No Longer Background Noise: Resource Planning When EE Really Matters

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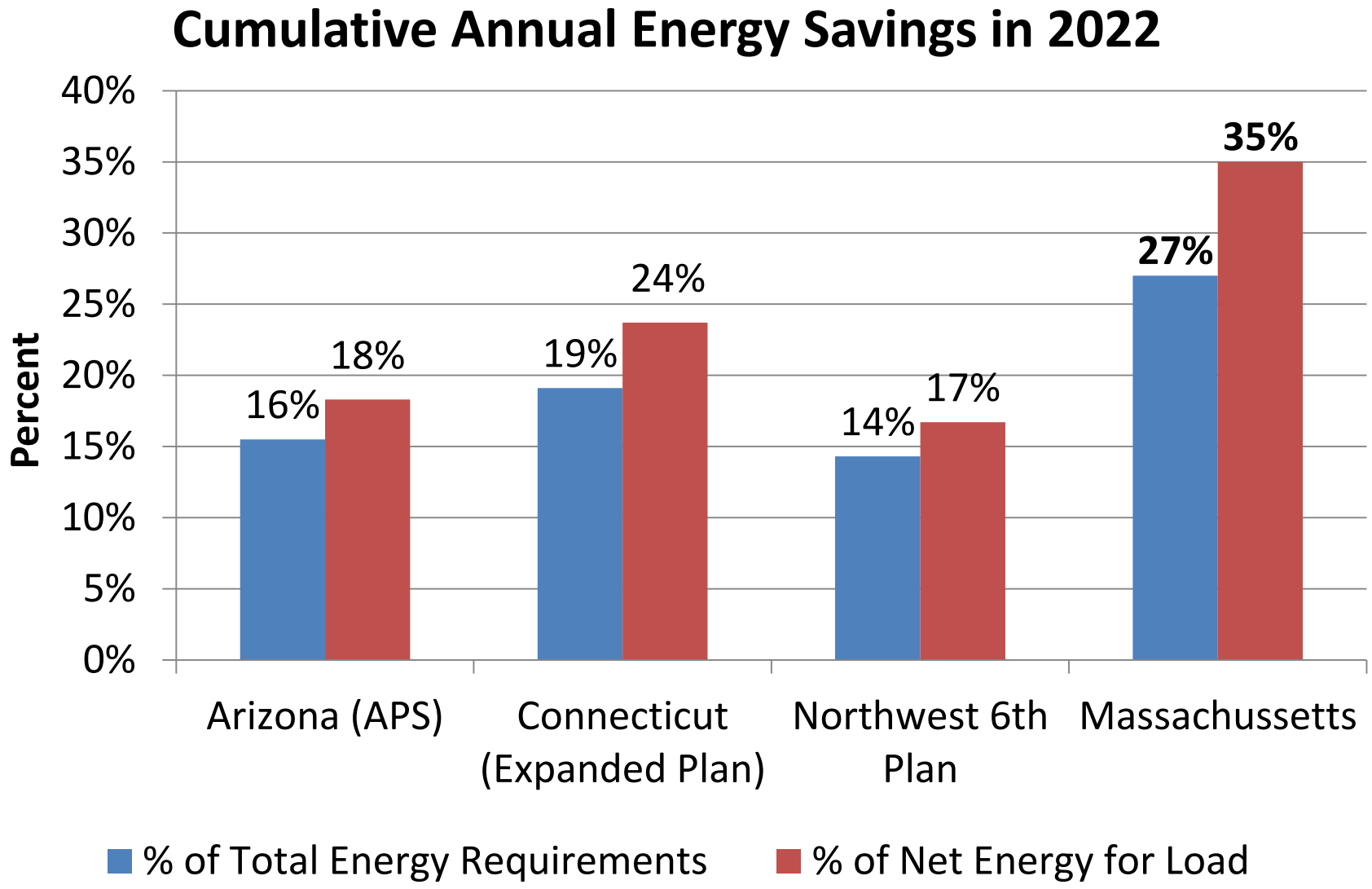
Integrated Resource Planning (IRP)

- "Comprehensive competition among resources"
- "Level playing field" to evaluate supply & demand
- Steps:
  1. Forecast future loads to determine the amount and timing of future resource needs
  2. Identify best resources to meet those needs
     - Consider risks, e.g. price volatility, resource availability, environmental impacts, etc.

Why Accurate Treatment of EE in IRPs Matters

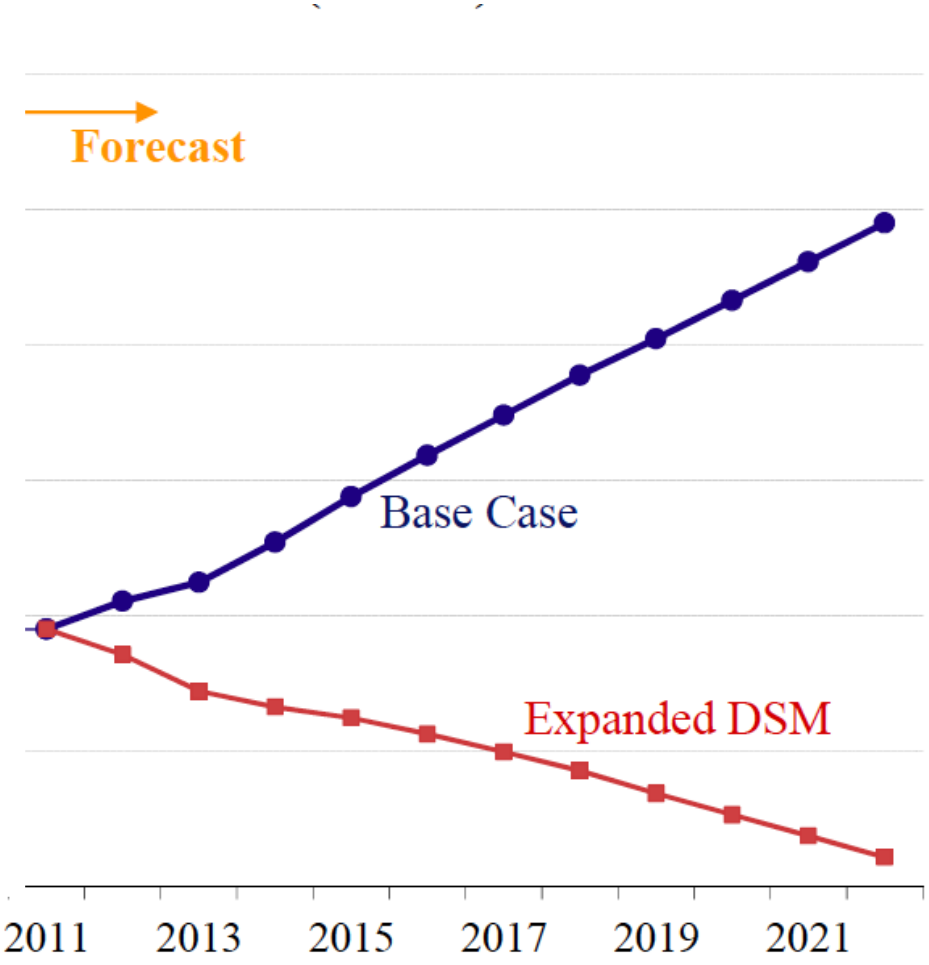
- EE is significant and no longer “in the noise”
- EE must be accurately quantified and aligned with forecasts so:
  - Our lights stay on
  - We don’t overinvest in unnecessary infrastructure
- To make the policy case for EE
  - Show EE benefits as reliable, inexpensive
  - Engender stronger political support

EE: *Making* Noise, Not *In the Noise*



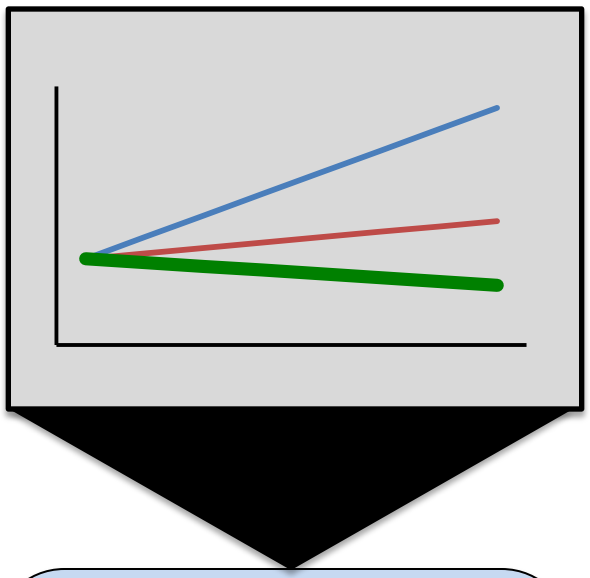
EE in Connecticut: Bending the Line Down

Effects of Expanded EE in Connecticut



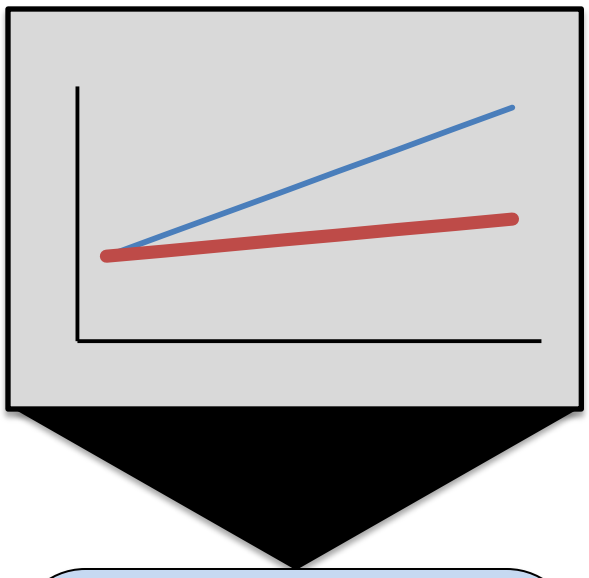
Source: Connecticut 2012 IRP

The Importance of Accurate Forecasting

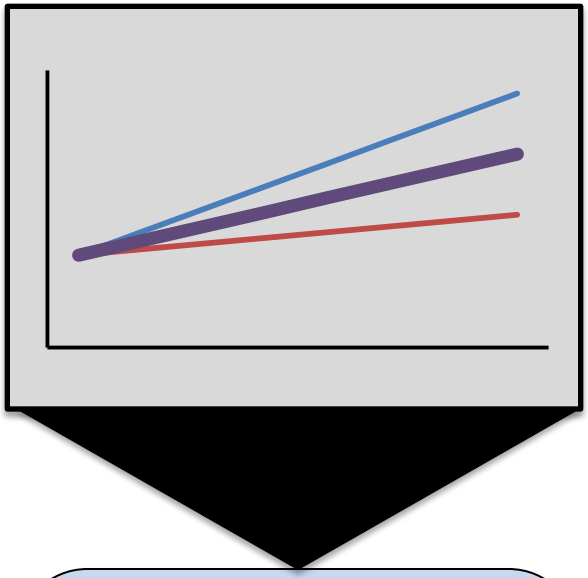


Save More than Expected:

Spend Billions on Unneeded Resources



Save What You Expected



Save Less than Expected:

Will the Lights Stay On?

Base Forecast without EE

Forecast with Savings as Expected

Historic Treatment of EE in IRPs

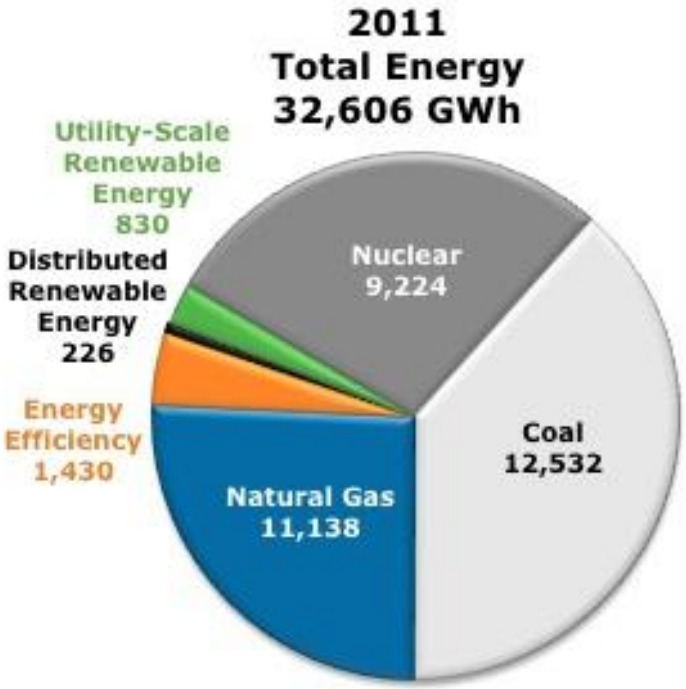
- IRPs ignored EE entirely
- IRPs did not allow EE to compete on a level playing field:
  - Volume of least-cost EE was limited based on a fixed budget amount
  - EE limited to an arbitrary level

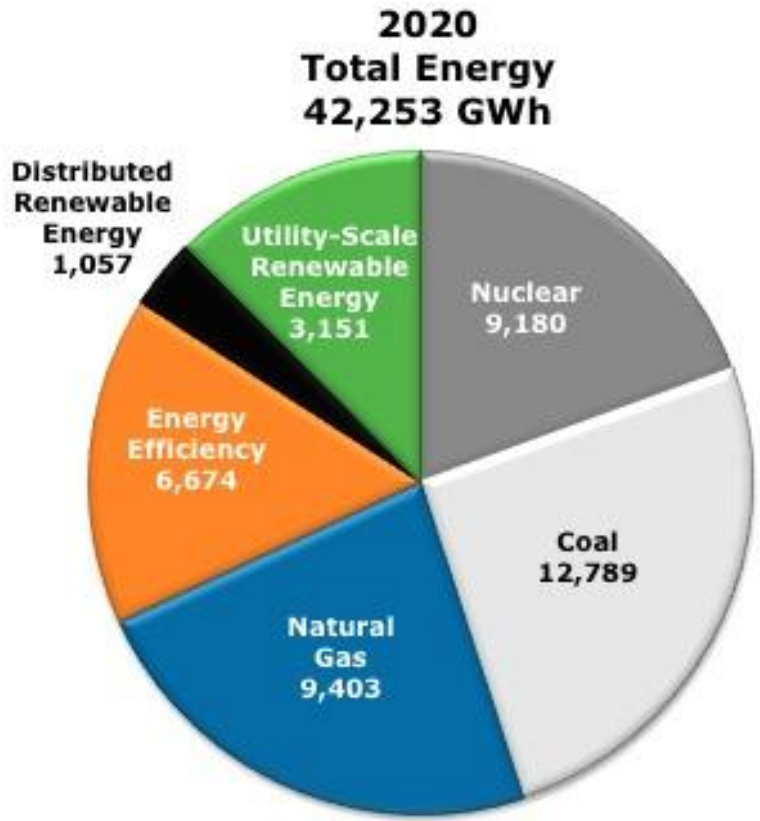
Three Examples Reviewed

LOCATION/PLAN	YEAR	PERIOD	NOTES
Arizona (Arizona Public Service Company, APS) 2012 IRP	2012	2012 - 2027	First plan in 17 years
Connecticut (DEEP) 2012 IRP	2012	2012 - 2022	Authored by DEEP
Northwest (NWPCC) 6th Conservation Plan	2010	2010-2030	

EE Can Be Treated as a Major Resource

Energy efficiency is the fastest growing resource at APS, reaching 16% of total resources and 19% of retail sales by 2020



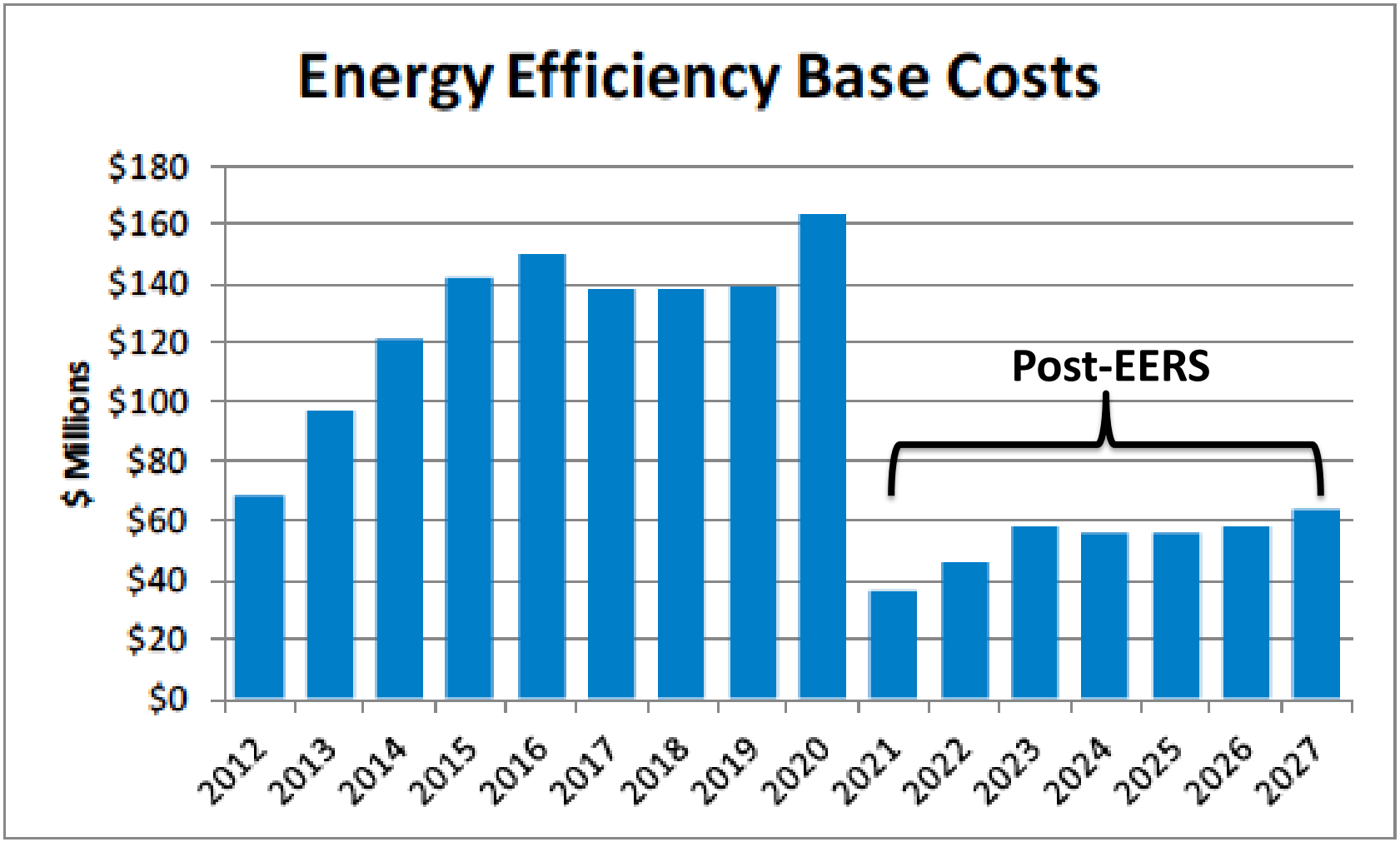


Customer energy growth of ~9,650 GWh *without EE impacts*, nearly 30% above current levels

APS meets Arizona's EERS, one of the most ambitious in the nation.

Source: Guldner, 2011.

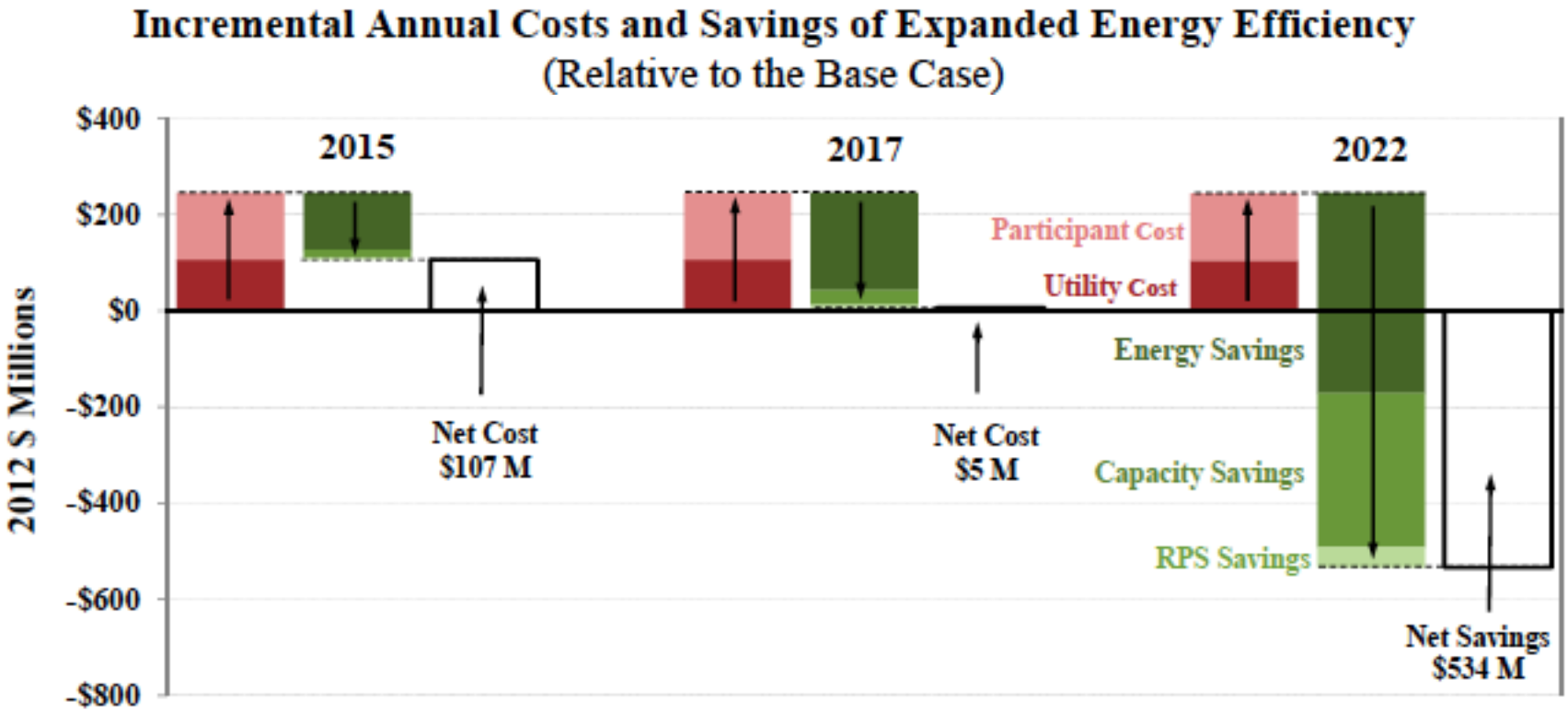
EERSs Can be Major Driver of EE Commitment



APS' funding for EE drops off significantly when the EERS period ends.

Source: APS 2012 IRP

EE Scenarios Demonstrate EE Value



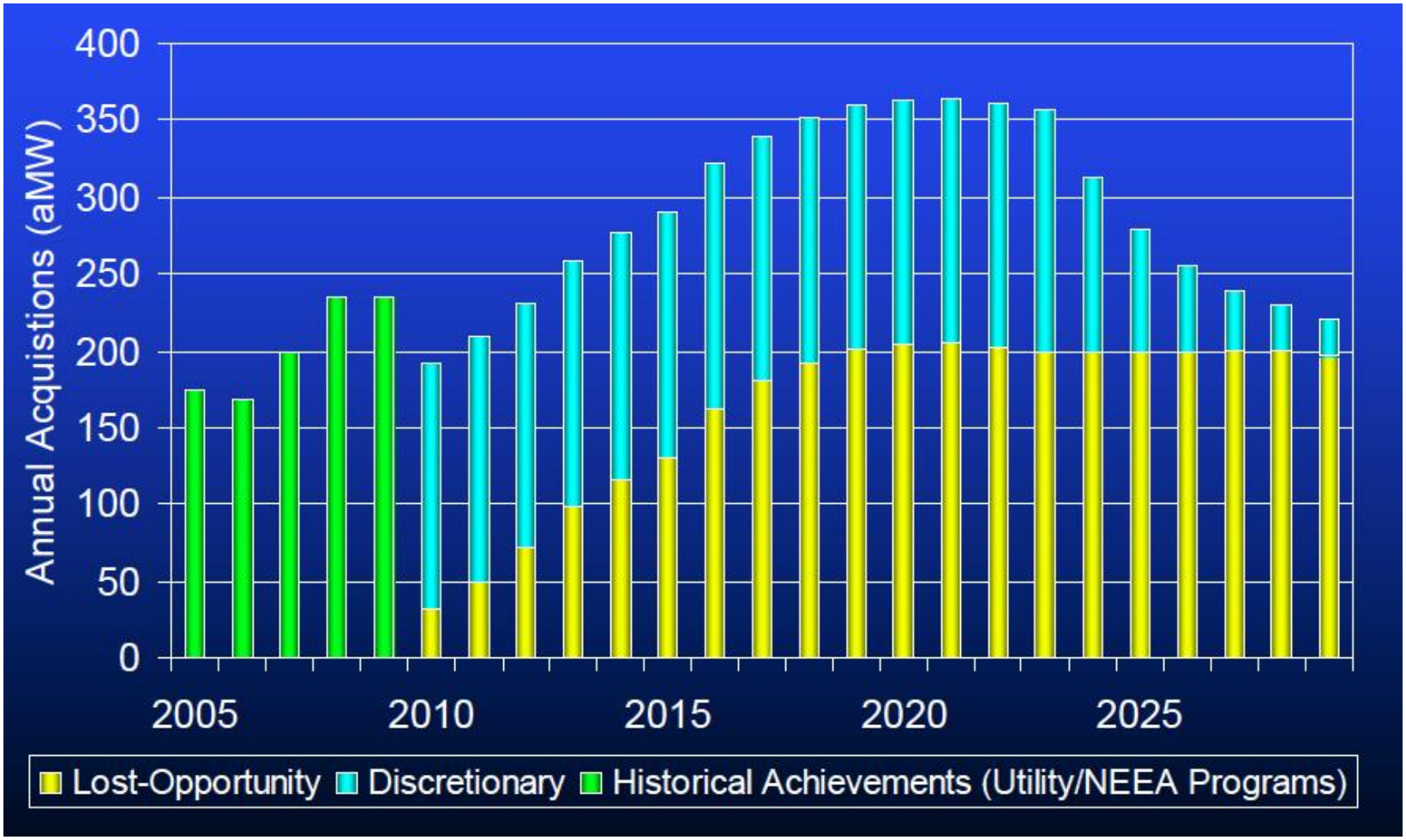
- ***Two Scenarios: "BAU" versus "Expanded EE"***
- ***Expanded EE Scenario Relative to BAU:***
  - Net bill savings of more than $534 million by 2022
  - 5,500 more jobs/yr; overall 0.60¢/kWh reduction (2022); 10% emission drop

Source: Connecticut 2012 IRP

APS: No Base Case Without EE Means No Documentation of Incremental Value

	Base Case (2012 Resource Plan)	Four Corners Contingency	Enhanced Renewable	Coal Retirement
Description	Plan includes APS closing Four Corners Units 1-3 and purchasing SCE's share of Units 4 & 5; continues the current trajectory of EE and RE compliance	Contingency plan depicting the retirement of the Four Corners coal-fired plant; energy replaced by additional natural gas resources	Assumes 30% (after EE/DE) of energy needs met by renewable resources; includes the consummation of the Four Corners transaction	Assumes APS retires all coal-fired generation; energy replaced with a combination of natural gas and renewable resources
	Resource Contributions (2027 Peak Capacity Contribution)			
Nuclear	1,146 MW	1,146 MW	1,146 MW	1,146 MW
Coal	1,932 MW	962 MW	1,932 MW	0 MW
Natural Gas & Demand Response	7,424 MW	8,394 MW	7,138 MW	9,188 MW
Renewable Energy (RE) & Distributed Energy (DE)	1,141 MW	1,141 MW	1,427 MW	1,308 MW
Energy Efficiency (EE)	1,525 MW	1,525 MW	1,525 MW	1,525 MW

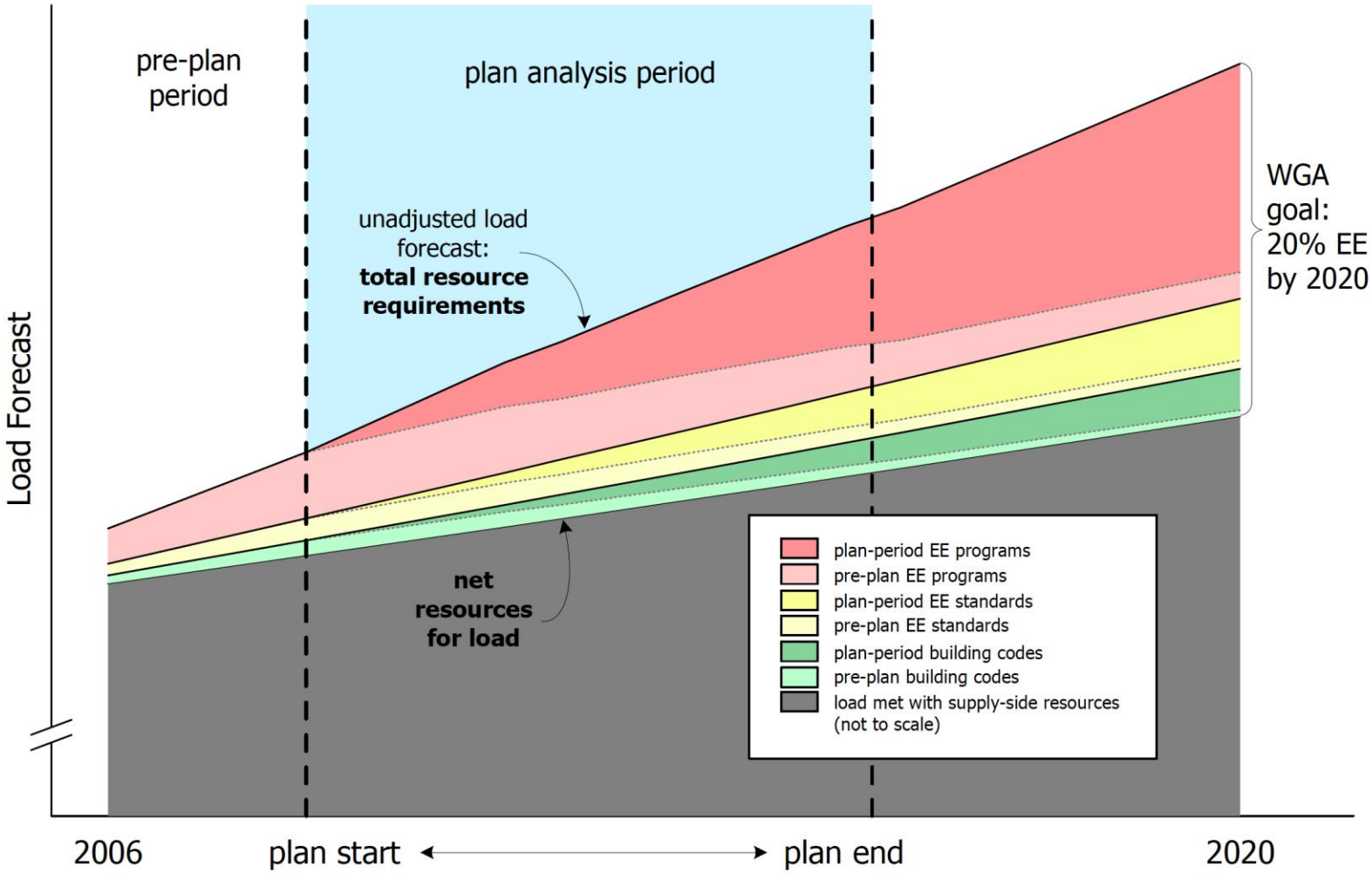
Explicit Documentation of EE Sources Provides Valuable Insights



Provides insight into policy strategies driving EE (timing of opportunity)

Source: Eckman, 2010.

EE Strategies Should Be Explicitly Documented



Source: Hopper, 2006.

Recommendations

Follow recommendations from Hopper et al. 2006:

1. Provide information on all demand-side resources.
2. Identify types of EE strategies included in the plan, e.g., programs, codes, and standards.
3. Treat EE as a resource competing with supply.
4. Treat EE as an explicit load-modifying resource.
5. Provide annual, lifetime, and cumulative annual effects, for energy and peak demand.
6. Describe the relationship between near-term EE program plans and longer-term goals/targets.

See Hopper et al. 2006 for other recommendations

Additional Recommendations

1. Include a no-EE base forecast to document EE's value.
2. Show resource plan for each year of planning horizon (not just selected years).
3. Delineate available EE by sector and by other descriptors (e.g. lost opportunity versus retrofit).
4. Identify the types and pace of EE strategies in the resource plan including and beyond programs, codes, and standards (e.g. labeling).
5. Quantify impacts on energy, demand, customer bill, and environment (e.g. emissions and water) – and also, on jobs, reliability, and dispatch.

Hopper et al., 2006 Recommendations

Recommendation	Description
Provide information on all demand-side resources (energy efficiency and other demand-side resources included in the resource plan, by type or resource).	Provide savings data for energy efficiency, demand response, fuel conversion, load management, and any other resources counted among the broader array of demand-side resources.
Clearly identify which types of energy efficiency strategies are included in the resource plan.	Resource plans should clearly indicate which types of energy efficiency strategies (ratepayer-funded energy efficiency programs, building energy codes, and appliance efficiency standards) are considered and how they are addressed.
Treat energy efficiency as a resource.	Evaluate scenarios with different levels of energy-efficiency resources and assess various supply-side scenarios designed to meet these levels of demand along key resource planning criteria (e.g. cost effectiveness, risk mitigation)
Treat energy efficiency as an explicit, load-modifying resource.	Clearly show energy efficiency impacts on forecast load. Adjust the forecast load to account for reductions in load due to energy-efficiency resources and use this adjusted forecast for the basis for calculating planning margins.

Hopper et al., 2006 Recommendations

Recommendation	Description
Clearly and separately identify the effects of energy efficiency measures installed during the resource plan analysis period and the pre-plan period.	Clearly document savings during the plan period and the residual effects of measures installed in the pre-plan period.
Describe the relationship between near-term energy-efficiency program plans and long-term goals/targets for energy efficiency.	Document the relationship between energy-efficiency programs and longer-term goals or resources to be acquired.
Provide both energy savings and summer-(winter-) coincident peak demand reductions for energy efficiency resources.	--
Provide annual effects of energy-efficiency resources by program and calendar year.	--
Provide energy-efficiency savings data for all years of the resource plan analysis period.	--
Include key metrics describing the relationship between the energy efficiency resources and key resource issues in the resource plan.	Metrics that should be reported include: energy efficiency effects as a percent of total resource growth; and energy efficiency effects as a percent of total resource requirements.