



## Filing Receipt

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# ENERGY EFFICIENCY AND DEMAND-RESPONSE: TOOLS TO ADDRESS TEXAS' RELIABILITY CHALLENGES

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An ACEEE White Paper



# ACEEE analyzed seven potential residential utility programs with large peak demand impacts

## Energy efficiency programs

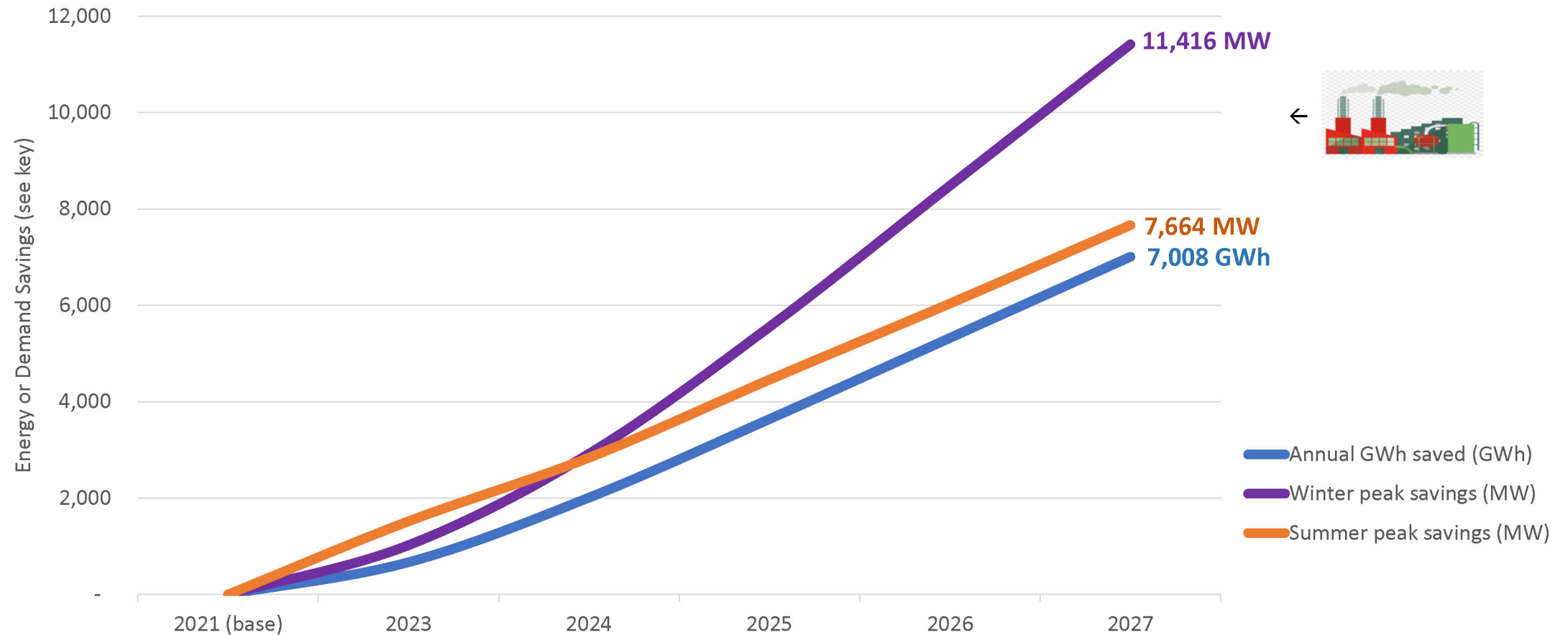
- Electric furnace replacement program (with Energy Star heat pumps)
- Attic insulation and duct sealing incentive program
- Smart thermostat incentive program
- Heat pump water heaters incentive program

PLUS, analyzed expected savings from federal incandescent lighting phaseout  
– FREE SAVINGS!

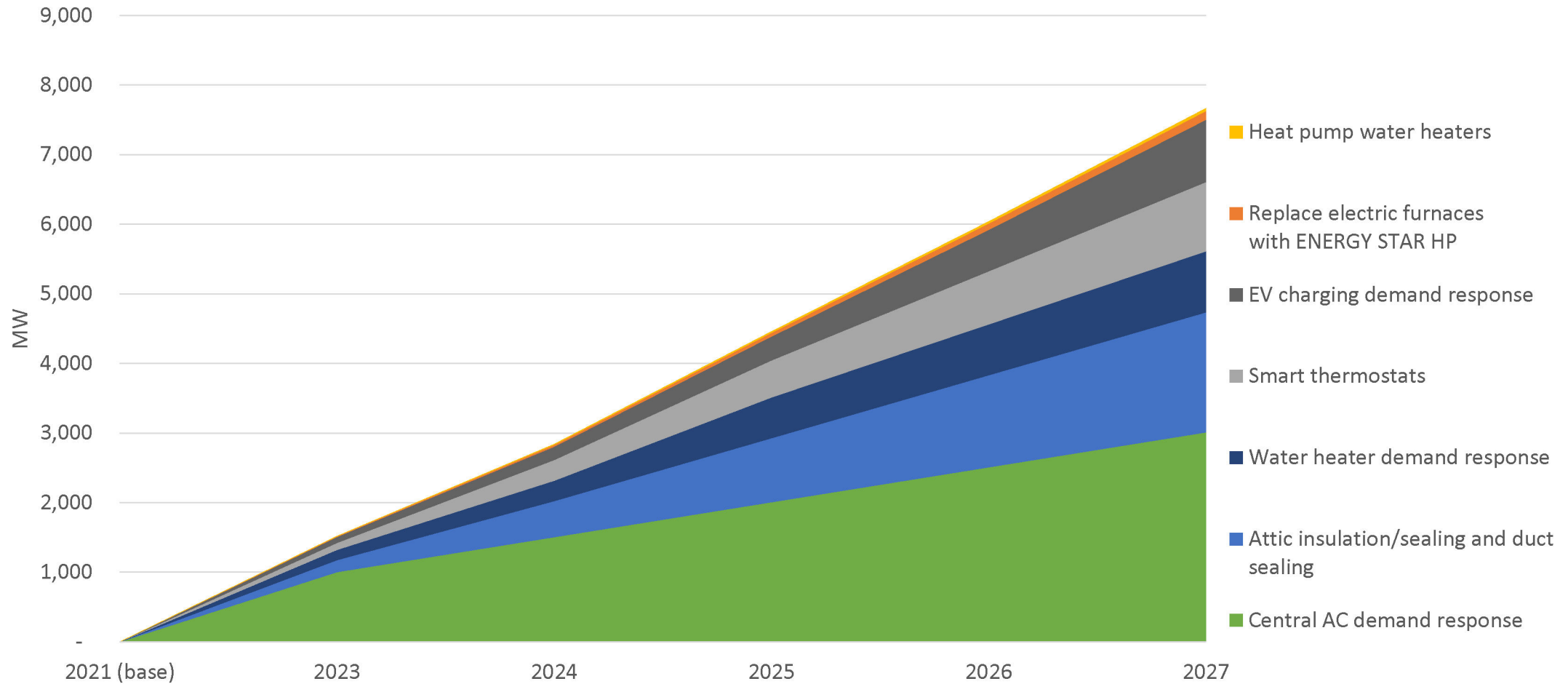
## Demand response programs

- Central air conditioner demand response program (with smart thermostat control)
- Electric vehicle managed charging program
- Water heater demand response program

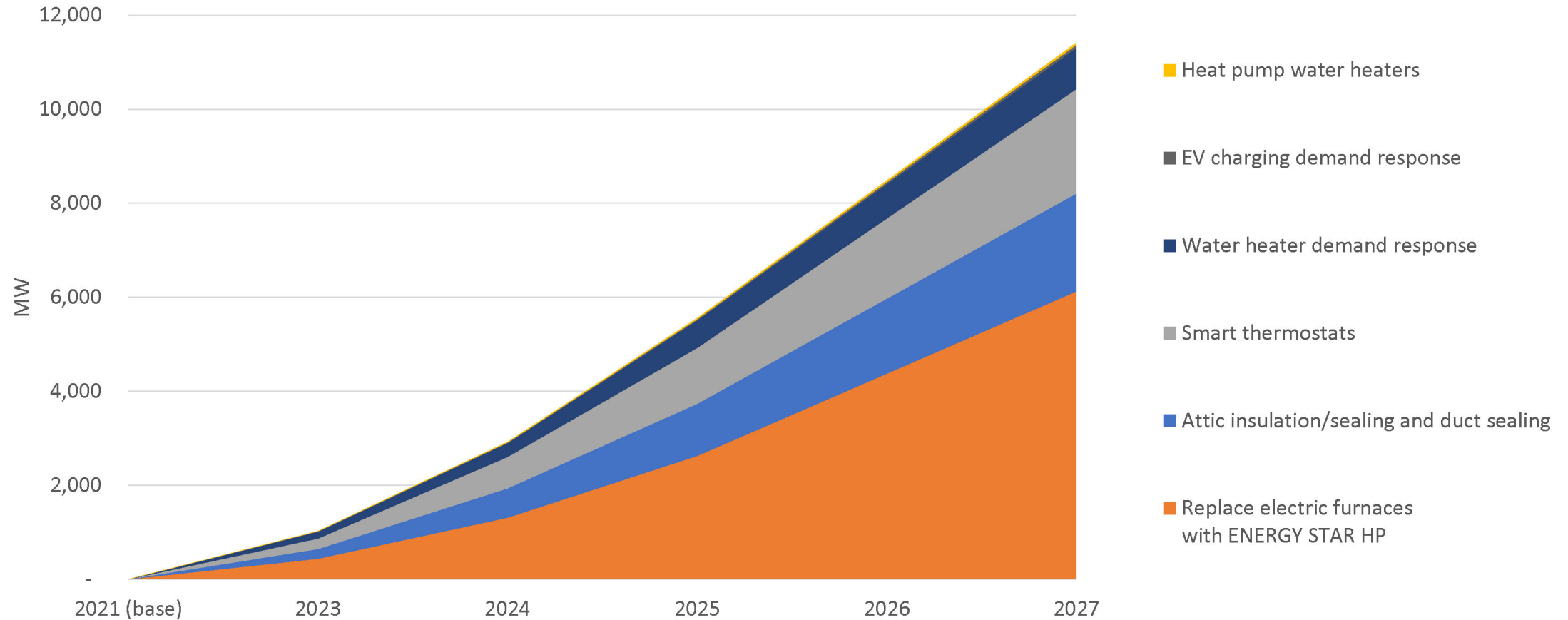
# Cumulative annual energy and peak savings by year from the seven programs analyzed



# Summer peak load reductions: 7,650 MW

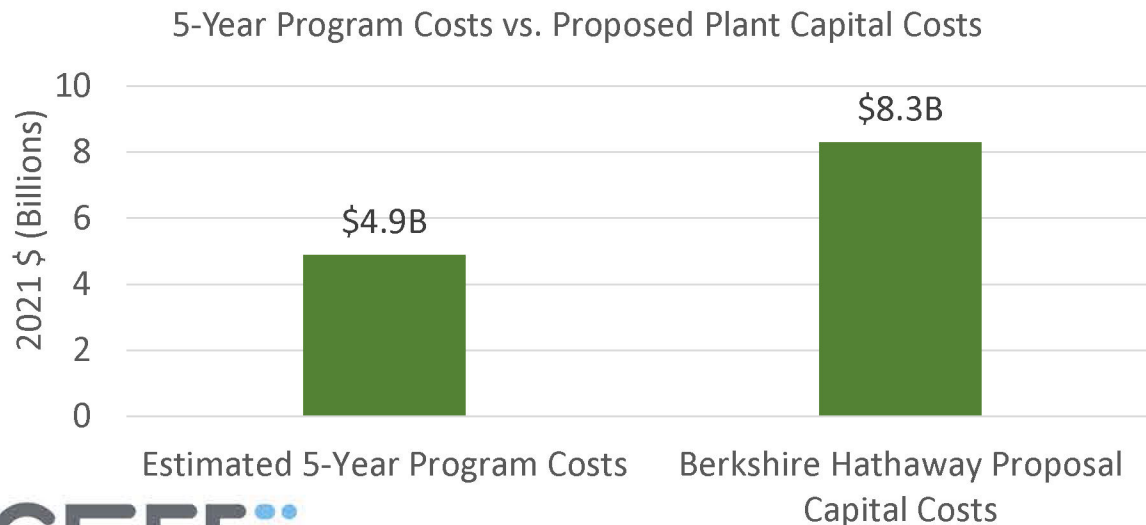
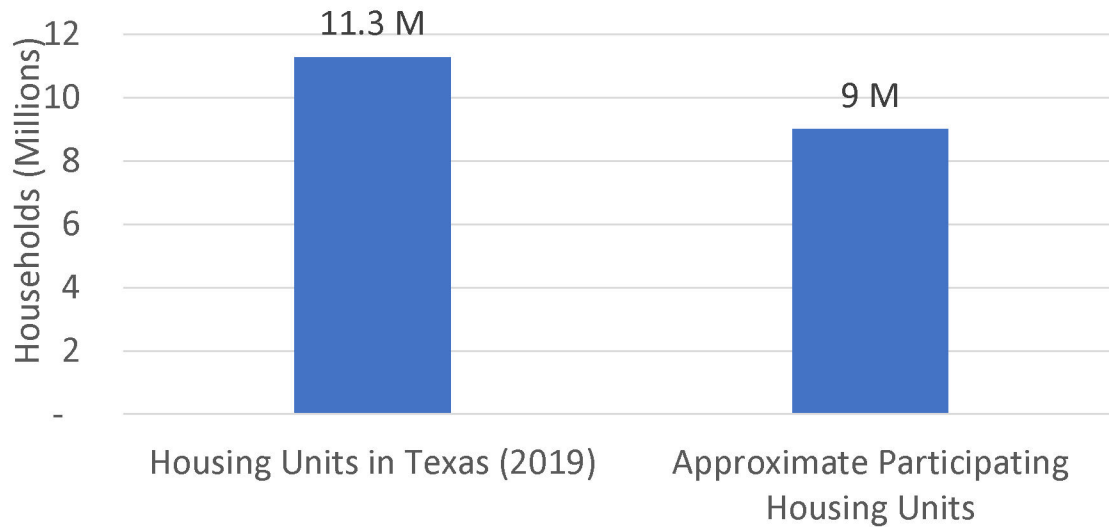


# Winter peak load reductions: 11,400



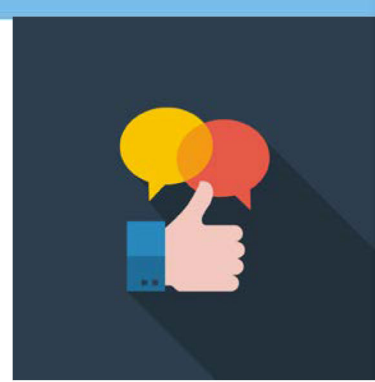


# Program participation, cost and cost-effectiveness



- \$700M program cost in year 1 (2023), ramping to ~\$1B per year
- \$4.9B over 5 years, this is 40% less than just the capital costs of the gas plant proposals
- For 2022, double current budget to \$280M
- Cost of saved energy: \$0.056/kWh
- Efficiency programs: 2.7 B/C
- DR programs: 1.2 B/C
  - BCR would be higher if valued at cost of proposed combined-cycle plants

# Market design recommendations



- Direct utilities to consider the high value programs analyzed
  - Similar summer peak and greater winter peak power at 60% of the upfront cost of proposed gas generation assets
- Reform Texas' energy efficiency resource standard (EERS) and increase goal to at least 1% of retail sales annually; let utilities trade savings credits
  - Increase energy efficiency cost recovery factors to support utility efforts
  - Increase program budget allocations for low-income households to 20%
- Set utility demand response goals to increase investments in under-tapped residential DR: up to 10% DR goal by 2027
- Set market rules for compensation and aggregation to better enable residential demand response; consider doing at ERCOT level



## Estimated 5-year costs, savings, and households served

Statewide savings including IOUs, large munis, and smaller co-ops and munis

Reserve margin allowance reflects impact of reduced demand on needed generating capacity. Used ERCOT estimated reserve margin for summer 2021.

Program	Households Served	Peak Savings in Year 5 (MW)		Energy Savings (GWh)	Costs (millions)
		Summer	Winter		
<b>Efficiency</b>					
Replace electric furnaces with ENERGY STAR HP	571,200	125	6,130	774	\$571
Attic insulation/sealing and duct sealing	2,097,051	1,725	2,079	4146	\$3,127
Smart Thermostats	2,031,004	995	2,225	1831	\$152
Heat pump water heaters	119,471	37	41	259	\$117
<b>Subtotal</b>	<b>4,818,726*</b>	<b>2,882</b>	<b>10,476</b>	<b>7008</b>	<b>\$3,968</b>
<b>Demand Response</b>					
Central AC demand response	2,877,255	3,010	-		\$587
Water heater demand response	1,553,120	876	876		\$202
EV charging demand response	606,572	896	64		\$120
<b>Subtotal</b>	<b>5,036,947*</b>	<b>4,781</b>	<b>940</b>		<b>\$909</b>
<b>TOTAL</b>	<b>9,855,673*</b>	<b>7,664</b>	<b>11,416</b>		<b>\$4,877</b>
Add 16% reserve margin		8,990	13,242		

\*These totals include some households that participate in more than one program.