



Department of Commerce

Innovation is in our nature.

2012 Energy Freedom Status Report

.....
Funding Bioenergy and Clean Energy Development in Washington State

August 2013
Report to the Legislature
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with Washington State
Department of Agriculture

Acknowledgements

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Introduction

Background

The Energy Freedom Program was established in 2006 under E3SHB 2939 to “promote public research and development in bioenergy, and to stimulate the construction of facilities in Washington to generate energy from farm sources or convert organic matter into fuels.” The program provides financial and technical assistance through the Energy Freedom Account to cities, counties, ports, special purpose districts, and other political subdivisions of the state, as well as federally recognized Tribes and state institutions of higher education.

Through the account, a project may receive up to \$5 million as long as the support constitutes no more than 50 percent of total project costs. Selection criteria include projects that:

- Convert in-state farm products, wastes, cellulose, or biogas into electricity, biofuel, or other co-products.
- Demonstrate technical feasibility and assist in moving commercially viable projects to market.
- Increase energy independence or diversity.
- Produce long-term economic benefits, such as new jobs, job retention, or higher incomes.
- Provide an option for the state to purchase fuel or feedstock produced by the project.

Initial administrative responsibilities were assigned to the Washington State Department of Agriculture (WSDA). In 2007, E2SHB 1303 transferred program administration from WSDA to the Washington State Department of Community, Trade, and Economic Development (CTED), now the Department of Commerce (Commerce), effective July 1, 2007.

WSDA continues to administer four loan agreements in place at that time. E2SHB 1303 also established the Green Energy Incentive Account to support development of alternative fuel refueling infrastructure along Interstate highway corridors throughout the state.

In 2009, ESHB 2289 expanded the scope of the Energy Freedom Program by adding a third component, the Energy Recovery Act Account, to capture federal American Recovery and Reinvestment Act (ARRA) funds. The Energy Recovery Act Account provides an efficient means of disbursing grants and loans under the ARRA State Energy Program.

Pursuant to RCW 43.325.050, the director of Commerce is to report on the status of the Energy Freedom Program to the Washington State Legislature and Office of the Governor by December 1 of each even-numbered year.

This status report addresses the five state-level projects funded through the original Energy Freedom Account appropriation, two projects that subsequently received targeted re-appropriations of Energy Freedom Account funds, and the grants and loans funded under the Energy Recovery Act Account.

Milestones

2006

- The Energy Freedom Program is established under E3SHB 2939. The Legislature appropriates \$23 million, including \$17 million to WSDA for low-interest loans, and \$6 million to Commerce for a designated grant.
- Eight public-private partnerships are designated by the Legislature or selected through WSDA's competitive process to receive loan awards.
- WSDA structures the loan program to provide 10-year terms and a 1 percent interest rate. Repayment may be deferred up to 24 months from date of funding unless the project generates revenue sooner.

2007

- Under E2SHB 1303, administrative responsibility for the program is transferred to Commerce effective July 1, 2007. WSDA continues to service the initial loan awards. Allowed technologies are expanded to include biogas and cellulosic feedstocks.
- Green Energy Incentive Account is established as a subaccount of the Energy Freedom Program to support development of alternative fuel refueling infrastructure along Interstate highway corridors throughout the state. No new appropriation is provided to either account.
- The Legislature amends the original awards in response to changing project needs. Two projects choose not to proceed, two projects have their awards adjusted, and one project changes its public partner.
- The remaining balance of \$2.5 million is reappropriated for an alternative fuel project loan outside the Energy Freedom Account, reducing revolving loan funds from \$17 million to \$14.5 million.
- Following completion of the legislative session, another loan recipient withdraws from the program and opts to use other sources of funding.

2008

- Funds returned in 2007 are reappropriated as designated grants for two new bioenergy projects, reducing revolving loan funds from \$14.5 million to \$13 million.
- The alternative fuel project offered a \$2.5 million loan in 2007 fails to move forward. The funds return to the state general fund.

- Following completion of the legislative session, another loan recipient opts not to move forward and returns their award. These funds returned to the state general fund in 2009, further reducing the total revolving loan account to \$10.4 million.
- By the end of 2008, the four remaining loan recipients begin a regular annual or semi-annual repayment schedule extending through 2016-17.

2009

- The Washington State Legislature allocates \$38.5 million for ARRA State Energy Program grants and loans. In October, Commerce reviews more than 100 applications for the first round. Requests total approximately \$130 million, five times the amount of available funding. Commerce awards funding to 16 projects.

2010

- In February, Commerce receives 48 applications for the second and final round of competitive ARRA State Energy Program funding. A variety of public and private entities from across the state request nearly \$60 million, about three times the amount of available funding. Commerce awards funding to nine more projects.
- Commerce reallocates unused funds from rounds one and two in a non-competitive third round, supporting 15 additional projects.

Current Status

Since program authority moved from WSDA to Commerce in 2007, no additional funding has been made available through the Energy Freedom Account or the associated Green Energy Incentive Account. All returned funds and loan repayments have been redirected for state budget deficit relief.

Of the original \$17 million appropriation in state loan funds, \$1.5 million was redirected as legislatively targeted grants and \$5.1 million returned to the general fund from projects that opted to not move forward. After three percent in administrative costs, the remaining \$10.4 million resulted in \$10.1 million in direct loans. As of the end of 2012, \$4 million in principal had been repaid. New loans and grants can be issued if repayment or new funds are appropriated by the Legislature, until the program sunsets, currently scheduled in 2016.

Should funding become available through the Energy Freedom Account in the future, Commerce will work with WSDA and other agencies and public entities to assess the technical and economic feasibility of proposals, and actively support those most likely to succeed. The ARRA State Energy Program loans awarded under the Energy Recovery Act Account remain in a revolving account. As long as Commerce continues to operate the program, loan repayment and reissue will continue.

Lessons Learned

Based on our experience of developing and operating the energy loan and grant program, we identified key learned lessons that should inform future federal or state funded energy programs.

- **Provide adequate time to develop and implement any new program.** The ARRA-funded projects had an extremely tight application timeline that often included changing federal guidance and new accountability requirements. In any future program, it is important to have sufficient time to fully develop a transparent and well-designed selection process with sufficient time to thoroughly and completely assess the financing, management, and market viability of all applicants prior to final selection. Future programs should rely more heavily upon private sector due diligence and project selection, and require that projects demonstrate significant investment commitments by other investors. This would allow the state to invest alongside more experienced and perceptive investors.
- **Recognize that new and emerging energy technologies and companies inherently involve higher levels of investment risk than well-established technologies and companies.** With the support of the federal Department of Energy and the state's Clean Energy Leadership Council, Commerce allocated a portion of the grant and loan funds to projects deploying new technologies and business models that had a significant risk of failure. Commerce also allocated grants to low-risk projects like energy-efficiency investments in state buildings. A number of the riskier projects were not completed. In many instances, Commerce was able to reallocate funds from high-risk projects that stalled to low-risk energy efficiency projects. However, in several instances, Commerce did not recover any funds from unsuccessful projects. Overall, about one-quarter of the selected projects were unsuccessful, a rate directly comparable to the average success rate of start-up businesses statewide. The lesson for the future is that grant and loan programs should be explicit about the risk profile associated with different grant types, and manage projects, expectations, and communications accordingly.
- **Use performance-based contracts with specific milestones and targets.** The agency and state's movement to performance-based contracting provides an important tool to mitigate project risk. During the course of our process, we recognized the value of performance-based contracts with three- to six-month milestones and targets with strong fund return provisions, as appropriate.

Energy Freedom Account Loans

WSDA administers loans to four Energy Freedom Account projects that received awards prior to June 30, 2007. The low-interest loans to public entities, totaling \$10.4 million, leveraged private financing, and required matching funds to cover at least one-half of each project's total cost.

WSDA signed agreements with local agencies to provide low-interest loans for these facilities. The agencies included two ports, a public development authority, and a conservation district. Each local agency received loan money designated in the state capital budget for a specific bioenergy project, with two of the agencies awarded additional monies through a competitive process. WSDA assumed the public partner duties of the Port of Sunnyside after the initial loan administration phase was completed in 2008.

WSDA Loan Agreements

<i>Public Partner</i>	Odessa Public Development Authority	Port of Warden	South Yakima Conservation District	Washington State Department of Agriculture
<i>Private Partner</i>	Inland Empire Oilseeds, LLC	Pacific Coast Canola, LLC	George DeRuyter and Sons Farms	Natural Selection Farms
<i>Activity</i>	Oilseed crushing, biodiesel manufacturing	Oilseed crushing, biodiesel manufacturing	Anaerobic digester	Oilseed crushing
<i>Energy Freedom Loan Amount</i>	\$4,348,102	\$3,296,177	\$1,973,000	\$750,000
<i>Project Cost</i>	\$9.4 million*	\$120 million	\$4.5 million*	\$1.75 million*
<i>Location</i>	Odessa	Warden	Outlook	Sunnyside
<i>Output</i>	Up to 8 million gallons biodiesel per year	35-40 million gallons oil per year	Up to 1.2 megawatts per hour	Up to 0.5 million gallons oil per year
<i>Jobs Created</i>	20 new jobs	43 new jobs (to date)	1 new job	7 new jobs
<i>Facility Operations</i>	Refinery: Nov. 2008 Crusher: July 2009	Crusher: January 2013	Nov. 2006	Sept. 2006

* Per completion certificate

State law provides that the director of WSDA fix the terms and rates of the loans to minimize the costs to the public entity and to encourage the establishment of a viable bioenergy industry. The original agreements provided 10-year loans with an interest rate of 1 percent. The term for two agreements has been extended for an additional year.

Repayments of the loans began in late 2007 and 2008 and are on annual or semi-annual schedules that end in June 2018. All payments due as of December 1, 2012 have been received and are summarized below. A total of \$1,048,012 was received during the 12-month period.

WSDA Loan Repayments

<i>Public entity</i>	<i>Repayment received in 2012</i>	<i>Total repayment to date*</i>	<i>Principal to be repaid**</i>
Odessa Public Development Authority	\$265,486	\$926,763	\$4,217,659
Port of Warden	\$582,422	\$1,862,238	\$3,197,292
South Yakima Conservation District	\$200,104	\$1,200,622	\$1,913,810
WSDA	\$0	\$298,498	\$727,500
TOTAL	\$1,048,012	\$4,288,121	\$10,056,261

* Includes interest

** Less 3 percent administrative cost allowance

All contracts require the public partner to report its project status to WSDA on a quarterly basis. The following narratives are drawn from quarterly reports received in December 2012 and summarize the status of the Energy Freedom loans administered by WSDA as of December 2012. WSDA prepared annual progress reports for these projects. Reports available here: agr.wa.gov.

Odessa Public Development Authority | oilseed processing and biodiesel production

Lincoln County

\$4,348,102 loan

- Odessa Public Development Authority (OPDA) partnered with Inland Empire Oilseeds, LLC (IEO) on an oilseed crushing and biodiesel refining facility.
- IEO refined its first biodiesel in November 2008 and crushed its first Washington-grown canola in July 2009, becoming the state's first fully integrated biodiesel company. IEO suspended operations in July 2010 due to delay in canola qualifying as an approved feedstock under the revised federal Renewable Fuel Standard (RFS2). Operations resumed in the summer 2011 with new private investment and management changes. IEO finalized agreements in July 2012, giving 1138 LLC of Kirkland 75 percent ownership in the company with IEO's original ownership group, primarily Odessa Union Warehouse and Reardan Grain Growers, taking a minority position.
- IEO crushed more than 25,000 tons of canola in the 12-month period ending September 30, 2012. It shipped more than 3.3 million gallons of biodiesel and sold more than 17,000 tons of canola meal and 130,000 gallons of glycerin. The crushline and degum systems performed exceptionally well throughout the year. Throughput of seed averaged 83 percent of nameplate capacity, while oil output exceeded 100 percent of nameplate capacity.
- Due to modifications in 2011, the biodiesel line capacity exceeds the crush capacity. IEO took advantage of the extra refining capacity by contracting for crushing at Touchet Seed and Energy, purchasing canola oil and toll processing rapeseed oil for a customer.
- With low biodiesel prices and all-time high seed prices in 2012, the focus was on producing fuel as efficiently as possible.
- IEO sourced its seed primarily from Washington, Oregon, Idaho, and the Dakotas, with less than 10 percent overall from Canada.
- IEO marketed canola meal primarily through regional feed brokers for use in dairy rations. IEO sold most biodiesel to a major oil company and a regional fuel terminal that supplies distributors providing fuel to state government. Biodiesel sales to local growers and businesses directly from IEO and through the neighboring Grange Supply increased each quarter as local demand strengthened.
- In 2012, OPDA contacted about 20 growers as well as community leaders and larger, fleet-owning businesses in the area, to promote local biodiesel availability and the community impact of IEO. All products produced during the period met or exceeded industry standards.



- Employment at IEO reached a high of 29 full-time positions during the period. By September 30, IEO employed 24 full-time staff. Most wages were above the county average rate.
- IEO entered into bankruptcy proceedings in December 2012. OPDA anticipates contracting with a new management entity in the near future.

Port of Warden | oilseed processing and biodiesel production

Grant County

\$3,296,177 loan



- Port of Warden is partnered with Pacific Coast Canola, LLC (PCC) to construct a large canola processing facility. PCC is initially developing the oilseed-crushing facility and will make oil available for biodiesel production as soon as the crushing facility starts operation. PCC intends to add biodiesel production facilities at the site when practical.
- The facility's designed processing capacity is 1,200 tons of canola seeds per day, yielding approximately 35 to 40 million gallons of high-grade refined, bleached, and deodorized (RBD) canola oil and approximately 250,000 tons of canola meal per year. The facility is on a 52-acre site leased from the Port of Warden.
- PCC gave its construction contractor, ICG, notice to proceed on July 14, 2011. Construction activities started in September 2011 and progressed as planned in 2012.
- At the end of November 2012, PCC reported that its employees had moved into the facility's office area, and its contractor continued progress towards meeting the target date for beginning production in early 2013. The meal load-out building was nearly complete, and crews were putting final piping in the tank farm and two load-out buildings. The contractor was completing work in the process building.
- PCC is working to use canola grown in Washington and the Pacific Northwest to supply a significant portion of facility needs within a first few years of operations. They have an agreement with CHS Inc. for the procurement of canola seed, sale of canola meal, and canola oil products. The agreement includes partnering to increase canola production in Washington and the Northwest. This effort encompasses outreach to grain elevators and their growers, support for university research-based agronomic support, new approaches to production contracts, and promotional activities through the media. PCC reports it is already seeing increased grower interest in canola production.
- Plant construction has generated jobs over the last year through the project's contractor and subcontractors. In an effort to pre-train employees prior to plant commissioning, PCC began

hiring operators and plant staff in the fall. Total employment in Warden as of the end of November was 43 full-time jobs and one part-time job, all of them paying above average Grant County wages. In addition, there are eight full-time employees and one part-time working in Seattle and Winnipeg. When operational, the project should generate 46 to 48 full-time jobs in Grant County, significantly more than previously estimated.

- As of first quarter 2013, PCC is operational and has provided canola oil for instate biodiesel production.

South Yakima Conservation District | anaerobic digester

Yakima County

\$1,973,000 loan

- South Yakima Conservation District partnered with George DeRuyter and Sons Farms to construct an anaerobic digester that converts methane from dairy waste into electricity. The digester uses manure from more than 5,000 mature dairy cows on the DeRuyter farm and a neighboring farm. It occasionally receives other organic waste materials, such as yeast.



- The DeRuyter digester has been operating since November 2006 and is the largest of the state's eight operating dairy digesters. It has an energy production capacity of 1.2 megawatts per hour, enough to power about 700 homes. The digester ran continuously during the 12-month period ending September 30, 2012.
- Under the current power purchase agreement, Pacific Power purchases electricity produced by the digester at 6.3 cents per kilowatt-hour, generating an average of \$40,000 per month in income during 2012. Under new rates approved by the Utilities and Transportation Commission, the price will decrease to 3.4 cents per kilowatt-hour in 2013. In light of pending lower electricity sale revenues, the DeRuyter digester participated in a feasibility study this spring, led by Washington State University, which assessed:
 - 1) Economics of current digester operation.
 - 2) Potential for converting from electricity to renewable natural gas production.
 - 3) Potential for adding nutrient recovery technology to the digester operation, and scrubbing the biogas to natural gas standards for use as transportation fuel.
- Since November 2010, digested solids have been sold to Organix, a Walla Walla company that produces a peat moss substitute called RePeet™. Income from fiber sales this period totaled \$456,000. The liquid effluent is stored in ponds on the farm and used to provide nutrients for crop production.

- The dairy uses heat from the generator engines to keep the digester operating properly during cold weather and provide hot water when possible. No viable commercial uses have been found for the additional waste heat. The digester system significantly reduces odors associated with manure storage and distribution and reduces pathogens in the manure by as much as 99 percent. Potential changes to the digester are expected to make it feasible to recover and export marketable bio-fertilizers, which will reduce nutrient loading when the liquid effluent is land-applied.
- The project created one new job at the dairy.

Washington State Department of Agriculture | oilseed processing

Yakima County

\$750,000 loan

- Natural Selection Farms (NSF) began operation of the state's first oilseed crushing facility in September 2006. WSDA assumed public partner duties on the project from the Port of Sunnyside in 2008, after the initial loan administration phase was completed. The facility crushes oilseeds to produce oil for use in biodiesel production. Meal from the crushed seeds is sold as high protein animal feed. The facility's crushing capacity is 24 tons per day.



- Activity at the facility has been intermittent due to a limited ability to secure seed for processing. NSF crushed 65 tons of Washington-grown canola during the 12-month period ending September 30, 2012. Other activity included shipping canola, soybean and camelina oil, and canola and other oilseed meal crushed in the previous year. Oil and meal were shipped to in- and out-of-state markets.
- When fully operating, the crushing facility provides employment for seven positions. These employees are used in other parts of the operation. During the period, a total of 1,195 hours worked were attributed to the crushing facility.
- In March 2012, NSF requested a restructuring of the lease payment schedule. With continued high commodity prices, NSF found it was not viable to purchase seed, and crush and sell the oil and meal in the current market. It is exploring opportunities to increase facility profitability. WSDA responded in May with a determination to defer annual lease payments due in 2012 and 2013 until June 1, 2018.
- NSF helped sponsor and made presentations at the Washington State University oilseed grower workshops in January 2012, and continued to work with growers, biodiesel producers, and university researchers in Washington and Oregon throughout the year to encourage oilseed production and development of the biofuels industry.

Energy Freedom Account Grants

Grays Harbor PUD | wood-fired heat and power

Grays Harbor County

\$6,000,000 grant

- Under the 2007 appropriation, a \$6 million grant was designated via Commerce to Grays Harbor Public Utility District to purchase and install a 7.5-megawatt turbine at Grays Harbor Paper (GHP) in Hoquiam. The turbine, driven by one of three steam boilers heated by wood waste, increased the mill's potential power output to 18 megawatts.
- This \$9 million upgrade enabled GHP to generate sufficient power for papermaking, and provided the opportunity to realize additional revenue from power sales to offset swings in the paper market. Some 25 new jobs were initially created through expansion of mill operations. Thirty-eight new jobs were anticipated, but while the mill continued to increase power generation (three megawatts in 2009, six megawatts in 2010), competition for woody biomass, limitations in federal incentive programs, and the lack of a long-term power purchase agreement made year-round operations economically unattractive.
- The woody biomass for this project benefitted a host of forest product processors, loggers, truck drivers, and other positions in the timber industry. In addition to woody debris left over from forest practices, the mill accepted storm debris that would have been sent to landfills. GHP is a leader in development of new densification technologies that reduce the cost of transporting woody biomass by 60 to 90 percent. Slow paper sales and associated financial challenges resulted in the mill's closure in 2011. The turbine and related generation assets were sold to a new owner and the mill resumed operations in August 2012. There is no power purchase agreement in place at this time.



Quillayute Valley School District | wood-fired heat and power

Clallam County

\$1,000,000 grant

- Quillayute Valley Schools, Clallam County Economic Development Council, the City of Forks, Port of Port Angeles, and numerous private businesses tapped a series of state-funded planning grants to explore biomass energy opportunities in the Forks area.



- The district received a \$1 million designated grant in 2009 via Commerce to purchase and install a wood-fired boiler for steam heat at Forks Middle School and High School, and explore use of micro-turbines for a heat recovery system to generate power. An assessment determined it was not cost effective to include this option at such a small facility. The facility became operational in October 2010.
- The new wood-fired system uses local sawmill waste and timber harvest debris, largely replacing the use of heating oil. It is more efficient and a less toxic source of area heating. It created one new position responsible for system operations.

Snohomish County | oilseed crushing and biodiesel processing

Snohomish County

\$500,000 grant

- Snohomish County, Washington State University, and local growers began to explore oilseed crops in 2005. The Snohomish County Farm-Grown Fuel Project launched in 2007 with the goal to grow oilseeds and produce biodiesel for use in county diesel vehicles.
- With investments of \$409,000 from the county and \$344,000 from U.S. Department of Energy, a seed dryer was installed at the former Cathcart Landfill near Mill Creek. Roughly one-quarter of the captured biomass is used to fuel the dryer, a more efficient and productive use of the biogas than flaring.
- In 2009, the Legislature awarded a \$500,000 grant via Commerce to purchase and install an oilseed crusher. Once seeds are crushed, the oil can be processed into biodiesel and the meal fed to local livestock.
- Due to the economy, a steep decline in petroleum prices, and changes in federal biofuel policy, the county was unable to secure an outside operator for the facility in 2010. The county did complete a new business plan and was able to use residual Energy Freedom grant funds to construct an enclosure to protect equipment and provide for year-round processing.
- During 2012, the county sought new opportunities for restarting the project. Once operational, they hope to have 2,500 acres of oilseeds in production and refine 240,000 gallons of biodiesel each year, enough to provide a 40 percent biodiesel blend for the county's diesel fleets.
- Snohomish County has contracted with a new operator, Sno-Valley Farms.



Energy Recovery Act Account

In 2009, ESHB 2289 expanded the Energy Freedom Program to accelerate energy efficiency improvements, renewable energy improvements, and deployment of innovative energy technologies in Washington State. It created the Energy Recovery Act Account to capture federal ARRA State Energy Program (SEP) funds awarded to Commerce. The U.S. Department of Energy's ARRA SEP Strategic Plan established four goals:

- Increase energy efficiency to reduce energy costs and consumption for consumers, businesses, and government.
- Reduce reliance on imported energy.
- Improve the reliability of electricity and fuel supply and the delivery of energy services.
- Reduce the impacts of energy production and use on the environment.

Energy Recovery Act Loan and Grant Projects

AltAir Fuels | advanced biofuels refinery

King County

www.altairfuels.com

\$2,000,000 grant

\$4,263,303 match



Project: AltAir proposed to construct a refinery to produce camelina oil biofuels to fuel aircraft and connect to the fuel pipeline serving Sea-Tac International Airport and McChord Air Force Base. Due to the economy and an explosion at the refinery site, AltAir reduced the project scope to the assessment and engineering work that will be useful when they build the refinery.

Outcomes: The revised project scope funded by Commerce is complete. AltAir anticipates producing up to 100 million gallons of biofuel per year when the refinery is complete. Energy Recovery Act Account funds supported six full-time equivalents, or FTEs.¹ AltAir is considering building a smaller refinery as a pilot project.

Barr-Tech | anaerobic digester

Lincoln County

www.barr-tech.net

\$250,814 contract (original \$1,500,000 loan and \$500,000 grant; \$1,749,186 de-obligated)

\$296,745 match



Project: Barr-Tech planned to build an anaerobic digester to process local food waste.

Outcomes: \$1,749,186 of the original loan and grant award was de-obligated in October 2012 and returned to Commerce. The project was not completed due to internal management issues.

Borgford BioEnergy | gasifier system for mill waste

Stevens County

www.borgfordbioenergy.net

\$771,406 contract (\$539,985 loan / \$231,421 grant)

\$912,773 match



Project: Borgford developed a novel way to burn mill waste in its patented gasifier system. The resultant heat dries lumber for the mill, which produces high-end lumber beams and other architectural products.

¹ The federal Office of Management and Budget (OMB) defines full-time equivalents. In calculating an FTE, the number of actual hours worked in ARRA-funded jobs are divided by the number of hours representing a full work schedule for the kind of job being estimated. FTEs are adjusted to count only the portion corresponding to the share of the job funded by the Recovery Act.

Outcomes: The portion of the project funded by Commerce is complete. The energy generated will power the mill, produce biochar for agriculture, and supply surplus electricity to the Stevens County grid. At full production, Borgford estimates it can supply enough electricity to power 3,500 homes. Energy Recovery Act Account funds supported one FTE. Additional funds are needed to complete the project.

Cascade Community Wind | community wind turbines

King and Kittitas Counties

www.cascadecommunitywind.com

\$1,000,000 contract (\$700,000 loan / \$300,000 grant)

\$1,230,554 match



Project: Cascade Community Wind (CCW) planned to install eight mid-scale wind turbines, funded and financially supported by communities in Kittitas and Whatcom counties.

Outcomes: Three wind turbines are complete and operational. CCW continues to work with utilities, agencies, lenders, vendors, service providers, and the public to remove barriers to development of community-supported wind, a replicable model found throughout Europe and several Midwestern states. CCW has nine wind leases on land capable of supporting more than 16 turbines. Energy Recovery Act Account funds supported three FTEs.

Cedar Grove Composting | anaerobic digester for food and yard waste

Snohomish County

www.cedar-grove.com

\$656,605 contract (original grant \$1,000,000; \$343,395 de-obligated)

\$823,369 match



Project: Cedar Grove planned to integrate a high-solids anaerobic digestion facility within the current Everett composting facility. The digestion process would receive fresh food and yard waste that would otherwise have gone directly to compost. Biogas would be collected from the breakdown of the material and combusted to produce electricity.

Outcomes: Project was not completed. Cedar Grove redirected efforts to a new site, and then postponed the project due to permitting issues. In January 2012, \$343,395 of the original grant was de-obligated and returned to Commerce. Energy Recovery Act Account funds supported one FTE.

Center for Advanced Manufacturing Puget Sound | supply chain improvements

King County

www.camps-us.com

\$1,000,000 grant

\$4,604,543 match



Project: The Center for Advanced Manufacturing Puget Sound (CAMPS) is a resource center bringing together manufacturers, supply chain partners, pre-qualified business development specialists, and strategic partners as an Advance Manufacturing Consortium.

Outcomes: Project is complete and CAMPS continues to work with its members. This project helps members to collaboratively retool, diversify, and support advanced innovation in the wind and solar markets. CAMPS estimates saving 100 megawatts. Energy Recovery Act Account funds supported five FTEs.

Clark Public Utilities | WaferTech cooling process

Clark County

www.clarkpublicutilities.com

\$402,000 contract (\$282,000 loan / \$120,000 grant)

\$1,202,025 match



Project: WaferTech installed a \$1.6 million energy efficient Process Cooling Water Free Cooling system at its Camas manufacturing facility, saving enough energy to power 350 homes annually.

Outcomes: Project is complete and operational. The new system uses cool Pacific Northwest weather to decrease the temperature of warm, post-manufacturing water instead of relying on traditional chillers. Clark PUD expects the system will reduce energy use by up to four million kilowatt-hours annually. The project required 2,000 construction hours. WaferTech anticipates annual cost savings will be equal to six WaferTech production specialists. Energy Recovery Act Account funds supported one FTE.

Demand Energy Networks | distributed electricity storage and network management software

Spokane County

www.demandenergynetworks.com

\$1,500,000 grant

\$2,998,199 match



Project: Demand Energy Networks develops distributed energy storage products and markets them internationally. The project involved commercializing a distributed electricity storage system comprised of electricity-storage units, and network management software to monitor and control them. The commercialization includes developing and commercializing custom

components that improve efficiency, form factor and cost effectiveness, and enhancing existing network management software to support large-scale systems with maximum security.

Outcomes: Project is complete. Energy Recovery Act Account funds helped commercialize the Demand Shifter for residential and business use and supported eight FTEs.

EnerG2 | ultracapacitors for electric vehicles

King County

www.energ2.com

\$1,800,000 contract (\$1,260,000 loan / \$540,000 grant)

\$7,935,322 match



Project: EnerG2's technical foundation rests on the proprietary synthesis of a carbon-based nanomaterial that radically improves the performance of energy storage devices, specifically vehicular ultracapacitors.

Outcomes: Project is complete. ARRA funding supported development of an ultracapacitor electrode optimized for EnerG2's nanostructured carbon and large format storage devices. Funds also supported design and specifications for manufacturing. The product is a high-performance ultracapacitor that fits into electric drive vehicle power modules. Energy Recovery Act Account funds supported four FTEs.

Farm Power Lynden | manure digester for electricity production

Whatcom County

www.farmpower.com

\$1,063,724 grant

\$3,591,876 match



Project: Farm Power produces energy from cow manure. Using anaerobic digestion, microbes produce biogas as they break down manure piped in from a nearby dairy. The biogas is burned in a generator to produce electricity. Excess thermal energy is provided to an adjacent greenhouse operation.

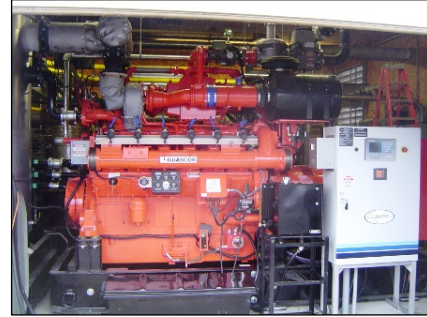
Outcomes: Project is complete and generating electricity. Farm Power generates more than 6,000 megawatt hours of electricity per year (enough to power about 500 homes), or up to 20 times the power needed to for digester operations. The excess electricity is sold to Puget Sound Energy under a 10-year fixed-price contract. Farm Power estimates the methane emissions eliminated by the project will reduce net annual greenhouse gas emissions by approximately 8,000 tons of carbon dioxide equivalent. Energy Recovery Act Account funds supported one FTE.

FPE Renewables | anaerobic digester for clean power

Whatcom County

\$320,000 contract (\$224,000 loan / \$96,000 grant)

\$483,244 match



Project: The anaerobic digester upgrade project enhances the capacity and performance of an existing digester, doubling power output to provide clean energy to an additional 200 homes. Other partners include Northwest Farm Credit Services, USDA Rural Development, and WSU. FPE is also working with WSU to commercialize emergent nutrient recovery technology.

Outcomes: Project is complete and generating electricity. Prior to the upgrade project, the generator was capable of producing 450 kilowatt-hours (kWh), yet the utility was only capable of receiving 350 kWh. Currently, the capacities of both the gen-set and the utility are 600 kWh. Funding also allowed owners the opportunity to secure additional matching funds from the U.S. Department of Agriculture’s National Resources Conservation Service to pay for collection pit construction. Energy Recovery Act Account funds did not support any FTEs.

General Biodiesel | biodiesel plant expansion

King County

www.generalbiodiesel.com

\$1,000,000 loan

\$10,781,994 match



Project: The existing biodiesel plant, generating fuel primarily from waste grease, had a capacity of approximately 2.5 million gallons per year but was limited by bottlenecks with onsite equipment and infrastructure.

Outcomes: The portion of the project funded by Commerce is complete. ARRA funding is supporting expansion of the existing General Biodiesel Seattle batch biodiesel plant into a continuous flow process, with a capacity of up to 10 million gallons per year. The project increases energy efficiency on a per gallon basis, enhances biodiesel quality, and helps extend the life of pre-existing infrastructure. Energy Recovery Act Account funds supported two FTEs.

Gen-X Energy Group | advanced biofuels refinery

Grant County

www.genxeg.com

\$720,000 grant

\$1,046,759 match



Project: The project supports construction of the first unit of a biorefinery in Moses Lake.

Outcomes: The portion of the project funded by Commerce is complete, though the biorefinery is not fully operational. Funds supported the manufacture and installation of a new biorefining module that significantly reduces costs through process simplification and heat integration, simplifies permitting, and reduces emissions. It also allowed access to the technical-grade market for glycerol, a primary co-product. Energy Recovery Act Account funds supported three FTEs.

GR Nano Materials | nanomaterials and carbonates to reduce greenhouse gas emissions

Pierce County

www.grnano.com

\$1,400,000 loan

\$1,179,831 match



Project: This project involves use of nanomaterial to reduce greenhouse gas emissions by capturing CO₂ gas from flue gas and converting to calcium carbonate for use in paper.

Outcomes: The portion of the project funded by Commerce is complete. Due to the closure of Grays Harbor Paper, the project moved to Tacoma. Energy Recovery Act Account funds supported six FTEs.

Green Energy Today | Columbia Basin renewable energy project

Franklin County

\$898,175 grant

\$2,064,822 match

Project: Green Energy Today's Project generates electricity from an agricultural canal that drains into the Columbia River.

Outcomes: Project is complete and generating electricity. By diverting water through a conduit that leads to a cross-flow turbine, hydroelectric energy is produced. Beginning in November 2011, the Esquatzel Project began generating enough power for about 225 homes in the area. Green Energy Today estimates production of 171,300 megawatt-hours between 2011 and 2020. Energy Recovery Act Account funds supported two FTEs.

Innovate Washington | Clean Energy Innovation Fund

King, Pierce, Snohomish, and Spokane Counties

www.innovatewashington.org

\$750,000 loan / \$750,000 grant

\$2,828,613 match



Project: Innovate Washington supported five successful clean technology growth projects: a geothermal heat pump for a commercial building (McKinstry); technological enhancements at a wood-fired furnace manufacturer (Greenwood Clean Energy); a company developing an efficient galley for Boeing aircraft (Nu Element); installation of a dryer and pelletizer at an anaerobic digester (VanDyk-S Holsteins); and battery storage for a commercial building solar power system (Demand Energy).

Outcomes: Projects are complete. Energy Recovery Act Account funds supported 10 FTEs.

Kadlec Regional Medical Center | energy efficiency retrofit

Franklin County

www.kadlec.org/krmc

\$2,000,000 contract (\$1,400,000 loan / \$600,000 grant)

\$5,284,671 match



Project: Funding supported implementation of energy efficiency and renewable energy production components, including solar thermal hot water, a 20-kilowatt solar array, a 5-kilowatt wind turbine, and various energy system upgrades. Given the facility's high community visibility, it provides an opportunity for outreach and education about clean energy solutions.

Outcomes: Project is complete. Commerce is working on contract closeout. Energy data will be included in the final report. Energy Recovery Act Account funds supported nine FTEs.

MacDonald-Miller Facility Solutions | utility-based energy efficiency and finance program

King County

www.macmiller.com

\$467,298 contract (original \$1,500,000 loan;

\$1,032,702 de-obligated)



Project: Funding supported Seattle Steam Company's utility-based energy efficiency project development and finance program. Due to the difficulty securing contracts with building owners, MacDonald Miller only renovated one building.

Outcomes: One project is complete; however, \$1,032,702 of the original loan was de-obligated and returned to Commerce. Commerce is working on contract closeout. Energy data will be included in the final report. Energy Recovery Act Account funds supported two FTEs.

NCS Power | LED manufacturing

Clark County

\$2,000,000 loan

\$7,211,737 match

Project: NCS Power planned to use funding to support relocation of LED manufacturing.

Outcomes: The business is no longer operating. Commerce is working with the Attorney General’s Office to secure repayment of the loan. During the course of the project, Energy Recovery Act Account funds supported 13 FTEs.

Nippon Paper Industries | co-generation biomass boiler

Clallam County

www.nipponpapergroup.com/e/index.html

\$2,000,000 total (\$1,400,000 loan / \$600,000 grant)

\$7,372,292 match

Project: Funding supported installation of a new biomass boiler and an additional 20-megawatt condensing turbine-generator.



Outcomes: The portion of the project funded by Commerce is complete; however, Nippon may decide to return loan and grant funds to Commerce pending other related project outcomes. ARRA funding was instrumental to Nippon’s decision to install a high-efficiency biomass boiler at its mill in Port Angeles. Nippon expects the new cogeneration boiler will operate at 90 percent capacity, producing 20 to 25 megawatts of electricity for area utilities in a capacity-constrained portion of the grid. It provides for increased use of forest byproducts as fuel, qualifying the project as a biomass combined heat and power generator under most western U.S. renewable portfolio standards. The excess heat is captured and used to dry the mill’s paper products. Energy Recovery Act Account funds did not support any FTEs.

Port Townsend Paper | biomass boiler upgrade

Jefferson County

www.ptpc.com

\$2,000,000 grant

\$2,719,492 match

Project: The funding was used for a biomass boiler upgrade, which supports a cogeneration plant using solid organic fuels such as wood waste and logging debris. Power output will increase from 15 megawatts to 24 megawatts in a capacity-constrained portion of the grid.



Outcomes: The portion of the project funded by Commerce is complete and operational. Energy Recovery Act Account funds did not support any FTEs; however, Port Townsend Paper estimates 290 jobs were retained at the plant because of the project.

Rainier Biogas | anaerobic digester for clean power

King County

www.andgar.com

\$1,392,500 contract (\$974,750 loan / \$417,750 grant)

\$1,414,973 match

Project: Funding supported installation of an anaerobic digester that processes dairy manure from more than 1,000 cows at three dairy farms on the Enumclaw Plateau.



Outcomes: Project is complete and operational. Commerce is working on contract closeout. The digester produces 3,582 megawatt-hours, enough to serve more than 300 homes. This project provides a model for addressing long-standing King County concerns about water quality in east county watersheds. Energy Recovery Act Account funds supported one FTE.

Renewable Energy Composite Solutions | repurpose boat manufacturing plant for small wind turbine production

Clark County

recompositesolutions.com

\$124,614 grant (original grant \$1,000,000;

\$875,386 de-obligated)

\$124,614 match



Project: RECS planned to use the funding to repurpose a boat manufacturing plant for small wind turbine production.

Outcomes: Project was not completed and \$875,386 of the original grant was de-obligated and returned to Commerce. Due to the 2008 economic crisis, RECS had trouble selling their wind blades and ramping up manufacturing. It is still trying to make the wind business work. Energy Recovery Act Account funds supported one FTE.

SeaFreeze | energy efficient refrigeration

King County

www.seafreeze.com

\$191,673 loan (original \$561,862 loan; \$370,189 de-obligated)

\$146,559 match



Project: SeaFreeze, a cold storage warehouse with local and international customers, took advantage of a low-interest Energy Recovery Act Account loan to invest in energy efficiency.

Outcomes: SeaFreeze completed the project for far less than originally planned. It also received additional match funds from its utility, and therefore \$370,189 of the original loan was de-obligated and returned to Commerce. Commerce is working on contract closeout. With daunting utility bills due to its refrigeration facilities, the company was looking for creative ways to cut costs. Today the company's energy bills are nearly 25 percent lower, thanks to an array of improvements made to its warehouse and processing stockrooms. Energy Recovery Act Account funds did not support any FTEs.

SGL Automotive Carbon Fibers | carbon fiber manufacturing

Grant County

www.sglacf.com

\$2,000,000 grant

\$2,000,000 match



Project: SGL Automotive Carbon Fibers is a joint venture of the SGL Group and BMW, both based in Germany. The company's new Moses Lake facility employs 80 workers manufacturing carbon fiber, a cutting-edge material strong enough to replace steel in some of BMW's automotive frames. SGL and BMW were drawn to eastern Washington because of the abundance of clean and renewable hydropower. The State Energy Program provided a grant to encourage the company to invest in energy-efficient equipment.

Outcomes: Project is complete. Commerce is working on contract closeout. Energy data will be included in the final report. Since opening, SGL and BMW have announced that they are starting construction on a second production line. This will add another 80 jobs, allowing the facility to produce 3,000 tons of carbon fiber per year. BMW and Boeing also recently announced a collaborative agreement to conduct joint research for carbon fiber recycling and to share manufacturing knowledge.

Snohomish County Public Utilities District | water system microhydro

Snohomish County

www.snopud.com

\$94,882 contract (original \$153,600 grant; \$58,718 de-obligated)

\$94,882 match



Project: SnoPUD planned to modify a pressure-reducing valve in its water distribution system to produce hydroelectric power, and replicate the design for other water system managers.

Outcomes: The project was not completed due to closure of the receiving plant. Contract was closed and \$58,718 was de-obligated and returned to Commerce. The project was to generate 220 kilowatts, enough to power 170 homes, with a long lifespan of 50 to 100 years.

Van Dyk-S Holsteins | anaerobic digester

Whatcom County

\$1,044,000 contract (\$731,000 loan / \$313,000 grant)

\$1,198,560 match



Project: Funding supported installation of an anaerobic digester that processes dairy manure.

Outcomes: Project is complete and operational. This project brought state-of-the-art technology to the region, and offered a less expensive approach to manure management and biogas production. Engine manufacturer 2G Cenergy custom designed the combined heat and power for this project. 2G Cenergy estimates full energy production, including recovered thermal energy, at 25.6 megawatt-hours per day. Energy Recovery Act Account funds supported two FTEs.

Washington State Department of Corrections | energy efficiency projects

Multiple counties

www.doc.wa.gov

\$1,205,464 contract

\$81,247 match



Project: Funding supports ongoing energy efficiency projects at the state's correctional facilities.

Outcomes: The first project at the Airway Heights Correction Center is complete. A second project at the Monroe Correctional Complex is underway and will be complete by spring 2013. Energy and FTE data has not yet been collected.

Washington State Department of Enterprise Services | energy efficiency projects and electric vehicle infrastructure

Multiple counties

www.des.wa.gov

\$2,190,594 grant



Project: This funding supported several energy efficiency upgrades to state buildings.

Outcomes: Project is complete. Commerce is working on contract closeout. Energy data will be included in the final report. Building upgrades include the old capital building in Olympia, which currently houses the Office of the Superintendent of Public Instruction, the Washington Soldiers Home in Orting, and buildings housing the Department of Corrections. ARRA funds were also used to purchase 45 Level 2 electrical vehicle-charging stations for use by state agencies and local governments. All stations have been claimed and will be installed in 2013. Energy Recovery Act Account funds did not support any FTEs.

Washington State Department of Transportation | interurban electric vehicle infrastructure, Department of Transportation building lighting, and ferry fuel blending

Thurston County

www.westcoastgreenhighway.com

\$2,027,716 grant



Project: Funding supported biodiesel refueling infrastructure, building lighting, and deployment of plug-in electric vehicle fast charging stations in western and central Washington.

Outcomes: Project is complete and operational. Commerce is working on contract closeout. Energy data will be included in the final report. ARRA funds were used as start-up funding to provide equipment, electrical upgrades, installation, operation, management, and maintenance of 12 DC fast chargers and 16 Level 2 pedestal chargers along Interstate 5, Interstate 90, and US 2. The Department of Transportation is expected to contribute an additional \$500,000 to \$650,000 in federal funding. Ferry refueling infrastructure for biodiesel and building lighting projects were added to the contract. Energy Recovery Act Account funds supported one FTE.

Washington State Department of Veterans Affairs | energy efficiency projects

Pierce County

www.dva.wa.gov

\$1,562,607 loan



"Serving Those Who Served"

Project: Funding supports ongoing energy efficiency projects at the Washington Soldier's Home in Orting and the Veteran's Home in Retsil.

Outcomes: The first project at the Washington Soldiers Home is completed. A second project at the Washington Soldiers Home and the Retsil Veteran's Home is underway and will be complete by spring 2013. Energy and FTE data has not yet been collected.

Washington State University Biosystems Engineering | commercialization of anaerobic digestion nutrient recovery

Whatcom, Whitman and King Counties

www.bsyse.wsu.edu

\$775,019 grant

Project: Washington State University's Center for Bioprocessing and Bioproducts Engineering is commercializing nitrogen and phosphorus recovery technology for anaerobic digestion. It has been working with research and industrial collaborators for the last seven years, and has developed patents and licensing agreements of international significance.



Outcomes: Project is complete and operational. Commerce is working on contract closeout. Energy data will be included in the final report. This grant serves as match funding for a \$1.5 million Natural Resources Conservation Service Conservation Innovation Grant to incorporate the technology into two digesters in the state: Vander Haak (Whatcom County) and Rainier Biogas (King County). The results are Class A biosolids using only waste engine heat, removal of 80 percent of phosphorus in solid form, and removal of 60 percent of total nitrogen (primarily ammonia) as biofertilizer slurry. These co-products displace mined or petroleum-based fertilizers that have significant imbedded energy costs. The process also scrubs hydrogen sulfide, reducing corrosion on biogas turbines, all at a cost substantially less than competing Danish technology. A feasibility study on the use of dairy digester biogas for transportation was added to this agreement. Energy Recovery Act Account funds did not support any FTEs.

Washington State University Extension Energy Program | blower door training and equipment to reduce energy in state buildings

Thurston County

www.energy.wsu.edu

\$490,653 grant



Project: The newly adopted version of the Washington State Energy Code requires that all new homes be tested for air leakage control. To ensure successful code implementation, builders and subcontractors need access to blower door equipment and operational training. Funding supported blower door training and equipment. With the delay in implementation of the energy

code, the training and tools for local jurisdictions may be even more valuable as a way to ensure the code is implemented in a rapid and cost-effective manner.

Outcomes: Project is complete. Commerce is working on contract closeout. Energy data will be included in the final report. Through a competitive process, 40 geographically distributed candidates were selected to participate. Candidates that passed a proficiency test were granted blower door test equipment. This project helped participants take an active role in the proposed federal HomeStar program. Most of the equipment and training was directed to rural and smaller code jurisdictions. Energy Recovery Act Account funds did not support any FTEs.

Whole Energy Fuels #1 | biodiesel refueling infrastructure

Skagit County

www.whole-energy.com

\$165,000 loan

WholeEnergy
Providing fuel for earth.

Project: The project funded production and distribution of alternative fuels, primarily biodiesel. Whole Energy Fuels operates production facilities and distribution terminals in Washington, California, and Oregon. The company's distribution facility in Anacortes features more than 100,000 gallons of heated storage, in-line filtration, and dye injection systems. The Anacortes location is also a short distance from Interstate 5 and a number of major petroleum distribution centers. It provides biodiesel-blended fuel to the Anacortes market, including the contractor responsible for delivering fuel to Washington State Ferries.

Outcomes: Project is complete. It helps increase availability of biodiesel blends to meet state contract specifications, increase the market for locally produced biodiesel, and reduce the cost of providing biodiesel to state ferries. The blending systems fill an important gap in Washington's biodiesel supply chain. Energy Recovery Act Account funds supported nearly one FTE.

Whole Energy Fuels #2 | Venoil glycerin project

Skagit County

www.whole-energy.com

\$450,000 loan

\$454,708 match

WholeEnergy
Providing fuel for earth.

Project: Whole Energy Fuels took over the project from another partner and successfully built a glycerin and biodiesel refinery in Mount Vernon to create value-added products.

Outcomes: Contract is closed and project is complete. Energy Recovery Act Account funds supported four FTEs.