



WORKFORCE
DEVELOPMENT COUNCIL
OF SEATTLE - KING COUNTY
Our Workforce, Our Future

Impact of Public Funding on Green Economy Jobs in Puget Sound



**Workforce Development Council of Seattle - King County
Public Funding and Green Economy Jobs**

IMPACT OF PUBLIC FUNDING ON GREEN ECONOMY JOBS IN PUGET SOUND

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IMPACT OF PUBLIC FUNDING ON GREEN ECONOMY JOBS IN PUGET SOUND

1.0 INTRODUCTION

1.1 Purpose of Study and Organization of Report

The Green Workforce Leadership Council, hosted by the Workforce Development Council of Seattle- King County (WDC), and co-chaired by David Allen, Executive Vice President of McKinstry, has sponsored several initiatives to assess workforce needs across green industry sectors as well as project job demand and growth. Under the sponsorship of the Council, the WDC contracted Berk & Associates to identify federal and state funding expected to flow into the four-county Puget Sound Region (King, Kitsap, Pierce, and Snohomish Counties) to support an emerging green economy and foster job creation. The study also provides a framework to estimate jobs created per “x” dollars invested in the region, along with descriptions of the types of jobs created. This information and framework will help the region’s employment training and educational institutions scale their workforce development programs based on anticipated demand for related jobs.

The project consisted of the following two primary tasks:

- 1. Identify the levels and characteristics of state and federal government funding going to businesses and jurisdictions in the Puget Sound Region to support the green economy.** The green economy sub-sectors studied include the following: energy efficiency in the built environment (Green Building), clean energy production/distribution (Energy), environmental protection/remediation (Environment), and Transportation. This task produced a compilation table of public funding, describing the funder and recipient, the amount of anticipated funding, and a general description of programs and projects being funded.
- 2. Create a framework to estimate the job creation potential of different types of funding mechanisms and programs.** This task built on the funding summary created in Task 1 and involved creating a framework for estimating a range of the number of potential jobs created in the most heavily funded market sectors. It also included a characterization of the types of jobs likely needed to support some of the specific project types.

This report is comprised of the following sections:

- The remainder of **Section 1.0** details the general methodology used in this study.
- **Section 2.0** is a discussion of Task 1 and provides our assessment of relevant state and federal government funding of the green economy likely to be received in the Puget Sound Region.
- **Section 3.0** is a discussion of Task 2 and describes the framework for a potential range of job estimates created by the funding determined through Task 1. Also identified are possible job types needed to support identified programs and projects.

1.2 General Methodology

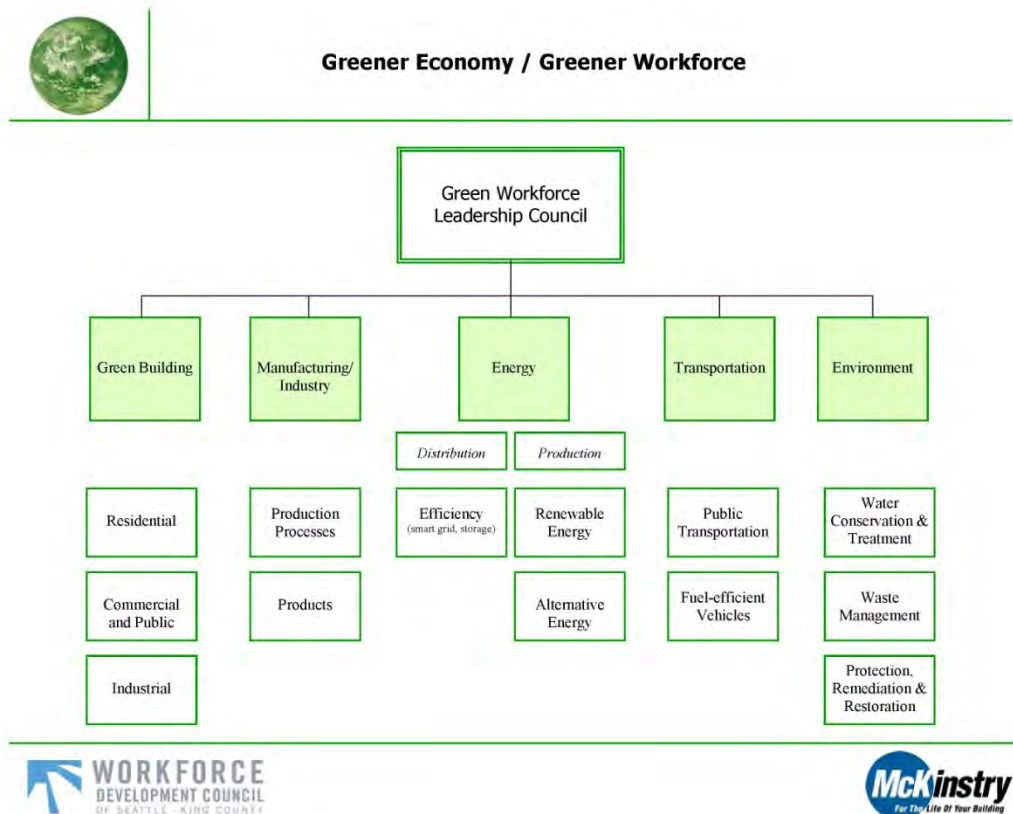
Task 1: Funding Summary

The Green Workforce Leadership Council has developed a framework that organizes the green economy into the five major sectors shown below— Green Building, Manufacturing/Industry, Energy, Transportation, and

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Environment—as shown in Exhibit 1. This framework was used to organize our research effort on state and federal funding sources.

**Exhibit 1
Greener Economy / Greener Workforce Schematic**



Source: WDC and the Green Workforce Leadership Council, 2010

This study focused on four of the five sectors listed in Exhibit 1, with particular attention paid to funds going towards Green Building and Energy, the two sectors the WDC sees as having the greatest job creation potential. Manufacturing was excluded from the analysis by the WDC because the sector was not expected to receive significant state and federal funding for the development and implementation of green manufacturing processes.

Transportation funds were included for several reasons, though much of the funding is going towards traditional road construction and would not be considered “green.” First, the magnitude of transportation projects in the region is important to understand since these projects pull from the same labor pool that supports green industries. Second, it is useful context to compare traditional transportation funding to the funding going towards green sectors.

Given the short time frame for this study, the breadth and complexity of federal and state funding opportunities, and the particular focus and interest of the WDC, the following factors were used to focus and prioritize the funds included in our study.

- 1) **ARRA Funding.** The American Reinvestment and Recovery Act (ARRA) was a major focus of this study because it provided significant amounts of new funding towards all sectors of the green economy through one-time grants, various federal and state programs, contracts, and loans. Since ARRA funds

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have been allocated primarily towards “shovel-ready” projects leading to immediate job creation, these awards are particularly relevant to the primary focus of this study: estimating workforce demand.

- 2) **Guaranteed Funds.** Although the funding compilation table does include some programs with funds dedicated to incentives and rebates, we have emphasized awards that are providing guaranteed funding towards relevant projects and activities. We have not included bonds in our funding summary and analysis, although they are discussed briefly in the conclusion of this section.
- 3) **Other New Large Federal and State Funds.** Overall, we have attempted to include most of the particularly sizable new items that will, or could potentially, impact the green economy, including grants, other relevant funds, and state and federal legislation. Older recurring funds and programs that have not significantly changed in recent years were generally excluded from the funding compilation as they were unlikely to generate demand for new jobs.
- 4) **Funds Impacting Entry-level Job Creation.** We placed an emphasis on green economy funds that will likely lead to the creation of entry-level jobs in the region (e.g. construction, maintenance and repair, installation, audits, etc.), as the skill sets for these jobs can often be met by workforce training organizations, community colleges, and certificate programs. We have also included some larger awards (primarily in the energy sector) that will require more specialized work because many of these funds will also generate some temporary and/or permanent entry-level positions. Whenever possible, we have excluded all funds going towards training programs or those dedicated exclusively for non-labor equipment purchases.

Our approach to generating the funding summary was to conduct primary research through telephone interviews and secondary research via federal and state agency websites and general internet research. Over 15 telephone interviews were conducted with contacts at 9 governmental agencies and businesses (a list of agencies and businesses interviewed for the funding summary is included in Appendix B). Secondary research focused on federal and state agency websites, where funding data clearinghouses were obtained and other program and project descriptions were reviewed. Information was also gathered and cross-checked through various press releases.

Task 2: Relationship between Funding and Job Creation

Job creation is a complex activity to estimate, full of complicating factors and uncertainties. Determining exact numbers and types of jobs created by each grant program or project is beyond the scope of this. Our effort, therefore, was focused on establishing a framework that would provide the WDC and its partners with a reasonable range of jobs likely to be created per \$1 million of grant funding actually allocated to and received by the region. This range can be applied on an ongoing basis by the WDC and others to continue to calibrate training efforts with expected demand as more information about actual funding is known. The range can also be refined as more information is gathered, projects get underway, and markets mature.

To determine a realistic level of labor demand generated by additional funding, we approached the question from three different angles, using these different perspectives to triangulate in on a reasonable range:

1. Job estimates quoted in funding awards and grant applications
2. Job estimates in national studies on “green economy” programs
3. Job estimates based on an input/output model

Further, we talked to several local companies and organizations either administering or performing work for relevant grant programs to determine the types of jobs needed to fill workload demand.

2.0 TASK 1: FUNDING SUMMARY

This section provides our assessment of relevant state and federal government funding of the region's green economy. We begin by discussing the issuing agencies and funding mechanisms involved, followed by a high-level summary of the funding compilation, general sector summaries, detailed descriptions of the various programs within each sector, and a list of several complicating factors. Full details on all the funding sources can be found at the end of this report in Appendix A.

2.1 Issuing Agencies

Primary Funding Source: ARRA

Most of the programs detailed in this study stem from the American Recovery and Reinvestment Act of 2009 (ARRA), signed into law by President Obama on February 17, 2009. The ARRA focused on jumpstarting the economy, with the goals of creating new jobs, saving existing jobs, and spurring economic activity and investment in long-term growth. The majority of funds in the Act were designated for infrastructure improvements, tax relief, and state and local fiscal relief. Much of the ARRA funding relevant to the green economy sectors discussed above were provided through the Department of Energy, the Environmental Protection Agency, the Federal Transit Authority, the Federal Highway Authority, and the United States Department of Transportation.

In Washington State, these funds were either directly awarded to local municipalities and organizations, or were channeled through state agencies, including the Department of Commerce (Commerce), the Washington State Department of Transportation, the Department of Ecology, and the Department of Health. While ARRA accounts for nearly all of the funding discussed in this report, our analysis also includes several separate programs, projects, and pieces of potential legislation.

National Issuing Agencies

All ARRA funds were administered through a federal agency. Listed below are the key agencies involved and a brief description of the green economy sectors each agency is allocating funds to:

- **Department of Energy (DOE).** DOE is administering funds focused on the green building and energy sectors. Typical projects include energy efficiency building retrofits and the deployment of new energy technologies.
- **Environmental Protection Agency (EPA).** EPA is administering funds directed at the environment sector, primarily in projects related to environmental cleanup and remediation.
- **Department of Housing and Urban Development (HUD).** HUD is administering funds going towards the green building sector through energy efficiency construction and retrofit projects.
- **United States Department of Transportation (USDOT).** USDOT is administering funds directed at transit, highway, and roads projects. Several divisions of USDOT are worth noting:
 - **Federal Transit Authority (FTA).** FTA is administering funds for transit projects. Typical projects include the maintenance and preservation of fleets, as well as the design and upgrading of transit systems
 - **Federal Highway Authority (FHWA).** FHWA is administering funds for highway and roads projects. Typical projects involve highway maintenance and construction.
 - **Federal Railroad Authority (FRA).** The FRA is administering High Speed Rail Intercity Passenger funds. These funds will be used for the upgrade, reconstruction, and installation of track.

State Issuing Agencies

Some awards were awarded directly to state agencies, which then allocated the funds to various municipalities and other entities.

- **Department of Commerce (Commerce).** Commerce received awards from DOE and the EPA and is administering funds in the green building, energy, and environment sectors
- **Department of Health (DOH).** DOH received funds from the EPA and is administering funds in the environment sector.
- **Department of Ecology (Ecology).** Ecology received funds from the EPA and is administering funds in the environment sector.
- **Washington State Department of Transportation (WSDOT).** WSDOT received funds from the FTA, the FHWA, and the USDOT, and is administering funds in the transportation sector.
- **Seattle Department of Transportation (SDOT).** SDOT received funds from the USDOT for the Mercer Corridor Projects.

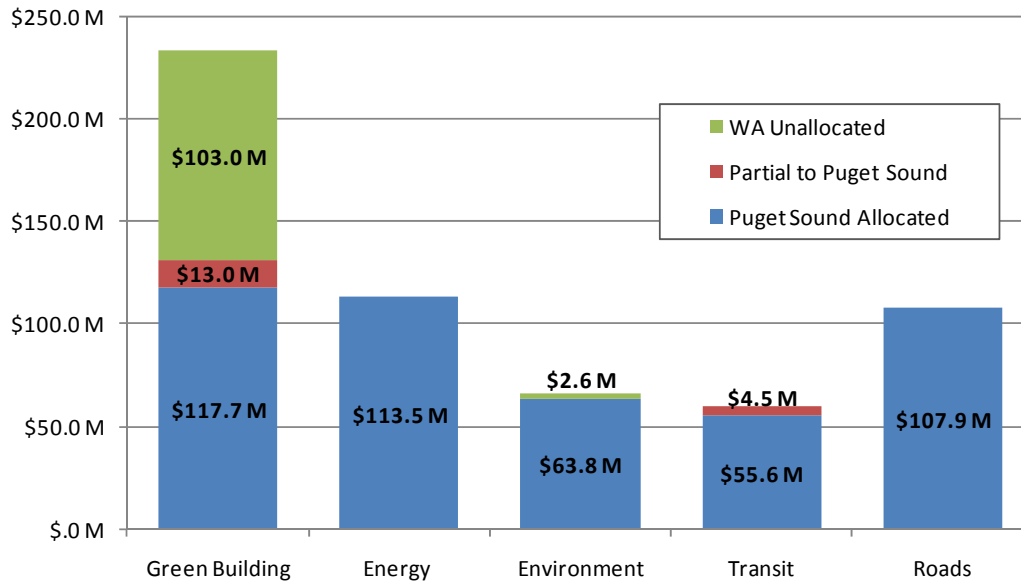
2.2 High-Level Funding Summary

This section provides a high-level summary of the funding compilation by sector, followed by a more detailed categorization of funds allocated to the Puget Sound for the two most prominent job-creating sectors: Green Building and Energy.

Green Economy Funding By Sector

Overall, a variety of state and federal funds have been awarded to businesses and jurisdictions in the Puget Sound Region. In addition, a number of funds have been awarded to the State of Washington but not yet been allocated to local jurisdictions; some portion of these unallocated funds is expected to go to the Puget Sound Region. Exhibit 2 shows guaranteed and potential funding for the green economy in the Puget Sound Region, grouped by sector. This exhibit excludes national projects, multi-state regional projects, and pending legislation.

Exhibit 2
Green Economy Funding by Sector, 2009-2010 Awards



Source: BERK, 2010.

Note: "WA Unallocated" indicates funds dedicated to Washington State of which some portion is expected to go to the Puget Sound. "Partial to Puget Sound" refers to funds dedicated to multi-county projects that are partially located in the Puget Sound Region. "Puget Sound Allocated" designates guaranteed funds allocated to businesses and jurisdictions in the four-county Puget Sound Region.

Green Building and **Energy** are the two most heavily invested in green economy sectors in the Puget Sound. In 2009 and 2010, the Region has been guaranteed \$117.7 million and \$113.5 million, respectively, in awards allocated towards these sectors. There are also \$13 million in funds allocated towards Green Building that will be partially spent in the Puget Sound. In addition, Washington State has received \$103 million in guaranteed statewide Green Building funds, a portion of which will likely be allocated to the Puget Sound.

The Puget Sound **Environment** sector has received \$63.8 million in guaranteed funds and Washington State has received an additional \$2.6 million in currently unallocated funds, most of which are likely to be spent in the Puget Sound.

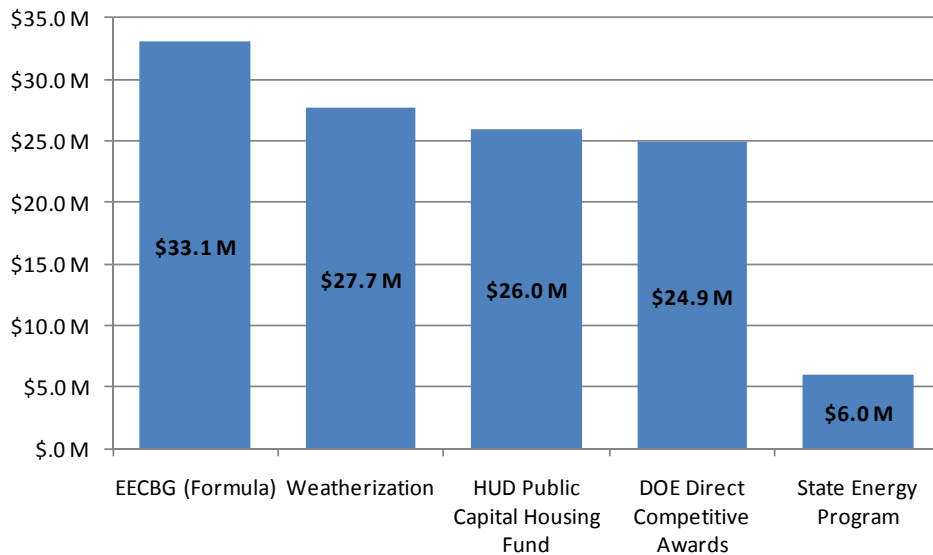
Transportation has been split into two categories, transit and roads, to highlight that the majority of funding allocated towards this sector in the Puget Sound are for road projects (\$107.9 million). Only \$55.6 million in guaranteed funds are for non-purchase (i.e. not involving the purchase of new vehicles or equipment) transit projects, with an additional \$4.5 million in transit funds partially allocated to the Puget Sound.

The next section provides more information about guaranteed funds allocated to the Puget Sound Region in the two largest categories: Green Building and Energy. Full details on all funding sources can be found in Appendix A.

Puget Sound Allocated Funds by Program (Green Building and Energy)

Exhibit 3 and Exhibit 4 show Puget Sound allocated funds by program for the Green Building and Energy sectors respectively.

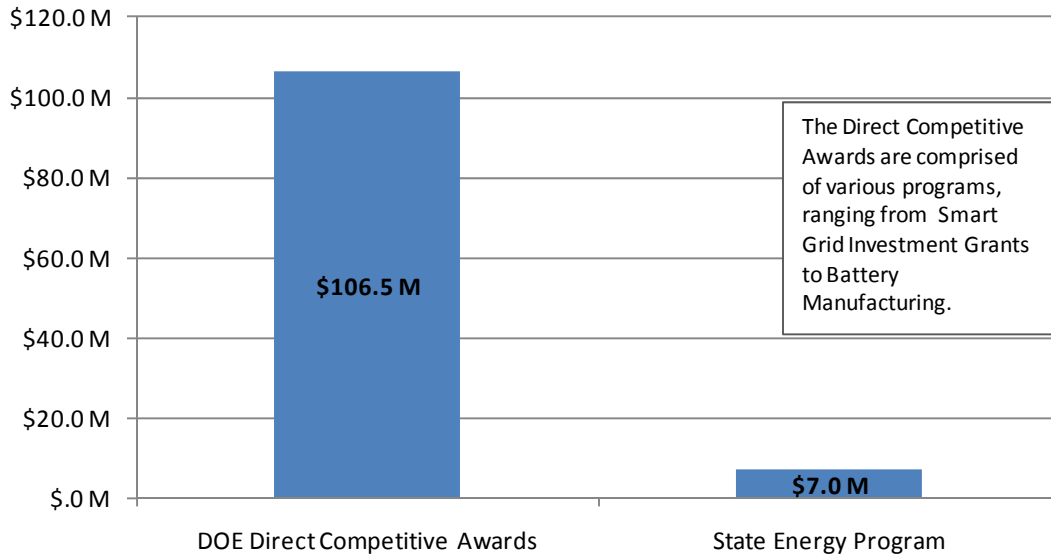
**Exhibit 3
Puget Sound Allocated Funds by Program
Green Building Sector**



Source: BERK, 2010

The Green Building sector in the Puget Sound has been allocated \$24.9 million in DOE Direct Competitive Awards, \$33.1 million in EECSBG formula-based grants (via DOE), \$27.7 in Weatherization funds (via DOE), \$6.0 million through the State Energy Program (via DOE), and \$26.0 million through HUD’s Public Housing Capital Fund. Despite the variety and complexity of funding channels and programs within this sector, the vast majority of these funds are dedicated to the same objective: improving energy efficiency in new and existing buildings through audits, retrofits, construction, and appliance upgrades.

Exhibit 4
Puget Sound Allocated Funds by Program
Energy Sector



Source: BERK, 2010

The Energy sector in the Puget Sound has been allocated \$106.5 million in DOE Direct Competitive Awards and \$7.0 million in State Energy Program funds. DOE Direct Competitive Awards are comprised of a variety of projects, most notably the construction of a combined heat power (CHP) plant; an Alternative Fuel Vehicle (AFV) grant for electrifying SEATAC airport’s ground support and constructing and installing alternative fueling stations and electric charging hubs; a major smart-grid technology upgrade; construction of a battery manufacturing plant; and the development of carbon-compressing technology.

2.3 Sector Summaries and Detailed Program Descriptions

In this section, we provide general summaries for the four green economy sectors, as well as detailed descriptions of the funding programs within each sector. The section concludes with a brief explanation of other identified sources not included in the funding compilation.

Green Building and Energy

We have incorporated the Green Building and Energy sectors in one section because ARRA and other funding allocated to Green Building typically are directed towards projects related to energy-efficiency. Most of these projects are supported by the same funding source (DOE), and sometimes from the same programs as funds dedicated explicitly to the deployment of energy technologies. More generally, there is an inherent compatibility and connection between projects related to making buildings more energy-efficient and the development and deployment of improved energy technologies. For the purposes of this analysis, we have attempted to parse these related sectors into distinct and mutually exclusive funding categories to the best of our abilities.

Overall, Green Building and Energy are the most heavily invested in components of the green economy in Washington State. DOE is providing the majority of new ARRA funding for these sectors, with HUD also administering some competitive ARRA funds in Green Building. These include direct awards to local

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municipalities and organizations, awards channeled through Commerce, and several relevant regional and national projects.

In total, Washington State has received over \$2.5 billion in ARRA funds from DOE in 2009 and 2010, with nearly \$2 billion of that amount going towards environmental cleanup at the Hanford Nuclear Site in Eastern Washington. Other than ARRA, there are several other key programs and initiatives (namely, the Energy Efficiency School Retrofits Grants, Referendum 52, and the Livable Communities Act) that are providing funding, or could potentially provide funding, towards the Green Building and Energy sectors.

Green Building

In total, the Puget Sound received \$117.7 million in ARRA funds towards the Green Building sector in 2009 and 2010, with King County receiving \$79.5 million of that amount. Of the \$117.7 million, \$91.7 million are via DOE awards, most of which are for energy efficiency related building projects. The remaining \$26 million has been provided by HUD through their Public Housing Capital Fund, all of which is going to housing authorities in King County for energy efficiency construction and retrofits. In addition, there are \$13 million in partially allocated DOE funds (some of which will go towards the Puget Sound) and an additional \$3 in DOE funds awarded to Washington State that have not yet been allocated.

Separate from ARRA, Commerce and the Office of Superintendent of Public Instruction (OSPI) received a combined total of \$100 million of statewide funds in 2010 for energy efficient school retrofits (via the State's Capitol Budget Committee). In addition, if passed by voters in the fall of 2010, State Referendum 52 would provide another \$500 million in unallocated statewide funds for energy efficient school retrofits.

Detailed below are the various programs and awards provided by DOE towards Green Building, as well as other relevant new (and potential) funding in this sector.

- 1. Energy Efficiency and Conservation Block Grant Program (EECBG) (formula-based portion).** The Energy Efficiency and Conservation Block Grant Program, funded for the first time by the ARRA, is intended to assist U.S. cities, counties, states, territories, and Indian tribes to develop, implement, and manage energy efficiency and conservation projects and programs designed to reduce fossil fuel emissions, reduce the total energy use of the eligible entities, improve energy efficiency in the building and other appropriate sectors, and create and retain jobs. The program includes both formula-based and competitive grants.

In total, DOE has awarded 2.7 billion dollars nationwide in EECBG population-based *formula* grants in 2009, with Washington State receiving nearly \$59 million. Of this amount, over \$33 million was provided directly to cities, counties, and Indian Tribes in the Puget Sound Region. King County's municipalities and Tribes received \$16.7 million.

These funds are being utilized for a variety of activities in the Region, including energy efficiency building audits, retrofits, and upgrades; subsidies and incentives for energy efficient building and appliance upgrades; new code and policy development; outreach through bilingual contractors and auditors; and other measures. In general, the majority of EECBG formula awards appear to be going towards direct and indirect measures to improve energy efficiency in buildings.

- 2. Direct Awards (Competitive Grants and Contracts).** The bulk of DOE's ARRA funds (\$32 billion in total) were awarded nationally through competitive grants and contracts in a variety of programs. These program categories cover a broad spectrum, and include electricity delivery, energy efficiency and renewable energy, environmental cleanup, scientific research and development, and others. Washington State municipalities and organizations received over \$2.3 billion in direct awards through competitive grants and contracts, including the aforementioned \$2 billion for Hanford contracts.

In the Green Building Sector, the Puget Sound received \$24.9 million via two competitive grants awarded by DOE:

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- **Retrofit Ramp-up Program (King).** The City of Seattle received a \$20 million grant through DOE's Retrofit Ramp-up Program. This award will support the creation of the Seattle Neighborhood WEB (Weatherize Every Building) Initiative, an energy efficiency retrofit effort in the City's most culturally and economically diverse area, extending from the downtown core to the Rainier Valley. It will use a neighborhood-based approach to invest in energy efficiency retrofits in single-family, multi-family, commercial, hospital, and municipal buildings, and is estimated to create nearly 2,000 living wage green jobs.
 - **EECBG Competitive Grant (Kitsap).** The City of Bainbridge Island and the City of Bremerton received a combined EECBG Competitive Grant (allocated to communities not eligible for the EECBG formula grants) of \$4.9 million for the Bainbridge Island Energy Challenge project. The grant will enable home and small-business owners to sign up for either a one-hour inspection and/or a more extensive three-to-four-hour assessment. Conservation Energy Solutions, based in Massachusetts, is managing the project, but the work will be done primarily by local and regional contractors and energy auditors. The Bainbridge-based Community Energy Task Force estimates it will create some 65 living-wage green jobs and another 252 jobs indirectly through additional economic activity.
- 3. State Energy Program.** DOE's Office of Energy Efficiency and Renewable Energy funds the State Energy Program (SEP), which provides grants to state energy offices (in Washington's case, the Department of Commerce), which then allocate the funding statewide. SEP funds may be used for a variety of energy efficiency and renewable energy programs, projects, or initiatives, including efficiency upgrades of state and local facilities, residential and commercial upgrades and audits, investments in alternative fuel infrastructure, and other endeavors. Total funding nationwide for the SEP in 2009 is \$3.1 billion.

Washington State received \$60.9 million in SEP funding, which Commerce has allocated through several programs. Only two of these programs – the Energy Efficiency and Renewable Energy (EE and RE) Loan and Grant Program and the Commercial Energy Efficiency Pilot Program – are relevant to the Green Building sector as the others focus on credit enhancement, agricultural energy tools, and I-5 electrification. The funding allocated through these programs (\$38.5 million and \$14.5 million, respectively) comprises the bulk of Washington's SEP funding.

- **Energy Efficiency and Renewable Energy Loan and Grant Program.** This \$38.5 million loan and grant fund provides interim financing to renewable energy projects, assists innovative companies that have commercial or near commercial energy technologies, and supports cost-effective energy efficiency projects. In order to qualify for these funds, an entity must be able to provide a 50% match at minimum.

In the Green Building sector, the Puget Sound received a total of \$3.8 million for four projects all within King County. These include a plant expansion for General Biodiesel in Seattle, energy efficiency upgrades to a cold storage facility for Seafreeze, Inc. in Seattle, the installation of an off gas heat recovery system for Nucor Steel in Seattle, and an energy efficiency project for Federal Way's city hall.

- **Community Energy Efficiency Pilot Program.** This \$14.5 million fund is being used for the development and deployment of eight large neighborhood-based building energy efficiency projects across the state.

The Puget Sound received a total of \$2.2 million for a project in Snohomish County to complete 3,100 energy retrofits and upgrades to residential and small commercial customers in two densely populated neighborhoods. The Puget Sound also received \$6 million in partial funding through two multi-county projects: 9,000 residential and small energy efficiency commercial upgrades across ten counties; and 2,000 energy audits, volunteer training, and installation of cost-effective measures across four counties. While these projects include King County, some of these awards are also being spent in counties outside the Puget Sound.

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- 4. Weatherization Assistance Program (WAP).** Weatherization Assistance Program (WAP) funds are used to improve the performance low-income housing using the most advanced technologies and protocols available in the housing industry. Along with improving energy efficiency, the program helps needy families permanently reduce their energy bills. Funds are provided by DOE directly to states, territories, and Indian Tribes, who in turn fund a network of local community action agencies, nonprofit organizations, and local governments that provide these weatherization services. Total funding nationwide for the WAP program in 2009 was approximately \$5 billion. In Washington State, Commerce received \$59 million of WAP funds in 2009 to disperse statewide. Of that amount, \$27.7 million has been allocated to the Puget Sound, with \$13 million awarded to King County.

Recently announced 2010 WAP awards include \$7 million the Innovation Pilot Program, some of which will go to projects in the Puget Sound, and \$3 million in currently unallocated state funds for the Sustainable Energy Resources Program.

- 5. Public Housing Capital Funds (PHCF).** The Public Housing Capital Fund, administered by HUD, provides funds for the capital and management activities of Public Housing Agencies, including modernization and development of public housing. Via ARRA, HUD allocated \$300 million in PHCF funds towards the “Green Communities” program, which allows public housing authorities across the country to develop new energy-efficient housing projects and to retrofit existing ones.

In total, Washington State received \$37.7 million in PHCF Green Communities funds, with \$26 million going to public housing authorities in the Puget Sound and \$22.7 million going in King County.

- 6. Energy Operational Cost Savings Improvement and Audits Grant (EOCSIAG) (Energy Efficiency School Retrofits).** EOCSIAG grant funds, which were appropriated in the 2010 supplemental capital budget, provide \$100 million in competitive funds for public school districts and public higher education institutions in Washington State for improvements to their facilities that save money in energy and operational costs. The grants are designed for energy projects in education facilities that use a performance-based contracting method that guarantees construction costs and energy savings. Projects may include such items as new lighting, windows, and insulation, as well as new or upgraded heating and cooling systems.

The Office of Superintendent of Public Instruction will administer \$50 million for K-12 public school districts and the Department of Commerce will administer another \$50 million for K-12 public school districts and public higher education institutions. Commerce has not administered any of its funds yet, and OSPI has administered only one of four rounds of funding. It is likely that a significant portion of these currently unallocated funds will go to the Puget Sound Region.

- 7. Referendum 52 (“JOBS Act”).** The “JOBS Act” passed in the 2009 Washington State legislative session appeared on the November 2010 ballot as Referendum 52. The legislation would have established a \$505 million bond sale distributed as competitive grants for energy efficiency projects at public K-12 schools and public colleges and universities and may have created as many as 30,000 new jobs. Unfortunately, the referendum was not passed.
- 8. Living Communities Act.** The Livable Communities Act is a piece of legislation being debated in Congress that would administer \$4 billion in funds nationally for regional efforts to create sustainable, walkable, transit-oriented communities. If the Livable Community Act passes, it is possible the Puget Sound could receive significant additional funds in the Green Building and Transportation sectors.

Energy

In total, the Puget Sound has been allocated \$113.5 million from DOE towards the Energy sector in 2009 and 2010. Of this amount, \$90.8 million has been awarded to King County. In addition to funds allocated exclusively to Washington State, there are two other DOE grants that could potentially lead to job creation in

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the Puget Sound: an \$88 million regional grant for smart grid demonstration projects and a \$98 million national grant for the Electric Vehicles Project.

Detailed below are the various programs and awards provided by DOE towards the energy sector. For all programs already discussed in the previous section, program descriptions have been excluded.

- 1. Direct Awards (Competitive Grants and Contracts).** In the Energy sector, the Puget Sound received a total of \$106.5 million via competitive DOE grants through 20 separate programs (all awarded in 2009). Within that total, King County received \$85.6 million through 17 separate programs. Of the \$106.5 million awarded to the Puget Sound, \$91 million stems from five programs (detailed below), with four of these programs providing awards to entities in King County.
 - **Battery Manufacturing Program (King County).** Seattle-based ENER2, an engineering firm specializing in energy storage, received \$21.3 million in funds. The company is using the award to build an energy production facility in Albany, Oregon, where they will manufacture synthetic high-performance carbon electrode material, an ingredient in batteries used in electric and hybrid vehicles. In addition to production jobs, ENER2 estimates 50 temporary construction jobs will be created during the build out of the plant. As the production facility is in Oregon, these jobs will likely not come be drawn from the Puget Sound labor pool. Total cost of the project is \$28 million.
 - **Clean Cities Alternative Fueled Vehicle Grant Program (King County).** The Puget Sound Clean Air Agency received \$15 million for its Clean Cities Coalition program. Projects to receive funding through this award include Evergreen Fleets, which will assist 21 fleets in acquiring over 450 alternative fuel or hybrid-electric vehicles, build three alternative fueling stations, two solar demonstration sites, and at least 90 electric charging hubs; SeaTac Ground Support Equipment Electrification, which will fully electrify the airport's ground support equipment through the acquisition of 200 pieces of equipment and the installation of new electric charging hubs; Biogas for Buses, which will harvest and convert biomethane from a dairy farm into fuel to be used by commercial tour buses; and Advanced Technologies Education and Outreach, which will help several colleges and universities develop electric vehicle and clean energy programs. These projects will put more than 650 alternative fuel and advanced technology vehicles on the road and build new fueling stations and several hundred electric charging stations.
 - **Combined Heat and Power (CHP), District Energy Systems, Waste Heat Recovery Implementation and Deployment of Efficient Industrial Equipment Program (King County).** Seattle Steam Company received \$18.7 million to develop a combined heat and power plant at its downtown plant on Post Avenue. The organization will partner with Puget Sound Energy on the project. As a combined heat and power plant, the new system will use a natural gas-fired turbine generator to create energy, which will also create waste heat. Seattle Steam will capture that heat and use it to create steam to warm customers' buildings. Seattle Steam estimates that the construction of the facility will result in 572 temporary jobs over three years. These estimates include both direct and indirect jobs.
 - **Industrial Carbon Capture and Storage Applications Program (King County).** Bellevue-based Ramgen Power Systems, a research and development company focused on energy-related applications of supersonic aircraft technology, received \$20 million in funding to develop and scale up technology that compresses excess carbon emitted by power plants so it can be sequestered and stored more compactly. The development of this technology is part of DOE's initiative to improve carbon capture and storage as a way to help coal power plants become "cleaner." The project is expected to generate jobs in engineering, computer consulting and machining parts. The total cost of the project is approximately \$47 million.
 - **Smart Grid and Investment Grant Program (Snohomish County).** The Snohomish County Public Utility District received \$15.8 million in funding to embark on a major smart grid technology upgrade which will create a stronger, more efficient, and reliable electrical system. The grant will allow the

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utility to install a new 156-mile state-of-the-art fiber system and bring up to 76 green jobs to Western Washington.

- 2. State Energy Program (SEP).** As noted previously, Washington State received \$60.9 million in 2009 SEP funding, which Commerce has allocated through several programs. Only two are relevant to the Energy sector in the Puget Sound:

- **Energy Efficiency and Renewable Energy Loan and Grant Program.** The \$38.5 million EE and RE loan and grant program is providing the energy sector in the Puget Sound \$5.7 million through five projects.

The five projects include four projects in King County at a total of \$5.2 million, including a food and yard waste anaerobic design, capture of CO₂ gas and conversion to calcium carbonate, allowing regional manufacturers to convert to solar and wind power, and installation of an anaerobic digester, as well as a truck conversion and refueling station installation project in Pierce County.

- **I-5 electrification.** WSDOT was awarded \$1.3 million in 2010 through the SEP to install seven to ten electric vehicle charging stations (one every 40-60 miles) along I-5 from Oregon to Canada. Total committed funds for the project are \$2.3 million. As only one or two charging stations will likely be installed in the Puget Sound, it is uncertain how much funding, or how many potential jobs, will be dedicated to the region through this project.

- 3. Smart Grid Demonstration.** DOE awarded Battelle Memorial Institute (based in Richland, Washington) \$88 million through its Smart Grid and Regional and Energy Storage Demonstration Project funds in 2009 for a smart grid demonstration project in the Pacific Northwest. The project will span five states including Washington and affect more than 60,000 consumers. The purposes of the project are to demonstrate and validate new smart grid technologies and inform business cases; provide two-way communication between distributed generation, storage, and demand assets and the existing grid infrastructure; quantify smart grid costs and benefits; and advance interoperability standards and cyber security approaches. Total cost for the project will be \$178, and it is expected to generate 500 jobs in Washington State.

Several entities in the Puget Sound (including Seattle City Light and the University of Washington) are involved in the project, so at least some funding is guaranteed to come to the region. However, the quantity and types of jobs this funding may create in the Puget Sound are still unclear.

- 4. Electric Vehicles (EV) Project.** ECotality North America, a “technology innovator” focused on electric transportation and storage capacity, was awarded \$99.8 million in 2009 by DOE to embark on its Electric Vehicles Project. The company will deploy nearly 15,000 charging stations in 16 cities located in six states (Arizona, California, Oregon, Tennessee, Texas, and Washington) and the District of Columbia. Nissan North American and General Motors/Chevrolet are partners in the EV project. Drivers of the Nissan LEAF zero-emissions electric car and the Chevrolet Volt plug-in hybrid with extended range who qualify to participate in the EV project will be provided a free residential charger, and most if not all of the costs of installation will be paid for by the EV project. The total cost of the EV project is \$230 million.

In the Seattle area, ECotality will establish up to 2,550 charging systems for electric vehicles. The charging station network will enable drivers to use electric vehicles throughout the region with the security of knowing a charging station is nearby. In addition, former Mayor Greg Nickels and Nissan North America signed an agreement last April to make Seattle one of the first markets to introduce Nissan's LEAF a zero-emission, all-electric car.

ECotality estimates at least 130 jobs will be created or retained in the State of Washington either as a direct or indirect result of the EV Project through 2012. These jobs will be in construction trades, project management, administration, IT, and other fields. As Seattle is the only city in Washington involved in the project, it is likely most of these jobs will be created or retained in the Puget Sound.

Environment

ARRA funds for the environment sector in Washington State have been awarded by the EPA, including funds channeled through state agencies and direct awards. Commerce administers the Brownfields Revolving Loan fund; the Washington Departments of Health and Commerce jointly administer the Drinking Water State Revolving fund; and Ecology administers the Water Quality State Revolving fund, the Diesel Emissions Reduction Program, and the Leaking Underground Storage Tanks program. The EPA provided direct awards through the National Clean Diesel Funding Assistance Program and through its Superfund Cleanup Program. Separate from ARRA, the EPA is also providing over \$27 million in 2010 awards through its Puget Sound Restoration Appropriation Fund and \$570,000 through its Brownfields Cleanup Program.

The environment sector is unique within the context of this study in that a couple of the smaller programs (the State Clean Diesel Grant Program and Leaking Underground Storage Tanks) have already spent a significant portion of their allocated funds. When discussing the funds administered to the Puget Sound and King County through these respective programs, we explicitly show only *remaining* funds.

In total, Washington State initially received \$146.9 million in allocated funds and \$2.6 million of currently unallocated funds towards the environment sector in 2009 and 2010. Of the \$146.3 million in allocated funds, the Puget Sound has \$63.8 million in remaining funds, while King County has \$17.5 million in remaining funds.

- 1. Brownfields Revolving Loan Fund.** The Brownfields Revolving Loan Fund involves the evaluation and cleanup of former commercial and industrial sites, typically in preparation for new building. Although there have been no official announcements as to how Commerce will be administering the currently unallocated \$2.6 million, all of the projects currently projected to receive loans are within King County. This program will create a range of jobs, including construction, remediation, and machinery operation.
- 2. Drinking Water State Revolving Fund.** The Drinking Water State Revolving Fund program finances drinking water projects and activities to protect public health and achieve or maintain compliance with the Safe Drinking Water Act. The program provides grants to state agencies, which then administer loans to various public water systems projects across the state. States are required to supply at least a 20% matching fund.

The DOH received \$34.7 million for this program through an ARRA EPA grant, awarded in 2009. In total, the program had \$63 million in funds for the current loan cycle. Of that amount, \$23.2 million has been loaned to projects in the Puget Sound, with \$6 million being allocated for projects in King County.

- 3. Clean Water State Revolving Fund/Water Quality State Revolving Fund.** The Clean Water State Revolving Fund, administered by the EPA, finances infrastructure improvements for public wastewater systems and other water quality improvement projects. The program provides grants to state agencies, which then administer loans for projects. States are required to supply at least a 20% matching fund.

Ecology received a total of \$65.4 million via this program, which was then loaned to projects across Washington through the state's Water Quality State Revolving Fund. In total, this program had \$79.2 million in funds for the current loan cycle. Projects in the Puget Sound received a total of \$19.8 million, with King County receiving \$1.4 million.

- 4. State Clean Diesel Grant Program.** The Diesel Emission Reduction program finances programs to reduce toxic diesel emissions through the installation of retrofit exhaust controls on cargo handling equipment and idle reduction technologies on public works vehicles and school and transit buses. Ecology received a total of \$1.7 million in funds to administer through this program. The amount of funds remaining to be spent in the Puget Sound is \$300,000, with \$30,000 in King County.
- 5. Leaking Underground Storage Tanks.** This program provides funding to investigate and clean-up contaminated soil from leaking underground storage tanks that are contaminating or have the potential

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to contaminate ground water sources. Ecology received a total of \$3.8 million in funds through this program. The amount of funds remaining in the Puget Sound is \$600,000, with nothing remaining for projects in King County.

6. **National Clean Diesel Funding Assistance Program.** The National Clean Diesel Funding Assistance Program is a competitive grant program directly administered by the EPA. The program supports the implementation of verified and certified diesel emissions technologies. Washington State received a total \$4 million in funds through this program, all of which went to the Puget Sound Region.
7. **Superfund Cleanup Sites.** The Superfund program is part of a federal government effort to clean up land that has been contaminated by hazardous waste and that has been identified by the EPA as a candidate for cleanup. Washington has received \$7.2 in superfund awards through ARRA, all of which has gone to the Puget Sound.
8. **Puget Sound Restoration Appropriations Fund.** Congress has allocated \$30 million in competitive grants (\$27.1 of which is being awarded in 2010) to be administered through the EPA towards 36 "Puget Sound" restoration and protection projects across Western Washington. Of the \$27.1 million, \$12.9 million is going to the Puget Sound Region, with nearly half going to King County
9. **Brownfields Cleanup Program.** The EPA's Brownfields Cleanup Program provides funds to prevent, inventory, assess, cleanup, and reuse brownfield sites. Washington State received \$570,000 in relevant funds through this program, \$400,000 of which is being spent in the Puget Sound Region.

Transportation

ARRA funds directed at the transportation sector in Washington State have been awarded by various divisions of the USDOT. Along with allocated transit and highway funds, there have also been several other notable transportation projects funded through ARRA, including the Mercer Corridor Project and funds for Washington State High Speed Rail. In addition, in early 2009 the FTA awarded an \$813 million grant to Sound Transit for the construction of the University Link light rail extension. There are also several other proposals and potential funds which could generate additional transportation-related awards.

1. **FTA-Allocated Transit Funds.** The Federal Transit Authority (a division of the USDOT) awarded a total of \$179 million to WSDOT in 2009 for various transit capital projects across the state. Of this total, \$132 million has been awarded to projects in the Puget Sound, although only \$55.6 million is going towards projects involving non-purchase funds (i.e. not involving the purchase of new vehicles or equipment). In King County, \$10.6 million is going towards projects involving non-purchase funds. In addition, \$4.6 million has been awarded to projects where partial funds will go to the Puget Sound Region.
2. **FHWA Allocated Highway Funds.** The FHWA (a division of the USDOT) awarded a total of \$492 million to WSDOT in 2009 for state and local highway projects. Of this total, \$77.9 million has been awarded to projects in the Puget Sound.
3. **FHWA Discretionary Grants for Highway Projects.** The FHWA has \$1.5 billion in funds for discretionary grants for highway projects to be administered nationwide. These funds are available through fall of 2011.
4. **FTA Grant to Sound Transit for University Link.** In early 2009, the FTA awarded Sound Transit \$813 million for the construction of the University Link light rail extension. The total budget for the project is \$1.9 billion (with other funds coming from local sales tax and MVET). Construction is expected to be completed by 2016-2017.
5. **Mercer Corridor Project.** The USDOT has awarded the Seattle Department of Transportation \$30 million in 2010 for the Mercer Corridor Project through its ARRA-funded TIGER grant fund. The project will transform Mercer Street into a two-way boulevard that links South Lake Union and the Seattle Center to

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I-5. It will provide significant bicycle, pedestrian and freight investments, including 30 blocks of sidewalks. Total cost for the project is \$190.5 million

- 6. High Speed Intercity Passenger Rail Grant.** In 2010, the Federal Railroad Authority (a division of USDOT) awarded \$8 billion towards high speed rail projects across the country. WSDOT received \$590 million in High Speed Intercity Passenger Rail grant funding to accomplish a series of passenger rail service improvements along the Pacific Northwest Rail Corridor, a 466-mile rail corridor running between Eugene, Oregon, and Vancouver, British Columbia.

Within Washington State, the project includes 437 miles of upgraded track and 30 miles of new track. Funds will go towards several construction projects including building bypass tracks to allow for increased train frequency and multiple upgrades to existing track and signal systems. Several safety-related projects will also be funded, including grade separations, positive train control, and seismic retrofits. A number of proposed upgrades are within the Puget Sound Region, so it is likely a significant portion of high speed rail funds will come to the Region.

- 7. TIGER II Discretionary Grants.** The USDOT is authorized to award \$600 million in TIGER II Discretionary Grants to be awarded for transportation projects on a competitive basis nationwide. TIGER II is being funded by the FY 2010 Appropriations Act, not ARRA, and is not constrained by the latter's focus on "shovel ready" projects. TIGER II grants are being awarded through 2012, although it is possible some of this money could be received in Washington State by the end of the year
- 8. The SR 520 Medina to SR 202: Eastside Transit and HOV Project Proposal.** This proposed \$300 million project would build an HOV lane between Lake Washington and SR 202 in Redmond. The project promises to enhance safety, improve community livability, and provide mobility along this transportation corridor.

WSDOT's application for TIGER I grant funds for this project was denied, but the state has revised its application and will continue to apply for federal funding through various channels (including TIGER II).

Other Funds

Several funding sources have not been included in the funding compilation, but are worth discussing as important influences on the green economy. SBIR/STTR funds and ARRA bonds have a less direct relationship to job creation and so are considered separately. In addition, several Sound Transit light rail extensions have been approved by voters, but have not yet received any federal funding, so they are considered separately as well.

SBIR/STTR Funds. The Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) provide competitive small-business grants to encourage and foster commercialization and innovation. Federal agencies with research and development (R&D) budgets exceeding \$100 million are required to have an SBIR program. The smaller STTR program includes agencies with R&D budgets that exceed \$1 billion. Both programs describe three phases of product development: Phase 1, a feasibility study; Phase 2, research and development; and Phase 3, commercialization. Between 2000 and 2009, the SBIR and STTR programs in Washington State received \$418 million and \$33 million, respectively, or approximately \$41.8 million and \$3.3 million annually.

We did not incorporate SBIR/STTR funds into our analysis because: 1) only Phase 3 funding and a small portion of Phase 2 funding could potentially lead to job creation; 2) it is not guaranteed (or even likely) that this will lead to jobs that match the skill set of WDC clients; and 3) the relatively modest amount of annual funding allocated statewide through this program further lessens the likelihood that any significant funds will go towards relevant job creation in the Puget Sound Region.

ARRA Bonds. A variety of tax-exempt/tax-credit bonds were made available through ARRA that could indirectly lead to investments in the Puget Sound green economy. We did not include these in our analysis

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since they are incentives, and actual project and program funds will not stem from federal or state sources. Generally, these bonds allow businesses and jurisdictions to reduce borrowing costs through tax credits and interest-free borrowing.

Some relevant bonds include:

- **Quality Energy Conservation Bonds (QECBs):** Washington State has been allocated nearly \$68 million in QECB issuing authority, administered by Commerce. A broad array of “green” projects are eligible to receive tax credits through these bonds.
- **Build America Bonds (BABs):** The newly created BABs are intended to reduce municipal borrowing costs through federal subsidies or tax credits.
- **New Clean Renewable Energy Bonds (CREBs):** CREBs provide tax credits to qualified renewable energy facilities, including wind, geothermal, solar, and various other types.
- **Qualified School Construction Bonds (QSCBs)/Qualified Zone Academy Bonds (QZABs):** QSCBs and QZABs are taxable, interest-free bonds provided to school districts for construction, rehabilitation, repair, energy savings renovations, teacher training, and land acquisition.

Sound Transit Light Rail Extensions. The passage of the Sound Transit 2 ballot measure in November 2008 ensured funding for the University Link, North Link, East Link, and South Link extensions of ST’s light rail system, through local sales tax and Motor Vehicle Excise Taxes (MVETs). However, the only extension to have received a federal grant so far is University Link, which is currently under construction and slated to be completed by 2016. Preliminary work on the other three extensions is expected to begin in 2011, and the projects are scheduled to be completed by 2021. Federal funding is anticipated for these extensions as well, which currently have a combined budget of approximately \$15 billion.

2.4 Complicating Factors

There are several complicating factors that must be considered when interpreting the funding summary in this report. The complexity of funding sources, types of funding mechanisms, types of projects, and timing of awards all affect the ways in which state and federal funding will impact the regional economy. A few of these complicating factors are discussed below.

Matching/Additional Funds

To keep our study consistent, and to gauge the *new* money coming into the green economy, we have not incorporated matching and additional funds in our analysis. However, it should be noted that there were a number of awards that required matching funds, or which were only a fraction of a larger overall project budget.

Some notable matching/additional funds include:

- The State Energy Program’s Energy Efficiency and Renewable Energy program required at least a 50% matching fund from awardees.
- DOE’s \$1.3 million award to WSDOT towards the electrification of I-5 (through the State Energy Program) is part of \$2.3 million in total funding for the project.
- DOE’s \$21.3 million award to EnerG2 through the Battery Manufacturing Program is part of an overall project fund of \$28 million for construction of an energy production facility.
- DOE’s \$18.7 million award to Seattle Steam Company through the CHP Program is part of an overall project fund of \$80 million for construction of a CHP plant.
- DOE’s \$20 million award to Ramgen Power Systems through the Industrial Carbon Capture program is part of an overall project fund of \$47 for development of an improved carbon compressor.

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- DOE's \$88 million award to Battelle through its Smart Grid and Regional and Energy Storage Demonstration Project funds is part of an overall project fund of \$178 for a Pacific Northwest smart grid demonstration.
- DOE's \$99.8 million award to ECotality is part of an overall project fund of an overall project fund of \$230 million for the Electric Vehicles project.
- EPA's Drinking Water State Revolving Fund (DWSRF) and Clean Water State Revolving Fund (CWSRF) both require at least a 20% state match. The DOH's \$34.7 million award through the DWSRF is part of \$63 million in total funds available statewide for the program.
- FRA's \$30 million award to WSDOT for the Mercer Corridor Project is part of \$190.5 million in overall project funds.
- Much of WSDOT's awards towards transit and highway projects via FTA and FHWA (respectively) have been allocated for projects with significant amounts of additional funding.

Guaranteed vs. Incentive Funds

One complexity we did not identify in our analysis was the difference between guaranteed funds and incentives. Guaranteed funds are assured to be spent on whatever activity they were allocated for. Incentives are funds that are available for certain activities (i.e. energy efficient appliance upgrades), but there is no guarantee they will be utilized. The majority of funding discussed here is guaranteed, but there are a few programs (e.g. EECBG Formula-based Grants, State Energy Program Funds) where at least some portion of the funds is slated to go towards incentive programs.

One-time vs. Ongoing Funds

Another issue not incorporated into our analysis is whether the funding is a one-time grant or part of an ongoing funding cycle. Apart from the environment sector, most of the funds were one-time grants, although these grants could lead to continued funding. A number of the programs funded by the ARRA (e.g. EECBG Formula Grants, State Energy Program, Drinking Water State Revolving Fund) are annual programs that have been in existence for years, but in some cases ARRA temporarily increased their funding pool by an order of magnitude. For example, the State Energy Program went from a \$33 million budget in 2008 to a budget of over \$3 billion in 2009.

Overall, ARRA funds serve as a strong indicator of what sectors are viewed as high priorities in today's political and economic climate. In particular, based on how the funds were allocated, it is evident that the Green Building and Energy sectors are high priorities. Investments in these sectors are generally viewed as having the highest return on investment, which is another reason these sectors may continue to receive ongoing funding.

Certainty of Funds

For the most part we've limited our analysis to already approved programs and awards, but we have included a few important items that are currently uncertain, including Referendum 52, the Livable Communities Act, and the SR-520 proposal.

Funds Spent and Remaining

An issue that was difficult to account for in our analysis was the exact amount of program or project funds that have been spent and the amount of funds that are remaining. Aside from the environment sector (where we explicitly note *remaining* funds), the available information indicates that the vast majority of funds detailed in this study have yet to be spent. Although we have attempted to present the data as clearly and accurately as possible, this uncertainty should be considered when interpreting the results.

3.0 TASK 2: RELATIONSHIP BETWEEN FUNDING AND JOB CREATION

This section builds on the funding summary presented in Section 2.0, and focuses primarily on job estimates in the Green Building and Energy categories, given the emphasis on grant funding in those areas.

As discussed in the beginning of this report, job creation is a complex activity to estimate. Our effort was focused on setting up a framework that would allow the WDC and others to have a range of potential jobs created per \$1 million of grant funding. To determine a realistic level of labor demand, we approached the job ratio estimates from three different angles:

1. Job estimates quoted in funding awards and grant applications
2. Job estimates in national studies on “green economy” programs
3. Job estimates based on an input/output model

To get an idea of the types of workers needed to fill labor demand, we also spoke with several local firms directly involved with administering or implementing the work.

3.1 Existing Job Estimates in Funding Awards and Grant Applications

The following job creation numbers represent estimates for overarching programs and specific projects that have been created by other sources garnered from our independent research. These numbers may have been generated by grant writers, program coordinators, project managers, or other sources. *If a program or project does not appear in the tables below, job estimates were not readily available.*

Green Building

DOE Direct Competitive Awards

Exhibit 5 shows job estimates for programs funded through DOE Direct Competitive Awards under the Green Building category.

**Exhibit 5
Existing Job Estimates by Program Type**

Program	Organization	Amount	Estimated Total Jobs Created			Jobs per
			Perm	Temp	Total	\$1M
Retrofit Ramp-Up	City of Seattle	\$ 20,000,000	-	2,000	2,000	100
EECBG Competitive Grant*	Cities of Bainbridge Is. & Bremerton	\$ 4,900,000		65	65	13
Total		\$ 24,900,000	-	2,065	2,065	

Sources: DOE, PSRC, BERK, 2010

* An additional 252 indirect jobs are estimated “through additional economic activity.”

Energy

DOE Direct Competitive Awards

Exhibit 6 shows job estimates for programs funded through the DOE Direct Competitive Awards under the Energy category. Although there are five known programs under this categorization, only three are shown here. The Industrial Carbon Capture and Storage Applications grant and the Clean Cities AFV Grant Program were excluded because they did not have job creation estimates.

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**Exhibit 6
Existing Job Estimates by Program Type**

Program	Organization	Amount	Estimated Total Jobs Created			Jobs per
			Perm	Temp	Total	\$1M
CHP District Energy Systems*	Seattle Steam Company	\$ 18,700,000		572	572	31
Smart Grid	Snohomish Co. PUD	\$ 15,800,000		76	76	5
Battery Manufacturing	EnerG2	\$ 21,300,000		50	50	2
Total		\$ 55,800,000	-	698	698	

Sources: DOE, BERK, 2010

*Includes direct and "ripple effect" jobs.

NOTE: The Battery Manufacturing grant, although awarded to a company in the Puget Sound Region, will primarily be spent in Oregon. We assume that the program will therefore be staffed with Oregon workers.

State Energy Program: Energy Efficiency and Renewable Energy Loans and Grants

Exhibit 7 shows existing job estimates for programs funded through the State Energy Program.

**Exhibit 7
Existing Job Estimates by Project**

Estimated Jobs Created Through State Energy Program EE + RE Loan & Grant Program (Puget Sound Projects)						
Organization	Description	Amount	Total Jobs Created			Total Jobs per \$1M
			Perm	Temp	Total	
CAMPS	Manufacturers retool into wind + solar power	\$1,000,000	245	0	245	245
GR Silicate Nanofibers & Carbonates	Capturing CO2 gas/converting to calcium carbonate	\$1,400,000	15	280	295	211
Nucor Steel	Install an off gas heat recovery system	\$2,000,000	325	22	347	174
General Biodiesel	General plant expansion	\$1,000,000	60	9	69	69
LeMay Enterprises	Truck conversions, install refueling station	\$931,422	18	35	53	57
City of Federal Way	City Hall energy efficiency project	\$223,000	1	10	11	49
Cedar Grove Composting	Food and yard waste anaerobic design	\$1,000,000	1	21	22	22
Rainier Biogas	Install an anaerobic digester	\$1,392,500	4	4	8	6
Seafreeze, Inc.	Energy efficiency upgrades to a cold storage facility	\$561,862	0	3	3	5
Total		\$9,508,784	669	384	1,053	

Sources: Website of the WA State Governor, BERK, 2010

3.2 Job Estimates from Other Studies

In this section we include job estimates from our survey of existing national studies that analyze job creation in "green economy" categories similar to those we see in the grant funding. Exhibit 8 shows general job estimates by type of program as gathered through that research.

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**Exhibit 8
Job Estimates by Program Type, Varied Sources**

Category	Amount	Estimated Jobs	Jobs per \$1M
Weatherization	\$1,000,000	52	52
Public Transportation	\$1,250,000,000	51,825	41
Solar, Geothermal or Biomass Tech.	\$1,000,000	6	6
Deploy Electric Vehicle and Infrastructur	\$600,000,000	3,500	6
Smart Grid	\$1,000,000	5	5
Advanced Battery Manufacturing	\$2,000,000,000	8,470	4

Sources: WAPTAC, Apollo Alliance, Dr. Ira Altman, BERK, 2010

3.3 Job Estimates from Input/Output Model

We used IMPLAN software to determine the job estimate ratios presented below. IMPLAN (short for IMPact Analysis for PLANning) is an input/output model that uses county-level data to trace the ripple effects of an expenditure that occurs within the economy. For this analysis, we have included the four-county region of King, Kitsap, Pierce, and Snohomish Counties. The model is used to track how an economic action, such as money spent in a specific market category, will ripple through a regional economy creating different levels of revenue, jobs, and income in many different economic sectors.

IMPLAN estimates rely on market categories specifically developed for the software. One complicating factor of this analysis is that many of the programs analyzed in this study deal with new and emerging market areas which do not have a corresponding IMPLAN category. Therefore, we have used categories that most closely represent types of work to be performed for these projects.

Exhibit 9 shows the IMPLAN job ratio estimates per \$1 million spent in a market category. The project type being modeled is shown on the far left, followed by the IMPLAN categories we assume to most closely represent the different types of work to be performed. The job estimates generated with IMPLAN are based on the average job hours seen in the corresponding North American Industry Classification System (NAICS) codes (with which the IMPLAN categories are correlated), and may not be Full Time Equivalent (FTEs). While the market categories may not directly match those seen in the grant funding, they give a general sense of the number of jobs generated by similar types of work for comparison against the job estimate numbers created by grant writers and administrators presented in the two sections above. In this table we have included IMPLAN's estimated Direct, Indirect, and Induced jobs by category.

As with the previous job estimates, these estimates do not necessarily represent all new jobs. There may be current capacity within companies to absorb additional work, or positions that already exist that will support these efforts. Given this, these job estimate ratios may represent both *new and existing* job hours.

**Exhibit 9
Job Estimates by Program, IMPLAN**

Project Type	IMPLAN Category as Proxy	Jobs per \$1 Million		
		Direct	Indirect	Induced
Building Retrofits for Energy Efficiency				
	Maintenance and repair construction of nonresidential structures	8.1	1.8	2.6
	Maintenance and repair construction of residential structures	1.5	2.2	1.4
Energy Plant Expansions				
	Construction of new nonresidential manufacturing structures	6.4	1.3	2.1
	Construction of other new nonresidential structures	6.9	1.9	2.3
CAMPS - Manufacturers Retool to Wind and Solar				
	Power, distribution, and specialty transformer manufacturing	3.0	1.2	1.4
	Scientific research and development services	6.8	2.5	2.9
Vehicle Conversions				
	Automotive repair and maintenance	9.4	1.8	2.0
	Electronic and precision equipment repair and maintenance	5.6	1.9	2.0
Electric Vehicle Charging Stations				
	Electronic and precision equipment repair and maintenance	5.6	1.9	2.0
	Maintenance and repair construction of nonresidential structures	8.1	1.8	2.6
	Maintenance and repair construction of residential structures	1.5	2.2	1.4
	Architectural, engineering, and related services	8.3	2.1	3.0
Advanced Battery Manufacturing				
	Storage battery manufacturing	3.9	1.5	1.3

Source: BERK analysis, 2010.

3.4 Complicating Factors in Job Estimates

Given the complex nature of job estimation, and the large range of estimates shown in the previous sections, it is useful to understand the host of complicating factors that can impact these numbers.

Temporary vs. Permanent

Many of the job creation estimates supplied by grant administrators in Section 3.1 do not distinguish between temporary and permanent jobs. A job that lasts for a few weeks or months is very different than one that lasts for several years, but in many cases, the estimates above make no distinction between the two. In a given year, \$100,000 in expenditures might support one permanent job, or four jobs each lasting three months.

Further affecting matters is that grants are temporary funding by nature. Therefore, even those jobs identified as permanent may only be funded by the grant for a few years. Beyond that, the job must necessarily either cease to exist, or be funded by other means.

Part-time vs. Full-time

Similarly to the issue of temporary and permanent jobs, many of the estimates do not distinguish between a part-time job and a full-time job. In some cases an anticipated “new job” may be just a fraction of full-time hours.

Excess Capacity in the Workforce

Further impacting the job creation estimates is the issue of current capacity within the workforce. If jobs generated by a new program are absorbed by unemployed or underemployed workers there will not be a significant demand for new workers. New demand for temporary or part-time jobs in particular, may end up being assigned to an existing worker's workload rather than to a new hire. Construction workers who have been underemployed may be able to take on additional work in energy efficiency retrofits. An inspector may have time available in his or her current schedule to inspect these retrofits. An engineer may want additional work inspecting electric charging stations.

Any of the "new jobs" described in the above section may be absorbed in this way by the current workforce, without the need for training and employing new workforce.

Direct vs. Direct, Indirect, and Induced

When considering economic impacts, jobs may be categorized as Direct, Indirect, or Induced, which are defined as follows:

- **Direct** jobs are created and paid for directly by the expenditures being analyzed.
- **Indirect** jobs are created through additional business demand generated by the new activity being analyzed. For example, grant funds may support the expansion of an energy efficient power plant. Once that expansion has been built, the plant must now purchase more materials and labor than it did before. That additional demand created in the supply and labor market would be an indirect impact.
- **Induced** jobs are those that are created by additional household demand generated by the direct jobs created. For instance, if the power plant discussed above gets grant funding for expansion, it would create direct jobs for construction of that plant. The laborers who fill those direct jobs then have more money for purchasing household goods and services. The jobs needed to fill that additional household demand would be induced jobs.

For the purposes of this study, we are interested in the **Direct** jobs funded by these grants. That is, those jobs that are paid for directly by grant funds. Estimating indirect and induced jobs is a complex effort that goes beyond the scope of this project. In addition, induced jobs and most indirect jobs are likely to be in unrelated fields. However, it may be that some of the existing job estimates in funding awards and grant applications include indirect and induced jobs.

Grant Funding Only vs. Grants and Matching Funds

For this study, we are primarily focused on the jobs created by the spending of direct grant dollars. However, many of the grants awarded require matching funds to be provided by the receiving entity. In some cases, the job estimates created for these programs may include all jobs anticipated to be created by the total funding of the program.

3.5 Summary of Range of Likely Job Estimates

In this section, we strive to provide a range of potential new jobs to be created for each \$1 million in grant funding that can be used as a tool by the WDC and other community stakeholders. As mentioned previously, this range can be refined by the WDC as it gathers more information, projects get underway, and markets mature.

In the existing job estimates presented in Section 3.1, we see a very wide range of jobs estimated per \$1 million of expenditures, from a low of 2 to a high of 245. This wide range likely comes from a variety of issues, including:

- All of the complicating factors in estimates discussed in Section 0

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- Percent of total expenditure dedicated to purchase of materials versus labor (some programs are heavily geared towards purchased of new systems, while others rely heavily on labor)
- Lack of detailed information on actual implementation and level of effort needed for projects.

Although the range is smaller based on research of other studies presented in Section 3.2, there is still a rather wide range in jobs estimated per \$1 million of expenditures, from a low of 4 to a high of 52. This might be reasonable given the labor-heavy nature of some programs, versus the large materials purchases of others, and the permanent versus temporary job issue.

The job estimates generated by analysis done with IMPLAN discussed in Section 3.3 are narrower in their range, with a low of 1.5 jobs per \$1 million, and a high of 9.4. However, this analysis uses existing market categories as a proxy for new, emerging industries performing work which in many cases has not yet been seen. These numbers may therefore not capture the nuance and particularities of these specific emerging and innovative industries.

After considering these three sources of data, we are comfortable asserting that a range of 4 to 10 direct jobs per \$1 million in expenditures is reasonable to expect, with the possibility for smaller or larger numbers depending on the specific nature of certain programs. In particular, projects that are relatively labor-intensive, such as building retrofits (or weatherization) and vehicle conversions, will support a higher level of jobs than programs that primarily support the purchase of new equipment.

3.6 Aggregate Job Projections by Sector

Exhibit 10 provides total aggregate job projections based on the estimates of jobs per \$1 million discussed above and the total amount of funding *allocated* to the Puget Sound in the Green Building and Energy sectors. The low projection is based on an estimate of 4 jobs per \$1 million, and the high projection is based on an estimate of 10 jobs per \$1 million.

**Exhibit 10
Aggregate Job Projections by Sector**

Green Economy Sector	Puget Sound Allocated Funds	Low Projection	High Projection
Green Building	117,700,000	471	1,177
Energy	113,500,000	454	1,135
Total	231,200,000	925	2,312

Source: BERK, 2010

These aggregate job projections provide a broad estimate of the total number of jobs that may be expected in the Puget Sound region based on *known allocated dollars in the Green Building and Energy sectors*. They may be higher or lower depending on the actual implementation of programs and can be refined as more information is gathered. The other sectors of the Green Economy examined in the funding summary, Environment and Transportation, may have different job ratios, and thus have not been projected above.

3.7 Types of Jobs

Current Washington State Green Jobs

The Washington State Employment Security Department (ESD) released a report in March 2010 titled, “2009 Washington state Green economy Jobs.” In this report, a green job is defined as, “those where employees are directly and predominantly engaged in at least one of the four green-economy core areas:

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- Increasing energy efficiency
- Producing renewable energy
- Preventing and reducing environmental pollution
- Providing mitigation or cleanup of environmental pollution.”

Under this definition, the ESD ranked the following private-sector occupations as the highest in green jobs in 2009:

1. Agricultural Workers, All Other*
2. Electricians
3. Carpenters
4. Construction Laborers
5. Heating, Air Conditioning, and Refrigeration Mechanics and Installers
6. Truck Drivers, Heavy and Tractor-Trailer
7. Architects, except Landscape and Naval
8. Civil Engineers
9. Maintenance and Repair Workers, General
10. Mangers, All Other*

(* According to notes in the EDC report “All Other” categories are considered residual and combine occupations which don’t fit into other detailed codes.)

Potential New Regional Green Jobs

We gathered additional information about the types of jobs being created by specific programs in the region through interviews with organizations involved with grant administration. This is primarily anecdotal information about a few key projects to provide additional insight to the types of jobs that may be in demand.

Building Retrofits

Much of the new grant funding to be received in the Puget Sound Region will be directed towards building retrofits for energy efficiency. This category of work is filled primarily by the construction worker labor pool, which currently has considerable excess capacity. Because of this, these dollars are likely to generate less demand for new workers than would otherwise be the case, even though these projects are relatively labor-intensive.

Sellen Sustainability, a local company that specializes in training other organizations in energy efficient building design, listed the following jobs as those primarily needed for energy efficiency retrofits:

- Plumbers
- Electricians
- Insulation installers/drywallers
- Carpenters
- Pipe fitters
- Glazing (windows)

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In addition to construction, building retrofits will need the support of:

- Energy auditors
- Permitters
- Inspectors

Acquire Hybrid-Electric Vehicles, Build Alternative Fueling Stations, Solar Demonstration Sites, Electric Charging Hubs, Etc.

The Puget Sound Clear Air Agency has received a \$15 million grant that will be broken up into funding for several different types of projects, each with their own labor demand. (Some portion of these funds will go towards purchases of equipment that will not require additional labor.)

Electric Charging Stations. Much of this funding will be spent installing electric charging stations, which primarily requires **temporary** contract labor in the following categories:

- Electricians
- Construction labor
- Engineers

A “simple” charging installation would require only an electrician to run the cable to the station to make it operative. A more complicated installation may require construction contractors to do work such as breaking up concrete or altering structures in the area. In either case, an engineer is required to do a final inspection of the charging station.

Vehicle Conversions. Some funding in this program will go toward converting gasoline-fueled vehicles to run on compressed natural gas. This work requires the following labor:

- Mechanics specializing in vehicles running on alternative fuels

There is a local company in Kent that hired specialized electrical mechanics to do this work. This is a field that is likely to expand as interest grows in having alternatively-fueled vehicles. Two local colleges want to develop programs to train mechanics to work with vehicles that run on alternative fuels.

Permanent Administration/Management Positions. There have been two known **permanent** positions hired for administration of these funds, and paid for by this grant:

- One position to administer funds for the Puget Sound Clear Air Agency
- One position to manage new staff at vehicle conversion company

Regional Manufacturers Retool into Wind and Solar Power

The jobs hired for this program administered through the Center for Advanced Manufacturing Puget Sound (CAMPS) are assumed to be **permanent**, as the goal of the program is to establish a new market in the state and position the region to be a permanent supplier of replacement parts for wind and solar power. This program is likely to require jobs in the following categories:

- Production workers
 - Assembly
 - Machine operations
- Production support
 - Shipping

- Warehousing
- Engineering and Design
- Procurement/BD/Sales

Food and Yard Waste Anaerobic Design

In administering this program, Cedar Grove estimates they will hire **21 temporary** jobs (for approximately six months each), and **one permanent** position. These jobs fall in the following categories:

- **Temporary**
 - 2 Engineering (planning and design)
 - 1 Permitting
 - 5 Construction
 - 2 Concrete Work
 - 2 Carpenters
 - 4 General Labor
 - 4 Landscaping
 - 1 Machinist
- **Permanent**
 - 1 Operations Manager

Industrial Carbon Capture and Storage Applications Program

Ramgen Power Systems received \$20 million in funding to develop and scale up technology that compresses excess carbon emitted by power plants. The project is expected to generate jobs in the following categories:

- Engineering
- Computer consulting
- Machining parts

Staffing for “Clean Tech”

According to Greenfoot Technologies, a staffing company for Clean Technology, Renewable Energy, and Smart Grid Technology, the trend in the types of jobs they are hiring for is toward these categories:

- Managers
 - Facilities
 - Account
 - Project
- Heavy electrical engineers
- Skill sets for:
 - Building technology
 - Building optimization
 - Operations performance

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➤ Design

The company also does some hiring in the following categories:

- Assembly
- Retrofitting

4.0 NEXT STEPS

In this report, we have taken the steps to set up a compilation of known, allocated grants in the Puget Sound region covering programs and projects that will support the primary “green economy” sectors. In addition, we have created a general framework for estimating the number of jobs needed to support these grants for every \$1 million of expenditures.

Below are recommended next steps for the Workforce Development Council to consider as opportunities to build on this initial study.

4.1 Further Analysis

To continue this analysis, the WDC may want to consider the following:

1. **In–depth analysis in select categories** – this would involve a work session with WDC staff to determine which specific categories of projects and programs are likely to produce the best opportunities for their client workforce based on this study.. For these select categories, the WDC could do the following additional analysis to more deeply understand workforce opportunities and training needs:

- a. Case studies of completed projects
- b. Interviews with companies likely to perform the work

These investigations would create more a nuanced, fact-based understanding of the following:

- a. Types of jobs needed to support the program
- b. Number of jobs likely to be created from the program
- c. Current workforce capacity
- d. Whether or not workforce will be drawn from out of the area
- e. Long-term versus short-term job opportunities
- f. Training needed for each type of job

2. **Research on other categories for job development** – in addition to the five sectors identified in the Green Workforce Labor Council’s framework, there may be other opportunities for entry-level job development related to the “green economy,” such as local food production, which is currently seeing grant funding in our region.

3. **Consider special skills in job seekers** – it may be useful to evaluate the skill sets of people seeking re-training through the WDC, and to identify special skills that would be a good fit for certain categories of green jobs. For instance, some jobs created through the energy efficiency building retrofits require workers to communicate with a diverse group of people from different cultures. Multi-lingual job-seekers may be a good fit for these entry level positions because of their unique ability to communicate with different communities in their native languages.

4.2 Tracking and Updating Information

The WDC may find value in continuing to track and update the funding information and job estimates gathered for this study. To do this efficiently, the WDC could consider the following:

1. **Partner with other agencies to track funding information and job estimates** – the WDC may want to contact other regional entities with an interest in this information to form a partnership. As tracking and reporting efforts are launched or finalized, the group could gather, track, organize, and consolidate information such as:
 - a. Grant funding by category
 - b. Job generation
 - c. Timeline for projects

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- 2. Create a common holding area for consolidating information** – another opportunity for organization and efficiency would be the creation of a resource portal for information or links. This would offer one centralized location where organizations could access related program descriptions, studies, and other information. The holding area could provide a series of links to the original sources of information, so they could be easily tracked by the user.
- 3. Update this study in the near future** – this study could be updated next year with new information on current grants, programs, and projects. This would produce a new funding summary, and a more refined job ratio estimate based on projects underway or completed in that timeframe.

APPENDIX A

GREEN ECONOMY FUNDING COMPILATION TABLES

NOTES

This appendix details our funding compilation for all four green economy sectors discussed in the report, and includes both detailed summaries of funding sources and roll-up tables showing funding type by geography.

WA State Allocated funds have already been assigned to specific municipalities and projects within the state. We know exactly how much of these funds will be going to the Puget Sound.

WA State Unallocated funds have been guaranteed to Washington State, but have not yet been assigned to specific projects or municipalities.

Partial (to Puget Sound) Allocated funds means a fraction of this amount will be going to the Puget Sound, although we don't know how much yet.

Puget Sound Allocated funds have been guaranteed to the Puget Sound Region.

King County Allocated funds have been guaranteed to King County.

Exhibit A-1

Detailed Funding Compilation: Green Building

Geography	Type of use	Amount	Source	Funding Agency	Awarded Agency	Time Period
GREEN BUILDING						
DOE Direct Awards						
WA State	EECBG (Formula)	\$58,800,000	ARRA	DOE	Municipalities	Award '09
Puget Sound	EECBG (Formula)	\$33,100,000	ARRA	DOE	Municipalities	
King County	EECBG (Formula)	\$16,700,000	ARRA	DOE	Municipalities	
WA State	*Direct Competitive Awards from DOE	\$2,317,200,000	ARRA	DOE	Various Entities	Award 09-10
Puget Sound	Direct Competitive Awards from DOE	\$24,880,000	ARRA	DOE	Various Entities	
	Better Buildings Retrofit Ramp-up	\$20,000,000	ARRA	DOE	City of Seattle	Award '10
	EECBG (Competitive)	\$4,880,000	ARRA	DOE	Bain. Isl./Bremerton	Award '10
King County	Direct Competitive Awards from DOE	\$20,000,000	ARRA	DOE	City of Seattle	
DOE Awards Through Department of Commerce						
WA State	*State Energy Program	\$60,900,000	ARRA	DOE	Commerce	Award '09
WA State	*EE + RE Loan & Grant Program	\$38,500,000	ARRA	DOE	Commerce	
Puget Sound	EE + RE Loan & Grant Program	\$3,800,000	ARRA	DOE	Commerce	
King County	EE + RE Loan & Grant Program	\$3,800,000	ARRA	DOE	Commerce	
WA State	Community Energy Efficiency Pilot Program	\$14,000,000	ARRA	DOE	Commerce	
Partial	Community Energy Efficiency Pilot Program	\$6,000,000	ARRA	DOE	Commerce	
Puget Sound	Community Energy Efficiency Pilot Program	\$2,200,000	ARRA	DOE	Commerce	
King County	Community Energy Efficiency Pilot Program	\$0	ARRA	DOE	Commerce	
WA State	Weatherization Assistance Program	\$59,500,000	ARRA	DOE	Commerce	Award '09
Puget Sound	Weatherization Assistance Program	\$27,700,000	ARRA	DOE	Commerce	
King County	Weatherization Assistance Program	\$13,000,000	ARRA	DOE	Commerce	
WA State	WAP: Sustainable Energy Resources	\$7,000,000	ARRA	DOE	Commerce	Award '10
WA State	WAP: Innovation Pilot Program	\$3,000,000	ARRA	DOE	Commerce	Award '10
HUD Direct Awards						
WA State	Public Housing Capital Fund	\$37,800,000	ARRA	HUD	State HAs	Award '09
Puget Sound	Public Housing Capital Fund	\$26,000,000	ARRA	HUD	Seattle HA & King Co. HA	
King County	Public Housing Capital Fund	\$22,700,000	ARRA	HUD	Seattle HA & King Co. HA	
Other Awards/Bills/Referendums (Local, Regional, and National)						
WA State	EE School Retrofits Grant	\$100,000,000	WA State	Cap. Budget Comm.	Commerce & OSPI	Award '10
WA State	EE School Retrofits Referendum	\$500,000,000	WA State	Referendum 52	N/A	Vote Fall '10
National	Livable Communities Act	\$4,000,000,000	N/A	N/A	N/A	N/A

Source: BERK, 2010

Note: * Amounts with an asterisk represent total DOE awards to WA State (for each respective category)

Exhibit A-2
Detailed Funding Compilation: Energy

Geography	Type of use	Amount	Source	Funding Agency	Awarded Agency	Time Period
ENERGY						
DOE Direct Awards						
WA State	*Direct Competitive Awards from DOE	\$2,317,200,000	ARRA	DOE	Various Entities	Award '09-10
Puget Sound	Direct Competitive Awards from DOE	\$106,500,000	ARRA	DOE	Various Entities	
King County	Direct Competitive Awards from DOE	\$85,600,000	ARRA	DOE	Various Entities	
	Battery Manufacturing	\$21,300,000	ARRA	DOE	EnerG2 (Seattle)	Award '09
	CHP District Energy Systems	\$18,700,000	ARRA	DOE	Seattle Steam Company	Award '09
	Industrial Carbon Capture and Storage App:	\$20,000,000	ARRA	DOE	Ramgen Power (Bellevue)	Award '09
	Clean Cities AFV Grant Program	\$15,000,000	ARRA	DOE	'S Clean Air Agency (Seattle)	Award '09
Other Counties	Direct Competitive Awards from DOE	\$20,800,000	ARRA	DOE	Various Entities	
	Smart Grid and Investment Grant Program	\$16,000,000	ARRA	DOE	Snohomish County PUD	Award '09
DOE Awards Through Department of Commerce						
WA State	*State Energy Program	\$60,900,000	ARRA	DOE	Commerce	Award '09
WA State	*EE + RE Loan & Grant Program	\$38,500,000	ARRA	DOE	Commerce	
Puget Sound	EE + RE Loan & Grant Program	\$5,700,000	ARRA	DOE	Commerce	
King County	EE + RE Loan & Grant Program	\$5,200,000	ARRA	DOE	Commerce	
WA State	I-5 Electrification Statewide	\$1,300,000	ARRA	DOE	Commerce/WSDOT	Award '10
Other Awards/Bills/Referendums (Local, Regional, and National)						
Pacific Northwest	Smart Grid Demonstration	\$88,000,000	ARRA	DOE	Battelle	Award '09
National	Electric Vehicle Project	\$99,800,000	ARRA	DOE	ECotality	Award '09

Source: BERK, 2010

Note: * Amounts with an asterisk represent total DOE awards to WA State (for each respective category)

Exhibit A-3

Detailed Funding Compilation: Environment

Geography	Type of use	Amount	Source	Funding Agency	Awarded Agency	Time Period
ENVIRONMENT						
EPA Awards through Department of Commerce						
WA State	Brownfields Revolving Loan Fund	\$2,600,000	ARRA	EPA	Commerce	Award '09
Project funds	*Brownfields Revolving Loan Fund	\$2,400,000	ARRA	EPA	Commerce	
Project Mang./Admin.	Brownfields Revolving Loan Fund	\$200,000	ARRA	EPA	Commerce	
EPA Awards through Department of Health						
WA State	Drinking Water State Revolving Fund	\$34,700,000	ARRA	EPA	DOH/Commerce	Award '09
Puget Sound	Drinking Water State Revolving Fund	\$23,200,000	ARRA	EPA	DOH/Commerce	
King County	Drinking Water State Revolving Fund	\$6,000,000	ARRA	EPA	DOH/Commerce	
EPA Awards through Department of Ecology						
WA State	Clean Water State Revolving Fund	\$68,200,000	ARRA	EPA	Ecology	Award '09
Puget Sound	Clean Water State Revolving Fund	\$15,100,000	ARRA	EPA	Ecology	
King County	Clean Water State Revolving Fund	\$2,300,000	ARRA	EPA	Ecology	
WA State	State Clean Diesel Grant Program	\$1,700,000	ARRA	EPA	Ecology	Award '09
Puget Sound	Diesel Emissions Reduction	\$1,100,000	ARRA	EPA	Ecology	
Puget Sound Remaining funds	Diesel Emissions Reduction	\$300,000	ARRA	EPA	Ecology	
King County Remaining Funds	Diesel Emissions Reduction	\$30,000	ARRA	EPA	Ecology	
WA State	Leaking Underground Storage Tanks	\$3,400,000	ARRA	EPA	Ecology	Award 09-10
Puget Sound	Leaking Underground Storage Tanks	\$1,000,000	ARRA	EPA	Ecology	
Puget Sound Remaining funds	Leaking Underground Storage Tanks	\$600,000	ARRA	EPA	Ecology	
King County Remaining Funds	Leaking Underground Storage Tanks	\$0	ARRA	EPA	Ecology	
EPA Direct Awards						
WA State	National Clean Diesel Funding Asst.	\$4,000,000	ARRA	EPA	Various Entities	Award '09
Puget Sound	National Clean Diesel Funding Assistance	\$4,000,000	ARRA	EPA	Various Entities	
King County	National Clean Diesel Funding Assistance	\$2,500,000	ARRA	EPA	Various Entities	
WA State	Superfund Cleanup Site	\$7,200,000	ARRA	EPA	Various Entities	Award '09
Puget Sound	Superfund Cleanup Site	\$7,200,000	ARRA	EPA	Various Entities	
King County	Superfund Cleanup Site	\$0	ARRA	EPA	Various Entities	
WA State	PS Restoration Appropriation Fund	\$27,100,000	EPA	EPA	Various Entities	Award '10
Puget Sound	PS Restoration Appropriation Fund	\$13,000,000	EPA	EPA	Various Entities	
King County	PS Restoration Appropriation Fund	\$6,300,000	EPA	EPA	Various Entities	
WA State	Brownfields Cleanup Program	\$600,000	EPA	EPA	Various Entities	Award '10
Puget Sound	Brownfields Cleanup Fund	\$400,000	EPA	EPA	Various Entities	
King County	Brownfields Cleanup Fund	\$400,000	EPA	EPA	Various Entities	

Source: BERK, 2010

Note: All or most of the project funds for the Brownfields Revolving Loan Fund will likely go to projects in the Puget Sound Region.

Exhibit A-4
Detailed Funding Compilation: Transportation

Geography	Amount	Source	Funding Agency	Awarded Agency	Time Period
TRANSPORTATION					
Transit Projects					
WA State	\$179,000,000	ARRA	FTA	WSDOT	Award 09-10
Partial	\$4,500,000	ARRA	FTA	WSDOT	
Puget Sound	\$132,000,000	ARRA	FTA	WSDOT	
Puget Sound exclusive non-purchase funds	\$55,600,000	ARRA	FTA	WSDOT	
King county exclusive non-purchase funds	\$10,600,000	ARRA	FTA	WSDOT	
Rest of State	\$41,500,000	ARRA	FTA	WSDOT	
Highway Projects					
WA State	\$492,000,000	ARRA	FHWA	WSDOT	Award 09-10
Puget Sound	\$77,900,000	ARRA	FHWA	WSDOT	
Rest of State	\$414,100,000	ARRA	FHWA	WSDOT	
Additional Grant for Highway Mega-Projects Nationally	\$1,500,000,000	ARRA	FHWA	WSDOT	Through '11
Other Notable Transportation Projects					
Mercer Corridor	\$30,000,000	ARRA	USDOT (TIGER)	SDOT	Award '10
SR-520 Corridor Proposal	\$300,000,000	WSDOT	N/A	WSDOT	Proposal
High Speed Rail Statewide	\$590,000,000	ARRA	FRA	WSDOT	Award '10
Additional Grants for Transportation Projects Nationally (TIGER II)	\$600,000,000	USDOT	USDOT (TIGER II)	N/A	Award 10-11

Source: BERK, 2010

Note: Non-purchase indicates funds that do not involve the purchase of new vehicles or equipment.

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**Exhibit A-5
Funding Type by Geography: Green Building, Energy, and Environment**

GREEN BUILDING		ENERGY		ENVIRONMENT	
Funding Type by Geography	Amount	Funding Type by Geography	Amount	Funding Type By Geography	Amount
WA State Allocated Total =	NA	WA State Allocated Total =	NA	WA State Allocated Total =	\$146,900,000
EECBG (Formula)	\$58,800,000	Direct Competitive Awards from DOE	\$2,317,200,000	Drinking Water State Revolving Fund	\$34,700,000
*Direct Competitive Awards from DOE	\$2,317,200,000	State Energy Program	\$60,900,000	Water Quality State Revolving Fund	\$68,200,000
*State Energy Program	\$60,900,000			Diesel Emissions Reduction	\$1,700,000
Weatherization	\$59,500,000	Puget Sound Allocated Total =	\$113,500,000	Leaking Underground Storage Tanks	\$3,400,000
HUD Public Housing Capital Fund	\$37,800,000	Direct Competitive Awards from DOE	\$106,500,000	Direct Competitive Awards from EPA	\$38,900,000
		State Energy Program	\$7,000,000		
WA State Unallocated Total =	\$103,000,000	King County Allocated Total =	\$90,800,000	WA State Unallocated Total =	\$2,600,000
EE School Retrofits (Capital Budget Comm.	\$100,000,000	Direct Competitive Awards from DOE	\$85,600,000	*Brownfields Revolving Loan Fund	\$2,600,000
WAP: Innovation Pilot Program	\$3,000,000	State Energy Program	\$5,200,000		
				Puget Sound Allocated Total (Rem.) =	\$63,800,000
Puget Sound Allocated Total =	\$117,680,000			Drinking Water State Revolving Fund	\$23,200,000
EECBG (Formula)	\$33,100,000			Water Quality State Revolving Fund	\$15,100,000
Direct Competitive Awards from DOE	\$24,880,000			Diesel Emissions Reduction	\$300,000
State Energy Program	\$6,000,000			Leaking Underground Storage Tanks	\$600,000
Weatherization Assistance Program	\$27,700,000			Direct Competitive Awards from EPA	\$24,600,000
HUD Public Housing Capital Fund	\$26,000,000				
				King County Allocated Total (Rem.) =	\$17,530,000
King County Allocated Total =	\$76,200,000			Drinking Water State Revolving Fund	\$6,000,000
EECBG (Formula)	\$16,700,000			Water Quality State Revolving Fund	\$2,300,000
Direct Competitive Awards from DOE	\$20,000,000			Diesel Emissions Reduction	\$30,000
State Energy Program	\$3,800,000			Leaking Underground Storage Tanks	\$0
Weatherization	\$13,000,000			Direct Competitive Awards from EPA	\$9,200,000
HUD Public Housing Capital Fund	\$22,700,000				
Partial Allocated Total =	\$13,000,000				
Community Energy Efficiency Pilot Program	\$6,000,000				
WAP: Sustainable Energy Resources	\$7,000,000				
Referendum 52 Total =	\$500,000,000				

Source: BERK, 2010

APPENDIX B REFERENCES

FUNDING SUMMARY

Web Research

Listed below are the major sources of cross-program and project information. There were dozens of additional websites and press releases used for information gathering and cross-checking, which are not included.

1. "2009 Recovery Act: National Clean Diesel Funding Assistance Awarded Projects." Environmental Protection Agency. <http://www.epa.gov/otaq/diesel/projnational-aara.htm>
2. "ARRA Home." WSDOT. <http://www.wsdot.wa.gov/Funding/stimulus/default.htm>
3. "DOE Recovery Act Awardees." Department of Energy. <http://www.energy.gov/recovery/data.htm>
4. "EPA Puget Sound Funding." Environmental Protection Agency. http://www.epa.gov/region10/map/funding/pugetsound_funding_map.html
5. "Funding by State Agency Program." Washington Recovery. <http://www.recovery.wa.gov/funding/contacts.asp>
6. "Governor Gregoire Announces \$16.5 million for Energy Efficiency and Renewable Energy Projects." Washington Governor's Website. <http://www.governor.wa.gov/news/news-view.asp?pressRelease=1465&newsType=1>
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8. "Recovery Act Capital Fund Competition Grantees." Department of Housing and Urban Development. <http://www.hud.gov/offices/pih/programs/ph/capfund/ocir/recovery-grantees.pdf>
9. "Recovery Projects at Ecology." Washington State Department of Ecology. <http://www.ecy.wa.gov/recovery/projectmap.html>
10. "Recovery Update." Puget Sound Regional Council. <http://psrc.org/funding/arra>
11. "The American Recovery and Reinvestment Act (ARRA)." FTA. http://www.fta.dot.gov/index_9440.html
12. "Washington State Department of Commerce Recovery and Reinvestment". Department of Commerce. <http://www.commerce.wa.gov/site/1164/default.aspx>

Informal Interview Contact List

1. **Batelle Corporation**, *Pacific Northwest Division*
2. **ECOtality North America**, *Pacific Northwest Division*
3. **Ramgen power Systems**, Bellevue, WA
4. **Seattle Housing Authority**, Seattle, WA
5. **Seattle Steam Company**, Seattle, WA
6. **United States Department of Energy**, *Customer Service*, Washington D.C.

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7. **United States Environmental Protection Agency**, *Region 10 Division*, Seattle, WA
8. **Washington State Department of Commerce**, *Energy Policy Division (State Energy Office)*, *Local Government Division*, Olympia, WA
9. **Washington State Department of Ecology**, *Water Quality Program, Cleanup Program*, Olympia, WA
10. **Washington State Office of Superintendent of Public Instruction**, *School Facilities Division*, Olympia, WA

JOB ESTIMATES

Research included many of the references listed above. In addition, the following resources were used:

Web Research

1. "Weatherization Assistance Program Overview." Weatherization Assistance Program Technical Assistance Center (WAPTAC). <http://www.waptac.org/WAP-Basics.aspx>

Documents

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