Energy Efficiency:
Still a Large and Attractive
Energy Resource

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Presentation at the
2004 NARUC Summer Conference
Salt Lake City, UT
July 13, 2004
Southwest Energy Efficiency Project (SWEEP)

- Public interest initiative promoting greater energy efficiency in AZ, CO, NV, NM, UT, and WY
- Founded in 2001, based in Boulder, CO
- Board of Directors includes utility, state government, national laboratory, and private sector representatives
- Majority of funding provided by the Energy and Hewlett Foundations, U.S. Department of Energy, and U.S. Environmental Protection Agency

www.swenergy.org
Definition of Energy Efficiency

- Energy efficiency reduces the energy used by specific end-use devices and systems such as air conditioning, heating, refrigeration, or lighting.
- Substitution of more advanced equipment, processes, or operational strategies to produce the same or an improved level of end-use service with less energy use.
- Opportunities in electricity and natural gas.
- Distributed, small scale, economical and reliable resource that also provides significant environmental benefits.
There is still very large potential for greater energy efficiency

- Penetration of many well-established energy efficiency measures is still relatively low
- New energy savings technologies and practices continue to be developed
- Cost and performance of existing energy efficiency measures continue to improve
- Capital stock turnover always presents opportunities to upgrade energy performance
Examples of Economic/Achievable Energy Efficiency Potential

- New York: 27% electricity savings potential over 20 years (2003 study)
- Vermont: 31% electricity savings potential over 10 years (2003 study)
- Southwest states: 33% electricity savings potential over 17 years (2002 study)
- California: 11% achievable electricity savings potential in 10 years from expanded utility programs only (2002 study)
- Utah: 20% achievable gas savings potential in 10 years (2004 study)
California 10-Year Savings Potential

From California’s Secret Surplus: The Potential for Energy Efficiency; Rufo and Coito; September 2002
The New Mother Lode: The Potential for More Efficient Electricity Use in Southwest

- **Base Scenario**
  Projects growth of electricity use assuming that current policies and trends are maintained, with demand growing 2.6% per year on average in SW between 2003 and 2020.

- **High Efficiency Scenario**
  Projects growth of electricity use assuming widespread adoption of cost-effective, commercially-available energy efficiency measures. Demand grows 0.4% per year between 2003 and 2020.
The High Efficiency Scenario

Costs and benefits (billion $, cumulative during 2003-2020)

<table>
<thead>
<tr>
<th>Sector</th>
<th>Energy Efficiency Costs</th>
<th>Overall Benefits</th>
<th>Net Benefits</th>
<th>Benefit-Cost Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial</td>
<td>3.0</td>
<td>17.7</td>
<td>14.7</td>
<td>5.8</td>
</tr>
<tr>
<td>Residential</td>
<td>3.2</td>
<td>9.3</td>
<td>6.1</td>
<td>2.9</td>
</tr>
<tr>
<td>Industrial</td>
<td>2.6</td>
<td>10.0</td>
<td>7.4</td>
<td>3.9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>8.8</strong></td>
<td><strong>37.1</strong></td>
<td><strong>28.2</strong></td>
<td><strong>4.2</strong></td>
</tr>
</tbody>
</table>

Savings can be achieved at an average cost of $0.02 per kWh.
Policies for Achieving Higher Efficiency

- Consider energy efficiency as a resource and use “Total Resource Cost” test to evaluate cost effectiveness
- Adopt an Energy Efficiency Standard
- Adopt mechanisms to fund utility (or non-utility) efficiency programs
- Provide utilities with financial incentives to implement effective programs
- Upgrade building codes, support code implementation, and adopt product standards
- Adopt “best practices” in public sector energy management
Potential Benefits from Energy Efficiency Improvements Today

- Energy bill savings for consumers and businesses
- Net economic benefits for society as a whole
- Reduced power plant pollutant emissions including CO$_2$ emissions
- Reduced water consumption
- Opportunity to avoid most costly and controversial new power plants or trans. lines
- Increased reliability of the electricity grid
- Reduced natural gas consumption and downward pressure on gas prices
- Net increase in employment
Examples of Leading Utility Energy Efficiency Programs

- National Grid, MA, 2001: $64M on energy efficiency and DSM, 37 MW peak load reduction, $0.024/lifetime kWh, 187 GWh/yr (1.0%) annual electricity savings
- Connecticut, 2002: $87M utility DSM budget, 99 MW peak load reduction, 246 GWh/yr (0.9%) electricity savings
- Efficiency Vermont, 2003: $13M effort, 54 GWh/yr (0.95%) of savings, $0.026/kWh average cost of electricity savings
- Xcel Energy, Minn., 2002: $38M DSM budget, 121 MW peak load reduction, 267 GWh/yr (0.9%) electricity savings
Utility Energy Efficiency Efforts in the Southwest Region

- **PacificCorp, Utah**: Spent $10 million on DSM in 2003, planning to spend $17 million in 2004 (~1.7% of revenues), saved 97 GWh/yr in 2003.

- **Nevada Power/Sierra Pacific Power**: Restarted DSM in 2003 at $11.2M per yr (~0.5% of revenues). Energy savings = 40 GWh/yr; peak load reduction = 23 MW per year, just in first year.

- **Xcel, CO**: Committed to 124 MW peak demand reduction through DSM during 2001-05; 170 GWh/yr savings by 2005; $61M over 5 years.

- **Ft. Collins, CO**: Municipal utility set goals to reduce electricity use per capita 10% and peak demand per capita 15% by 2012, now launching programs.
Challenges to Developing Energy Efficiency Resources

- Efficiency measures are small scale and highly diffuse; need to influence millions of purchase and operating decisions.
- Need to design and operate programs that “make a difference” in the marketplace.
- Need to carefully monitor and evaluate program impacts.
- Need to combine policies and programs into effective market transformation strategies.
What Should State Regulators Do?

- View energy efficiency as a strategic resource equivalent to supply-side resource options
- Support implementation of all cost-effective energy efficiency programs using a Total Resource Cost perspective
- Adopt energy savings goals and appropriate program funding mechanisms and evaluation procedures
- Provide utilities with financial incentives to operate effective programs, if utilities are responsible for program implementation
Conclusions

- The energy efficiency resource is still very large and is still worth pursuing vigorously.
- Energy efficiency should be a significant part of state/utility resource portfolios especially in high growth regions such as the Southwest.
- Regulators should support implementation of cost-effective energy efficiency programs, give utilities financial incentives to operate effective programs, and carefully evaluate program results.
- Leading utilities and states are spending ~2% of revenues on energy efficiency programs and reducing electricity use ~1% per year.
SWEEP:
Dedicated to More Efficient Energy Use in the Southwest

Resources available online at:
www.swenergy.org

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