Five Actions Governors Can Take to Help Industry Save Energy

Executive Summary

The industrial sector accounts for one-third of the nation's total primary energy consumption and is projected to be the fastest-growing energy user through 2040.[1] Energy costs as a portion of revenue vary by industry. Most major industries spend less than 1 percent of revenues on energy; chemicals, pulp and paper, and others spend 5 percent or more, while aluminum refining and gypsum manufacturing can reach 25 percent.[2] However, reducing energy use, even where it accounts for a small percentage of total costs, can be an attractive option to help a company stay competitive in the world market. For that reason, among others, most states offer their industrial companies various forms of assistance to improve the efficiency of their energy use. Yet many cost-effective opportunities remain untapped.

According to a 2010 National Academy of Sciences report, industrial energy use could be reduced 14 to 22 percent by 2020 through energy-efficiency measures and combined heat and power (CHP) technologies.[3] CHP systems produce both electricity and thermal energy from a single fuel source. Some industrial companies could realize energy savings by replacing their current power source (either an on-site electric-only generator or purchased electricity provided over the electric power grid) with on-site CHP technologies. More than 80 percent of the existing 83 gigawatts of CHP capacity in the U.S. is at industrial facilities.[4] CHP and other technologies that improve efficiency present an opportunity for governors to take action to help industry save energy.

The National Governors Association Center for Best Practices (NGA Center) launched the Policy Academy on Enhancing Industry through Energy Efficiency and CHP in 2012 to help states identify and encourage industrial companies to implement new measures that can save energy and increase their competitiveness. The NGA Center spent one year working with governor-designated teams from five states—**Alabama**, **Arkansas**, **Illinois**, **Iowa**, and **Tennessee**—to explore key technical and policy issues and develop strategic action plans.

This paper highlights lessons learned from the policy academy and how states continue to help industry save energy. Those lessons point to five actions all governors can consider.

- **Streamline environmental permitting processes**. **Iowa** is developing a resource guide to help companies navigate the state's environmental permitting process for on-site CHP. The state is also evaluating alternative permitting structures, such as "permit by rule," as a method of recognizing environmental benefits associated with CHP units, which are at least 65 percent more energy-efficient than power that comes

[1] U.S. Energy Information Administration, Annual Energy Outlook, 2014, http://www.eia.gov/consumption/manufacturing/reports/2010/decrease_use.cfm Page 153, A-3 (accessed August 29, 2014).

[2] Leonard, Jeremy, A. "The Tide Is Turning: An Update on Structural Cost Pressures Facing U.S. Manufacturers," Manufacturers Alliance/MAPI, http://www.themanufacturinginstitute.org/~/media/3B952D79F3774F728E5909695522D6E7.ashx (accessed October 2, 2014).

[3] Real Prospects for Energy Efficiency in the United States. America's Energy Future Energy Efficiency Technologies Subcommittee; National Academy of Sciences; National Academy of Engineering; National Research Council. Table 4.4. Sector-wide and by Selected Subsectors and Technologies, Page 198. http://www.nap.edu/openbook.php?record_id=12621&page=198 (accessed September 11, 2014).

[4] U.S. Department of Energy, CHP Deployment Program. November 2014. http://energy.gov/eere/amo/chp-deployment (accessed December 2, 2014).

from centralized generation plants.

- **Build on existing state policies and programs.** Using ratepayer funds collected in support of the state's energy-efficiency portfolio standard, **Illinois** developed an incentive program for installing CHP in state, local, and federal government facilities as a precursor to an industrial-sector program.

- **Develop a communication strategy targeting industry. Arkansas** created a web-based clearinghouse to connect manufacturers seeking to adopt energy-saving measures to state information and tools, university research, and technical experts. **Tennessee** hosted industry dialogues to increase engagement with manufacturers and continues to provide education and outreach to stakeholders on CHP and the availability of state tax incentives.

- **Provide access to training and resources**. **Alabama** is working through the state community college and university systems to develop curricula for a new degree track for both engineering and business students that combines key features of both to provide a knowledge base about energy efficiency and management.

- **Recognize success. Arkansas** and **Alabama** hosted governors' summits to recognize companies that are leaders in industrial energy efficiency and share information about state activities.

Introduction

U.S. industrial energy demand is significant and growing. According to the Energy Information Administration, industrial use accounted for one-third of the nation's total primary energy consumption in 2012 and is expected to grow by 28 percent by 2040.[5] That represents the fastest projected growth rate of any sector of the economy and is attributed in part to increased use of low-cost natural gas in some industries (for example, chemical production).[6] Energy costs, as a portion of revenue, vary by industry. Most major industries spend less than 1 percent of revenues on energy; chemicals, pulp and paper, and others spend 5 percent or more, while aluminum refining and gypsum manufacturing can reach 25 percent.[7] However, even where it accounts for a small percentage of total costs, reducing energy use can be an attractive option to help a company stay competitive in the world market.

Industrial energy efficiency generally falls into two categories: equipment upgrades and process improvements. Companies can realize energy savings by retrofitting or replacing existing equipment such as lighting or heating, ventilating, and air conditioning systems. Upgrading industrial lighting systems, for example, can save up to 7 percent of a manufacturing plant's total electricity use.[8] Manufacturing processes often can be improved through intelligent engineering designed to increase production output per unit of energy used.[9] Examples range from integrating energy management devices into assembly lines to establishing facility-wide programs such as the U.S. Department of Energy's (DOE) Superior Energy Performance (SEP) program.[10] In one study, SEP-certified

[5] U.S. EIA Annual Energy Outlook, 2014. Page 153, Reference Table A-3 http://www.eia.gov/forecasts/aeo/er/executive_summary.cfm (accessed August 29, 2014).
[6] According to U.S. EIA, natural gas use accounts for 34 percent of the total increase in energy consumption from 2012 to 2025 and 59 percent of the increase from 2025 to 2040. U.S. EIA Annual Energy Outlook, 2014. http://www.eia.gov/forecasts/aeo/er/early_fuel.cfm (accessed August 29, 2014).
[7] Leonard, Jeremy, A. The Tide Is Turning: An Update on Structural Cost Pressures Facing U.S. Manufacturers, Manufacturers Alliance. November 2008. Page 14. http://www.themanufacturinginstitute.org/~/media/3B952D79F3774F728E5909695522D6E7.ashx (accessed October 2, 2014).
[8] Assumes lighting accounts for 10 percent of a facility's energy use and savings of 70 percent from advanced systems. Arkansas Industrial Energy Clearinghouse. http://www.arkansasiec.org/industrial-systems/lighting-systems/ (accessed October 2, 2014).
[9] While scaling production can also achieve efficiencies, this set of activities is focused on optimizing energy savings for existing production levels.
[10] State and Local Energy Efficiency Action Network. (2014). *Industrial Energy Efficiency: Designing Effective State Programs for the Industrial Sector*. Prepared by A. Goldberg, R. P. Taylor, and B. Hedman, Institute for Industrial Productivity. Page 47. http://www.energy.gov/eere/amo/downloads/industrial-energy-efficiency-designing-effective-state-programs-industrial-sector (accessed October 2, 2014).

companies achieved an average energy savings of 10 percent over 18 months.[11]

Some industrial companies could realize energy savings by replacing their current power source (either an on-site electric-only generator or purchased electricity provided over the electric power grid) with on-site CHP technologies. CHP systems produce both electricity and thermal energy from a single fuel and recover the steam heat that normally would be wasted in an electricity-only generator. CHP can achieve efficiencies of 65 percent or greater with similar rates of emissions and cost savings. Although more than 80 percent of CHP systems are located in manufacturing facilities, they also are practical for state buildings and other facilities such as hospitals and universities. CHP currently provides approximately 8 percent of U.S. generating capacity.[12]

State Actions

States have long supported the efforts of industrial companies to save energy due to the sector's overall high level of energy use. Almost all states operate programs focused on industrial energy efficiency or CHP.[13] Such programs vary by industry type, geography, and regulatory framework. Collectively, states have worked in partnership with the DOE's Industrial Assessment Centers (IAC) to provide 16,000 companies with free or low-cost energy audits, which are aimed at identifying near-term improvements such as plugging air leaks and eliminating unnecessary lighting. Since 2006, assessments for small and medium-sized manufacturing facilities have achieved an estimated energy savings of more than $500 million.[14]

States also are working to support greater use of CHP technologies. Twenty-eight states allow CHP to qualify for credit under their energy efficiency or renewable energy standards, and more than half of all states have standalone financial incentives that support CHP installations, including loans, grants, and tax credits.[15] Recently, some states have been exploring how CHP incentives fit within state energy assurance or resilience planning initiatives.[16] DOE estimates that by 2020, the United States could cost-effectively increase CHP capacity by 50 percent from the current level to 122 gigawatts, which is the goal of a 2012 federal executive order.[17]

Collectively, state actions can lead to significant energy savings for industry. According to a 2010 National Academy of Sciences report, 14 percent to 22 percent of industrial energy use could be saved by 2020 through

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[11] U.S. Department of Energy, Superior Energy Performance program website. For more information, see http://www.energy.gov/eere/amo/business-case-sep#case-studies (accessed September 16, 2014).

[12] The International Energy Agency CHP and District Heating and Cooling Collaborative, CHP/DHC Country Scorecard: United States, November 2014 http://www.districtenergy.org/blog/2014/11/25/the-iea-chp-and-dhc-collaborative-issues-2014-country-scorecard-for-u-s/ (accessed November 25, 2014). For a state-by-state estimate of CHP installations, see: http://www.eea-inc.com/chpdata/index.html

[13] State and Local Energy Efficiency Action Network. (2014). *Industrial Energy Efficiency: Designing Effective State Programs for the Industrial Sector*. Prepared by A. Goldberg, R. P. Taylor, and B. Hedman, Institute for Industrial Productivity. Page 12. http://www.energy.gov/eere/amo/downloads/industrial-energy-efficiency-designing-effective-state-programs-industrial-sector (accessed October 2, 2014).The 2014 State Energy Efficiency Scorecard, Gilleo, A. et al, American Council for an Energy Efficient Economy. October 2014. Pages 68-69 http://www.aceee.org/research-report/u1408 (accessed October 2, 2014.

[14] The U.S. DOE's Industrial Assessment Center Program Update, Spring 2014. http://energy.gov/eere/amo/downloads/industrial-assessment-centers-quarterly-update-spring-2014-0 (accessed October 2, 2014).

[15] The U.S. Environmental Protection Agency provides resources on CHP, including a database of policies and incentives can be found at: http://www.epa.gov/chp/policies/database.html (accessed August, 1, 2014).

[16] Hedman, Bruce et al. The Guide to Successful Implementation of State Combined Heat and Power Policies, U.S. DOE State and Local Energy Efficiency Action Network report. March 2014. Page 59 http://www.energy.gov/eere/amo/downloads/industrial-energy-efficiency-designing-effective-state-programs-industrial-sector (accessed July 11, 2014).

[17] White House Executive Order, Accelerating Investment in Industrial Energy Efficiency. http://www.whitehouse.gov/the-press-office/2012/08/30/president-obama-signs-executive-order-promoting-industrial-energy-effici (accessed August 29, 2014). Also, see http://energy.gov/articles/energy-department-turns-heat-and-power-industrial-energy-efficiency

implementation of industrial energy efficiency and CHP measures.[18] DOE IACs have identified energy savings of up to 15 percent per year through implementation of energy-efficient lighting, process improvements, CHP or other efficiency measures.[19] Those savings can help a company improve its bottom line and remain competitive.[20]

In addition to cost savings for business, recent and proposed environmental rules provide more motivation for states to help industry save energy. In 2012, the U.S. Environmental Protection Agency (EPA) set national Maximum Achievable Control Technology standards for emissions of hazardous air pollutants such as mercury and particulate matter.[21] Those rules apply to more than 14,000 boilers and other heating equipment located in refineries, chemical plants, and other institutions. Industrial facilities can consider natural-gas CHP as a compliance strategy.[22]

In June 2014, the EPA proposed a rule to reduce greenhouse gas emissions from existing power plants.[23] As proposed, the rule would allow states to comply using energy-efficiency actions taken outside the "fence line" of the power plant, including in the industrial sector. States should continue to monitor action by the EPA to understand how industrial energy efficiency and CHP savings might help them comply with the final rule, scheduled for release in June 2015.

Challenges

Just as state motivations for actions vary, so do the barriers to energy-efficiency uptake. Small companies may want to act but find it difficult to fund the upfront cost of improvements or dedicate the staff time needed to evaluate opportunities. Large companies may have greater budget flexibility to invest in energy-efficiency measures or technologies but, as some engineering staff have reported, have difficulties engaging top decision makers and securing commitment for new investments because of competing priorities.[24] In general, there appears to be an information gap about available energy savings programs and technologies, which provides an opportunity for state education and outreach to industry stakeholders.

The diversity of the industry sector—which spans from aluminum, iron and steel, paper, and chemical production to petroleum refining, food processing, automobile, textile, and other manufacturing—means that state industrial energy-efficiency programs must be tailored to specific circumstances rather than programs for residential or commercial sectors, which generally have more uniformity.

Lessons Learned from the Policy Academy

To support state efforts to help industry save energy, the NGA Center convened a Policy Academy on Enhancing Industry through Energy Efficiency and CHP in 2012. The NGA Center spent one year working with governor-designated teams from five states—**Alabama**, **Arkansas**, **Illinois**, **Iowa**, and **Tennessee**—to explore key technical and policy issues and develop strategic

[18] Real Prospects for Energy Efficiency in the United States. America's Energy Future Energy Efficiency Technologies Subcommittee; National Academy of Sciences; National Academy of Engineering; National Research Council. Table 4.4. Sector-wide and by Selected Subsectors and Technologies, Page 198. http://www.nap.edu/openbook.php?record_id=12621&page=198 (accessed September 11, 2014).

[19] U.S. Department of Energy, Industrial Assessment Center Database, 2014. http://energy.gov/eere/amo/industrial-technical-assistance#ii See footnote ii (accessed August 15, 2014).

[20] Ibid

[21] U.S. EPA Emissions Standards for Boilers and Process Heaters and Commercial / Industrial Solid Waste Incinerators http://www.epa.gov/airquality/combustion/actions.html (accessed October 27, 2014).

[22] U.S. EPA Fact Sheet, CHP as a Boiler Replacement Opportunity. http://www.epa.gov/chp/documents/boiler_opportunity.pdf (accessed September 11, 2014).

[23] U.S. EPA, 79 Fed. Reg, 34830, 34899, June 18, 2014, "Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units." https://www.federalregister.gov/articles/2014/06/18/2014-13726/carbon-pollution-emission-guidelines-for-existing-stationary-sources-electric-utility-generating (accessed September 11, 2014).

[24] State and Local Energy Efficiency Action Network. (2014). *Industrial Energy Efficiency: Designing Effective State Programs for the Industrial Sector*. Prepared by A. Goldberg, R. P. Taylor, and B. Hedman, Institute for Industrial Productivity. Page 44-45. http://www.energy.gov/eere/amo/downloads/industrial-energy-efficiency-designing-effective-state-programs-industrial-sector (accessed October 2, 2014).

action plans. This paper highlights lessons learned by the policy academy states as of October 2014. Those lessons point to five actions all governors can consider to help industry save energy, described below.

Streamline Environmental Permit Processes

The policy academy teams recognized that a leading barrier to CHP adoption is lengthy deployment time, which is partly because of requirements for obtaining state air-quality permits. In many states, CHP is regulated under the same processes as a typically larger centralized power plant, and a developer must complete a multistep process, which can take nearly a year, to certify that a CHP unit will meet state emission standards. During that period, potential customers can lose interest and project economics can change. Several state teams discussed how permitting processes could be improved to reduce time and better reflect the expectation that overall air emissions will decline after the installation of CHP technologies.

During the policy academy, the **Iowa** team conducted a survey of large manufacturers and received feedback that a key barrier to deployment of larger CHP units was the perception of onerous permitting requirements. To address that barrier, Iowa plans to release a state resource guide to CHP development and showcase it through a series of public outreach events. The guide will:

- Offer a clear step-by-step guide to obtaining all permits for large CHP units operating at industrial facilities;
- Identify state and local financing options for CHP installations; and
- Provide a directory of experts to help companies navigate state regulatory approval processes.

Based on presentations during the policy academy, Iowa is exploring the use of a permit-by-rule (PBR) approach for smaller CHP units, and the state team is working with the Iowa Department of Natural Resources to evaluate the potential for an output-based emissions standard.[25] Output-based emissions standards limit the amount of pollution produced per unit of output (for example, pounds of sulfur dioxide per megawatt-hour of electricity).

A PBR allows facilities using generation technologies with quantifiable air quality benefits to operate such units without going through the permit process required for energy-generating units under EPA's National Ambient Air Quality Standards.[26] The PBR approach avoids an often lengthy state permitting process, saving time and costs for developers while maintaining air quality protection. **Connecticut**, **New Jersey**, and **Texas** have developed PBR or related rules that apply to CHP installations below a specified size.[27] Most recently, Texas issued a PBR for CHP systems up to 8 megawatts.[28] Under the Texas PBR, developers or owners are still subject to reporting requirements and must verify emissions savings to ensure new CHP units meet modeled emissions parameters.

Build on Existing State Policies and Programs

The policy academy experience taught state teams the value of aligning efforts to support deployment of less well-known technologies, such as CHP, with existing programs. Two leading approaches involved expanding existing incentive programs and integrating efforts related to energy assurance.

Illinois used the policy academy to help stakeholders understand how CHP might qualify for ratepayer funds

[25] Approaches to Streamline Air Permitting for Combined Heat and Power: Permits by Rule and General Permits. US EPA Fact Sheet. 2011. http://www.epa.gov/chp/policies/output.html (accessed October 20, 2014). The Fact Sheet explains how to ensure new CHP units comply with National Ambient Air Quality Standards.

[26] Output-based emissions standards can be designed to account for two types of output in the compliance computation (accounting for thermal output is particularly important because CHP achieves its superior energy-efficiency by producing both electricity and thermal energy from a single fuel source). US EPA, CHP partnership, http://www.epa.gov/chp/policies/output.html (accessed October 20, 2014).

[27] If a CHP system is not eligible for PBR, it must apply to the state air agency for an air emissions permit.

[28] Texas Commission on Environmental Quality, Chapter 106 - Permits by Rule, Rule Project No. 2012-008-106-AI. http://www.texaschpi.org/content/Press_Releases/Press_Releases.asp (accessed September 10, 2014).

collected in support of the state's energy-efficiency portfolio standard (EEPS).[29] Discussion during the policy academy focused on how to count and credit CHP energy savings under Illinois' EEPS. In 2014, the Illinois Department of Commerce and Economic Opportunity launched a CHP pilot program that provides financial incentives for CHP projects in eligible public sector facilities, which include: local governments, municipal corporations, public school districts, community college districts, public universities, and federal facilities. The pilot is structured as a three-phase award with incentives distributed after the design phase, upon commissioning, and after 12 months of measured operational performance.[30] The state plans to use the CHP pilot to lay the groundwork for a similar program aimed at utility-run programs in the industrial sector. Recently, the Chicago Infrastructure Trust announced a new program for municipal building upgrades that will seek to use the state's new CHP incentive program.[31] Meanwhile, utilities in the state are working on developing a CHP incentive program while they accept any immediate applications for support through their "custom" programs.

Alabama, **Illinois**, **Iowa**, and **Tennessee** are looking at how CHP could be part of resiliency efforts at state buildings, hospitals, and health care facilities. Such efforts aim to put technologies, materials, and equipment in place that can withstand natural disasters that lead to disruptions in the energy supply and related industries.[32] Iowa is collaborating with the state hospital association to identify sites for pilot projects. Although not industrial applications, the pilots are opportunities for states to educate industry on the benefits of CHP.

Develop a Communications Strategy Targeting Industry

Traditionally, state programs offer companies energy audits or single-measure energy-efficiency upgrades, but many states do not have the budget or staff capacity to support ongoing engagement that could help achieve more substantial energy savings. The policy academy process helped states examine how to enhance outreach efforts to industry to achieve more sustained interaction. Several states refined their communications strategies to better engage and educate companies on the latest industrial energy-efficiency programs. In particular, states enhanced their use of web-based tools that serve as two-way communication networks to reach key industry stakeholders.

The policy academy helped **Arkansas** improve outreach to industry through the creation of a web-based platform, the Arkansas Industrial Energy Clearinghouse, which aims to make state-based manufacturers more aware of energy savings opportunities. The clearinghouse was developed as a partnership of the governor's office, the state energy office, and the University of Arkansas at Fayetteville. It uses case studies, research papers, and other relevant publications to build connections between university engineering staff and companies. The clearinghouse website offers an online calculator to help companies estimate measure-specific savings and connects industry to state-funded technical experts at the University of Arkansas who can offer energy assessments. The clearinghouse includes technical information as well information to aid the decision-making process of companies considering CHP.[33]

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[29] Illinois public benefit funds are administered both by utilities and the state. Investor-owned electric utilities are responsible for roughly 75 percent of program spending, while the Illinois Department of Commerce and Economic Opportunity (DCEO) administers the remaining 25 percent of the funds dedicated to government facilities and low-income households, and public sector training programs.

[30] Illinois DCEO CHP Program Guidelines. http://www.erc.uic.edu/energy-efficiency/illinois-energy-now-programs/dceo-chp-pilot-program/ (accessed November 10, 2014).

[31] Keane, Aimee, Northwestern University. Chicago Infrastructure Trust is chugging along. htpp://news.medill.northwestern.edu/chicago/news.aspx?id=229929 (accessed December 2, 2014).

[32] Housing and Urban Development (HUD). Guide to Using Combined Heat and Power for Enhancing Reliability and Resiliency in Buildings, http://portal.hud.gov/hudportal/documents/huddoc?id=CHPSept2013.pdf (accessed December 2, 2014).

[33] The Arkansas industrial energy efficiency and CHP clearinghouse is available at http://www.arkansasiec.org/.

Alabama is creating a comprehensive web portal to provide companies with information on energy efficiency. The portal will offer information from federal and state agencies, including best practices for energy audits, energy-efficiency technologies, financing opportunities, and case studies of successful projects. Alabama anticipates the portal will create more interest in industrial energy efficiency from manufacturers. Alabama SAVES, the state's revolving loan fund, plans to realign funds as necessary from other areas to prepare for an anticipated increase in loan applications from companies.[34]

Tennessee used the policy academy to connect with key industrial stakeholders through a series of education and outreach events. From March 2013 through September 2013, the Tennessee team served as conveners, presenters, or moderators at numerous events designed to educate industry on the cost-saving benefits of energy efficiency and CHP. The Tennessee team launched an annual industrial energy-efficiency summit in July 2013, which was then expanded to target a broader southeastern audience in November 2014.[35] The annual summits were well received by industry and included topics ranging from energy management standards, such as SEP and International Standards Organization 50001, to compressed air, technology developments for pumps and water treatment, and induction heating and melting.[36] Both summits focused on moving from energy assessments to project implementation. As a result of those events, Tennessee has increased its engagement with manufacturers and utilities and fostered peer-to-peer exchanges. Team members are now working with several Tennessee companies to rank energy-efficiency actions for further exploration and implementation, as well as identify funding options.[37] Tennessee also continues to provide education and outreach to industry stakeholders regarding a variety of CHP topics, including state tax incentives for CHP and how the Tennessee Valley Authority (the federal utility that covers nearly all of the service territory in the state) treats qualifying facilities (QFs). Under the Public Utility Regulatory Policies Act, QFs are small power production facilities or cogeneration facilities eligible for special rate or regulatory treatment.[38]

At the opening workshop for the policy academy, states learned about outreach efforts under **Oregon**'s industrial energy-efficiency program. Oregon stakeholders, including the Oregon Energy Trust, Oregon Department of Energy, and the Oregon Public Utility Commission, as well as nonprofit organizations and trade associations, work with companies to carry out energy-efficiency upgrades and continuous energy-efficiency improvements. Oregon's program directors identified the following actions as essential ingredients to a successful program: provide companies with a high-quality energy audit; build an ongoing relationship based on positive customer engagement; collaborate with trusted partners, including trade associations; and offer high-quality technical services.[39]

Provide Access to Training and Information Resources

The policy academy teams recognized that most manufacturers lack awareness of best practices for improving energy efficiency in their facilities. They discussed how energy audits and assessments can

[34] Alabama SAVES is a revolving loan program run by the Alabama Department of Economic and Community Affairs. The program provides financing for commercial and industrial energy-efficiency and renewable-energy projects in Alabama and is administered by Abundant Power Solutions, LLC. http://www.alabamasaves.com/Default.aspx (accessed August 21, 2014).

[35] For more information on the Tennessee Summits, please see: http://tnenergy.org/

[36] International Standards Organization 50001 establishes a framework for organizations to manage energy. http://www.iso.org/iso/home/standards/management-standards/iso50001.htm (accessed December 2, 2014).

[37] Personal conversation with Tennessee policy academy team members.

[38] Public Utility Regulatory Policy Act (PURPA), Pub.L. 95–617, 92 Stat. 3117, 1978. http://www.ferc.gov/industries/electric/gen-info/qual-fac/what-is.asp (accessed December 2, 2014).

[39] More information on Oregon's industrial energy efficiency program can be accessed at http://www.nga.org/cms/home/nga-center-for-best-practices/meeting--webcast-materials/page-eet-meetings-webcasts/col2-content/main-content-list/policy-academy-on-enhancing-indu.html.

educate companies and encourage them to adopt cost-effective, energy-saving technologies or process improvements. The teams also looked at how to improve access to training and information resources.

Alabama and **Arkansas** are using the previously mentioned web-based programs as entry points for deeper engagement with industrial sectors. The Alabama team is working with its state university and community college system to develop curricula for an academic degree track in energy that will be available to both engineering and business students and include coursework on advanced manufacturing, marketing, supply-chain management, business and policy. An important aspect will be the incorporation of cross-discipline discussions for students, which will include dialogues with corporate executives and maintenance managers to help students better understand each profession's needs and challenges. Alabama's new degree program will fill a growing need for trained energy professionals in the state and complement deeper engagement with industry on energy savings benefits.

Building upon interactions at the policy academy, Arkansas is expanding its technical training capabilities by creating an Economy, Energy and Environment (E3) program.[40] The state is working with the National Institute of Standards and Technology Manufacturing Extension Partnership to ensure its E3 program meets the economic, energy, and environmental needs of manufacturers. During the policy academy, the state team met with E3 program directors in **Idaho** and **North Carolina** to identify effective program structures and outreach plans. The governor's office provided funding to create Arkansas' E3 charter and implement an outreach program. The program received approval in November 2014 and subsequently launched as a partnership between the state energy office and Arkansas Manufacturing Solutions. The E3 program partners expect to conduct five site assessments in 2015. The assessments will help Arkansas' companies identify energy, water and costs saving measures and start to implement lean management.

Recognize Success

Governors can serve as effective public champions of industrial energy efficiency by recognizing corporate efforts to save energy in manufacturing. That can help address the lack of awareness and attention given to energy efficiency by the manufacturing sector. The summits each state held at the culmination of its policy academy provided opportunities to recognize successful state and manufacturing efforts to save energy and encourage greater engagement.

Tennessee used its summit to urge manufacturers to take advantage of energy-efficiency technical assistance to identify and set priorities for energy savings opportunities. In **Alabama**, Governor Robert Bentley delivered a keynote address at the state's policy academy summit that highlighted the efforts of leading industries and industry groups in helping the state increase the energy efficiency of its manufacturing sector. In **Arkansas**, Governor Mike Beebe touted the state's annual energy-efficiency savings goals and highlighted how industry efforts have been essential to helping Arkansas meet those goals and increase the competitiveness of its industry.

Looking Ahead

As governors look to enhance efforts to help industry save energy, they will undoubtedly face new challenges as the industry's demand for energy grows; the regulatory landscape shifts; and domestic prices of energy, although currently projected to continue to drop, may be less predictable in the face of new environmental rules and other factors.[41] States are

[40] The E3 program is a joint effort run by the US Environmental Protection Agency, Department of Energy, and Department of Commerce. The program provides states with E3 programs access to free energy-, water-, and emissions-savings audits for selected industrial facilities and also offers their staff training on lean management practices. http://www.e3.gov/ (accessed September 16, 2014).

continuing to implement solutions and learn from other states, but more work is required. Policymakers need to know how to build more rigorous and high-quality evaluations into industrial energy-efficiency program design. Although every state's industrial needs are unique, leadership from governors can help states find cost-effective solutions to reduce energy use and increase the competiveness of their manufacturing sectors.

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[41] Projected Henry Hub natural gas prices average $4.44 per one thousand British thermal unit MMBtu in 2014 and $3.83/MMBtu in 2015. US U.S. Energy Information Administration, Short-Term Energy Outlook, November 2014. http://www.eia.gov/forecasts/steo/ (accessed November 25, 2014).