



Washington State Clean Energy Leadership Plan Report Executive Summary and Overview

For the:



Accelerating Washington Clean Energy Job Growth

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This summary version of the Washington State Clean Energy Leadership Plan Report contains the executive summary, the Leadership Plan Overview, and an appendix that describes the initial Market Driver Initiatives that are key to the implementation of the Leadership Plan. A full version of the report providing further detail on analyses, assumptions and plan element description can be found in the full report, which is also available at www.washingtoncelc.org.

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Executive Summary

This report is the culmination of over a year's effort by the State legislatively created Washington Clean Energy Leadership Council to develop a Clean Energy Leadership Plan targeted specifically to grow clean energy businesses and jobs in Washington. The goal of the Leadership Plan is to transform the market for clean energy solutions in Washington to create sustained clean energy job growth. The Council's Leadership Plan details an innovative approach with two major components to accelerate clean energy jobs in Washington State. One component is a targeted approach to leverage funding to improve the ability of Washington State businesses to demonstrate market-leading clean energy solutions that grow jobs *without the need for continued subsidy*. The other component focuses attention on those areas where regulation needs to be better aligned with policies and actions enabling job-creating clean energy solutions to move forward. Together, these efforts can transform the market for clean energy in Washington to greatly enhance in-state clean energy businesses and jobs. Absent an effort such as this Leadership Plan, Washington will continue to fall further behind other states in clean energy jobs per capita.

Many states in the country have programs and funding which target clean energy business and job growth. The key steps of this Plan are a fundamental shift from how Washington and other states have sought to create clean energy jobs. By design, this Plan uses a more efficient and cost-effective way to accelerate leading-edge clean energy solutions and associated jobs. This approach is particularly targeted to address the limited state government funding available in this post-recession period, while still advancing the creation of sustainable clean energy jobs.

Why Does Washington State Need a Clean Energy Leadership Plan?

Despite its reputation as a state with a strong environmental ethic and its large reliance on hydroelectric energy sources rather than fossil-fuel resources, Washington's clean energy industry has grown slowly relative to competing states. In fact with only about 0.55% of total jobs in Washington in the clean energy sector, it ranks 14th in the nation and just barely above the average of all of the states. Our neighboring state of Oregon is the leading state in clean energy jobs with nearly twice the percentage of Washington. More importantly, other states are taking significant actions to increase their clean energy businesses and jobs. Absent a positive step forward with a cohesive plan and reasonable investment, Washington will not likely significantly increase its clean energy business and job standing and likely will cede ground to those states that are taking proactive steps.

Other states are meeting the clean energy job growth challenge with strong central clean energy policy adoption, alignment of clean energy job growth and regulatory policy, and funding from various sources to attract and build clean energy jobs. These other states are undertaking this job growth effort largely in a manner that supports clean energy economic growth without burdening the overall state economy to do so. If the status quo in Washington State continues, other states and other nations will outpace Washington's clean energy business and the associated jobs. The Leadership Plan described herein outlines a plan to improve Washington's clean energy businesses and jobs to achieve long-term, sustained job growth and retention and compete effectively on a national, if not global basis.

What is Different About This Plan?

Most existing Washington and other state clean energy job plans rely heavily on direct state funding to invest in clean energy infrastructure within a state's borders to create jobs. During the period the state money is available to be spent, largely short-term jobs are created. When the funding is depleted, the jobs trail off as the funded projects wind up. Washington needs sustained clean energy jobs, and a growth trend in those jobs. Implementing this Plan will deliver sustained clean energy job growth.

Rather than “buying” clean energy jobs “dollar for dollar”, this plan brings the purchasers of clean energy solutions and the providers of those solutions together in Washington to demonstrate *today's commercially viable* leading-edge solutions. Those solutions are identified and *partially* funded through a state-sponsored program that also brings in funding from the private sector and other non-state sources. In this manner, state funding is highly leveraged. Using “market driver initiatives”, new clean energy solutions are demonstrated by Washington companies and their employees. Once the new solutions are demonstrated, they become commercially viable to be replicated without subsidy. This process creates a commercial market transformation in clean energy solutions. This is not government funded, new laboratory research with the hope of new technologies deployed decades in the future. These market driver initiatives will be specifically selected to demonstrate *combinations* of commercially viable clean energy technology solutions. This is also a material difference from many traditional “R&D” efforts that will provide jobs only if new unproven technologies are implemented years from now. *This approach deploys combinations of existing clean energy solutions in new ways, rather than seeking to invent or deploy yet to be proven technology on a standalone basis.* Solutions will be demonstrated in a manner that can differentiate Washington companies and employees in the deployment of clean energy.

What is a Clean Energy Market Driver Initiative?

Today, the use of clean energy solutions is largely in response to government mandates to meet certain energy efficiency, renewable energy or greenhouse gas emission targets or standards. These mandates have increased the use of clean energy technology, but not necessarily in a manner that best produces sustained new in-state jobs.

The Leadership Plan would bring utilities, building owners/developers, government and providers of clean energy solutions together to plan and implement leading-edge clean energy projects in those areas where Washington can differentiate itself. Following a major review of the market for clean energy jobs by Navigant Consulting, the Council has focused on specific initial clean energy segments where Washington has competitive advantages over other states, and potentially over other global players. This approach goes beyond deploying “tried and true”, but lower efficiency clean energy solutions as is so often the norm today. Instead, market driving, more efficient, clean energy solutions would be deployed in high-profile projects where purchasers of solutions, such as utilities and building owners/developers seek out the most promising new opportunities. By proving the validity of those new solutions in commercial scale demonstrations, Washington companies set new standards for clean energy solutions and become a part of a new wave of offerings that differentiates Washington companies.

Implementing the Leadership Plan will create demand for Washington clean energy companies and build jobs. By creating a framework where buyers of clean energy solutions *seek out* suppliers of leading-edge solutions, the market is transformed to have new commercially viable clean energy business growth, rather than relying 100% on government subsidy to create short-term jobs deploying yesterday's less efficient solutions. The Leadership Plan explains this process in more detail in the Overview section of this report, and in Chapter 4.

Regulatory and Clean Energy Policy Alignment

Several key regulatory structures in Washington constrain the advancement of clean energy job growth. Creating a “culture” of clean energy business and job growth requires a strong, continued awareness and commitment to removing barriers and enhancing opportunities. While State government alone cannot assure clean energy economy growth, it is in a strong position to influence that growth through aligned regulatory and clean energy policy in areas including:

1. Clean Energy Regulatory Oversight
2. Regulated Utility Incentive Alignment and Barrier Removal
3. Streamlining of Permitting and Standards

Uncertainty about timing and extent of new building energy efficiency standards dampen innovation in new energy efficiency and green building solutions. Limited term contracts to access State-owned lands for biomass harvest for biofuel or biomass power constrains the ability to use this renewable fuel source. The prospect of after-the-fact disallowance of utility expenditure or investment in renewable energy or energy efficiency projects or programs is a disincentive to deploying leading-edge solutions. The risk of disallowance of utility costs of demonstrating new energy storage to better integrate renewable energy into the grid puts a chill on market leading solutions in that clean energy segment. These are but a few of the regulatory issues that need resolution to help expand clean energy jobs in Washington.

If these issues have to be permanently resolved before efforts are taken to deploy market leading demonstration of clean energy solutions in Washington, new clean energy job growth will continue to be constrained, delayed or permanently thwarted. Positive actions can be taken to remove barriers and support new clean energy jobs. Establishing a senior energy advisor in the Governor’s office in Washington to address these issues and to interact with the clean energy industry as a single point of focus would be a positive step forward. These and other regulatory alignment efforts are described in more detail in the Overview section and in Chapter 5 of this report.

Funding

This Leadership Plan will require funding. The report addresses a number of potential sources of funding to implement the plan. Of the many options theoretically available, two sources are most promising. For a quick start-up, a portion of existing economic development funding sources could temporarily be redeployed while a longer-term solution is implemented. One of the more promising long-term funding sources would be a so-called “system benefit charge.” This mechanism is a minor fee for each kilowatt hour (kWh) of retail electricity supplied in the State of Washington. This mechanism is used in several states as described in more detail in Chapter 7 and is proposed at a level that would not affect the competitive levels of Washington utilities retail rates.

The minimum level of annual funding deemed necessary to implement the Leadership Plan is approximately \$20 million. A system benefits charge of \$0.00025/kWh would provide this level of funding at a cost of less than 20 cents a month per average residential utility customer – less than 10 percent of the cost of a single gallon of gasoline per month. Certainly larger funding levels than this would enable more clean energy job growth to happen sooner. However, the advantage of the market driver initiative structure is that this program funding is highly

leveraged by other sources. The monies from new funding structures like the system benefit charge are needed for only a *portion* of the market driver initiative projects. Building developers, electric utilities, and alternative transportation fuel developers and their customers have budgets today for certain levels of clean energy solutions. This process provides *an increment* of funding to push the efficiency and technological achievement of demonstration projects up further.

Once these market-leading projects are demonstrated, they become the new standard that the market seeks – the leading-edge solution goes “mainstream” without subsequent projects requiring a subsidy. More importantly, Washington companies are those that lead the way and the jobs follow that market leadership here, in state.

This modest level of funding is further expanded through gaining matching dollars from federal programs and non-profit foundations seeking to achieve these same goals, as described in Chapter 7.

Creating a Central Organization Focus to Implement the Plan

Providing focus and implementing the market driver initiatives requires an entity with skills in the clean energy sector to address three key needs:

1. Provide the point of focus collectively for purchasers and suppliers of clean energy solutions in Washington;
2. Regularly seek non-state matching funds from the federal government, private enterprise and non-profit organizations to leverage the proposed state funding, as well as to administer the funding of the market driver initiatives projects; and
3. Provide timely and focused insight to regulatory and policy organizations regarding changes and alignment needed between regulation and clean energy policy to pave the way for accelerated clean energy business and job growth.

Chapter 6 describes a recommended scope and structure for such an organization. This organization cannot be a “government as usual” administrative organization. It needs to be a combination of (a) private enterprise professionals who are active in the clean energy sector in Washington and (b) a small set of government employees with energy industry experience and strong economic development skills dedicated to the successful transformation of Washington’s clean energy market and associated job growth.

Estimated Clean Energy Job Creation

Properly structured, the Leadership plan could create an incremental over 50,000 direct and indirect clean energy jobs and \$2.3 billion in Washington annual personal income by 2020.

The balance of this report provides a summary overview of the Leadership Plan and several chapters which provide more detail on the assumptions, analyses and recommendations embodied in the Plan. Appendix A provides example descriptions of the Market Driver Initiative projects. Appendix B provides more detail on prior work performed by Navigant for the Council to help focus the initial areas of the clean energy sector to enhance job growth. Appendix C provides a sample overview of the clean energy initiatives by other states. Appendix D lists some other clean energy segments which warrant further consideration in another economic development framework.

Leadership Plan Overview

Washington’s clean energy technology industry has grown slowly relative to competing states. Continuing this trend will result in Washington losing additional job opportunities to other states and nations. In 2009, the Washington State Legislature created the Clean Energy Leadership Council to develop a leadership plan of actions to accelerate business growth and associated increased jobs in Washington as the world transitions to a clean energy economy. The Council, with the assistance of Navigant Consulting, Inc., has prepared a recommended Clean Energy Leadership Plan to meet this objective. This Leadership Plan recommends a framework to grow clean energy businesses and jobs in Washington by promoting deployment of leading-edge clean energy solutions in state as a platform for exporting clean energy solutions nationally and globally. In parallel, actions to address in-state clean energy growth barriers are proposed.

Status of Washington’s Clean Energy Business Sector

The status of Washington’s clean energy sector, “where we are”, is a key factor in determining actions needed to accelerate clean energy job growth in Washington. With its robust hydroelectric system, Washington State is one of the cleanest economies in the nation with some of the lowest electric rates. Until the 2006 adoption of voter initiative I-937, under a policy practice that encouraged the lowest initial direct cost as the criteria for addition of new energy resources, the percentage of renewable energy in Washington’s mix had been in decline. More recently, in-state policies¹ have driven the majority of the new renewable energy and energy efficiency investments and deployments in Washington. However, similar mandates and policies have been instituted in many other states in the nation, and internationally, often at a pace well ahead of Washington.

These policies, mandates, and trends have increased the use of clean energy in the state, but not necessarily created growth of businesses and jobs *here in Washington*.

Washington ranks fourteenth among states in overall economic activity², making it a relatively small market in clean energy when seeking to compete with states like California, Texas, New York, and Massachusetts. For the size of its economy, the state’s electric utility market is highly fragmented with over 60 utilities, and approximately 50 percent of total electric customers are served by self-regulated public power utilities; the other half are served by three investor-owned utilities regulated by the Washington Utilities and Transportation Commission (WUTC). This fragmented structure has made it difficult to implement policies which drive investment in renewable energy and changes in the use of energy in homes and businesses.

For clean energy-related business and jobs to grow in Washington, companies need to be active in Washington. To compete in national and global markets, Washington companies need to be providing leading clean energy solutions. Most renewable energy sources and many of the energy efficiency solutions have initial costs that are higher than Washington’s low-cost existing supplies. This cost pressure can cause regulated utilities to face disallowance by the WUTC of costs expended for clean energy resources. Public power utilities governed by their own boards don’t face a regulator’s disallowance of their incurred costs, but like their investor-owned utility counterparts, they are highly mindful of initial increases in costs from addition of

¹ Renewable portfolio standards, sustainability initiatives, and building standards modifications

² As measured by state Gross Domestic Product, 2008 US Bureau of Economic Analysis

clean energy resources to their portfolio. As a result, some form of initial cost assistance is typically required to overcome inertia and spur the adoption of new, market-leading clean energy solutions.

Other states face similar challenges and are meeting these challenges with various forms of assistance and strong alignment of clean energy and regulatory policy. California has a “public benefits charge” applied to all electric sales of regulated utilities in the

state, providing over \$150 million annually to be used for clean energy research, pilot programs and new technology commercialization. California also has a central clean energy research and demonstration funding entity for leading clean energy solutions. It provides for certain levels of pre-approval of expenditure for renewable energy and energy efficiency programs and incentives to regulated utilities for achieving target levels of energy efficiency. Similarly, Massachusetts provides \$20 to \$25 million annually for clean energy research and commercialization from a systems benefit charge, and like California, has an organization dedicated to advancing clean energy business. The state also funded a one-time \$20 million effort to initiate this program.

Absent implementing a Washington State leadership plan to improve the State’s clean energy business climate, there are few compelling reasons to expect significant growth in clean energy business and jobs in the state.

Washington clean energy businesses have expanded out of state. For example, Seattle-based Blue Marble opted to build its bioenergy production facility in Montana due to favorable governmental action there. SolarWorld closed its Vancouver facility and moved, losing 100 jobs in WA and adding 1,000 at its new location in Hillsboro, OR due to favorable tax incentives.

Washington’s neighboring state of Oregon has adopted a Business Energy Tax Credit system to incent clean energy technology. Oregon also offers residential clean energy tax credits and provides annual clean energy research funding through the Oregon Energy Trust. States previously not known for clean energy business have accelerated efforts as well. As an example, Iowa is midstream in implementing an adopted four-year, \$25 million per year, state general fund-sourced power fund to accelerate clean energy business development. Actions by these and other states have attracted clean energy companies who started in Washington, but have later expanded or even relocated their businesses out of state. These contrasts to Washington’s efforts are stark, and the implications for clean energy job growth important.

If the status quo continues, Washington will be outpaced by other states as well as other nations in clean energy technology market presence and the jobs that follow. Herein, we propose how the state can

accelerate clean energy business and job growth to be among the leading states in this sector.

Applying a Different Model to Accelerate Clean Energy Business and Job Growth

Washington needs concerted action to achieve critical mass in clean energy business development. For over 20 years, governments have adopted clean energy application mandates or “strong policy goals” to advance the implementation of renewable energy and energy efficiency. Bonneville Power Administration, as an example, has been a leader in energy efficiency programs. This model has served well to accelerate many clean energy technology applications, but not always with corresponding local economic growth. A better model is to intentionally align both public and private efforts, to develop market-leading clean

energy solutions that can be replicated not only in Washington, but beyond its borders. The important difference here is that proving up these clean energy solutions in a commercial market allows them to be repeated on a commercial basis where buyer and seller recognize their value *without subsequent subsidy*. This method creates *sustained* clean energy business and job growth without returning back to government to seek the next funding contribution. Growth is then driven by deployment of leading-edge clean energy technology in Washington and then in interstate and international export markets.

Undertaking large-scale pilot or demonstration applications of clean energy solutions applied in new ways will reveal how best to solve current challenges in existing markets and pathways to meet performance, environmental and economic/ financial goals. Such leading-edge demonstrations provide Washington-based companies with “reference” projects that can attract global attention and opportunities beyond state boundaries. Accelerated deployment using this systems approach can *inform* policy makers, end-users of the technologies, and the supply chain of equipment, software, and services for these solutions of their validity and value. This is a subtle, but profoundly important shift in the role of policy, mandates, and technology application to achieve market development, business growth, and job creation.

To compete with other states, Washington needs a focused effort to enable clean energy business to thrive and grow in state. Washington can make a difference by:

- » Bringing in-state providers of clean energy solutions to the buyers of those solutions;
- » Better aligning regulatory policies and practices with clean energy and job growth policy;
- » Providing targeted funding to reduce the initial risk of demonstrating market-leading clean energy solutions that create new jobs; and
- » Working with existing economic development organizations (government and non-profit) to develop clusters of economic activity throughout the supply chain to create a continuum of business and job development in the clean energy sector.

The Council and Navigant evaluated a wide range of potential clean energy sector opportunities to pursue to build jobs in Washington. The proposed Leadership Plan would accelerate the funding and deployment of so-called “market driver initiatives” in clean energy areas where Washington has inherent competitive advantages. As is explained in more detail later in this report, these areas of advantage include:

- » **Energy Efficiency** – Implementation of leading-edge, large scale combined energy efficiency, green building and smart grid solutions that leverage Washington’s strong green building and software sectors with upgrades to the electrical grid;
- » **Renewable Energy Integration** – Integration of renewable energy resources into the electric grid and utility portfolios to better demonstrate combinations of renewable energy, energy storage and smart grid solutions to move cost-effectively deploy the rising percentage of wind energy and later, the expected future development of solar energy in ways that can applied to other regional utility systems; and
- » **Bioenergy** – Demonstration of market-leading deployment of biomass power generation and development of transportation biofuels using Washington’s extensive forest- and agriculture-based resources and in-state capabilities.

Key Action Areas for the Clean Energy Leadership Plan - The proposed Leadership Plan addresses each of the above advantage areas with the following parallel action plans:

- » **Action Plan 1: Align Clean Energy Policy and Regulation** - Align regulatory practice with clean energy policies that support, rather than constrain, clean energy business and job growth in Washington;
- » **Action Plan 2: Accelerate High Profile Clean Energy Development** - Organize and partially fund large-scale or smaller high profile clean energy pilot projects to demonstrate new paths forward that showcase Washington innovation, resources, and skills as a platform to serve out-of-state markets; and
- » **Action Plan 3: Create a Focal Point for Clean Energy Economic Development** - Form and operate an entity dedicated to the creation and ongoing success of economic “clusters” that will build and sustain long-term growth and competitiveness of Washington’s clean energy industry.

These three proposed three action plans are summarized below and are described in more detail in the full Report.

Action Plan 1: Align Clean Energy Policy and Regulation -- Alignment of regulatory requirements and clean energy policy is key to growing clean energy jobs in Washington. First, Washington needs to establish a clear and durable public policy supporting clean energy business growth to provide the foundation for regulation that supports demonstration of clean energy solutions that will feed that growth. A single point of clean energy policy and regulatory oversight in State government would greatly improve the prospects of getting and retaining attention to this key lever to create a clean energy economy in Washington. Specific areas of regulatory change that would enhance clean energy economic growth in Washington include, but are not limited to:

- » *Provide greatly increased assurance of utilities’ recovery of investment in or expenditures for clean energy measures and programs that support the State’s clean energy policy ;*
- » *Amend utility rate structures to avoid disincentives to utilities for successfully implementing energy efficiency programs (so-called “decoupling”);*
- » *Create incentives to meet or exceed renewable energy and cost-effective energy efficiency targets;*
- » *Encourage and enable the regulated, investor-owned utilities to partner with public power utilities and similarly incent the public power utilities to collaborate and share in renewable energy, energy efficiency, and smart grid pilot projects to pool investment risk. Sharing the informative results of such pilot projects will benefit all retail customers in Washington as well as enhance Washington’s in-state economic platform to more quickly access out-of-state markets; and*
- » *Reduce siting and permitting barriers to the development of renewable energy facilities that align with clean energy policy goals.*

Examples of key actions needed to address the above regulatory issues and the types of clean energy growth benefits that would be achieved are described in the market driver initiatives section of this report, Appendix A.

Action Plan 2: Accelerate High Profile Clean Energy Development -- Efforts by other states and other nations to be leaders in this new sector of the economy means that Washington must move quickly if it is to catch up, let alone be among the leaders in clean energy sector business and job growth. This requires pursuing leading-edge clean energy technology applications that can be deployed quickly. Rapid deployment *within* Washington will lead to opportunities for Washington-based companies to create “reference” examples that can be used to win customers and businesses out-of-state. This action plan “pulls” demand for clean energy jobs. Properly implemented, near-term opportunities are proven and developed in state, leading to the expansion of businesses in state to serve a global market. Specific areas of change to enhance in-state clean energy economic growth include, but are not limited to efforts which:

- » Pursue development of new combinations of clean energy technology applications which can be deployed in the short-term – the next three to five years - by providing incentives and risk-reducing economic support to leading-edge pilot projects;
- » Select clean energy solutions for economic support and target solutions and business segments that can leverage the circumstances, resources, skills, and capabilities in Washington critical to creating job and business growth in Washington instead of importing out-of-state solutions; and
- » Facilitate purchasers of the clean energy solutions and the in-state providers of those solutions initially in sufficiently narrow areas to avoid diluting available in-state leadership and financial resources, but broadly enough to avoid picking winners and losers in technologies or solutions. The recommended Action Plan largely targets clean energy business solutions that are part of *integration* of existing clean energy technology into more rapid and expanded use in the economy. The emphasis on *integrating* existing clean energy technology with other technologies to *deploy clean energy solutions in new ways rather than seeking to invent or deploy not yet proven technology in a stand-alone fashion* is an important distinction as part of the Leadership Plan. It will result in more immediate job growth.

Action Plan 3 – Create a Focal Point for Clean Energy Economic Development – Clean Energy Growth Partnership Organization Formation -- Creating a sustained clean energy competitive advantage requires continuous focus to reduce market fragmentation, reduce regulatory friction and increase the odds for success in creating clean energy jobs in Washington. To this end, the State should form an organization dedicated to building clean energy economic “clusters” in ways that augment existing economic development organizations.

A small, focused joint industry and governmental “Clean Energy Growth Partnership” organization can accelerate the implementation of clean energy technology in a manner that brings buyers and providers of clean energy solutions together. Unlike a widely divergent and large stakeholder group, this “Partnership” organization would be directed by representatives actively involved in accelerating clean energy solutions – those who have “skin in the game” and a direct interest in successful outcomes. This can best be achieved by implementing market driver initiatives that unite technology solution buyers and providers, and government organizations involved in policy, economic development and regulation. By focusing on the clean energy growth needs of the State, the Partnership can more readily identify the priority needs in economic cluster development to inform the Washington Department of Commerce of those needs. In turn, the Department of Commerce can help guide participants in the clean energy economy in Washington to other resources to leverage. More importantly, the needs for economic development assistance that arise from the efforts to implement the market driver initiatives will be more clearly revealed. This focused attention better enables mobilizing the existing resources of the Department of Commerce and other economic development organizations within the State.

Focusing Clean Energy Job Growth Through Market Driver Initiatives -- Following a detailed review of a wide-range of technologies and segments of the clean energy-related economy in Washington and beyond, three major areas were selected for initial attention in this Action Plan.

- » *Combined energy efficiency, green building and smart grid projects* - Demonstrate the potential deeper levels of energy savings of high profile, leading-edge combination energy efficiency, green building and smart grid applications. This initiative will inform utilities, regulators, and electric consumers of the types of savings that can be achieved using leading-edge solutions rather than deploying less effective known measures and programs.
- » *Renewable energy optimization and smart grid deployment* – This clean energy area is rich in opportunity and scope. This Market Driver Initiative will demonstrate combinations of renewable energy, energy storage and smart grid applications in ways that demonstrate paths to more cost-effectively integrate renewable energy resources into the mainstream of customer and utility use. Proving these combinations of solutions in Washington will enable Washington companies to provide those solutions outside the state borders. Types of Market Driver Initiative projects that would be undertaken include, but are not limited to, combinations of:
 - Energy storage to better time delivery of renewable energy supplies like wind and solar energy to meet the daily pattern of customer loads; and
 - Improved forecasting of renewable energy time-of-day and seasonal production to better plan and integrate its production into the utility grid and improve utilization of existing electric transmission system. This initiative will improve

delivery of energy in state and for using smart grid technologies to optimize the use of existing and new transmission facilities.

- Use of smart grid applications to improve the efficiency of the existing transmission system to deliver renewable and conventional energy to in-region and out-of-region markets.
- » *Accelerated use of biomass energy resources* – This Market Driver Initiative includes both renewable power production and alternative transportation fuels. Types of projects that would be undertaken include, but are not limited to those which:
 - Deploy high-efficiency biomass power generation applications using Washington’s forest and agricultural biomass resources to demonstrate the ability to use these resources in environmentally favored ways; and
 - Advance the use of biobased aviation fuels; and
 - Accelerate research in creating high value, non-energy products from “biorefineries” to support the reduction in cost of biofuel production to accelerate market use of such fuels

There are significant opportunities in each of these areas for near-term applications to deploy proven or near-proven clean energy technology. In addition, these areas share the challenge of a highly fragmented market: many buyers of different needs, sizes and buying patterns; and many suppliers of different parts of the clean energy supply chain. The Leadership Plan will organize and implement *market driver initiatives* in these clean energy solution areas to overcome the fragmented nature of the market and friction in regulatory practice for these clean energy solutions. In turn, the Leadership Plan will help demonstrate how best to deploy combinations of clean energy technologies as a means to rapidly develop and expand businesses and jobs. Upon demonstrating the commercial viability of these clean energy solutions, they can be replicated in Washington and elsewhere without subsidy. The business and job growth this creates then benefits Washington without a continued obligation for funding of those initiatives.

These market driving initiative, large-scale pilot/ demonstration projects can be structured to be large enough, or high profile enough, to provide validity of performance and cost without being so large that if they do not perform as expected that it results in an undue cost burden to rate payers. If the projects perform as expected, they will reveal the pathway to cost-effectively, deploy such applications to be undertaken more broadly, on a sustainable foundation.

Equally importantly, the leading-edge solutions and applications are demonstrated *in Washington, by Washington businesses and employees*. Success begets success, and marketing of the success within and outside of Washington creates demand for similar leading-edge solutions and services, rather than yesterday’s sub-optimal solutions.

Funding Washington’s Clean Energy Economy Development

Convening buyers and solution providers along with government representatives to pilot leading-edge solutions in targeted clean energy sectors will require clear intent, prioritized effort, and durable funding support. Gaining the attention and tapping the knowledge and interest of active participants in the clean energy technology segments in Washington will require some commitment to funding the market driver initiatives such as those described in this Report.

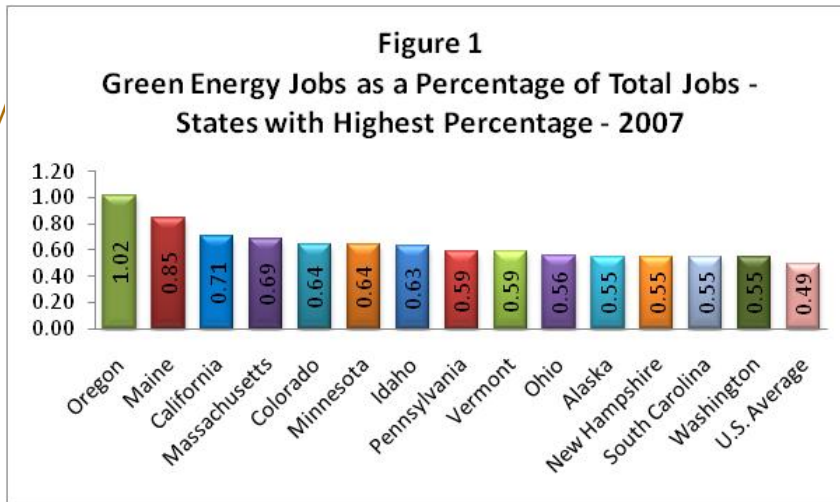
As described in more detail in the full report, funding levels for individual Market Driver Initiative projects could be from \$1 million to perhaps \$25 million. Only a *portion* of these funds would come from the Clean Energy Growth Partnership. The balance would be funded on a commercial basis by actual project sponsors, such as utilities, commercial building developers, biofuel production companies, or biomass power generation developers and other non-state sources. The federal government has funded, and in the near-term is likely to continue some level of funding for, well-designed clean energy technology projects that can be shown to enhance job and business growth. Various non-government foundations (e.g., the Pew Charitable Trusts, the Energy Foundation, the Paul G. Allen Family Foundation Science & Technology Innovations Program, the Bullet Foundation, the Doris Duke Charitable Foundation, the William and Flora Hewlett Foundation, the ClimateWorks Foundation, the Rockefeller Foundation, among many others) share similar interests.

If Washington State provided annual funds contingent upon a match basis of, for example, one to two times to leverage the smaller share of State contribution, an annual contribution of \$20 million from state sources could become \$40 to \$60 million annually. As many as three to ten Market Driver Initiative projects could be implemented each year once the program was fully operational, depending upon the amount of non-state funding that could be leveraged and the mix of projects. That level of funding, particularly on a consistent multi-year basis, will attract attention of buyers and sellers in the clean energy technology sector. Most importantly, *it will match the lower range of efforts of other states to create clean energy jobs and provide a reason for clean energy solution companies to seriously consider investment and expansion in Washington rather than elsewhere.*

Identifying and adopting one or more methods for providing this funding is crucial. The State could choose to reprioritize general funds from lesser priority work to this Leadership Plan. Or, the State could dedicate new revenue accruing from the expiration of past tax exemptions. Another equitable approach used by some states is a “system benefits charge” approach, applying a small fraction of a penny for every kilowatt-hour of energy sold within a state as a means to create a funding pool for clean energy programs rather than relying upon State general funds. If applied to all electric utility customers in the state uniformly, regardless of type of ownership, an annual fund of approximately \$20 million to provide shared clean energy solutions and economic development would cost no more than \$0.00025 per kilowatt-hour, or an average of less than 20 cents per month for a typical household. Such a funding approach provides at a minimal cost for citizens of the entire state to benefit from the clean energy jobs created under this Leadership Plan. This and other options for sources of funds provided for the Clean Energy Partnership are discussed in more detail in Chapter 7 of the Report.

Expanding the Partnership’s Long-Term Benefit

The example market driver initiatives described herein are only part of the recommended Leadership Plan. The convening of stakeholders in the clean energy technology sector in Washington also includes bringing together parties with a long-term interest in improving in-state opportunities for research/innovation, work force training, financing/funding and marketing of clean energy technology solutions (and businesses/jobs) to markets outside the State’s boundaries. Chapter 4 of the full Report provides additional explanation of an important feedback loop between these accelerated clean energy technology projects and the better formation of an economic cluster that provides a foundation for future long-term growth.



Creating Clean Energy Jobs

The Clean Energy Partnership could be formed by the end of 2011. By the end of 2012, the Partnership could be responsible for successful initiation of leading-edge clean

energy projects that form the platform for Washington’s clean energy job growth.

These outcomes will produce clean energy jobs. Total *clean economy* jobs in Washington have been estimated at around 1.6 percent of total in-state employment or about 45,000 jobs³. Independent research by Navigant indicates that approximately 35 percent to 45 percent of those *clean economy* jobs are actually in *clean energy*-related fields, resulting in approximately 16,000 to 20,000 jobs⁴. Based on a study by the Pew Charitable Trusts, as shown in Figure 1, *clean energy* jobs in Washington are estimated to be about 0.55 percent of total jobs. This is consistent with the Navigant estimate referenced above and results in a national ranking in clean energy jobs for Washington of roughly 10th place, tied with several other states⁵.

Based on the recommended Leadership Plan, with implementation starting in 2012, Washington could increase clean energy jobs by 2.5 times by 2020. Ignoring the multiplier effect of indirect jobs created by new primary jobs, this could conservatively add \$1.2 billion annually in clean energy base wages in Washington⁶. Including a conservative estimate for indirect jobs created from these clean energy base level jobs, implementation of this Leadership Plan could result in an incremental over 50,000 jobs and approximately \$2.3 billion (in 2010 dollars) in annual employment income to Washington by 2020, with an increased growth rate from that level for many years to come. Increases of in-state income in clean energy will come not only from the numbers of jobs created, but also from the typically higher than average incomes associated with clean energy employment.

The remaining chapters of this report provide further details of the data, analyses and recommendations reflected in this Overview.

³ 2008 Green Energy Jobs in Washington, Washington State Employment Security Department.

⁴ Phase I: Washington State Clean Energy Technology Landscape, April 2010, Presented to the Washington Clean Energy Leadership Council.

⁵ The Clean Energy Economy: Repowering Jobs, Businesses and Investments Across America, June 2009. The Pew Charitable Trusts.

⁶ Average annual salary based on U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Accounts, State Annual Personal Income, Table SA05N - Personal income by major source and earnings by NAICS industry (line 50 - Wage and salary disbursements) and Table SA27N - Full-time and part-time wage and salary employment by NAICS industry (line 20 - Wage and salary employment by place of work), Washington, 2008. <http://www.bea.gov/regional/spi/>

Appendix A -Market Driver Initiative Description

Market driver initiatives are a key foundation of the Clean Energy Leadership Plan with a direct focus on creating clean energy jobs in Washington. As described in Chapter 4, three areas of market driver initiatives are recommended for initial focused attention by the Clean Energy Growth Partnership:

1. Combined Energy Efficiency, Green Building and Smart Grid Projects;
2. Renewable Energy Resource Integration Projects; and
3. Bioenergy Projects.

This Appendix describes representative project types for each of these clean energy segments covering:

- » Economic Objectives;
- » Strategic Opportunity;
- » Challenges;
- » Proposed Actions:
 - Regulatory
 - Logistics
- » Funding Sources & Levels; and
- » Economic Benefits.

These specific projects are representative only. The intent of the Leadership Plan is to “convene” clean energy solution providers and buyers of clean energy solutions to identify leading-edge project opportunities in these broad areas to receive partial funding from the Clean Energy Growth Partnership. The scope, timing, size and cost of market driver initiative projects would be determined by what buyers desire and clean energy solution providers can provide.

Increased total personal annual income, tax revenue and associated economic activity is a common goal of each of these initiatives.

Initiative 1: Combined Energy Efficiency, Green Building & Smart Grid Projects

Economic Objectives:

- » Demonstrate combinations of energy efficiency, green buildings and smart grid applications that achieve greater net energy savings than utilities and building owners/ developers traditionally have implemented as a means to showcase Washington skills and capabilities to provide similar solutions within and outside Washington for in-state job growth.
- » Prove the cost-effectiveness of the combined technology solutions to provide long-term savings to Washington utility customers. Use the demonstration projects for subsequent building projects to adopt these solutions as market standards without future subsidy.
- » Create new and expand existing energy efficiency, green building and smart grid solution companies in Washington based on the results of these combined technology projects as examples of the next generation of deeper energy savings solutions.

Strategic Opportunity: Washington State can demonstrate leadership in the next generation of energy efficiency, green building and smart grid applications through bringing utilities, local governments, green builders, energy efficiency solution providers and smart grid⁷ solution providers together in a competitive, leading-edge, properly scaled demonstration project or set of projects. The most promising opportunities could involve “clean energy district” developments⁸. This approach will provide real-world application of combined technologies and applications in energy efficiency to inform utilities, commercial/ governmental building owners, regulators, technology providers and financial players what can be achieved. The result will be implementation of sustainable, leading-edge energy savings opportunities that can be replicated in Washington as a new status quo to demonstrate viability of deeper savings for Washington utilities and customers while proving opportunities to be replicated for export to other out-of-state markets.

Current Challenges:

- » Coordination of Investment: Lack of targeted risk-sharing funding to bring solution providers and utilities together for shared utility purchaser and energy end-user benefit to prove market-leading solution performance.
- » Need for Reduced Risk of Investment: Commercial building developers need demonstration of the cost of leading-edge energy efficiency/ green building prior to committing to investment. State regulatory structure that includes WUTC retroactive review and potential disallowance of investment or expenditure by utilities chill initiative to push boundaries for market-leading energy efficiency/ green building projects/ measures.
- » Cost Recovery Risks: Present economic conditions also challenge commercial building owners from capturing return of added energy efficiency/ green building costs in sales

⁷ Smart grid applications will focus on monitoring and feedback on energy customer end-use of energy in designated major end use to modify consumer/ building owner-tenant behavior and optimize efficient use of energy saving features. Successful deployment demonstrates market value of Smart Grid at the utility distribution level

⁸Applying energy efficiency/ green building/ distribution level smart grid at various size and types of buildings with a designated boundary, new development, campus or commercial/ government center, potentially in combination with distributed renewable energy or district heating/ cooling systems

or lease payments. Utility rate structures that tie cost recovery largely to the volume of energy sold create a disincentive to higher energy efficiency savings. Lower energy sales result in under-recovery of costs when energy efficiency reduces volume of energy sold.

Proposed Actions

Regulatory Actions:

- » Improve Regulatory Certainty on Costs & Performance Requirements: Establish required legislative code modifications (or administrative actions) that:
 - Allow pre-approval of authorized project/program expenditure by regulated utilities that are designed to meet performance targets proven by commercial scale and independently measured demonstration projects.
 - Use the market driver initiative projects to set general performance expectations for broader implementation within total authorized utility budget level expenditures.
 - Eliminate retroactive disallowance of funds spent other than for specific improper management. Use program evaluation of Initiative projects to guide future investment/expenditure authorizations as a substitute for retroactive disallowance.
- » Eliminate Electric Rate Structures with Energy Efficiency Disincentives: Accelerate the on-going WUTC utility rate “decoupling” inquiry proceeding to implement rate structures that do not create energy sales volume reduction disincentives.⁹

Logistical Actions:

- » Use Market Players to Define Leading-Edge Demonstration Projects: Work with utilities and building owners/developers to establish target pilot project criteria, sizes, expected energy and cost savings and required funding levels.
- » Team Utilities and Green Building Owners/ Green Building Developers to Solicit Projects: Utilities work with the green building owner/green building developer sector to collaboratively solicit competitive appropriate scale and scope project proposals for shares of combined Partnership and other matched funding support to develop market-leading demonstration projects. Utilities solicit bids from energy efficiency/green building developers to seek Clean Energy Growth Partnership funding. Utilities could combine to share a demonstration project, or individual utilities and development partners could compete separately. The objective is to seek “best new practices” opportunities that best showcase Washington leading-edge opportunities.
- » Use Government as a Market Leading Purchaser – State government can be a market leader in selecting the solutions and standards developed as part of this market driver initiative to apply the next generation of energy efficiency and green building solution packages. Procurement efforts could be modified for targeted levels of demonstration projects to help provide proof of concept for this initiative for the government/public building sector.

⁹ The WUTC presently has an open proceeding evaluating incentives for renewable energy and energy efficiency measures, of which “decoupling” of rates to eliminate disincentives for energy efficiency due to rates being tied to volume of energy sold. RCW 80.28.260(2) provides latitude for such adoption.

Funding Sources & Amounts:

- » **Funding Sources:** Funded by a combination of utility energy efficiency / Smart Grid funding, commercial builder contribution to be recovered from real estate market (sales or lease \$), and combined matched Clean Energy Growth Partnership and funding collaborators monies. Local and municipal weatherization block grants could be an additional source of funding in cases where demonstration projects qualify for those funding sources.
- » **Funding Amounts:** Subject to utility and solution provider input, scale of individual projects could be individual or combined “clean energy zone / district” buildings in 100,000 to 1 million sq ft range requiring \$2.5 million to \$30 million per project “above market” funding, some share of which would be grant dollars from Clean Energy Growth Partnership¹⁰. Smaller projects could also provide viable demonstration of these target solutions. Profile and proof of concept can be more important than scale in some building markets and applications.

Economic Benefits:

- » **Near-term Job Growth:** Acceleration of construction jobs (including clean energy trades apprenticeships) from accelerated building development or retrofits that would not otherwise happen as quickly. Additional engineering, software, architecture, finance jobs from pilot projects and subsequent repeat projects enabled by successful pilot projects.
- » **Sustained Job Creation:** Create platform for continued cost-effective investment in energy efficiency, green building and associated Smart Grid deployment in Washington and associated business and job growth. Establish basis for similar services in Northwest region and outside the region based on leading-edge project deployment, experience and capabilities proven from successful in-state pilot projects.
- » **Increased Property-Tax Revenue:** Receipt of more property tax revenue in Washington to the extent demonstration projects show net value of higher total building investment to achieve deeper energy savings¹¹

Initiative 2: Renewable Energy Optimization & Smart Grid Deployment

Economic Objectives:

- » Create businesses and jobs that support the integration of renewable energy into the transmission grid and the regional power supply.
- » Establish Washington-based businesses and jobs in distributed energy storage deployment that balances renewable energy time of day production with customer needs.
- » Lower the cost of energy in the region with more economic use of existing transmission system through smart grid applications that optimize delivery of energy on existing system.

¹⁰ “above market” costs referring to amounts that may not be recoverable from combined building / development sales or lease payments and utility program investment / expenditure levels until the demonstration project has proven post-completion results

¹¹ Incremental property tax revenue could be 10% to 20% per building over its commercial life, and could result in some construction occurring more quickly than status quo, resulting in earlier tax revenue

Strategic Opportunity: Combine in-state renewable energy generation with energy storage and smart grid applications to demonstrate cost-effective integrated solutions to differentiate Washington-based clean energy solution providers in the market. Smart grid improvements in transmission and distribution delivery efficiency can more effectively utilize the existing transmission grid, allowing higher percentages of renewable to be utilized system-wide. New and unique energy storage solutions, including demand response solutions, could provide balancing or “firming” of intermittent generation sources (wind, solar, biomass, etc.), similarly allowing a higher percentage of intermittent renewable penetration system-wide. Wind (and in the future, solar) energy development in Washington is being undertaken to meet in-state I-937 RPS requirements of Washington utilities. The ability of the system to cost-effectively incorporate a higher percentage of renewables that meet in-state and export markets would allow WA to be a leader, while demonstrating how best to integrate renewable energy into the regional power supply portfolio and grid operations.

Current Challenges:

- » Coordination of Investment: Lack of advance approval of renewable energy investment or power purchase commitment to meet I-937 RPS requirements and retroactive review of expenditures limits the amount of renewable energy regulated utilities in Washington can and will commit to deploy. Energy storage solutions which are likely needed to meet total I-937 targets will similarly need investment approval.
- » Risk of Investment: Investment in continued renewable energy, along with energy storage and smart grid technology deployment to integrate renewable resources faces new levels of uncertainty in regulated utility cost recover from the WUTC. Cost of “proof of concept” of energy storage for any one utility (regulated or public power) places undue burden on large scale demonstration of that technology.
- » Uncertainty of Operational Cost of Intermittent Renewable Energy: Concerns remain on the operational costs of wind energy in particular on the Northwest grid due to imbalance energy effects as the percentage of renewable energy resources in the region expands.¹²
- » Limitations on Existing Transmission System: Operational limitations on existing transmission lines within the Northwest and between the Northwest and California constrain the amount of energy that can be exported until new transmission can be developed or existing transmission loading is optimized using smart grid technology. In addition, a similar financial/investment risk of WUTC denial of cost recovery is a barrier to developing transmission assets that can relieve present load constraints.

Proposed Actions

Regulatory Actions:

- » Renewable Energy Cost Recovery: Reduce the uncertainty of cost recovery for regulated utility renewable energy expenditure or investment cost recovery. Provide for regulated utilities to purchase or develop renewable energy and enable cost recovery within utility cost projections for approved levels of capacity without risk of retroactive disallowance of costs within allowed cost variance boundaries.¹³

¹² Imbalance energy effects refers to costs imposed on the grid to ramp non-wind generation up or down to compensate for variation in wind production from predicted levels and related operational adjustments

¹³ Regulatory alignment is needed to warrant utility participation in the types of pilot project described herein.

- » Enable Smart Grid and Energy Storage Project Cost Recovery: Allow regulated utilities to participate in and recover their cost share of smart grid/renewable energy optimization pilot projects to demonstrate cost-effective means to:
 1. improve the availability of existing electric transmission capacity within Washington and to export renewable energy outside of Washington,
 2. improve inter-balancing area operations and coordination to reduce imbalance energy costs from wind energy,
 3. improve operational prediction of wind energy to reduce imbalance energy costs to the grid, and
 4. demonstrate the operational benefits and cost of alternative energy storage systems to store intermittent energy from wind and solar generation to better match customer time of use

Logistical Actions:

- » Build Utility Consensus on Renewable Energy Growth: Reach consensus of Washington utilities (investor-owned and public) and Bonneville Power Administration regarding levels of incremental wind and solar energy that can be developed to meet NW in-region needs and California export within the existing transmission system and available operational adjustments
- » Establish Renewable Energy Supply Optimization Systems/Tools: Define and implement an energy storage/wind forecasting/smart grid competitive solicitation with combined Clean Energy Growth Partnership, utility, Bonneville, U.S. DOE and non-profit foundation support for a pilot project
- » Show and Share Benefits of Renewable Optimization Project: Use interim results from existing DOE-funded transmission system optimization project¹⁴ to identify additional benefit potential from energy storage, improved wind forecasting and power marketing mechanisms to optimize wind energy development and operation.
- » Launch an Integrated Pilot Renewable Energy Optimization Pilot: Define a combined wind energy operation, energy storage and transmission optimization program at a pilot level for implementation by 2012. Use multi-utility collaboration/participation approach, including involvement by Bonneville, to reduce cost and risk of the pilot project¹⁵.

Funding Sources & Amounts:

- » Amount: Level to be defined based on size of pilot project deemed necessary. Likely undertaken on a phased basis at \$15 to \$25 million/yr total funding, with Clean Energy Growth Partnership participation in range of \$5 to \$8 million/yr.
- » Sources: Funded from recommended WA utilities system benefit charge proceeds with match from participating utilities, Bonneville, DOE and solicited foundation participation.

Economic Benefits:

¹⁴ Western Electricity Coordinating Council synchrophasor project funded by utilities, grid operators and U.S. DOE to improve transmission system operation to increase delivery capability over existing system and system reliability, total funding \$108 million

¹⁵ Include public power and investor-owned utilities to gain greater market penetration and economic benefit

- » Grid Interface: Formation and growth of engineering, software and planning jobs created to establish energy storage, wind energy forecasting and smart grid device and system development for the combined solution, at the pilot and long-term implementation stages
- » Energy Storage: Expansion of businesses providing energy storage installation and O&M services and software solution providers for communication and monitoring systems for the storage system function.
- » Renewable Energy Producers: Increased wind and solar energy generation facility planning, engineering, site preparation, installation and O&M enabled by the pilot project and subsequent enhanced development potential
- » Supply Chain: Formation of solutions businesses at existing or new companies in Washington for all of the above components of this combined energy storage, smart grid, transmission, distribution and wind and solar energy expansion solutions.

The Bioenergy Initiative is discussed in two segments as 3A and 3B.

Initiative 3A: High-Efficiency Biomass Power Initiative

Economic Objectives:

- » Create additional jobs in the forestry and agricultural sector to supply biofuels for transportation fuel and biomass for power generation
- » Establish and expand businesses and jobs in biomass power generation and biofuel production
- » Provide additional economic value for inputs to the forestry and agricultural sector in Washington to enhance those overall business sectors to stabilize and grow.

Strategic Opportunity: Expand Washington’s biomass power production capability using high-efficiency technologies to increase production and develop businesses and jobs to export technology and skills to out-of-state markets. Washington’s extensive forest-based and agricultural biomass feed stock can be a significant contributor to sustainable renewable power supply to add to the existing approximately 325 megawatt (MW) of existing in-state biomass power supply. Focused, competitive demonstration of high-efficiency biomass power production could add depth to renewable energy production in Washington. This expansion can create businesses, systems and practices in bio feedstock farming, harvest/restoration and transportation that could be equally applicable to future large scale biofuel industry success. Biomass power has applicability outside of Washington and in-state demonstration by Washington companies can build a platform for export of solutions.

Current Challenges:

- » Uncertain Fuel Supply: Concerns about competition between future biofuel production and combustion of biomass material for nearer-term biomass power creates uncertainty for biomass power development on a project-by-project basis.
- » Uncertainty on Net Carbon Emissions: Questions on the net carbon emission effects of biomass power production (from fuel harvest to power project operation) raise barriers to implementation.
- » State Land Biomass Resource Contracting: Difficulties in securing commercially viable rights to forest-based biomass feed stock from Washington Department of Natural Resources controlled lands and timber resources.
- » Project Development Lead Time: Lead-time and up-front investment required to demonstrate project viability creates challenges in ability to compete in renewable energy procurement windows.

Proposed Actions

Regulatory Actions:

- » Longer-Term Biomass Contracts: Washington Department of Natural Resources establishes long-term forest biomass harvest contract rights to better match life of biomass power projects (could apply equally to biofuel projects).
- » Less Onerous Facility Permitting Processes: Provide accelerated or coordinated facility permitting process for environmentally sensible biomass power projects competing for Clean Energy Growth Partnership pilot demonstration project programs (enhanced

inter-agency coordination should be a long-term solution beyond demonstration projects). Regulatory approval provisions that recognize and encourage biomass power projects that demonstrate net carbon reduction, high efficiency use of biomass resources and environmentally-appropriate use of harvested, farmed, and/or available residual bio feedstock should be developed and applied.

Logistical Actions:

- » Competitive Project Solicitation Process: Work with utilities and biomass power suppliers to implement a competitive biomass power solicitation process for pilot high efficiency biomass power projects on a performance standard basis¹⁶. Solicitation could be for siting, design and permitting support for larger projects or for a portion of capital cost for smaller projects. A sequencing solicitation for planning and design for multiple projects, followed by a competition for construction/ production project(s) could be undertaken.
- » Establish Power Purchase Framework: Clean Energy Growth Partnership works with utilities to provide power purchase framework for successful project(s).
- » Share Pilot Project Results: Use cost, fuel efficiency and biomass feed stock results from pilot project to inform the market, resource agencies and stakeholders of viability of expanded biomass power generation

Funding Sources & Amounts

- » Sources: A combination of Clean Energy Growth Partnership, U.S. Dept of Energy, U.S. Dept of Agriculture and foundation funding could be used.
- » Amounts: Planning & design funding could be \$500,000 to \$2 million per project, project development funding could be \$1 million to \$10 million, of which Clean Energy Growth Leadership funding could be 1/3 of total.

¹⁶ Establish fuel efficiency and net carbon targets

Economic Benefits:

- » Differentiating Washington Biomass Energy Businesses: Position Washington as the “next generation” biomass power supply technology design/implementation center to expand businesses and jobs.
- » Improve Overall Forest & Agriculture Economic Sector in Washington: Adding an energy value component to forest and agricultural production provides additional economic input to forest and agricultural production per acre, enhancing those industry sector job opportunities in Washington. Result is retaining existing sector jobs and creating more jobs in the sector.
- » Help Accelerate Biofuel Business: Biomass power planning and development, rather than compete with future biofuels for transportation, will further research and demonstration for feed stock growth, harvest/restoration and transportation. This demonstration will also be relevant to biofuel feed stock supply needs, reducing costs to that industry and helping job growth in both bioenergy segments.

Initiative 3B: Biofuel Refinery Demonstration Projects

Economic Objectives:

- » Use Washington’s Biofuel Industry Position to Create Jobs: Leverage Washington’s leadership in aviation biofuel commercialization efforts to gain global market recognition to foster additional biofuel development and associated business and job growth.
- » Leverage Military Presence to Demonstrate Biofuel Viability: Use Washington’s major military operations presence to demonstrate broader biofuel use to accelerate the state’s biofuel business and associated jobs.

Strategic Opportunity: Washington has significant biofuel research on-going through the Bioenergy State Laboratory (BESL) and private research and commercialization in biofuel, particularly for biobased aviation fuel. Acceleration of a broader range of transportation biofuels could be achieved through the development of a “biorefinery” which targets intermediate high-value non-energy products from biofuel conversion in a manner similar to that used in the traditional petrochemical industry. In addition, increased support for biobased aviation fuel commercialization and partnering with U.S. military facilities in Washington State to use those markets for transportation biofuel could accelerate biofuel commercialization and differentiate Washington biofuel companies, expanding in-state bioenergy jobs.

Current Challenges:

- » Coordination of Fragmented Biofuel Production Business: The biofuel development market is highly fragmented, with numerous biomass feed stock and end-uses of biofuels being sought by many parties, typically with limited capitalization. Focus of research has been on fuel only, largely due to funding sources at the federal level aimed at energy. Excluding intermediate chemical or other non-energy refinery products requires the lower value fuel commodity to fund the entire cost of research and ultimate efforts at commercial development.
- » Biofuel Facility Permitting Process: Biofuel production plants are in early stages of commercialization, with each plant typically being unique. This creates permitting challenges, with overlap among many state, local, and some federal agencies, burdening the development process for large scale prototype biofuel plants.

Proposed Actions

Regulatory Actions:

- » Permitting and Regulatory Approval Facilitation: Provide a single point in state government to help coordinate permitting processes among federal, state and local review agencies for demonstration and first commercial biofuel plants to reduce development risk, timelines and costs. This function is well suited for a Clean Energy Policy & Regulation Ombudsman or Senior Energy Advisor as described in Chapter 2 of this report.

Logistical Actions:

- » Structure a Biorefinery Design Solicitation: In collaboration with BESL, develop a solicitation for a facility design and program implementation for a “biorefinery” that focuses on refining high-value intermediate non-energy products along with biofuels to enhance commercial viability for biofuel production from a broader array of biofeed stocks.
- » State-Federal Collaboration for Military Transportation Biofuel Demonstration: Solicit U.S. military interest in a biorefinery program to include strategic alternative fuels for military transport purposes to be tested in U.S. military facilities in Washington State as a near-term biofuel test market.
- » State Government as Purchaser – Where possible without increasing costs, have State government be a market leading purchaser and user of in-state produced biofuel.

Funding Sources & Amounts:

- » Sources: Combination of Clean Energy Growth Partnership, U.S. Department of Defense (Navy or other), U.S. Department of Agriculture and U.S. Department of Energy funding for facility design parameters and program design under competitive solicitation for Washington-located firms. Subsequent phases would be for funding of project development for risk sharing of leading-edge projects.
- » Amounts: Level of funding is highly variable based on scale and complexity of projects. Funding is likely to be phased with design, followed by project development. Initial effort to define the facility requirements, preliminary design and program of research, including stakeholder input process likely to be in \$500,000 to \$750,000 level, with approximately 1/3 to 1/2 share from Clean Energy Growth Partnership funding. This effort would define the cost of implementing the biorefinery program to be funded out of a subsequent program effort. The initial “soft costs” of planning, specifying and designing a biorefinery project can be a major obstacle to move forward with the actual capital funding of project construction. The subsequent full biorefinery project specification and design phase could involve total project design funding (incremental to the developer’s contribution) in the range of \$3 million to \$10 million, with approximately 1/3 share coming from the Clean Energy Growth Partnership. Having Washington provide at least this design level funding can help differentiate the State from others in this sector.

Economic Benefits:

- » Differentiate Washington Biofuel Companies to Grow Businesses and Jobs: This commercialization acceleration research effort is a longer-term program than the other market driver initiatives. It will provide a continuum of biofuel development in Washington for biofuel programs that do not compete with food crops to establish Washington among the national leaders in biofuel development, market creation and commercialization. Business and jobs will be developed including primary research, facility design, field labor (agriculture and forestry), transportation, finance, marketing and operations.
- » Providing Additional Economic Input to Forest and Agricultural Economy: By creating energy and other biorefinery non-energy intermediate products, incremental sources of income are provided for the forest and agriculture economy in Washington to help vitalize those sectors.

- » Reinforce Washington's Military Operations Economic Ties: Attracting U.S. Department of Defense interest to a state-based transportation biofuel demonstration program can help accelerate funding and lever the strong presence of military facilities and fuel use here in Washington. This provides an additional tie between the major military operations in state as an additional means to foster the mutual economic support between U.S. military operations and Washington State.