New Hampshire Department of Resources and Economic Development: Recommendations on Best Practices and Energy Program Initiatives

Submitted to the:
New Hampshire Department of Resources and Economic Development

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April, 2012
1. Introduction

State economic development agencies such as the New Hampshire Department of Resources and Economic Development (NH DRED) can play a crucial role in assuring profitable, productive, and competitive business sectors. They also can facilitate a state’s development of a prosperous economy for industries, businesses, and residents. Although the programs and methods of each economic development agency (EDA) are typically based on unique state and local economic conditions, the most effective EDAs share key attributes and approaches.

In service to the NH DRED, the Vermont Energy Investment Corporation (VEIC) has completed a “mini-research project” covering the following tasks:

- Research and identify 3 to 5 EDAs involved in providing energy efficiency services to industries and businesses, and / or in the development of a “clean energy” sector of the economy in a state;¹
- Review and assess the programs and methods of the EDAs; and
- Suggest further enhancements and additions to the current clean energy programs and methods of NH DRED, for future consideration.

This report is a high-level outline of EDA best practices in general, and identifies those that relate specifically to energy efficiency and clean energy services to businesses and industries in a state. It also identifies EDAs that help stimulate location-based economic development and expansion of clean energy businesses.

This research informed, and is intended to be utilized with a second NH DRED mini-research project carried out by Jeffrey H. Taylor Associates, Inc. entitled “New Hampshire Division of Economic Development Energy Related Services.” The Jeffrey H. Taylor Associates work draws from this document and the New Hampshire Independent Study of Energy Policy Issues to present appropriate recommendations for NH DRED’s future leadership or support. This determination is consistent with the agency’s current role in providing energy efficiency services to New Hampshire businesses and industries—and effort that helps support the development of a clean energy economy in the state.

2. Economic Development Agency Best Practices

An examination of multiple EDAs, reports, presentations, and interviews with state economic development officials reveals consistent best practices for any EDA; in addition, this report is informed by an analysis of documents on state economic development, available from the National Governors Association Center for Best Practices (NGA).² In no particular order of importance, these key best practices are presented as tasks for effective EDA programming and administration:

- Identifying and building local strengths through cluster identification and development³
- Developing the local workforce through education and training

¹ For purposes of this report, clean energy includes energy efficiency and renewable energy resources—primarily solar, wind, biomass, geothermal, hydropower, and tidal energy.
³ Cluster development is a term for the support of interconnected businesses, suppliers, and associated institutions in a particular field and within a specific geographic region.
• Providing technical assistance and business acumen
• Providing grants and loan products, including bonds, to start-ups and existing businesses
• Aligning and coordinating state incentives for businesses
• Collaborating with businesses and local government to promote and establish favorable tax and economic incentives
• Providing market analysis and sector data
• Fostering collaboration and partner engagement within the business sector and larger communities, as well as among academic, government, and business sectors
• Promoting new industry growth, concurrent with support to existing businesses

Because each EDA pursues initiatives that are tailored to the specific state or local economic climates and needs, they are assumed to be dependent on EDA staffing and financial resources.

3. Economic Development Agencies and Clean Energy Programs
There are two distinct routes that EDAs can pursue in energy efficiency:

1) Developing and offering programs that provide technical assistance, energy audits, incentives, and clean-energy-specific financing to businesses, and/or coordinating with the EDA for the delivery of programs and incentives that are initiated and funded by others; and/or

2) Holistic development of an energy efficiency and clean energy sector in the state or local economy as a way to stimulate jobs, economic growth, and tax revenue. Such an approach can include comprehensive strategy and roadmap development, state economic policy development, outreach and education, stakeholder collaboration and coordination, the securing of grant funding, and workforce development.

EDAs such as the Arkansas Economic Development Commission, the Baltimore County Department of Economic Development (Maryland), and the Community Development Corporation of Long Island (New York) have programs that follow the first route, coordinating when possible with utility or statewide energy programs. It should be noted that the latter two are regional EDAs, whereas the Arkansas Commission is a statewide EDA with a dedicated energy sub-department.

Additional examples of EDAs that have direct energy efficiency initiatives are:
• The Ohio Department of Development Energy Resources Division, which directs a program to issue the state’s Qualified Energy Conservation Bonds (QECBs) to finance comprehensive energy efficiency building retrofits
• The Iowa Economic Development Authority, which has joined a consortium of public and private energy efficiency stakeholders to promote outreach, education, partnerships, research, and demonstration projects.

In these examples, the EDAs coordinate with other statewide clean energy programs and initiatives, and tie in information and links to federal incentives and programs. Table 1 provides an outline of clean energy programs offered through the EDAs mentioned in this document.

In the absence of an established centralized, statewide clean energy framework, EDAs that offer energy efficiency outreach, audit, and financing programs can be particularly effective in lowering business operating costs while promoting the benefits of building energy retrofits. To maximize effectiveness, it is
essential that EDAs pursuing these initiatives coordinate with other energy efficiency programs operating in their states, including utility-sponsored programs. In this regard, EDAs can play an important role in coordinating energy audit, incentive, and financing programs to provide a strategic single point of entry for businesses. Combined with technical assistance and program guidance, either through EDA internal staff or via a network of trained staff from partner organizations, the EDA can be a single entity driving energy efficiency throughout its operational area (either statewide or regional). In such cases, these EDAs also have the ability to diversify funding sources and decrease reliance on traditional funding through state appropriation. For example, many EDAs derive a significant source of funding through fees and interest collected from energy finance products. They also can obtain funding from utility-sponsored energy efficiency programs.

Although offering energy efficiency programs and incentives to individual businesses can be a key strategy, EDAs are also well suited to pursue a comprehensive and holistic approach that can result in long-term sustainable support and growth for existing businesses—not to mention the potential location of new businesses to a state or locality. This strategy is in line with the second route, and incorporates a larger suite of the identified best-practice efforts. Examples of EDAs pursuing this approach are the Michigan Economic Development Corporation and the Rhode Island Economic Development Corporation (RIEDC). These entities pursue strategies that promote profitable and sustainable businesses by addressing all channels within industry—from the supply side to the demand side. This is often referred to as cluster development.

Successful cluster development depends largely on the EDA’s ability to identify core strengths and industry players within a state or locality, as well as points of leverage within government, industry, and research institutions. The EDA can then begin to build a bottom-up strategy that incorporates those factors and entities and sets realistic development goals and milestones. The RIEDC has been particularly effective in leveraging its coastal location, academic institutions, energy legislation, and industrial technology base to drive renewable energy sector growth, including its utility-scale energy generation from offshore wind. In addition to managing a sizable statewide renewable energy fund that has an affordable housing component, the RIEDC worked with key state officials to develop and implement The Roadmap to the Green Economy in Rhode Island. This document created a clear strategy for advancing a clean energy economy throughout the state. RIEDC staff also identified clean energy workforce development as a key initiative in 2012. This effort will be led by the RIEDC, involving a taskforce of government and industry representatives to collaboratively set goals and develop programs to help the local workforce gain skills to meet the present—and more important—future needs of business and industry.

4. Conclusions
The Independent Study of Energy Policy Issues states simply that “Energy Is the lifeblood of the economy.” NH DRED has the ability to leverage the study’s findings and align them with a wealth of local resources to ensure a prosperous economy for New Hampshire’s industries, business, and residents. The following pathways provide options for NH DRED to pursue coordinated direct offerings (e.g. energy audits, financing programs, technical support. and guidance) and clean energy cluster development.

Specifically, NH DRED is well positioned to:

- **Coordinate the multiple energy efficiency finance and audit programs** offered by public entities and utilities, and to create a single strategic point of entry for business;
- **Coordinate the issuance of New Hampshire’s remaining QECBs**;
• Facilitate private investment in energy efficiency, and creation of public-private partnerships through stakeholder outreach and coordination;
• Drive job creation and workforce development in a sector that has a higher-than-average median wage and is experiencing faster growth than in the rest of the United States;
• Pursue a “lead by example” approach, engaging the broader community, collaboratively developing goals, and showcasing the model for others; and
• Set the stage for the next level of energy legislation through coordinated development of the clean energy cluster, which presently has more than a decade of experience in offering energy efficiency and weatherization services.

The benefit to the NH DRED in taking this approach could be substantial. It potentially can mean immediate operational cost reductions for businesses, while simultaneously developing strategies and programs that have sustaining effects beyond simply helping businesses stay afloat during difficult economic periods. The specific strategies involved in cluster development will depend on closer examination of existing resources within the state, and pursuing well-articulated, long-term goals for economic development. An example of what energy efficiency cluster development strategy looks like in another state is presented in the Washington State Energy Strategy as Appendix B.

New Hampshire has a solid foundation of clean energy resources—both in terms of related businesses and services, and of public attitude towards energy savings and the need for reduced dependence on imported fossil fuels. Combining these factors with a clean energy workforce of more than 13,000 people in the field, and a stated need to promote increased profitability and growth within existing businesses, yields a prime opportunity and path for NH DRED to lead New Hampshire into the future.

### Table 1. A comparison of clean energy programs administered through EDAs, by state

<table>
<thead>
<tr>
<th>Entity</th>
<th>Clean Energy Related Programs</th>
<th>Brief Program Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arkansas Economic Development Corporation</td>
<td>Industrial Energy Technology Loan Program</td>
<td>Finances energy efficiency retrofits and encourages investments in clean technologies</td>
</tr>
<tr>
<td></td>
<td>Home Energy Affordability Loan Program</td>
<td>Provides limited number of businesses with facility audits and 0% retrofit financing. Further provides home audit services to 100 employees of each selected business. Businesses agree to devote a portion of energy savings to creating 0% interest employee loan fund to finance residential energy efficiency retrofits</td>
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<tr>
<td></td>
<td>Arkansas Green Technology Grant Program</td>
<td>Provides grants to support clean technology companies (energy efficiency or renewable energy) within Arkansas</td>
</tr>
<tr>
<td></td>
<td>Residential and commercial sector guidance</td>
<td>Online links to utility-sponsored programs; online tools and tips; contractor location links</td>
</tr>
<tr>
<td></td>
<td>Homebuilder services</td>
<td>Energy code information and links; state and federal green building tax incentive information</td>
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<tr>
<td></td>
<td>Energy training</td>
<td>Free energy conservation and renewable energy training to K-6 teachers, with professional development credit</td>
</tr>
<tr>
<td>Baltimore County Department of Economic Development</td>
<td>Green @ Work Program</td>
<td>Free small business energy audits and low cost loans</td>
</tr>
<tr>
<td></td>
<td>Commercial and Industrial</td>
<td>Links to utility-sponsored efficiency programs</td>
</tr>
<tr>
<td>Entity</td>
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<tr>
<td><strong>Community Development Corporation of Long Island</strong></td>
<td>Long Island Green Homes</td>
<td>Free or reduced-cost residential energy audits; coordination with incentives offered through statewide efficiency programs (NYSERDA, LIPA) including low-cost financing through NYSERDA for energy efficiency retrofits</td>
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<tr>
<td></td>
<td>Weatherization Assistance Program</td>
<td>Manages WAP program for State of New York</td>
</tr>
<tr>
<td><strong>Iowa Economic Development Authority</strong></td>
<td>Partnership for Industrial Energy Efficiency (PIE²) Program</td>
<td>PIE² is a consortium of industrial energy efficiency public/private stakeholders that develop and disseminate educational materials, tools, and research; they also conduct other projects to improve energy efficiency in Iowa industrial facilities.</td>
</tr>
<tr>
<td></td>
<td>Workforce training programs</td>
<td>Develops multiple workforce training programs to meet needs of all industries / companies within state</td>
</tr>
<tr>
<td><strong>Michigan Economic Development Corporation</strong></td>
<td>Alternative Energy Market Development</td>
<td>Coordinates and manages Missouri’s $61 million allocation of Qualified Energy Conservation Bonds</td>
</tr>
<tr>
<td><strong>Missouri</strong></td>
<td>QECB Program</td>
<td>Professional development program for small business/commercial entities to train facilities staff on energy-efficient building operation</td>
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<tr>
<td></td>
<td>Builder Operator Certificate Program</td>
<td>Coordinate funding applications for HB 264, giving school districts ability to borrow funds for energy improvements without requiring taxpayer ballot; serves as technical resource for information regarding HB 264 opportunities and sources of supplemental funding</td>
</tr>
<tr>
<td></td>
<td>Institutional / Local Government</td>
<td>Connects manufacturers to financial and technical resources to deploy energy efficiency and renewable energy technologies</td>
</tr>
<tr>
<td><strong>Ohio Department of Development</strong></td>
<td>Targeted Industry Efficiency</td>
<td>Provides financing through federal and state funding sources for energy efficiency and renewable energy projects that demonstrate reduced energy usage and job creation and/or retention</td>
</tr>
<tr>
<td></td>
<td>Energy Loan Fund</td>
<td>Administers incentive programs through advanced energy fund to support investments in renewable energy and energy efficiency in industrial, agricultural, public, and residential sectors—in coordination with state utilities</td>
</tr>
<tr>
<td></td>
<td>Ohio Advanced Energy Fund</td>
<td>Department of Development manages and directs funds</td>
</tr>
<tr>
<td></td>
<td>Ohio State Energy Program</td>
<td>Manages statewide Renewable Energy Fund to stimulate job growth in green technology and clean energy</td>
</tr>
<tr>
<td><strong>Rhode Island Economic Development Corporation</strong></td>
<td>Renewable Energy Fund</td>
<td>Developed and implemented Rhode Island Roadmap to the Green Economy to create a strategy and growth path to advance the clean energy economy throughout the state</td>
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Bibliography


Appendix A
NGA Center for Best Practices

Experts Roundtable on Economic Development in the
Clean Energy Sector
Experts Roundtable on Economic Development in the Clean Energy Sector
Meeting Summary & Experts’ Policy Recommendations

This document summarizes the key points and policy recommendations that were provided by expert participants in each pillar. Their comments are augmented by insights from additional experts and reports that were consulted in preparation for this Experts Roundtable. Policies towards the top of each category are the policies most commonly cited by the experts surveyed. These findings are not attributable to the NGA Center or any individual expert participant.

Below is a summary of the key points discussed regarding each of the pillars.

I. Identifying Local Strengths and Building a Comprehensive Strategy

Key Discussion Points

- We cannot frame any one technology, policy or business as a panacea.
- We need to understand that policy setting does not equal policy execution: states and businesses need to focus on the entire chain of events. Ensuring that strategies are developed with outreach to businesses, will increase likelihood of a successful strategy and execution. But also need to not overestimate industry and their ability to understand market intelligence.
- Analyzing regional clusters based on comparative advantage is a good tool.
- We need to do a far-better job of collecting and analyzing relevant data. In California, having useful data enabled the state to see hidden benefits from renewable energy, such as the adoption of solar panels in the agricultural sector.
- We’re standing on the cusp of a third industrial revolution. Thoughtful policy can foster this energy efficient revolution and thoughtless policy will prevent it.
- There should be an emphasis placed on growing the market for clean energy and not just attracting away from other states. Many state policies hold the key to this market growth.

Policy Opportunities:

- Support clean energy cluster development and be broad, honest and thorough when creating the strategy. Encourage a detailed mapping of state research, manufacturing, infrastructure, labor and policy environment, and match it against clean energy industries’ needs. Be broad in considering what assets exist in a state- and include characteristics such as good road infrastructure to clean energy development sites, above-average collaboration between agencies, complex regulatory markets as hotbed for testing, energy resources, and energy efficiency as locally produced asset. Be honest about what assets a state does and does not have. For instance, most locations believe they have above-average labor. It is difficult to identify local strengths since the data is not clear. Some states analyzed the supply chain to see which OEMs in-sources and out-sources as part of deciding which sector to invest in. One way to support clusters is to create a Regional Energy Innovation Institute that provides technical assistance to the industry thereby building long-term capacity and branding of the state as friendly for clean energy investments. Another way is to provide anchor tax credits to foundational companies.
- Support training of entrepreneurs and economic development professionals on the nuances and unique attributes of the energy markets and regulations. Most economic development models are
based on the IT and biotech successes, but energy is a very different sector in that it is a legacy sector that has invested infrastructure so there are significantly higher capital costs and longer-term ROIs. The regulated monopolistic nature of electricity leads to little investment in innovation and a highly complex market structure. Training programs that provide this market training to entrepreneurs and policymakers can be found at NorTech’s Clean Energy Fellowship, the New England Clean Energy Business Council and the NCSL-Horizon Energy Institute.

- **Educate and publically communicate the multiple opportunities & benefits of clean energy** (e.g. reducing utility bills) and the costly externalities of fossil fuels that get paid in other pockets (e.g. asthma, pollution, EPA compliance costs, black lung cancer of miners). This can increase direct demand, if communicated with specific actions to take, as well as can increase political appetite for state policy in the short and long-term. Public opinion polls find that in addition to stories about in-state job creation, the majority of voters like hearing about in-state examples of local innovation and local job creation councils – so governors can tout these intermediary steps with confidence. Some noted that a governor’s most important role in fostering clean energy markets is to use their position to raise awareness among the policy community and the public as to the importance of clean energy policies.

- **During the economic development strategy development phase, invite businesses and MEP to join the conversation to help identify local cluster strengths and once strategy developed, invite MEPs to do outreach for deployment.** Asking business leaders about where they see growing business and what support they need reveals assets and comparative advantages that can’t be found on paper. MEPs can help SMEs identify new products to develop due to projected sales and help them reduce costs by reducing inputs such as energy and materials.

- **Call upon clean energy businesses to converge their policy priorities** for a consistent position. The clean energy sector is comprised of dozens of different business types and governors’ offices don’t have the capacity to meet with each sub-sector. Governor Patrick asked the clean energy businesses in Massachusetts to self-organize and prioritize their policy needs, and this resulted in much more effective policy support for the clean energy economy.

- **Align disparate incentives with a state strategy.** States tend to have dozens of disparate pools of funds and incentives that are not aligned under a single strategy. Funding streams from the federal, state, regional, and local level can be aligned to generate some serious power. Inviting business to the table to help design a comprehensive policy can increase likelihood of realistic implementation.

- **Present efforts in terms of opportunities to invest in economic development for a nascent sector rather than in terms of a short-term job-creation opportunity, while also publically recognizing the real short-term benefits.** Clean energy is one emerging sector in a dynamic economy that is organically beginning to grow, so governments have an opportunity to support this emerging sector. Building the clean energy infrastructure requires long-term 10-20 year investments and is not a short-term job-creation panacea. Yet there are real short-term economic benefits that can be gained, as is being realized in New York where every dollar they invested in clean energy business development resulted in $5 of gross state product. Shifting debate away from the term ‘subsidies’ and towards ‘investments’ helps policymakers and the public understand this model better as a means of achieving these types of economic growth opportunities.

- **A portfolio of policies** is needed to create a holistic policy environment to stimulate clean energy job growth through both supply and demand side policies. No single policy will make it work and necessary
components include public-private engagement, job training and generally supportive business environment.

- **Create an energy risk profile** to help states understand the variety of scenarios of policy and market variables and how a balanced mix of energy sources mitigates these risks. For instance, while natural gas prices have dropped significantly, we don’t yet know the full cost and political pressures on extracting the shale gas, and one gas pipeline explosion will shut down the grid. A better understanding of these risks can inform state governments of the appropriate balance of energy supplies. Note that the new lower prices of natural gas is a game-changer that must be included in the strategic planning.

- **Establish long-term energy planning** to allow the industry to plan and secure lower interest and more leverage with capital manufacturers. Integrated resource planning that has stakeholder involvement can help companies.

- Frame the conversation around a need for a ‘balanced portfolio including advanced energy’ maximizes the number of stakeholders interested in having the conversation.

- Focus on reducing cost for energy services by reducing the energy waste. Since the US currently wastes 86% of the economic energy resource generated, addressing this will free up the economy to grow by shifting money to more productive assets and more job-intensive sectors. Fossil fuels are not job-intensive, but the rest of the economy is, so by saving money currently spent on unnecessary energy we can gain jobs at a rate of 1:17, states ACEEE. In-state spending on energy is often times greater than the amount raised by state governments through taxes, highlighting the importance of reducing energy spending.

- Integrate economic benefit analysis within energy planning, to ensure local benefits. Currently, most clean energy policies that go through utilities are not subject to this analysis, so utilities are not going to make efforts to use local suppliers. State government can help coordinate this planning and organization.

### II. Building Demand for Robust Clean Energy Markets

#### Key Discussion Points

- States and regions, and not federal government, are the actors with the power to create big manufacturing jobs in clean energy.

- RPS’s have been crucial in the development of renewable energy project. Yet, if we want to develop the supply chain and manufacturing base, we need more policies than just an RPS, since otherwise will import all technology. Over 80% of clean energy components are imported, although 55% of the value is produced here. Over 95% of solar components are produced overseas. An RPS can be a large external economic stimulus that encourages in-state value. However, it is important to recognize that the demand side policies that have worked for the last decade may not work in the future. This is particularly true in states where low-cost shale natural gas represents a game-changer for the energy market.

- Presently, most state policies are not actually expanding markets, but are simply enabling states to steal from one another. An option for not just playing the attraction angle, but growing the market and bringing in clean energy companies is to have a well-structured RPS.

- We need to look deeper into energy efficiency, and not simply concern ourselves with waste energy after it occurs. This can have significant impacts on economic development. An energy economist noted that this is highlighted by the phrase “17 and 7” – for every $1,000,000 of spending on energy, we create roughly 7 jobs. However, in thinking about cost-effective switching, 17 jobs are produced by energy efficiency. Energy is not labor intensive, but the rest of the economy is labor intensive.
• Balanced and uniform siting policies, advocacy and community involvement, and protection of the environment are all critical.

• A lot of the financial mechanisms for clean energy are balkanized, and need to be brought together. Many industry, residents and utilities do not understand what financial mechanisms and financial incentives exist and are available to them. In order to promote understanding amongst clients, these policies need to be brought together.

• Fixing the transmission issue will be critical in developing robust clean energy markets. Transmission policies need to be involved in integrated resource planning, and strategic siting needs to be implemented for efficient transmissions management.

• Project certainty is more important than project cost

Policy Opportunities:

• **Send market signal of predictable long-term demand.** This is important for the providing companies and also increases likelihood of having the supply chain be built locally, since without long-term market security the supplies will likely be imported from countries that have regulations ensuring stable market demand. A procurement commitment within Delaware’s RPS trumped states that offered financial incentives that were ten-times greater. Policies that send this long-term price signal include: RPS, long-term PPAs, clean energy standard with performance based approach, etc.

• **Create a predictable long-term market by establishing a robust Renewable Portfolio Standard (RPS) and an Energy Efficiency Resource Standard (EERS).** Experts widely agree that the RPS and EERS are the primary drivers of building clean energy markets in most states by driving innovation and implementation. Both are done through utility reforms, so governors offices can encourage PUCs and legislatures to prioritize these types of policies. EERS also save funds for residents to invest in more in-state goods and services. Note that some experts are beginning to question if the RPS model of the past may transform to a different model, due to recent political and economic trends, but even these experts stress that the essential ingredient is a policy that ensures predictable long-term market demand. Research to date has not quantified the number of jobs created by the RPS, in large part because they haven’t been operating long enough. Studies of the RPS find that 70% of states with RPS had ratepayer cost impacts of less than 1% increase in electricity rates, and in six states the RPS caused a rate decrease (LBNL). Note that most states with RPS have relatively high electricity rates, so low-cost states are likely to have different impacts.

• **Require utilities to sign long-term contracts in order to reduce the interest rate** that suppliers can secure from banks as well as their infrastructure OEMs, and thereby bring down the overall cost of clean energy.

• **Incentivize use of in-state suppliers through multipliers and proposal preferences.** The scale of impact on in-state economic development from renewable energy policies, is largely determined by the amount of the supply chain that is based in-state, finds NREL’s research. Some states choose to increase local suppliers by using carve-outs of the RPS that designate in-state generation or particular technologies that are more likely to be created in-state such as solar photovoltaic. Concerns about inter-state commerce clause and overall cost implications from state-carve-outs exist. Alternative policies that incentivize in-state businesses are local multipliers and local preference clauses.
- **Internalize the externalities** of energy sources to allow the market to demand the appropriate pricing and demand. This can most efficiently be achieved through a carbon tax or cap and trade, as was done for cigarettes, when 48 states agreed to increase the excise tax by 400%. Even modest tax increases on oil have led to increased demand for energy efficiency in vehicles and appliances.

- **Energy code implementation and training of code inspectors.** Updating building energy codes and having them automatically update to match national codes in the future is recommended by some. Others say that attention should be on implementing existing codes rather than updating the codes. For every dollar a state invests in energy code compliance, it can save six dollars on reduced energy spending for residents, finds Institute for Market Transformation. States can provide training for building code inspectors to learn about the benefits and requirements of existing energy codes.

- **Ensure Stable Price Signals through a Standard Contract.** This policy sets a fixed price that will be paid to a generator of clean energy for a set number of years, rather than subjecting the generator to daily market variability, and thereby enables lower interest rates by demonstrating a guaranteed buyer. It is also known as a Feed in Tariff or Clean Local Energy Accessible Now (CLEAN) or long-term contracts with price ceiling for distributed generation of residential and commercial. It can give preference to contract applicants that use in-state-made systems, components, and labor in addition to the usual requirement that the energy be delivered to the state grid. Note that Rhode Island just passed a modification on this policy by having long-term contracts for distributed generation that were bid on with a price ceiling, so the state capped its risk but still drives down the price through a reverse auction.

- **Support cost-recovery reforms that incentivize utility and investor support, such as decoupling, retroactive cost disallowed allocation, enhanced credit to utilities, and ratebase investments.** Some experts argue that reforming cost-recovery regulations can have a far greater impact on investment than having the state find new financing streams, since utilities have the security of the ratepayers to leverage in their corporate financing negotiations. One innovative idea called ‘retroactive cost disallowed allocation’ provides incentives to utilities for pursuing the higher risk clean energies – such as innovative efficiency or offshore wind – by creating a small carve out of higher returns on investment for higher risk ventures. Higher ROIs can be offered for clean energy procured, and this can be paired with a prudence review to ensure that ratepayers are not being charged with unnecessary or overly-risky projects. Current regulations on utilities largely do not incentivize innovation and many experts note that the monopolistic nature of the industry will maintain this lack of innovation unless there are innovations in the regulated compensation formulas that inspire more risk-taking and investment in cleaner energy.

- **Require disclosure of energy performance ratings on existing buildings to allow market information about the utility bill impacts from different buildings.**

- **Support policies that encourage co-generation**, which minimizes energy waste. For instance, a governor can convene a conversation about how to bring on natural gas in the most efficient way, such as requiring co-generation. Some states are having these conversations on requiring CHP now that the states are increasing their natural gas portfolios.

III. Fostering Supply and Innovation in Clean Energy Markets

**Key Discussion Points:**

- We have built our policy structure around innovation models in biotech and IT. These models may not work for clean energy companies. Simply parachuting new technologies into a sector as old and entrenched as the energy sector may not be effective.
• The university technology push efforts need to be improved in the US, and new markets need to develop in the energy sector.

• In the current regulated monopoly utility model, there is no room for innovation. An energy company has two important barriers in terms of development – the valley of death and the mountain of death. Need at least $100 million to overcome both. There is no way around the public sector playing a role in developing innovation and energy companies.

• Cross-agency teams and multi-stakeholder processes are needed to achieve the big results.

• It is important to bring OEMs into the process earlier.

• Cultural behavioral changes are essential to achieve this transition, so educating the public about options relating to reducing thermostats and other energy conservation measures are key.

• Given the big changes that are needed, we need to support both failure as well as effort. This is difficult to support in this economic climate and requires more effort to figure out how to execute.

Policy Opportunities:

• **Support supply-chain development by offering consulting support on clean energy sourcing** strategies of OEMs and by hosting networking workshops on the capacities of in-state supply chain companies. Encourage companies involved in R&D to learn about the in-state materials and manufacturing options through the Manufacturing Extension Program (MEP Centers), so they know of options before the prototype-to-production stage. To begin to provide the initial awareness-raising between qualified suppliers and vendors, MEPs can have industry fill out surveys of their capacity, interest & need for entering clean energy market, and then host matchmaking events to link suppliers. With state support, MEPs can work with existing manufacturers that have excess capacity to become suppliers to clean energy sector companies and provide support on the process to becoming a qualified supplier. For high-potential matches, a state can provide one-on-one technical and financial support. Some argue that a large manufacturing supply chain for clean energy is only going to come to a state with long-term price signal of demand, such as a carbon price or RPS.

• **Encourage utility regulations, universities and R&D centers to invest in energy storage.** The ability for renewable energy to scale-up is largely constrained by current utility-scale storage capacity. States can be promoting increasing storage capacity in a variety of ways. Universities can be encouraged to focus on energy storage for next-generation storage options. In the short-term the storage options are PHES (99% of current storage happens with PHES), fly wheel and compressed air. States can monetize the array of benefits that storage units offer the grid, so that utility compensation rates can assign accurate cost-recovery. One option that Texas pursued is to defined storage as resource generation and give it right of access to the grid to provide market certainty. States can also require utilities to create plans for increasing their storage capacity, as California is requiring. States can also provide tax incentives for battery manufacturing as was done in Michigan.

• **Provide technical assistance** for clean energy companies including: energy data, market intelligence, joint venture opportunities, networking, seed grants, and test beds. To best identify the set of TA to provide, engage industry in their local needs. For instance, state investments in identifying the high capacity spots can reduce market intelligence costs for all companies in this sector. Providing test bed centers allow companies to quickly and cheaply test new technology. At a cost of a couple million to the state, they can attract companies to the area.
• **Foster collaboration between researchers and businesses.** Research institutions can be encouraged to work with business, rather than just test technology, by designing grants that call for pilot project implementation that require manufacturing. This shifts research incentives towards greater attention to commercialization needs.

• There is a debate on how best to balance basic research and applied research within state R&D funds. Some argue that states should shift the balance R&D funding towards applied/commercialization and economic development, while others argue for more state funding of basic research with the goal of finding breakthrough R&D opportunities. Most states focus on the applied research since that is where they have increased likelihood of capturing the economic development benefits. Some states only fund basic research if federal funds are offered with matching requirements.

• Rebates for clean energy have proven helpful as a critical first step in deploying and diffusing technologies that are ready to move from prototype to mass production. This is especially true when they are supported by a suite of policies that contains some designed for the subsidized technologies’ market initiating strengths. However, because rebates typically target emerging industries they don’t tend to foster large scale market share. Some experts note that incentives for manufacturing can be required to have matching funds from the private sector along with a minimum job creation commitment that has a prevailing wage.

• Provide one-stop-shop of business support services that help clean energy businesses identify all the relevant government agencies, including training. Arizona and California have begun to do this.

IV. **Helping Clean Energy Businesses Grow**

**Key Discussion Points**

• We need to make sure businesses are at the table and are working together. This should include encouraging the private sector to converge on a more consistent position.

• Critical nature of reforming permitting processes within states. Streamlined permitting processes need to involve local stakeholders early and the state can provide technical assessment and consulting. For energy companies engaging in a state’s likely complex financing arrangement, too much wasted time is death for the company.

• In order to keep manufacturing in the domestic market, we need to find a way to streamline the process of getting a company up and running – before the valley of death. A crucial question to ask is this: “If a business came and wanted to locate within the state, is there a state with all the right departments ready to sign off?”

**Policy Opportunities**

• **Upgrade transmission policies and infrastructure.** The renewable energy industry is currently prevented from growing due to the capacity limit of the transmission grid. The optimal sites are not being utilized because of the transmission shortages in many locations and this causes lost productivity. Additional transmission capacity is needed not only to bring wind across the country, but also within regions to limit the amount of forced curtailment that happens where there is ‘too much wind’ and they are forced off the grid with significant cost implications. There is enough data to predict these times and more transmission can prevent this. Addressing issues including inter-jurisdictional siting and cost and revenue allocation are essential for large-scale expansion of the market.

• **Streamline permitting.** State and local policies on siting and permitting can be made more uniform to increase companies’ ROI and increase the number of projects that are pursued. For instance, VT eliminated permit requirements for certain small scale solar projects. Germany’s streamlined permitting
that has a one-page form that is filled out by consumers and submitted to utilities with automatic approval unless the utility objects within a short amount of time – is widely cited as a main driver in expanding their market. Iowa passed a FastTrack citing certification and changed the permit period to cover the lifetime of the product, which played a significant role in their wind energy development.

- **Provide business support as well as technology development support.** NY used to only provide technological support but then realized that they critically needed support on developing business plans, market strategies and capital access.

- **Promote interconnectivity policies such as “Net Metering”**.
Appendix B
The Washington State Energy Strategy
The Washington State Energy Strategy

Daniel Malarkey, Deputy Director
Department of Commerce

December 8, 2011, Phoenix, AZ
National Governors Association
Three Legislated Goals

1. Maintain **competitive energy prices** that are fair and reasonable for consumers and businesses and support our state’s continued economic success

2. Increase competitiveness by fostering a **clean energy economy and jobs** through business and workforce development

3. Meet obligations to **reduce greenhouse gas emissions**
Nine Legislated Principles

1. Pursue **conservation** as the preferred energy resource
2. Ensure our energy system meets the needs of citizens, especially **vulnerable populations**
3. Maintain and enhance **economic competitiveness**
4. **Reduce** dependence on **fossil fuels**
5. Improve efficiency of **transportation** energy use
6. Meet green house gas limits and **environmental requirements**
7. Build on our **clean electrical grid**
8. Make **state government** a model
9. Maintain & enhance **existing energy infrastructure**
Washington State Energy Strategy Process

Analytic Process

- Commerce Energy Policy
- Technical Experts Panel
- Other efforts, e.g., NPCC power plans, WSDOT VMT strategy

Policy & Implementation

- Commerce
- Advisory Committee
- Other efforts, e.g., CELC, WUTC conservation & renewables

Prior work

- Compile menu of promising options
- State Energy Strategy 2010 update
- Full State Energy Strategy revision

Releases:

- Scenarios & forecasts
- Permanent capacity

Information & notification

You are here
Focusing the 2012 State Energy Strategy

Transportation Efficiency

Buildings Efficiency

“Distributed Energy”

- district heat
- distributed generation
- CHP

jobs
Overall areas of effort/analysis

**TRANSPORTATION EFFICIENCY**
- vehicles & fuels
- travel efficiency
- **pricing**

**BUILDINGS EFFICIENCY**
- disclosure
- funding & financing
- support for implementation

**DISTRIBUTED ENERGY**
- facilitating DE development
- analyzing DE financial incentives
- coordination with I-937 changes
# Transportation Efficiency

## 3.4 Near-term Recommendations

These are mature policy concepts, or pilot projects to test newer policy concepts.

<table>
<thead>
<tr>
<th>Vehicles and Fuels</th>
<th>Travel Efficiency</th>
<th>Pricing</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.4.1 electric vehicle support</td>
<td>3.4.4 Commute Trip Reduction program expansion</td>
<td>3.4.8 electric vehicle mileage pricing pilot</td>
</tr>
<tr>
<td>3.4.2 Renewable fuel standard</td>
<td>3.4.5 smart growth and transportation planning</td>
<td>3.4.9 pay-as-you-drive insurance offerings</td>
</tr>
<tr>
<td>3.4.3 diesel engine emission reductions and fuel efficiency improvements</td>
<td>3.4.6 transportation systems management</td>
<td></td>
</tr>
<tr>
<td>3.4.4 Commute Trip Reduction program expansion</td>
<td>3.4.7 regional mobility grants</td>
<td></td>
</tr>
</tbody>
</table>

## 3.5 Long-term Policy Options

These are candidates for long-term policy and require piloting or additional analysis before deployment.

<table>
<thead>
<tr>
<th>Vehicles and Fuels</th>
<th>Travel Efficiency</th>
<th>Pricing</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.5.1 revenue neutral feebate</td>
<td>3.5.5 comprehensive trip reduction program</td>
<td>3.5.8 emerging pricing methods</td>
</tr>
<tr>
<td>3.5.2 low carbon fuel standard</td>
<td>3.5.6 energy efficient transportation choices</td>
<td>- congestion pricing</td>
</tr>
<tr>
<td>3.5.3 advanced aviation fuels</td>
<td></td>
<td>- mileage pricing</td>
</tr>
<tr>
<td>3.5.4 improvements to railroads</td>
<td></td>
<td>- cordon pricing</td>
</tr>
<tr>
<td>3.5.5 comprehensive trip reduction program</td>
<td></td>
<td>6.0 carbon pricing</td>
</tr>
</tbody>
</table>

- congestion pricing
- mileage pricing
- cordon pricing
6.0 carbon pricing
# Buildings Efficiency

## 4.4 near-term recommendations

These are mature policy concepts, or pilot projects to test newer policy concepts.

<table>
<thead>
<tr>
<th>Performance and transparency</th>
<th>Funding and financing</th>
<th>Low income and rental housing</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.4.1 non-residential disclosure</td>
<td>4.4.4 meter-based financing</td>
<td>4.4.6 minimum standards for rental housing</td>
</tr>
<tr>
<td>4.4.2 residential disclosure</td>
<td>4.4.5 energy efficient property conversions</td>
<td>4.4.7 low-income housing investment</td>
</tr>
<tr>
<td>4.4.3 marketing and quality assurance</td>
<td></td>
<td>4.4.8 prevailing wage class for weatherization</td>
</tr>
</tbody>
</table>

## Long term

<table>
<thead>
<tr>
<th>6.2 Carbon Pricing</th>
</tr>
</thead>
</table>

---

*Department of Commerce
Innovation is in our nature.*
# Distributed Energy

<table>
<thead>
<tr>
<th><strong>regulatory streamlining</strong></th>
<th><strong>financial incentives</strong></th>
</tr>
</thead>
</table>

### 5.3 near-term recommendations

These are mature policy concepts, or pilot projects to test newer policy concepts

- 5.3.1 interconnection standards
- 5.3.2 net metering policies
- 5.3.3 streamlined permitting for distributed energy

### 5.4 long-term policy options

These are candidates for long-term policy, and require piloting or additional analysis before deployment.

- 5.4.1 distributed energy-compliant power purchase agreements
- 5.4.2 distributed energy in I-937*
- 5.4.3 rationalize distributed energy incentives
  - renewables sales tax
  - production incentives
  - biomass incentives
  - distributed energy credit in I-937*
- 6 carbon pricing
Executive Summary >> CELC Preliminary Focus

WA state has largest share of GSP devoted to exports (1 of 3 jobs). Orient economic policy to markets **external to Washington**.

Other state clean energy strategies focus on maximizing utilization of internal markets and resources. Advantageously, WA CELC’s export focus looks toward larger markets.
Navigant evaluated attractiveness and fit to determine the best opportunities for WA state, to focus the strategy and roadmap process.

**Attractiveness**
- What are the Key Clean Energy Sectors?
- How big is the US market & its growth potential?
- What factors are shaping market development?

**Fit**
- How well suited are these Clean Energy sectors for Washington State, and vice versa?

* and global considerations where possible

These steps are applied to five major clean energy technology segments.
Executive Summary >> What are the Key Clean Energy Sectors?

These are the Clean Energy Segments and Sub-segments we evaluated. The segments to be evaluated were selected based on size and growth potential; the key sub-segments were selected to determine applicability to WA State.

<table>
<thead>
<tr>
<th>Segment</th>
<th>Sub-Segment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy Generation</td>
<td>Wind</td>
</tr>
<tr>
<td></td>
<td>Solar Electric</td>
</tr>
<tr>
<td></td>
<td>Hydro</td>
</tr>
<tr>
<td></td>
<td>Biomass</td>
</tr>
<tr>
<td></td>
<td>Geo-thermal</td>
</tr>
<tr>
<td></td>
<td>Wave / Marine</td>
</tr>
<tr>
<td></td>
<td>Solar Thermal</td>
</tr>
<tr>
<td></td>
<td>Nuclear</td>
</tr>
<tr>
<td>Energy Storage</td>
<td>Batteries</td>
</tr>
<tr>
<td></td>
<td>Fuel Cells</td>
</tr>
<tr>
<td>Energy Infrastructure</td>
<td>Transmission</td>
</tr>
<tr>
<td></td>
<td>Smart Grid</td>
</tr>
<tr>
<td>Energy Efficiency</td>
<td>HVAC</td>
</tr>
<tr>
<td></td>
<td>Green Buildings</td>
</tr>
<tr>
<td></td>
<td>Design / Services</td>
</tr>
<tr>
<td></td>
<td>Controls</td>
</tr>
<tr>
<td></td>
<td>EE Other*</td>
</tr>
<tr>
<td>Transportation</td>
<td>High Efficiency Vehicles</td>
</tr>
<tr>
<td></td>
<td>Alternate Fuels (H₂, Biofuels)</td>
</tr>
<tr>
<td></td>
<td>Electric Vehicles incl. Hybrids</td>
</tr>
<tr>
<td></td>
<td>High Speed Rail</td>
</tr>
</tbody>
</table>

* Includes lighting, insulation, windows, appliance (including IT products)
Number of Employees in Washington per segment

<table>
<thead>
<tr>
<th>Energy Generation</th>
<th>Wind</th>
<th>PV</th>
<th>Hydro</th>
<th>Biomass</th>
<th>Geothermal</th>
<th>Wave / Marine</th>
<th>Solar Heating</th>
</tr>
</thead>
<tbody>
<tr>
<td># of People</td>
<td>224</td>
<td>704</td>
<td>1,429</td>
<td>13</td>
<td>20</td>
<td>-</td>
<td>35</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Energy Storage</th>
<th>Batteries</th>
<th>Fuel Cells</th>
</tr>
</thead>
<tbody>
<tr>
<td># of People</td>
<td>501</td>
<td>105</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Energy Infrastructure</th>
<th>Utility* Transmission</th>
<th>Smart Grid</th>
</tr>
</thead>
<tbody>
<tr>
<td># of People</td>
<td>5,010</td>
<td>3,910</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Energy Efficiency</th>
<th>HVAC</th>
<th>Green Buildings</th>
<th>Design/Services</th>
<th>Controls</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td># of People</td>
<td>1,011</td>
<td>3,382</td>
<td>376</td>
<td>227</td>
<td>245</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Transportation</th>
<th>Efficient Vehicles</th>
<th>Alt Fuels (H2, Biofuels)</th>
<th>Electric Vehicles</th>
</tr>
</thead>
<tbody>
<tr>
<td># of People</td>
<td>1,660</td>
<td>812</td>
<td>11</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cross-Cutting</th>
<th>Smart Grid/ Energy Efficiency</th>
<th>Smart Grid/ Transmission</th>
<th>Biomass / Biofuels</th>
</tr>
</thead>
<tbody>
<tr>
<td># of Co’s</td>
<td>163</td>
<td>315</td>
<td>5,617</td>
</tr>
</tbody>
</table>

Note that “Utility Transmission” includes utility staff, and is not considered the same type of growth source as those in other segments, resulting in different ranking.

* Transmission outside of utilities and EPC contractors is difficult to quantify.
Sales Revenue in Washington per segment

<table>
<thead>
<tr>
<th>Energy Generation</th>
<th>Wind</th>
<th>PV</th>
<th>Hydro</th>
<th>Biomass</th>
<th>Geo-thermal</th>
<th>Wave / Marine</th>
<th>Solar Heating</th>
</tr>
</thead>
<tbody>
<tr>
<td>US$m</td>
<td>41</td>
<td>147</td>
<td>237</td>
<td>1</td>
<td>2</td>
<td>-</td>
<td>6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Energy Storage</th>
<th>Batteries</th>
<th>Fuel Cells</th>
</tr>
</thead>
<tbody>
<tr>
<td>US$m</td>
<td>118</td>
<td>8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Energy Infrastructure</th>
<th>Utility* Transmission</th>
<th>Smart Grid</th>
</tr>
</thead>
<tbody>
<tr>
<td>US$m</td>
<td>988</td>
<td>954</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Energy Efficiency</th>
<th>HVAC</th>
<th>Green Buildings</th>
<th>Design/Services</th>
<th>Controls</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>US$m</td>
<td>135</td>
<td>579</td>
<td>44</td>
<td>29</td>
<td>31</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Transportation</th>
<th>Vehicles</th>
<th>Alt. Fuels (H₂, biofuels)</th>
<th>Electric Vehicles</th>
</tr>
</thead>
<tbody>
<tr>
<td>US$m</td>
<td>274</td>
<td>171</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cross-Cutting</th>
<th>Smart Grid/ Energy Efficiency</th>
<th>Smart Grid/ Transmission</th>
<th>Biomass/Biofuels</th>
</tr>
</thead>
<tbody>
<tr>
<td># of Co’s</td>
<td>16</td>
<td>31</td>
<td>695</td>
</tr>
</tbody>
</table>

Note that “Utility Transmission” includes utility staff, and is not considered the same type of growth source as those in other segments, resulting in different ranking.

* Transmission outside of utilities and EPC contractors is difficult to quantify.
WA State has many competitive advantages for formation, attraction, and retention of businesses. However, the speed of cluster growth is heavily influenced by whether or not there is a current viable WA clean energy presence— a glowing spark hot enough to start a fire.

Fit

How well suited are these Clean Energy sectors for Washington State, and vice versa?

Existence of a cluster of companies – a “platform”- to build from, is one key to rapid economic development.
Executive Summary >> Cluster Identification Results

Green Buildings is the highest rated opportunity considering WA State fit, and relative attractiveness of the market opportunity.
The Results

Based on input from key stakeholders and detailed sector analysis by Navigant Consulting, the CELC has identified four Target Clean Energy Technology Segments in which the state is well positioned to lead:

- Energy Efficiency & Green Buildings
- Renewable Energy Resource Integration
- Smart Grid
- Bio Energy

Additionally, Navigant has identified two additional segments that warrant further pursuit but require additional analysis outside the scope of CELC’s current efforts:

- Nuclear Energy Technology
- High Efficiency Vehicles
Washington Green Building expertise is concentrated in architecture and construction companies.

1. The majority of Green Building-product manufacturers are encompassed in the Energy Efficiency cluster (e.g. lighting & glass manufacturers).
WA has a more than 100 architecture, design, and green building services firms due to historical, regional environmental culture and large, on-going utility and public policy programs.

<table>
<thead>
<tr>
<th>Company</th>
<th>Location</th>
<th>Value Chain</th>
<th>2008 Sales ($$MM)</th>
<th>2008 Workers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mithun</td>
<td>Seattle</td>
<td>Green Buildings</td>
<td>$10.9</td>
<td>140</td>
</tr>
<tr>
<td>Absher Construction Co.</td>
<td>Bellevue</td>
<td>Construction Co.</td>
<td>$69.2</td>
<td>100</td>
</tr>
<tr>
<td>Callison Architecture</td>
<td>Seattle</td>
<td>Architect/Design Firm</td>
<td>$48.4</td>
<td>440</td>
</tr>
<tr>
<td>Polygon Northwest</td>
<td>Bellevue</td>
<td>Real Estate</td>
<td>$30.6</td>
<td>115</td>
</tr>
<tr>
<td>Seattle Sun Systems</td>
<td>Seattle</td>
<td>Manufacturing</td>
<td>$1.6</td>
<td>18</td>
</tr>
</tbody>
</table>

- The mainstream construction markets are shifting toward green building, and/or green building labeling, with many definitions. A number of buildings are built that meet LEEDs standards, but are not certified; and certification requirements are a moving target.
- Nevertheless, LEEDs standards are becoming more stringent, especially with regards to energy efficiency.

As with other clean energy technology segments, firms listed above, these firms are only representative. In addition, true comparative data on revenue and head count by sector in the architecture and construction sector to identify “green building” is challenging and will be evaluated further in Phase 2.
Washington EE companies are distributed throughout the energy efficiency project value chain.

Cluster Value Chains >> Energy Efficiency Company Distribution

Firms noted are representative only.
Many Washington EE companies crosscut segment subcategories for a holistic portfolio of service offerings.

<table>
<thead>
<tr>
<th>Energy Efficiency Subcategories</th>
</tr>
</thead>
<tbody>
<tr>
<td>HVAC</td>
</tr>
</tbody>
</table>

- **Industrial Light & Energy**
  - Carlson Mechanical, Radiant Heat Plus

- **Energy Savings Management Systems, Honeywell**
  - Microplanet Inc, Quantum Eng.

- **Onsite Energy, Siemens Building**
  - Cascade Energy Engineering
  - Energy Efficiency Finance Corp

Firms noted are representative only.
Cluster Value Chains >> Energy Efficiency Cluster Profile

WA has many firms with specialized expertise in energy efficiency including controls, performance contracting, program planning, installation and evaluation.

<table>
<thead>
<tr>
<th>Illustrative Companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company</td>
</tr>
<tr>
<td>McKinstry</td>
</tr>
<tr>
<td>Energy Market Innovators</td>
</tr>
<tr>
<td>Ucons LLC</td>
</tr>
<tr>
<td>Travis Industries</td>
</tr>
<tr>
<td>Honeywell</td>
</tr>
</tbody>
</table>

- Some Washington based firms have developed nation-wide reputations and practices building upon the historical regional commitment to energy efficiency
- Little manufacturing occurs in the region
- Most firms do planning, design, auditing, engineering, and installation
- Energy efficiency is only one aspect of their service. Most contractors do energy efficiency, almost as a premium service for those customers who want energy efficient appliances, HVAC, or lighting.
- Cloud computing data farms are springing up near hydro in WA– energy efficiency of electronics is another growth trend that WA is in a unique position to mine – IT, inexpensive power, hardware design, and energy efficiency all contribute.
Strategy Focus: Pursue limited large-scale clean energy technology opportunities in promising segments to create the “pull” to build the support structure that enables clean energy technology cluster formation.

Key Strategy Components >> Make a Market & Create Economic Cluster Support

Market Driving Technology Applications

- Viable technology applications with near-term potential
- Select opportunities with scale
- Pursue investments with profile
- Keep the efforts tightly focused

Economic Cluster Support

- Policy clarity
- Regulatory alignment
- Incentives
- Financing support
- Work force training
- Innovation “mining”

Specific opportunities drive the cluster formation support

Cluster support efforts help initial technology applications succeed