Energy Codes & Standards - A Key Strategy for Energy Efficiency in Buildings

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Course is Clear

- Energy efficiency in buildings is a big target
- Utility programs only reach some
- Standards apply to all
- Rebates are costly
- Standards raise the bar for the entire industry
California’s Favorite Graph

Per Capita Electricity Sales (not including self-generation)
(kWh/person) (2006 to 2008 are forecast data)

United States
California

2005 Differences
= 5,300kWh/yr
= $165/capita

Per Capita Income in Constant 2000 $

<table>
<thead>
<tr>
<th>Year</th>
<th>US GDP/capita</th>
<th>Cal GSP/capita</th>
</tr>
</thead>
<tbody>
<tr>
<td>1975</td>
<td>16,241</td>
<td>18,760</td>
</tr>
<tr>
<td>2005</td>
<td>31,442</td>
<td>33,536</td>
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% change:
- US GDP/capita: 94%
- Cal GSP/capita: 79%
C&S Provide Foundation

Annual Energy Savings from Efficiency Programs and Standards

~15% of Annual Electricity Use in California in 2003

Utility Efficiency Programs at a cost of ~1% of electric bill

Building Standards

Appliance Standards
Energy Standards

- Establish norms for energy use
- Transform the building industry
  - Conservative & cautious
  - Slow to change
  - Diverse
- Combat “race to the bottom”
Codes & Standards

- Building codes govern construction
  Energy codes set efficiency standards

- Advantages:
  - Large market penetration
  - Elevates standard practice
  - Pushes prices down

- Disadvantages:
  - Can’t be too advanced
  - Depends on enforcement
  - Must be updated
    (else drags market)
Standards Affect the Market

Building Population Efficiency

Energy Code Minimum Efficiency

New average efficiency

Post-Code distribution
Get the framework right

- Set public policy for efficiency
- Adopt an energy code
  - Start with a building code
  - Strengthen enforcement mechanism
- Include C&S in utility savings goals
- Measure & credit the energy savings
New Construction Standards

- Efficiency is most cost effective
- Integrated design is most efficient
- If not now, wait many years (lost opportunity)
- Link to sustainability and green movement
- Extension of normal bldg permit process
Existing Building Standards

- Many more existing buildings
- Discrete efficiency change-outs
- Apply to individual trades
- Harder to reach through permits
Appliance Standards

- Govern what can be sold
  - Primary heating/cooling equipment
  - Water heaters & appliances
  - Lighting lamps & ballasts
  - Controls, electronics, etc.
- Apply to new & existing bldgs
- Federal pre-emption issue
- Enforced at point-of-sale
Utility C&S Programs

- Utility efficiency experts propose new standards

- Disadvantages
  - Takes away easy stuff
  - Rebate programs costlier

- Advantages
  - Everybody must do it
  - C&S programs most cost effective of all
How CA C&S programs work

- Utilities & CEC vet initial ideas
- Utilities prepare CASE studies
  - Assess technology opportunity/problems
  - Fill gaps – test methods, calcs, tools
  - Work through issues w/ stakeholders
  - Calculate cost effectiveness & savings
  - Develop code language
- Assist with deployment & education
Getting credit for savings

- CPUC C&S evaluation protocol
  - Estimate statewide energy savings
  - Adjust for normal market adoption
  - Adjust for non-compliance
  - Determine attribution credit (%) for utils

- Assist with enforcement/compliance
  - Train designers & building officials
  - Develop compliance tools
Conclusion

- We have a lot of buildings to improve
- Utilities have a lead role to play
- We’re dealing with the building industry (i.e., it won’t be easy)
- C&S are key to overall success
Questions/Comments?

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