

The \$20 Billion Bonanza:

Best Practice Utility Energy Efficiency Programs and Their Benefits in the Southwest

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Arizona Presentation

Southwest Energy Efficiency Project

- Public interest organization founded in 2001
- SWEEP's primary focus is expanding and improving utility energy efficiency programs in AZ, CO, NV, NM, UT, and WY
- We also work on state legislation, building codes, state/local programs, industrial energy efficiency, and transportation issues
- SWEEP is funded by charitable foundations and government entities



Summary: Implementing Best Practice utility energy efficiency programs in Arizona would:

- Cut electricity use in 2020 by 21%
- Cut peak demand in 2020 by 3,240 MW
- Save households & businesses \$7.3 billion
- Avoid 10.5 large (400 MW) power plants
- Support 10,400 new jobs in the state
- Cut air pollution and improve public health
- Reduce water use 4.1 billion gallons per year by 2020



Questions Addressed in the Study

- What comprises a comprehensive set of Best Practice utility energy efficiency programs?
- What are the costs and benefits of implementing Best Practice utility energy efficiency programs in each state and the region?
- Is it possible to achieve 20% electricity savings by 2020 in each state, from programs 2010-2020?
- What policies are needed to realize the benefits offered by Best Practice energy efficiency programs?

Study Methodology

- Program characteristics taken from leading programs nationwide
- Programs ramped up through 2020 in each state
- High Efficiency Scenario compared to a Reference Scenario without energy efficiency programs
- Study projects energy savings, peak demand reduction, and cost to utilities, households and businesses from implementing Best Practice programs
- Analyzes avoided investment in new power plants, pollution controls, fuel purchases, and O&M costs
- Analyzes avoided pollutant emissions, water savings, and impact on jobs and personal income



Best Practice Utility Programs

Residential	Commercial and Industrial
New Construction and Code Support	New Construction and Code Support
Low-income Weatherization	Small Business Direct Install
Single Family Home Retrofit	Prescriptive Rebates
Multi-family Retrofit	Custom Rebates, Process Efficiency and Self-Direct
Retail Products	Lighting Redesign
Lighting	Retrocommissioning
Refrigerator/Freezer Recycling	Computer Efficiency & Plug Loads
Cooling	Combined Heat & Power
Water Heating	
Home Energy Reports and Information Feedback	



Program Portfolio Is Highly Cost Effective

- Investing in energy efficiency and helping consumers save energy continues to be the lowest cost utility resource, by far
- Commercial and industrial programs have an average cost of saved energy of 2.2 cents per kWh
- Residential programs have an average cost of saved energy of 3.6 cents per kWh



Electricity Savings in the High Efficiency Scenario (GWh)

State	Electricity Savings in 2010	Electricity Savings in 2015	Electricity Savings in 2020	Savings in 2020 as % of Sales in 2020
Arizona	695	6,059	16,713	21%
Colorado	285	4,373	11,495	22%
Nevada	304	2,722	7,040	22%
New Mexico	87	1,863	5,110	24%
Utah	194	2,455	6,234	20%
Wyoming	17	1,143	3,238	15%
Region	1,582	18,615	49,828	21%

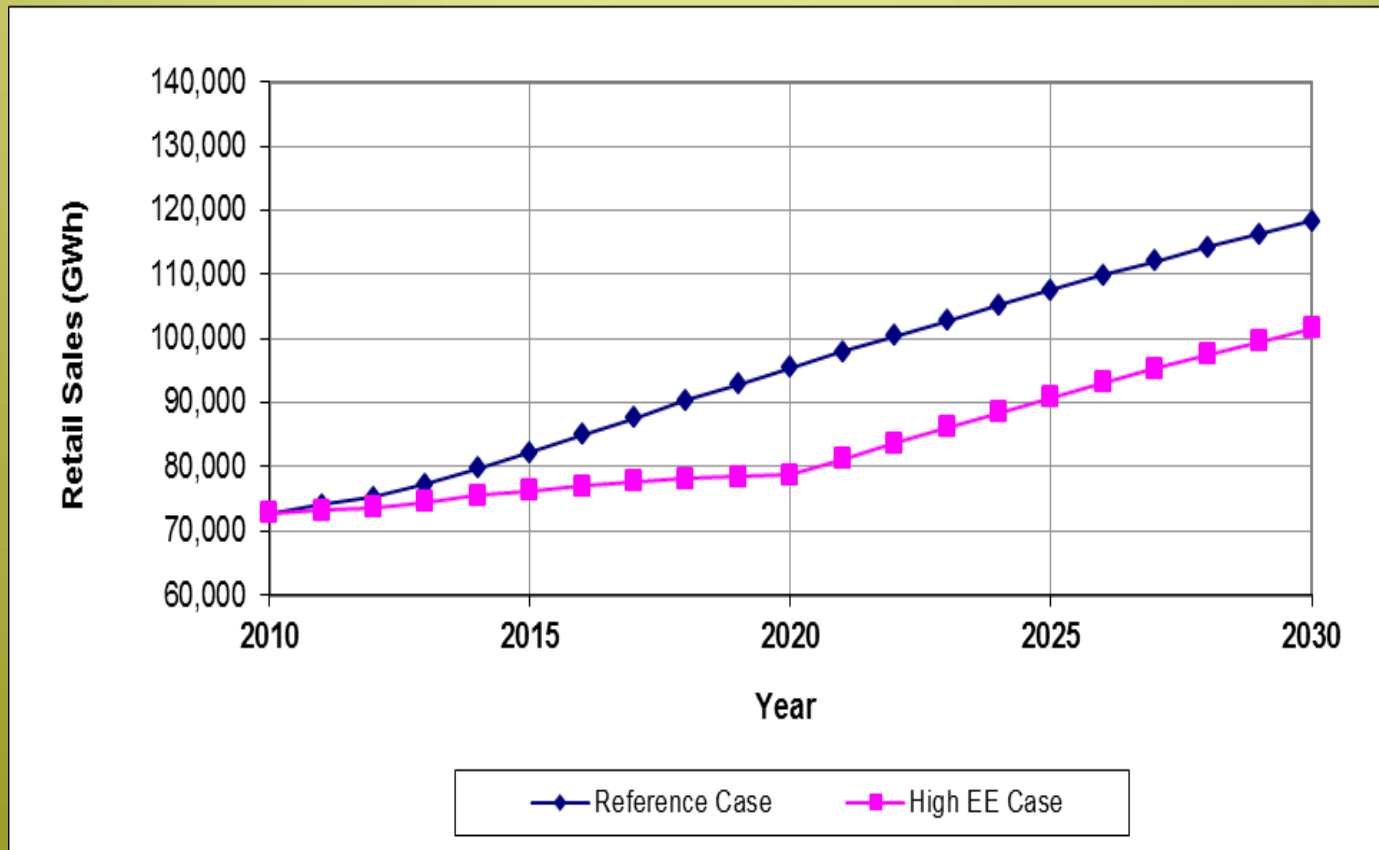


Utility Program Costs in the High Efficiency Scenario (Million dollars)

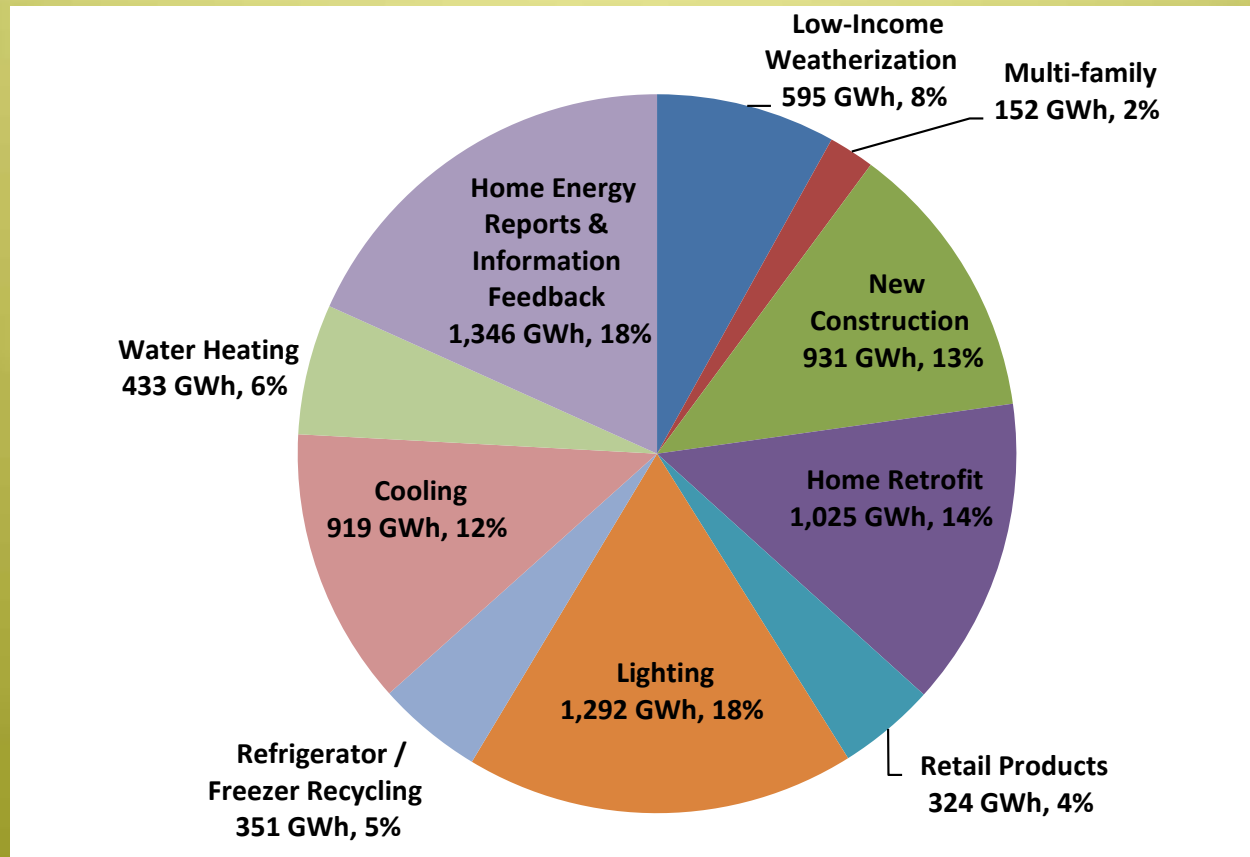
State	Cost in 2010	Cost in 2015	Cost in 2020	Net Present Value Through 2020
Arizona	54	377	623	2,767
Colorado	43	257	404	1,918
Nevada	29	152	248	1,137
New Mexico	15	121	191	877
Utah	40	138	214	1,052
Wyoming	4	71	101	480
Region	185	1,116	1,780	8,230



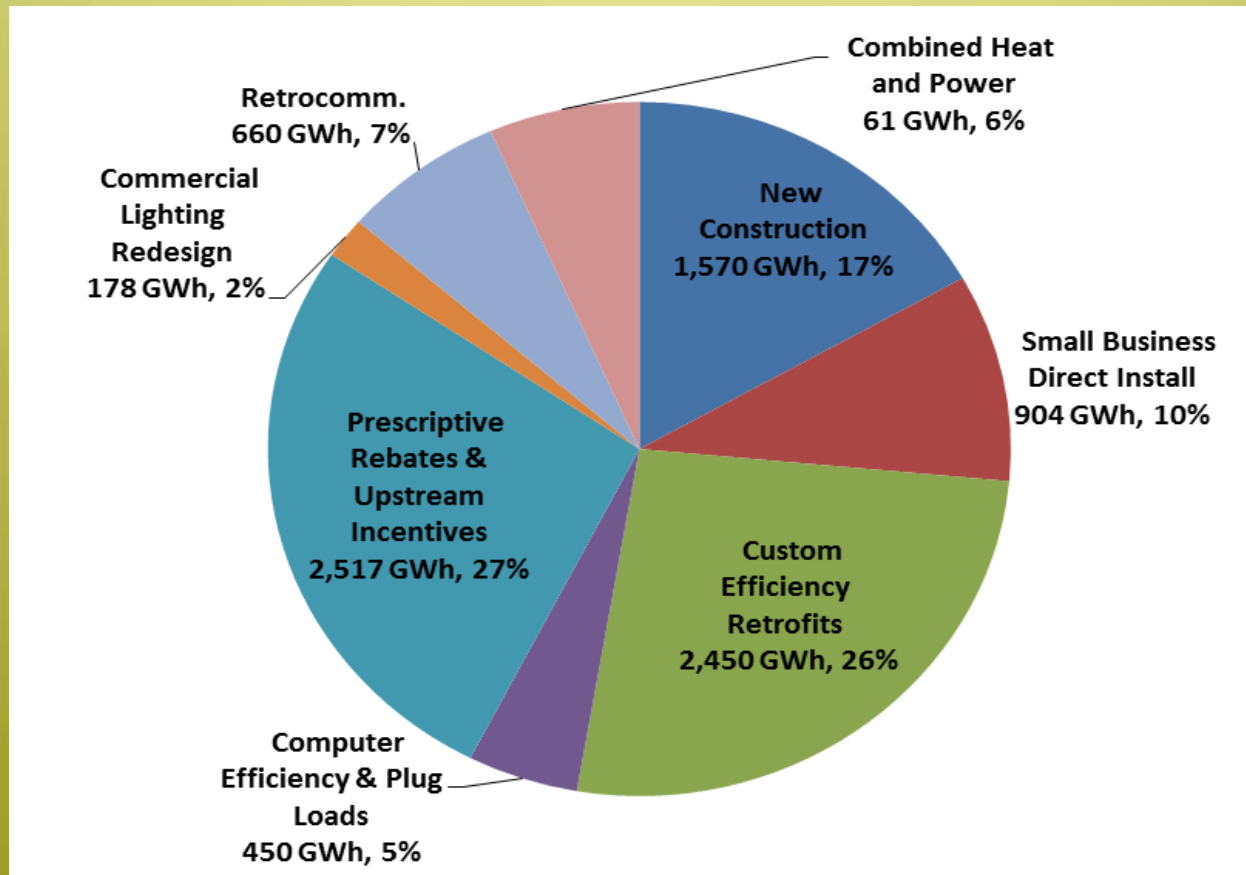
Electricity Sales in Arizona by Scenario



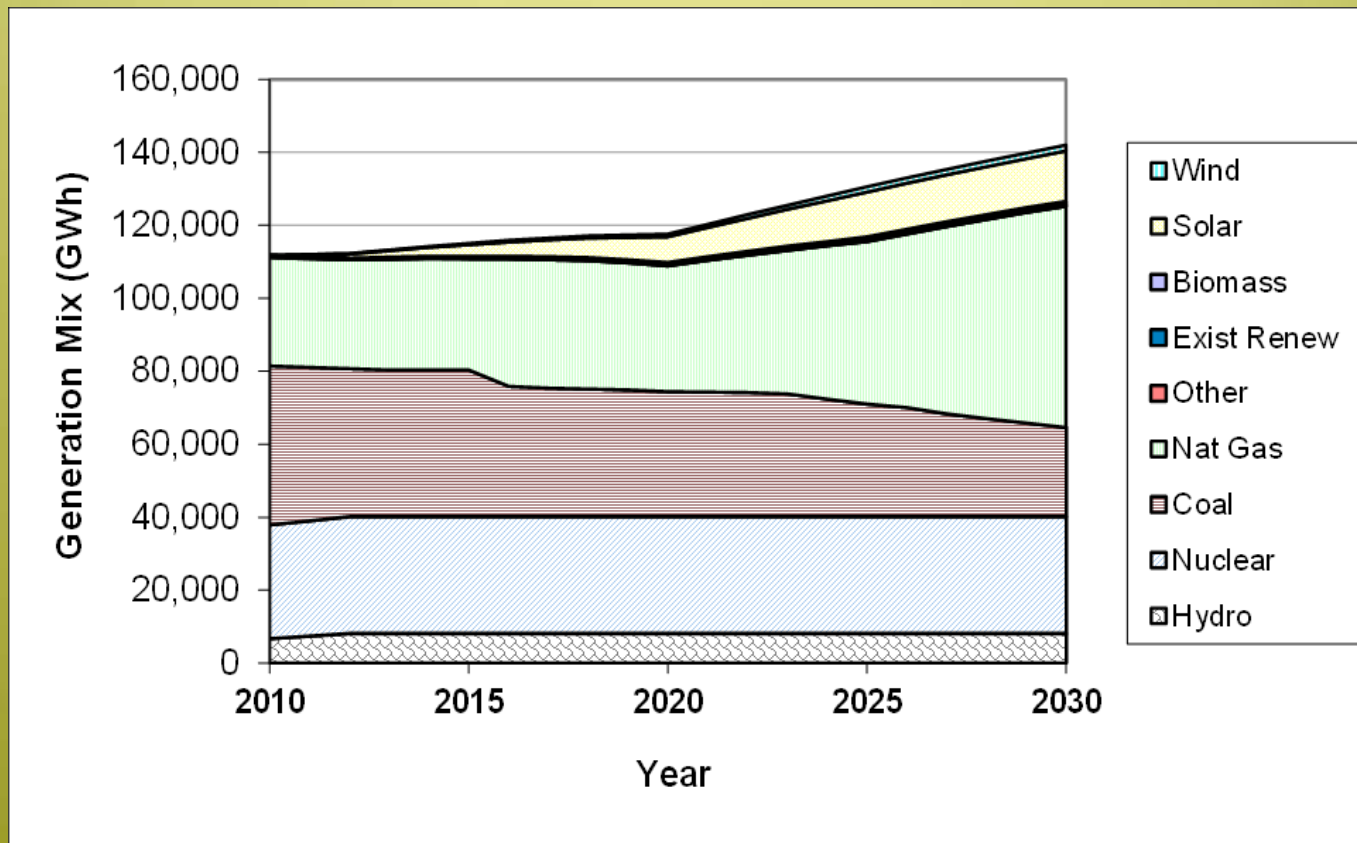
Residential Electricity Savings in 2020 in Arizona by Program (GWh/yr)



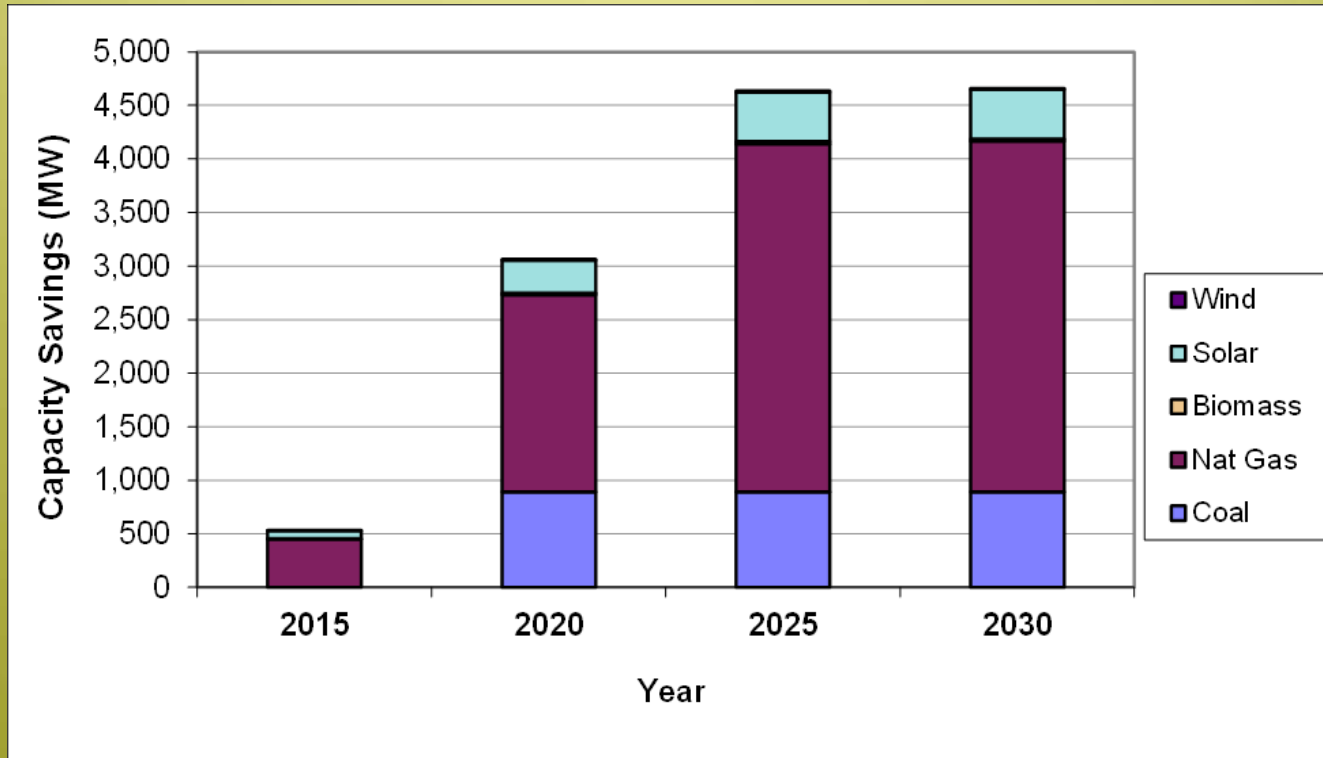
Business Electricity Savings in 2020 in Arizona by Program (GWh/yr)



Generation Mix in Arizona in the High Efficiency Scenario



Avoided Capacity in Arizona in the High Efficiency Scenario

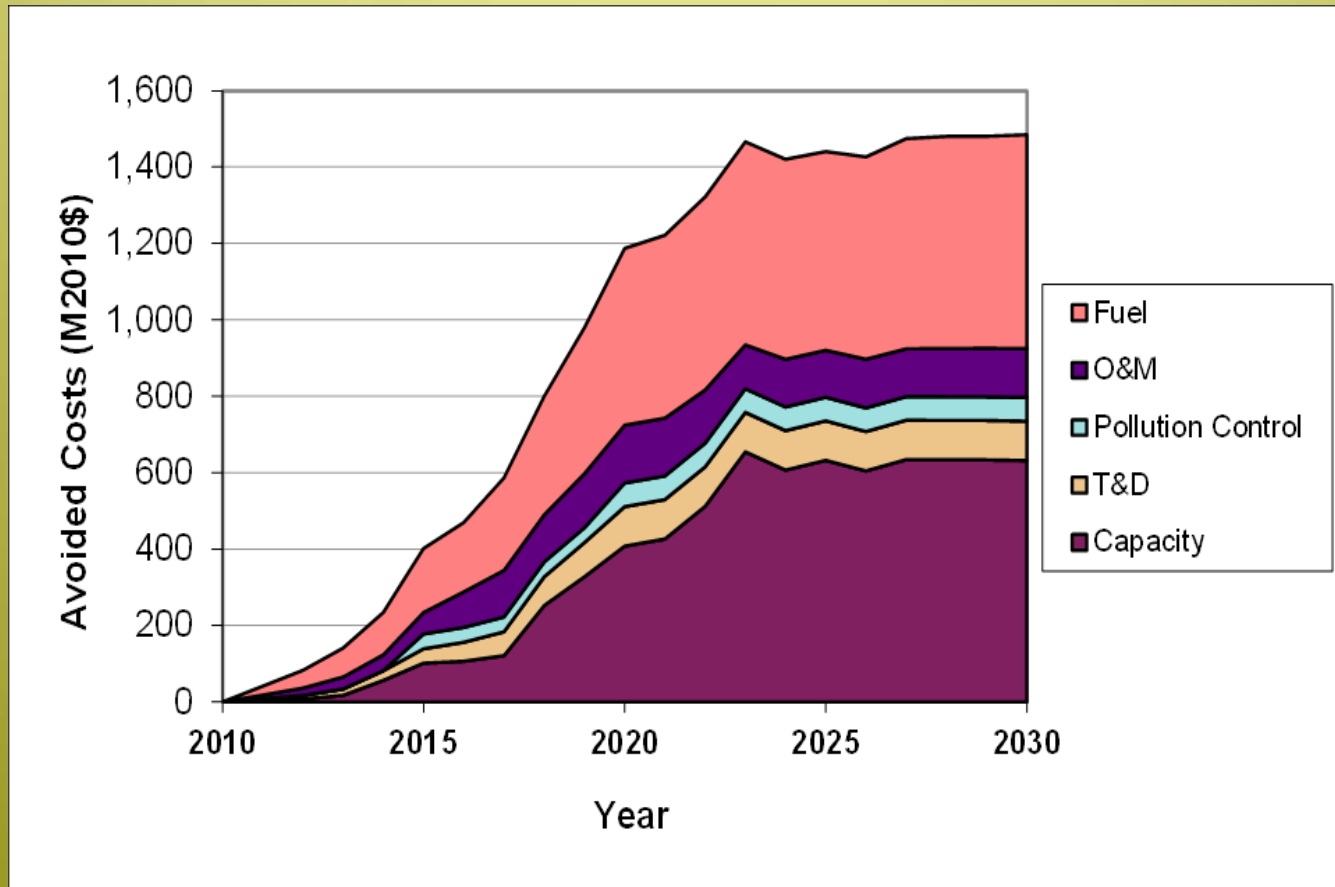


Enables closing or avoiding 10.5 large (400 MW) power plants or their equivalent!

Additional Coal Plant Retirements in the High Efficiency Scenario

State	Plant	Unit	Year Built	Capacity (MW)
AZ	Apache Station	2 & 3	1979	408
AZ	Cholla	3	1980	312
AZ	H. Wilson Sundt	4	1967	173
CO	Martin Drake	5, 6 & 7	1962-74	257
CO	Nucla	1 - 4	1959-91	114
NM	San Juan	3 & 4	1979-82	1,110
NV	North Valmy	1	1981	277
NV	Reid Gardner	1 - 3	1965-76	342
UT	Bonanza	1	1986	500
UT	Carbon	1 & 2	1954-57	189
WY	Dave Johnston	1 & 2	1959-61	228
WY	Naughton	1 & 2	1963-68	381
--	Other	--	--	116

Avoided Costs in Arizona in the High Efficiency Scenario



Benefit-Cost Comparison in Arizona in the High Efficiency Scenario

	Net Present Value 2010-2030 (Million \$)
Utility Avoided Costs	
Capacity	3,571
Fuel	3,717
Other	2,341
Total	9,629
Customer Benefits	
Utility Bill Savings	12,583
Public Health Benefits	175
Total	12,758
Energy Efficiency Costs	
Program Costs	2,767
Participant Costs	2,692
Total	5,459
Net Economic Benefits	7,299
Benefit-Cost Ratio	2.33



Avoided Pollutant Emissions and Water Savings in the High Efficiency Scenario

Category	Units	2015		2020	
		Reduction Amount	%	Reduction Amount	%
NO_x Emissions	Metric tons	411	4.0	847	10.3
SO₂ Emissions	Metric tons	745	2.6	6,078	22.5
Water Savings	Million gallons	1,285	2.5	4,075	8.0

Macroeconomic Impacts in Arizona in the High Efficiency Scenario

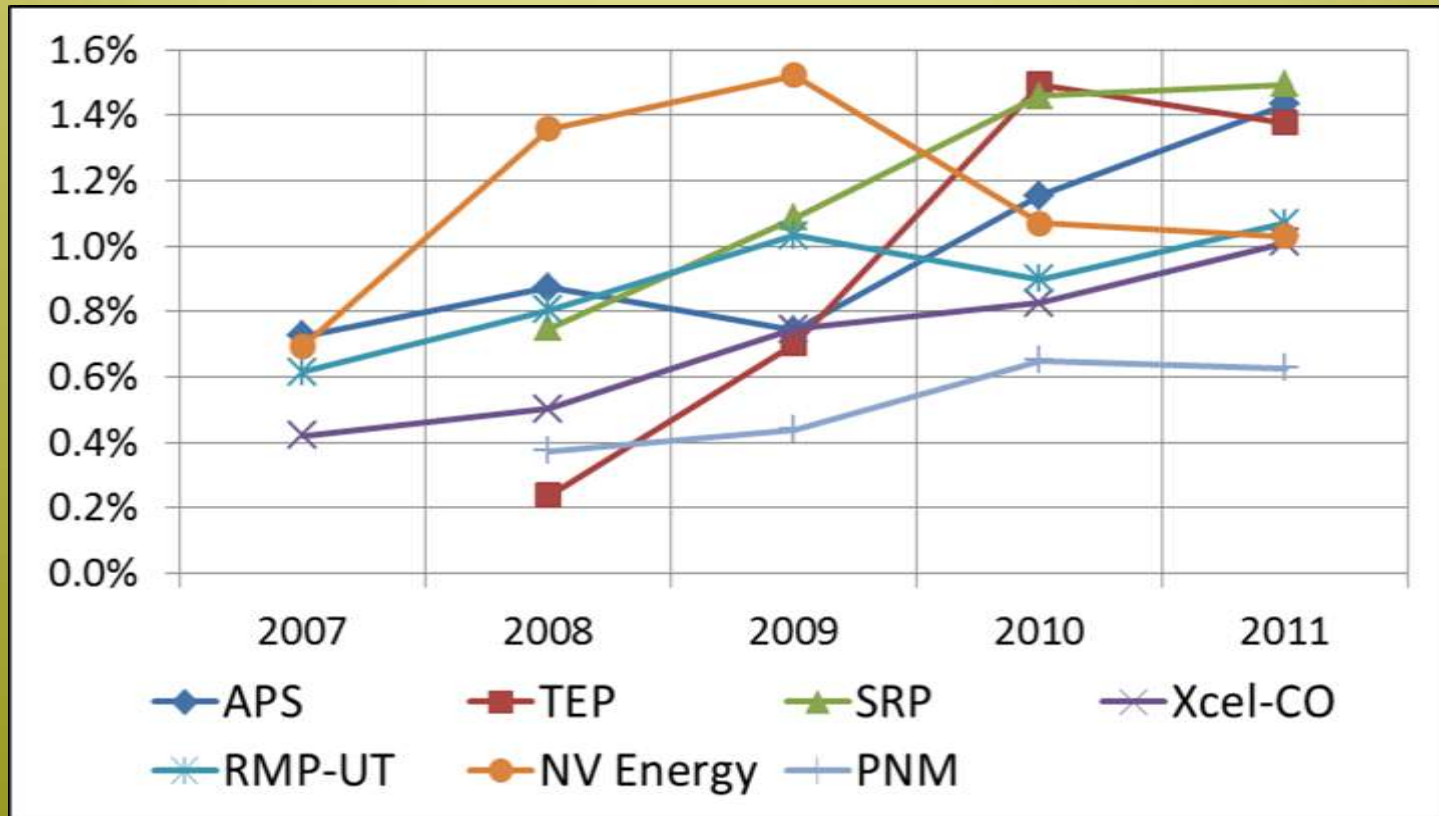
Year	Change in Jobs		Change in Wages (Million \$)		Change in GSP (Million \$)	
	Amount	%	Amount	%	Amount	%
2015	3,810	0.1	128	0.6	(9)	--
2020	10,400	0.3	382	1.4	44	--

Estimated Benefits by Utility

	APS	SRP	TEP	UNS EI.
Electricity Savings in 2020 (GWh/yr)	6,418	5,966	2,139	401
Net Economic Benefits (billion \$)	2.80	2.61	0.93	0.18
Net Increase in Jobs in 2020	3,990	3,710	1,330	250
Water Savings in 2020 (million gallons)	1,575	1,465	525	98

How Are Major Utilities in the Region Doing?

First Year Energy Savings as a Fraction of Retail Electricity Sales



Arizona utilities are leading the way!



How Much Energy Savings Would There Be in 2020 if Current Utility Efforts Continue?

	AZ	CO	NV	NM	UT	WY	Region
Energy Savings in 2020	15%	10%	9%	7%	9%	2%	10.5%

For Arizona, continuing current efforts would get us about 3/4s of the energy savings that implementing Best Practice programs would

Policy Recommendations for Arizona

- **Remove disincentives** – decouple utility fixed cost recovery and electricity sales or adopt lost revenue recovery for all IOUs in the state
- **Reward performance** – establish performance-based incentives so that utility shareholders earn a profit when they help their customers save energy
- **Maximize participation and savings** – fully fund all cost-effective efficiency programs
- **Involve all utilities** – municipal utilities and rural electric co-ops should implement robust and cost-effective programs as well as IOUs

**ENERGY EFFICIENCY
IN ARIZONA:**

**THE ROAD TO
ENORMOUS
BENEFITS**



**HOUSEHOLDS &
BUSINESSES**
Save \$7.3 Billion Net



ELECTRICITY SAVED
Enough to Power
1.4 Million Homes



WATER SAVED
4.1 Billion Gallons
per Year by 2020



POWER PLANTS
10.5 Plants
Closed or Avoided



JOBS CREATED
10,400 in AZ



CO₂ NOT EMITTED
Same As 1.9 Million
Cars Off the Road



FEWER AIR EMISSIONS
Improved
Public Health

The \$20 Billion Bonanza:

*Best Practice Utility Energy Efficiency Programs and
Their Benefits in the Southwest*

For more information or full report:

www.20BillionBonanza.com

Other resources available online at:

www.swenergy.org

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