



California Energy Demand (CED) 2013 Preliminary Electricity and Natural Gas Forecast

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Chris Kavalec
Demand Analysis Office
Electricity Supply Analysis Division
Chris.Kavalec@energy.ca.gov / 916-654-5184

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CED 2013 Schedule

- *CED 2013 Preliminary* forecast workshop on May 30
- Incremental uncommitted efficiency scenarios developed in June and July
- *CED 2013 Revised* forecast released in August
- *CED 2013 Revised* forecast workshop early September
- *CED 2013* final forecast adopted in Fall 2013



Presentation

- Methodology
- Statewide results
- Inputs
- Efficiency
- Climate change
- *CED 2013 Preliminary* vs. econometric forecast
- Other issues



Forecast Planning Areas (electricity)

- Burbank/Glendale
- Imperial Irrigation District
- LADWP
- Pasadena
- PG&E
- Southern California Edison
- SDG&E
- SMUD

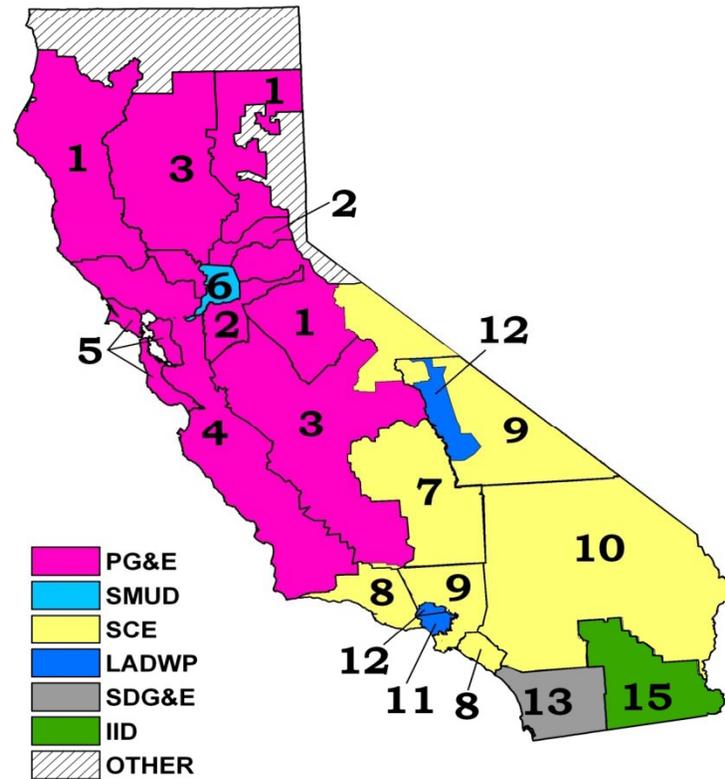


Forecast Planning Areas (end-user natural gas)

- PG&E
- Southern California Gas
- SDG&E
- Other



16 Climate Zones



Not Shown:
Burbank / Glendale CZ - 14
Pasadena - CZ 16



Forecast Models

- Residential (end use)
- Commercial (end use)
- Industrial (hybrid end use-econometric)
- Agricultural (disaggregate econometric model)
- Transportation, communications, and utilities; street lighting (disaggregate trend analysis)
- Summary and Peak models
- Predictive models for self-generation



Econometric Models

- Separate models for all sectors, electricity and gas, except TCU gas
- Peak model
- Used to inform, to make adjustments, and as point of comparison



What's New for *CED 2013 Preliminary*

- New industrial model
- New econometric models, old models re-estimated
- Climate change impacts for both peak and consumption (electricity and natural gas)
- New efficiency programs and standards
- Climate zone analysis
- Predictive model for commercial CHP



Three Scenarios

- High Demand: higher economic and demographic growth, lower efficiency program impacts, lower rates, higher climate change impacts
- Low Demand: lower economic and demographic growth, higher efficiency program impacts, higher rates, no climate change impacts
- Mid Demand: in between high and low



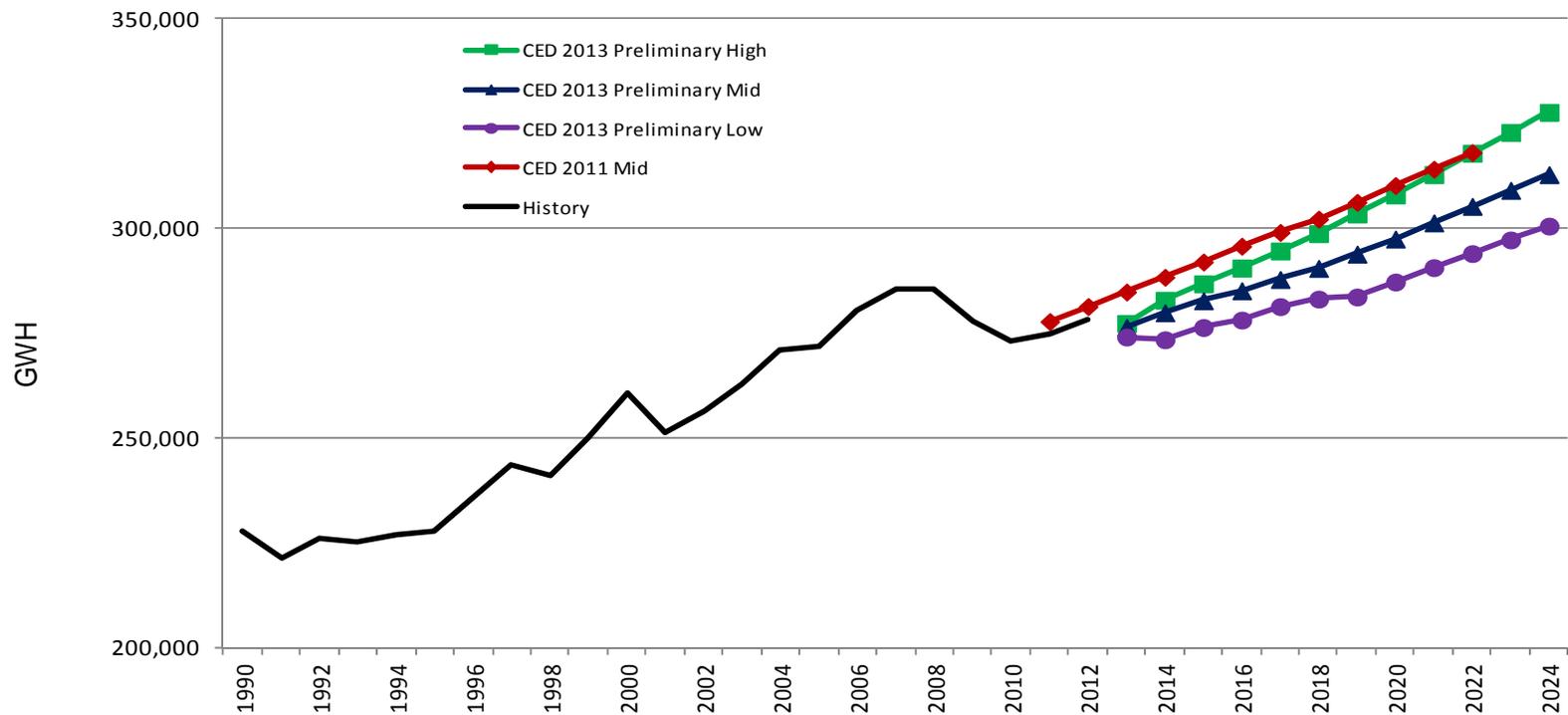
Key Inputs

- Population
- Average household size
- Employment
- Personal income
- Manufacturing output
- Commercial floor space (derived from economic/demographic data)
- Rates



Statewide Electricity Consumption: *CE*D 2013 Preliminary vs. *CE*D 2011 Mid

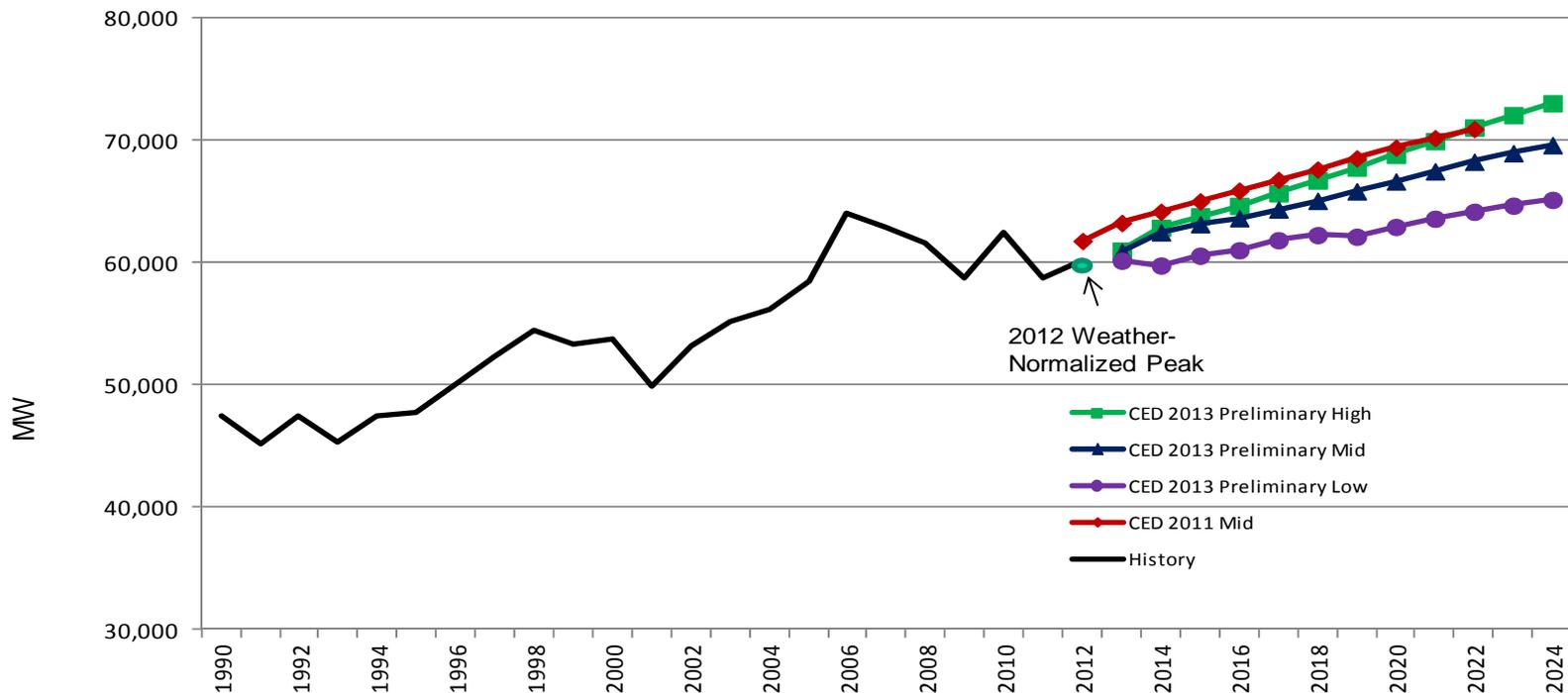
Lower at start of forecast, slower growth in mid and low





Statewide Electricity Peak Demand: *CE*D 2013 Preliminary vs. *CE*D 2011 Mid

Lower at start of forecast, slower growth in mid and low





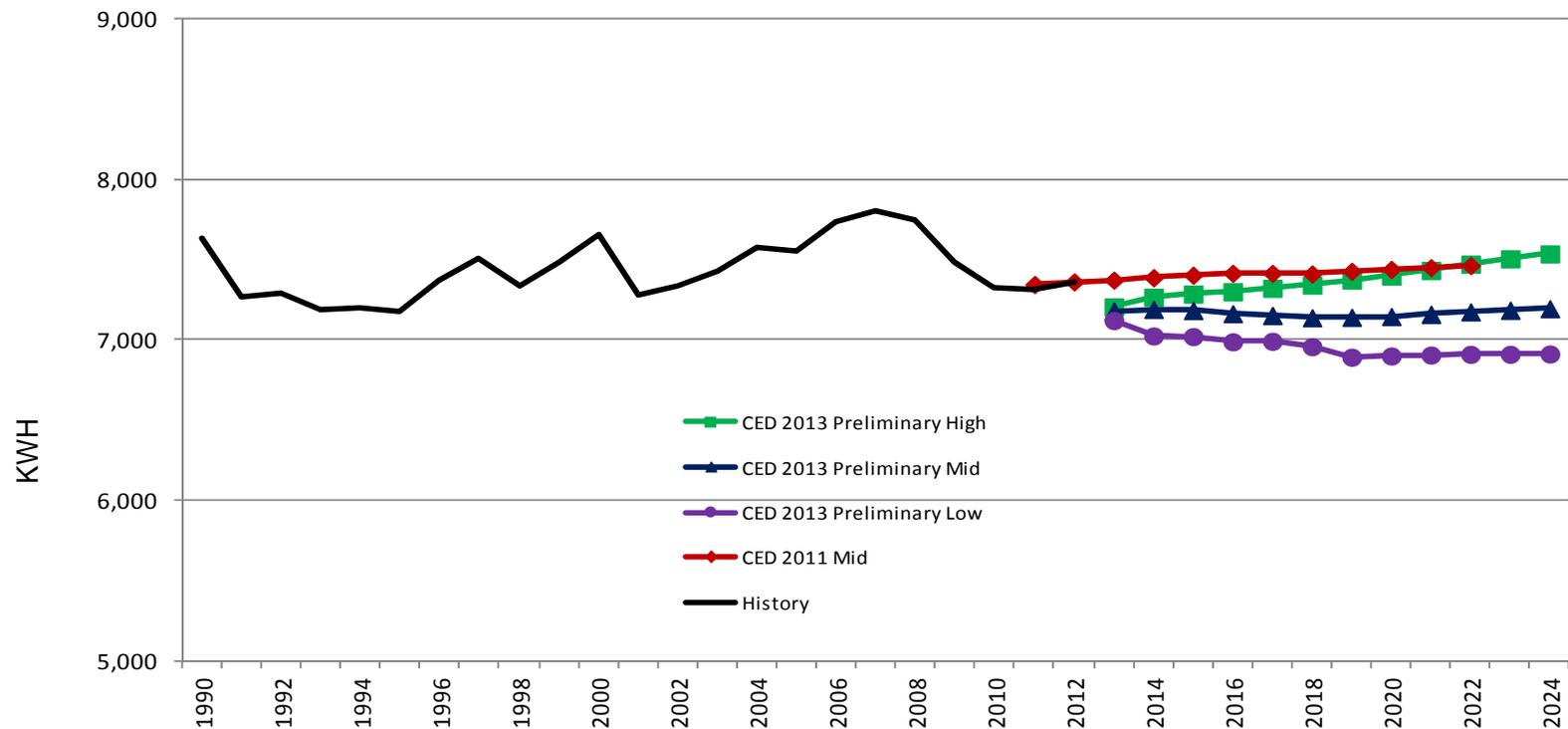
Statewide Electricity Consumption and Peak Demand

- Flat growth from 2012-2013
 - Significant increase in rates
 - IOU 2013-2014 efficiency programs, POU 2013 programs
 - Historically high cooling degree days in 2012 (consumption)
- Lower growth in mid and low scenarios vs. *CED 2011 Mid*
 - Lower population growth
 - Higher rate increases
 - Additional standards



Electricity Consumption per Capita

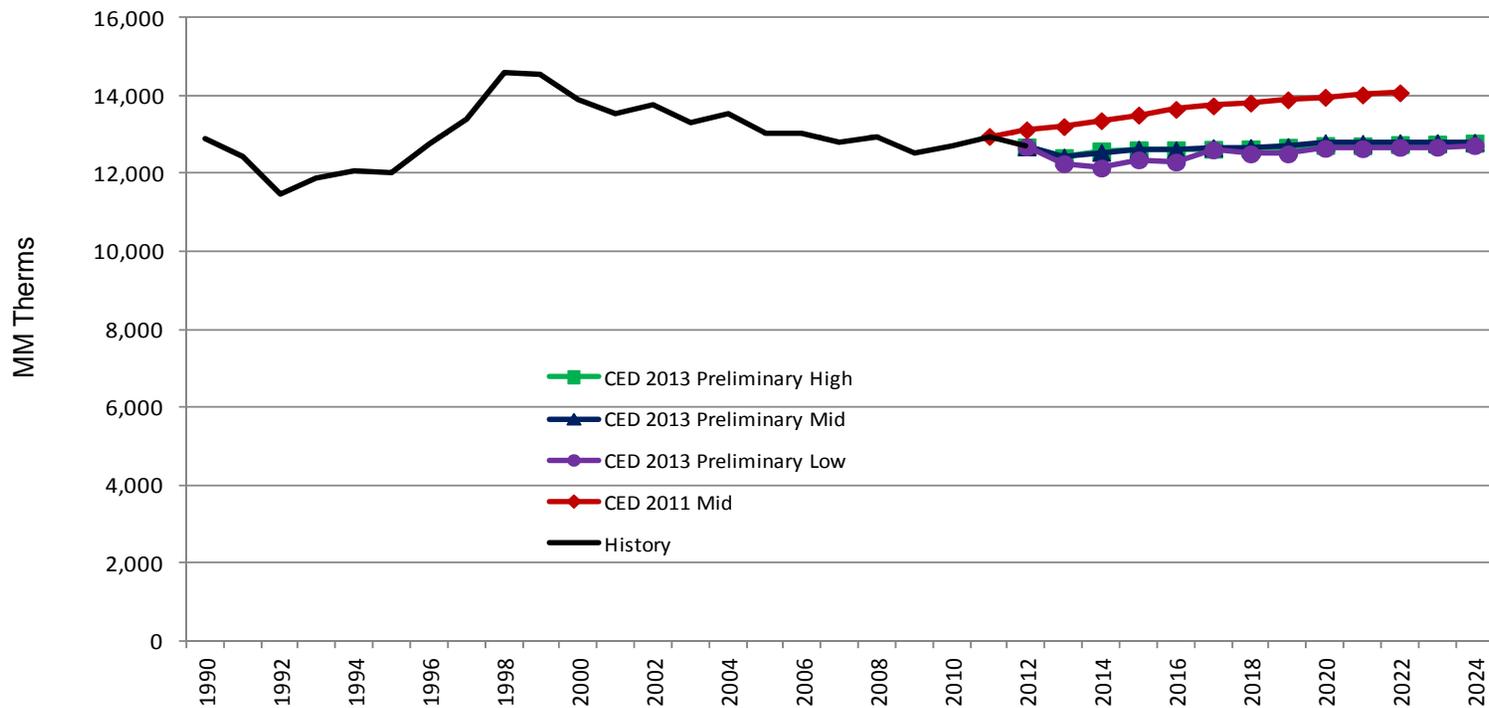
Declines from 2012 to 2013, EVs push later increase





End-User Natural Gas Consumption

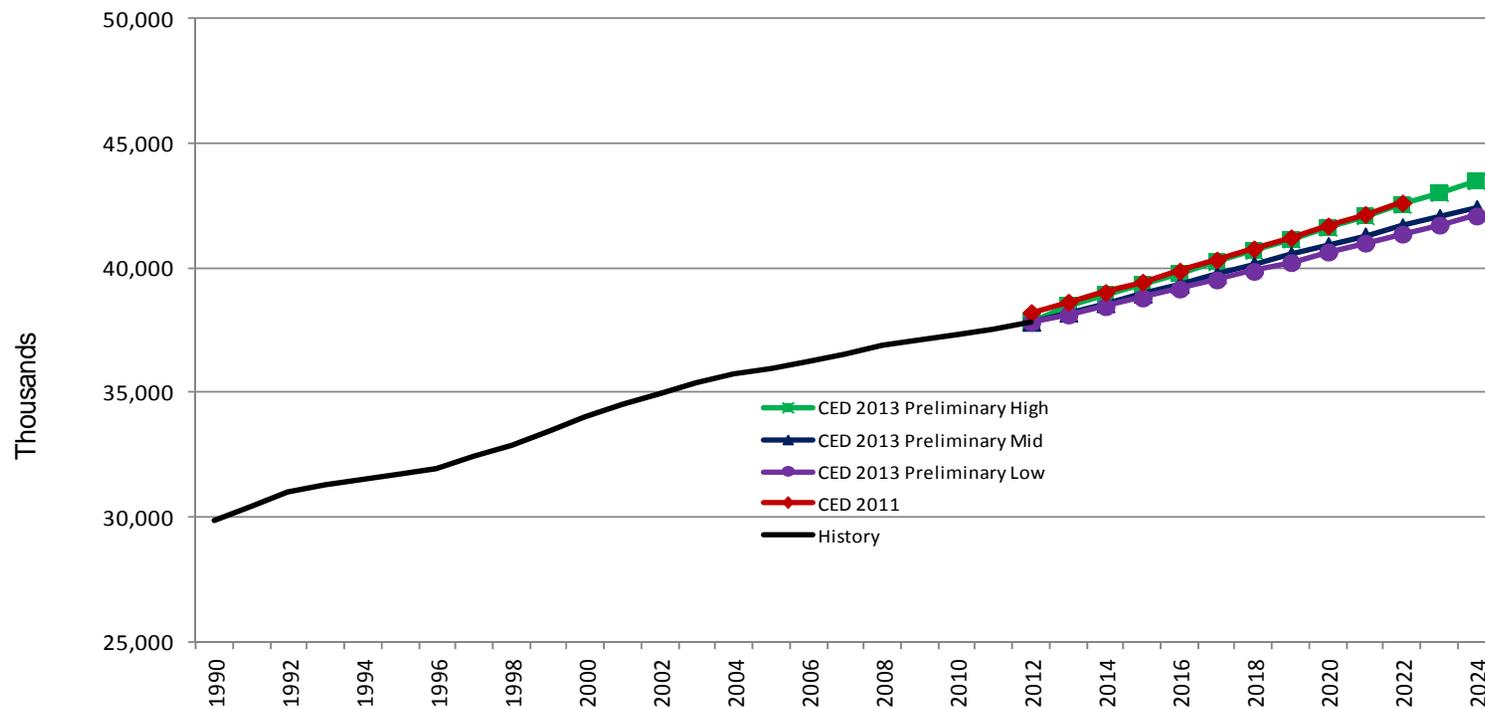
Reduced cooling contributes to flat growth





Inputs: Population

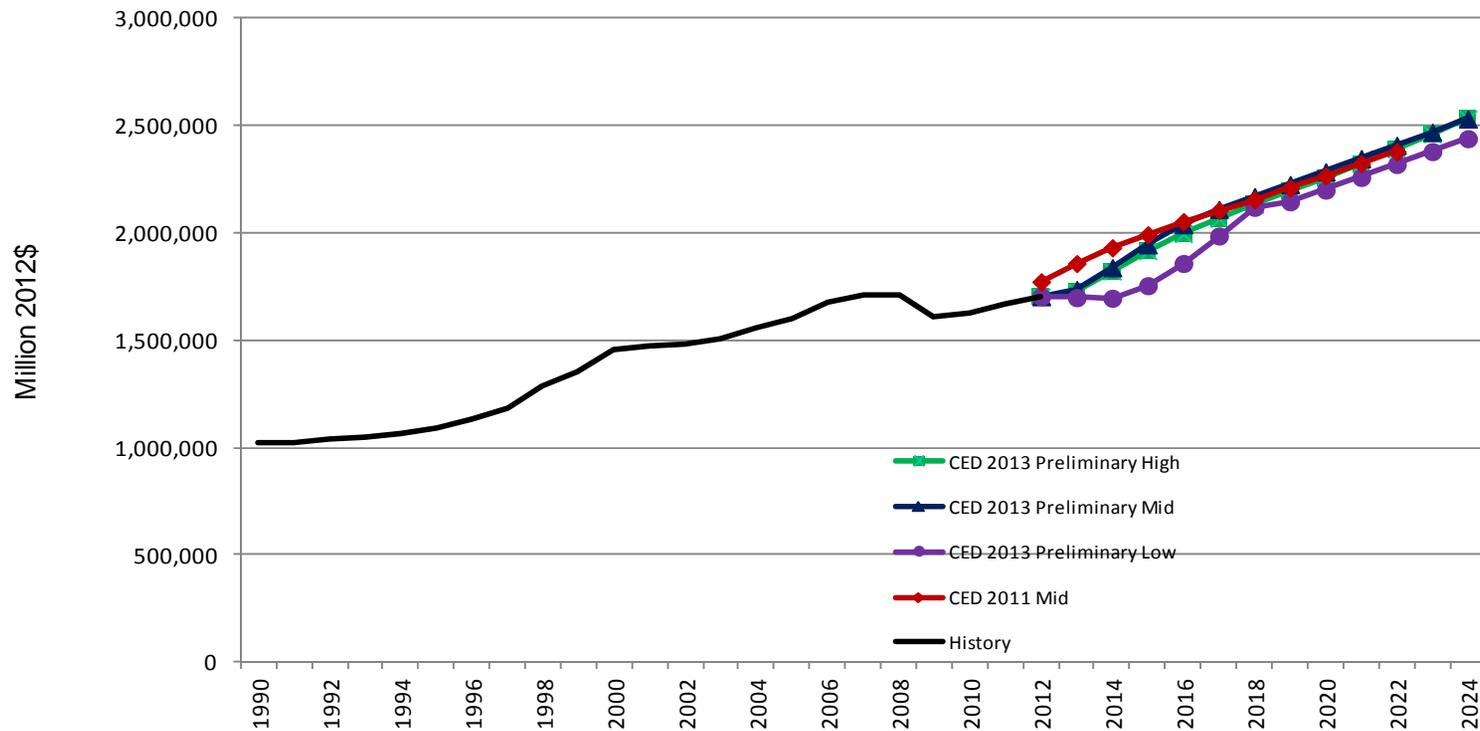
CED 2011 mid case matches new high case





Inputs: Personal Income

Lower in near term vs. CED 2011 mid





Inputs: Electricity and Natural Gas Rates

Period	% Change, High Demand Scenario	% Change, Mid Demand Scenario	% Change, Low Demand Scenario
Electricity			
2012-2015	12.2	14.4	16.0
2012-2020	26.2	33.7	41.6
2012-2024	31.3	39.2	47.3
Natural Gas			
2012-2015	42.4%	40.9%	45.8%
2012-2020	62.3%	63.7%	77.1%
2012-2024	72.9%	78.9%	92.2%

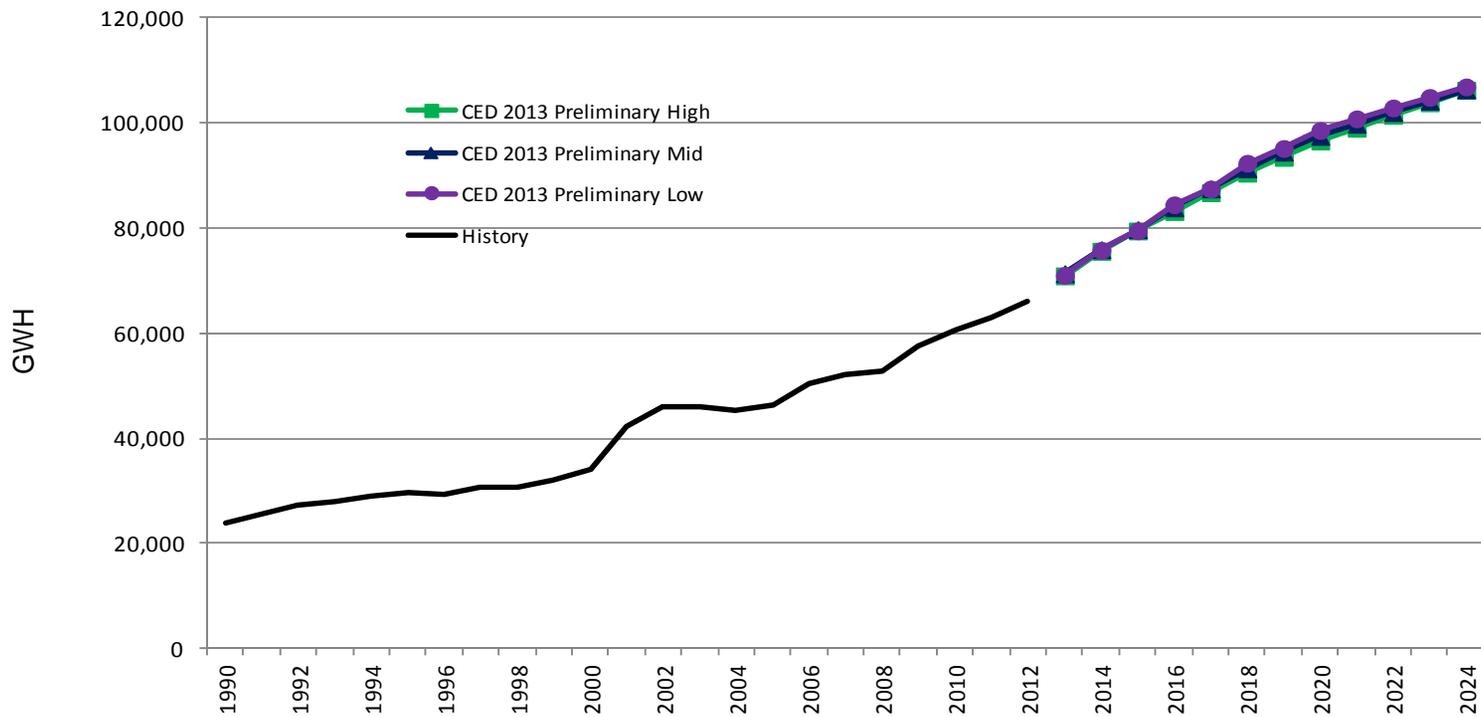


Efficiency

- Committed impacts
 - Funded and approved programs
 - Finalized and/or implemented standards
 - Price effects
- Incremental uncommitted impacts
 - Additional likely to occur initiatives
 - Developing scenarios with Navigant
 - Achievable? Incremental? Projected?



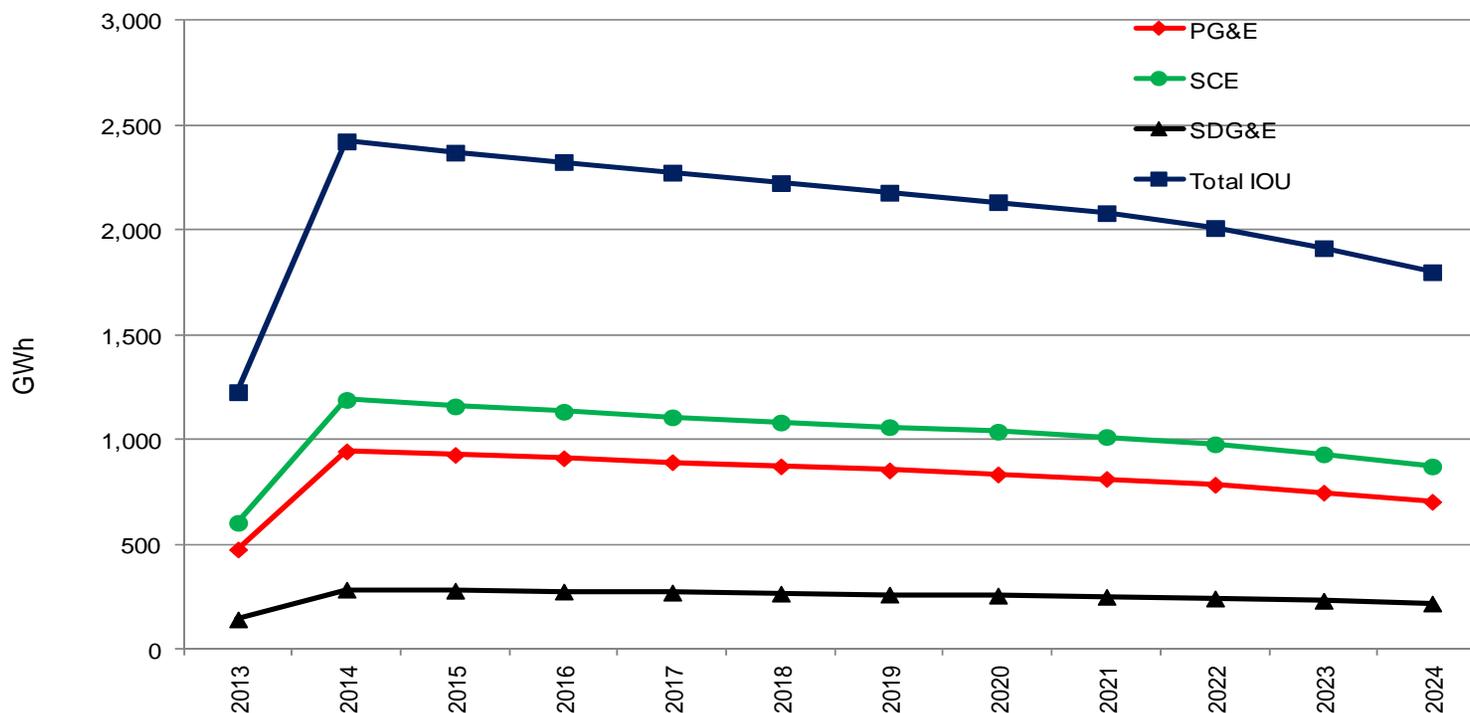
Committed Efficiency Savings *Relative to a “counterfactual” back to 1975*





IOU 2013-2014 Program Cycle Savings, Mid Case

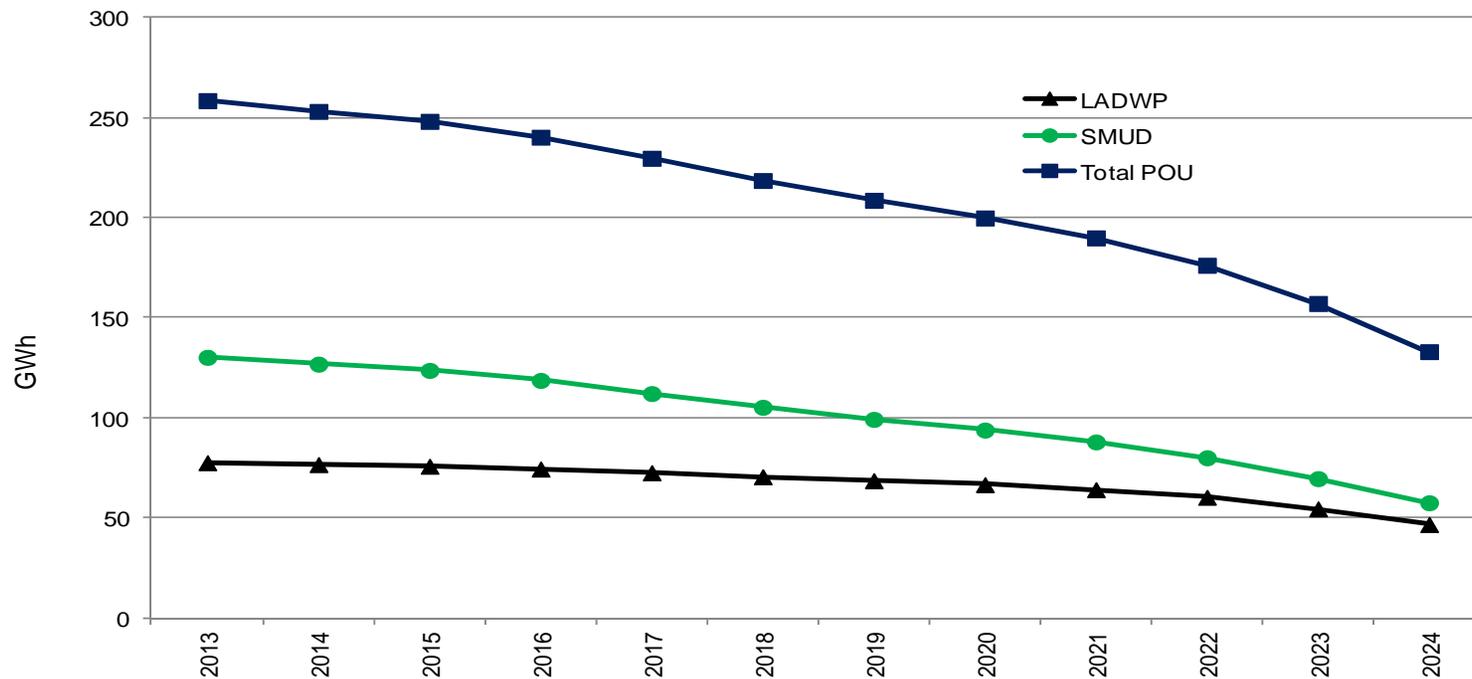
Other demand scenarios 10% higher and lower





2013 POU Program Savings, Mid Case

Other demand scenarios ~10% higher and lower





Other Efficiency Impacts

- 2013-2014 IOU natural gas program savings reach 80 million therms in 2014 and decay to 68 million by 2024
- New standards save ~2,000 gWh by 2024
- New standards save ~50 million therms by 2024
- Half of new electricity savings in forecast period come from price effects



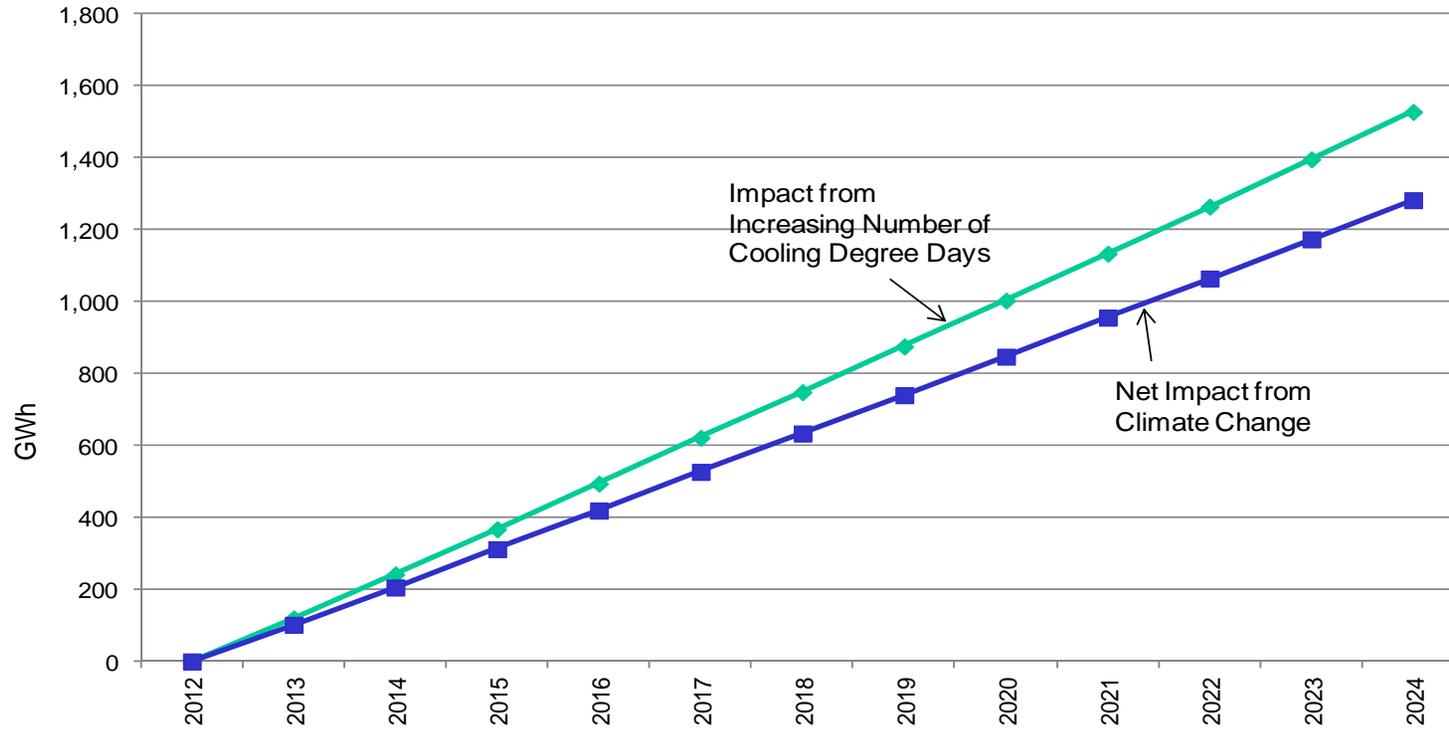
Climate Change Impacts

- Based on Scripps Institute of Oceanography scenarios using 10 climate change models
- Electricity consumption impacts estimated through changes in cooling and heating degree days
- Natural gas consumption impacts estimated through changes in heating degree days
- Peak impacts estimated through changes in annual maximum daily average temperatures



Climate Change: Electricity Consumption Impacts, Mid Case

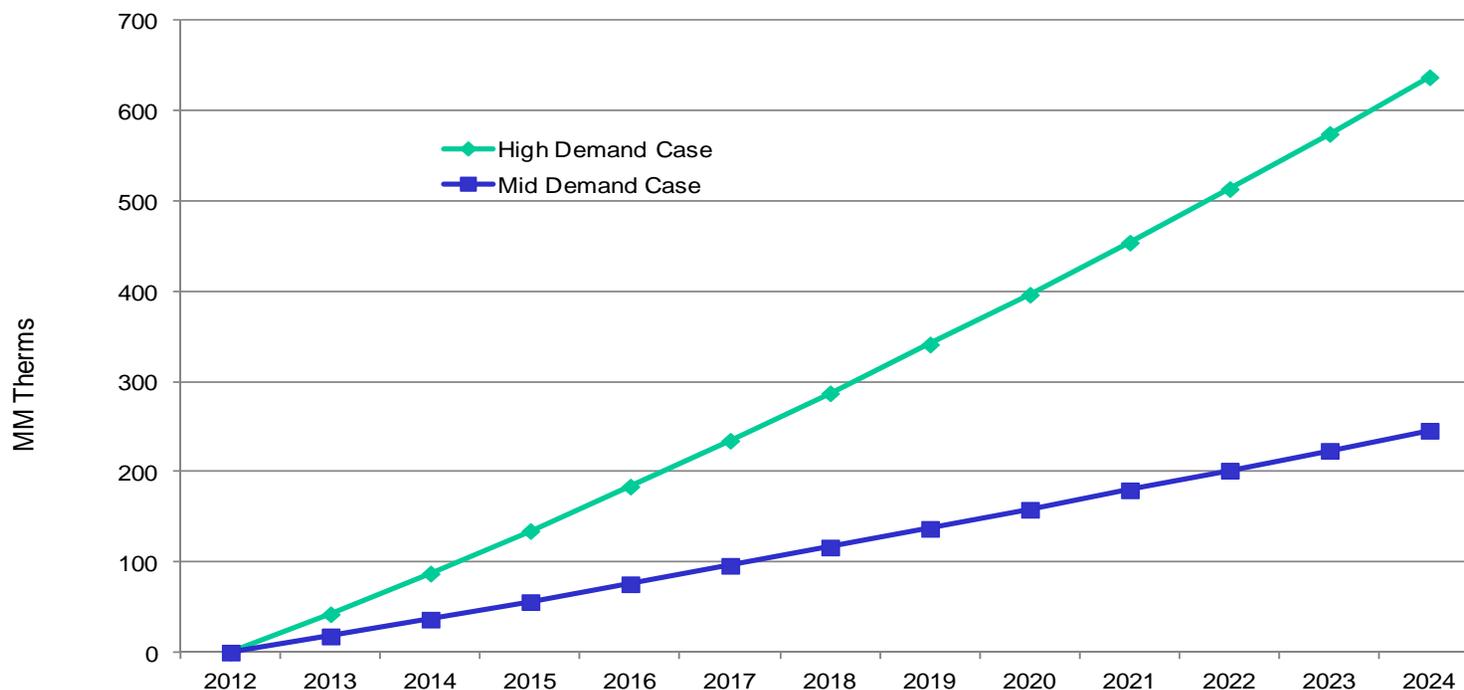
2,400 GWh and 1,800 GWh in High Case, 2024





Climate Change: Natural Gas Consumption Impacts

Higher percentage impact vs. electricity consumption





Climate Change: Peak Demand Impacts

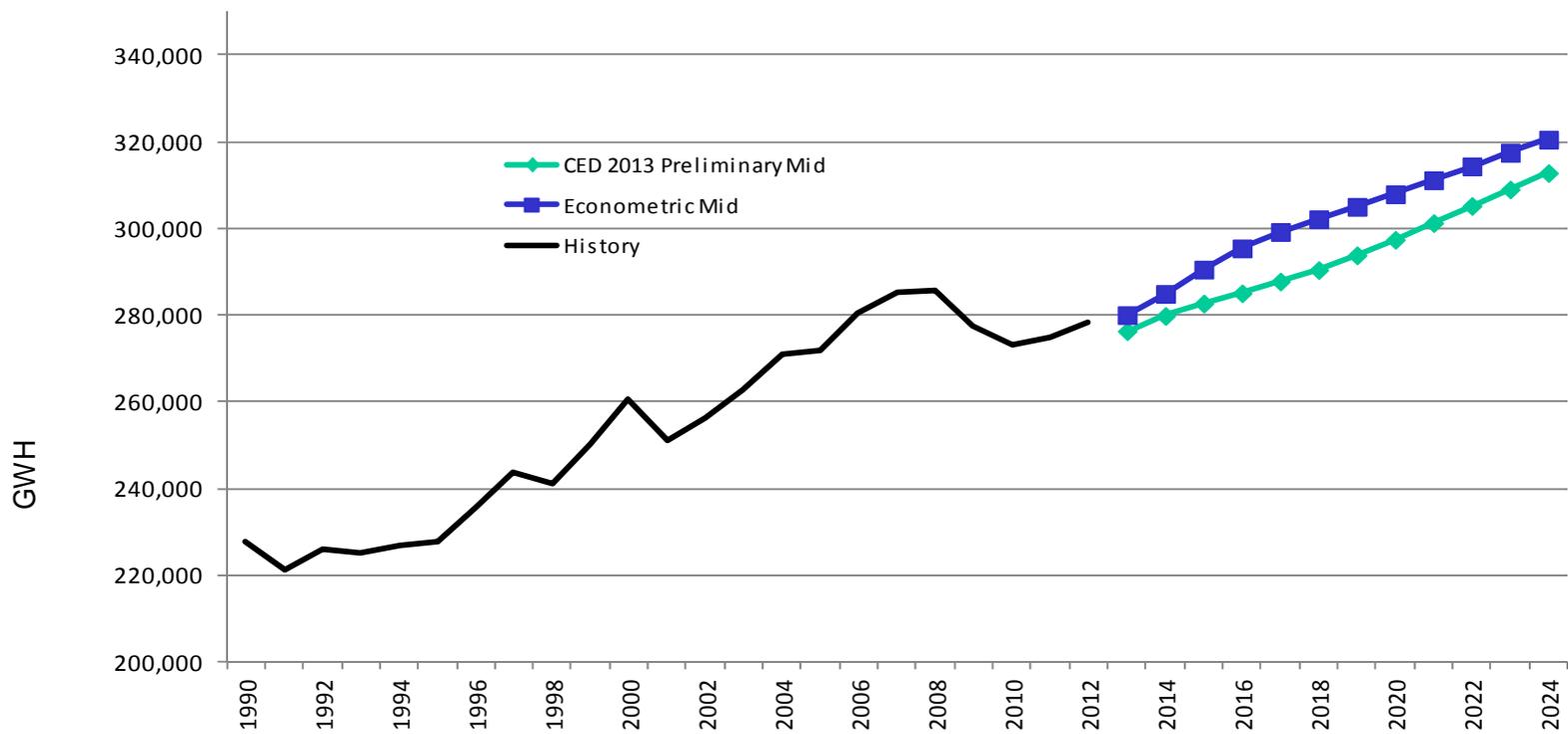
Around 1,000 gWh and 1,700 gWh statewide in 2024

		Annual Maximum Average ⁶³¹ (°F), Mid Demand Scenario	Annual Maximum Average ⁶³¹ (°F), High Demand Scenario	Peak Impact, Mid Scenario (MW)	Peak Impact, High Scenario (MW)
LADWP	2015	83.8	84.0	24	41
	2020	84.3	84.8	68	120
	2024	84.6	85.4	106	191
PG&E	2015	86.0	86.1	92	136
	2020	86.4	86.7	266	398
	2024	86.8	87.3	420	634
SCE	2015	86.0	86.2	87	134
	2020	86.5	86.8	252	397
	2024	86.8	87.4	397	639
SDG&E	2015	78.2	78.4	18	31
	2020	78.6	79.0	51	92
	2024	78.9	79.6	80	148
SMUD	2015	85.4	85.6	8	18
	2020	85.7	86.3	23	55
	2024	85.9	86.8	36	88
State	2015	--	--	233	369
	2020	--	--	672	1,089
	2024	--	--	1,061	1,745



CED 2013 Preliminary vs. Econometric Forecast: Statewide Consumption

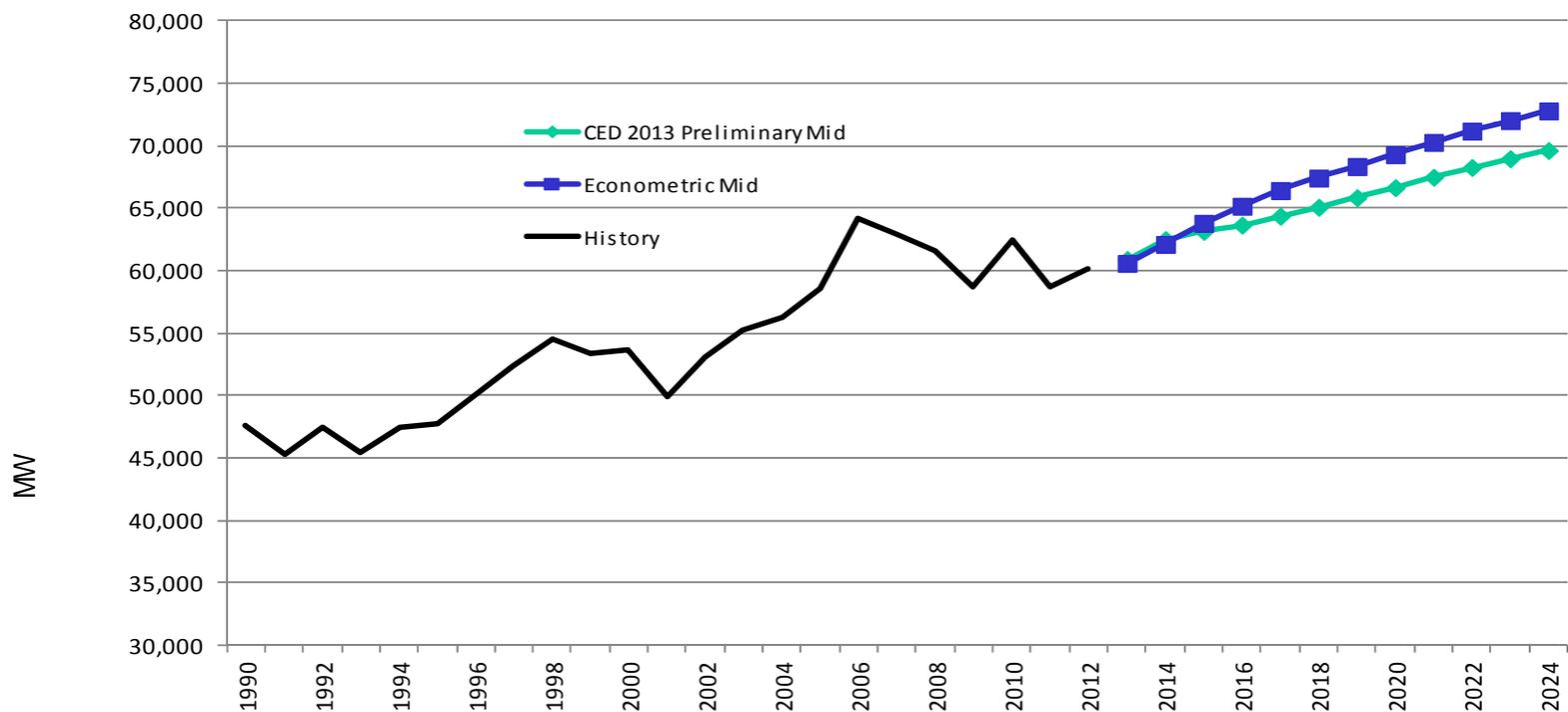
Econometric 2.5% higher in 2024





CED 2013 Preliminary vs. Econometric Forecast: Statewide Peak

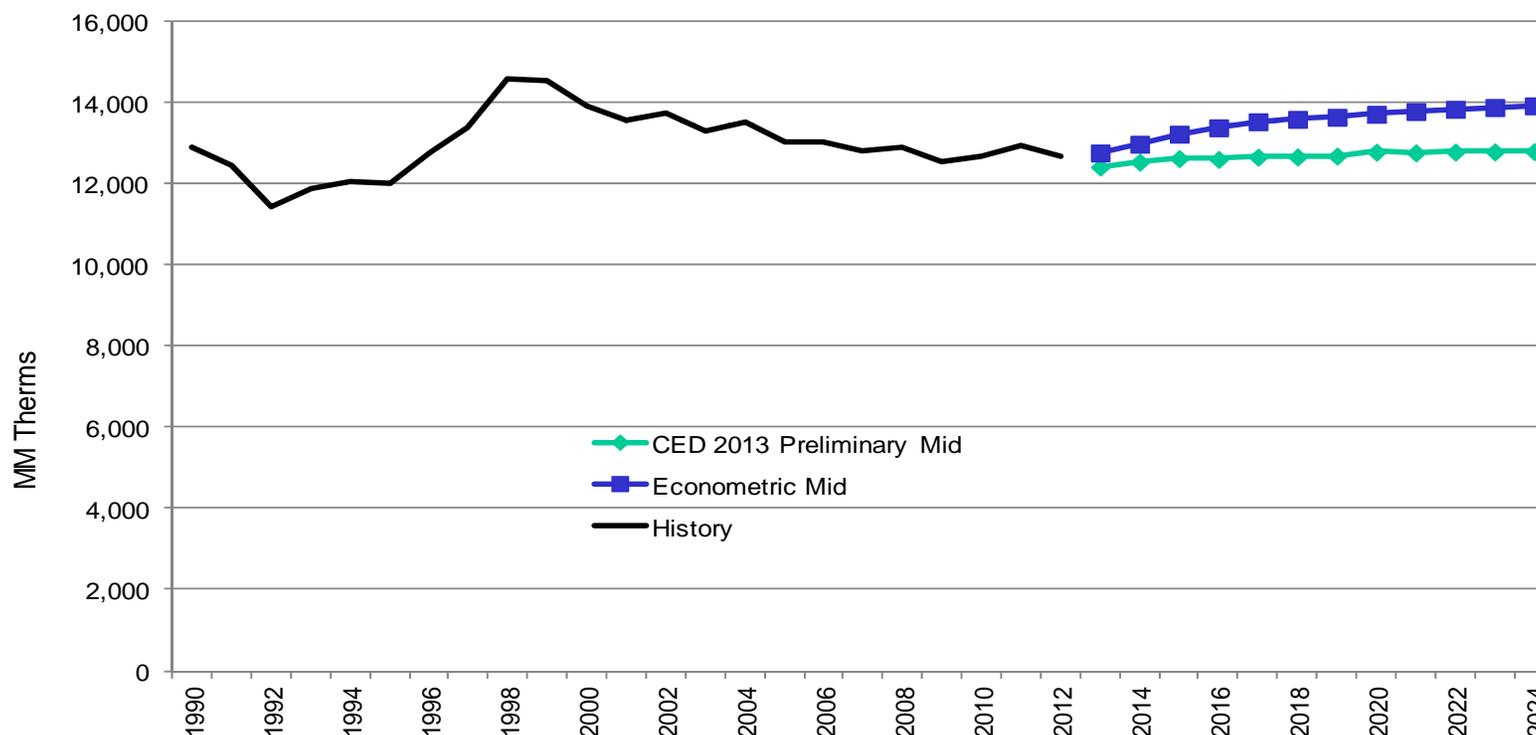
Econometric 4.5% higher in 2024





CED 2013 Preliminary vs. Econometric Forecast: Natural Gas Consumption

Econometric 9% higher in 2024





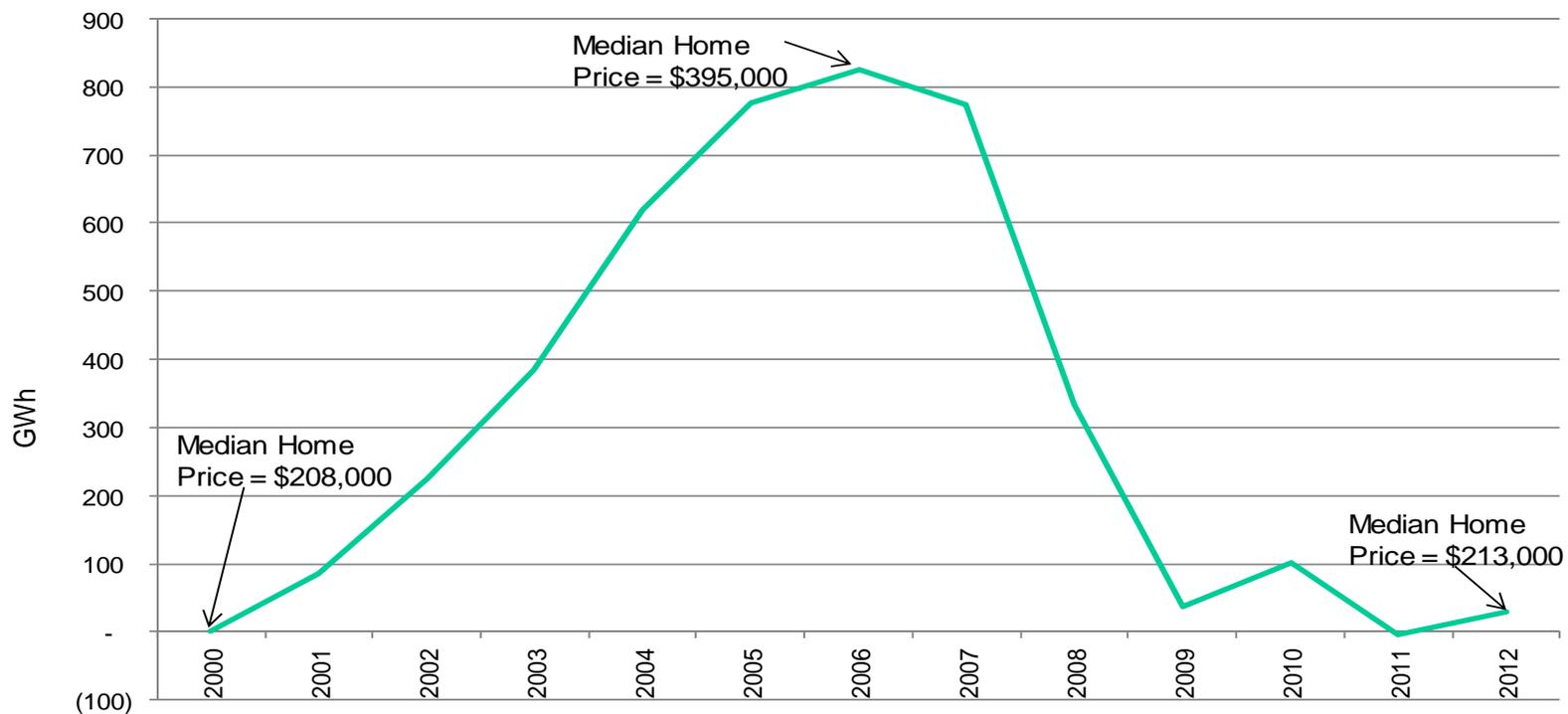
Explaining Differences Between *CED* *2013 Preliminary* and Econometric Forecasts

- Econometric models likely do not fully capture recent efficiency trends since estimation period goes back to 1980
- Commercial price elasticities much lower in econometric models (electricity and natural gas)
- Disaggregation of construction/resource extraction sector in *CED 2013 Preliminary*



Additional Factoid of Interest

Impact of housing boom and bust on statewide electricity consumption





For Revised Forecast (August)

- Incremental uncommitted efficiency (a.k.a ?)
- New EV forecasts
- Additional electrification, including high-speed rail
- Climate change and temperature distributions (1 in 2 vs. 1 in X peak demand)
- ARRA impacts
- Revised inputs