Energy Efficiency Potential: California Experiences

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Topics

- Brief history of energy efficiency in CA – 1990 on
- Purposes of energy efficiency potential studies
- Key research questions for EE potential studies
- How were the 2002 CA potential studies used
- 2002 study recommendations for future research
- Maximum achievable potential
  - A key, sometimes misunderstood element of 2002 CA energy efficiency potential work
Brief history of energy efficiency in CA

- Early round of potential studies
- Re-emphasis of IOU Energy Efficiency Programs
- Retail electricity and market transformation
- Resource oriented energy-efficiency programs
- Energy crisis
- Next round of potential studies
- More potential studies
- CPUC/CEC Goals

Purposes of energy efficiency potential studies

- Understanding which measures and markets to target with programs
- Incorporating energy efficiency into integrated resource planning (IRP) process
- Goal setting
- Advocating for more energy efficiency

- Early CA studies targeted the first 2 points; next round touched on all 4 points; latest round of studies focused on first 3 points – little need for advocacy
2002 CA potential studies: key research questions

- How much near-term EE potential is there today?
- What are the relative costs of acquiring savings?
- How aligned are programs with potential?
- How robust/sensitive is potential to avoided costs, rate increases, etc.?

- Latest round of potential studies improved upon points 1 and 2; did not focus on points 3 and 4
How were the 2002 CA potential studies used?

- **Program planning**: utility planners utilized the studies to identify key measure groups and customer groups to focus program efforts on
  - For example: lighting in schools
- **Resource planning**: utility planners utilized results to incorporate energy efficiency into their resource plans
  - Additional scenario runs were conducted for specific utilities to align results with internal program approaches and planning assumptions
- **Goal setting**: Regulators utilized elements of the studies to set utility EE goals
2002 study recommendations for future research

- Improve estimates of current efficient measure saturation
  - Yes. CEUS, CLASS, RASS studies

- Improve estimates of sustained conservation and efficiency resulting from 2001 energy crisis
  - Yes. Picked up in above studies and calibration

- Improve estimates of efficiency potential for the industrial and new construction sectors
  - Yes. Expanded industrial and new construction modeling efforts

- Improve forecasts and tracking of customer adoption of efficiency measures
  - No. Tracking databases lacking; absence of funding for adoption studies
Maximum Achievable Potential

- Defined as the amount of economic potential that could be achieved over time under the most aggressive program scenario possible.
  - Assumes a direct-install type set of programs to ensure maximum penetration
- Modeled in 2002 by ramping incentives up to 100% of incremental measure cost over several years and doubling marketing/education budgets.
  - Studies assumed traditional program cost-savings relationships would hold
- 2002 estimated program costs for maximum efficiency were 4x those of business-as-usual
  - Present value of $8 billion vs. $2 billion over 10 year period
Maximum Achievable Potential

- In 2002, CA net maximum achievable potential over 10 years was estimated at about 60% of economic potential.
Maximum Achievable Potential

• Maximum achievable potential, in net terms, will never reach economic potential
  – Naturally occurring EE will take away some potential
  – Some customers will not install measures on a voluntary basis
  – Marginally cost-effective measures will not remain cost effective for programs, when program overhead costs are added
Maximum Achievable Potential

- PROs and CONs of modeling and striving for Max-Ach
  - PROs
    - Provides a good technical upper bound for ensuring program potentials are not overestimated
    - Provides a context for setting stretch goals
  - CONs
    - Rapid attempts to reach Max-Ach may lead to spending inefficiency – infrastructure limitations
    - Costs associated with reaching Max-Ach will be higher than initially estimated
      - Harder to reach market segments
      - More bad measures and programs
    - Possible boom-bust EE industry
    - Large transfer payments to program participants
- Are mandatory standards a better way to reach economic potential?