STATE ENERGY PLANNING GUIDELINES

A Guide to Develop a Comprehensive State Energy Plan
Plus Supplemental Policy and Program Options

NASEO

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EXECUTIVE SUMMARY

States conduct comprehensive energy planning to establish a strategy or framework to meet current and future energy needs in a cost-effective and sustainable manner. State energy plans allow states to capitalize on indigenous resources, infrastructure, and human capital through targeted goals and directives to encourage economic development. A state energy plan should be created through a stakeholder consensus-building process to foster competitive energy markets, promote diverse energy supplies, and ensure energy affordability and reliability. These *State Energy Planning Guidelines* (the *Guidelines)* are to aid in creating state energy planning processes that are of the highest integrity and institutionalized to perpetuate sound planning practices.

The National Association of State Energy Officials (NASEO) prepared the *Guidelines* because the 56 State and Territory Energy Offices generally lead the energy-planning processes. These offices play a key role in developing and implementing energy policies and programs at the state level. As such, the *Guidelines* recognize the leadership role of State Energy Offices in the development and review of state energy plans. While a State Energy Office may lead the planning process, collaboration with other state agencies throughout the development of a plan is encouraged to leverage the expertise and resources of those agencies and to ensure that state policy objectives are aligned across state government. Private sector engagement is also an essential part of the planning process to involve the range of input required for a holistic plan that integrates the various energy sector priorities and goals. State and local government agencies use state energy plans to support legislative and regulatory decisions and actions and the private sector can utilize these plans to inform investment decisions, so broad stakeholder engagement is critical.

Energy planning has a longstanding history in many states and is typically carried out by the State Energy Offices. Recent analysis by the NASEO shows that this planning is rapidly becoming a priority for governors and legislatures that seek to establish policies and programs to deal with evolving energy markets by promoting energy supply diversification that fosters economic opportunities[1]. Of the 39 state energy plans in existence in 2011, State Energy Offices led the development of 21 and participated on the planning team of 14. While State Energy Offices typically serve as a lead author or coordinating entity, a state energy plan should serve as a comprehensive, statewide coordination of policies and programs to meet defined goals and objectives. The interdependencies of the energy sector with other sectors such as transportation, housing, banking, and agriculture reinforces the need for statewide energy planning.

Each state possesses a unique set of energy resources, infrastructure, and demand. The *Guidelines* are intended to provide a distillation of suggested topics, areas of concentration, and processes for consideration; however, each plan must address state-specific needs, economic opportunities, legal authorities, and organizational structures. Foremost among the lessons learned from existing energy planning efforts are how a well-designed energy plan helps state decision makers:

- **Enhance a state's ability to prioritize energy-related policies, activities, and programs;**
- **Build consensus around state energy policy and investment decisions;**

1 There are 18 state energy plans under development as of August 2013. NASEO Database of State Energy Plans. www.naseo.org/stateenergyplans

- **Ensure that new and existing policies and programs are coordinated and complementary;**
- **Build a long-term energy roadmap that is based on widely accepted data and analysis;**
- **Manage risk associated with energy markets to ensure that system reliability and integrity are maintained;**
- **Assign responsibility for specific energy actions and resources for successful implementation of plan recommendations;**
- **Enhance transparency and accountability within state government; and**
- **Serve as a roadmap for both economic development and prudent stewardship of a state's natural resources.**

The *Guidelines* serve as a benchmark against which states can compare their plans and planning processes for continued refinement. Within the *Guidelines* are the following ten steps that NASEO recommends for the comprehensive energy planning process.

Step 1: Establish a Requirement and Scope for a State Energy Plan

Step 2: Convene the Planning Team

Step 3: Collect and Analyze Data and Project Future Energy Needs

Step 4: Develop the Vision for the State Energy Plan

Step 5: Garner Public Input and Feedback

Step 6: Outline Goals and Recommended Actions to Meet the Vision

Step 7: Draft the State Energy Plan

Step 8: Finalize and Adopt the Plan

Step 9: Conduct Outreach and Marketing

Step 10: Monitor Progress and Update the Plan

There are a number of recommended actions that a state energy plan might include, depending upon the plan's declared goals. For instance, energy efficiency goals can be supported by recommendations to advance building energy codes and utility energy efficiency programs. States seeking to reduce their dependence on imported oil may implement state vehicle acquisition requirements that require the procurement of highly efficient or alternative fuel vehicles. Descriptions of widely adopted and effective policies and programs that help achieve energy plan goals are included in Section IV titled *Supplemental Policies and Programs.*

Each state has unique challenges, opportunities, and goals. By developing the *Guidelines*, NASEO seeks to formalize and institutionalize the state energy planning process to support the states in capturing their energy goals in a holistic and thoughtful way. The *Guidelines* are a tool to aid state policymakers in ensuring that plans are comprehensive, strategic, and practical, and reflect a state's unique energy resources and economic opportunities.

I. INTRODUCTION

State governments must be able to respond to and take advantage of energy and market changes to ensure economic growth, environmental quality and to protect public health, safety, and welfare. The role of state energy plans is to help states comprehensively address energy supply and demand challenges; target opportunities to support economic development, assure reliable supply, and minimize societal costs; and maximize the benefits of energy production and efficient utilization. The changing energy landscape makes it clear that states should develop strategic and comprehensive plans to meet future energy needs and create energy economic opportunities. In 2013, U.S. crude production reached its highest point since 1992. In the buildings sector, homes, businesses, and factories account for more than 40% of the energy consumed in the country. Transportation in this country is responsible for more than 70% of U.S. petroleum consumption[2] and transportation costs are the second costliest expense for American households. Finally, a global race is underway to develop and manufacture clean energy technologies—the country that wins this race will reap the economic benefits.

State energy plans help to identify and design a pathway to a prosperous energy future that capitalizes on a state's indigenous resources, infrastructure, and human capital to promote a healthy economy and environment. States historically have affected how the energy sector has evolved. State energy plans can help catalyze positive, transformative change.

A state energy plan is a package of strategic goals with recommended policy and program actions to support those goals. The attributes of an energy plan guide public policy – and in some cases private sector – energy decisions, which are further defined through legislation, investment incentives, energy conservation guidelines, and taxation. A comprehensive state energy plan encompasses current and trending fuel demand, supply, and price characteristics, as well as other factors such as job creation, economic development, environmental quality, and energy security. Planning can help to insulate the energy system – asset owners and consumers – from market fluctuations and adverse externalities.

There is also a tremendous need for carefully executed long-term planning. Much of the infrastructure influencing energy consumption and production was established decades ago– buildings, homes, power plants, transmission lines, and transportation networks and fleets. The decisions made today will affect society for many years; thoughtful planning will ensure that societal costs are minimized, while benefits such as economic development and environmental mitigation are maximized.

The energy market (suppliers and consumers) – at the global, national, and state levels – is constantly evolving. New challenges and opportunities are emerging in energy production, electricity, and fuel distribution, as well as energy demand by the manufacturing, construction, and transportation sectors. Growth in domestic oil and gas production, more cost-competitive renewable energy, and mounting pressure for new investments in an aging infrastructure represent resource availability and technological advances that are causing real change in trends and forecasts that have been in place for decades. That means state and local governments, along with the private sector, are at

2 See Energy Information Administration, www.eia.gov.

an opportune juncture in which to develop energy plans for an energy future that will be very different from that upon which many prior energy plans were predicated. With these new opportunities come new challenges, such as an increased risk and vulnerability to cyber-attacks and protecting critical infrastructure from increasingly severe weather events.

Energy planning has a longstanding history in many states and is typically carried out by the State Energy Offices. Recent analysis by the National Association of State Energy Officials (NASEO) shows that this planning is rapidly becoming a priority for governors and legislatures that seek to establish policies and programs to deal with evolving energy markets by promoting energy supply diversification that fosters economic opportunities[3]. Of the 39 state energy plans in existence in 2011, State Energy Offices led the development of 21 and participated on the planning team of 14. While State Energy Offices typically serve as a lead author or coordinating entity, a state energy plan should serve as a comprehensive, statewide coordination of policies and programs to meet defined goals and objectives. The interdependencies of the energy sector with other sectors such as transportation, housing, banking, and agriculture reinforces the need for statewide energy planning.

A comprehensive plan encourages the following energy, economic, and environmental benefits through the goals and recommendations outlined.

- **Cost savings:** Efficient use of energy resources will reduce energy and operating costs, resulting in savings for public and private entities.
- **Job creation:** Advancing innovation and new markets (e.g., local sources of energy, such as renewables or natural gas) will generate a demand for a highly skilled workforce in sales, installations, manufacturing, and operations.
- **Economic growth:** Establishing a regulatory policy, and investment framework through which the state will develop its energy resources and serve consumers within its jurisdiction can attract new businesses to the state and encourage increased investment by existing industry across the energy supply chain.
- **Industry competitiveness:** Identifying ways the state's key industry sectors can grow, be more efficient, and manufacture new products will boost the state's competitive advantage and the industry's ability to compete in a global marketplace.
- **Environmental benefits:** Reducing energy intensity or switching to low/no emissions energy sources will contribute to a healthy and safe environment.
- **Security, reliability, and resiliency:** Ensuring the state's energy needs draw from a variety of resources will allow the state to react more effectively to market disruptions.

Note that the plan itself is not intended to *produce* these benefits, only enable them. The policies and programs developed from the plan's recommended actions are what affect these results. State energy plans should provide a structure that is accepted by a broad stakeholder community, offer

3 There are 18 state energy plans under development as of August 2013. NASEO Database of State Energy Plans. www.naseo.org/stateenergyplans

quantifiable and achievable goals, assign responsibility to specific public and private entities, and link financing mechanisms to each goal to translate the plan into practical implementation.

Recognizing the enabling benefits and value of state energy planning, NASEO conducted a baseline analysis of 39 state energy plans created between 2002 and 2011 as identified by the state as the most recent operating plan[4]. The plans analyzed by NASEO ranged from governors' energy policy statements to lengthy, legislatively required and biennially updated state energy frameworks for energy policy development. The baseline analysis of the 39 state energy plans was conducted to illustrate trends across states, compare differing planning approaches and priorities, and to become a foundation for analyses of plans.

The *Guidelines* integrate the lessons learned from NASEO's analysis of state comprehensive energy plans and from discussions with planning experts about energy planning and plan development. The sections that follow offer a recommended systematic planning process. Section IV includes a set of suggested *Supplemental Policies and Programs* that a number of states have utilized and may be appropriate for other states to adapt and adopt.

The *Guidelines* framework encompasses the following steps in the energy planning process.

Step 1: Establish a Requirement and Scope for a State Energy Plan

Step 2: Convene the Planning Team

Step 3: Collect and Analyze Data and Project Future Energy Needs

Step 4: Develop the Vision for the State Energy Plan

Step 5: Garner Public Input and Feedback

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Step 7: Draft the State Energy Plan

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Step 10: Monitor Progress and Update the Plan

4 Plans completed in 2012 were not included in the overview. NASEO recognizes that many states are in the process of writing or updating their state energy plan and that review of these plans must be an iterative process.

II. THE GUIDELINES: A STEP-BY-STEP PROCESS

NASEO's overview of state energy plans and processes, as well as consultation with state energy planning experts[5], resulted in the identification of a series of steps essential for a state energy planning process and corresponding state energy plan that is *comprehensive, adaptable, guiding,* and *strategic*. These key characteristics enable states to respond to the changing needs of consumers, resource availability, and other market signals.

Comprehensive: Take into consideration a holistic perspective of the state's energy profile, including all energy resources and end-use sectors; input from the key public and private stakeholders will ensure a more complete, synergistic, and systematic plan.

Adaptable: Project future energy supplies and demand and be able to accommodate the impacts of supply shifts, geopolitical risks and uncertainties, and other externalities that may affect near- and long-term energy needs.

Guiding: Provide a framework that allows state and business decision makers to make informed and educated judgments based on the predictability ensured by a defined and structured plan.

Strategic: Offer a deliberate and vetted plan that lays out clear recommendations and actions that are set within goals that are measurable and achievable.

Overall, these characteristics define state energy planning and highlight its value and importance. The *Guidelines* present and describe clearly the steps and policy strategies. As a state carries out energy planning, the *Guidelines* can serve to standardize and enhance the process and substance of the state's energy plan.

This document presents ten steps for states to use in their comprehensive energy planning process. Nevertheless, plans and processes will require customization and tailoring based on state requirements and resources. Although the various steps within this document are presented sequentially, some of the steps may need to be completed concurrently, repeated cyclically for routine evaluation, and updating

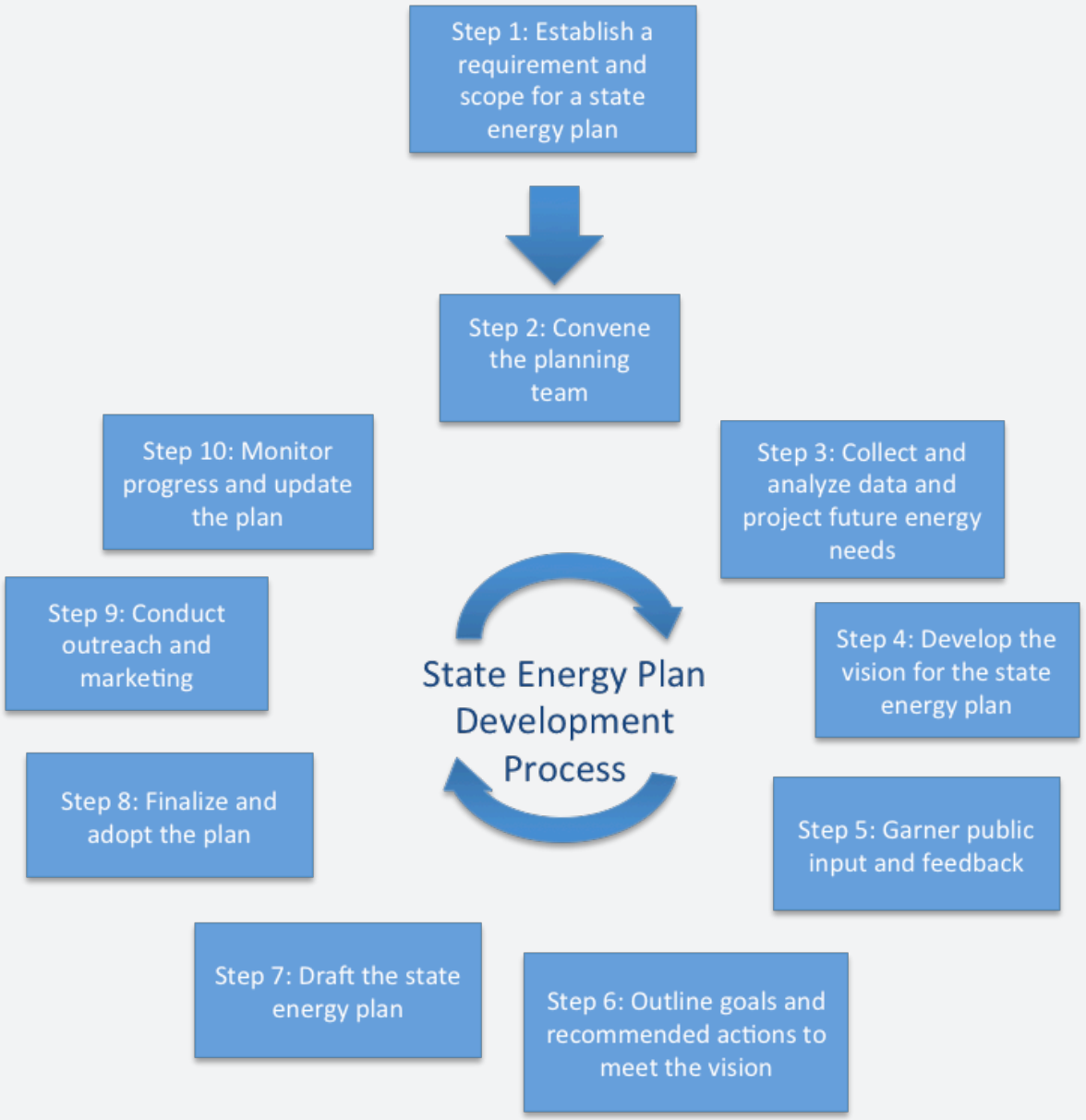
While it may be difficult to draw a direct linkage between energy policies and programs adopted by a state and the plan itself, states often do reflect on their plans in the out years (and some are required to do so) to note the accomplishments that stemmed from the plan. In Washington, for example, the State Energy Office is required to implement a state energy strategy every four years. As part of this process, every two years the energy office issues a biennial energy report that looks back at implementation to determine whether the legislature, governor, and state agencies have

5 In addition to State Energy Office directors, NASEO drew from the expertise of its Regional Coordinators Network. The seven Regional Coordinators are all former State Energy Office directors with experience leading a state energy planning process. http://naseo.org/members/regions/index.html

taken steps as outlined in the plan. The biennial report provides "a status of fundamental energy indicators – quantities and costs of energy generated and consumed in Washington – augmented with analysis of a few emerging issues unique to the Pacific Northwest's energy economy."[6] This cyclical process and compliancy review is an effective mechanism to ensure the plan is effective, and adaptable.

The process flow chart, or "steps in the state energy plan development process," presented below (Figure 1) reflects the cyclical nature of the state energy planning process. In addition, energy plans built on a foundation of sound energy data and analysis provide a lens through which new policies can be evaluated.

Figure 1. Steps in the State Energy Planning Process



6 2013 Biennial Energy Report: Issues, Analysis, and Updates, Report to the Legislature. Washington State Department of Commerce Energy Office. December 2012.

The purpose of each of the steps is outlined below.

Step 1: Establish a requirement and scope for a state energy plan to give the plan the appropriate influence and authority.

Step 2: Convene the planning team that reflects the cross-section of energy sector stakeholders.

Step 3: Collect and analyze data and project future energy needs to establish a baseline and assessment for the current and future energy needs.

Step 4: Develop an accurate vision to reflect the state's overarching purpose and energy objectives.

Step 5: Garner public input and feedback to collect insight from consumers, businesses, industry, and other stakeholders.

Step 6: Establish goals and recommended actions to outline the strategy and process to achieve the state energy plan objective(s). The Supplemental Policies and Programs in Section IV (page 48) outlines specific strategies for states to consider.

Step 7: Draft the State Energy Plan to provide a clear representation of the planning process and recommended actions.

Step 8: Finalize and adopt the plan to ensure that the plan meets the objectives as laid out in the authorizing vision and establish the plan as the strategy for meeting the state's energy needs.

Step 9: Conduct outreach and marketing to guarantee that the public is aware of the state energy plan and planning process as needed (e.g., minutes from planning team meetings) and recognizes it as the overarching state energy strategy.

Step 10: Monitor progress and update the plan to assess the accomplishments and progress and formulate any necessary modification to the analysis or actions.

While each state's plan will be unique in substance based on factors such as energy resources, stakeholders, and scope, the steps provided in this guidance document can be applied to each state's energy planning process to result in a comprehensive and valuable plan.

Based on NASEO's overview, state energy plans vary in the structure of the advisory group members, plan content, degree of detail, data and analysis employed, number of recommended actions, plan length, and means of distribution. However, most state energy plans include the following:

- **Assessment of the current energy profile, industries, and educated an technically-trained workforce, "intellectual capacity;"**
- **Energy outlook, forecast, or projection of future needs including supply, demand, and costs;**

- **Vision of the desired energy future and requirements;**
- **Challenges to be addressed;**
- **Goals and strategies;**
- **Prioritized and specific actions with timeline, evaluation, and measurement criteria; and**
- **Financing and funding mechanisms for the actions.**

These *Guidelines* explore each of these elements further. The first step focuses on establishing or strengthening the requirement or authority to develop a state energy plan.

Step 1: Establish a Requirement and Scope for a State Energy Plan

> "We're not doing this for the next election, we're doing this for the next generation."
>
> - Representative Tanya Pullin, Kentucky

The state energy planning process often is initiated through a top-level state authority such as an executive order, statute, or agency directive. This section explores how a state authority establishes the requirement for a state energy planning process or plan and the elements covered within that requirement. For reference, links to executive orders or statutes that require an energy planning process and/or plan are provided. The vision and objectives often included in these requirements are described. This section describes the vision and objectives as included in the requirements for a plan or planning process, reviews the various stakeholders engaged in the planning process, and discusses the resources required to develop a plan in the following subsections.

Step 1.a. - Present Mandated State Energy Plan Objectives and Scope

Step 1.b. - Identify the Stakeholders

Step 1.c. - Classify the Resources Needed to Develop a State Energy Plan

Typically, a governor or legislature initiates the state energy planning process through an executive order or enabling legislation that requires either a one-time planning event or a cyclical process that ensures revision, review, and evaluation of the plan at regular intervals. Executive orders and legislation generally offer a timeframe for a state energy plan's development (e.g., three months to one year), as well as an outlook for the plan (e.g., 5, 10, or 20 years). The majority of state energy plans are required to be reviewed and updated every two years.

State energy plans that are required or integrated within state executive and/or legislative policy help give the plan "teeth", or the appropriate authority and influence, thereby ensuring that the plan is the states broadly accepted energy framework. A state energy plan that is rooted in a statute or executive order will give credence and weight to the plan and can improve acceptance by key stakeholders and the public. Plans with "teeth" will outlast changes in executive and legislative leadership and provide consistency in long-term energy planning. After a plan is developed, integrating elements of the plan into state executive or legislative actions may also give it greater significance. The overall objective is to have a useful and guiding plan that the state energy stakeholders acknowledge as the framework for making energy policy and program decisions. Further, states that are required to have a plan and/or planning process often include an intermediate step between plan due dates that provide an opportunity to recognize accomplishments, update analyses, and assess external factors that may necessitate modifications to the plan.

In its 2011 analysis, NASEO found that 23 of 39 plans were initiated through state legislation or executive order (see Table 1), which granted authority for the creation of the state energy plan and/or planning process.

Table 1. State Energy Plans by Legislation or Executive Order (2011)

State	Energy Plan	Statute / Executive Order
California	California's Energy Policy	Warren Alquist Act (Division 15 of the Public Resources Code) Senate Bill 1389 (Bowen and Sher, Chapter 568, Statutes of 2002)
Connecticut	2007 Energy Plan for Connecticut	Public Act 03-140, Public Act 11-80, Statute 16a-3a
Delaware	Delaware Energy Plan 2009-2014	Del. Code Ann. Tit. 29 §8053(c)(7)
District of Columbia	Green DC Agenda	Clean and Affordable Energy Act of 2008 (CAEA)
Florida	Governor's Action Team on Energy and Climate Change Final Report	Executive Order 07-126, Executive Order 07-127, and Executive Order 07-128
Hawaii	Hawaii Energy Strategy	Section 226-18, Hawaii Revised Statutes (HRS)
Idaho	Idaho Energy Plan	HCR 062 (2006 session) and HCR 013 (2007 session)
Maine	State of Maine Comprehensive Energy Plan	Me. Rev. Stat. Ann. tit. 2 §9
Massachusetts	Massachusetts Clean Energy and Climate Plan for 2020	Chapter 298 of The Global Warming Solutions Act (GWSA, or the Act) of 2008, and as codified at M.G.L. c. 21N
Michigan	Michigan 21st Century Energy Plan	Executive Directive No. 2006-02
Montana	Montana's Energy Policy (plus supp. goals)	Senate Bill No. 225 (Chapter 242, Laws of 1993) and Montana Code Annotated 90-4-1001
New Hampshire	New Hampshire's 10-Year State Energy Plan	HB 443 (2001 Session, not codified)
New Jersey	Energy Master Plan	52:27:F-14
New York	2009 NY State Energy Plan	March 2008 - Executive Order No. 2 directing the creation of a state energy plan; 2009 New York consolidated law ENG: Article 6 - Energy Planning.

Table 1. State Energy Plans by Legislation or Executive Order (2011)

State	Energy Plan	Statute / Executive Order
North Carolina	North Carolina's Strategic Plan for Biofuels Leadership	Session Law 2006-206 (Senate Bill 2051)
North Dakota	Empower North Dakota Comprehensive State Energy Policy 2008-2025	2007 Session Laws Chapter 204 §6
Oregon	State of Oregon Energy Plan	Or. Rev. Stat. Section 469.060
Pennsylvania	Energy Development Plan	Pennsylvania Energy Development Authority and Emergency Powers Act of 1982
Utah	Governor's 10-Year Strategic Energy Plan	Utah Code Ann. §63M-4-301
Vermont	Vermont Comprehensive Energy Plan	Vermont Energy Act of 2011
Virginia	The Virginia Energy Plan	Chapters 1 and 2 of Title 67 (§§ 67-100 through 67-203) of the Code of Virginia
Washington	Energy Strategy and Biennial Energy Reports	Chapter 271 (2010), Section 401
West Virginia	Energy Policy	WV State Code 5B-2F-1d

Source: An Overview of Statewide Comprehensive Energy Plans: From 2002 to 2011. NASEO. July 2013.

NASEO's analysis showed that beyond the plans in Table 1, the remaining state energy plans were either initiated by the governor (without executive order) or created by a state energy agency (e.g., State Energy Office, administrative services division, economic development agency, environmental office, or other energy-related state agency) that identified a need for a plan.

Step 1.a. - Present Mandated State Energy Plan Objectives and Scope

The State Energy Office typically determines the overarching scope and objectives for the plan. This sets the stage for the energy planning process and the overall purpose for the plan (e.g., diversifies the state's energy portfolio, create jobs, promote the use of in-state energy resources).

A governor may come into leadership with an energy strategy developed during their candidacy that could serve as the State Energy Office's foundation for a state energy plan. On the other hand, the legislature may determine that an energy plan could help the state address energy prices, supplies, and other changing needs in the energy sector.

For a legislator, the first step is to draft a bill that requires an energy plan or energy planning process. Getting the bill through the full legislature may require more of a concerted effort to explain the need, purpose, and to garner support to pass the bill.

If an executive or legislative authority does not initiate the state plan, the development of a vision is up to the state energy planning body. (See Step 4: Develop the Vision for the State Energy Plan.)

Step 1.b. - Identify the Stakeholders

State energy planning executive orders and legislation generally designate particular energy representatives and/or government leads to serve on a planning team. The requirement may designate a state agency to draft the plan. Alternatively, a state energy agency may be tasked with leading the entire planning process and engaging the appropriate stakeholders. Identifying the appropriate stakeholders to involve in the planning team is a critical point in the process. The comprehensiveness of the state energy plan depends on the diversity of the stakeholders. While a large group may require careful management, getting buy-in from targeted leaders ensures a broad level of involvement from a cross-sector of energy players.

The stakeholders involved in the state energy planning process will vary across states. There are a number of options for stakeholder involvement. A majority – 23 – of the states with an energy plan as of late 2011 relied on the state energy office as the lead in outlining, drafting, and finalizing the plan, according to NASEO's analysis. Of the 13 states with a team of selected stakeholders, six included the State Energy Office in that group among other key stakeholders. Five states had plans authored by the governor and two had plans developed by the public utility commission. The stakeholders' influence on the plan will define the direction and substance of the plan, so it is important for the state to consider the end goal(s) before selecting the final lead and/or stakeholders to be involved in the planning process.

Planning bodies, whether prescribed in the legislation or executive order, or appointed by the governor, often include specified public (state and local) and private sector energy representatives by title or sector. The New York State Planning Board — which demonstrates an inclusive planning team, especially from a state government perspective — consists of 13 members lead by the president and chief executive officer of the New York State Energy Research and Development Authority (NYSERDA, the State Energy Office) and includes the chair of the public service commission; department heads from agriculture, state, labor, homeland security, health, transportation, environmental conservation, and budget; appointees of the governor, speaker of the House, Senate president; and an officer of the independent system operator (non-voting).

In states where the plan is not required, the governor may convene the cabinet secretaries or agency directors from energy, environment, economic development, agriculture, and other energy or economic-related state-level authorities by request or specific appointment. The governor may also decide to include legislators and external representatives from utilities, businesses, investment firms, industry, consumer advocacy groups, energy companies, and other affiliations. As noted above, a comprehensive slate of stakeholders will ensure a holistic approach to planning.

For purposes of the *Guidelines*, the "planning team" will refer to the group of stakeholders tasked

with the development of the state energy plan. Overall, the planning team is responsible for providing direction and maintaining the timeline and budget during the plan development process. A comprehensive planning team will include energy-related public and private sector representatives that reflect the state's industries, economic and intellectual capacity, and energy resources, drawing from the following stakeholder groups (Figure 2).

Figure 2. Key Stakeholders in the Planning Process

PUBLIC SECTOR

- **Governor's office**
- **Legislators**
- **State Energy Office**
- **Public Utility Commission**
- **Environmental agencies**
- **Related agency directors**
- **Local government and tribal leaders**
- **Military installation representatives**
- **Consumer advocates**
- **Research entities**

PRIVATE SECTOR

- **Utility representatives**
- **Major industry groups**
- **Business leaders**
- **Energy producers**
- **Financial institutions**
- **Academic institutions**
- **Energy-focused non-profit organizations**
- **Others: civic groups, faith-based groups, community groups**

As a supervisory mechanism, states may want to appoint an advisory board to oversee the planning process. An advisory board is separate from the actual planning team in that the advisory board does not have a role in drafting the plan—the members only provide leadership and guidance through the process. States with an advisory board typically draw from energy-focused legislative, executive, and business leaders through invitations by the governor.

The planning team should maintain regular and open communication with the governor, legislature, or other designated authority throughout the process. Coordination between the planners and leadership is essential in ensuring the plan stays on track and meets the intended needs.

Inclusion of local government(s) within the planning team can help to ensure early local support for the plan and local assistance in implementing various provisions of the plan in the future. Some local governments may choose to align their energy goals based on the state energy plan.

Step 1.c. – Classify the Resources Needed to Develop a State Energy Plan

The budget and timeline for plan development must be determined before the planning process moves forward from this point. When a state has required a planning process by legislation or executive order, both of these factors are likely reflected in the authorizing legislation or executive order. If the plan is delivered by a lead agency, it is likely that the agency's budget will include a line item to cover the activities conducted under the energy planning process. If the plan is required, it should provide the expected outlook for the plan (e.g., 5-, 10-, and 20-year duration) and the schedule for drafting and reviewing the plan (e.g., the state's energy plan will be drafted within one year

and reviewed every two years). Otherwise, the planning team will identify and acquire the budget and establish the timeframe with guidance from state leadership.

According to NASEO's analysis of the existing state energy plans collected as of June 2011, the resources needed to develop a state energy plan vary widely. Some states have dedicated modest amounts of existing staff time and funds to cover printing of the plan. Others have dedicated as much as $2 million to conduct an intensive biennial planning process with dedicated staff and consultants.

States pay for energy planning using state appropriations, utility assessments, foundation funding, federal program support such as formula funding from the U.S. State Energy Program, and from in-kind resources such as national or private labs and universities. Where the planning process is designated to a particular agency, typically the state energy office, the effort generally becomes part of that agency's annual budget through the initial requirement. If the planning team is selected from a broader group of stakeholders, they typically volunteer or provide their time in-kind to the planning process. If the state selects a contractor(s) to conduct the planning process, perform data analysis and projections, and/or draft the plan, direct funding may be required. (In this case, states often circulate a request for proposals to solicit contractors who will work closely with a lead agency or planning team to administer the process.) Once the plan is finalized, states may want to conduct outreach and marketing, which will also require a budget.

The time it takes to complete the development of a state energy plan can range from several weeks to one year. The scope of the state energy plan will help to define the timeline and related milestones (this will be discussed further under Step 2). The total cost of the energy planning process will depend on the timeline, scope of the plan, use of consultant(s), and marketing and distribution.

Once the authority and these various elements are established, the state has the foundation to move forward with the state energy planning process.

SEC. II: THE GUIDELINES

Step 2: Convene the Planning Team

The second step in the energy planning process is to convene the planning team. This section describes the structure, management, and responsibilities of the planning team. Bear in mind that from this point onward the steps outlined in this document may begin to occur in parallel. New York's planning board chair once noted that the resulting collaboration among the participating entities on their planning board was beneficial in and of itself, and perhaps as important as the content of the plan.

Best practices in managing a planning team include the following activities:

1. Define and assign clear roles and responsibilities to ensure accountability;
2. Establish a structured process for meetings and collection of input;
3. Develop a clear agenda with objectives and circulate prior to each meeting; and
4. Keep detailed minutes of each meeting to record actions and progress.

The initial meeting of the planning team may focus on defining the structure and leadership. Subsequent meetings will be needed to establish the timeline and milestones based on the defined scope, goals, and recommended actions (discussed in future steps). The planning team will continue to meet until the plan is finalized and approved by the appropriate state authority. Therefore, much of what is described in this section occurs as part of a series of meetings and steps throughout the planning process.

While planning team structures vary across states, the key is to have an organized, effective, and engaged group of members with diverse subject matter expertise. By taking the time in early planning team meetings to establish a systematic process, the planning team's time will be spent on developing the plan rather than procedural issues.

If the plan is required under statute or initiated by the governor or legislature, the planning team should hold an initial meeting with that authority to discuss the scope and outlook for the plan. (Alternatively, the planning team may need to develop the scope for the state energy plan.) In addition, scheduling recurring check-ins throughout the planning process with the authority will keep them apprised and ensure the plan is on track and in line with their expectations.

The planning team may want to develop a state energy plan website to publicly share the minutes from each meeting, input collected, analysis, and drafts of the plan as they become available. This is an effective tool to showcase the planning team's efforts and share information as the energy planning process evolves.

The following sub-steps are included in this section to support the administration of a planning team.

Step 2.a. - Define and Assign Roles and Responsibilities

Step 2.b. - Establish a Structured Process for Meetings and Input

Step 2.c. - Set the Timeline and Milestones

Step 2.d. - Determine How to Manage Resources

Step 2.a. - Define and Assign Roles and Responsibilities

At the initial meeting of the planning team, the group may want to designate specific leadership roles for the members. This could mean assigning one member to run the planning meetings or defining a role for each planning team member (e.g., chair, vice chair, secretary, treasurer) if these roles are not already defined. For example, a secretary would be responsible for keeping a record of meeting discussion and decisions, which may prove helpful for engaging the public and making the planning process more transparent. A treasurer, for instance, will ensure that the planning process does not run over budget. Once the structure is defined, the planning team should assign the members various roles. Each of the roles should have well-defined responsibilities. The analysis or writing of certain sections of the plan may be delegated to specific state agencies. For instance, a department of transportation may take the lead in developing the content for the transportation section of the plan, or a state environmental agency might take the lead analyzing air emissions impacts of the energy strategies purported. These components of the comprehensive plan are integrated into a single document by the energy office of other lead agency.

In order to delineate the roles and responsibilities, the planning team may want to draft bylaws or a charter. This will help confirm the planning team's mission, scope, decision making, and expectations. Beyond responsibilities for developing substantive plan content, duties might include leading meetings, logging action items, taking meeting minutes, and organizing meetings. Staff from various state agencies or planning team member organizations and companies may be brought in to support administrative duties, logistics, and/or facilitation.

Step 2.b. - Establish a Structured Process for Meetings and Input

The planning team should consider setting up a system for decision-making (e.g., identifying voting versus non-voting members, consensus voting) and communications (e.g., in-person meetings versus virtual meetings). Throughout the energy planning process, the planning team members' input will need to be collected, vetted, and prioritized. Early agreement on how to make decisions will maximize the effectiveness of the planning team as it progresses.

Creating an agenda for each planning team meeting can help keep the discussion on track and monitor progress from one meeting to the next. Agendas should include time for updates from planning team members or workgroups, prioritization, and agreement on suggested actions or recommendations. Some states open their planning team meetings to the public.

Once the scope of the state energy plan is established, states often create workgroups to review current state policies and resources and make specific recommendations within topic areas (e.g., energy efficiency, renewable energy, transportation). Workgroups bring together planning team members with certain expertise and background in specific topic areas. Separating the planning team into workgroups will allow the planning team to collect data and draft recommendations across a variety of sectors or topics concurrently. The working groups can then report their findings and suggestions to the full planning team for review.

Step 2.c. - Set the Timeline and Milestones

The planning team will need to establish a clear timeline for the development of the plan with critical milestones defined throughout. Working back from the expected due date of the plan and identifying target points for completion of certain activities and progress measures will keep the planning team on track. The *2009 New York State Energy Plan* schedule of events illustrates a 20-month timeline with specific dates for planning board meetings, public comment periods, and interim and draft plan report submissions.[7] Development of the 2014 Rhode Island State Energy Plan is expected to take approximately 16 months from the time data collection and research commences through the adoption of the plan in March 2014.[8] The timeline for every state will be different depending upon the states' resources, priorities, and needs. As stated earlier, many of these steps occur in parallel. A Gantt chart may be an appropriate tool to establish the project timeline.

Most state energy plans are developed within three months to one year. Specific milestones may include scheduled planning team meetings, data collection due dates, submission for deliverables laid out by working group, anticipated final draft date, and other key activities by date that must take place throughout the energy planning process. The steps laid out in the *Guidelines* provide a good starting point for the establishment of specific milestones.

Step 2.d. - Determine How to Manage Resources

The planning team should be aware of the resources allotted to the energy planning process and monitor the available resources carefully. Upfront consideration for the total costs and timeline associated with each milestone (e.g., contractor costs to perform projection analysis for one month or marketing and outreach expenses over three months) will promote the efficient use of resources. Keep in mind that resources also include required staff if employees of state agencies or planning team member organizations take the lead. Identifying a planning team member to serve as treasurer or accounting director may improve the tracking of resources and budgets.

The next section outlines the collection and analysis of energy data and projection of future energy needs to provide a foundation for the scope, objectives and goals of the state energy plan.

7 2009 State Energy Plan Schedule of Events. New York State Energy Plan. Date accessed January 31, 2013. http://www.nysenergyplan.com/2009events.html

8 The 2014 Rhode Island State Energy Plan was not the version of the Rhode Island Energy Plan that was included in the report, *State Energy Plans and the Implications for Energy Markets.* Office of Energy Resources, State of Rhode Island. October 2012.

Step 3: Collect and Analyze Data and Project Future Energy Needs

Step 3 outlines the critical data sets that will lay the foundation for the state energy plan. The remainder of the energy planning process is based on this critical step. Analysis of this information will allow the planning team to consider options within realistic parameters and set benchmarks for measuring progress.

Following the data collection is the assessment of the state's future energy needs based on projections of population; energy demand, supply, and price; and economic growth. It is incumbent upon all planning team members to ensure that the plan is based upon proven facts and statistically valid methodology. This section explores the collection and analysis of these projections, so the planning team can begin to understand the state's future energy needs, in the following substeps.

Step 3.a. - Collect and Analyze State Energy Data and Statistics

Step 3.b. - Collect and Analyze Projections of Future Energy Needs

Step 3.a. - Collect and Analyze State Energy Data and Statistics

The planning team should collect and analyze baseline data elements to establish a starting point and answer the following questions.

- What other energy-related plans and policies exist at the state level that can be leveraged by the state energy plan?
- What is the current profile of the state's energy resources, industry figures, and workforce and intellectual capacity?

States often use a state agency, research entity (e.g., university, non-profit), or a consultant to conduct this analysis. While this step may seem overwhelming in terms of the breadth and depth of the data that must be reviewed, keep in mind that specific entities within the state—including the State Energy Office[9] and public utility commission[10]—monitor and track this data regularly. Relying on these established and informed agencies can help to reduce the resources expended by the planning team.

The planning team should review previous energy plans and other state-level plans that contain elements commonly addressed in a state energy plan, including environmental plans, such as a climate action plan or state implementation plan; transportation plan; economic development plans; land use plans; end-use specific plans (e.g., an industrial or commercial buildings efficiency plan); topic-specific plans (e.g., a solar roadmap); and the energy assurance or security plan.[11] Knowing

9 Visit the National Association of State Energy Officials (NASEO) website for contact information for each state and territory energy office. State and Territory Energy Office Members, National Association of State Energy Officials. Date accessed, December 3, 2012. http://www.naseo.org/members/states/default.aspx.

10 Visit the National Association of Regulatory Utility Commissioners (NARUC) website for contact information for each state's regulatory commission. Regulatory Commission, National Association of Regulatory Utility Commissioners. Date accessed, December 3, 2012. http://www.naruc.org/Commissions/.

11 Following on a point made above, a comprehensive state energy plan is intended to be separate from a state's energy assurance, energy emergency preparedness and response, or energy management plan. While some measures to deal with energy volatilities may be considered as part of a comprehensive energy plan, energy assurance planning is more focused on building a more resilient critical energy infrastructure system that can

more about the plans that already exist can highlight gaps across the plans, reinforce cross-sector state priorities, and ensure that the state is communicating their priorities in a consistent manner.

The planning team should then evaluate state (and in some cases local) energy-related policies and programs already in place. This will include statewide laws and funding for energy programs, such as energy efficiency or renewable energy portfolio standards, and other relevant regulations (utility commission), statutes, codes, executive orders, etc.

The program initiatives of the various state and local agencies with purview over energy or related areas may also serve as a useful basis for the energy planning process. If the appropriate state entities are included on the planning team, the collection—or awareness and knowledge—of these agencies' programs will be readily accessible. Identifying the resources at this level can serve as a potential advantage point for the plan's goals and recommended actions later in the planning process. Local government entities may also have high quality/highly granular data that could inform the planning process.

The planning team may want to review utility plans (e.g., integrated resource plans) to identify any associated opportunities. These plans may or may not be readily available depending on the public nature of the entity. The state's public utility commission may be a useful point of access for the regulated utility information.

As the factors that affect energy production and consumption are global in nature, the planning team should examine national and international energy forecasts. At a minimum, the most current Annual Energy Outlook and International Energy Outlook produced by the Energy Information Administration should be reviewed.[12]

Following the energy-related review of programs and policies, the state will want to outline the industrial and intellectual capacities of the state. This includes an assessment of primary industries (e.g., mining, manufacturing, transportation, agriculture, financial, service) that may be impacted by or affect the energy sector. The intellectual capacity evaluation includes a review of laboratories, research institutions, universities, entrepreneurs, and other entities whose mission it is to promote technology development, create markets, promote investment, and commercialize products. The state energy plan can serve to encourage industry, technology, and investment growth, so a careful review of these capacities is important. Assessing the state's industry and intellectual capacities will help to ensure that the potential opportunities that exist in these areas are considered as part of the plan.

Next, the planning team should begin to collect hard data of the state's energy profile, including statistics about the energy usage by sector and end user, energy prices and expenditures, fuel imports and exports, transmission and distribution infrastructure, generation, and production. Much of this is available by state and territory on the U.S. Energy Information Administration (EIA) website. This is another key point at which a State Energy Office, Public Utility Commission, or other state agency (e.g., emergency management) can contribute, given their responsibility for tracking and monitoring energy data. NASEO and the Kentucky Department for Energy Development and Independence

adapt to or recover from an energy disruption or emergency event. Both planning frameworks are crucial to the states' security and public welfare. States may want to consider cross-referencing the plans. State Energy Assurance Guidelines, National Association of State Energy Officials. December 2009. www.naseo.org/energyassurance.

12 See: AEO2013 Early Release Overview at http://www.eia.gov/forecasts/aeo/er/
See International Energy Outlook 2011 at: http://www.eia.gov/forecasts/ieo/

(DEDI) offer a state energy data profile service that provides states with relevant energy, environmental, and socioeconomic data from state and federal government agencies in one concise report. All of this data will provide the planning team with a clear and comprehensive account of the state's energy profile on which to base the energy plan's goals and recommended actions.

Environmental information (e.g., emissions data) should be collected as well. Technical tools, databases, and software for modeling environmental conditions are available through the EPA. The EIA also tracks some environmental data (e.g., annual emissions of carbon dioxide in the electric power industry by state). However, the state environmental or air agency generally monitors and has access to this information and can provide the necessary data elements available to the planning team.

Corporate commitments of entities within the state may offer potential opportunities to consider within the plan. Typically, these types of energy pledges are shared publicly through a major corporation's website.

Based on the data collected, the final stage is to conduct a gap analysis to identify where the state might be able to make better use of its resources and capabilities. This is the starting point for the development of the goals in the state energy plan.

Below are a number of resources for states to evaluate in the development of the data analysis.

Table 2. Resources for Energy and Emissions Data

EIA State Energy Data System	Included are maps and references to information and data on state energy use, prices, and expenditures, and the capacity and throughput of the states' energy infrastructure.	http://www.eia.gov/state
DSIRE	This website is a comprehensive source of information on state, federal, local, and utility incentives, and includes policies and regulations that support renewable energy and energy efficiency.	www.dsireusa.org
EPA Technical Tools, Databases, and Software	This webpage includes environmental and consumer information, as well as test methods, guidelines, and EPA models used to measure the presence of physical and chemical pollutants.	http://www.epa.gov/epahome/data.html
NASEO and Kentucky DEDI State Energy Profiles	Through this webpage, NASEO offers customized State Energy Data Profile publications that summarize relevant energy, environmental, and socioeconomic data.	https://www.naseo.org/stateenergyprofiles

Table 2. Resources for Energy and Emissions Data

NCSL State Legislative Information Database	This database contains information gleaned from the home pages and websites of the 50 state legislatures, the District of Columbia and the Territories.	http://www.ncsl.org/about-us/ncslservice/state-legislative-websites-directory.aspx
NGA Clean Energy Actions	Through this website, the NGA Center continually tracks and profiles state clean energy actions to help states identify promising actions and best practices. This information is compiled in reports and data tables and presented in webinars and conference calls.	http://www.nga.org/cms/home/nga-center-for-best-practices/center-issues/page-eet-issues/col2-content/main-content-list/state-clean-energy-actions.html
EPA eGrid	The Emissions & Generation Resource Integrated Database (eGRID) is a comprehensive source of data on the environmental characteristics of almost all electric power generated in the United States.	www.epa.gov/egrid
EPA, Air Markets Program Data	The Air Markets Program Data tool allows users to search EPA data to answer scientific, general, policy, and regulatory questions about industry emissions.	http://ampd.epa.gov/ampd/
EPA, GHG Reporting by Facility	Comprehensive greenhouse gas data reported directly to EPA from across the country are accessible to the public through EPA's GHG Reporting Program.	www.epa.gov/ghgreporting/

This data collection effort will be combined with the projections developed in the next step to formulate a complete perspective of the state's current and future energy needs. With this package of information, the planning team can begin to outline an educated and informed series of objectives, goals, and actions that will aim towards meeting the state's future energy needs.

Step 3.b. - Collect and Analyze Projections of Future Energy Needs

The planning team should also collect and analyze the projections of future energy needs.

Collecting this information or performing this assessment may seem difficult given the scope of potential data items. However, states may consider having a state agency (e.g., the State Energy Office) or a contractor complete this step to provide a compilation and analysis of the projections. Some of the projection data elements suggested below will be readily available. Other data will require collection that is more systematic or analysis.

Factors that affect the state's electricity demand include those derived from economic and demographic forecasts. The state's economic development agency likely will monitor the economic data points. Demographic data are available through some state agencies and the U.S. Census Bureau.

Assessing the state's energy needs and impacts can be based on projected electricity and transportation fuel production and consumption patterns separated by source or end-use sector. The factors that influence the projections will include energy availability and price expectations, environmental impacts, and air models. States may consider developing projections based on different assumptions to identify sensible pathways forward within the energy plan. Moreover, states may explicitly want to identify the impacts of the proposed pathways on air quality. Including an analysis of the emissions impacts of the options to meet future energy needs will strengthen the energy planning process.

Some utility and supplier data will be useful in this process. Electric utilities may be required to file sales and demand forecasts with the public utility commission. The planning team should review, if possible, the projections and assumptions the utilities and suppliers are utilizing for defining their planning efforts. If these types of entities are part of the planning team, this will be a much easier task. Some of this data may not be readily available to protect competition; however, most will be willing to share some version of energy forecast.

Studies of "energy potential" should also be developed for various energy resources, including energy efficiency. Often, existing studies can be drawn upon or updated. These studies of the potential for energy efficiency, renewable energy, and conventional fuels will help shape the assumptions used in the planning process. The report *Advancing Energy Efficiency in Arkansas: Opportunities for a Clean Energy Economy (March 2011)*[13] is an example of such an efficiency study. Studies regarding transmission and distribution of energy or industry forecasts provide data to consider as well.

The analysis of the state's existing energy profile and projected energy needs will provide the data necessary to make informed decisions about the direction of the state energy plan. As is evident, the data collection and analysis process for state energy planning is extensive. Vermont and New Hampshire utilized a consultant to perform statistical energy and scenario modeling to develop the states' near- and long-term numeric goals and the supporting policy and programmatic recommendations included in their state energy plans. The *2011 Vermont Comprehensive Energy Plan* also included the projected economic impact of the modeled electricity policies recommended within the plan. Economic impacts should be part of the cost-benefit or risk management framework that a state employs in the course of developing a state energy plan.

The following resources provide insightful information on energy forecasting.

13 Neubauer, Max et al. American Council for an Energy-Efficient Economy. March 2011. http://aceee.org/research-report/e104

Table 3. Resources for Potential and Reserve Studies

Eastern Interconnect State Planning Council Studies	Through this online workspace, information can be found on how to evaluate transmission development options throughout the eastern interconnection.	http://communities.nrri.org/web/eispc/community-home-and-charter
EIA Analysis and Projections (by state, covers all fuels and electricity)	This webpage provides analytical information and projections regarding a number of fuel types, including coal, natural gas, and nuclear, among others.	http://www.eia.gov/analysis/
Guide for Conducting Energy Efficiency Potential Studies	This guide provides assistance to state officials, regulators, and legislators by identifying applications and examples for energy efficiency potential case studies.	http://www.epa.gov/cleanrgy/documents/suca/potential_guide.pdf
Renewable Energy Technical Potential	Through this webpage, information (including maps and data) can be found on renewable energy technical potential across the nation.	http://www.nrel.gov/gis/re_potential.html
U.S. Bureau of Labor Statistics	This website provides information on employment rates, inflation and prices, productivity, and statistics, among others.	www.bls.gov
U.S. Census Bureau	This website provides information on everything from market adsorption and economic indicators to residential sales and business inventories.	www.census.gov
U.S. Crude Oil, NG, and NG Liquids Proved Reserves	In this report, detailed information can be found on crude oil, natural gas, and natural gas liquids proved reserves, as of 2010.	http://www.eia.gov/naturalgas/crudeoilreserves/pdf/uscrudeoil.pdf

The next section walks through the collection of public input and feedback to engage the state's citizens in the development of the state energy plan and encourage public support.

Step 4: Develop the Vision for the State Energy Plan

As discussed in Step 1, the initial prompt for the development of a state energy plan – through an executive order, legislation, or other means – may establish a scope or vision for the state's energy future. Based on the data and projections, the planning team should assess whether this scope is realistic and if any amendments are necessary (or possible). Otherwise, the planning team will develop the vision statement(s) for the state energy plan. This step provides considerations for the planning team in creating a vision for the plan.

A focused vision statement or statements will reflect the overall objective of the plan. A reflective example of a concise vision statement is included in Vermont's 2009 Comprehensive Energy Plan where the policy priorities were presented in one sentence: "*Through this Plan, we intend to manage the continuing transition from traditional energy fossil fuel to cleaner energy supplies in a manner that secures our economic and environmental future.*" The plan's policy directions or goals each correspond to that vision.

States may also consider developing multiple vision statements by energy or end-use sector. Some states avoid this approach, however, to prevent the perception of picking winners. These states instead focus on thematic priorities, such as the approach of the Wyoming governor to address economic competitiveness, energy efficiency, expansion and diversification, efficient and effective regulation, reclamation, mitigation, education, and innovation and new technologies.

Keep in mind that the vision for the plan should reflect the outlook for the plan (i.e., is the state considering a 5-year, 10-year, or 20-plus-year outlook?). The reality of particular energy resources and markets is such that certain actions may not be possible within a shorter five-year timeframe, for example.

Based on NASEO's analysis, vision statements often address the state's broad and overarching priorities for the energy sector and include variations of or some combination of the following examples of declarative statements.

- **Demonstrate state leadership.**
- **Expand economic opportunities.**
- **Encourage investment.**
- **Save taxpayers money.**
- **Lead in research and development.**
- **Reduce the environmental impacts of energy use.**
- **Lower energy costs.**
- **Capitalize on emerging technologies.**
- **Ensure affordability and reliability.**
- **Reduce risks and vulnerabilities.**

- **Increase security, reliability, and resilience.**
- **Enhance use and production of domestic resources.**

The vision is the guiding statement or set of statements that drive the remainder of the plan's development. The goals and recommended actions are intended to align with and support the overall vision. The next step in the *Guidelines* reviews the significance of public involvement and provides approaches to consider in the solicitation of public input and feedback.

Step 5: Garner Public Input and Feedback

One of the most critical actions in the state energy planning process is that of public communication, which includes both outreach and feedback mechanisms. In fact, this step often is required. Communication will elevate the visibility of the plan, attract valuable input from energy consumers, facilitate public support, and improve government transparency and accountability. As noted in the section about stakeholder involvement, broad acceptance for the state energy plan is essential to reinforcing it as the primary energy strategy for meeting future energy needs. This section addresses organized and facilitated public engagement. Such engagement allows the public voice to be heard on the policies, programs, and solutions they hope the state will include in the comprehensive energy plan.

The approach to public communication will vary by state in terms of when the outreach is conducted throughout the energy planning process. Some states may choose to get public input before drafting the goals and action items. Other states wait until a final draft is available to request public feedback. Often, states employ a combination of these approaches to engage the public throughout the process. Increasingly, states are using an online format to collect public input; however, there are still many states that hold in-person public input forums at various locations throughout the state. The budget will affect this decision, as holding multiple in-person public forums can be costly.

Typically, states that hold public forums limit them to a specific number (generally three to four) across the states in key areas that provide for a broad range of input (e.g., from urban and rural areas). A representative from the planning body (e.g., the chair or lead agency director/staff) can provide opening remarks about the plan's purpose, vision, and intended goals. Certainly, some states go beyond what is typical. The EmPower ND Commission, a 14-member commission appointed by then-Governor Hoeven with representatives from all sectors of the energy industry, held seven public meetings throughout the states following the initial meeting of the commission. States sometimes choose to separate the forum participants into small groups to engage in topical discussions. A recorder should be on hand to capture the comments in a format that allows the planning body to deliberate over them later.

Announcements informing the public about the details of the public forums—dates, times, locations—often are distributed through local media, online news sites, and state agency communications. In order to prepare for the forums in terms of public participation, states often choose to request web-based registration and comment submission prior to the events. Building relationships with local government contacts can help raise awareness of these meetings among their constituents and will bolster the public input process.

States may consider using the topical working groups established under the planning team as a means for soliciting and tailoring input. The input can be provided as part of the recommended actions the working group offers to the whole planning team.

A summary from each of the public forums or a compendium of all public input can show how the recommendations collected were incorporated into the final plan. The summary can be distributed on the state energy plan website. In doing so, the planning process becomes more transparent and credible.

Broader public outreach might include an information campaign that can help facilitate active

public participation, heighten awareness, and foster understanding of energy issues. Multiple types of outreach and communication strategies can be employed to support public involvement in the plan's development. Open educational events, tailored outreach (e.g., public transportation summits that promote alternative fuel and gasoline reduction measures), public training events, and workforce development opportunities that align with the plan's vision and goals, will offer a comprehensive public engagement approach. Factoring in the costs for these types of outreach is also a key component of the budget for the energy planning process.

The next step in the energy planning process is to develop the goals and recommended actions to align with the vision. The next section provides insight into the development of goals and recommended action and policy options to achieve the vision laid out for the plan.

Step 6: Outline Goals and Recommended Actions to Meet the Vision

The next step is for the planning team to determine the goals and recommended actions that will direct the state towards meeting the energy needs and vision. This step forms the substance of the state energy plan. The substeps address how states should establish goals and define recommended actions to meet those goals as part of the overall vision for the plan.

Step 6.a. - Establishing Goals

Step 6.b. - Developing Recommended Actions to Meet Each Goal

States can use the **"SMART"** goals checklist to ensure that each goal meets the defined criteria of being "specific, measurable, attainable, realistic (relevant), and timely" as described below.

- **Specific:** Identify who is involved and what should be accomplished and within what timeframe.
- **Measurable:** Establish goals that are quantifiable and capable of measurement to allow for the tracking of progress.
- **Attainable:** Create goals that are actionable and achievable and answer how the goal will be accomplished.
- **Realistic:** Set a realistic goal that the state is willing to work toward and able to achieve. The goal should also be relevant and worthwhile.
- **Timely:** Ground each goal within a practical and certain timeframe.

Section IV in these Guidelines, *Supplemental Policies and Programs,* provides NASEO's suggested topic areas and recommended actions for the planning team to consider in developing state energy plan goals. The *Supplemental* section also offers key information to include as part of each goal and recommended action. While the *process* of state energy planning is the focus of this document, the *Supplemental* section outlines specific considerations in the development of strategic goals and actions.

As the states move through the development of goals, they organize their goals and recommended actions in various ways. For example, goals can be separated into short-, medium-, and long-term time horizons to make the plan more manageable. Typically, goals and recommended actions fall into a few general categories in terms of implementation, such as:

- **Requirements (e.g., executive orders, legislation);**
- **Regulatory actions; and**
- **Program development (e.g., establishes an energy education program, create a revolving loan fund).**

Some states choose to arrange their recommended actions by implementation measure, suggesting specific executive, legislative, agency, or private-sector actions. For action items that require

financial support to implement, a specific financing mechanism should be designated to address how the implementation of that goal or action will be covered. Possible financing mechanisms to consider are addressed later in this section to address the "first-cost" issue of paying to implement a particular type of action.

Step 6.a. - Establishing Goals

State energy plan goals tend to be high-level directives in support of the overall vision. Examples of state energy plan goals are provided below.

- **Generate 50% of the state's electricity needs from renewable and alternative energy sources by 2025 (2010 Alaska Energy Pathway).**
- **Reduce State government energy consumption by 20% by 2012 (2007 Colorado Climate Action Plan).**
- **By 2025, 50% of Kentucky's coal-based energy facilities will be equipped with carbon management technologies (2008 Intelligent Energy Choices for Kentucky's Future).**

The planning team should develop a detailed narrative explaining the rationale for each goal. The narrative for each goal should define the objective, timeline and milestones, and baseline.

- **Objective:** Identify the purpose of the goal and how the goal helps achieve the vision(s) for the plan.
- **Timeline and Milestones:** Establish a general time/date by which the goal should be met with any relevant target dates up to the final date of completion.
- **Baseline:** Establish a starting point for each goal. This will serve as a comparison point and help gauge progress when the plan undergoes review.

Federal programs may support some of the goal setting in state energy plans. For example, the U.S. Department of Energy administers the U.S. State Energy Program, from which each state derives formula funding to support their state-identified energy priorities. This is the only cost-shared program administered by the U.S. Department of Energy that provides funds directly to the states for the governor-designated state energy office to allocate in designing and implementing energy efficiency and renewable energy programs and demonstration projects. The U.S. Environmental Protection Agency and Federal Energy Regulatory Commission are two additional federal entities that states interact with in the energy sector that may directly affect comprehensive energy planning efforts from a program and regulatory perspective. Leveraging the federal policy drivers and programs that apply to the state's policy priorities is an effective way to enhance state-federal collaboration.

Step 6.b. - Develop Recommended Actions to Meet Each Goal

Once the goals are established, the planning team establishes the recommended policy and programmatic actions to meet those goals. Recommendations should include detailed action plans and milestones for implementation. Where possible, responsibility for implementation of each rec-

ommendation should be assigned to a state agency. Each recommended action will outline particular funding mechanisms and measurement criteria to ensure the action is financially supported and tracked.

The planning team should also focus on barriers to completing the recommended actions to build adaptability into the plan. The planning team may focus on accommodation for emerging technologies, evolving consumer behaviors, possible environmental hazards, transmission challenges, and unpredictable supply, demand, and pricing issues. The estimated health, air quality, and economic benefits of the recommended actions may also be presented in the plan.

The next step addresses the outline of a state energy plan. This is where the states "put pen to paper" and draft the energy plan.

Step 7: Draft the State Energy Plan

While these Guidelines in total provide direction for states in the overall development of an energy planning process that ultimately concludes with the creation of a state energy plan, this section provides a general outline for the actual written state energy plan document. The content of a state energy plan will be unique to each state's forecasted energy needs and constraints, as well as state-specific political, economic, and social drivers. Although the state plans differ in the specific vision, goals, and recommended actions, the following general content considerations can be applied to any state energy plan (see Figure 3).

Figure 3. General Outline for a State Energy Plan

Following is a brief description of each state energy plan's content.

- **Executive Summary.** Two to three pages at most that capture the essence or vision for the state energy plan. The executive summary should include the topic areas the plan covers as well as the stakeholders involved in the planning process.
- **Scope and Purpose.** Provide an introduction that outlines the range and overarching goals of the state energy plan and sets expectations for the reader.
- **Current Energy Profile, Policies, and Programs.** Describes the current energy profile of the state (e.g., characteristics of energy production, consumption data, prices and expenditures, import/export overview). This presentation should include clear graphs showing these facts, as well as projected production and consumption trends based on work completed early in the planning process. Assess existing policies and programs, including a review of their costs and benefits.
- **Future Projections and Needs.** Address the energy forecast models used to warrant the recommended actions suggested to meet the plan's goals. Document assumptions and key variables that may affect the projections.
- **Vision.** Describe the vision in detail so that it depicts clearly the result foreseen once all elements of the state energy plan are adopted and implemented. This section must indicate how the state energy plan's recommendations harmonize with all current, applicable energy plans, policies, programs, laws, executive orders, and trends.
- **Goals and Recommended Actions.** Include a complete list of the goals and recommended actions being offered in the plan organized by responsible entity (e.g., legislature, specific state agency), and corresponding goal, energy type, or end-use sector. The recommended actions should follow the "SMART" framework (see page 35). The Supplemental Policies and Programs that are provided beginning on page 48 offer options for states to consider including in their plans.
- **Implementation and Timeline.** Establish an implementing agency or strategy for the goals and recommended actions. Include milestones and duration to set an end date by which each should be accomplished.
- **Financing Mechanisms.** Determine the "pay-for" strategies for the goals and recommended actions to ensure that the plan is financially sustainable.
- **Evaluation and Measurement Strategies.** Clearly explain measurement strategies and identify metrics to quantify and capture progress in the state energy plan implementing process. Include specific metrics that will be used to gauge success in implementation of each goal and each specific recommendation. This section should also clearly define responsibilities and assign leaders to implement each of the state energy plan's specific recommendations.
- **Challenges and Solutions.** Focus on specific barriers to completing the goals outlined in the energy plan, such as the accommodation for emerging technologies,

evolving consumer behaviors, possible environmental hazards, regional transmission challenges, and unpredictable supply, demand, and pricing issues. Address potential solutions to dealing with those issues.

- **Summary.** Provide a summary section to describe highlights of the state energy plan, plus commitments to report on implementation of the plan, procedures for modifying the plan, and a projected cycle for updating the plan.
- **Glossary.** Include a glossary of terms and abbreviations used in the plan.
- **Acknowledgements.** Provide acknowledgements of contributions for the creation of the plan, including recognition of the lead planner, planning team, and/or advisory team.
- **Appendices.** Include appendices, such as data sets used, staff analyses performed in constructing specific state energy plan recommendations, complete documentation of assessments performed or used in the preparation of the state energy plan, etc.
- **References and Resources.** Provide the list of references used in the development of the plan. Also, provide any resources that support the plan.

Step 8: Finalize and Adopt the Plan

This step focuses on the finalization and adoption of the state energy plan. Typically, the planning team will complete the written state energy plan and present it to the appropriate authority (e.g., governor, legislature) for approval. In some states, this will trigger a series of follow-on actions that will vary across states. Regardless, the most critical part of this step is to gain approval from the state authority in order to initiate implementation of the state energy plan.

Concerning follow-on actions, the statute authorizing the New Jersey Energy Master Plan, for example, requires the planning team to provide copies of the state energy plan to the governor and members of the legislature, advertise the existence of the plan in local media, and hold a series of public hearings. The planning team will then consider the testimony provided at the public hearings and modify the plan accordingly. Once the planning team adopts the plan, the final version is submitted to the governor and legislature.

The planning team will respond to any final questions and defend the plan as needed. Because the authority is likely to have received updates throughout the planning process, the hope is that this step happens relatively quickly (depending on the state's requirements and associated timeline for approval). Once approved, the state energy plan should be made publicly accessible.

The next step describes the outreach and marketing aspects of the planning process to elevate recognition for the plan and distribute it broadly.

Step 9: Conduct Outreach and Marketing

Once the state energy plan is approved, the state will provide it to key stakeholders, state agencies, local governments, businesses, industry, the media, and the public. The development of an overall outreach strategy will help the state to tailor its information to the target audiences and build local understanding and support for the plan.

In some cases, the planning team may take some additional time at the end of the development process to create the state energy plan in various formats to accommodate widespread dissemination of the plan across multiple media outlets (e.g., version of record, press release, video presentation). Regardless of the format, states may want to consider using colorful charts, graphs, illustrations, diagrams, flowcharts, and graphic content to communicate final version(s) of the state energy plan visually and professionally.

Another option for building commitment and support of the state energy plan while presenting a polished product is to host local events to showcase the plan and the recommended actions. These events can be held in various locations throughout the state or in the state capital. The planning team may consider selecting a spokesperson(s) for the state energy plan marketing campaign and presentations. This spokesperson should hold a key role in the development of the state energy plan and be knowledgeable in the various energy issues presented within the plan.

Creating a website to report on the progress of the state energy plan helps to create an all-inclusive and transparent approach to its development and implementation. In addition to print, web, and television, states may consider hosting a series of community meetings throughout the state as a "road show" to unveil the finished product. As mentioned earlier, such public outreach may be required by legislation or statute. Community events help to build interest and commitment to implementation of the plan's various measures.

The extent of the outreach strategy will depend on the state's planning budget. For limited budgets, a website is the most cost-effective form of communication. New York State Energy Planning Board, responsible for conducting the planning process, is also tasked with tracking the progress and recording milestones met in the implementation of the *New York State Energy Plan* on a public website, www.nysenergyplan.com.

The next section lays out how the state can monitor the implementation progress of the state energy plan.

Step 10: Monitor Progress and Update the Plan

Following the release and distribution of the energy plan, the state should continue evaluating, tracking, and monitoring its progress. Before the plan is released, the planning team or assigned lead agency (e.g., the State Energy Office) should be tasked with the tracking and monitoring of the state energy plan.

As part of the planning team's responsibilities, a specific outline should be developed to evaluate the implementation and progress of goals and actions against the established timelines and measurement criteria. If the goals and action items were appropriately set up, each will include verifiable metrics to ensure the implementation and progress can be clearly measured.

- **Measuring progress and implementation:** Progress can be measured in a number of ways—jobs created and retained, increases in state revenue from energy-related activities, energy savings, number of new installations, reduced greenhouse gas emissions, etc.
- **Process for collecting data:** The process by which data is measured, collected, and summarized should remain consistent in all monitoring efforts to ensure reliable progress reports and accurate success metrics. For example, if data on energy savings from public buildings is first collected and analyzed using a mechanism such as Portfolio Manager, all energy saving data should be collected using that same performance assessment tool.
- **Reporting protocol:** The progress on implementing the state energy plan should be reported consistently using a standard format and periodic reporting cycle (e.g., every two years).

States across the country recognize the importance of monitoring progress made to implement their state energy plans and of updating the plans as necessary. The *Rhode Island Energy Plan 2002* directs the State Energy Office to develop and implement a measurement and evaluation plan independently of the Energy Plan. The measurement and evaluation plan is to consist of an annual energy savings report on its energy programs to track the response of government agencies within Rhode Island to the recommendations of this plan.

Publicly reporting on the progress of the state energy plan measures and implementation efforts will help to build accountability and transparency. This progress can be displayed through the state energy plan public website that tracks and monitors the plan milestones, timelines, and progress reports. Minnesota's *2001 Energy Planning Report* includes a chapter titled, "Legislative Changes in 2001: How They Relate to Energy Challenges."[14] The chapter is a summary of the way in which legislation passed in the 2001 legislative session relates to the three main energy obstacles addressed in the state energy plan. A state energy plan should examine the policies and programs effectuated by other branches or agencies of state government, as these are statewide plans and energy production and consumption are affected by multiple facets of government. Energy initiatives by local governments, in aggregate or for larger municipalities, may also be considered when monitoring the progress and updating a plan.

14 NASEO State Energy Plans Database. http://www.naseo.org/stateenergyplans/MN.pdf

Another public outlet to highlight the plan's progress is a state press release distributed by the planning team or governor. Periodic press releases can showcase successful implementation of the state energy plan and resulting benefits (e.g., number of jobs created, energy savings, new construction, advances in emerging technologies). This not only serves to alert the public to the successful implementation and progress of the state energy plan while also reigniting future stakeholder buy-in and support, but also highlights the legacy role of the state energy plan and keeps the roadmap timely and relevant.

The planning team or lead agency may need to modify the plan as result of the tracking of the state's progress and implementation toward meeting the goals and action items. If the state has not met or needs to adjust certain goals or action items, there should be a clear process for making necessary modifications.

Prior to the plan's adoption and release, the planning team should establish a transparent process for modifying and updating the plan. This is the point at which the energy planning process comes full circle. A cyclical energy planning process requires review and revision of the plan at regular intervals. Regular updates will ensure that the plan adequately reflects current realities and the states evolving energy objectives and needs.

The process for reviewing and amending the plan should include both necessary *ad hoc* modifications depending on changing circumstances (these can also be considered mid-course corrections) in addition to regular periodic updates. NASEO's analysis found that in many states the enabling legislation for the development of the state energy plan requires review at regular intervals (e.g., every two years).

The California Energy Commission is required to prepare a biennial integrated energy policy report (IEPR) for the governor and legislature as an update to the energy plan, with progress reports due in even years. The IEPRs keep the Energy Action Plan (EAP) process active and current. The EAP is intended to capture recent changes in the policy landscape and describe intended activities to accomplish those policies. In Oregon, the state Department of Energy is required to review, present findings to the state legislature, and write updates for the State of Oregon Energy Plan every two years.[15]

Elements that should be incorporated into the process for modifying and amending the plan include the following:

1. **Assigning responsibility for the review and update of the state energy plan to the most appropriate state agency as the lead and sub-agency (ies) as support.**

2. **Evaluating the effectiveness of the state energy plan overall to assess whether the overarching objectives and goals are still relevant to the state's current energy landscape, capabilities, priorities, and needs.**

3. **Updating the state energy plan according to the following considerations:**

15 Oregon adopted the *10-Year Energy Action Plan* in December 2012. However, the *State of Oregon Energy Plan* was the plan included in NASEO's analysis. http://www.oregon.gov/energy/Ten_Year/Ten_Year_Energy_Action_Plan_Final.pdf.

- **Verified energy data based on recent tracking and monitoring;**
- **Current state energy policies and any recently enacted policies, laws, or regulations impacting the energy sector; and**
- **New state energy goals, priorities, capabilities, and resources.**

4. **Engaging stakeholders and the public to ensure continued acceptance of the state energy plan.**
    - **This may include periodic meetings with stakeholders and the public to report on progress and solicit feedback on the plan to reflect the state's current energy landscape.**
5. **Adopting the updated plan with endorsement from state leadership.**

The method for modifying and updating the state energy plan should recognize the variability in the energy sector. The state's energy needs, uses, resources, and capabilities will advance over time and raise the need for new and different responses and actions. This is where the justification for a flexible state energy plan is most evident. Depending on the state's planning process, this step often completes the cycle and triggers it anew as the plan is monitored and updated according to the state's energy profile, external factors influencing the plan, and assessment of future energy needs.

III. CONCLUSION

Comprehensive energy planning is an important step in securing an energy future that is sustainable from environmental, economic, and social perspectives. A well-structured energy plan can help manage some of the risks associated with market volatility as well as natural and manmade threats to the nation's infrastructure. At the same time, energy planning can provide the basis to catalyze positive change – bringing disruptive technologies to market and capturing the societal benefits embedded in efficient energy production and consumption.

State energy planning is an ongoing and collaborative process. As outlined in this document, an effective energy plan requires input from multiple stakeholders, strong leadership to bring the plan to completion, and iterative process that allows for public feedback. Through the Guidelines, NASEO hopes to institutionalize and formalize the process of state energy planning. States without an energy plan and those with existing energy plans can use this document to inform and enhance their efforts.

As part of the Guidelines, NASEO compiled a Policies and Programs Supplemental (see page 54) that covers policies and programs for a state to consider during the state energy planning process. The policies and programs presented in the supplemental focus on demand-side energy management and customer-sited generation technologies. These policies and programs are not a comprehensive list of the actions states can take, but include strategies that many states have found to have had an impact and that are widely applicable across states.

In 2014, 26 states had active energy plans and 18 were updated or developing new plans. From this collection of state energy plans, there is an opportunity to draw out trends and priorities that could inform a national dialogue on meeting the country's future energy needs. The state energy plans provide an initial point of reference for items that could be included in a national energy strategy.

Successful implementation of a state energy plan is dependent on its comprehensive and strategic development. Utilizing the steps and considerations outlined in the Guidelines —development of a strong planning team, collection of appropriate data, establishment of targeted and quantifiable goals and actions, communication with the public, and measurement of progress—are critical to an effective and meaningful state energy plan.

IV. SUPPLEMENTAL POLICIES AND PROGRAMS

Introduction

For decades, states have exhibited leadership in creating and operating energy efficiency and cost-effective renewable energy policies and programs. Transportation and energy assurance initiatives provide additional avenues through which a state may achieve its economic, security, and environmental goals. A well-designed state energy plan includes a broad scope of resource strategies to meet a state's energy supply and demand needs while advancing economic development. Policymakers and stakeholders have an opportunity in the state energy planning process to review and evaluate the efficacy of existing policies and programs, to identify ways in which they might be improved, or to design new ones to maximize a state's energy productivity and to generate growth in industries and jobs.

This supplement to NASEO's *State Energy Planning Guidelines* covers policies and programs for a state to consider during the state energy planning process. Given this significant opportunity, the strategies presented herein focus on demand-side energy management and customer-sited generation technologies. The following recommended policies and programs are not a comprehensive list of the actions states can take, but rather those strategies that many states have found impactful and that are widely applicable across states. They are organized into the following six topic areas:

A. Energy Efficiency;

B. Renewable Energy Grid Integration;

C. Clean and Efficient Transportation;

D. Financing Energy Efficiency and Clean Energy;

E. Evaluation, and Measurement for Continuous Improvement; and

F. Energy Assurance and Emergency Response Planning.

Examples of the policies and programs outlined in this supplement highlight states' approaches to each topic area and provide the reader with examples of the design and impacts nationally or within a single state. Excerpts or language taken from state energy plans illustrate the ways in which a policy or program is codified in the plan.

Some states have significant renewable and fossil fuel resources to develop. The development of these resources should be, and typically is, considered during the process of preparing a state energy plan. However, because energy supplies such as oil and natural gas vary greatly from state to state, the majority of the policies and programs presented in this supplement speak to customer-sited generation and demand-side management activities (in the electricity and transportation sectors) that are broadly applicable to all states. Financing, evaluation, measurement, and verification (EM&V), and energy assurance programs are included, as they are activities that will influence recommendations for the design and implementation of the electricity and transportation plans. Moreover, these strategies should be considered by all states developing a state energy plan.

A. Energy Efficiency

Energy efficiency is a zero-emissions objective and a least-cost goal for meeting a state's energy needs. Implementing energy efficiency policies that encourage energy savings typically lower the cost of providing power as compared to developing new energy supplies, at about one-third the cost.[16] While most states have incorporated some energy efficiency policies and programs, the process of preparing a state energy plan provides an excellent opportunity to revisit existing policies and programs to consider refinement and expansion. For those states lacking a set of robust, cost-effective energy efficiency policies and programs, the state energy planning process offers the prospect for considering new options that can be tailored to meet their energy resource needs. Among the many energy efficiency policy and program options utilized by states and reviewed by NASEO, those that follow in this document stand out as delivering enduring energy, economic and environmental benefits.

Leading By Example

States have taken the practice of including energy efficiency in their state plans to a next level, encouraging more extensive market transformation through "Lead By Example" programs that incorporate higher energy efficiency standards in the public sector. Such programs often encompass policies and programs across many of the areas listed above. The Massachusetts Leading By Example (LBE) program establishes energy consumption reduction targets of 20% by 2012 and 35% by 2020, compared to a 2004 baseline,[17] for state-owned and state-leased buildings. The state established the program in April 2007 through Governor Duval Patrick's Executive Order 484; it contains energy efficiency requirements for both state buildings and equipment procurement.[18] For state government buildings under control of the Executive Office, all new construction and renovation projects over 20,000 square feet must meet the Massachusetts Leadership in Energy and Environmental Design (LEED) Plus building standard. In addition, all state agencies must procure ENERGY STAR qualified heating, ventilation, and air conditioning (HVAC) equipment, office equipment, and appliances.

State and municipal governments are well positioned to encourage greater market transformation through Lead By Example programs, as Massachusetts has done. For example, 51 of the 56 U.S. states and territories have set specific standards or goals for their public buildings[19]. These standards can include requiring new public buildings to achieve certain ratings as defined by ENERGY STAR, ASHRAE[20], the U.S. Green Building Council LEED , or the U.S. Green Building Initiative's Green Globes. Another approach is to require state-owned or state-leased buildings to adhere to a building energy code that is more stringent than that of the current statewide code. Procurement requirements for energy-efficient appliances and equipment, like those adopted in the Massachusetts program, are also effective policies to include as part of a "Lead By Example" program in a state's

16 American Council for an Energy-Efficient Economy (ACEEE), http://aceee.org/topics/utility-regulation-and-policy.
17 Massachusetts Energy and Environmental Affairs, Leading by Example Program, Massachusetts Office of Energy and Environmental Affairs. Date accessed, December 19, 2012. http://www.mass.gov/eea/grants-and-tech-assistance/guidance-technical-assistance/leading-by-example/.
18 Mass.gov. Date accessed, August 16, 2012. http://www.mass.gov/governor/legislationeexecorder/executiveorder/executive-order-no-484.html
19 DSIRE Rules, Regulations, and Policies for Energy Efficiency, Database of State Incentives for Renewables and Efficiency. Date accessed, December 3, 2012. http://www.dsireusa.org/summarytables/rrpee.cfm.
20 International technical society organized to advance the arts and sciences of heating, ventilation, air-conditioning and refrigeration.

energy plan. By requiring that all public agencies purchase ENERGY STAR-rated appliances and equipment, a state reduces the energy costs for taxpayer-funded buildings and encourages manufacturers to create products that meet those standards, due to the large purchasing power of state governments.

New Jersey's *2011 Energy Master Plan* states, "New Jersey will Lead By Example with an initiative to increase the [energy efficiency] of State-owned and/or operated facilities and building."[21] The plan reviews the legislation that enables the state to utilize energy service companies to upgrade state facilities and designates the State Energy Office within the Board of Public Utilities as responsible for implementation and oversight. Last, the plan encourages specific state agencies to become more engaged in demand response programs offered by third-party providers.

Public Facility Retrofits and Energy Savings Performance Contracting

A public facility retrofit program focuses on meeting specific energy- and cost- savings targets in public buildings (e.g., a 20% reduction in energy use in state-owned facilities by a particular year.). Often, these types of programs are implemented through Energy Savings Performance Contracts (ESPC), which utilize energy and other utility (e.g., water) cost savings from building upgrades to pay for the upgrades and retrofits. In ESPC projects, a state or municipal entity enters into a contract with an Energy Service Company (ESCO). The ESCO conducts a comprehensive audit of the facility and identifies building upgrades that will result in energy cost savings. The ESCO may secure up-front financing for the project or the financing may be provided by the state. The ESCO guarantees that the building upgrades will generate cost savings sufficient to pay for the cost of the retrofit project over the term of the contract. Nationwide, in 2008, public and institutional markets accounted for 84% of the ESCO industry revenues. This represents more than a 10% increase in market share from 2006, largely due to state and local government "Lead By Example" programs.[22]

Over several decades, a number of states have refined this approach to create statewide programs, which both protect the interests of state and local governments and streamline the ESPC process for ESCOs in ways that accelerate retrofits and cost savings for taxpayers. These programs are effective in helping state and municipal governments reduce energy costs, illustrate the benefits of energy efficient upgrades, and partner with the private sector to create local jobs. The Energy Services Coalition, a national educational non-profit, provides a series of program design best practices for states to consider in the development of an ESPC program.[23]

In April 2011, an Executive Order issued by the Governor initiated Minnesota's creation of the Guaranteed Energy Savings Programs, which offers public entities in the state a Master Contract for ESPCs with a goal of reducing aggregate energy consumption by 20% throughout all state agencies. Under the program, state and local entities can elect to sign a Joint Powers Agreement with the Minnesota Department of Commerce (the State Energy Office) to implement energy efficiency and renewable energy improvements offered by 11 pre-qualified ESCOs. To promote participation in the program, State Energy Office staff provide technical assistance to ensure the ESPC M&V plan is

21 2011 New Jersey Energy Master Plan. December 6, 2011.

22 Satchwell, Andrew et al. "A Survey of the U.S. ESCO Industry: Market Growth and Development from 2008 to 2011." Lawrence Berkeley National Laboratory. June 2010. http://www.naesco.org/resources/industry/documents/ESCO%20study.pdf

23 Best Practices and Tools, Energy Services Coalition. Date accessed, December 3, 2012. http://www.energyservicescoalition.org/espc/tools/index.html.

properly performed and executed, and the Energy Services Coalition Minnesota Chapter's Outreach Committee promotes the program through speaking engagements around the state.

The Colorado Energy Office (CEO) is working to transfer lessons learned from the state's public sector ESPC program to private sector entities. CEO received an SEP competitive grant in 2011 to introduce select private sector partners to the ESPC process as a means to establish and achieve ambitious energy goals and advance energy projects in their facilities. Selected participants with a utility bill of more than $100,000 a year enter into a contractual relationship with CEO and receive free project guidance and technical assistance to facilitate project completion. In addition, the participants are eligible for a subsidy of 75% (capped at $25,000) for a technical energy assessment and will have their successful projects highlighted by the CEO. To date, CEO has accepted 10 businesses to the program. The program is a practical and cost- effective way for CEO to support financing for large energy users in the state.

In 2010, voters in Georgia passed a constitutional amendment allowing the state to utilize energy savings performance contracting. The *2012 Georgia Energy Report*, authored by the Georgia Environmental Finance Authority (GEFA), includes a discussion of GEFA's activities to implement energy savings performance contracts. The plan notes that GEFA is now coordinating with other state government agencies and industry experts to develop model contract and procurement documents along with ESPC program rules and regulations.

Building Energy Codes

According to Pacific Northwest National Laboratory, the potential site energy savings from 2013 to 2040 for building energy codes under ideal adoption and compliance conditions equals 42.6 quads. Furthermore, the estimated cumulative energy cost savings potential is $330 billion.[24] Of the 56 states and territories, 46 have adopted a statewide mandatory commercial building energy code that meets or exceeds ASHRAE Standard 90.1-2004. In addition, 44 states and territories have a mandatory residential building energy code that meets or exceeds the 2006 International Energy Conservation Code (IECC). To date, nine states have adopted ASHRAE Standard 90.1-2010 and seven states have adopted the 2012 IECC, which are the most recent versions of the commercial and residential energy codes, respectively.[25] Numerous other states are engaged in the code adoption process for these more advanced codes. Since residential and commercial buildings are often in service for 50 years or more, ensuring that these buildings are constructed in accordance with cost-effective building energy codes will deliver value to both the building owners and the nation's energy system over time.

By setting robust building energy codes and encouraging compliance through incorporation into an energy plan, states can help to reduce energy consumption and energy costs for homeowners and businesses, and mitigate the economic impact of periodic energy price spikes. State building energy codes are typically developed using model energy codes as a basis, such as the IECC for residential buildings and ASHRAE Standard 90.1 for commercial buildings, and may include state-specific

24 Building Energy Codes Program: National Benefits Assessment, 1992-2040. Pacific Northwest National Laboratory. Date accessed, April 3, 2014. http://www.energycodes.gov/sites/default/files/documents/BenefitsReport_Final_March20142.pdf. Page iv.

25 Status of State Energy Code Adoption. U.S. DOE Building Energy Codes Program. Date accessed, April 3, 2014. https://www.energycodes.gov/status-state-energy-code-adoption

amendments. While several leading states to date have adopted the most current versions of the residential and commercial building energy codes, nationwide adoption of the latest building codes would achieve significant energy savings. An analysis conducted by the Alliance to Save Energy projects that if all states adopted the 2012 IECC and achieved full compliance by 2013, more than 3.5 quadrillion Btu of annual source energy could be saved by 2030,[i] which is roughly equivalent to 260 medium-sized power plants.[ii]

Once a building energy code is developed and adopted, states create procedures to ensure code compliance that results in a more energy-efficient building stock, simultaneously saving energy costs for taxpayers and building owners. This includes providing energy code training to builders, architects, and engineers. The Texas State Energy Code Training Center offers an excellent example of one state's approach to training to enhance enforcement. Through the Center, the Texas State Energy Conservation Office (SECO) provides online video training and resources for the 2009 IECC residential and commercial codes. Because compliance is typically enforced by building code or other departments in local jurisdictions, State Energy Offices often partner with local governments to improve compliance and enforcement. The New York State Energy Research and Development Authority (NYSERDA), for example, supports compliance and enforcement of the state's 2010 mandatory energy code by providing one-on-one training to code officials and delivering tailored information sessions to municipalities.[26]

The 2009 New York State Energy Plan had estimated that in 2015, energy savings due to building energy codes would total 2,158 GWh in electricity savings, 46 MW in peak demand savings, and 4,960 billion Btu in other heating fuels. Section 2.1.3 of Volume I of the plan includes an in-depth discussion of the potential impact of the building energy code, the ways in which it is implemented, and a series of recommendations to improve the code. Chapter 6*, Energy Conservation Construction Code and Appliance Standards*, which is part of the Energy Efficiency Assessment of the New York State Energy Plan 2009, goes into further detail regarding code applicability, compliance, and training.[27]

The West Virginia Energy Plan 2013 – 2017, prepared by the state's Division of Energy, includes a number of recommendations on the topic of building energy codes:

- the adoption of the 2009 IECC and 2007 ASHRAE standards for state-funded construction and public buildings;
- the appointment of an energy management specialist to the State Fire Commission in an ex officio capacity, to provide the necessary expertise and advocacy in building codes rulemakings; and
- the provision by the state of training on energy codes to homebuilders, local governments, and the building industry.

26 Energy Code Training Efforts, New York State Energy and Research Development Authority. Date accessed, December 19, 2012. http://www.nyserda.ny.gov/Workforce-Development-and-Training-Programs/Training-Information/Energy-Code-Training.aspx.

27 New York State Energy Plan. 2009 State Energy Plan Volume I. December 2009. Date accessed, August 16, 2013. http://www.nysenergyplan.com/Prior-State-Energy-Plans/2009stateenergyplan.aspx

Energy Benchmarking and Disclosure

Energy benchmarking standardizes the process of measuring building energy performance (typically in energy use per square foot) and is a proven means of motivating energy efficiency upgrades. Benchmarking allows building energy managers to track how efficiently a building uses energy over time, relative to what the building's performance would be if it was operating to a certain energy code or standard, or its performance relative to other buildings of similar size and use. Studies have shown that the majority of buildings that are benchmarked receive some type of energy efficiency upgrade. Disclosure of benchmarking results can further catalyze market transformation to a more energy-efficient building stock by driving competition and investment from the private sector.

Benchmarking and disclosure policies can apply to public buildings—benchmarking and disclosure can be a part of a state or local government's Lead By Example program—in addition to commercial and institutional buildings. When designing benchmarking and disclosure policies, particularly for privately owned buildings, it is important for State Energy Offices to engage key stakeholders: real estate owners and managers, real estate brokers, tenant organizations, utilities, utility regulators, and energy service companies. While the U.S. Environmental Protection Agency's Portfolio Manager is commonly used to benchmark facilities, government policies and programs should recognize that there is a learning curve for effective utilization.

The State of Washington's benchmarking legislation (SB 5854) is fairly unusual, in that it applies to both non-residential public and private buildings larger than 10,000 square feet (often benchmarking legislation only applies to public facilities) and requires the disclosure of benchmarking data to those involved in the sale, lease, or financing of a building. Public facilities that are benchmarked and receive a low ENERGY STAR rating (meaning poor energy performance), an initial energy audit is required. In the event that the audit identifies cost-effective energy efficiency measures, the legislation requires that the state invest in these improvements.[28]

The *2012 Washington State Energy Strategy* includes a suite of building efficiency policies to improve building energy performance and the transparency of energy use for residential and commercial properties. These policies are based on the idea that "universal disclosure of building energy use will help create demand for efficiency improvement."[29] On the commercial building side, the strategy details how the Washington Commercial Building Energy Disclosure law can be improved to emulate the City of Seattle's CB 116731, the city's comprehensive disclosure ordinance. For residential buildings, the strategy calls for electric and gas utilities to provide an annual energy report to all consumers statewide, and that the most recent version of this report be disclosed to prospective home buyers or renters.[30]

Appliance Standards

Appliance standards, similar to building energy codes, provide minimum energy efficiency requirements for a variety of appliances, such as clothes washers, lighting, and refrigerators. Federal efficiency standards apply to more than 40 product classes of various equipment and appliances. Never-

28 Institute for Market Transformation. http://www.buildingrating.org/content/policy-brief-washington-state
29 2012 Washington State Energy Strategy. Washington Department of Commerce. Page 99.
30 2012 Washington State Energy Strategy. Washington Department of Commerce. Pages 99 – 109.

theless, states have historically been leaders in the development of new appliance standards, a role recognized by the *2012 Washington State Energy Strategy*. The plan reads, "States have historically led the nation in the development of new appliance standards… Today, state adoption of standards helps conserve energy at the local level and encourages the federal government and impacted manufacturers to move toward national standards. Many of the products adopted in Washington and 11 other states in 2007 have been incorporated into the federal appliance efficiency rules."[31]

These standards are meant to save homeowners and businesses money on energy expenses and spur innovation in the manufacturing sector. If a state develops an appliance standard not covered by federal law, the standard will often serve as a model that other states, and eventually Congress, can choose to adopt. For example, Title 20 of the California Code of Regulations sets appliance efficiency regulations in the state and many of California's standards have established parameters that have informed the eventual adoption of federal appliance standards.

State-Operated or Managed Ratepayer Energy Efficiency Programs

States from New York to Indiana to California operate significant, cost-effective energy efficiency programs paid for through modest charges on customers' electric bills. States such as New York operate these programs directly through the State Energy Office, while others choose to implement utility-operated models. Separately or in combination, both approaches offer advantages and play key roles in achieving tangible and enduring energy efficiency gains in the residential, commercial, and industrial sectors. As part of this approach, utilities in some states are required to meet annual or periodic efficiency goals determined by Energy Efficiency Portfolio Standards. These programs are often among the largest drivers of energy efficiency in a state, as state- and utility-directed ratepayer energy efficiency program budgets are estimated at $7 billion annually.[32] In 2009, a survey of utility ratepayer-funded energy efficiency programs found that the electricity savings (on a cents/kWh basis) ranged from 2.3 cents to 4.4 cents per kilowatt-hour.[33]

In cases where utilities operate ratepayer energy efficiency programs directly, the State Energy Offices can influence these programs and priorities through a variety of means that offer leverage and greater value. One approach includes providing oversight to the utility program design and implementation as the State Energy Offices in Minnesota, Maryland, and Massachusetts do. A second approach involves either collaborating with utilities to implement energy efficiency programs or utilizing ratepayer funds to implement programs directly. New York, Illinois, and California, among others states, have State Energy Offices that perform this function. Additional approaches that State Energy Offices often take include encouraging utilities to factor energy efficiency into integrated resource planning and working with regulators and legislatures to define how utility programs will be developed and evaluated. An overall goal for State Energy Offices in this area is to coordinate with utilities to ensure that their energy efficiency programs align with broader state priorities and goals.

31 2012 Washington State Energy Strategy. Washington Department of Commerce. Page 97.

32 Ben Foster, Anna Chittum, Sara Hayes, Max Neubauer, Seth Nowak, Shruti Vaidyanathan, Kate Farley, Kaye Schultz, and Terry Sullivan, ACEEE 2012 State Energy Efficiency Scorecard, American Council for an Energy-Economic Economy. October 2012. http://www.aceee.org/research-report/e12c

33 Friedrich, Katherine et al. "Saving Energy Cost-Effectively: A National Review of the Cost of Energy Saved Through Utility-Sector Energy Efficiency Programs." American Council for an Energy-Efficient Economy. September 2009. http://www.aceee.org/sites/default/files/publications/researchreports/U092.pdf

A state energy plan may explicitly or implicitly call for the development or continuation of a ratepayer-funded energy efficiency program. Vermont's 2011 *Comprehensive Energy Plan* references Efficiency Vermont – the ratepayer-funded entity responsible for delivering energy efficiency to citizens and businesses within the state – throughout the document. In doing so, there is an implicit recommendation to continue and expand ratepayer-funded energy efficiency in Vermont.

The *2008 Texas State Energy Plan* explicitly recommends utilizing the state's benefit fund system to support energy efficiency and demand-response customer education campaigns, calling for action by the legislature to fund in full these statewide education initiatives. The Plan calls for the PUC to develop campaign messaging consistent with the goals outlined in The 2008 *Intelligent Energy Choices for Kentucky's Future.* This an example of a state that recommends creating a public benefit fund to advance non-utility-sponsored energy efficiency programs to aid the state in reaching its goal of meeting 18% of the projected energy demand in 2025 with energy efficiency.[34]

Energy Efficiency Portfolio Standards

An Energy Efficiency Portfolio Standard (EEPS) (or Energy Efficiency Resource Standard (EERS)) is a mandate to achieve a set amount of energy savings by or during a specified period. An EEPS is set by a legislative body and places the requirement on the regulated utilities operating in that state. As of October 2012, 20 states have adopted an energy efficiency portfolio standard.[35] Creating an EEPS allows a state to meet a portion of its energy demand by decreasing energy consumed by homeowners and businesses through increased energy efficiency, rather than through additional generation capacity, which is usually the more expensive option. Depending on a state's regulations, the utilities can achieve the savings through a variety of means, such as weatherization and building retrofit programs, incentive programs for energy-efficient equipment, and behavioral change programs. Some EEPS also contain separate reduction targets for overall electricity sales, peak demand, and natural gas consumption.

The Minnesota legislature set an EEPS in 2007, called the Next Generation Act, requiring its investor-owned gas and electric utilities to invest 0.5% and 1.5% of gross operating revenue, respectively, in energy conservation measures. Beyond standard energy efficiency programs, Minnesota's legislation allows for utility programs that target waste heat recovery and consumer behavior to count towards the energy savings target.[36] The U.S. Environmental Protection Agency estimates that in 2015, the Next Generation Act will save the state 886 gigawatt-hours (GWh), having saved cumulatively 5,087 GWh since 2010.[37]

The 2008 *Intelligent Energy Choices for Kentucky's Future* illustrates how a state energy plan can be used as a foundation for new policy and regulatory initiatives. The plan states, "energy efficiency will offset at least 18 percent of Kentucky's projected 2025 energy demand."[38] One of the recommendations put forth to accomplish this goal includes establishing an energy efficiency resource standard to reduce energy consumption by at least 16% below projected energy consumption in 2025. The

34 Intelligent Energy Choices for Kentucky's Energy Future. November 2008.
35 Efficiency Resource Standards summary map, Database of State Incentives for Renewables and Efficiency. October 2012. http://www.dsireusa.org/documents/summarymaps/EERS_map.pdf
36 Minnesota Energy Efficiency Resource Standard, Database of State Incentives for Renewables and Efficiency. Date accessed, December 19, 2012. http://www.dsire.usa.org/incentives/incentive.cfm?Incentive_Code=MN18R&re=0ee=0.
37 State and Local Climate and Energy Program. U.S. Environmental Protection Agency. http://www.epa.gov/statelocalclimate/documents/pdf/state-energy-savings-summaries.pdf
38 Intelligent Energy Choices for Kentucky's Energy Future. November 2008.

plan goes on to detail components of the EEPS including, among other things, an energy efficiency potential study for the state, demand-side management program development and review, and a study of the design and cost of establishing a public benefit fund to support non-utility-sponsored energy efficiency programs. The plan also includes an extensive review of the design and impact of EERPS in other states. To date, Kentucky does not have an EEPS, but this example illustrates the way in which a state energy plan may be used as a driver of legislative and utility regulatory initiatives.

Combined Heat and Power

Combined Heat and Power (CHP)[39] represents a highly efficient means of generating electric power and useful thermal energy from a single fuel source through waste heat recovery.[40] As an energy generator, CHP is positioned to contribute to a state's supply-side resources, and its increased generation efficiency lends to its use as a demand-side strategy. As of October 2011, 82 gigawatts (GW) of CHP have been installed across nearly 4,000 industrial and commercial facilities.[41] This represents just over 8% of U.S. generating capacity.[42] There are both technical and economic potential studies that have been done to show the further role CHP can play in a state's energy portfolio.[43] The SEE Action Network reports that across the country there is potential for $50 billion of cost-effective CHP investments to be made, resulting in the saving of 14 quads of energy and $75 billion by 2020.[44] State policies and regulatory initiatives as well as financing programs can catalyze and sustain CHP deployment. Since CHP is a form of distributed generation, many of the policy initiatives discussed as part of integrating clean energy into the grid are applicable, including renewable portfolio standards, interconnection standards, and streamlined permitting.

An increasing number of states promote CHP by including the electricity or thermal energy generated by a CHP system in their renewable/alternative generation portfolio standard or EEPS. CHP is named as an eligible technology within 23 state generation portfolio standards. CHP is also an eligible resource to meet state energy efficiency goals. Thirteen states allow CHP to count towards their EEPS or the energy efficiency portion of the renewable portfolio standard.[45] Ohio is an example of a state with both an RPS and an EEPS that recently passed legislation categorizing waste energy recovery as an eligible resource under the RPS and CHP as a qualifying resource under the EEPS.[46]

Furthermore, the financing mechanisms discussed in this supplement can be utilized to support CHP. For instance, CHP is considered an eligible technology under Alabama's Sustainable and Verifiable Energy Savings Program (AlabamaSAVES) revolving loan fund. In Minnesota, the state used its bonding authority to finance a CHP project at the University of Minnesota. Project financing is impacted by a number of factors, such as the size and configuration of the CHP system and the owner-

39 For the purposes of this document, combined heat and power is used as an umbrella term for waste energy recovery, cogeneration, and combined heat and power.

40 US EPA CHP Partnership, CHP Basics, http://epa.gov/chp/basic/index.html

41 Todd Currier and Greg White, Industrial Energy Efficiency/CHP Working Group Executive Summary, ICF International. March 25, 2011. http://www1.eere.energy.gov/seeaction/pdfs/seeaction_ie_chp_executive_summary.pdf

42 Combined Heat and Power: Frequently Asked Questions, U.S. Environmental Protection Agency. January 6, 2012. http://www.epa.gov/chp/documents/faq.pdf

43 See The American Gas Association's 2013 study (http://www.aga.org/Kc/analyses-and-statistics/studies/efficiency_and_environment/Pages/TheOpportunityforCHPintheUnitedStates.aspx) and the Oak Ridge National Laboratories 2008 Report (http://info.ornl.gov/sites/publications/files/Pub13655.pdf)

44 Industrial Energy Efficiency and Combined Heat and Power Fact Sheet. U.S. Department of Energy July 2012. http://www1.eere.energy.gov/seeaction/combined_heat_power.html

45 Portfolio Standards and the Promotion of Combined Heat and Power. U.S. EPA Combined Heat and Power Partnership. January 4, 2013. http://www.epa.gov/chp/documents/ps_paper.pdf

46 SB 315: Ohio's Energy Policy, Ohio Development Services Agency. June 11, 2012. http://development.ohio.gov/files/bs/SB%20315_Energy%20FINAL.pdf

ship structure. Given the varied nature of the CHP market, multiple financing options may be desirable to meet the needs of CHP system owners and host facility operators including, but not limited to, commercial banks, energy service companies, third-party ownership, and utility cost recovery.

Expanding the amount of combined heat and power is one of the policy options named in the *2011 New Jersey Energy Master Plan* to help the state develop a "diverse portfolio of new, clean, cost-effective in-state electric generation". Specifically, the plan sets an aggressive target of deploying 1,500 MW of CHP generation by 2021 (1,400 MW of commercial and industrial applications and 100 MW through district energy systems). To achieve this goal, the plan calls for the state to provide incentives in the form of loans or loan guarantees and an initiative to streamline the permitting process for CHP projects. It also prompts the state to initiate a procurement process through the Board of Public Utilities and the Economic Development Authority for third-party providers to build, own, and operate CHP assets on State-owned facilities such as prisons or colleges. Finally, the plan also includes CHP in the state's Lead By Example program and public education programs geared toward the commercial and industrial sectors.[47]

In early 2013, NASEO issued *Combined Heat and Power: A Resource Guide for State Energy Officials* with additional information on policies, financing, and energy assurance planning to advance CHP deployment.[48]

Industrial Energy Efficiency

In 2010, industrial energy consumption constituted 31% of the total U.S. primary energy consumption. The U.S. industry and manufacturing sector constitutes 11% of the nation's gross domestic product and employs 12 million people in predominantly high-skill jobs. Industrial energy efficiency is a means of achieving multiple goals set forth in a state energy plan including increased economic competitiveness, reduced greenhouse gas emissions, and increased energy reliability. Within the industrial sector, there is potential for more than $100 billion in cost-effective energy efficiency investments to be made by 2020. Investments of this scale would lead to energy savings of five quads and annual cost savings of $50 billion.[49]

State energy plans can promote existing or new industrial efficiency programs administered by a government agency, utility, or third party. Financial incentives, air quality regulations that account for energy efficiency, flexible utility rate structures, and technical assistance are a few of the ways in which a state can advance energy efficiency in the industrial sector; these strategies are mentioned in a number of state energy plans.

In Maine, weatherizing 50% of all businesses and industrial facilities over the next 20 years is one of the goals stated in the 2009 *State of Maine Comprehensive Energy Plan*. The plan recommends that bonding, system benefit charge funding, grants and loans be made available to facility owners in the

47 2011 Energy Master Plan. New Jersey Board of Public Utilities. 2011.
48 Combined Heat and Power: A Resource Guide for State Energy Officials. NASEO. February 2013. http://www.naseo.org/publications/documents/CHP-for-State-Energy-Officials.pdf
49 Industrial Energy Efficiency and Combined Heat and Power Fact Sheet. U.S. Department of Energy July 2012. http://www1eere.energy.gov/seeaction/combined_heat_power.html

commercial and industrial sectors to aid in the implementation of these energy efficiency upgrades.[50]

Finally, the 2011 Oklahoma First Energy Plan includes a number of recommendations to capture the benefits of energy efficiency and combined heat and power in the industrial sector. The plan calls for:

- utilities to allow reduced back-up capacity requirements or reduced fees associated with standby charges to encourage more robust investments in CHP applications;
- load-leveling and peak-shaving practices through demand-side management opportunities and through favorable structured rates;
- emissions standards that account for efficiencies and evaluate industrial emissions based on the total useful energy actually produced, not simply the fuel put into the system; and
- evaluate[ing] the feasibility of providing feed-in tariffs or net metering that allow compensation (based on the time of generation) for companies that put power back into the grid.[51]

One of the lesser-mentioned industrial energy efficiency strategies mentioned in state energy plans, but worth considering, is ISO 50001, the International Standard for Energy Management, published by the International Organization for Standardization. It establishes requirements for creating, implementing, maintaining, and improving an energy management system. An organization of any size can implement ISO 50001, independently or in concert with another energy management strategy, in order to achieve continued improvement in energy performance.[52]

As illustrated above, there is a range of ways in which industrial energy efficiency can be incorporated into a state energy plan.

B. Renewable Energy Grid Integration

State governments view renewable energy as both a solution to address climate and energy security/resiliency challenges and an economic development opportunity. The increase in renewable energy generation of the past 10 years is largely attributable to states' energy policies and incentive programs. The policies listed below have served as catalysts to increase installed renewable energy capacity in states across the country. Well-designed interconnection standards and permitting practices all serve to bring down the soft (non-hardware) costs of distributed generation – the non-hardware (or balance of system) costs of a renewable energy project. Bringing down the soft costs of distributed generation is important; in the case of rooftop solar photovoltaics, for example, they can account for up to 40% of installation costs.[53] Renewable Portfolio Standards (RPS) and net metering have been primary policy drivers for creating markets for renewable energy within a state, particularly when an RPS is designed with a distributed generation carve-out.

50 State of Maine Comprehensive Energy Plan. State of Maine. January 15, 2009.
51 Oklahoma First Energy Plan. Office of the Governor. State of Oklahoma. 2011. Pg. 27.
52 Energy Management System - Requirements for Guidance with Use, ISO (International Organization for Standardization). Date accessed, December 3, 2012. http://www.iso.org/iso/catalogue_detail?csnumber=51297.
53 Rooftop Solar Challenge. U.S. Department of Energy. Accessed September 6, 2013. http://www.eere.energy.gov/solarchallenge/.

Streamlined Permitting

Permitting a small-scale renewable energy system can be a complicated and expensive process. Utilities, local planning departments, city fire departments, and others may all be involved. Site inspections, design reviews, and electrical and fire code reviews are all usually part of the process. However, the process and the fees for a permit can vary greatly from one local jurisdiction to the next. Just for residential solar installations, the average authority with jurisdiction over permitting requires eight weeks to process a residential solar permit; approximately one-third of installers claim to avoid certain jurisdictions because the permitting process is too complicated.[54]

While permitting processes, fees, and standards are often under the purview of municipalities and counties, initiatives at the state level can streamline permitting practices to bring down the cost of distributed generation. For instance, Vermont instituted a registration process for small solar projects (under or equal to 10 kilowatts) that reduced the permitting timeline for a Certificate of Public Good—necessary for net metering and interconnection—to 10 days. If the utility has any issues with the system's interconnection, it has 10 business days to file comments with the Vermont Public Service Board. After 10 days, assuming there are no comments filed, the permit is deemed issued.[55] In response to wildly differing municipal solar permitting fees, the State of Arizona developed a standardized fee schedule to provide project developers with cost certainty and increased transparency.[56] Hawaii, like many states, is developing online tools to streamline the permitting process. The State of Hawaii's Renewable Energy Permitting Wizard guides project developers through the permitting process, allowing them to better manage their time and capital.[57]

The *Hawaii Clean Energy Initiative Road Map 2011 Edition* calls for the state to increase certainty in the process for developing renewable energy. This is partially achieved by reducing the uncertainty in permitting requirements and creating an online system for the permitting application process.[58]

Renewable Portfolio Standard

Throughout the nation, 29 states, as well as the District of Columbia and 2 territories, have enacted a renewable portfolio standard.[59] In 2010, RPS obligations generated more than 91,000 GWh of demand for renewable energy.[60] Iowa was the first state to establish a renewable energy requirement, later called an RPS, when Governor Terry Branstad championed the idea in 1983. An RPS is generally designed to achieve at least two important goals. First, it offers a means to nurture the development of in-state renewable electricity sources, thereby promoting economic development and achieving emissions reductions in the power sector. Second, and critically important, it is a means

54 Tong, James. Nationwide Analysis of Solar Permitting and the Implications for Soft Costs. Clean Power Finance. December 2012. Accessed September 6, 2013.

55 Expedited Permitting Process for Solar Photovoltaic Systems, Database of State Incentives for Renewables and Efficiency. Date accessed, December 19, 2012. http://dsireusa.org/incentives/incentive.cfm?Incentive_Code=VT13R&re=0&ee=0

56 Brug, Leisa. Streamlined Permitting for Renewable Energy Generation. August 9, 2012. Accessed September 6, 2013. http://naseo.org/renewable-energy-task-force

57 Renewable Energy Permitting Wizard, Hawaii State Energy Office. Date accessed, December 19, 2012. http://wizard.hawaiicleanenergyinitiative.org/

58 Hawaii Clean Energy Initiative Road Map 2011 Edition. Hawaii Clean Energy Initiative. U.S. Department of Energy and the State of Hawaii. National Renewable Energy Laboratory. Subcontract Report NREL/SR-7A40-52611. August 2011.

59 Renewable Portfolio Standard Policies, Database of State Incentives for Renewables and Efficiency. October 11, 2012. http://dsireusa.org/documents/summarymaps/RPS_map.pdf

60 Calculation performed using LBNL RPS Compliance Data Spreadsheet. Database for State Incentives for Renewables and Efficiency. May 1, 2013. Date accessed, August 15, 2013. http://dsireusa.org/rpsdata/index.cfm.

to diversify electricity fuel sources to hedge against conventional fuel price spikes. Diversification of fuel supplies to include renewables, which have no fuel cost component in generating electricity, can be thought of in the same terms as a financial planner's recommendation to have a diverse investment portfolio to reduce risk.

For states seeking to increase the use of renewable energy resources, a renewable energy portfolio standard (RPS) that establishes a production requirement by a certain date is a successful mechanism to stimulate new renewable capacity. While 29 states and the District of Columbia have renewable portfolio standards, and eight states and two territories have renewable portfolio goals, there are still opportunities to update and expand these policies. California, New York, Colorado, and Hawaii have some of the most robust RPS targets in the country.61 Beyond the target and year by which the target must be met, there are numerous other program design factors to adjust, such as resource eligibility, in-state requirements, cost recovery, penalties, and renewable energy credit trading. One of the important benefits of an RPS is diversifying electricity generation supplies to mitigate periodic fuel price spikes that occur for most fossil fuel sources. This portfolio approach is similar to an investment portfolio in that it seeks to balance risks through diversity.

The *Hawaii Clean Energy Initiative Road Map 2011 Edition* includes a series of RPS goals, ratcheting up over time:

- by 2015, the RPS is 15% of net electricity sales;
- by 2020, the RPS is 25% of net electricity sales;
- by 2025, 32.5% of net electricity sales; and
- by 2030, 40% of net electricity sales.

While the RPS was established prior to the publishing of this road map, the plan serves to reinforce the state's commitment to these goals and outlines myriad policies and programs that will achieve these goals.[62]

Interconnection Standards

Interconnection standards specify the technical and procedural process by which a customer connects an electricity-generating unit to the grid. Standardizing the process ensures that the project interconnection adheres to the safety and reliability needs of both the customer and the utility. To date, 43 states, the District of Columbia, and Puerto Rico have interconnection standards.[63] These standards usually include a limit to the size of the system being connected to the grid, although that size varies widely across existing state interconnection policies. States with interconnection policies utilize the state energy planning process to evaluate the impact of increasing the system capacity limit allowed under existing interconnection procedures or removing a limit altogether.

61 Renewable Portfolio Standards Policies, Database of State Incentives for Renewables and Efficiency. December 2012. http://dsireusa.org/documents/summarymaps/RPS_map.pdf

62 Hawaii Clean Energy Initiative Road Map 2011 Edition. Hawaii Clean Energy Initiative. U.S. Department of Energy and the State of Hawaii. National Renewable Energy Laboratory. Subcontract Report NREL/SR-7A40-52611. August 2011.

63 Interconnection Policies, Database of State Incentives for Renewables and Efficiency. November 2012. http://www.dsireusa.org/documents/summarymaps/interconnection_map.pdf

In 2010, the Utah Public Service Commission adopted an interconnection policy that embraces the Institute of Electrical and Electronics Engineers' (IEEE) Standard for Interconnecting Distributed Resources with Electric Power Systems, IEEE 1547, and provides three levels of review for customer-sited systems of up to 20 MW of system capacity. These three elements—following the IEEE 1547 technical standard, using multiple screening processes for systems with varying degrees of size and complexity, and setting a system capacity limit of at least 10 MW—follow some of the best practices promoted by efficiency and distributed generation advocacy groups. There are several different model interconnection standards that states can adopt.[64]

Net Metering

Net metering is for consumers with generally small renewable energy facilities that receive a credit for a portion of the electricity they generate. Forty-three states, the District of Columbia, and four territories have net metering policies.[65] Under the Energy Policy Act of 2005, all public utilities are required to make net metering available to consumers.[66] Consumers can save and even make money if the utility compensates consumers for their excess energy generated. If the state is seeking to increase renewable energy generation, net metering can reduce pressure on the grid during peak consumption and save utility companies meter reading, installation, and billing costs. Under existing net metering policies, the limits and compensation amounts can be modified.

The Washington Energy Strategy recognizes that amending the state's net metering, interconnection, and permitting practices will provide near-term opportunities to deploy distributed generation. Specifically, the plan recommends that the state "scale net metering limits to customer size and distribution system capacity; allow customers to carry forward annual generation credits". While the recommendation to consider legislation to raise the cap on net metering to 2-MW or 100% of the load is still modest relative to other states' standards, it illustrates the way in which net metering can be addressed in a state energy plan. Washington's plan also calls for a modification of the state's interconnection standards in light of new analysis of the state's interconnection practices. Prior to the writing of the plan, the state's public utilities commission and State Energy Office determined that a rulemaking is in order to review interconnection rules for smaller generation systems (< 2 MW) and the plan encourages the rulemaking to go forward.[67]

Some states are currently evaluating their policies to address reliability, safety, and fairness.

C. Clean and Efficient Transportation

Average annual motor gasoline prices increased by 94% between 2001 and 2011.[68] High and volatile gasoline and diesel prices, among other reasons, are driving states to examine energy use

64 Model Interconnection Procedures, 2009 Edition, Interstate Renewable Energy Council. January 2010. http://irecusa.org/wp-content/uploads/2010/01/IREC-Interconnection-Procedures-2010final.pdf and Madri Model Small Generator Interconnection Procedures, November 2005. http://sites.energetics.com/MADRI/pdfs/inter_modelsmallgen.pdf

65 Net Metering, Database of State Incentives for Renewables and Efficiency. December 2012. http://www.dsireusa.org/documents/summarymaps/net_metering_map.pdf.

66 Sec. 1251, Net Metering and Additional Standards, Public Law 109-58. August 2005. http://www.gpo.gov/fdsys/pkg/PLAW-109publ58/pdf/PLAW-109publ58.pdf.

67 2012 Washington State Energy Strategy. Department of Commerce. December 2011.

68 Real Prices Viewer, U.S. Energy Information Administration. Date accessed, December 3, 2012. http://www.eia.gov/forecasts/steo/realprices/

in the transportation sector. State energy plans can include any number of recommendations to promote energy efficiency, greenhouse gas emissions reductions, and energy security within this sector. Depending upon a state's geography, economy, demographics, and other factors, some alternative fuel/advanced vehicles may be more feasible than others. In fact, in a number of existing state energy plans, conducting market and feasibility studies for biofuel, electric charging, and compressed natural gas is a recommended action item. Additional information on the policies, regulations, and incentives offered to promote alternative and advanced vehicle and infrastructure deployment can be found on the U.S. Department of Energy's Alternative Fuel Data Center website.[69]

Fleet Management Policies

States can lead by example in the transportation sector as they do in the buildings sector. The policies and programs described below are means through which states can drive demand for alternative fuels, advanced vehicles, and demonstrate their viability. These actions are most often initiated through legislation or executive orders.

State Vehicle Acquisition Requirements: There are variations on this policy, but it generally sets forth that a certain percentage of the state's fleet comprise advanced vehicles, or that all new vehicles purchased must be advanced vehicles. This policy may encourage the acquisition of vehicles without discriminating as to the fuel type (natural gas vehicles, hybrid electric vehicles, etc.), or it may be biased towards vehicles that use fuels produced in-state to further advance a state's economic development goals. In Delaware, the 2010 *Executive Order – Leading by Example Towards A Clean Energy Economy and Sustainable Natural Environment*, requires that all new light-duty vehicles purchased by state agencies be hybrid electric, alternative fuel, fuel-efficient, or low-emission vehicles.[70] Illinois, on the other hand, when awarding contracts for vehicle procurement, may give preference to a bidder who will fulfill the contract using vehicles powered by ethanol and biodiesel produced from in-state agricultural commodities.[71] Ultimately, the policy should reflect the state's environmental, health, economic, and energy goals.

> **Emissions or Petroleum Reduction Requirements:** While the two policies listed below will help reduce the state's fleet emissions, it may be prudent to identify fleet emission reduction goals to guide the acquisition of advanced vehicles. Within the 2010 *Executive Order – Leading by Example Towards A Clean Energy Economy and Sustainable Natural Environment*, the State of Delaware established a goal of reducing both state fleet petroleum consumption and vehicle emissions by 25% of 2008 levels by 2012.[72]

The commitment to improving the fuel efficiency of its state fleet is demonstrated in the Delaware Energy Plan 2009 - 2014. It reads, "the Office of Management and Budget should establish high standards for fuel efficiency and environmental impacts for new fleet purchases by the State." This recommendation is ranked as a high priority for the state.[73]

69 Alternative Fuels Data Center. U.S. Department of Energy. Date accessed, April 26, 2013. http://www.afdc.energy.gov/laws/state

70 Executive Order Eighteen, State of Delaware. Date accessed, December 19, 2012. http://governor.delaware.gov/orders/exec_order_18.shtml#TopOfPage

71 Illinois Laws and Incentives for Acquisition / Fuel Use, U.S. Department of Energy. Date accessed, December 19, 2012. http://www.afdc.energy.gov/laws/laws/IL/reg/3249.

72 Executive Order Eighteen, State of Delaware. Date accessed, December 19, 2012. http://governor.delaware.gov/orders/exec_order_18.shtml#TopOfPage.

73 Delaware Energy Plan 2009 – 2014. The Governor's Energy Advisory Council. February 26, 2009.

Driver and Rider Behavior Modification

Transportation sections of a state energy plan may include any number of recommendations beyond those encouraging the deployment of alternative fuel/advanced vehicles. Depending upon a state's air quality, land use, and economic development goals, a plan may propose: anti-idling legislation and enforcement measures; programs and incentives to increase public transit ridership and expansion of public transit services; implementation of congestion pricing; and ride sharing or telecommuting programs for public- and private-sector employers.

Idle Reduction Requirements: Anti-idling policies restrict vehicle operators from idling for a certain period and, sometimes, within a designated geographic area. In 2011, an estimated 32.3 million gasoline-gallon equivalents were saved through idle reduction technologies and policies (with 41% of those savings coming from anti-idling policies alone).[74] The most stringent of these policies prohibit vehicles from idling for more than three consecutive minutes. For example, in Virginia, vehicles that are licensed for commercial or public service cannot idle for more than three minutes in commercial or residential urban areas.[75] States may also implement idle reduction strategies such as truck stop electrification to reduce the drivers' tendency to idle in order to maintain heat, air conditioning, and/or electricity within their vehicles.

A portion of the 2009 *State of Maine Comprehensive Energy Plan* is devoted to improving passenger and freight transportation systems. As stated in the plan, this goal will in part be achieved through the implementation of the Truck Efficiency Tax Incentives Program. This program will provide incentives to small fleet motor carrier operations to save energy by, among other things, reducing idling.[76]

State energy plans can do the following.

- **Provide recommendations for funding and financing alternative fuels/advanced vehicles and the necessary infrastructure.**
- **Assess the extent of public investment in the transportation sector.**
- **Identify types of funding or financing assistance that maybe of greatest value such as grants, rebates, tax incentives, loans, etc.**
- **Address workforce development for vehicle and infrastructure maintenance in the transportation sector.**
- **Advance consumer education programs to support a long-term vision for transforming the transportation sector regardless of the fuel type.**
- **Direct state energy officials to coordinate these activities among other state agencies and local governments.**

74 Johnson, Caley. Clean Cities 2011 Annual Metrics Report. National Renewable Energy Laboratory. NREL/TP-7A30-56091. December 2012. https://www1eere.energy.gov/cleancities/accomplishments.html

75 Virginia Laws and Incentives for Driving / Idling, U.S. Department of Energy. Date accessed, December 19, 2012. http://www.afdc.energy.gov/laws/laws/VA/reg/3246.

76 State of Maine Comprehensive Energy Plan. State of Maine. January 15, 2009.

Table 4. Resources for the Development of Recommended Actions and Policy Options

NASEO Database of State Energy Plans	NASEO provides this database of State Energy Plans from 38 states and the District of Columbia as a resource to other states and territories interested in developing similar frameworks when creating plans of their own.	http://naseo.org/stateenergyplans
EPA Energy-Environment Guide to Action	This guide provides in-depth information about 16 clean-energy policies and programs that states are using to meet their energy, environmental, and economic objectives.	http://www.epa.gov/statelocalclimate/resources/actionguide.html
The Role of State Policy in Renewable Energy Development (NREL)	This report provides detailed information on the role of state policy in the development of renewable energy throughout the nation, including renewable energy generation trends, resources, and market transformations.	www.nrel.gov/analysis/pdfs/45971.pdf
State Energy Efficiency Policy (ACEEE)	This database provides information on state energy, efficiency policies, priorities, and programs.	http://aceee.org/sector/state-policy
State and Local Energy Efficiency Action Network	This website provides information on SEE Action, a state- and local-led effort facilitated by the U.S. DOE and EPA to take energy efficiency to scale and achieve cost-effective energy efficiency by 2020.	http://www1.eere.energy.gov/seeaction/

D. Financing Energy Efficiency and Clean Energy

For every recommended action and policy objective, the state must determine if and how it will provide financial support for implementing and achieving its public policy goals. Public financing for energy efficiency and clean energy improvements is often necessary to overcome market failures and catalyze the development of capital markets for these sectors. Investment by the public sector should be leveraged to attract private capital. Public entities making such investments should be repaid and eventually exit the market once private sector investors gain market confidence. Financing should be considered for energy efficiency improvements in public, industrial, commercial, institutional, and residential buildings and facilities, renewable energy projects, and clean transportation initiatives.

Many state energy plans provide examples of potential financing mechanisms for implementing various actions listed within the plan. Some plans will go so far as to indicate an exact dollar amount for a particular recommended action. Other plans reference new funding mechanisms or the expansion of existing funding programs without providing exact budget estimates, leaving it to the implementing entity to determine the appropriate level of funding.

Regardless of whether a state energy plan includes exact budget recommendations, it is important for the planning team to align a financing mechanism or resource to each recommended action within the plan. Most of the recommended financing mechanisms should also include some discussion of the state's anticipated return on investment for that particular action.

A growing number of state energy plans are focusing on self-sufficient financing mechanisms that allow the state to reuse funds for future energy activities. These financing mechanisms often rely on an initial investment (either by the state, foundational funding or by federal grant/loan) and perpetuate themselves by issuing the funds with the expectation of repayment at a predetermined interest rate. Examples of these types of financing mechanisms include:

Revolving Loan Funds (RLFs): An RLF is a self-replenishing pool of money that utilizes interest and principal payments on old loans to issue new loans. An excess of $2 billion has been invested in clean energy programs through revolving loan programs in 44 states.[77] Established by the Alabama Department of Economic and Community Affairs (ADECA) Energy Division, AlabamaSAVES offers the only energy revolving loan fund for existing industries and businesses within the state. The program was created with $25 million from a State Energy Program (SEP) grant and supports over $60 million in loans, leveraging investment by the private sector. Over a period of 20 years, AlabamaSAVES, through the revolving structure coupled with leverage, has enabled $121 million in loans.

Loan Loss Reserve Funds (LLRF): LLRFs are structured similarly to a revolving loan fund but use public monies to provide partial risk coverage to motivate commercial financial institutions to offer energy efficiency or renewable energy financing, pioneer new finance products, broaden access to finance, extend loan terms, and offer lower interest rates. The AlabamaSAVES program referenced above includes a 10% reserve kept in a separate escrow account. Loan loss reserves represent one type of credit enhancement mechanism that states can employ to bolster private sector investments.

Bonding: A bond enables qualified state, tribal, and local government issuers to borrow money at attractive rates to fund clean energy projects. States have the option of using generation obligation, revenues, or Qualified Energy Conservation Bonds (QECBs). QECBs may be issued as either generation obligation or revenue bonds. In the American Recovery and Reinvestment Act (ARRA), Congress authorized up to $3.2 billion in QECBs. The states of Kansas, Kentucky, Montana, South Dakota, and California have exhausted or utilized nearly all of their qualified energy conservation bond (QECB) allocations.[78] QECBs have been used for energy efficiency improvements to public facilities, renewable energy projects, and local mass transit projects. NASEO and the Energy Programs Consortium have developed a suite of resources for states issuing QECBs.[79]

On-bill Financing: Utilities, or a third party, cover the upfront costs of the energy improvement and the customer repays the investment through a charge on their monthly utility bill. As of mid-2013, five states had mandated on-bill financing, another seven had enacted or were considering enacting policies to support on-bill financing, and utilities in nine other

77 State Energy Financing Programs. NASEO. Accessed September 2013.
78 Qualified Energy Conservation Bonds, Energy Programs Consortium. September 2012. http://www.energyprograms.org/wp-content/uploads/2012/09/QECB_Memo_9-5.pdf
79 State Energy Financing Resources, National Association of State Energy Officials. Date accessed, December 19, 2012. http://naseo.org/financing-resources-qecb

states provided an on-bill financing option. The Power New York Act of 2011 (A.8510/S.5844) established an on-bill recovery charge for repayment of loans for energy efficiency improvements through the Green Jobs, Green New York (GJGNY) initiative. The on-bill recovery structure is an offering that supplements technical assistance and financial incentives offered through energy efficiency programs administered statewide by the New York State Energy Research and Development Authority (NYSERDA).

Commercial Property Assessed Clean Energy (PACE): PACE enables property owners to implement energy improvements to their property and repay the costs over an assigned term (typically between 15 and 20 years) through an annual assessment on their property tax bill. By tying the debt to the property rather than to the owner, PACE enables a credit enhancement for underwriting energy efficiency and renewable energy loans. It addresses the reluctance of some owners to invest heavily in the energy performance of their properties if they plan to vacate before they fully realize the return on investment. As of July 2013, 30 states have PACE enabling legislation.[80] In the spring of 2010, the Florida state legislature passed HB 7179, which included PACE enabling language. Within 18 months, three commercial PACE programs were launched that included numerous city and county government participants.[81]

The leveraging of public-private partnerships is a low-cost mechanism for supporting and driving statewide energy actions and programs. In implementing on-going, low-cost actions recommended within the state energy plan, such as education and outreach, energy and technology challenges, and lead by example activities, partnerships between the state and private parties or utilities can serve a critical role in generating interest, providing in-kind support and program administration.

Financing is integrated throughout the 2013 Connecticut Comprehensive Energy Strategy. The finance recommendations included within the plan move the state away from subsidizing particular technologies to a more flexible finance approach designed to facilitate economies of scale and leverage resources from the private sector. This will be done through the Clean Energy Finance and Investment Authority (the state's green bank), on-bill financing, standardization of energy efficiency performance contracts, and the state's commercial PACE program among other financing programs.[82]

Oregon's *10-Year Energy Action Plan* recognizes the role that financing plays in meeting a state's energy vision. The plan's second stated goal reads, "enhance clean energy infrastructure development by removing finance and regulatory barriers." To accomplish this goal, the plan calls for the establishment of the West Coal Infrastructure Exchange, in part to attract investment capital through new regional partnerships. The plan goes on to discuss the potential for on-bill financing and an energy efficiency power purchase agreement, among other models, to attain implement energy efficiency improvements.[83]

There will be different effective solutions depending on the scope of the work, the implementing agency, and the duration of the activity. A single financing mechanism has the potential to support

80 This includes the District of Columbia.
81 Yelverton, Travis. "Property Assessed Clean Energy (PACE) and commercial PACE activities in Florida." September 6, 2012. http://mojo.naseo.org/data/sites/1/documents/committees/financing/notes/2012-09-06-PACE.pdf
82 2013 Comprehensive Energy Strategy for Connecticut. Connecticut Department of Energy and Environmental Protection. February 19, 2013. http://www.ct.gov/deep/cwp/view.asp?a=4120&q=500752
83 10-Year Energy Action Plan. State of Oregon. December 17, 2012. http://www.oregon.gov/energy/pages/ten_year/ten_year_energy_plan.aspx

multiple energy improvements. NASEO's Finance Committee addresses a variety of state financing mechanisms to identify implementation barriers, facilitate peer learning and private sector financing strategies, and engage program partners such as financial institutions and local governments. More information is available on the NASEO website.[84]

Table 5. Resources for Financing

NASEO State Financing Energy Resources	This webpage includes a collection of documents and samples used by states for financing projects, including but not limited to information on revolving loan funds, qualified energy conservation bonds, and loan loss reserves.	http://naseo.org/resources/financing/index.html
Clean Energy Finance Guide for Residential and Commercial Building Improvements	This webpage provides information to help state, local, and tribal governments use federal funds to create financing programs that support energy efficiency and renewable energy upgrades.	http://www1.eere.energy.gov/wip/solutioncenter/financialproducts/building_improvements_finance_guide.html
Energy Efficiency and Renewable Energy Finance Guide	Through this webpage, an online page-by-page guide can be found that examines financing as a tool to enable energy efficiency and renewable energy investments.	http://www1.eere.energy.gov/wip/solutioncenter/financialproducts/financingoverview.html

E. Evaluation and Measurement for Continuous Improvement

Evaluating and measuring the goals and recommended actions as they are implemented and completed will demonstrate the value of the policies/programs by providing precise and consistent appraisals of their performance. As an exercise, evaluation, measurement and verification (EM&V) serves three distinct purposes: confirm energy savings and verify cost-effectiveness, facilitate energy efficiency into integrated resource planning, and inform energy efficiency investments going forward.[85]

The U.S. Department of Energy and U.S. Environmental Protection Agency facilitate the State and Local Energy Efficiency Action Network EM&V Working Group, which uses the following definition for EM&V:.

> **Evaluation**: The performance of studies and activities aimed at determining the effects of a program; any of a wide range of assessment activities associated with understanding or doc-

84 Statewide Program Best Practices, Energy Services Coalition. Date accessed, December 3, 2012. http://www.energyservicescoalition.org/espc/tools/index.html.

85 SEE Action EM&V Blueprint, State Energy Efficiency Action Network. May 2011. http://www1eere.energy.gov/seeaction/pdfs/seeaction_emv_blueprint_052311.pdf.

umenting program performance, assessing program or program-related markets and market operations; any of a wide range of evaluation efforts including assessing program-induced changes in energy efficiency markets, levels of demand or energy savings, and program cost-effectiveness.

Measurement and Verification (M&V): Data collection, monitoring, and analysis associated with the calculation of gross energy and demand savings from individual sites or projects.

The need for standardized and ubiquitous EM&V practices has increased as funding for energy efficiency has grown over the years so that efficiency program administrators, policymakers, and the public can have a better understanding of the energy savings resulting from energy efficiency investments. From 2005 to 2011, energy efficiency budgets for ratepayer-funded programs increased from $1.6 billion to $6.8 billion.[86] Currently, EM&V for ratepayer-funded programs range from 0.5% to 5% of the total program costs with a mean of 2.8%.[87] In addition, as states search for ways to meet existing and new federal air regulations, EM&V can provide a means of making energy efficiency a credible means of meeting air quality goals (aiding in the translation of energy savings into greenhouse gas or pollution reduction). Streamlined, standardized, and transparent EM&V enhances the credibility of these investments and enables cross-jurisdictional comparisons of efficiency programs, integration of energy efficiency into portfolio planning and forecasting processes, and informed infrastructure investments.

There are several challenges to implementing EM&V frameworks. EM&V is often viewed as an expensive, time-consuming, unreliable, and opaque process. The appropriate level of effort for an EM&V initiative will vary depending upon the efficiency program's complexity and whether it is a commonly offered program. For example, compact fluorescent light bulb replacement programs are standard and can use a low-cost, deemed savings approach. Newer, untested programs may require a great investment in EM&V. The National Action Plan for Energy Efficiency's *Model Energy Efficiency Impact Evaluation Guide (November 2007)*[88] details the process for implementing an EM&V framework:

1. Defining evaluation goals and scale, including which program benefits to evaluate.
2. Setting a time frame for evaluation and reporting expectations.
3. Setting a spatial boundary for evaluation.
4. Defining a program baseline, baseline adjustments, and data collection requirements.
5. Establishing a budget in the context of expectations for the quality of reported results.
6. Selecting impact evaluation approaches for gross and net savings calculations, and avoided emissions calculations.
7. Selecting who (or which type of organization) will conduct the evaluation.

86 Cooper, Adam and Wood, Lisa. Summary of Ratepayer-Funded Electric Efficiency Impacts, Budgets and Expenditures (2010 – 2011). Institute for Electric Efficiency. January 2012. Date access, December 3, 2012. http://www.edisonfoundation.net/iee/newsevents/Pages/2012-01-03-IEE_CEEReport.aspx

87 SEE Action EM&V Blueprint, State Energy Efficiency Action Network. May 2011. http://www1.eere.energy.gov/seeaction/pdfs/seeaction_emv_blueprint_052311.pdf.

88 Model Energy Efficiency Program Impact Evaluation Guide, National Action Plan for Energy Efficiency Leadership Group. November 2007. http://www.epa.gov/cleanenergy/documents/suca/evaluation_guide.pdf

There are several approaches to EM&V that the *Model Energy Efficiency Impact Evaluation Guide* also covers. These include evaluating impact, process, market effects, and cost-effectiveness. Given the numerous ways in which a State Energy Office's programs can be measured and evaluated, and the impact of the results on a state's allocation of resources, it is important for the planning team to give EM&V its due in the state energy plan.

Table 6. Resources for Evaluation and Measurement Criteria

State and Local Energy Efficiency Action Network	This webpage provides information on SEE Action's Evaluation, Measurement, and Verification Working Group, which works to improve energy efficiency management by increasing the accuracy, credibility, and timeliness of EM&V results.	http://www1.eere.energy.gov/seeaction/evaluation.html
Calculating Energy Savings	The information found on this webpage provides details on calculating energy savings and planning an evaluation, in addition to a number of other tools and resources associated with energy savings.	http://epa.gov/statelocalclimate/state/activities/measuring-savings.html
Northeast Energy Efficiency Partnership (NEEP)	This website provides information on NEEP, an organization that maximizes energy efficient solutions through regional partnerships that leverage knowledge, capability, learning, and funding.	http://neep.org/emv-forum

F. Energy Assurance and Emergency Response Planning

As mentioned earlier in this document, it is important that a state energy plan reference and complement other state plans, including a state's energy assurance plan. An energy assurance plan assigns responsibilities and detailed procedures for responding to an energy emergency in the event of a man-made or natural disaster and includes recommendations for improving the resiliency of the energy sector over the long term. The *NASEO State Energy Assurance Guidelines* were developed to assist state in their planning efforts.[89]

Continuously Update the State Energy Assurance Plan

Any number of factors can affect a state's exposure to vulnerabilities and threats within the energy sector. These include infrastructure capacity, availability of energy generation resources, demographic shifts, industry composition, and global energy markets, to name a few. In order to account for the changing energy landscape, states must update their energy assurance plans on a regular – possibly annual – basis. Moreover, many energy assurance plans include emergency contact lists as appendices and it is important to keep these lists updated in the event that contacts have retired or left their positions. Last, copies of the plans and contact lists should be maintained in both

89 State Energy Assurance Guidelines. *NASEO. December 2009. http://naseo.org/Data/Sites/1/documents/publications/State_Energy_Assurance_Guidelines_Version_3.1.pdf*

electronic and hard copy form and in locations accessible during an emergency. The more data and information that are collected, analyzed, and organized prior to an emergency, the greater a state's ability to avoid or mitigate the effects of an energy emergency. For all of these reasons it is beneficial for a state energy plan to reference and recommend the continuous updating of the state's energy assurance plan.

As the majority of states' energy assurance plans were completed in mid-2013, there is not a strong history of tying these plans to a state's comprehensive energy plan. Going forward, however, the plans should reference one another and the goals put forth in the plans should be synergistic.

Table 7. Resources for Energy Assurance and Emergency Response Planning

NASEO State Energy Assurance Guidelines	The guidelines detail the states' overall role in energy assurance including organizing and building response mechanisms; coordination with stakeholders; operating within the federal emergency support function structure; profiling energy use and vulnerability; and identifying fuel-related response measures.	http://naseo.org/Data/Sites/1/documents/publications/State_Energy_Assurance_Guidelines_Version_3.1.pdf
U.S. Department of Energy's Infrastructure Security and Energy Restoration Division (ISER)	This Department of Energy Division leverages technical expertise to ensure the security, resiliency, and survivability of key energy assets and critical energy infrastructure at home and abroad. ISER products housed on this page include Energy Assurance Daily and Emergency Situation Reports, among others.	http://energy.gov/oe/mission/infrastructure-security-and-energy-restoration-iser
FEMA's Developing and Maintaining Emergency Operations Plans (Version 2.0)	This document provides State Energy Offices with guidance on the planning process. It is intended to promote a common understanding of the fundamentals of planning and decision making to help emergency planners examine a hazard and produce integrated, coordinated, and synchronized plans.	http://www.fema.gov/pdf/about/divisions/npd/CPG_101_V2.pdf

Supplemental Policies and Programs Conclusion

This *Supplemental Policies and Programs* document is intended to serve as a companion to NASEO's *State Energy Planning Guidelines.* Developing a state energy plan affords key government decision makers an opportunity to examine the policies and programs that best support the realization of the plan's vision. A comprehensive examination of policies and programs that are on the books, as well as those that may be adopted, informs the quantification of energy, environmental, and economic development goals to be included in the plan. Financing and funding mechanisms should be examined and tied to specific goals and recommendations to ensure that sufficient resources are available to support implementation.

The policies and programs considered in this document represent those that have proven to be widely applicable across the country and effective in promoting efficient use of energy. Each policy or program will need to be tailored to a state's specific needs, and as the list presented above represents demand-side policies, should be considered in tandem with policies to promote clean and efficient energy generation.

ENDNOTES

i Alliance to Save Energy, “Potential nationwide savings from adoption of the 2012 IECC”, Nov. 2010. http://www.thirtypercentsolution.org/solution/2012_IECC_savings_estimates.pdf.

ii U.S. Department of Energy, Building Energy Codes Program, “Building Energy Codes 101”, May 2010, http://www.energycodes.gov/becu/documents/BECU_Codes_101_Slide_Notes.pdf, 4.