



Forecasting and Energy Efficiency at Southern California Edison

CEC IEPR Committee Workshop
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Forecasting & Energy Efficiency at SCE

- We treat SCE program savings as a dependent variable in our econometric equations of electricity consumption per customer:

$$(\text{ResUse} + \text{ResEE}) = f (\text{CDD}, \text{HDD}, \text{Pr}, \text{Y}, \text{W}, \text{BDays})$$

$$(\text{ComUse} + \text{ComEE}) = f (\text{CDD}, \text{Pr}, \text{Employ}, \text{BDays})$$

etc.

- The reasoning is that in the absence of SCE programs, avoided consumption would have responded in the same way as observed consumption to economic conditions, weather, etc.
- Also helps to establish separation between impact of IOU EE directed at accelerating appliance standards and impact of mandated standards.

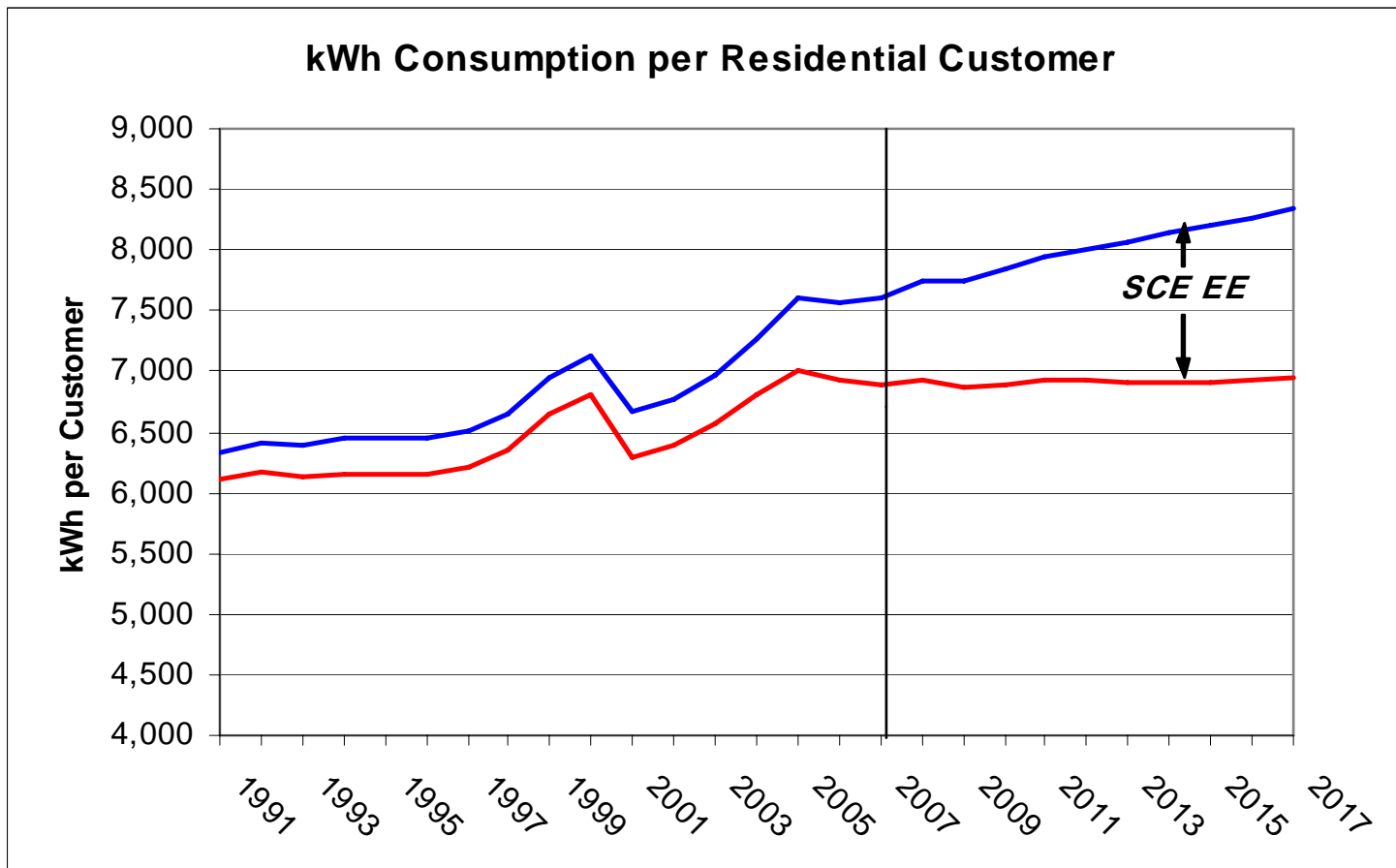


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- Since EE is a “known” value in the forecast period, predicted consumption per customer is $(\text{ResUse} + \text{ResEE}) - \text{ResEE}$.
- Chart 1 shows recorded and forecast consumption and EE for the residential customer class.
- As the Chart shows, EE has a significant impact on kWh per customer consumption growth.
- Without EE, long term trend residential growth is about 0.8% per year. With EE included, we predict that growth is basically flat.
- Total Residential Sales growth then must come from new customers, which in the recent past, has averaged about 1.1% per year.



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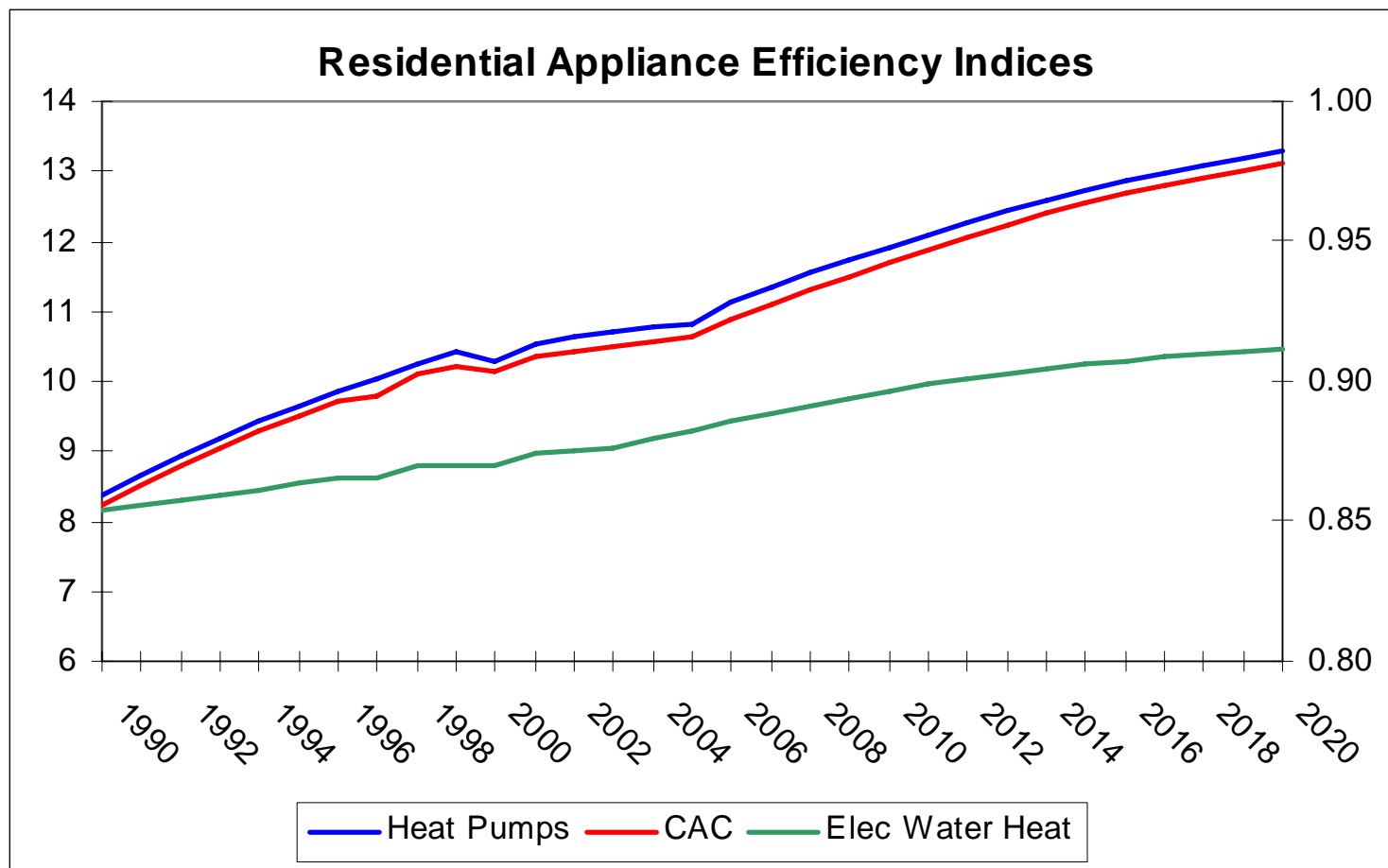
- The EE in the forecast period includes committed and uncommitted.
kWh consumption is weather adjusted.

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- What about the impact of current and future building and appliance efficiency standards?
- We sympathize with the CEC in attempting to separate standards from utility sponsored EE. SCE programs are mainly targeted at accelerating the introduction of new appliances.
- SCE's forecasting approach does not explicitly recognize
- appliance stocks.
- According to EIA data, the average efficiency of consumer appliances increases at a steady rate (about 1% per year for HP and CAC in forecast period).



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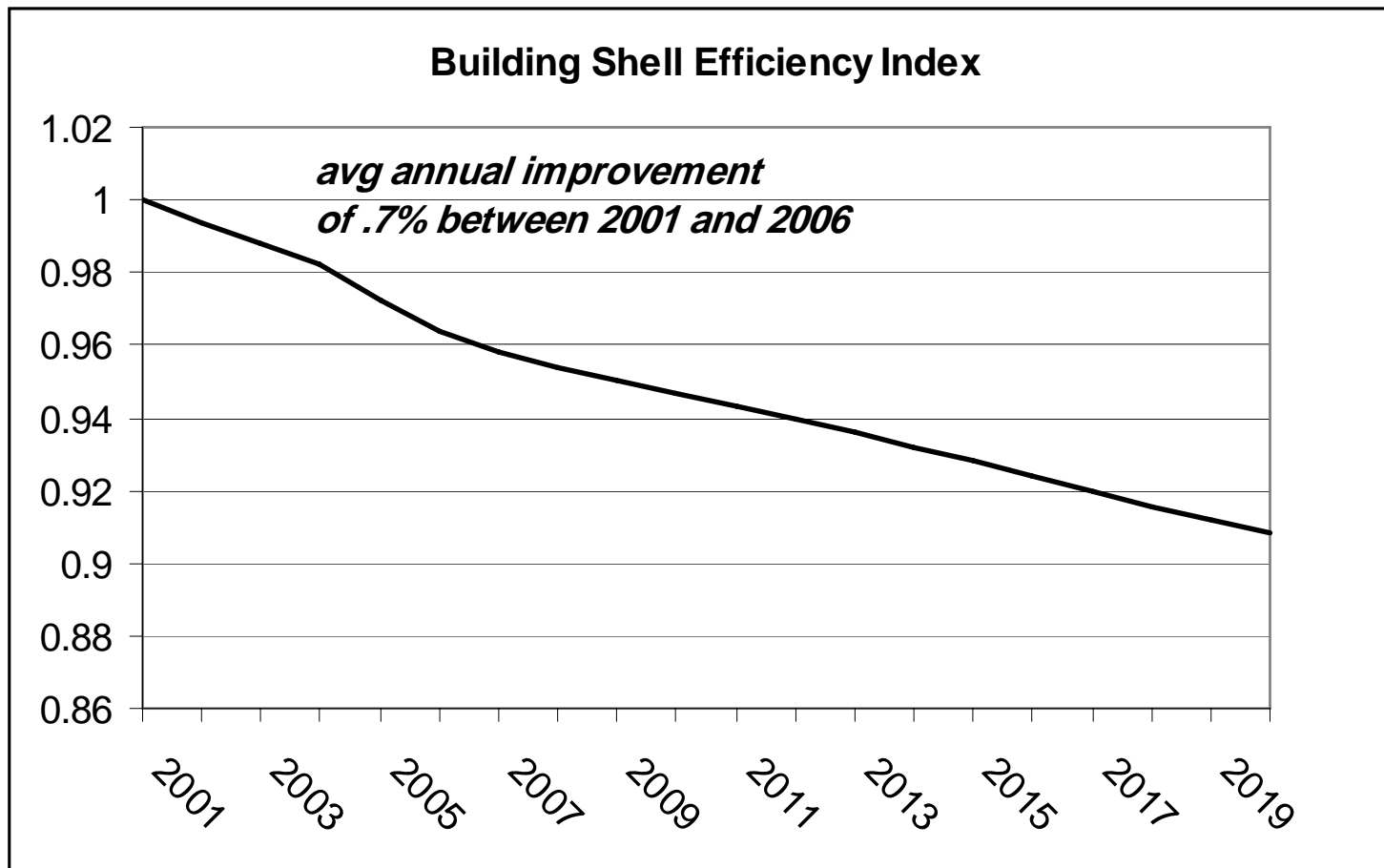
Source: Energy Information Administration, Feb. 2007; Federal Standards only.



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- You can't just add an index to the right-hand side of the Res equation:

$$(\text{ResUse} + \text{ResEE}) = f (\text{CDD}, \text{HDD}, \text{Pr}, \text{Y}, \text{W}, \text{BDays}, \text{Index})$$

- Index is just another trending variable that will be correlated with Y and W and possibly CDD/HDD.
- You could do this:

$$(\text{ResUse} + \text{ResEE}) = f (\text{CDD}/\text{Index}, \text{HDD}/\text{index}, \text{Pr}/\text{index}, \text{Y}, \text{W}, \text{BDays})$$

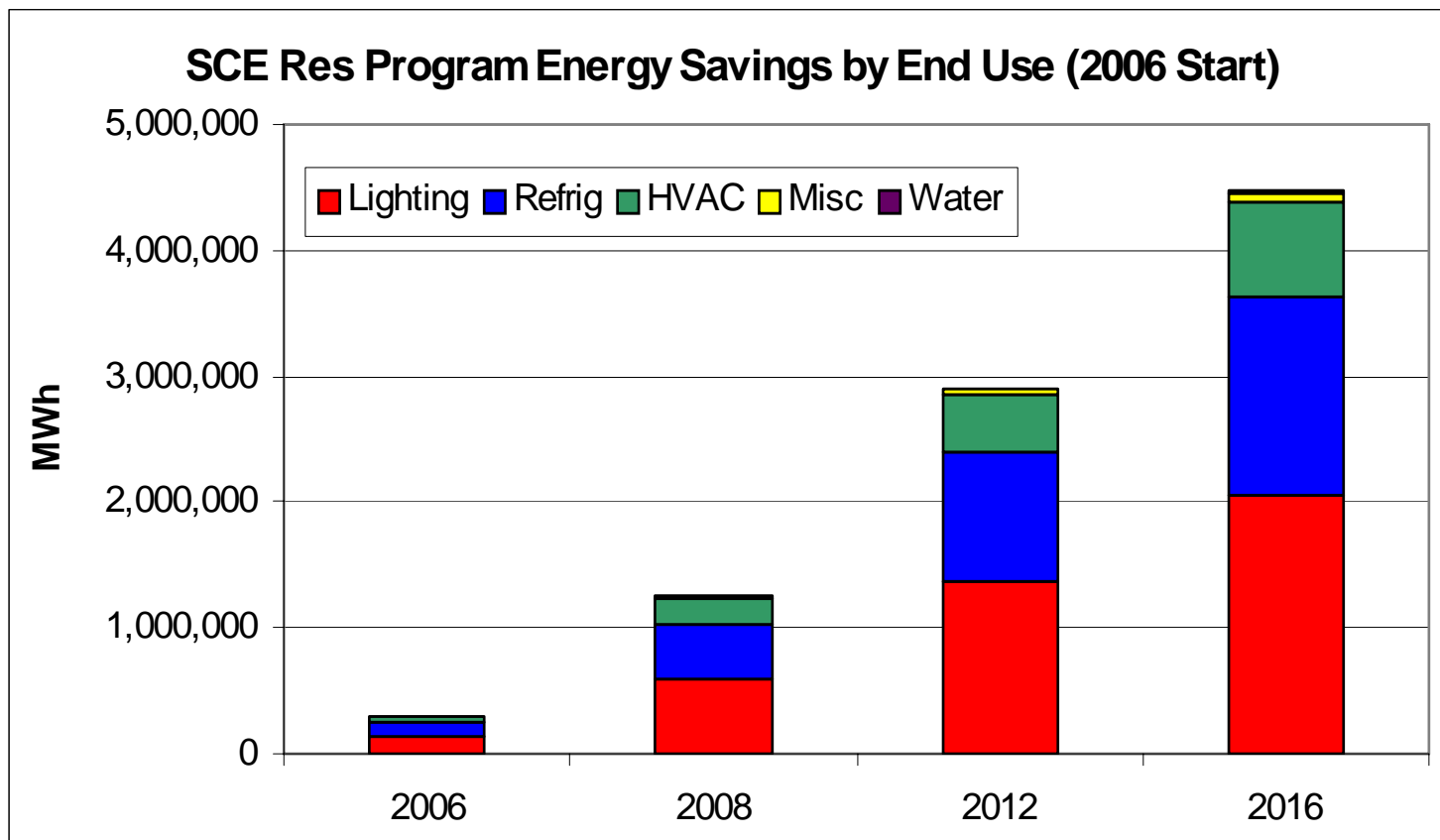
But it does not seem to make too much difference.

- Standard impacts are subsumed in other variables and are assumed to progress at the historic average rate.



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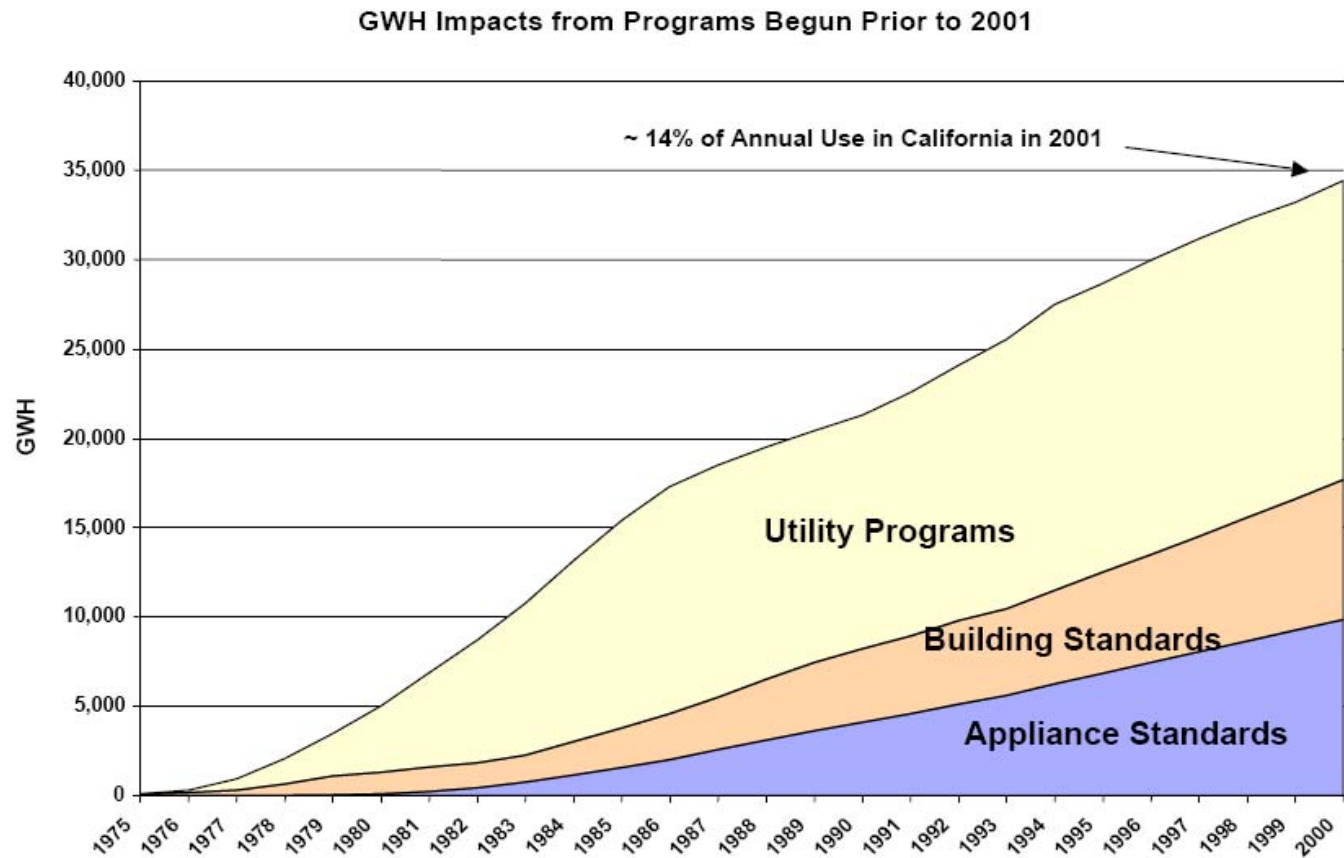
SCE Residential Programs appear to target end-uses where efficiency gains are most achievable



Excludes New Construction and includes Committed and Uncommitted.



Historically utility program contribution to energy efficiency savings was estimated to be approximately equal to that of the standards



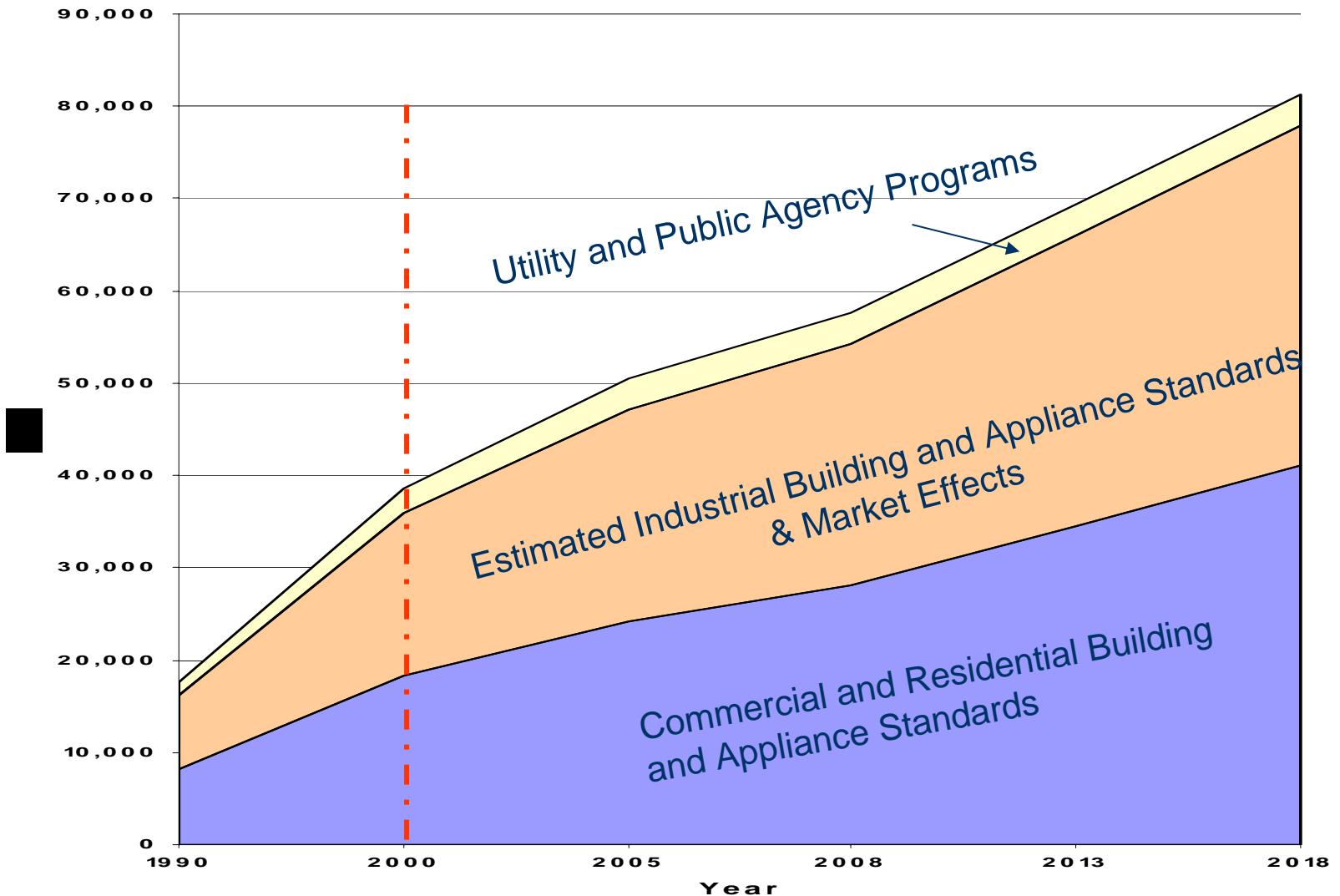
Source: Mike Messenger, CEC Staff, April 2003

14



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In the latest CED the utility program contribution is estimated to be only 10% of total energy savings



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Why is It Difficult to Detect Impact of Standards in SCE Models?

Changing Residential Customer Base:

- o Shift to Hotter Climate Zones
- o Average Housing Size is Increasing
- o Housing Size largest in Hotter Climate Zones
- o Increase in AC saturation
- o So Newer Customers generally have larger average kWh
- o Explains increase in kWh consumption in 2002-2005
- o Impact of Standards probably slowed growth



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Questions for the Workshop

1. Financial and Resource Planning for internal purposes.
LTPP and ERRR filings and NERC Compliance filing.

Potential for confusion between Managed or Unmanaged.

We deduct Uncommitted EE from our forecast for internal planning purposes, but do not do this when instructed – IEPR and LTPP.

CEC recognizes Uncommitted EE as Supply Resource, so legitimacy is established.

2. End-use models better suited to explicit representation of impact of standards.

We agree with CEC that significant overlap occurs (pages 28 and 108 in Staff Revised Forecast – 80% to 90%). In SCE case, possibly more than 100%.



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Questions for the Workshop

3. In 2006 LTPP, the overlap % used to reduce amount of uncommitted EE in Resource Plan.

We expect future estimates of overlap to be used in the same way in upcoming LTPP.

4. Previous slides discussed this question.



Back-Up Slides

**CEC IEPR Committee Workshop
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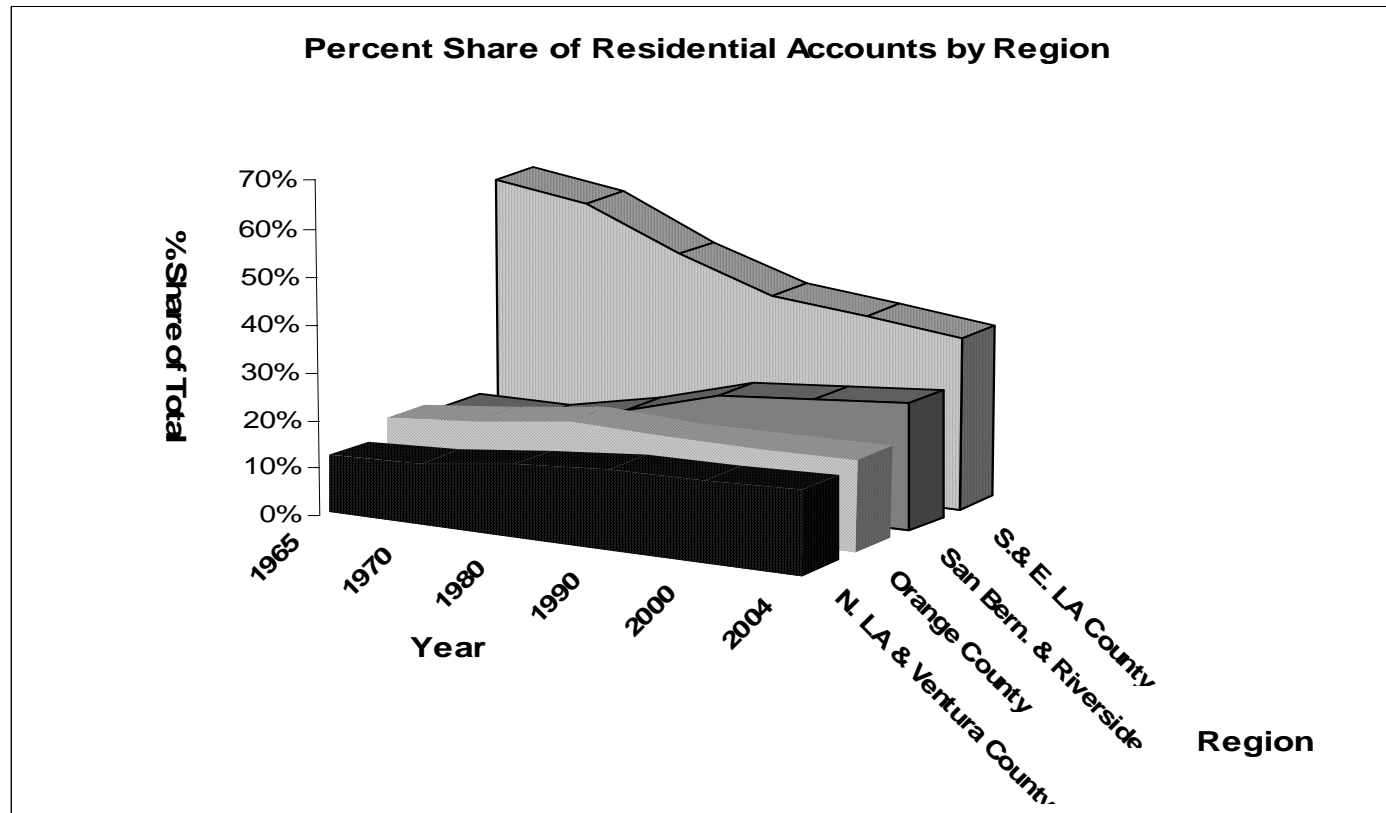
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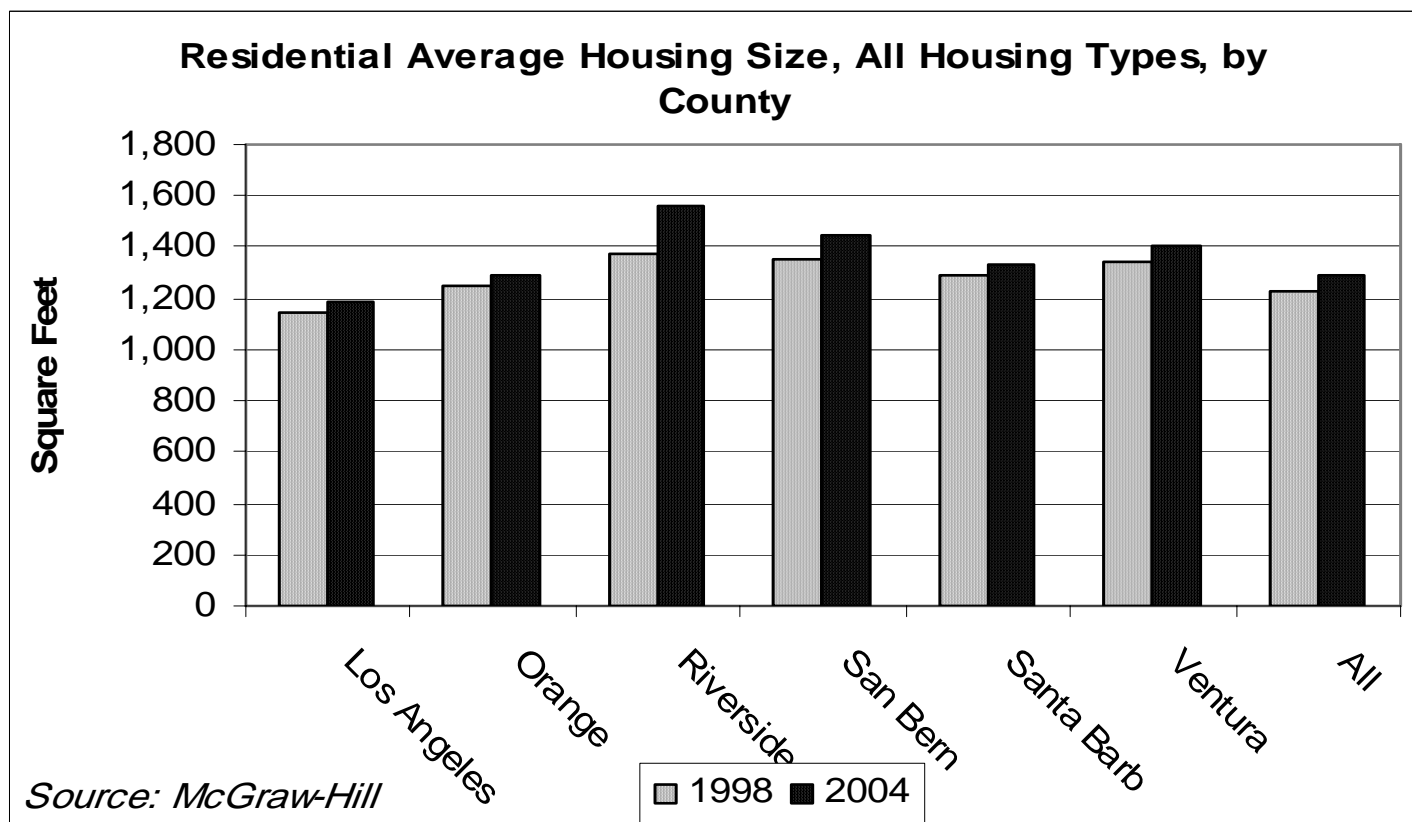
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Shift to Hotter Climate Zones



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Average Housing Size is Increasing

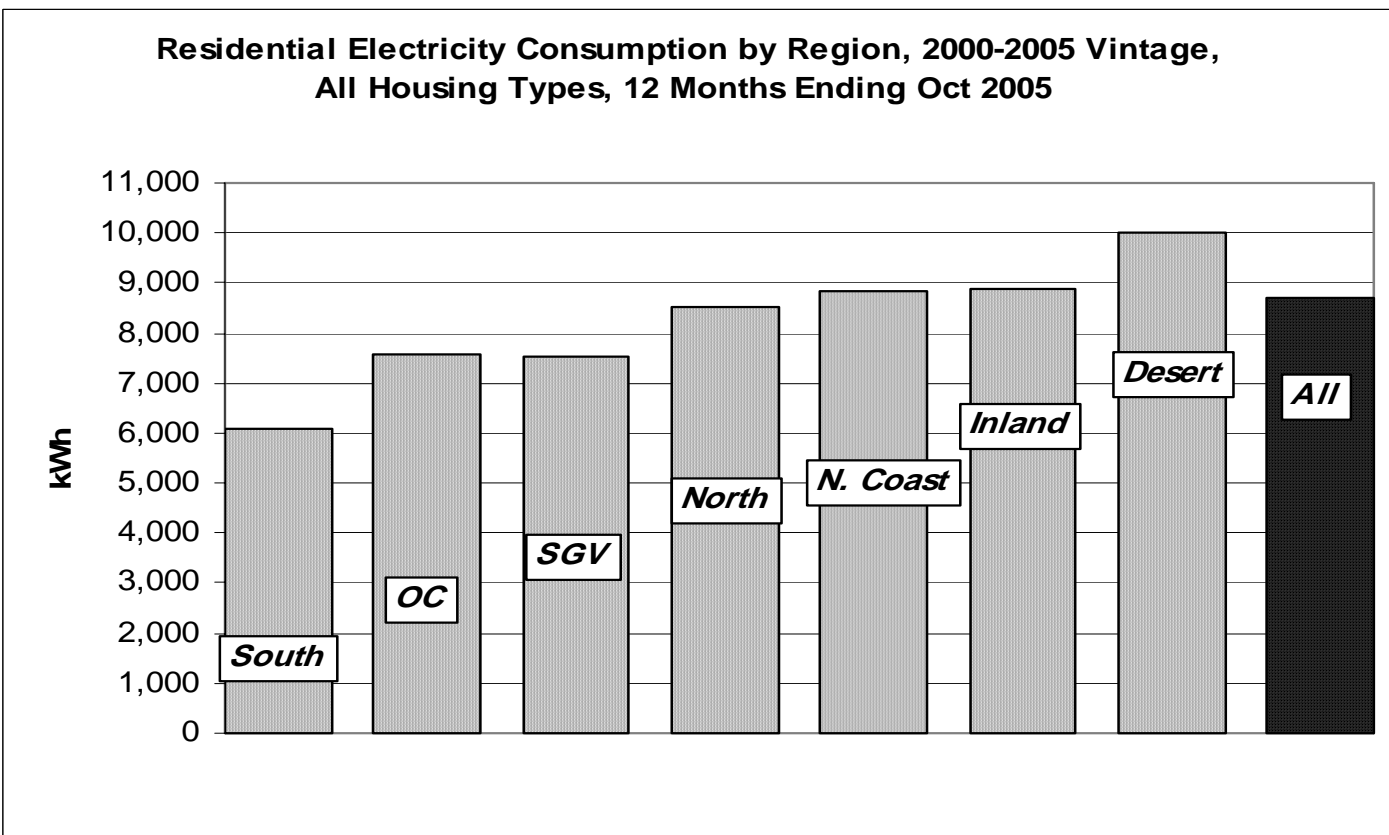


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Housing Size Largest in Hottest Climate Zones



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Newer Customers have larger kWh Consumption

