

EPA State Clean Energy-Environment Technical Forum
Call #10: State and Regional Clean Energy Planning
November 10, 2005, 2:00 – 3:30 PM EDT

This background piece is based in part on the forthcoming “EPA Clean Energy-Environment Guide to Action,” Chapter 3.1, State and Regional Energy Planning, which will be available at: <http://www.epa.gov/cleanenergy/stateandlocal/index.htm>.

I. Background

Energy planning at the state or regional level can be an effective means for ensuring that clean energy¹ is considered and used as an energy resource and for helping states address multiple energy and non-energy challenges.

Historically, many states have undertaken energy planning to one degree or another; however a smaller number of states have undertaken an effort that either specifically focuses on the development of clean energy or incorporates clean energy as a significant element in a broader, more comprehensive planning effort. However, in the past few years, as energy concerns have grown (including concerns with rising costs, availability and reliability), alongside environmental and economic concerns, more and more states and regions have either expanded their existing energy planning efforts or created new efforts that attempt to capture the multiple benefits associated with increased clean energy.

Energy plans are usually developed by one or more state agencies, typically led by the state energy office. These efforts may be at the behest of the governor or other top official or the State legislature. Frequently, public and private sector stakeholders provide input into the plan. In addition, under the State Energy Program (SEP) directed by the US Department of Energy (DOE), state energy offices develop plans for how to invest support received through an annual funding appropriate to help promote energy efficiency and renewable energy.

Energy planning can serve as a platform to promote or adopt significant policy initiatives that can help advance multiple policy concerns with respect to energy, the environment and the economy. Implementation may call for specific legislative and/or executive level action. The 2002 New York State Energy Plan, for instance, included a renewable energy goal that helped spur the development of New York’s renewable portfolio standard and a greenhouse gas emissions reductions goal that set the stage for the governor to solicit support for a regional greenhouse gas initiative

II. Benefits

States have identified a number of broad benefits associated with integrating environmental and economic concerns into their energy planning which drives increased utilization of clean energy:

¹ Clean energy typically includes: energy efficiency, renewable energy and combined heat and power. States may define this more broadly or more narrowly, depending upon their particular energy context.

- Providing a cost-effective response to projected load growth, possibly avoiding the need for new power plants and infrastructure;
- Helping meet challenges that load growth places on an aging systems, and/or alleviating congestion and related concerns with system stability and reliability;
- Increasing energy supply diversity and security with greater reliance on domestic, regional, or in-state resources;
- Reducing energy prices and price volatility;
- Reducing emissions associated with energy use.

In addition, integrated energy planning efforts have yielded many policy-making benefits, including:

- Providing a framework to coordinate energy efficiency and renewable energy initiatives among state agencies/states within a region;
- Reducing the time and costs associated with meeting existing and future environmental requirements through more efficient deployment of agency resources and efforts and adoption of least-cost and least time-intensive measures;
- Developing a climate in the state favorable to investment, innovation, and economic development of energy efficiency and renewables;
- Providing technical insights and organizational relationships that are valuable in a crisis or unexpected situation where quick decision-making is required; and,
- Conveying a sense of coherence and joint purpose to the public and other stakeholders.

Examples of specific benefits are noted in the summary of state experiences below.

III. Key Considerations

Below is a list of key considerations to help states develop an energy plan that incorporates clean energy. The list is based on the experiences of states across the country.

Step One: Development and Adoption

- Create a collaborative. Create an advisory board to identify and assess resources and tools developed by other organizations, including state agencies, legislatures, universities, and the private sector.
- Establish quantitative and other goals. Identify policy objectives and specific goals, including areas for agency coordination as well as specific, quantitative clean energy goals, to help guide the work of the planning agency and provide the public and other stakeholders with expectations for the outcomes.
- Forecast energy demand. Develop forecasts of energy demand that are based on end uses rather than economic drivers.
- Assess clean energy potential. Assess the technical, economic and achievable potential for clean energy resources to help meet forecasted demand and integrate clean energy resources fully into the analysis.

- Examine policy options. Consider how new and existing policies and programs can help expand the use of cost-effective clean energy.
- Evaluate impacts of policy scenarios. Develop forecasts of energy use that include a full range of impacts for each scenario (e.g., environmental, economic, system reliability, and price).
- Link plan to action. Develop steps for plan adoption and implementation and make action items enforceable where appropriate.

Step Two: Implementation

- Designate specific implementation tasks to specific agencies and staff.
- Create an entity or working group to monitor plan implementation
- Link implementation to other policies so that state activities overall are compatible with the energy plan.
- Include provisions that bind agencies to conduct certain activities, such as procuring certain resources or conducting key studies.

Step Three: Evaluation

- Identify a specific schedule and steps for plan evaluation.
- Select appropriate measures to determine the success of programs (e.g., metrics can include kilowatt-hours saved, appliances sold, dollars spent, and new renewables installed).
- Prepare a comprehensive report that examines all aspects of the energy plan as a whole.
- Recommend adjustments to respond to new opportunities or barriers identified in the evaluation process.

IV. Representative State Experiences²

This section presents a number of leading state and regional clean energy planning efforts that include broad, comprehensive approaches as well as initiatives targeted specifically at clean energy.

A. California

Additional detail on the California Integrated Energy Policy report will be provided on the call.

California Energy Commission (CEC) annual Integrated Energy Policy Report (IEPR) focuses on the California economy's requirements for reliable, affordable supplies of electricity, natural gas, and transportation fuels. The draft 2005 IEPR³ contains recommendations based on the goals of the 2003 Energy Action Plan (EAP) and the 2003

² Links to reference documents used to prepare state experience summaries are listed by state in the references section at the end of this paper.

³ 2005 Integrated Energy Policy Report, Committee Draft Report, September 2005

and 2004 iterations of the IEPR. It focuses on environmental issues associated with energy resources, and includes a chapter devoted to climate change. The IEPR addresses issues uncovered in an integrated assessment of major energy trends and challenges facing California's electricity, natural gas, and transportation fuel sectors. The report makes policy recommendations to conserve resources; protect the environment; ensure reliable, secure, and diverse energy resources; enhance the state's economy; and protect public health and safety.

In addition to the IEPR, the CEC, along with the California Public Utilities Commission (CPUC), also prepared California's 2005 Energy Action Plan II (EAP II), which updates the 2003 EAP. The plan asserts that energy must be available and affordable, with minimal environmental risks and impacts, when and where it is needed. Other participants included the State Business, Transportation, and Housing Agency; the Resources Agency; the State and Consumer Services Agency; the California Independent System Operator (CAISO); the California Environmental Protection Agency (Cal EPA); and other agencies with energy-related responsibilities.

The EAP II notes that California's energy efficiency efforts, particularly efficiency requirements for appliances and new buildings, have already reduced peak capacity needs by more than 12,000 MW and continue to save about 40,000 GWh of electricity annually. In 2004, the CPUC adopted further energy savings goals for electricity and natural gas. In meeting these targets, investor-owned utilities (IOUs) will save an additional 5,000 MW and 23,000 GWh per year of electricity, and 450 million therms per year of natural gas by 2013.

A key feature of EAP II is the "loading order" that describes the priority sequence for adding energy resources. The loading order indicates a preference for cost-effective energy efficiency and demand response, followed by renewable power sources and distributed generation, such as combined heat and power applications. To the extent that these resources fall short of meeting demand, the state supports clean, efficient fossil fuel-fired generation.

The Plan also calls for improvements to the bulk electricity transmission grid and distribution facility infrastructure to support growing demand centers and the interconnection of new generation, on both the utility and customer sides of the meter.

Open communication, transparency, and education for all stakeholders are also important features of the Plan. In particular, the state seeks to remove barriers to transparency in the electricity resource procurement processes and to increase outreach to consumers by providing improved education and services regarding energy efficiency, demand response, rates, climate change, and opportunities to reduce the environmental impacts of energy use.

B. Connecticut

The Connecticut Legislature reconstituted the Connecticut Energy Advisory Board (CEAB) in 2003. The Board includes leaders from multiple state agencies who identify and coordinate state energy needs and recommend strategies and solutions. Of the ten

strategies listed by the CEAB in the 2005 Connecticut State Energy Plan, the first five are related to energy efficiency and renewable generation:

1. Continue to support energy efficiency and conservation;
2. Support renewable energy technologies;
3. Support demand response programs;
4. Support transportation and land-use policies that reduce energy use; and
5. Optimize fuel diversity.

The plan includes preferential standards or criteria for projects that support and balance energy reliability, environmental and natural resource protection, cost effectiveness, and quality of life goals.

Mitigating the state's contribution to climate change is an important focus of Connecticut's energy planning activities. In 2005, the Governor's Steering Committee on Climate Change completed the Connecticut Climate Change Action Plan with a goal of reducing greenhouse gas emissions to 1990 levels by the year 2010 and an additional 10% by 2020. Some of the plan's 38 recommended actions are already underway. Examples include a clean cars program, appliance efficiency standards, and development of a clean energy market.

D. New Jersey

The New Jersey Board of Public Utilities Strategic Plan: 2005-2008 and Beyond, contains an objective for renewable energy and conservation that states:

- By 2008, six and a half percent of the electricity used by New Jersey residents and businesses will be provided by Class I and/or Class II renewable energy resources,⁴ of which a minimum of four percent will be from Class I renewable energy resources.
- By 2008, the state will foster installation of 300 MW of Class I renewable electric generation capacity in New Jersey, of which a minimum of 90 MW shall be derived from photovoltaics.
- By 2012, 785,000 MWH per year and 0.6 billion cubic feet gas per year of energy savings will be derived from measures installed under the Clean Energy Program.
- By 2020, twenty percent of the electricity used by New Jersey residents and businesses will be provided by Class I renewable energy resources.

⁴ "Class I renewable energy" is defined as "electric energy produced from solar technologies, photovoltaic technologies, wind energy, fuel cells, geothermal technologies, wave or tidal action, and methane gas from landfills or a biomass facility, provided that the biomass is cultivated and harvested in a sustainable manner."

"Class II renewable energy" means electric energy produced at a resource recovery facility or hydro power facility, provided that such facility is located where retail competition is permitted and provided further that the Commissioner of Environmental Protection has determined that such facility meets the highest environmental standards and minimizes any impacts to the environment and local communities.

E. New Mexico

In 2003, New Mexico's Energy, Minerals and Natural Resources Department published a Natural Resources Report. Part V of the report covers energy efficiency, conservation and renewable energy resources. The Energy Conservation and Management Division (ECMD), which is responsible for Part V, adopted a mission statement: "Develop and implement effective clean energy programs -- renewable energy, energy efficiency and conservation, alternative transportation/fuels -- to promote environmental and economic sustainability for New Mexico and its citizens." Several ECMD objectives are designed to help accomplish their mission, including:

- Ten percent of New Mexico's electricity needs met with renewable energy by 2010;
- Position New Mexico among the top three states in wind energy production by 2007;
- Reduce energy consumption in all sectors of the New Mexico economy, including residential, commercial, industrial, institutional (government/schools), and transportation;
- Promote and facilitate sustainable, energy-efficient ("green") building construction practices throughout New Mexico;
- Facilitate compliance with state and federal mandates for acquisition of alternative fuel vehicles; and
- Assist and encourage the increased use of alternative fuels.

F. New York

The New York State Energy Planning Board was created by the legislature to oversee the development and adoption of the Annual State Energy plan. The 2004 Annual Report and Activities Update to the 2002 State Energy Plan and Final Environmental Impact Statement includes several initiatives to improve energy diversity, including investing in energy efficiency through a statewide public benefits program and the energy efficiency programs of the New York Power Authority (NYPA) and Long Island Power Authority (LIPA), as well as steps toward implementing a Renewable Portfolio Standard (RPS). A key environmental goal is reduction of greenhouse gas emissions to 5 percent below 1990 levels by 2010 and 10 percent below 1990 levels by 2020.

Energy efficiency and demand management measures installed through 2004 are credited with reducing electricity use and peak demand by about 1,340 GWh per year and 1,135 MW, respectively. Of the 1,135 MW reduction potential, more than 361 MW represent reductions from permanently installed energy efficiency measures, and the remaining 774 MW represent callable reductions available on short notice from customers participating in day-ahead programs. The generation of nitrogen oxide (NO_x) and sulfur dioxide (SO₂)

credits from these reductions help support continuing economic growth in New York, where offsets are required. Jobs created as a result of investments in energy efficiency are expected to exceed 4,700.

The target for the New York RPS is to generate 25 percent of in-state retail electricity from renewable resources within ten years. Currently, approximately 17 percent of the state's electricity is generated from renewable resources. The Plan update calls for expanding the state's efforts to improve the efficiency of electricity generation and encouraging the use of indigenous and renewable energy resources, including solar, wind, waste methane, geothermal, sustainable biomass, combined heat and power, and clean and efficient distributed generation.

The Statewide Transportation Master Plan identifies many major initiatives designed to increase energy efficiency in the transportation sector while reducing emissions of criteria pollutants and greenhouse gases.

The New York State Energy Research and Development Authority (NYSERDA) tracks government and private implementation of the Energy Plan. An annual report provides updates documenting progress in implementing policies and recommendations contained in the plan. It also summarizes the data and information filed with the Board by major energy suppliers.

G. North Carolina

Additional detail on the North Carolina plan will be presented on the call.

The 2003 North Carolina State Energy Plan recommends improvements in energy use and development of new energy resources and explores funding options for implementing these recommendations.

Six objectives were recommended by the State Energy Policy Council:

- Ensure energy reliability;
- Improve the public health and environmental quality;
- Develop policies that promote wise land use;
- Implement strategies supportive of a sound North Carolina economy;
- Develop an achievable sustainable energy strategy for North Carolina; and
- Implement a strategy by which the state can lead by example.

Of the 12 elements addressed by the plan, several were focused on clean energy resources and environmental quality. Five of six elements specified in the report as requiring immediate attention were closely aligned with clean energy issues:

- Energy, Economics, and the Environment
- Alternative Fuels from Biomass
- Alternative Energy Sources
- Public Sector Energy Use
- Residential Sector Energy Use

North Carolina's plan has a strong focus on environmental issues and points to increased emissions of air pollutants from energy use, including NO_x, SO₂, particulates, mercury, greenhouse gases such as carbon dioxide (CO₂) and methane, and others. Human health impacts from ozone form part of the basis for North Carolina's interest in promoting clean energy resources.

The plan notes that, in addition to coal-fired power plants, other contributors to the high level of air pollutants include increasing vehicle miles traveled; energy use in industrial facilities; and extensive use of construction, farming, and other off-road equipment.

H. Oregon

In the 2005-2007 State of Oregon Energy Plan, the Oregon Department of Energy focused on actions to foster economic growth by spending less on energy and using new energy investments to create jobs. The plan notes that renewable resources like wind, solar, geothermal, and biomass can reduce price volatility and cut greenhouse gas emissions while offering substantial opportunity for economic growth.

Among the key concepts underlying the plan, several are focused on energy efficiency and renewable generation:

1. Maximize energy conservation and efficiency. Includes business and residential programs and incentives.
2. Support a stable energy supply for Oregon. Includes promotion for utilities to invest in diverse renewable energy generating resources to meet 10 percent of Oregon's electricity load by 2015.
3. Support renewable energy development and technology companies in Oregon. Includes a Business Energy Tax Credit and the State Energy Loan Program to encourage large-scale renewable energy systems such as solar, wind, geothermal, and biomass.
4. Promote alternative fuels to protect Oregonians from petroleum price increases. Includes incentives for alternative fuel production and fueling stations, hybrid vehicles, and projects to reduce diesel truck idling.

The Energy Plan is supplemented by the state's Renewable Energy Action Plan, Strategy for Greenhouse Gas Reductions, and Sustainability Plan.

I. Northwest Power and Conservation Council (NPCC)

Additional detail on the NPCC planning effort will be presented on the call.

Created by Congress in 1980 because of the Federal Power System in the Northwest, the NPCC includes two representatives from each of the four states of ID, MT, OR and WA. The Council develops a 20 year electric power plan for reliable energy at the lowest economic and environmental cost. The energy plan gives highest priority to cost-effective conservation, followed by renewable resources, to the extent they are cost-effective. The current plan (5th Plan) includes specific targets and action items for conservation, demand

response, and wind resources. The target for conservation is 700 average⁵ MW between 2005 and 2009, and 2, 500 average MW over the 20-year planning horizon. The plan also calls for over 1,100 MW of wind from system benefit charge programs and utility integrated resource plans.

J. Western Governors Association – Clean and Diversified Energy Initiative

The Governors of the 18 states in the Western Governors Association created the Clean and Diversified Energy Advisory Committee (CDEAC) in 2004, to oversee the work of eight task forces associated with the Clean and Diversified Energy Initiative ([Advanced Natural Gas](#), [Biomass](#), [Clean Coal](#), [Energy Efficiency](#), [Geothermal](#), [Solar](#), [Transmission](#), [Wind](#)). The Governors are examining the feasibility of and actions that would be needed to develop 30,000 megawatts of clean energy in the West by 2015, ensure adequate transmission capacity, and increase energy efficiency 20 percent by 2020.

The Energy Efficiency Task Force of the CDEAC recently released an analysis of the potential for improving energy efficiency in the 18-state WGA region, a review of barriers inhibiting greater investment in energy efficiency, and recommendations for how the region can increase energy efficiency through policy actions such as state appliance standards, building codes, enhanced electricity and natural gas demand-side management, utility pricing/rate structure adjustments, public sector initiatives, and education and outreach. The analysis found that a combination of current state and utility energy efficiency policies and programs, and widespread adoption of “best practice” policies and programs would achieve the WGA’s goal of reducing electricity consumption in 2020 by 20%. The absolute electricity savings in 2020 are equivalent to the electricity supply of 100 baseload power plants.

V. Discussion Questions

1. Does your state have a clean energy plan in place or under development?
2. What are the primary policy drivers for state or regional energy planning?
3. How do states identify and prioritize options, i.e., what factors or benefits are most important and how are they evaluated?
4. What resources (including modeling tools and approaches) are/were required in creating and implementing an energy plan that includes clean energy options?
5. How do various participants and stakeholders provide input and follow up?
6. How can states ensure that other activities/policies/agencies support or at least do not conflict with the goals and strategies of an energy plan?
7. How can states/regions evaluate progress towards clean energy goals?
8. How have states/regions attempted to estimate the air quality and/or other environmental benefits of energy planning?
9. What are key issues for states new to clean energy planning?

⁵ An average MW is the amount of energy delivered or saved over a year’s time.

VI. Resources

A. Federal Programs

(1) EPA Clean Energy Programs website
<http://www.epa.gov/cleanenergy/epaclean.htm>

(2) Draft EPA Clean Energy-Environment Guide to Action Abstract (the full report will be available soon)

This Draft EPA guidance is intended to help states evaluate clean energy options and develop a clean energy-environment action plan. The guide describes 16 clean energy policies and strategies that states have used to develop cost effective clean energy resources. The Guide lists benefits, examples, key players, coordination opportunities, best practices, action steps, and resources.

http://www.epa.gov/cleanenergy/pdf/guide_to_action.pdf

(3) Department of Energy (DOE) – Office of Energy Efficiency and Renewable Energy (EERE) State Energy Program (SEP)

DOE makes SEP grants available annually for state energy efficiency programs. The application process requires energy efficiency and renewable energy planning elements including states' energy efficiency goals, how the state intends to achieve those goals, how the goals will be measured, and the state's strategy. Guidance for 2005 grant applications is available online.

http://www.eere.energy.gov/state_energy_program/pdfs/fy05_grant_guidance.pdf

B. State Reports and Resources

(1) DOE – EERE list of Publications about State Energy Strategic Plans
http://www.eere.energy.gov/state_energy_program/publications_by_topic.cfm/topic=509

(3) 2005 Integrated Energy Policy Report Committee, Committee Draft Report, September 2005
<http://www.energy.ca.gov/2005publications/CEC-100-2005-007/CEC-100-2005-007-CTD.PDF>

(2) Energy Action Plan II
 A 2005 update to California's 2003 Energy Action Plan
http://www.energy.ca.gov/energy_action_plan/2005-09-21_EAP2_FINAL.PDF

(3) 2005 Connecticut State Energy Plan
http://ceab.staging.ashtonweb.com/pdf/ep_2005final.pdf

(4) The Kansas Energy Council
<http://www.kansasenergy.org/>

(5) Minnesota's Leadership in Renewable Energy

http://www.state.mn.us/mn/externalDocs/Commerce/Renewable_Energy_Objective_Report_020305041245_REOComplete-NoH1-13.pdf

(6) New Jersey Board of Public Utilities Strategic Plan: 2005-2008 and Beyond
<http://www.bpu.state.nj.us/tmp/NJBPUStrategicPlan.pdf>

(7) New Mexico Energy, Minerals and Natural Resources Department
Natural Resources Report
<http://www.emnrd.state.nm.us/Mining/resrpt/default.htm>

(8) The New York 2004 Annual Report and Activities Update to the 2002 State Energy Plan and Final Environmental Impact Statement
http://www.nyserda.org/Energy_Information/2004sep_annual_report.pdf

(9) 2005 Status of Energy in Nevada
<http://energy.state.nv.us/2005%20Report/Final%20CD/Chapter%206%20-%20Final.doc>

(10) North Carolina State Energy Plan 2003
<http://www.energync.net/sep/docs/sep03.pdf>

(11a) 2005-2007 State of Oregon Energy Plan
<http://egov.oregon.gov/ENERGY/docs/EnergyPlan05.pdf>

(11b) Oregon Renewable Energy Action Plan
<http://egov.oregon.gov/ENERGY/Renew/renewplan.shtml>

(12) The Texas Energy Plan 2005
<http://www.rrc.state.tx.us/tepc/finalenergyplan.pdf>

C. Regional Clean Energy Planning

(1) A Balanced Energy Plan for the Interior West

This privately funded 2004 report describes an energy plan for Arizona, New Mexico, Nevada, Utah, Colorado, Wyoming, and Montana that integrates energy efficiency, renewable energy, and combined heat and power with existing power system elements.
<http://www.westernresourceadvocates.org>

(2) Powering the South: A Clean Affordable Energy Plan for the Southern United States

This 2005 plan models clean power opportunities for Alabama, Florida, Georgia, North Carolina, South Carolina, and Tennessee. <http://www.poweringthesouth.org/report/>

(3) Repowering the Midwest: The Clean Energy Development Plan for the Heartland

This 2001 report describes a strategic clean energy development plan for Illinois, Indiana, Iowa, Michigan, Minnesota, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin; including environmental, public health, and economic development benefits.

<http://www.repowermidwest.org/repoweringthemidwest.pdf>

(4) Northwest Power & Conservation Council – 5th Power Plan

<http://nwcouncil.org/energy/powerplan/default.htm>

(5) Western Governors Association – Clean and Diversified Energy Initiative

<http://www.westgov.org/wga/initiatives/cdeac/index.htm>