STATE CLEAN ENERGY - ENVIRONMENT TECHNICAL FORUM
Call #16: Energy Efficiency Portfolio Standards (EEPS)
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BACKGROUND

I. Background

A. Introduction

Energy Efficiency Portfolio Standards (EEPS), also known as Energy Efficiency Resource Standards (EERS), are a simple, market-based mechanism that require energy providers to meet quantitative targets for energy savings, typically in the electricity and/or natural gas sectors. Patterned after renewable portfolio standards (RPS) which are in place in over 20 states, EEPS depart from the prevailing resource procurement and public benefits frameworks that mandate efficiency *spending* levels. The use of quantitative kWh and/or mmbtu targets corresponds to the growing recognition of energy efficiency as a "resource" – on par with supply options – that can lower energy demand and provide economic and environmental benefits. EEPS are being used by a growing number of states to help capture cost-effective energy savings opportunities that, in contrast to many other energy options, are achievable in states throughout the country.

EEPS of various forms are in effect or under development in 10 states, including: California, Colorado, Connecticut, Hawaii, Illinois, Nevada, New Jersey, Pennsylvania, Texas and Vermont. Depending upon the originator, a state legislature, public utility commission, or other regulatory body specifies numerical goals – e.g., a set kWh level of reduction or a % reduction from projected growth or total sales -- that regulated utilities (or in some cases other entities engaged in energy efficiency program delivery[1]) are expected to meet on an annual and/or cumulative basis. These goals are achieved through end-user energy efficiency improvements that are delivered with assistance from utilities or other providers of efficiency. In some cases, distributed generation such as combined heat and power (CHP) systems are included. The savings targets may be tied to a public benefit fund (PBF) or part of a renewable portfolio standard (RPS) or broader energy portfolio standard. They may be implemented in conjunction with policies that reduce utility and/or consumer barriers to investing in cost-effective energy efficiency.

EEPS can be designed to include a market-based credit trading system that offers energy providers flexibility in reaching their energy efficiency targets. Under such a system, a utility that exceeded its targets would be able to sell excess credits to other utilities that found it more expensive or difficult to comply with savings targets in a given year. Alternatively, excess credits could be banked for use in a future year when the utility anticipated more difficulty in reaching savings targets.

[1] For instance, in Vermont, meeting the energy savings target is the responsibility of the third-party administrator of the energy efficiency program.

B. Objectives & Benefits

Studies of energy efficiency programs suggest that wide scale adoption of energy efficiency measures could meet up to 20% of U.S. energy demand, or about half of the expected demand growth.[2] States are taking steps to capture this energy efficiency potential and the range of resulting benefits. Well-designed energy efficiency policies and programs will capture:

- Reduced growth in energy demand, leading to reduced upward pressure on fuel prices. When markets are tight, a small change in demand can mean a much larger change in wholesale and retail prices.
- Peak load reductions which help address concerns about new capacity needs and the resulting investments.
- Reduced costs, increased profitability, and greater availability of capital for other goods and services. Energy efficiency projects typically pay for themselves in energy savings.
- Cost effective reductions of criteria pollutants (where they are not covered under a tight cap and trade system) and greenhouse gases..

States are turning to EEPS to capture the benefits of energy efficiency for a number of reasons. Depending upon the level of kWh savings target adopted, EEPS increase the likelihood that cumulative energy efficiency efforts will be large enough to attain policy goals for energy demand reduction, emissions reduction and economic benefits. States are also finding that EEPS achieve greater certainty around energy savings, harness market forces to lower costs, and increase the simplicity and transparency of administration. Improved administration can in turn help coordinate dispersed efficiency efforts, achieving economies of scale in purchasing equipment, program marketing, and calculating, verifying, and reporting energy savings.

D. Barriers

Barriers to investing in energy efficiency can reduce the effectiveness of an EEPS policy. For example, when utility profits depend on the quantity of energy sold, end-user energy efficiency programs have the potential to adversely affect utilities' bottom line. Under this "cost-plus system," increased efficiency can decrease utility profits, sometimes with a large multiplier effect. This occurs when profits are tied to sales beyond a specific margin related to the costs of generation and transmission. As policymakers confront this reality they are finding that EEPS can be designed in a way that addresses concerns with utility profits and does not place regulated and non-regulated electricity providers on a different competitive footing.

Barriers also exist to greater consumer investment in energy efficiency. One type of barrier – the "split incentives" problem – occurs when one party (often a builder or landlord) pays a premium for more efficient appliances or building products, while another party (typically a tenant or homebuyer) receives most of the payback in the form of reduced operating costs.

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[2] For more information, see "The Technical, Economic, and Achievable Potential for Energy-Efficiency in the U.S." in the Resources section.

Lack of information and marketing also limits the distribution of energy efficient products. This occurs when planners, designers, and other buyers forgo research into the benefits of efficient products and make purchase decisions based on criteria other than energy efficiency.

II. State Programs

A. States with Energy Efficiency Portfolio Standards

Ten states currently have EEPS in one form or another in place or under development. Each state policy specifies a savings target as a set percentage of load growth or base year sales, or as a fixed number of units of energy savings (e.g., kWh). For example, the Texas target is 10% is of load growth, Connecticut set its goal at 1% of total electricity load. Some state targets also cover peak electricity demand (e.g., MW capacity). Please see the table on the following page.

B. Design & Implementation

Many of the key policy design and implementation questions associated with EEPS are common to any efficiency program, including: who should participate; what is the optimal coverage, timing, and duration for the efficiency target; what analyses will be required; what funding sources are available; and how will the program interact with federal and other state policies. These issues are briefly addressed here:

(1) Participants

- State Legislatures. In many states, legislation is required to enable the setting of EEPS targets. Legislatures have either set EEPS targets in legislative language or directed an executive agency to do so. In either case, states have clearly designated an executive agency to work out administration details and implement the policy .
- Public Utility Commissions (PUCs). PUCs in some states have the authority to set EEPS directly. PUCs also are a likely agency to administer EEPSs, given their oversight role of utility markets.
- Utilities. Given the direct impact on the utility sector, legislatures and PUCs have sought input from utilities on potential impacts to profitability and ongoing operations from EEPS design and related ratemaking and other regulatory policies. States may require utilities to implement the ensuing energy efficiency programs directly or may specify administration through energy service companies.
- Customers/General Public. While customers generally are not directly involved with the EEPS, some states have sought to include public opinion through formal comment processes that provide input on various topics, such as potential costs/economic impacts and benefits.
- Public Interest Organizations. States may seek technical expertise as well as public perspectives from groups representing consumers, environmental interests, and other public interests.

Current and Pending State EEPS Policies

State	EEPS Description	Applies to	Savings Target (TL=total load; LG=load growth)	Timeframe
California	Sets specific energy and demand savings goals.	Investor-owned utilities	Annual MWh, MW, and therm savings goals set for each program year from 2004 to 2013. For 2013: • 23,183 GWh, 4,885 MW peak • 444 MMtherms	2004–2013
Colorado	Settlement agreement approved by PUC includes specific targets utility will make "best efforts" to achieve.	Public Service of Colorado (the state's largest utility)	320 MW and 800 GWh (40 MW and 100 GWh each year)	2006-2013
Connecticut (Pending final Department of Public Utility Control decisions)	Includes energy efficiency at commercial and financial facilities as one eligible source under its Distributed Resources Portfolio Standard (also includes combined heat and power and load management programs). Goals are given as a percentage of load.	Investor-owned utilities	Savings goals set for the beginning of each program year:	
			1% (TL)	2007
			2% (TL)	2008
			3% (TL)	2009
			4% (TL)	2010 and thereafter
Hawaii	Allows efficiency to qualify as a resource under RPS requirements.	Investor-owned utilities	up to 20% of kWh sales (TL)* *overall RPS target, EE % not specified	2020
Illinois	Will set goals as percentage of forecast load growth.	Investor-owned utilities	10% (LG)	2006–2008
			15% (LG)	2009–2011
			20% (LG)	2012–2014
			25% (LG)	2015–2017
New Jersey (Program under development)	Two initiatives: 1. Setting energy and demand goals for overall PBF program. 2. Setting goals for savings as a percent of sales.	1. PBF program administrators (which is based on competitive solicitation) 2. Investor-owned utilities	1. 1,814 GWH (four-year total) 2. Conceptual draft calls for 1% per year for a total of 12% in 2016 (TL)	1. 2005–2008 2. 2005–2016 in conceptual draft
Nevada	Redefines portfolio standard to include energy efficiency as well as renewable energy. Targets are given as a percentage of sales.	Investor-owned utilities	Energy efficiency can meet up to 25% of the energy provider's portfolio standard:	
			6% -- EE up to 1.5% (TL)	2005–2006
			9% -- EE up to 2.25% (TL)	2007–2008
			12% -- EE up to 3% (TL)	2009–2010
			15% -- EE up to 3.75% (TL)	2011–2012
			18% -- EE up to 4.5 % (TL)	2013–2014
			20% -- EE up to 5% (TL)	2015 and thereafter
Pennsylvania	Includes energy efficiency as part of a two-tier alternative energy portfolio standard. There is no minimum for the energy efficiency portion of the resource mix. Targets are given as a percentage of sales.	Investor-owned utilities	up to 4.2% (TL)	Years 1–4
			up to 6.2% (TL)	Years 5–9
			up to 8.2% (TL)	Years 10–14
			up to 10.0% (TL)	Years 15 and thereafter
Texas	Sets goals as percentage of forecast load growth.	Investor-owned utilities	10% (LG)	2004 and thereafter
Vermont	Sets energy and demand goals for overall PBF program.	Program administrator	83,766 MWh 119,490 MWh 204,000 MWh	2000-2002 2003-2005 2006-2008

Source: EPA (2006) and Nadel (2006).

(2) Setting Targets

Under an EEPS, a state legislature, utility commission, or other regulatory body specifies numerical energy savings targets that electricity service providers must meet, on an annual and sometimes cumulative basis. EEPSs can be set as a percentage of load growth or base year sales, or as a fixed number of units of energy savings (e.g., kWh), the latter having the advantage of the actual energy savings being known in advance. Targets can also cover peak electricity demand (e.g., MW capacity). The appropriate EEPS target depends upon a number of factors including the economically achievable energy efficiency potential, funding availability, emission reduction goals, and other issues, including how to treat any existing energy efficiency requirements (e.g., if a PBF program or utility program is in place). Key issues to consider include determining how and what analysis to conduct, establishing coverage, deciding on the timing and duration of the targets, and addressing funding and related cost-recovery issues.

(3) Efficiency Potential and Benefits

A first step in setting a target is conducting or reviewing existing analysis and program experience within the state or in states believed to be comparable. This typically includes an analysis of energy efficiency potential (i.e., technically, economically, and practically achievable energy efficiency), combined with a review of past experience running energy efficiency programs. For example, California set its target by considering both per capita energy reduction goals and cost-effectiveness at various reduction levels. California's combined efficiency initiatives are designed to capture 70% of the economic potential for electric energy savings over a 10-year period and approximately 40% of the maximum achievable potential for natural gas.

In addition to estimating efficiency resource potential, states have conducted analysis of benefits such as expected emission reductions, reduced energy prices, and total energy costs. They have also used power-sector and economic modeling tools to look at net economic benefits such as impacts on gross state product, wages, and the number of jobs. Energy savings related to an EEPS may also help states avoid the need to build additional infrastructure like power plants and transmission and delivery systems.

(4) Coverage

The coverage of an EEPS depends on the entities under the state's jurisdiction. In the majority of states, utility commissions typically do not have authority to set requirements for municipal, federally owned, or rural cooperative utilities (although many states do have authority). For this reason, EEPS requirements tend to be assigned to investor-owned utilities. Most EEPSs cover only electric utilities, although some states have set savings goals for both electric and gas utilities.

At the customer level, states typically include provisions to ensure that the energy efficiency measures (and hence energy bill savings) are distributed broadly among customer classes (e.g., residential, industrial, commercial) and income levels. In addition to the energy savings that accrue directly to program participants, indirect systemwide benefits may also accrue to non-participants. These include air quality improvements, greenhouse gas emissions reductions, and potentially reduced total costs for energy-dependent goods and services.

(5) Timing

Determining the timing and duration of an EEPS includes considering the time it can take to achieve energy savings. Generally, only a portion of the total energy savings potential can be realized in a given year because of the length of market cycles, limits on funding, and other real-world considerations. Reviewing regulatory compliance deadlines and the achievable efficiency potentials for specific years can help inform these considerations. See the table of EEPS Policies on Page 4 for an indication of timeframes in state EEPS.

(6) Funding

Establishing funding sources and regulatory incentives for utility or public programs to achieve efficiency resource goals is another key issue for states. Different approaches have included one or more of the following: utilizing resources under a state PBF, allowing for cost recovery as part of utility rates, providing for direct resource acquisition, and establishing regulatory provisions that decouple utility profits from sales volumes.

States are taking a range of approaches to defining how funds will be raised, spent, and accounted for in meeting EEPS goals. In California, for example, the PUC requires utilities to invest in cost-effective energy efficiency as a procurement resource using funds that would otherwise go to purchase power; the utilities also use PBFs and efficiency resource acquisition funds to meet the overall goals. In New Jersey's program, energy efficiency will be used to meet overall energy and demand savings goals within the limits of funds available from the state's PBF. For more information on funding mechanisms that states have employed, see the EPA Clean Energy-Environment Guide to Action, Section 4.2 Public Benefit Funds for Energy Efficiency, and Section 6.2, Utility Incentives for Demand-Side Resources.

(7) Program Administration

The administration of EEPS occurs primarily through designated utilities and other third-party energy service providers. However, continued state involvement is important in overseeing the development of implementation rules and ensuring that funding is available. In Texas, for example, where the electric distribution utilities must meet the EEPS goals, the utility commission is actively involved in determining how resources can be acquired, including defining the means by which covered entities are allowed to comply with goals; defining and implementing reporting requirements; and defining measurement, verification, and other evaluation methods by which compliance will be determined.

(8) Measurement & Verification

Measurement and verification (M&V) is a key aspect of a well-functioning EEPS. In cases where EEPS are tied to tradable energy efficiency credits, robust M&V is critical to maintaining a credible and viable marketplace. However, it is also important that M&V requirements are clearly defined and present a reasonable burden so that the benefits of cost-effective energy efficiency projects outweigh time and expense of M&V. For more information on the M&V tools that states have employed, see the EPA Clean Energy-Environment Guide to Action, Appendix B.

(9) Credit Trading

Some states have specified that tradable energy efficiency credits may be used to meet EEPS requirements. Modeled off the successful federal Acid Rain Trading Program for SO2, these systems offer an opportunity for utilities to meet savings goals in a cost-effective manner while offering financial inducements for broad private sector participation and high levels of market investment. Credit trading systems are typically developed and overseen by the efficiency program administrator. Examples of states incorporating this feature include:

- Nevada -- allows utilities to purchase credits from third party energy efficiency resources;
- New Jersey -- proposes energy suppliers achieve the required savings through energy efficiency programs, buying Energy Efficiency Certificates, or making Energy Efficiency Alternative Compliance payments to the BPU; and,
- Pennsylvania -- has a credit-based compliance system for alternative energy resources.

(10) Oversight

States are finding that instituting a mechanism to provide for oversight and review of EEPS can enhance long-term effectiveness. Some states have established official oversight or advisory bodies, typically composed of stakeholders who periodically review the EEPS program to determine whether goals are being met, whether goals should be renewed or adjusted, and whether other aspects of implementation need modification.

(11) Interaction with Federal Programs

A variety of federal partnerships, technical assistance, and other programs, are available to help states achieve their EEPS savings goals. The ENERGY STAR program, for example, offers technical specifications, certification processes, and market development assistance to states and other partners for a range of products and whole-building solutions.[3]

To the extent that EEPS produce verifiable capacity savings, they can have favorable reliability and resource adequacy implications reflected in wholesale markets overseen by Federal Energy Regulatory Commission (FERC), North American Electric Reliability Council (NERC) and the regional reliability organizations, regional transmission organizations (RTOs), and transmission owning companies.

(12) Interaction with State Policies

EEPSs can complement other energy efficiency policies and serve as a framework for a suite of policies and programs. For example, EEPSs can be goals for PBF-supported programs or can be additional resource goals beyond savings realized through PBF programs. EEPS can also leverage state rate-making procedures and decoupling policies. States such as California and Hawaii have allowed utilities to recover costs through ratemaking procedures. Other states

[3] See the EPA Clean Energy-Environment Guide to Action: Section 4.2, Public Benefits Funds for Energy Efficiency, for a broader discussion of ENERGY STAR-related opportunities.

have pursued decoupling policies to address adverse revenue and profit impacts on investor-owned utilities from EEPS implementation.[4] Experience to-date suggests that policy interactions often depend on the structure of the underlying utility regulatory context, (e.g., whether there is a vertically integrated structure or not).

C. State Examples

(1) California

California is an example of a state with a regulated utility sector that has an EEPS. The EEPS goals call for a ten year period of increasing annual reductions, reaching 30,000 million kWh overall and about 7,760 MW of peak power by 2013. The goals represent about 10% of predicted overall demand and 12% of peak demand using CEC forecasts The goals specify added efficiency resource procurement on top of existing public benefits program elements. For natural gas, a 116% increase in savings relative to the status quo is expected over the next decade.

The California EEPS is part of the state's Energy Action Plan (EAP), which is designed to decrease per capita energy use and reduce toxic emissions and greenhouse gases through increased conservation and efficiency. In developing the EAP, the California Energy Commission (CEC) prepared statewide energy savings goals based on input from key stakeholders, including utilities, environmental groups, and businesses. Statewide studies of electric energy and natural gas efficiency potential supported the goals through analyses of the cost effectiveness of opportunities to save energy in every sector of the economy. To address the goals, the California Public Utilities Commission (CPUC) adopted annual energy savings targets for the state's four largest investor-owned utilities (IOUs). These targets were adopted through a rulemaking process and are embedded in the EAP. The targets are projected to meet more than half of the IOUs' load growth in electric energy demand between 2004 and 2013. The IOUs, with input from stakeholder advisory groups, prepared plans detailing programs they would use to meet their targets.

The CPUC established a 3 year planning cycle with coordinated EE savings & IOU procurement planning and set cumulative EE savings goals for 2004-2013:

- 26,508 GWh;
- 6,892 MW;
- 290 million therms; and
- Incremental increases in demand met first through EE.[5]

Program administrators within each IOU are required to submit energy efficiency program planning and funding levels to the PUC. Goals will be updated every three years as part of the regular state program planning and funding cycle. Achieving the savings targets will involve actions such as energy efficiency standards for new and remodeled building construction, improved air conditioner efficiency, and utility and customer incentives for demand

[4] See the EPA Clean Energy-Environment Guide to Action: Section 6.2, Utility Incentives for Demand-Side Resources.
[5] See www.cpuc.ca.gov/PUBLISHED/FINAL_DECISION/40212.htm

reduction, as well as many others. A key element in the California approach is a "loading order" which requires utilities to pursue energy efficiency, renewable energy, and clean distributed generation before fossil fuel-fired generation.

As part of their effort to craft a program that is acceptable to utilities as well as energy consumers, California annually adjusts electric rates for differences between forecast and actual sales (decoupling). Thus, if energy efficiency programs reduce sales below forecast amounts, rates are increased to allow utilities to recover fixed costs; on the other hand, if sales are higher than forecast, rates are reduced to reimburse customers for excess charges. In addition, the CPUC is establishing penalties and incentives for utility performance aimed at attaining energy savings targets.

(2) Colorado

As part of a settlement with the Colorado Public Services Commission (PSC) allowing a new 750 MW power plant, Xcel Energy, the state's largest utility, agreed to use cost-effective demand side management (DSM) programs to reduce demand by 40 MW and save 100 GWh of energy annually from 2006 through 2013. The company agreed to spend $196 million on the commitment, include all classes of customers, and conduct “appropriate evaluations” of efficiency programs. Xcel will study energy efficiency opportunities in their service area for a possible expansion of DSM programs beyond those required in the settlement. The PSC will consider incentives for Xcel.

(3) Connecticut

In 2005, Connecticut expanded its renewable portfolio standard (RPS) to encompass energy efficiency, including combined heat and power (CHP). However, there are separate goals for these new “Class III” requirements that include commercial and industrial energy efficiency and CHP plants. Expanding the program to incorporate savings from the residential sector is being considered. Under Public Act 05-1, the Energy Independence Act, IOUs must procure 1% of their supply from efficiency by January 1, 2007, increasing 1% annually to 4% by January 1, 2010. Since 2000, Connecticut's public benefit fund (PBF) has offered utilities pretax performance incentives of up to 5% of energy efficiency program budgets for meeting specific milestones. The 2005 Act establishes savings targets that will include savings generated under programs covered by the performance incentives, but will also require further efforts, including purchasing certificates from the state or third parties such as energy service companies. Gas utilities must also submit annual conservation plans for Public Utility Commission (PUC) review, and operate conservation programs. A fund was established under the 2005 Act for use by municipal utility conservation and load management programs. The fund will require utilities to contribute a minimum of 1.0 mill/kWh in 2006 (1 mill=1/10 of 1 cent), increasing to 2.5 mills in 2011. The Energy Conservation Management Board (ECMB) provides input and reviews program plans and estimated energy savings that the utilities submit to the PUC for approval.

(4) Hawaii

In 2004, under Act 95, Hawaii expanded its existing RPS to encompass energy efficiency, including CHP electricity and heat. The RPS requirement increases from 8% of kWh

sales in 2005 to 20% by 2020. Hawaii's program counts efficiency and renewable energy programs that existed before the RPS towards utility targets. Hawaiian utilities' support for the program is augmented by utility commission regulations that provide for lost revenue recovery.

(5) Illinois

In 2005, the Illinois Commerce Commission (ICC) (equivalent to a state PUC) adopted a state Sustainable Energy Plan. The plan calls for both a Renewable Energy Portfolio Standard and an Energy Efficiency Portfolio Standard. Under the Energy Efficiency Portfolio Standard, utilities will create programs to reduce 10 percent of electricity demand growth by 2007 by helping customers purchase energy saving equipment and technology. By 2015, these energy efficiency programs will reduce 25 percent of Illinois' growth in energy demand. The ICC backed the proposed plan with some modifications, including limits to rate increases, voluntary implementation, and moving the start date from 2006 to 2007. The Sustainable Energy Plan is expected to save more than 5,600 GWh, generate more than $2 billion in investments in Illinois, and create about 2,000 construction jobs and hundreds of permanent jobs. The Illinois EEPS is part of a broader effort that includes an RPS requirement and is intended to gain the combined benefits of reduced demand growth and increased clean generation. This twin approach has broad support from utilities, environmental and consumer groups, and other stakeholders.

(6) Nevada

The Nevada RPS was established as part of the state's 1997 restructuring legislation. In an effort to provide greater flexibility under the RPS, the Nevada legislature adopted Assembly Bill 3 (AB3) during a special session in June of 2005 to allow electricity providers to meet a portion of their RPS requirements through energy efficiency measures and renewable resources. AB3 gradually increases the EE/RE portion of total electricity sales from the 5% that was specified under the original RPS to 20% from 2015 on, and allows use of eligible energy efficiency measures to meet up to 25% of the requirement. Eligible measures include those that are installed on or after January 1, 2005; located at a retail customer's location; reduce the consumption of energy by the retail customer; and are directly subsidized, in whole or in part, by the electric utility.

In response to this adjustment, two utilities, Nevada Power Company and Sierra Pacific Power Company, have requested approval from the Nevada PUC for additional funding -- through electricity rates -- for their 2005 and 2006 demand side management (DSM) programs. This is the second increase proposed by the utilities since passage of AB3. The utilities have indicated that they want to maximize the energy efficiency component of the RPS, and now plan to spend $16.2 million on DSM programs in 2005 and $30.5 million in 2006. The 2006 budget will include more than $2 million for ENERGY STAR appliances and lighting rebates; $1.9 million for recycling of old, inefficient refrigerators; and $185,000 for ENERGY STAR New Construction programs.

Regulations allow utilities the option to operate energy efficiency programs and/or to purchase credits to meet EE/RE portfolio requirements. Utilities may propose M&V procedures for energy savings that are then subject to PUC review and approval. The PUC also receives quarterly and annual reports on utility portfolio goals and credits earned, and uses the annual

reports to determine compliance with the RPS. Utilities that earn extra credits can use them in future years, while utilities that fail to meet their goals may be subject to fines and administrative sanctions (although these can be waived if the PUC determines that not enough EE/RE resources were available for purchase).

(7) New Jersey

In 1999, New Jersey established a Public Benefit Fund (PBF) to pay for energy efficiency and renewable energy programs. Electric and natural gas utilities administered the programs and established goals for equipment installed and market share. Overall energy savings goals were specified by the Board of Public Utilities (BPU) in 2003, when the BPU established specific electric and natural gas savings goals and took responsibility for program administration. New Jersey's new administrative model for energy efficiency is similar to Vermont's EEPS. Program administration will be managed by a contractor who will agree to the energy savings targets and specific performance goals. New Jersey's program adds an EEPS component (i.e., the energy savings goals) to a PBF program. However, the EEPS requirement is not imposed directly on utilities, but on whatever entity wins the bid to administer PBF funds.

In addition, New Jersey is developing a more formal EEPS with energy efficiency goals for electricity retailers. The goals are being developed as part of a state energy master plan and are the focus of an electricity distribution portfolio management workgroup. A straw proposal, currently undergoing stakeholder review, calls for energy efficiency savings starting at 1% per year and increasing an additional 1% each subsequent year. The proposal specifies minimum savings from different classes of energy efficiency resources, such as residential, commercial, and industrial. Energy suppliers would achieve the required savings through energy efficiency programs, buying Energy Efficiency Certificates, or making Energy Efficiency Alternative Compliance payments to the BPU. (Nadel, 2006)

(8) Pennsylvania

Pennsylvania's 2004 Alternative Energy Portfolio Standard Act (AEPS) (Act 213) requires all load-serving energy companies in Pennsylvania to provide 18% of their electricity using alternative sources by the year 2020. The AEPS is essentially a renewable portfolio standard (RPS) that includes energy efficiency as an eligible compliance option. The Pennsylvania PUC is charged with implementing and enforcing Act 213.

The law established two categories of alternative energy sources responsible for a gradually increasing percentage of electricity generation. By the year 2020, Tier I will be responsible for 8% of electricity generation, and Tier II will be responsible for 10% of energy generation. Energy efficiency is included among the Tier II energy sources and will compete with other eligible resources, including waste coal. The decision to include demand-side management in the AEPS was supported by a third party analysis that modeled implementation costs and economic impacts.

Tier I:	Tier II:
Solar photovoltaic energy	Waste coal
Wind power	Distributed generation systems
Low-impact hydropower	Demand-side management
Geothermal energy	Coal mine methane
Biologically derived methane gas	Large-scale hydropower
Fuel cells	Municipal solid waste
Biomass energy	Large-scale hydropower
Coal mine methane	Municipal solid waste
	By products or wood pulping and manufacturing processes
	Integrated combined coal gasification technology

A credit-based compliance system will be established and banking of credits will be allowed for up to two years. Alternative energy systems must include a qualifying meter to record the cumulative electric production to verify the advanced energy credit value. To prevent double counting, the electric distribution supplier or electric generation company will not be allowed to satisfy Pennsylvania's AEPS requirements using alternative energy generation projects that are used to meet portfolio requirements in other states.

Where appropriate, the PUC will use two means to establish qualifications for Alternative Energy Credits, a catalog approach for standard energy savings measures and general guidelines for metered and custom energy savings measures. The catalog approach is intended for standard energy savings measures, such as energy efficient appliances, light bulbs, and HVAC equipment, that are available to retail customers but whose effects cannot be directly metered. Energy savings from standard measures are considered "deemed savings." These savings are detailed in the Technical Reference Manual ("TRM"), which provides a framework for calculating deemed savings for a menu of energy efficiency measures. The manual builds on comparable protocols in other states, including Vermont and New Jersey.

(9) Texas

The Public Utility Commission of Texas (PUC) adopted energy efficiency goals for utilities as a part of the implementation process for the state's 1999 restructuring law (SB 7). Electric distribution utilities were required to offset 10% of forecast load growth through energy efficiency. To achieve this goal, the utilities were required to provide incentives through standard offer programs or targeted market transformation programs funded through transmission and distribution rates. In the standard offer programs, offered by private energy service providers, utilities pay a specified amount per unit of energy saved. PUC approved market transformation programs are designed to overcome barriers and improve long-term market conditions for energy efficiency and are created in a collaborative process involving utilities and other stakeholders.

Energy and demand savings are measured in accordance with the International Performance Measurement and Verification Protocol (IPMVP)[6] and/or estimated using PUC approved deemed savings estimates.

The Texas PUC worked with IOUs and other interested parties to develop energy efficiency program "templates" that are now being adopted, including:

- Commercial and Industrial Standard Offer;
- Residential and Small Commercial Standard Offer;
- ENERGY STAR® Homes Market Transformation;
- Residential ENERGY STAR® Windows Market Transformation;
- Load Management Standard Offer;
- Hard-to-Reach Customer Standard Offer;
- Air-Conditioner Distributor Market Transformation; and
- Air-Conditioner Installation Information and Training Market Transformation.

In 2001, the Texas legislature adopted energy savings goals for local governments under Senate Bill 5, known as the "Texas Emissions Reduction Plan." SB5 requires 38 local governments to reduce electricity consumption by 5 percent a year for 5 years, and report annually to the State Energy Conservation Office (SECO). The PUC and SECO are working with utilities and local governments to implement efficiency improvement programs and projects, measure and verify energy savings, and incorporate emission reductions into local air quality plans. Dallas-Fort Worth is including efforts under SB5 in its State Implementation Plan (SIP) for attainment of the national air quality standard for ozone.

Evaluations indicate that the offset to forecast load growth has exceeded 10%. Load growth has averaged about 2% annually, and 10% of this growth amounts to about 0.2% of total annual electricity sales. Leading state efficiency programs are showing impacts as high as 1% of total annual sales.

(10) Vermont

In 1990, the Vermont Public Service Board (PSB) instituted utility-managed energy efficiency programs as a least-cost planning element. In 1999, management for programs throughout the state shifted to a PBF funded "energy efficiency utility," Efficiency Vermont, which is run by a competitively selected contractor through a performance–based contract with the PSB. The PSB designed the program to balance multiple goals like short and long-term savings, broad participation, and equity.[7] The contract specifies energy and demand savings targets along with techniques for measuring savings. The PSB reviews and adjusts savings claims submitted by the contractor in an annual report that details the efficiency measures that have been tracked and documented in a data tracking system. The 2006-2008 contract has an

[6] Http://www.ipmvp.org

[7] For more information, see: The Technical, Economic, and Achievable Potential for Energy-Efficiency in the U.S. http://www.aceee.org/conf/04ss/rnemeta.pdf

annual savings goal of 1% of electricity sales. Note that PBF funds don't become "funds of the state" and are thus less subject to raiding than similar funds in other states.

Under a separate provision (Section 8004 of Chapter 89 in Title 30 of the Vermont Statutes), the state requires retail electricity providers to supply an amount of energy equal to total incremental energy growth or 10% of retail electric sales between January 1, 2005 and January 1, 2012 using electricity generated by new renewable resources. While no efficiency provision is explicity included, this rule provides an indirect incentive to reduce load. In fact, from 2000 to 2003, Vermont's program halved electricity load growth.

III. Questions for Discussion

1. What are the primary policy drivers for implementing EEPS in your state?
2. What are the pros and cons of including EE as part of a larger clean energy portfolio standard?
3. For those with EEPS, how was the efficiency target determined? Does your state measure the target in terms of kWh, kW or percent of demand growth or sales? Are there other considerations beyond the target (i.e. the type of efficiency measures or equity in implementation)? Is there a built-in mechanism for reevaluating the standard over time?
4. For those with EEPS, how are the EE measures identified, delivered, and verified? What are the greatest challenges in implementing and enforcing the EEPS?
5. If your state allows trading of EE credits, how has that affected the overall effectiveness of the program? What additional program design factors do states need to consider if they plan to implement trading?
6. Has your state attempted to quantify the actual or potential environmental benefits the EEPS?

IV. Resources

A. State Resources

(1) California

California 2005 Energy Action Plan

http://www.energy.ca.gov/energy_action_plan

California Integrated Energy Policy Report

California Energy Commission, 2005 policy recommendations for electricity, natural gas, transportation, and the environment
http://www.energy.ca.gov/2005_energypolicy/index.html

California Interim Opinion: Administrative Structure for Energy Efficiency (Decision 05-01-055).

This CPUC rule sets the administrative structure and process for energy efficiency programs

http://www.cpuc.ca.gov/PUBLISHED/FINAL_DECISION/43628.htm

http://www.cpuc.ca.gov/PUBLISHED/REPORT/28715.htm

California Interim Opinion: Energy Savings Goals for Program Year 2006 and Beyond Decision 04-09-060, Rulemaking 01-08-028

Order instituting rulemaking to examine the Commission's future energy efficiency projects, administration, and programs
http://www.cpuc.ca.gov/PUBLISHED/FINAL_DECISION/40212.htm

California Public Utilities Commission Evaluation, Measurement and Verification Workshops

http://www.fypower.org/feature/workshops/workshop_5.html

Instructions for Filing Proposals on Energy Efficiency Administrative Structure

This CPUC ruling sets the requirements and process for proposals recommending an energy efficiency administration structure
http://www.cpuc.ca.gov/PUBLISHED/RULINGS/35120.htm

Southern California Edison 2004 Program Summary Reports

http://www.sce.com/AboutSCE/Regulatory/eefilings/MonthlyReports.htm

(2) Colorado

Xcel Colorado Least Cost Plan

Includes settlement agreement
http://www.dora.state.co.us/puc/docket_activity/HighprofileDockets/04A-214E_-215E_-216E.htm

(3) Connecticut

Connecticut Energy Independence Act

This act establishes a distributed RPS that includes energy efficiency from commercial and industrial facilities, combined heat and power, and commercial and industrial load management programs
http://www.cga.ct.gov/2005/TOB/h/pdf/2005HB-07501-R00-HB.pdf

Interim DPUC Decision on Developing a New Distributed Resources Portfolio Standard

http://www.dpuc.state.ct.us/DOCKCURR.NSF/f068a53a31082a558525664e00498f40/256da2d18a94766d85257117006ce3a2/$FILE/050719-021606.doc

(4) Hawaii

Hawaii's Renewable Portfolio Standard Act

This act requires electric utilities to meet an RPS of 15% in 2015 and 20% in 2020
http://www.hawaii.gov/dbedt/info/energy/

(5) Illinois

ICC Adopts Governor's Sustainable Energy Plan

Illinois Commerce Commission press release, July 19, 2005
http://www.icc.illinois.gov/docs/en/050720ecEnergyPR.pdf

Illinois Sustainable Energy Initiative ICC Staff Report, July 7, 2005

http://www.icc.illinois.gov/docs/en/050713ecEnergyRpt.pdf

Illinois Sustainable Energy Plan

http://www.renewableenergyaccess.com/assets/download/IllinoisGov_RPS.pdf

Renewable Portfolio Standard Fact Sheet

Illinois Commerce Commission press release, July 19, 2005
http://www.icc.illinois.gov/docs/en/050719ecEnergyPR2.pdf

(6) Nevada

Nevada AB 3

This bill redefines the portfolio standard in Nevada to include EE/RE
http://www.leg.state.nv.us/22ndSpecial/Reports/history.cfm?ID=2546

http://leg.state.nv.us/22ndSpecial/bills/AB/AB3_EN.pdf

http://www.newrules.org/electricity/rpsnv.html

(7) New Jersey

Clean Energy Board Order - New Jersey Clean Energy Program Policies and Procedures

http://www.bpu.state.nj.us/wwwroot/cleanEnergy/EO02120955_20041209.pdf

http://www.bpu.state.nj.us/home/home.shtml

Comprehensive Energy Efficiency and Renewable Energy Resources Analysis

This 2004 NJ PBU rule establishes PBF goals
http://www.bpu.state.nj.us/home/BOCleanEn.shtml (Click on BPU order EX04040276)

New Jersey Clean Energy Board - Clean Energy Program Policies and Procedures

http://www.bpu.state.nj.us/wwwroot/cleanEnergy/EO02120955_20041209.pdf

(8) New York

NYSERDA Standard Performance Contracting Program Measurement and Verification Guideline

http://www.nyserda.org/

(9) Pennsylvania

Economic Impact of Renewable Energy in Pennsylvania

http://www.bv.com/energy/eec/studies/PA_RPS_Final_Report.pdf

Pennsylvania Alternative Energy Portfolio Standards Act of 2004 (Senate Bill 1030)

http://www.legis.state.pa.us/WU01/LI/BI/BT/2003/0/SB1030P1973.HTM

Pennsylvania Public Utility Commission, Alternative Energy Portfolio Standards Website

This website contains information on legislation, technical conferences, work groups, and general information about alternative energy sources.
http://www.puc.state.pa.us/electric/electric_alt_energy_port_stnds.aspx

Potential Impacts of an Advanced Energy Portfolio Standard in Pennsylvania

Presentation for the National Renewable Energy Laboratory (NREL) Energy Analysis Forum
http://205.168.79.26/analysis/forum/presentations_04.html

Standardized Methods for Free-Ridership and Spillover Evaluation-Task 5 Final Report

This 2003 report is used by Massachusetts utilities to estimate free ridership and spillover effects
http:///www.paconsulting.com

(10) Texas

Emission Reduction Incentive Grants Reports

In this report, the Texas PUC has quantified the results of legislated energy efficiency programs designed to reduce electric power production and air emissions
http://www.tnrcc.state.tx.us/oprd/sips/PUC_report.pdf

PUCOT Rules for Texas Electric Restructuring Act § 25.181

The Texas PUC rules set out implementation strategies for utility and local government energy efficiency programs
http://www.puc.state.tx.us/rules/subrules/electric/25.181/25.181.doc

§25.181. Energy Efficiency Goal

http://www.puc.state.tx.us/rules/subrules/electric/25.181/25.181ei.cfm, and
http://www.puc.state.tx.us/electric/projects/22241/032700ar.pdf

S.B.5

http://www.seco.cpa.state.tx.us/zzz_sb5-tep/sb5draftres2.pdfhttp://www.seco.cpa.state.tx.us/zzz_sb5-tep/sb5factsheet.pdf

S.B.7

http://www.capitol.state.tx.us/cgi-bin/tlo/viewtext.cmd?LEG=76&SESS=R&CHAMBER=S&BILLTYPE=B&BILLSUFFIX=00007&VERSION=5&TYPE=B,

State Clean Energy Policies Matrix

Presentation to EPA Technical Forum, Texas PUC
http://www.epa.gov/cleanenergy/pdf/keystone/TX_legislative_authority.pdf

TXU Electric Delivery, Commercial & Industrial Standard Offer Program
Includes a link to IPMVP standards for Measurement and Verification
http://www.oncorgroup.com/electricity/teem/candi/default.asp

Texas Cleans Up Its Act

This (Texas) Center for Energy Efficiency and Renewable Technologies article details the passage and key provisions of Texas S.B.7
http://www.ceert.org/pubs/cpjournal/99/summer/texas.html

(11) Vermont

Efficiency Vermont website

http://www.efficiencyvermont.org/

Renewable Energy, Efficiency, Transmission, and Vermont's Energy Future

http://www.leg.state.vt.us/docs/legdoc.cfm?URL=/docs/2006/bills/intro/S-052.HTM

Vermont Public Services Board website

http://www.state.vt.us/psb

Vermont Statutes, Title 30, Chapter 89: Renewable Energy Programs

Includes renewable energy goals, portfolio standards, the Sustainably Priced Energy Enterprise Development (SPEED) program, and provisions for tradeable credits
http://www.leg.state.vt.us/statutes/sections.cfm?Title=30&Chapter=089

B. Other Resources

Building Cost and Performance Metrics: Data Collection Protocol

This building cost and performance measurement protocol has been developed for the Federal Energy Management Program to provide a tool for high-level comparative measurements of sustainably designed buildings
http://www.eere.energy.gov/femp/pdfs/pnnl15217.pdf

Clean Energy-Environment Guide to Action

The Guide identifies and describes 16 clean energy policies and strategies that states have used to meet their clean energy objectives, including EEPSs
http://www.epa.gov/cleanenergy/stateandlocal/guidetoaction.htm

EPA report: Creating an Energy Efficiency and Renewable Energy Set-Aside in the NO_x Budget Trading Program: Measuring and Verifying Electricity Savings

This forthcoming EPA report describes key M&V resources
http://www.epa.gov

Energy Efficiency Resource Standards: Experience and Recommendations

An up-to-date (March 2006) review of state Energy Efficiency Resource Standards and similar programs from the American Council for an Energy Efficient Economy
http://www.aceee.org/pubs/e032full.pdf

Energy Efficiency Resource Standards

State EE/RE Technical Forum Call #7, April 14, 2005
http://www.keystone.org/spp/documents/Background_EERS%204-14-05_Final.doc

5th Power Plan. 2005-2009 Targeted Conservation Measures and Economics

Northwest Power Planning Council
http://www.nwppc.org/energy/powerplan/draftplan/Default.htm

International Performance Measurement and Verification Protocol (IPMVP)

Documents for M&V of energy and water savings resulting from energy/water efficiency projects; also contains information for developing an M&V strategy, monitoring indoor environmental quality, and quantifying emission reductions
http://www.ipmvp.org

Measurement and Verification (M&V) Guideline for Federal Energy Projects; Version 2.2

Federal Energy Management Program (FEMP)
http://www.eere.energy.gov/femp/pdfs/26265_seci.pdf

Measurement and Verification Guidelines for Energy Savings Performance Contracting

Energy Savings Performance Contracting (ESPC) - saving measurable quantities of energy
http://www.eere.energy.gov/femp/pdfs/028758m_fs_mv_guidelines.pdf

Natural Gas Price Effects of Energy Efficiency and Renewable Energy Practices and Policies

Council for an Energy-Efficient Economy (ACEEE), Washington, D.C., 2003
http://www.aceee.org/pubs/e032full.pdf

Scenarios for a Clean Energy Future

This report describes the DOE Interlaboratory Working Group on Energy-Efficient and Clean-Energy Technologies use of scenarios to estimate the costs and benefits of clean energy resources including energy efficiency
http://www.ornl.gov/sci/eere/cef/

State Energy Efficiency Policy Bulletin

Alliance to Save Energy (ASE) online newsletter
http://www.ase.org/content/article/detail/2075.

The Technical, Economic, and Achievable Potential for Energy-Efficiency in the U.S.

From the 2004 ACEEE Summer Study on Energy Efficiency in Buildings
http://www.aceee.org/conf/04ss/rnemeta.pdf