

## **Energy Efficiency Program Costs**

## Project No. 37623 Rulemaking to Amend Energy Efficiency Rule

June 30, 2010

## Outline



- Types of Energy Efficiency Programs
- Components of Program Costs
- External Factors
- Historical Results
- Solar PV Programs
- Strategies to Mitigate Cost Increases

## **Energy Efficiency Programs**



- Programs are designed to overcome market barriers in the adoption of energy efficiency technologies
- Types of market barriers\*:
  - <u>Structural barriers</u> occurs when parties in the market are not motivated to purchase energy efficiency technologies; for instance, the tenant/landlord split incentive.
  - Financial barriers occurs when incremental cost of technology is higher than the cost of the standard efficiency counterpart; for instance, if the cost of a high efficiency device is \$500 more than the standard, then customer will more than likely choose the standard.
  - Information barriers happen when customer or other market participants do not have all the information, expertise, or time to make the most energy efficient choice

\* National Action Plan for Energy Efficiency, February 2010

## Energy Efficiency Programs -Standard Offer Programs



- Encourage the private sector delivery of energy efficiency products through a wide range of Energy Efficiency Service Providers (EESP).
- EESPs apply to participate in TDSP Standard Offer Program.
- EESPs work with their customers on energy efficiency product and technology selection. This program typically targets customer financial barriers.
- EESPs use TDSP incentive payments to discount cost of the measure to the customer.
- TDSP validates that the measure was installed and is capable of delivering the demand and energy savings reported.

## **Energy Efficiency Programs -Market Transformation Programs**



- Strategic efforts to make lasting changes in the market that result in increased adoption of energy efficient technologies, services, and practices.
- Market transformation programs use several approaches to accomplish these changes:
  - . Upstream and customer financial incentives
  - . Contractor training
  - . Marketing and outreach
- A TDSP will typically select an implementer to operate the program.
- The implementer is responsible for day to day operations along with achieving energy efficiency savings.

## **Components of Program Costs**



#### Costs can be broken out into three general areas:

- Payments to Energy Efficiency Service Providers in Standard Offer Programs
- . Payments to implementers of Market Transformation Programs
- . Utility Administrative Costs (currently capped at 10% of program costs)
- In order to be cost-effective, sum of all program costs must be less than or equal to allowed avoided cost.
- Avoided costs are the peak demand (kW) and energy consumption (kWh) that are saved through the installation of an energy efficiency measure over the life of the measure. For instance, an air conditioner lasts approximately 15 years.

## **External Factors That Increase Program Costs**

- More Stringent Building Codes and Equipment Standards are being adopted
  - . Will reduce incremental energy savings available to be captured in utility programs
  - . Will result in higher cost per unit of energy saved
- Cost of Energy
  - . Per DOE, residential rates dropped 3% and commercial rates dropped 8% from 2008 to 2009
  - . Lower energy costs extend payback period for energy efficiency technologies
  - Larger incentive payments may be required to get customers to adopt technologies

#### Cost of Technology

- Innovative technologies may be more expensive
- Incentives may need to cover a larger portion of the installed cost

#### Issues of Scalability

Due to nature of market or availability of qualified installers, program may not be able to grow in meaningful size in short term

## Average Cost per Reduced kW of EUMMOT Utilities; 2009 Energy Efficiency Reports\*





2009 Statewide Demand Reduction = 240 MW; Total Spending = \$106 million Average costs/kW (both statewide and per utility) are based on the majority of energy efficiency programs offered in 2009; data collected from April 1, 2010 filings. Statewide average was rounded and may not match actual filings

## **Program Cost per kW Reduced** Statewide Average 2009 (Selected Programs)





Full list of programs and costs is found in the Appendix

#### **Statewide Demand Reduction and Spending**







\* Statewide, Energy Star New Homes accounted for 13% (28 MW) of total MW reduction in 2009

#### Low Cost, High Savings Compared to next three lowest cost per kW savings programs





Combined, the SCORE/CitySmart and Commercial SOP programs would cost more than the Energy Star New Homes program and result in less savings.

## **Energy Star New Homes**



To achieve the 28,000 kW produced by the 2009 Energy Star New Homes, programs in future years, through other energy efficiency programs, spending will have to increase.

Energy Star New Homes: \$269/kW

	Extra \$/kW	Total \$/kW	Additional Cost
Texas SCORE & CitySmart	\$117	\$386	\$3,276,000
Commercial and Industrial SOP	\$154	\$423	\$4,312,000
Residential/Small Commercial SOP	\$246	\$515	\$6,888,000



In general, even with Federal tax credits of 30% of program costs, the payback for residential PV systems is relatively long.

Assuming Solar PV Installed Cost of \$7 per Watt (no discount rate).

Utility Incentive (\$/W installed)	Cost of Electricity (\$/kWh)	Simple Payback (years)
\$2.46	\$0.10	16
\$2.25	\$0.10	17
\$2.00	\$0.10	19
\$0.00	\$0.10	31
\$2.46	\$0.15	11
\$2.25	\$0.15	12
\$2.00	\$0.15	13
\$0.00	\$0.15	21

#### **Solar/PV Programs**



## **US PV Installed Costs**



Source: Tracking the Sun II: The Installed Cost of Photovoltaics in the U.S. from 1998-2008, Lawrence Berkeley National Laboratories, October 2009



#### **Texas Solar Incentive Programs – Incentive Level History**

# 2009 Texas Solar Installations with TDU Incentive Support









#### Demand is Still High

- Long paybacks haven't discouraged consumers from installing systems through utility programs.
- Installed costs are dropping (partially due to competition spurred by utility programs).
- Despite decreasing utility incentives, demand remains high. (Oncor, Austin Energy, and others have reduced incentives.)

#### **Solar/PV Programs**



## **Results – Oncor 2009**

4-year program opened February 2009, funded through Energy Efficiency Commitment. Intitial incentive level \$2.46/dc watt

2009 Goals	Results
Commit \$4.2 million in incentive funds to proposed projects	\$4.2 million committed by October 2009; 2010 program funds advanced to continue commitments
Pay \$1.9 million in incentive funds to completed projects	Paid \$2.5 million to completed projects by end of year
Complete 120 projects totaling 785 kW	Completed 140 projects totaling 1,152 kW
Recruit 12 companies to work in the program	140+ companies signed up to work in the program; 83 submitted projects; 65 have completed projects

## **Solar/PV Programs**



## **Results – Oncor 2010**

2010 Goals	Actual to Date
Commit \$5.8 million in incentive funds to	\$5.8 million committed by February 2010
proposed projects	<ul> <li>\$2.5 million added to program in March 2010 incentives at \$2.46/dc watt residential \$2.00/dc watt non-residential \$7 million added to program in June 2010 incentives at \$2.25/dc watt residential \$1.75/dc watt non-residential</li> </ul>
Pay \$5.8 million in incentive funds to completed projects	Paid \$1.9 million to completed projects by early March 2010

#### 4 year program goal:

Create a sustained solar market with incentives of less than \$2.00/watt.

\* Achieved in March 2010 for non-residential projects..

## Potential Strategies to Mitigate Costs of Meeting a Statewide 50% Energy Efficiency Goal



- Count Results From Other Energy Efficiency Programs Towards Energy Efficiency Goal
  - . American Recovery and Reinvestment Act Funding
  - . Low Income Weatherization
- Count Impact of Strengthened Building Codes and Equipment Standards
  - . Conduct studies to quantify energy efficiency savings due to codes and standards

#### Capture energy savings due to educational and behavioral programs

- . Educating customers on how to conserve energy and measure the results.
- . In-home devices or other customer feedback techniques that cause them to change their consumption behavior.

## **Summary**



- Wide range of program costs
- Some programs options are less expensive than others, but issues of scalability remain
- Solar PV programs are popular, but entail large program costs
- Budget caps will prevent utilities from achieving performance bonus in 2015 because cap will keep programs from achieving goals
- The goal for energy efficiency is a statewide goal, we should take a statewide perspective



# Appendix

#### **Program Cost per kW Reduced**



ONCOR

#### Incentives to Service Providers – Residential Insulation Project



**Average Project:** 

- 1,800 Sq Ft home with Gas Heat
- Existing level of insulation level of 3 inches
- Add an additional 9 inches of insulation
- Per Commission approved deemed savings this will result in .53 kw and 720 kWh savings. The expected life of this energy efficiency measure is 25 years.
- Average cost of installation is .50 sq ft of attic treated to add insulation (per contractor survey and home improvement stores).

Cost for this project would be:

- \$900 cost to customer for installation
- A \$205 incentive available to the contractor through the Residential/Small Commercial program. The maximum incentive (and still be cost effective is \$876)
- \$695 difference between install and incentive
- The incentive paid for approximately 23% of the total install price for this project

#### Incentives to Service Providers – Commercial Chiller Project



- For a chiller of 380 tons in capacity exceeding current standards:
  - . The cost to the customer will be approximately \$350,000
  - . With this new chiller the customer will save 57 kW and 127,000 kWh
  - . Under current incentive rates, the Service Providers would be eligible for a \$40,600 payment
  - . The maximum incentive a TDSP could pay would be \$118,600 and still be cost effective
- The incentive paid for approximately 12% of the total install price for this project