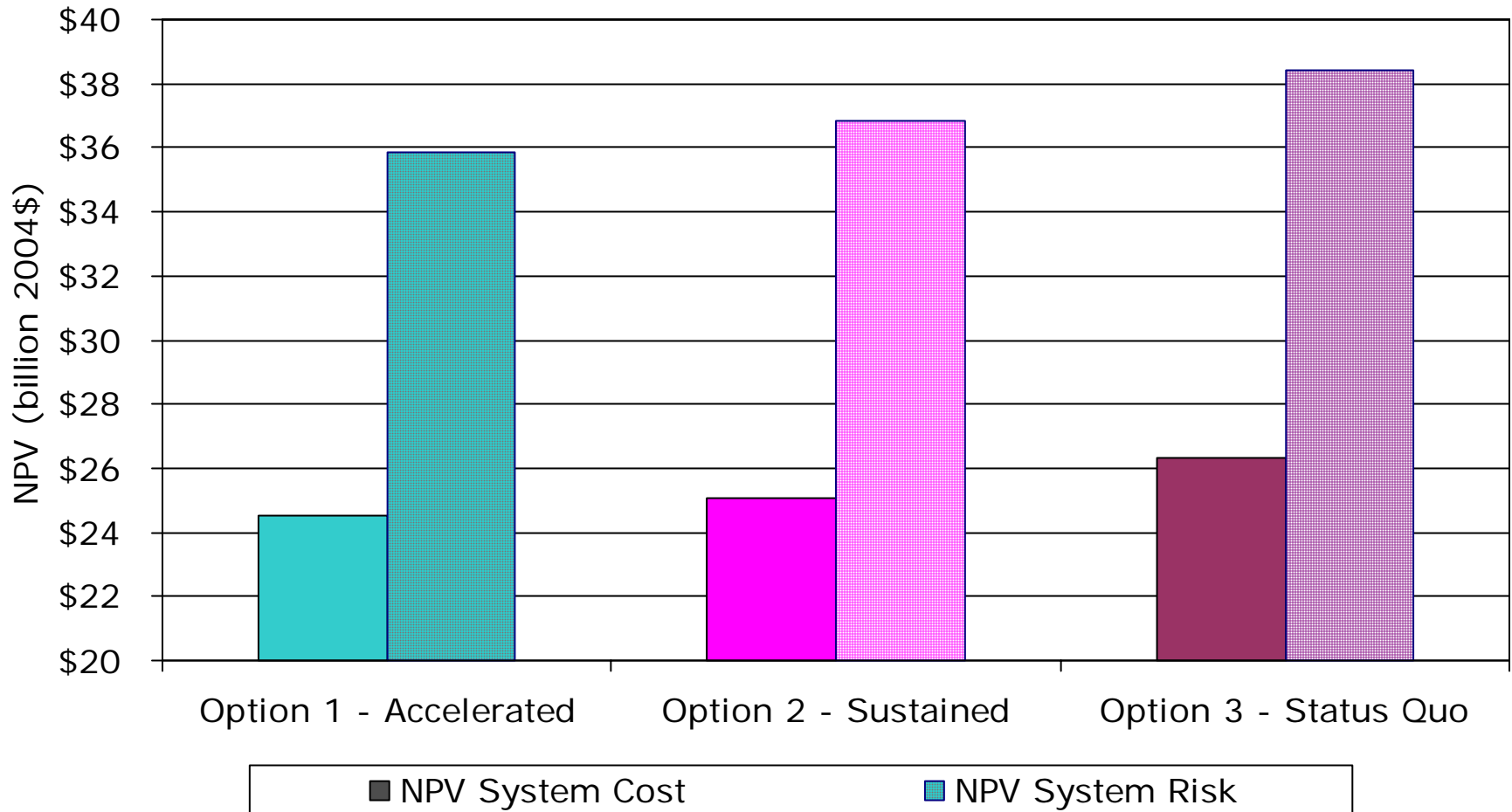
Three Conservation Options Tested

- **Option 1: Accelerated** – Similar to the “best performance” over the last 20 years
 - Non-lost opportunity limited to 120 aMW/year
 - Ramp-up lost-opportunity to 85% by 2017
- **Option 2: Sustained** - Similar to typical rates over last 20 years
 - Non-lost opportunity limited to 80 aMW/year
 - Ramp-up lost-opportunity to 85% by 2017
- **Option 3: Status Quo** - Similar to lowest rates over last 20 years
 - Non-lost opportunity limited to 40 aMW/year
 - Ramp-up lost-opportunity to 85% penetration by 2025

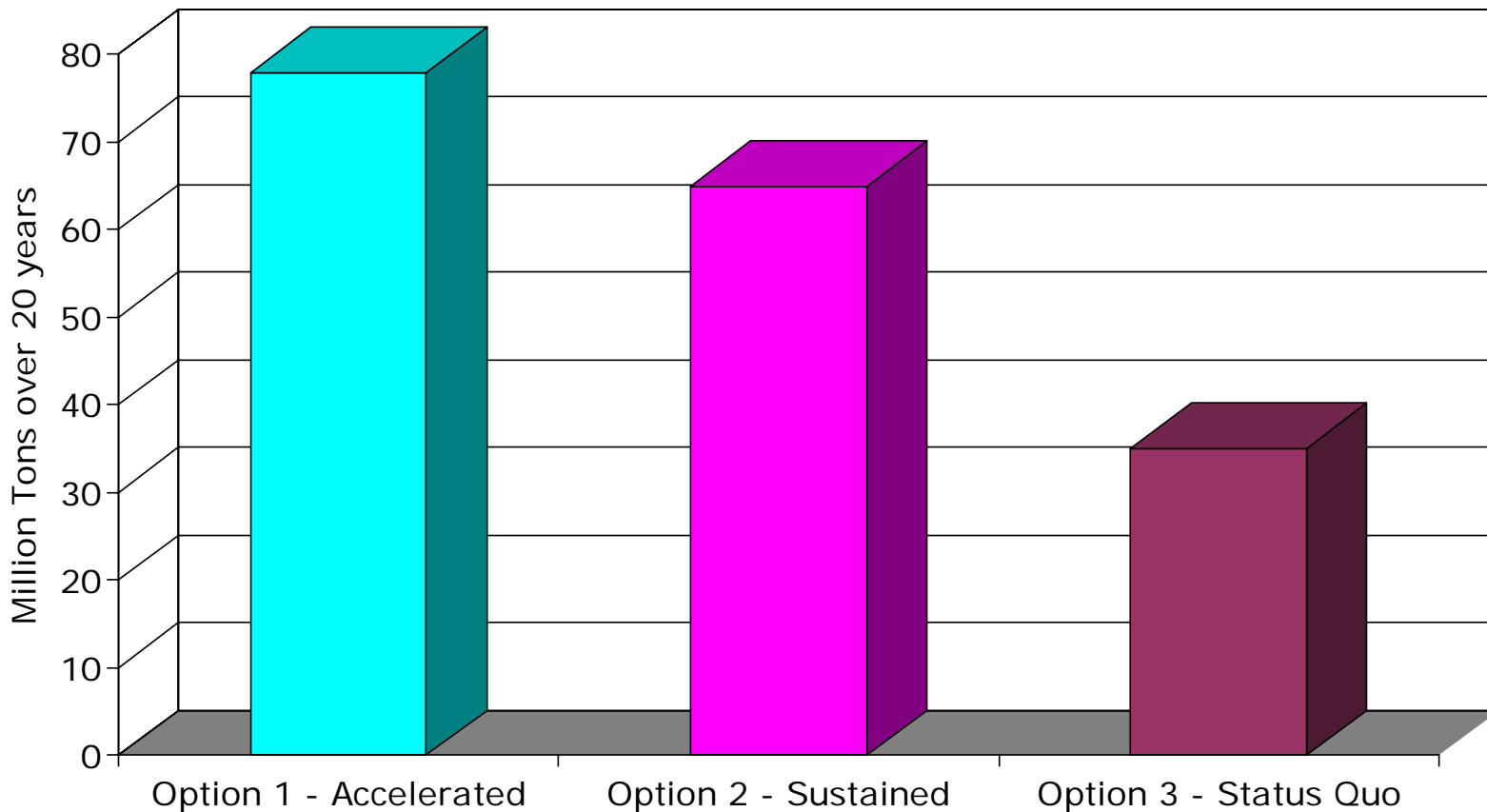
Average Annual Conservation Development for Alternative Levels of Deployment Tested



Accelerating Conservation Development Reduces Cost & Risk



WECC Carbon Dioxide Emissions Reductions for Alternative Conservation Targets



Why Energy Efficiency Reduces System Cost and Risk

- It's A Cheap (avg. 2.4 cents/kWh TOTAL RESOURCE COST) Hedge Against Market Price Spikes
- It has value even when market prices are low
- It's Not Subject to Fuel Price Risk
- It's Not Subject to Carbon Control Risk
- It's Significant Enough In Size to Delay “build decisions” on generation

The Plan's Targets Are A Floor, Not a Ceiling

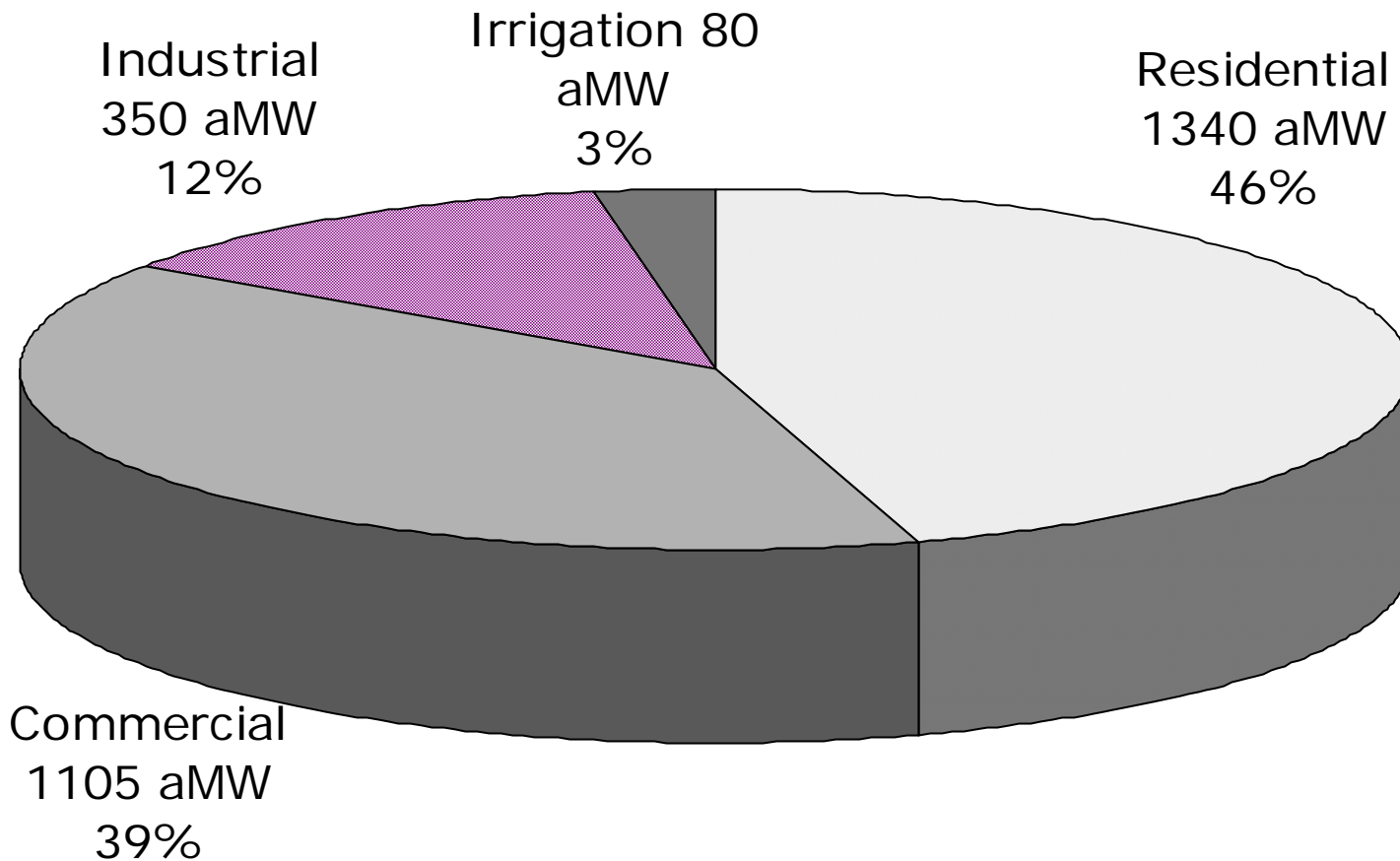
When we took the “ramp rate” constraints off the portfolio model it developed

1500 aMW

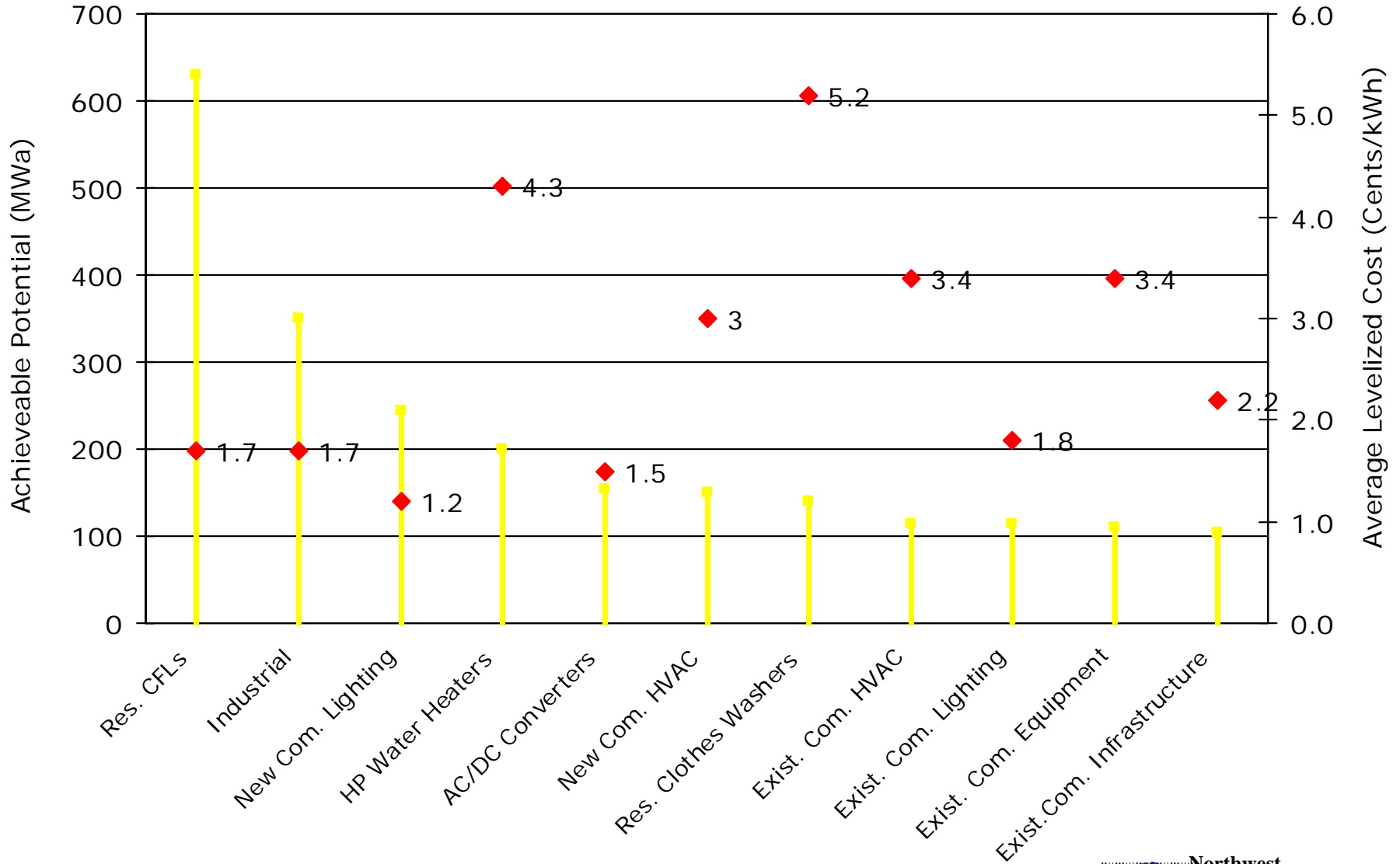
of Energy Efficiency in 2005

Where Are We Getting The Savings?

Sources of Savings by Sector



Major Sources of Efficiency Resource



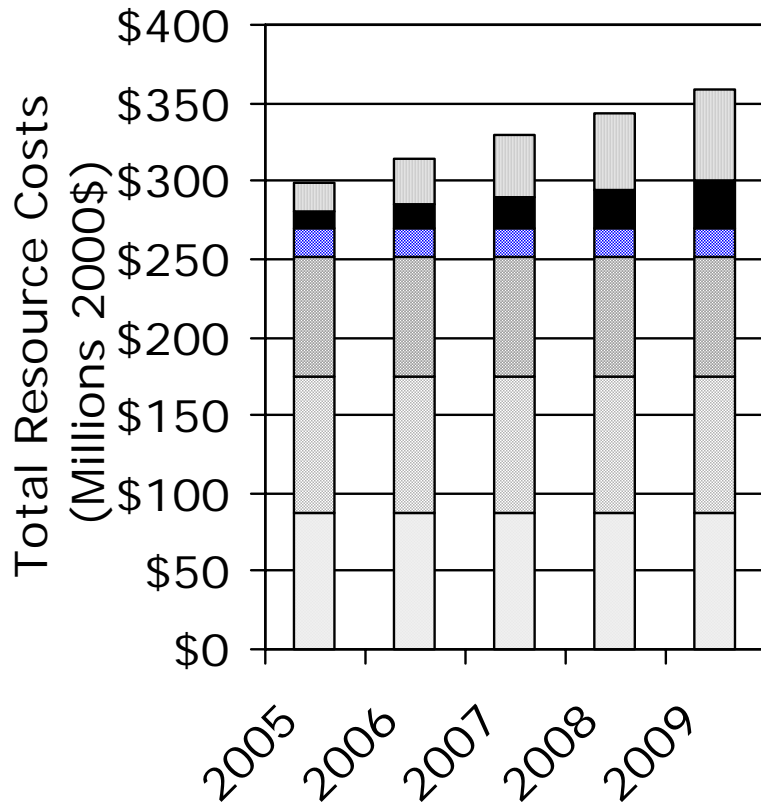
Implementation Challenges

Plan

Conservation Action Items

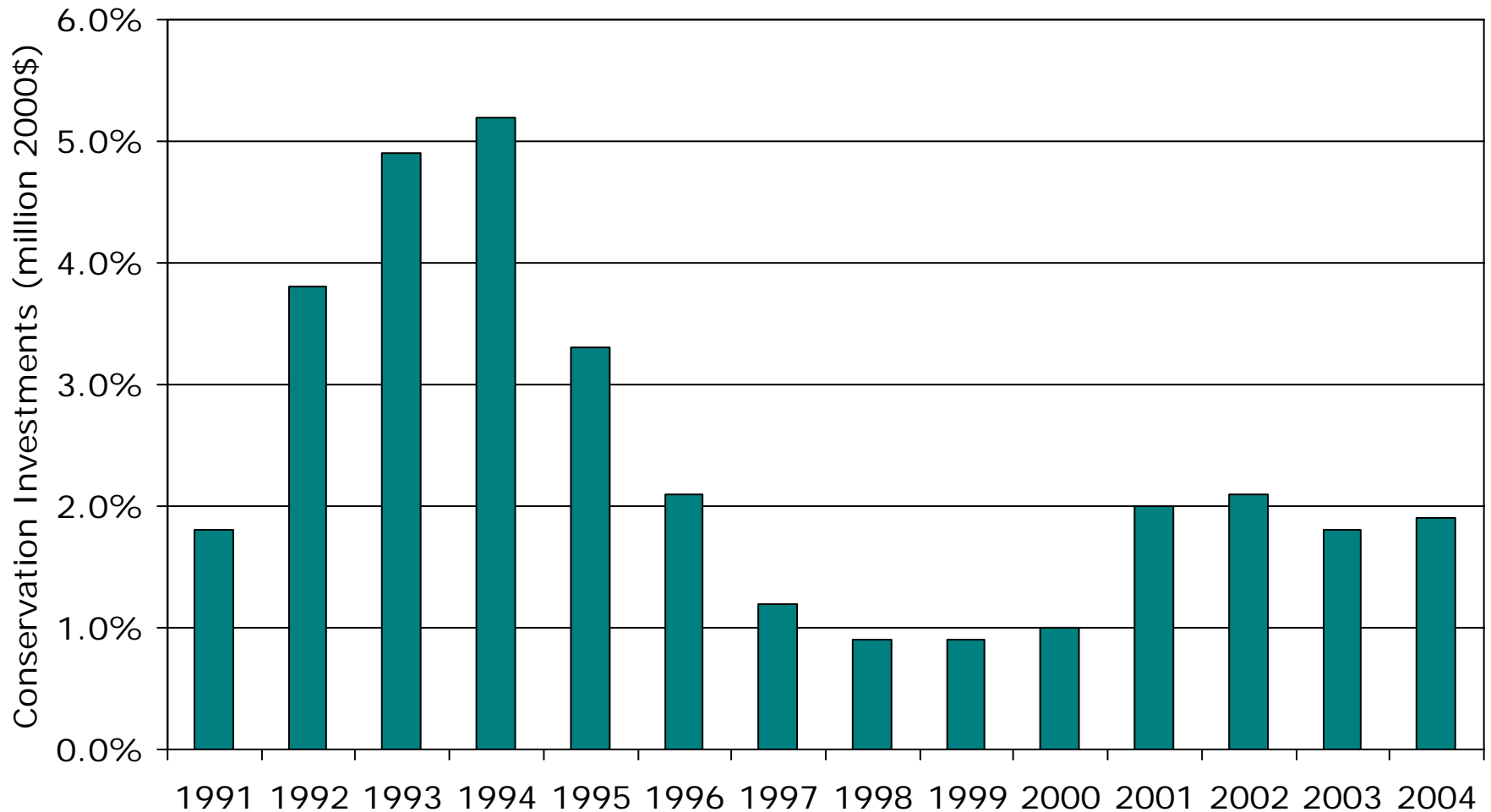
- Ramp up “Lost Opportunity” conservation
 - » Goal => 85% penetration in 12 years
 - » 10 to 30 MWa/year 2005 through 2009
- Accelerate the acquisition of “Non-Lost Opportunity” resources
 - » Return to acquisition levels of early 1990’s
 - » Target 120 MWa/year next five years
- Employ a mix of mechanisms
 - » Local acquisition programs (utility, SBC Administrator & BPA programs)
 - » Regional acquisition programs and coordination
 - » Market transformation ventures

The Total Resource Acquisition Cost* of 5th Plan's Conservation Targets 2005 – 2009 = \$1.64 billion

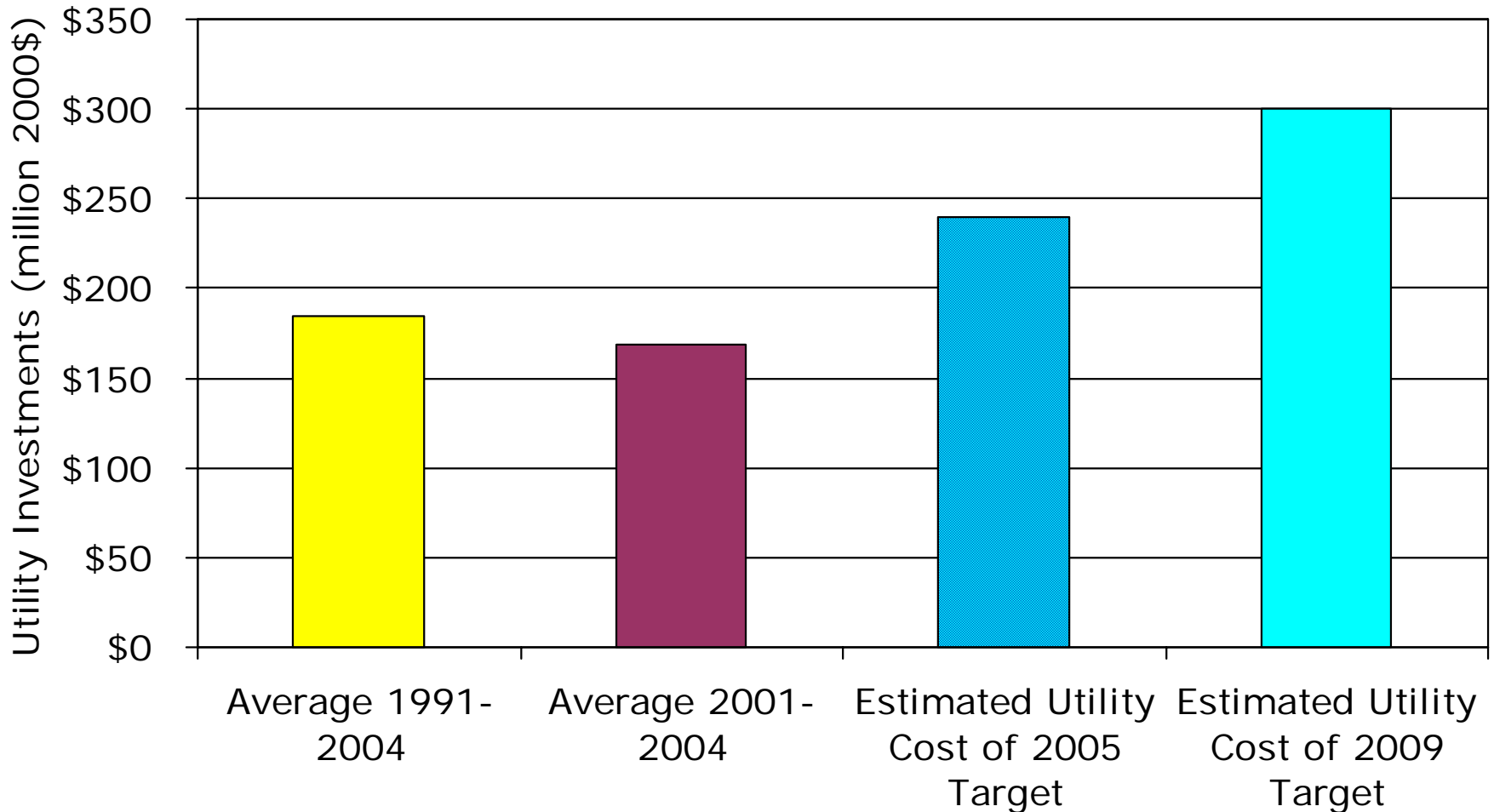


*Incremental capital costs to install measure plus program administration costs estimated at 20% of capital.

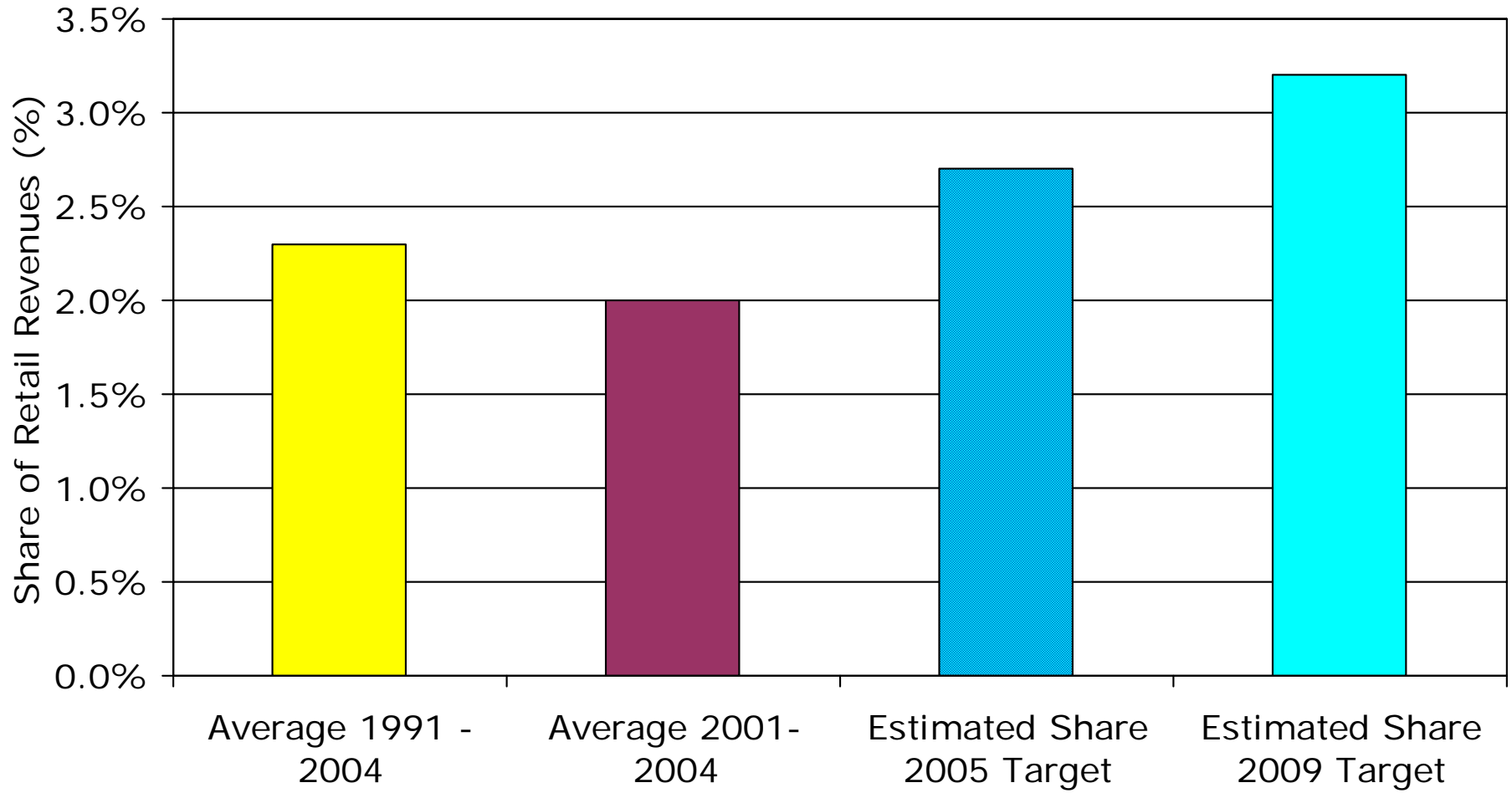
PNW Utilities Now Invests Less Than 2% of Their Retail Sales Revenues in Energy Efficiency



Meeting the Plan's Efficiency Targets Will Likely Require Increased Regional Investments

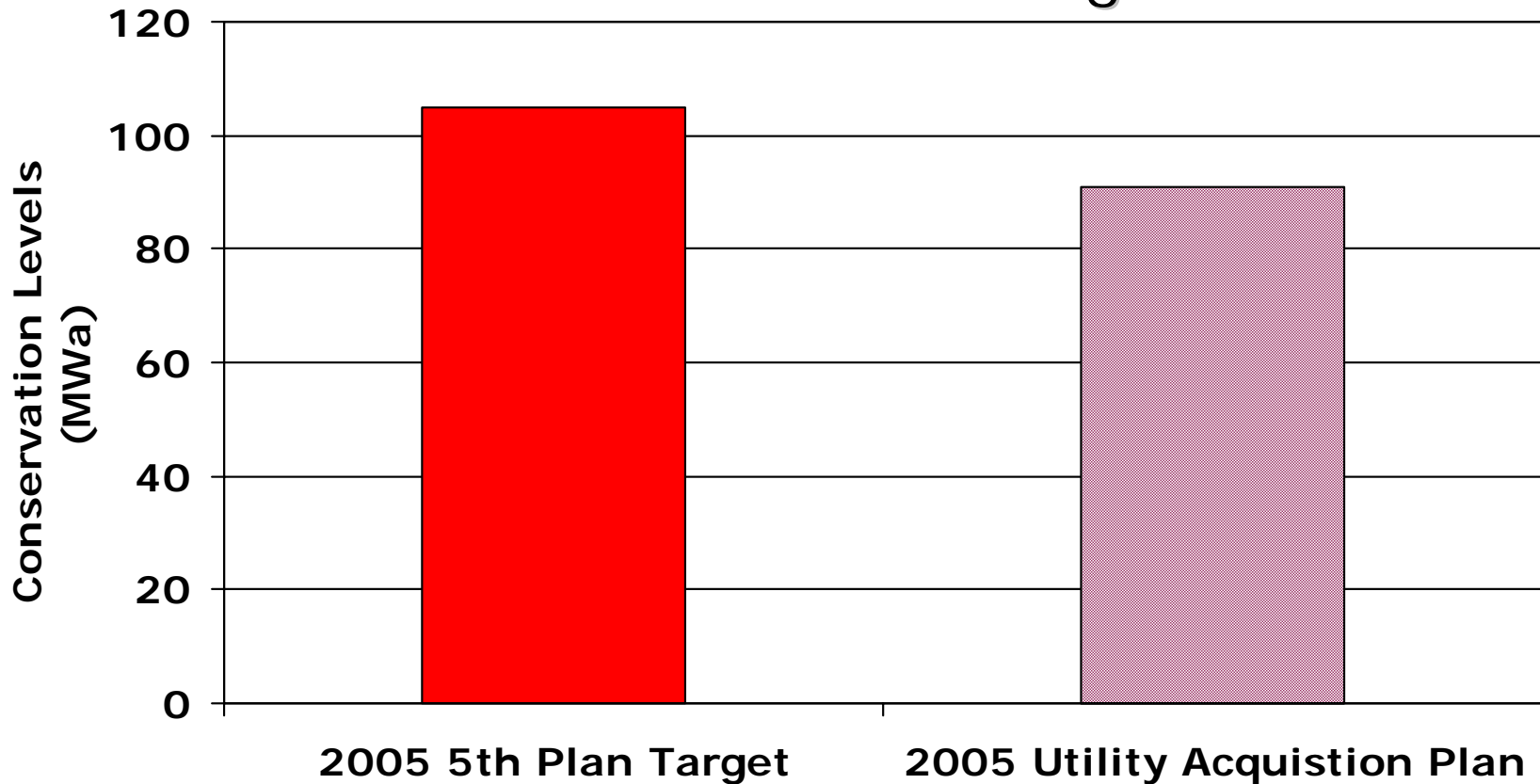


Although, The Share of Utility Revenues Required is Modest



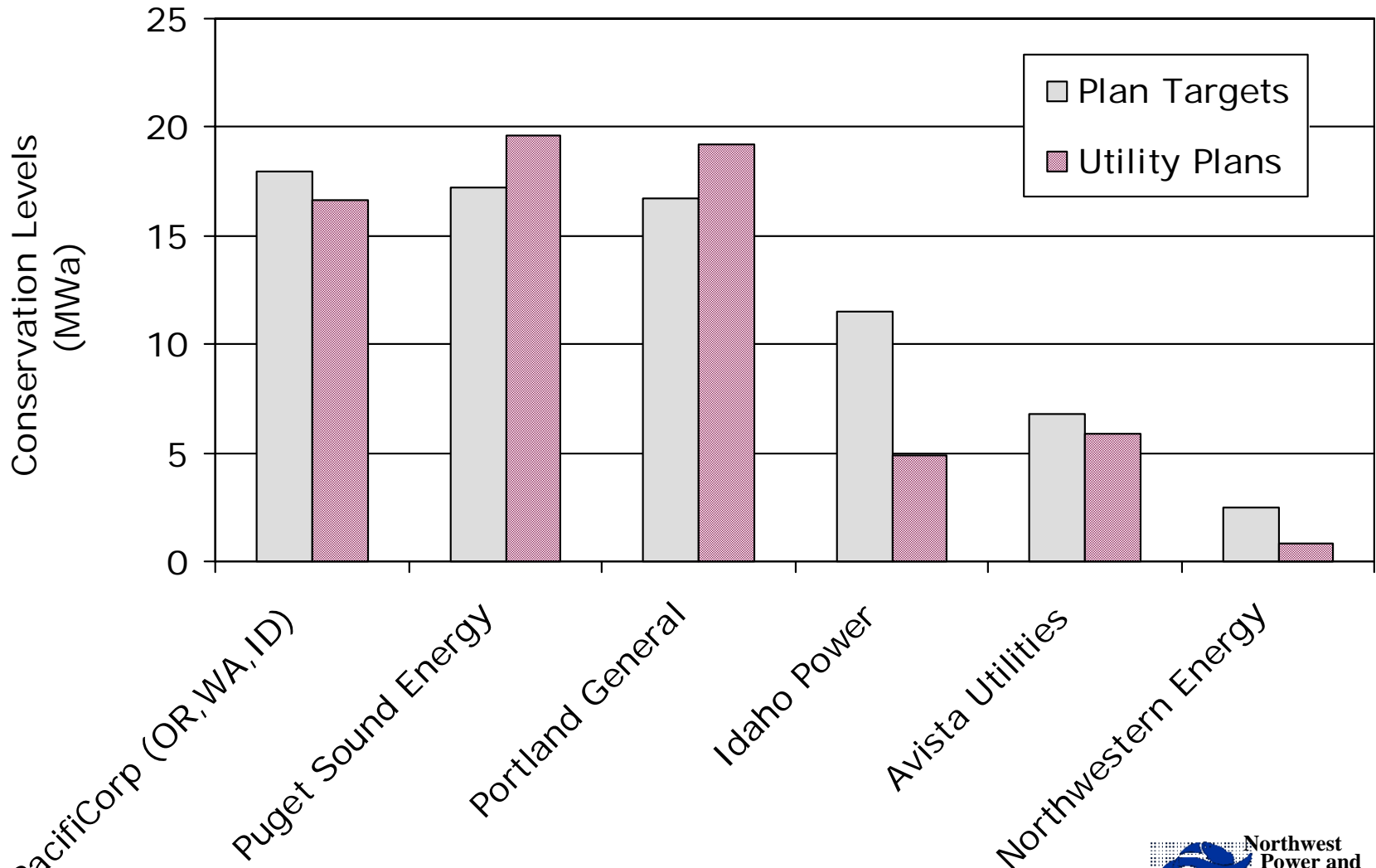
Regional Average Revenues/kWh will need to increase by \$0.000008/kWh

Utility* Efficiency Acquisition Plans for 2005 Are Close to 5th Plan Targets



*Targets for 15 Largest PNW Utilities. These utilities represent approximately 80% of regional load.

Most IOU Efficiency Plans are Close to 5th Plan's Targets



However, Several Large Public Utility Efficiency Plans Are Well Below 5th Plan Targets

