



**NW Energy Coalition**

# Realizing the Power of Efficiency

Barriers, Opportunities & Solutions to Financing Energy Efficiency for Small and Mid-sized Businesses in the Northwest

March 2010



IN PARTNERSHIP WITH

SEATTLE-NORTHWEST SECURITIES and  
SHOREBANK ENTERPRISE CASCADIA

## ■ ■ ■ ■ About NW Energy Coalition

The NW Energy Coalition is an alliance of more than 100 environmental, civic, and human service organizations, progressive utilities, and businesses in Oregon, Washington, Idaho, Montana, Alaska, and British Columbia. NWECC promotes development of renewable energy and energy conservation, consumer protection, low-income energy assistance, and fish and wildlife restoration on the Columbia and Snake rivers.

## ■ ■ ■ ■ Acknowledgments

This report was prepared by Cascadia Consulting Group with the support of Seattle Northwest Securities and Shorebank Enterprise Cascadia. Christine Grant served as principal researcher. Ann Grodnik, an investment banker with Seattle Northwest Securities, and Rachel Brombaugh, a lending specialist with Shorebank, contributed their expertise in financial markets and lending practices to smaller businesses, respectively. Marc Daudon served as Principal in Charge for this project, with oversight and input by NW Energy Coalition project manager John Healy and other Coalition staff.

The project team would like to thank all of the bankers, government officials, utility executives, and other experts who contributed their insights and expertise through interviews. This report would not have been possible without their time and input.

Funding for this study was provided by a grant from the SeaChange Foundation.

Contents

---

- Executive Summary..... 1**
- Introduction ..... 5**
  - Methodology ..... 6
  - Energy Efficiency Projects ..... 7
  - Small and Medium-sized Businesses in the Northwest ..... 10
  - Northwest Energy Efficiency Players..... 11
- I. Key Findings and Barriers ..... 15**
- II. Current Programs ..... 27**
  - Credit Enhancement..... 27
  - Direct Subsidies ..... 28
  - Public Loan Programs ..... 29
  - Assessment of Current Public Finance Programs..... 30
- III. Proposed Solutions ..... 32**
  - Improvements to the Performance of Financing Mechanisms..... 35
  - Improvements to Existing Support Services and Systems..... 37
  - Legislative and Regulatory Changes to Alter the Marketplace ..... 40
  - New Programs and Institutions to Add Capacity ..... 42
- IV. Recommendations ..... 45**
  - The Preferred Future..... 45
  - Realizing the Preferred Future: Key Initiatives and NW Energy Coalition Leadership ..... 46
- Appendix A. Literature Sources Reviewed ..... 47**
- Appendix B. Additional Supporting Data ..... 48**



## Executive Summary

---

The NW Energy Coalition commissioned this study to identify and find ways to overcome barriers—including lack of capital—to financing energy efficiency projects in the Northwest, specifically the states of Idaho, Montana, Oregon, and Washington. The report focuses on understanding the financing needs of small to medium-sized businesses with fewer than 500 employees. These businesses represent a major share of the regional economy and energy use but generally have lower participation rates in existing energy efficiency programs than larger businesses. As our region plans to meet its growing energy needs, energy efficiency consistently rises to the top as the most cost-effective solution for the Northwest. According to the Northwest Power and Conservation Council, the commercial sector offers the potential for about 1,400 average megawatts through efficiency gains over the next 20 years, nearly two-thirds of which will come from improved lighting systems.

Aside from utility incentives, financing for energy efficiency projects for small to medium-sized business sector is extremely limited. This report explores the current financing marketplace in the Northwest, examining its status, constraints, and opportunities for financing commercial-sector energy efficiency improvements. It identifies current programs that can help address the financing gap, and it makes recommendations for future enhancements to foster energy efficiency lending. The report seeks to answer this core question: **What steps are needed to increase the flow of commercial capital in the small and mid-sized commercial market to achieve energy efficiency on the scale envisioned by Northwest utilities and power planners?** To do so, the report examines key findings and barriers, reviews current programs, identifies potential solutions, and recommends a path forward.

The research team interviewed and examined key current and potential players in the energy efficiency lending marketplace, including lenders and investors (banks, credit unions, venture capitalists, and economic development organizations); public and investor-owned utilities; policymakers and government agencies; energy service companies and other vendors; as well as nongovernmental organizations and other regional energy efficiency experts.

### Key Findings

The research and interviews identified the following key findings regarding the current energy efficiency financing marketplace and major industry players.

1. Overall demand for energy efficiency financing is limited at present, and accordingly, demand for energy efficiency financing from small and medium-sized businesses is also limited.
2. Both lending markets and markets for energy efficiency services are highly complex and segmented.
3. In the current economy, lending to small and medium-sized businesses is limited for anything, including energy efficiency projects.
4. Financing institutions generally are not focused on energy efficiency lending as a special or significant business opportunity.
5. Lending for energy efficiency to the commercial sector brings its own set of risks.

6. Some financial institutions are actively seeking opportunities in this field and are pioneering innovative lending programs.
7. ESCOs and related vendors are leading the way to secure financing for energy efficiency investments using both private equity and conventional lending.
8. Utilities provide substantial funding for energy efficiency, but generally do not see issuing and servicing loans to their customers as a business opportunity.
9. Trade allies occupy a central place in the network that includes business owners, contractors, utilities, and lenders, suggesting an important role in promoting financing for energy efficiency.
10. Efforts to create a secondary capital market for energy efficiency loans are in their infancy.
11. Interest in legislation that enables energy efficiency loans to remain with the property—rather than the property owner—is growing in the Northwest.

### ■ ■ ■ ■ Key Barriers

Multiple barriers limit energy efficiency financing, including the severely weakened economy and financial sector, the relatively poor creditworthiness of many smaller businesses, limited demand for such loans from businesses, and a series of specific challenges associated with establishing collateral for and the near-term financial viability of some energy efficiency investments. In addition, many small businesses share energy use and billing with landlords, splitting costs and benefits and complicating transactions. Finally, the environmental benefits of energy savings are not currently monetized. These barriers mean that for most businesses, lending institutions, and investors, returns are too low and perceived risks are too high for energy efficiency investments to occur on a scale commensurate with either their potential or the need. Accordingly, this marketplace lacks both sufficient liquidity and capital.

### ■ ■ ■ ■ Current Programs

Despite these challenges, financial institutions, utilities, energy efficiency service providers, and governments are undertaking a number of innovative programs and initiatives to advance energy efficiency lending. Efforts include **credit enhancement** programs that provide loan guarantees as well as **public loan** programs that offer financing or cover a portion of the financing in partnership with a private lender. These initiatives point the way forward, providing new approaches and solutions to increase capital flows for energy efficiency projects.

### ■ ■ ■ ■ Options for Increasing Energy Efficiency Lending

A portfolio of solutions will be needed to address the barriers and increase energy efficiency financing across the diverse spectrum of small to mid-sized businesses. The following table summarizes 15 potential solutions to increase energy efficiency financing in the Northwest. The checkmarks indicate that **the option reduces risk, increases demand and improves return, or increases liquidity and capital flows to financial institutions or lenders.**

## Summary of Proposed Solutions to Increase Energy Efficiency Financing in the Northwest

CATEGORIES AND OPTIONS		Mitigates Risk for Lenders	Increases Demand/ Return to Lenders	Provides Liquidity/ Capital
<b>IMPROVEMENTS TO THE PERFORMANCE OF EXISTING FINANCE MECHANISMS</b>				
<b>1</b>	Encourage utilities to adopt on-bill repayment mechanisms.	✓		✓
<b>2</b>	Encourage utilities to provide progress payments to businesses that qualify for energy efficiency rebates and incentives.		✓	✓
<b>3</b>	Dedicate a portion of existing Small Business Administration lending to energy efficiency projects.			✓
<b>4</b>	Accelerate the development of secondary markets for energy efficiency loan portfolios.	✓		✓
<b>IMPROVEMENTS TO EXISTING ENERGY EFFICIENCY FINANCING SUPPORT SERVICES AND SYSTEMS</b>				
<b>5</b>	Accelerate the adoption of commercial building energy performance tracking and disclosure.	✓	✓	
<b>6</b>	Facilitate information sharing among utilities, financial institutions, and contractors about energy efficiency opportunities and cost savings.	✓	✓	
<b>7</b>	Create a utility-sponsored technical assistance program for lenders.	✓	✓	
<b>8</b>	Launch an education and marketing campaign to small and medium-sized businesses to build demand for energy efficiency projects and associated financing.		✓	
<b>9</b>	Promote trade ally networks and “one-stop shopping” for energy efficiency resources to small and medium-sized businesses.	✓	✓	✓
<b>LEGISLATIVE AND REGULATORY CHANGES AT THE FEDERAL OR STATE LEVEL TO ALTER THE MARKETPLACE</b>				
<b>10</b>	Advance Property Assessed Clean Energy (PACE) financing in Washington, Idaho, and Montana—similar to Oregon’s existing law.	✓	✓	✓
<b>11</b>	Provide utilities with more incentives and fewer barriers to invest their resources in deep energy efficiency retrofits.		✓	
<b>12</b>	Support federal legislation to permit tax-exempt bond financing for clean energy and energy efficiency.		✓	✓
<b>NEW PROGRAMS AND INSTITUTIONS TO ADD CAPACITY</b>				
<b>13</b>	Create a federal Clean Energy Deployment Administration or “Green Bank.”	✓		✓
<b>14</b>	Use municipal, state, or federal bond-issuing authority to raise funds for energy efficiency projects.			✓
<b>15</b>	Develop and expand revolving loan funds to support energy efficiency projects.	✓		✓
<b>16</b>	Expand credit enhancement and other mechanisms that leverage private capital.	✓	✓	✓

## ■ ■ ■ ■ Recommendations

Each of these solutions, if implemented, has the potential to strengthen the marketplace for energy efficiency financing, but **which options should be pursued and in what priority order to increase financing of energy efficiency projects for small and medium-sized businesses in the Northwest?** The report's conclusion recommends priorities for early action. These recommendations are intended to lay the foundation for further change and help the marketplace function better on its own to drive energy efficiency action.

For near-term action, we recommend several solutions that stand out in their potential to leverage resources, stimulate change in the marketplace, engage lenders, and consequently lead to rapid growth in financing for energy efficiency.

- **Early action #1.** Market existing energy efficiency programs more effectively through coordinated efforts of governments, utilities, and organized trade ally networks. This effort includes collection and dissemination of better information about the performance and financial benefits of energy efficiency upgrades for businesses. We recommend doing so through 1) widespread adoption of the U.S. Environmental Protection Agency's Energy Star portfolio manager or an alternative standardized rating system to track a building's energy performance and 2) implementation of a utility-sponsored Energy Conservation Advisor program for lenders.
- **Early action #2.** Advance Property Assessed Clean Energy (PACE) financing legislation where feasible, providing the basis for emergence of a secondary market for energy efficiency loans, benefiting both commercial and residential sectors.
- **Early action #3.** Encourage utilities whose billing systems have been upgraded to enable on-bill repayment to use this mechanism to facilitate and increase lending for energy efficiency projects, reducing upfront capital contributions required from businesses, simplifying loan repayment, and making a direct connection between energy and cost savings for the customer.
- **Early action #4.** Provide utilities with more incentives and fewer barriers to invest their capital and human resources in comprehensive, deep energy efficiency retrofits throughout their service markets.
- **Early action #5.** Establish public energy efficiency funds dedicated to offering credit enhancement to leverage private capital through the use of available municipal, state, and federal funds, including bonds.

Together, these solutions can provide a catalyst for lenders and investors to finance energy efficiency. They can serve to reduce risks for banks and investors (transferring risk to government or utilities in some cases), increasing returns to borrowers and lenders, boosting liquidity and capital flows—and helping secure the Northwest's clean, efficient energy future.

## Introduction

---

The NW Energy Coalition commissioned this study to identify and find ways to overcome barriers—including lack of capital—to financing energy efficiency projects by small and medium-sized businesses in the Northwest, specifically the states of Idaho, Montana, Oregon, and Washington. The report focuses on this sector because while it is a major part of the regional economy with substantial energy usage, these businesses generally have lower participation rates in energy efficiency programs than larger businesses.

This report explores the financing marketplace, examining the current status of, constraints to, and opportunities for financing commercial-sector energy efficiency improvements in the Northwest. It also identifies current public and utility programs that can help address the financing gap, and it makes recommendations for future enhancements to foster energy efficiency lending. The report seeks to answer this core question: **What steps are needed to increase the flow of commercial capital in the small and mid-sized commercial market to achieve energy efficiency on the scale envisioned by Northwest utilities and power planners?**

This report builds on a previous Coalition study, *The Power of Efficiency*, which documents the critical role of energy efficiency in meeting our region's growing energy needs and reducing greenhouse gas emissions. *The Power of Efficiency* shows that energy efficiency can meet all typical new electric load growth through 2020 at approximately half the cost of new generation. For natural gas, efficiency can meet about half the new demand during that timeframe at less cost and with less risk than new pipelines.

The Coalition commissioned this follow-up study to examine more closely the often-cited barrier that the lack of upfront capital presents. The research and analysis sought to identify workable strategies to overcome that barrier and accelerate efficiency investments. Following this introductory chapter—which defines the study methodology, relevant energy efficiency projects, small and mid-sized businesses, and key industry players—the remainder of the report includes these major sections:

- I. **Key Findings and Barriers**—the current state of the marketplace for energy efficiency financing.
- II. **Current Programs**—existing government-supported and utility programs to support financing of energy efficiency projects.
- III. **Proposed Solutions**—options to increase the flow of energy efficiency financing and spur implementation of cost-effective projects.
- IV. **Recommendations**—top-priority options and strategies recommended for near-term action.

## Methodology

Our team conducted in-depth interviews with a diverse cross-section of experts in the energy efficiency financing marketplace. Interviewees represented the following sectors:

- Lending and investment institutions, including banks, credit unions, venture capitalists and publicly funded economic development lending organizations.
- Public and private utilities from all four Northwest states.
- Northwest energy service companies (ESCOs).
- Local and state policymakers and government entities.
- Non-profit organizations and regional energy efficiency experts, including representatives of the Northwest Energy Efficiency Council, the Northwest Energy Efficiency Alliance, and the Energy Trust of Oregon.

Table 1 lists the 25 interviews conducted for this study, including individuals and their organizations.

**Table 1. List of Interviewees and Organizations**

ORGANIZATION	CATEGORY	CONTACT
Alternative Energy Resources Organization	Nonprofit	Ben Brouwer
Bank of America	Lender/investor	Neil Skiver
BECU	Lender/investor	Scott Strand
City of Portland, Office of Sustainable Development	Government	Derek Smith
City of Seattle, Office of Economic Development	Government	Tina Vlasaty
Community Capital Development	Lender/investor	Roland Chariton
Energy Trust of Oregon	Nonprofit	Steve Lacey
Hannon Armstrong	Lender/investor	John Christmas
HomeStreet Bank	Lender/investor	Richard Bendix
Idaho Department of Commerce	Government	Lane Packwood
Idaho Falls Power	Utility	Van Ashton
MacDonald-Miller	ESCO	Perry England
McKinstry	ESCO	Matt Wegworth
National Development Council	Lender/investor	Chuck DePew
Northwest Energy Efficiency Alliance	Nonprofit	Jack Davis
Northwest Energy Efficiency Council	Nonprofit	Stan Price
Oregon State Representative Jules Kopel Bailey	Government	Jules Kopel Bailey
Performance Mechanical Group	ESCO	Danny Miller
Pivotal Investments	Lender/investor	Gregg Semler
Puget Sound Energy	Utility	Bob Stolarski
Seattle City Light	Utility	Bob Balzar
Small Business Administration	Government	Mark Costello
Spokane Neighborhood Economic Development Alliance	Lender/investor	Thomas Speight
Umpqua Bank	Lender/investor	Dan Weldon
USDA Rural Development	Government	Mary Traxler
U.S. Representative (Washington) Jay Inslee	Government	Maura Little

The research for this report also included a review of current publications related to energy efficiency financing. All literature reviewed was published within the last two years and represented both public and private authors and sponsorship organizations. Appendix A includes a list of the literature sources reviewed.

### Energy Efficiency Projects

This section describes typical energy efficiency projects in small and medium-sized businesses in the Pacific Northwest that are the desired end result of the financing recommendations in this report. Analyses from private, public, and nongovernmental organizations have documented the major opportunity that energy efficiency presents for meeting our energy needs and saving money. A 2007 McKinsey & Company report, for example, found that “mass market ready” energy-saving opportunities

worth approximately \$130 billion annually to the U.S. economy go unrealized.<sup>1</sup> (Appendix B provides additional information on cost-effective energy efficiency measures for the commercial sector.)

The Northwest's official power planning agency, the Northwest Power and Conservation Council (NWPCC), assesses the region's long-term electricity needs. In its draft Sixth Power Plan, released in mid-2009, NWPCC identifies the lowest cost and lowest risk power sources to meet the region's long-term needs. For the first time, NWPCC foresees meeting the vast majority (about 85%) of new electricity needs over the next 20 years with energy efficiency—an aggressive but reasonable target of 5,800 average megawatts. The commercial sector offers the potential for about 1,400 average megawatts through efficiency gains, including nearly two-thirds from improved lighting systems. New technologies like light-emitting diodes and improved lighting fixtures and controls offer added potential savings in both outdoor and indoor lighting.

As noted above, *The Power of Efficiency* concludes that cost-effective energy efficiency measures can cut new natural gas demand in half over the next decade. In existing commercial buildings those savings will come primarily from more efficient equipment and appliances as well as reclaimed heat from refrigeration units.

---

<sup>1</sup> McKinsey & Company, *Reducing U.S. Greenhouse Gas Emissions: How Much at What Cost?* 2007.



### Sample Energy Efficiency Retrofit and Equipment Upgrade Cost Ranges and Benefits\*

**Upgrade Commercial Dishwasher to Energy Efficient Model:** Common energy efficiency equipment upgrade for businesses in the food service, hospitality, and care-giving industries.

- **Cost:** Approximately \$10,000 to \$15,000
- **Average Utility Rebate:** \$2,000 to \$3,000
- **Annual Energy Savings:** Approximately 25,000 kWh
- **Annual Cost Savings from Avoided Energy Consumption:** \$1,900
- **10-year Net Present Value at 7% Discount Rate:** \$200 to \$6,000
- **Payback Period:** 4 to 7 years

**Commercial Office Building Interior Lighting Upgrades:** Replace about 300 incandescent and T12 fluorescent fixtures and lamps with T5 and compact fluorescent fixtures and lamps.

- **Cost:** \$40,000
- **Average Utility Rebate:** 50 to 100 percent of total costs
- **Annual Energy Savings:** 69,000 kWh
- **Annual Cost Savings from Avoided Energy Consumption:** \$5,000
- **10-year Net Present Value at 7% Discount Rate:** \$16,000 to \$36,000
- **Payback Period:** 0 to 4 years

**Full Heating, Ventilating, and Air Conditioning (HVAC) Modernization for 50,000 SF Commercial Office Building:** Update all existing equipment and control systems.

- **Cost:** \$750,000
- **Average Utility Rebate:** 35 to 50 percent of total costs
- **Annual Energy Savings:** 400,000 kWh and 20,000 therms
- **Annual Cost Savings from Avoided Energy Consumption:** \$70,000
- **10-year Net Present Value at 7% Discount Rate:** \$6,000 to \$110,000
- **Payback Period:** 5 to 7 years

\* Assumes \$0.075 per kWh—the blended average cost for commercial electricity in the Northwest states. Based on Energy Information Administration, *Average Retail Price of Electricity to Ultimate Customers by End-Use Sector, by State*, 2009. Note that when a utility calculates cost-effectiveness, the calculation is based on wholesale avoided costs (plus some risk and environmental benefit), resulting in smaller savings value and longer payback periods.



## ■ ■ ■ ■ Small and Medium-sized Businesses in the Northwest

For the purposes of this report, we define small and medium-sized businesses as having fewer than 500 employees. According to the U.S. Census Bureau, a small business has fewer than 100 employees, and a medium-sized business has fewer than 500 employees.<sup>2</sup> We have excluded from our analysis chain businesses with headquarters outside the Northwest and energy customers that utilities classify as industrial (e.g., aluminum smelters, pulp and paper mills, timber mills, and data centers).

As displayed in Table 2, small and medium-sized businesses account for 58 percent of the total employment and 49 percent of the total annual payroll in our region. While reliable data on the energy consumption of the diverse universe of small and medium-sized businesses are not available, the fact that these firms represent such a large part of overall economic activity strongly suggests they offer considerable potential for energy conservation. Utility conservation program managers say their smaller commercial customers generally lag in energy efficiency investment.

**Table 2. Businesses, Employment, and Annual Payroll by Employment Size in the Northwest<sup>3</sup>**

DATA TYPE	TOTAL IN NORTHWEST	< 100 EMPLOYEES	< 500 EMPLOYEES
# of Businesses	688,194	614,697	637,532
Employment	4,771,710	2,025,135	2,744,364
Annual Payroll (\$1,000)	\$184,808,837	\$64,405,270	\$90,789,470

In addition to the sheer number of small and medium-sized businesses, research has shown that energy costs are a growing concern to many of these businesses. A 2008 report commissioned by the U.S. Small Business Administration showed that, in most commercial sectors, small entities have higher energy expenditures per dollar of sales than larger entities. Specifically, the energy cost per sales ratio for a small business is 2.7 times that of a large entity.<sup>4</sup> While it is true that energy costs in the Northwest are lower than in other parts of the country, the larger relative burden on smaller businesses remains consistent with the SBA study.

<sup>2</sup> Statistics about business size and small businesses from the U.S. Census Bureau. <http://www.census.gov/epcd/www/smallbus.html>.

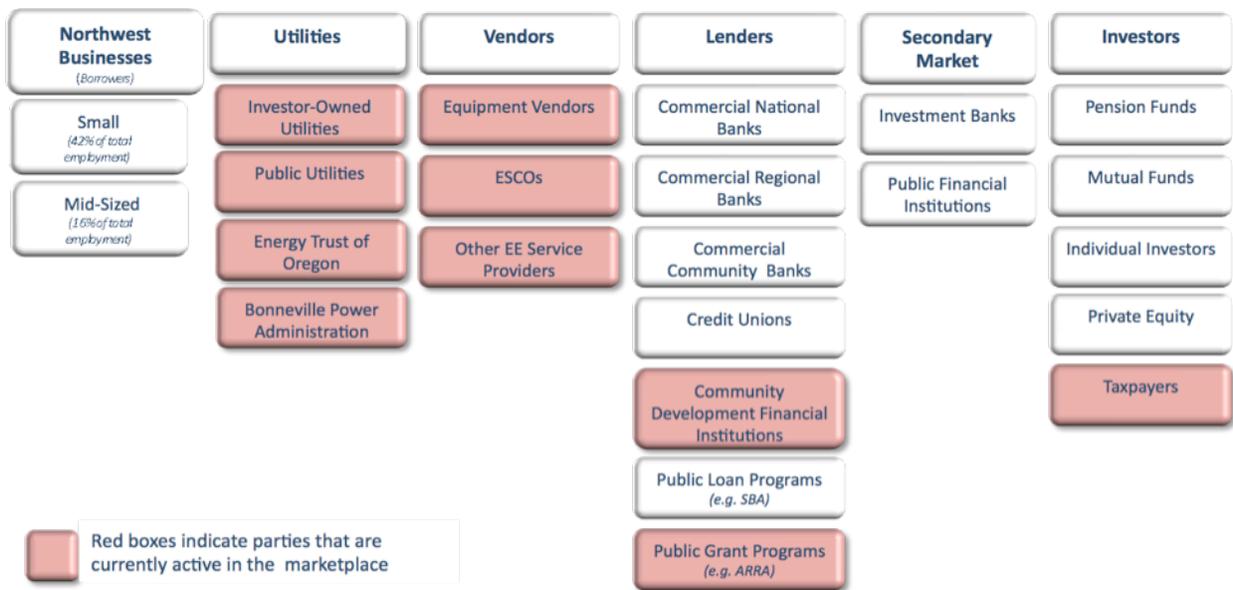
<sup>3</sup> U.S. Census Bureau, 2006 County Business Patterns. <http://www.census.gov/epcd/susb/introusb.htm> and <http://www.census.gov/csd/susb/defterm.html>.

<sup>4</sup> *Characterization and Analysis of Small Business Energy Costs*. For the Small Business Administration Office of Advocacy, prepared by E.H. Pechan & Associates. April, 2008

## Northwest Energy Efficiency Players

Numerous organizations either are involved or could be involved in energy efficiency in the Northwest. Each of these players in the energy efficiency market perceives the opportunities for and barriers to increased energy efficiency financing from a particular vantage point and applies different methods for assessing the marketplace. Figure 1 provides general groupings for these different players based on their current—or potential—roles within this market. The red boxes illustrate the players that are currently more active in the marketplace. As the options described later in this report indicate, however, further involvement from these players is also needed to bolster the marketplace for energy efficiency lending in the Northwest.

**Figure 1. Northwest Energy Efficiency Financing: Current and Potential Players and Roles**



The remainder of this section provides a brief overview of entities with a presence in the Pacific Northwest that are either actively involved in energy efficiency finance or have the potential to play important roles.



## Risk, Return, and Liquidity

### *How Financing Institutions View Lending Opportunities*

Understanding how lenders make decisions about any type of loan helps explain how the financial industry views the business opportunity associated with energy efficiency lending. Risk, return, and liquidity are at the heart of these decisions. Knowledge of this framework provides a basis for both assessing barriers and identifying solutions.

**Risk and return.** Fundamentally, the business of lending is a matter of risk and return. Lenders make decisions about whom to lend to, how much, and on what terms based on their assessment of the risks associated with the borrower and the project to be financed, balanced by the expected return on the loan. If a project or borrower is considered riskier, the lender will demand a higher interest rate and provide shorter terms. Conversely, the best customers with the highest ratings will receive the lowest rate and best terms. Similarly, businesses and investors decide how to deploy their scarce capital based on risk and return calculations with the goal of maximizing return. According to finance industry experts interviewed for this study, lending for energy efficiency projects is no different in this regard than any other commercial lending transaction.

**Liquidity.** The second important concept in understanding any financial marketplace is liquidity—readily available cash and capital. Secondary financing markets—such as when the Federal National Mortgage Association (Fannie Mae) purchases bundled home mortgages from the original lending banks, providing capital the banks can loan again—help provide liquidity in the lending marketplace. Liquidity is the essential ingredient for lending and for markets to grow in the energy efficiency space.

**Utilities.** The region’s natural gas and electric utilities play a central role in realizing energy efficiency. For many years, the region’s electric utilities have invested in energy efficiency as the least-cost resource to meet growing demand; more recently, natural gas utilities are also relying on energy efficiency to meet growing energy use. Utilities have made those investments primarily by offering customers financial incentives in the form of cash assistance for energy-saving measures through rebates, effectively purchasing energy through conservation at costs far lower than those for new power plants or pipelines. In 2008, Northwest utilities spent a total of \$300 million on energy conservation programs and cash incentives for efficiency measures.<sup>5</sup> In recent years, many utility conservation programs have improved program results by developing valuable relationships with “trade allies”—vendors who sell and install energy-saving equipment and retrofits—and larger energy services companies (discussed below).

Both public and investor-owned utilities throughout the region offer conservation programs, and the Energy Trust of Oregon (ETO) is the state’s largest energy conservation program entity. ETO serves customers of several investor-owned Oregon utilities and offers energy efficiency resources and incentives. ETO came into existence in 2002 after the state passed a law requiring investor-owned utilities to collect a 3 percent public purpose charge to fund energy conservation.<sup>6</sup>

Given the central role utilities and ETO play in regional energy efficiency efforts, their participation in creating ways to bridge the funding gap for energy efficiency projects is essential.

**Energy Services Companies (ESCOs).** ESCOs are typically larger firms offering clients integrated energy services—technical and financial—often through a system known as performance contracting, in which the ESCO finances the project cost and is repaid over time from the client’s energy cost savings. Once the debt is repaid, the client

<sup>5</sup> Massoud Jourabchi, Northwest Power and Conservation Council, personal communication with Christine Grant, October 23, 2009.

<sup>6</sup> Energy Trust of Oregon, “Who We Are,” accessed November 9, 2009. <http://energytrust.org/About/who-we-are/>

realizes the ongoing energy cost savings. ESCOs tend to favor “patient” clients—institutions and others that own and operate their buildings over a long time horizon and who see value in deeper energy upgrades with relatively extended payback periods. ESCOs are experts regarding the government and utility rebates and incentives available to help pay for project costs.

**Equipment and Smaller Energy Services Vendors.** This category includes vendors of specific energy-efficient equipment (e.g., heating and cooling systems, energy-efficient commercial dishwashers). Equipment vendors and other energy efficiency service providers are often highly skilled at navigating and maximizing utility rebates. Northwest utility representatives report that energy services vendors are the informal “sales force” to the small business sector for the rebates and incentives the utilities offer. Energy services vendors, along with ESCOs, are the most technically savvy players in the industry, providing businesses and lenders with valuable cost and energy expertise to inform purchasing and financing decisions.

**Primary Lenders.** Private lenders range from large national banks that provide commercial loans of up to \$100 million to smaller regional banks to community development financial institutions (CDFIs) that provide loans as small as \$5,000 to businesses. CDFIs are financial institutions whose primary mission is to promote economic development in struggling communities, both urban and rural, that are underserved by traditional financial institutions.<sup>7</sup> Numerous regional banks in the Northwest lend to smaller businesses, and loan amounts at regional banks can range from \$5,000 to several million dollars. Most national banks will not consider deals that are smaller than \$150,000 because of the staff and administrative costs associated with processing a loan. Though credit unions are also mission-driven financial institutions, by law only 12.5 percent of their total lending can go toward commercial transactions. This federal regulation limits the diversity of services credit unions are willing to offer to businesses, such as specialized commercial energy efficiency lending programs. Only a handful of lenders in the Northwest have energy efficiency lending expertise. Several public loan and grant programs offer funds to businesses expressly for energy efficiency, as discussed in the *Current Programs* section.

**Secondary Market (Refinancers).** The secondary market consists of organizations—both investment banks and publicly backed financial institutions—that buy loans from lenders and then sell them to

<sup>7</sup> Rachel Brombaugh, Shorebank Enterprise Cascadia, personal communication with Christine Grant, September 30, 2009.



### Lender Perspectives on Energy Efficiency Financing Opportunities: A Local Example

Shorebank Enterprise Cascadia, a Northwest community development financial institution (CDFI), recently received a referral from a national commercial bank for a local faith-based organization. The organization is planning to replace its heating, ventilating, and air conditioning (HVAC) system at a cost of \$250,000. The organization has \$40,000 for the project and would need a \$210,000 loan. Though the organization has had many years of positive cash flow, it had a small loss in 2008. The national bank was unable to calculate the projected energy cost savings from the new HVAC system, and thus was unable to use those cost savings in calculating the Debt Service Coverage Ratio (DSCR). The resulting DSCR did not meet the bank’s policy for lending. The CDFI, however, plans to calculate the DSCR using both revenues and lowered energy cost projections; the loan is currently in preliminary underwriting.

This case study illustrates the willingness of large national banks to forgo lending opportunities because they lack the capacity to analyze the risks associated with energy efficiency lending. On the other hand, banks that are developing energy efficiency expertise stand to gain in these types of lending scenarios.



other investors who expect the bundled loans to yield an acceptable financial return. The purchase of loans adds liquidity that allows primary lenders to make additional loans to borrowers. While potential exists for a secondary market to expand the amount of capital available for energy efficiency projects, no such market exists today. The lack of a secondary market is largely due to the challenges associated with developing a robust *primary* market of loans specifically for energy efficiency.

Investors will be attracted to energy efficiency products on the secondary market once energy efficiency transactions are rated and show a track record of success on the primary market, according to an investment banker interviewed.<sup>8</sup> In addition, no government agency exists to help facilitate and drive this demand for commercial loans, as currently occurs in the *residential* housing market with energy efficiency loans. For example, the Federal National Mortgage Association (Fannie Mae) purchases residential energy efficiency loans from lenders, which subsequently enables lenders to issue more residential energy efficiency loans with the capital they receive from Fannie Mae. To date, Fannie Mae has purchased \$225 million worth of residential energy efficiency loans nationwide.

**Investors.** At present, little market exists for direct investment in financial products tied to energy efficiency. Once a secondary market develops, key investor groups will likely include pension funds, private equity, individual investors, and mutual funds. Steve Lacey, Director of Energy Efficiency Programs at the Energy Trust of Oregon, predicts that investments in bundled energy efficiency loan programs will be highly attractive to “patient capital”—such as pension funds with long investment horizons—because investors will likely see a steady 4 to 5 percent annual return on investment.

---

<sup>8</sup> John Christmas, Hannon Armstrong, personal communication with Christine Grant, October 13, 2009.



Findings, Barriers, and Current  
Programs for Energy Efficiency  
Financing



## I. Key Findings and Barriers

---

From our research and interviews, we identified the following key findings regarding the current energy efficiency financing marketplace and major industry players.

1. Overall demand for energy efficiency financing is limited at present, and accordingly, demand for energy efficiency financing from small and medium-sized businesses is also limited.
2. Both lending markets and markets for energy efficiency services are highly complex and segmented.
3. In the current economy, lending to small and medium-sized businesses is limited for anything, including energy efficiency projects.
4. Financing institutions generally are not focused on energy efficiency lending as a special or significant business opportunity.
5. Lending for energy efficiency to the commercial sector brings its own set of risks.
6. Some financial institutions are actively seeking opportunities in this field and are pioneering innovative lending programs.
7. ESCOs and related vendors are leading the way to secure financing for energy efficiency investments using both private equity and conventional lending.
8. Utilities provide substantial funding for energy efficiency, but they generally do not see issuing and servicing loans to their customers as a business opportunity.
9. Trade allies occupy a central place in the network that includes business owners, contractors, utilities, and lenders, suggesting an important role in promoting financing for energy efficiency.
10. Efforts to create a secondary capital market for energy efficiency loans are in their infancy.
11. Interest in legislation that enables energy efficiency loans to remain with the property—rather than the property owner—is growing in the Northwest.

The remainder of this section provides additional information and discussion on these findings regarding the energy efficiency financing marketplace.

**Finding 1. Given scarce capital and debt capacity, overall demand for energy efficiency financing is limited at present; accordingly, demand for energy efficiency financing from small and medium-sized businesses is also limited.**

**Finding 2. Demand for energy efficiency financing is mixed.** Nine interviewees involved in business lending cited low demand from business owners to borrow money for energy efficiency projects at this time. Lenders report that some projects that incorporate aspects of energy efficiency are occurring, however, but they often are not called “energy efficiency projects” because they are part of a larger remodel or construction project.

- **Businesses appear concerned about the opportunity cost of investing in energy efficiency upgrades.** Many building owners have concerns about the opportunity cost of investing capital in energy efficiency upgrades when those funds could be used for another investment with a greater return, such as new production capacities that would increase revenue. Interviews indicate that in today’s capital-constrained economy, businesses are cautious about borrowing for all but the most essential projects or those with the quickest return.
- **The Northwest’s relatively low-cost electricity provides less economic incentive for energy efficiency upgrades.** While smaller businesses bear an energy cost-per-sales ratio that is nearly triple that of large firms, the Northwest’s electric rates mean energy remains a relatively small part of operating expenses for most businesses. This fact complicates efforts to spur greater activity in the marketplace because payback for efficiency upgrades take longer. According to the Energy Information Administration, Washington and Idaho ranked second and third respectively for the least expensive commercial electricity in the nation. The average cost of commercial electricity in the four Northwest states in 2009 was 7.5 cents per kWh, compared to a national average of 10.5 cents per kWh and as much as 16.2 cents per kWh in the New England region.<sup>9</sup>

**Finding 3. Both lending markets and markets for energy efficiency services are highly complex and segmented.** The marketplace for energy efficiency services and associated financing to small and medium-sized businesses is fragmented and complicated. Businesses vary in sizes and type, with myriad energy efficiency project needs, balance sheets, cash flow requirements, ownership structures, energy costs, locations, and business priorities. Similarly, many different types of financial institutions, investors, and other players have the potential to operate in the marketplace. It is important to understand this complexity and recognize that a variety of solutions ultimately will be needed to address the many different types of businesses and financial institutions in the Northwest.

---

<sup>9</sup> Energy Information Administration, *Average Retail Price of Electricity to Ultimate Customers by End-Use Sector, by State, June 2009 and 2008*, released September 11, 2009.

**Finding 4. In the current economy, lending to small and medium-sized businesses is limited for anything, including energy efficiency projects.** Commercial banks have a low appetite for risk and are lending only to their best customers and to those with the strongest balance sheets. Financial institutions currently are hesitant to consider new lending opportunities such as those associated with energy efficiency.

- **Overall lending to small and medium-sized businesses is down.** Both lenders and ESCOs report that, as a result of the credit crisis, less lending is available to smaller businesses that tend to be less creditworthy than larger businesses. As a result, many businesses are having difficulty securing a fixed, low rate loan for any type of project.
- **A business's lack of creditworthiness is a key obstacle for lenders when they are considering making a loan for an energy efficiency project.** An interviewee from McKinstry, a major ESCO, estimated that poor creditworthiness causes 90 percent of the financing failures for potential commercial energy efficiency projects. Another interviewee from the ESCO MacDonald-Miller emphasized that many of their commercial customers' balance sheets were stressed at this time, and those customers are unable to take on more debt.
- **Most businesses do not borrow money from large national banks for energy efficiency upgrades.** An interviewee from one major national bank reported that medium-sized businesses typically make energy efficiency upgrades on an as-needed basis (e.g., when the aging boiler breaks) and pay for those upgrades out of their capital budgets.<sup>10</sup> Smaller businesses are constrained in the amount money they can borrow. Large national banks observe that when a smaller business does borrow, it will invest in projects that result in the quickest payback and immediately improve quarterly earnings. For example, businesses will invest in machinery that automates a process or increases labor productivity.

**Finding 5. Financing institutions generally are not focused on energy efficiency lending as a special or significant business opportunity.** Most lenders assess energy efficiency projects as they would any other type of loan—comparing return and risk while considering collateral, creditworthiness of the business, and cash flow to meet repayment terms.

- **Lending institutions are loyal to their traditional lending models.** Although a handful of lenders are considering and even developing customized energy efficiency lending tools and services, this field is still in the “early adopter” stage. Most commercial lenders are not cognizant of energy efficiency as a distinct market.
- **Lenders are only beginning to understand the impact of energy efficiency upgrades on the asset value of a holding.** Energy efficiency upgrades can add value to properties and projects, primarily through lower operating costs. Lenders have had difficulty portraying this value-add in financial terms until recently. ESCO representatives and energy policy experts noted that the growth of systems in which buildings receive published energy efficiency scores will move energy efficiency valuation more into the mainstream. Furthermore, as more buildings obtain energy efficiency ratings, more data will become available to demonstrate that the net

---

<sup>10</sup> Neil Skiver, Bank of America, personal communication with Christine Grant, October 13, 2009.

operating income of a building increases after upgrades are made. According to an interview with McKinstry, a growing number of insurance companies and real estate professionals are now considering energy efficiency when appraising a building.<sup>11</sup> Lenders may begin to favor financing for energy efficient projects on the basis of improved cash-flow and collateral asset valuation as it becomes more common to include energy efficiency ratings in financial analyses.

- **Most lenders interviewed cited a lack of standardized, financial data on energy efficiency outcomes,** meaning they cannot include operating savings calculations in their evaluation of the viability of energy efficiency lending. A 2009 policy briefing from the Natural Resources Defense Council also found that a lack of data demonstrating the financial benefits of energy efficiency investments is a key barrier to the participation of private lenders in this market.<sup>12</sup>
- **Venture capital firms do not invest in small to medium-sized business energy efficiency projects.** Even though venture capital firms have a growing interest in the clean energy economy, Northwest venture capital representatives stated that firms usually look for large-scale projects that are more technology-based, particularly in renewable energy. Also, venture capital firms typically seek returns between 20 to 35 percent.
- **Long payback period of “deep” energy efficiency retrofits limits lender interest.** Several ESCO representatives noted that lenders are frequently uncomfortable with the long payback periods associated with “deeper” commercial energy efficiency projects—such as building shell improvements. Many lenders do not want to offer a loan term that matches the payback period of the retrofit, which in turn makes shorter-term financing packages unattractive to potential borrowers.

**Finding 6. Lending for energy efficiency to the commercial sector brings its own set of risks.** Risks and returns associated with energy efficiency projects vary widely and differ in important ways from other types of equipment or project investment. These risks are in addition to the generic risks of lending to small and medium-sized businesses and complicate the development of new programs and initiatives to expand lending for energy efficiency.

- **Many energy efficiency investments are characterized by high initial costs and long repayment periods.** This combination requires lenders to take on more risk. Although the lifecycle costs of energy efficiency are nearly always positive, the initial outlay of capital can be a stumbling block for lenders and businesses alike. In addition, the simple payback—*not to be confused with loan repayment periods*—for energy efficiency upgrades frequently can exceed 10 years. A recent McKinsey report found that the average payback period expected by commercial customers considering energy efficiency investments is only 3.6 years.<sup>13</sup> The longer the payback period, the riskier the investment from a lender’s perspective. Not surprisingly, demand is limited for energy efficiency projects that have a longer payback than businesses expect.

---

<sup>11</sup> Matt Wegworth, McKinstry, personal communication with Christine Grant, October 15, 2009.

<sup>12</sup> Natural Resources Defense Council, *Scaling up Investment in Energy Efficiency with a Federal Energy Efficiency Financing Facility*, April 2009.

<sup>13</sup> McKinsey & Company, *Unlocking Energy Efficiency in the U.S. Economy*, July 2009.

- **The ownership structure of buildings frequently results in split incentives.** Commercial building owners who lease their buildings and require tenants to pay the utility bills have less incentive to install conservation measures, as energy savings benefits accrue to the tenants rather than owners. Owners of small to medium-sized businesses can be found among both tenants and building owners.
- **Collateral is a key barrier to increased financing.** Lenders have limited recourse in the event of nonpayment on certain energy efficiency loans. Many energy efficiency retrofits are considered fixtures (permanently attached to the property) and therefore are considered real property and thus have limited value as collateral. On the other hand, certain types of equipment and appliances can be removed in the event of non-payment and, therefore, can be used as collateral.<sup>14</sup>

**Finding 7. Some financial institutions are actively seeking opportunities in this field and are pioneering innovative lending programs.**

- Based on interviews, CDFIs are presently the most actively engaged entities in energy efficiency lending to small and medium-sized businesses. CDFIs receive grants from private foundations and government programs, which allow them to provide a lower cost of capital to businesses making energy efficiency upgrades (or other types of targeted investments). Recently, many CDFIs have started to see increased interest in energy efficiency from their public and private funders and have therefore started to transition more quickly into energy efficiency lending than larger commercial banks. As a result, CDFIs tend to be somewhat savvier about energy efficiency lending; for the most part, however, CDFIs continue to evaluate loans for energy efficiency projects in the same way as most other loan requests.
- **Some regional banks see energy efficiency lending as a niche market.** In the course of our research, we identified one regional bank operating a commercial-sector energy efficiency lending program. In 2008, Umpqua Bank launched its GreenStreet Lending program in collaboration with the Energy Trust of Oregon (ETO). This program provides low-interest financing of up to \$500,000 for small businesses to implement energy efficiency projects that are eligible for ETO incentives. These loans are equipment-secured, or they have a senior lien on the property. The benefit of this collaboration for Umpqua Bank is that ETO's Trade Allies serve as a sales force for GreenStreet while they are selling their own products and services to customers. Dan Weldon, Umpqua's Eco-banking Manager explained that the GreenStreet program has helped Umpqua reach new customers and reinforce its values-driven banking philosophy.
- Umpqua Bank is staying true to its triple-bottom line philosophy of environmental, economic, and community benefits, though it is forgoing some revenue by operating the GreenStreet program. To leverage the ETO Trade Ally network, Umpqua agreed to waive all closing fees for GreenStreet loans (typically 1 to 2 percent of the total loan amount), and Umpqua also offers

---

<sup>14</sup> U.S. Department of Energy, Energy Efficiency and Renewable Energy, *Innovative Energy Efficiency Financing Approaches*, June 2009.

interest rates for GreenStreet loans that are about 50 basis points lower than their typical commercial loans—approximately 6.5 percent.

- **Innovative lenders are incorporating energy efficiency into their standard lending screening process.** For example, the National Development Council (NDC), one of the CDFIs interviewed, reported that it will not approve a loan for a capital or construction project unless the borrower demonstrates awareness of all applicable utility rebates and incentives. Though it inquires about the use of utility rebates and incentives, NDC will not modify loan terms based on the use of rebates or incentives because it already offers very low rates to its customers. NDC sees this policy as an educational step, rather than a part of determining the loan package.

**Finding 8. ESCOs and related vendors are leading the way to secure financing for energy efficiency investments using both private equity and conventional lending.** These firms typically work with larger businesses, however, along with public and non-profit institutions. Generally, smaller companies of fewer than 100 employees are not attractive clients for ESCOs because administrative costs are high relative to the typical revenues of small business energy efficiency projects.

- ESCOs predominantly finance energy efficiency projects in the Municipal–University–School–Hospital (MUSH) market and at the federal level. Public clients like schools, cities and counties have longer investment horizons and in many cases are politically and socially obliged to act as “early adopters.” Many large national banks and ESCOs will not offer long-term financing to private businesses for energy efficiency projects but will do so for MUSH market and federal government entities because they are considered lower long-term risks.
- One local ESCO has forged relationships with lending institutions to facilitate streamlined financing for energy efficiency projects. McKinstry Capital, a practice group within McKinstry, issues requests to a broad range of lenders to identify possible financing partners. The company leverages these lender partnerships as it proposes services to potential clients.
- **Another ESCO has created an investment vehicle that is attracting public and private investors.** MacDonald-Miller’s customer base is businesses with 250 to 500 employees. Many of these businesses are conserving capital for other projects, and they are cautious about adding more debt. The company created its *Energy Fund*, which behaves much like a typical ESCO performance contract: the business agrees to a monthly charge to pay for the upgrades based on a monthly energy savings guarantee resulting from the installed upgrades. Businesses do not have a loan on their books and do not need upfront capital. This system has essentially made MacDonald-Miller an aggregator of small energy efficiency projects, and the company is currently seeing interest from public and private institutional investors in expanding this model because of the substantial cost-saving opportunities available in this sector. For example, a recent analysis completed by MacDonald-Miller found approximately \$9 million worth of annual energy efficiency savings among 70 commercial facilities in downtown Seattle.<sup>15</sup> MacDonald-Miller recently received a \$1.5 million loan from the Washington State Department of Commerce to help fuel the expansion of its *Energy Fund*.

---

<sup>15</sup> Perry England, MacDonald-Miller Facilities Solutions, personal communication with Christine Grant, October 5, 2009.

**Finding 9. Utilities provide substantial funding for energy efficiency, but they generally do not see issuing and servicing loans to their customers as a business opportunity.**

- **Energy providers are promoters and funders of energy efficiency.** Utilities fund millions of dollars worth of energy efficiency upgrades in the commercial sector each year. In 2007, the Bonneville Power Administration alone spent over \$7 million on commercial energy conservation programs throughout the Northwest.<sup>16</sup>
- **Rules and regulations limit utility investments in energy efficiency to what is cost-effective.** In calculating cost-effectiveness, utilities weigh all energy efficiency program costs—marketing, administration and the full cost of the conservation measure or project—against the projected lifetime energy-saving benefits. The financial incentive a utility offers a customer is based on that cost-effectiveness test; rarely do utility conservation programs pay 100 percent of the cost of an energy efficiency measure or project. If utilities choose to offer their customers financing, it adds an additional cost to the measure, reducing the percentage of project cost paid by the utility. In the past, when utilities have offered a choice between loans or rebates to customers for energy conservation projects, customers nearly always chose rebates because it was a better financial “deal” for them.
- **On-bill financing is more attractive to utilities, but start-up costs are high.** On-bill financing facilitates the repayment of loans for efficiency upgrades on utility bills. Many Northwest utilities have witnessed the success of on-bill financing in other parts of the country and are potentially amenable to processing loans in partnership with a financial entity that would assess the creditworthiness of borrowers and take on the financial risk. One utility representative explained that on-bill financing systems could become a widespread energy efficiency financing repayment mechanism, but at this time his utility, like many others in the Northwest, lacks the budget or staff to start an on-bill financing program.<sup>17</sup>
- Trade allies occupy a central place in the network that includes business owners, contractors, utilities, and lenders, suggesting an important role in promoting financing for energy efficiency.
- **Trade ally networks can help ensure effective service delivery and enhanced marketing for all involved players.** The Green Street Lending program offered by Umpqua Bank with the Energy Trust of Oregon is an example of how trade ally networks use the strengths of all involved partners. ETO’s Trade Ally Network of contractors, real estate professionals, distributors, and other professionals support the program. The trade allies promote ETO programs, provide energy efficiency and renewable energy services, and assist customers with necessary paperwork. In return, ETO staff members refer customers to Trade Allies, provide training and assistance, and direct customers to Umpqua’s GreenStreet Lending program for project financing.<sup>18</sup>

---

<sup>16</sup> Bonneville Power Administration, *Conservation Resource Energy Data—Fiscal Year 2007*, released 2008.

[http://www.bpa.gov/energy/n/pdf/RED\\_Book\\_FY07\\_FINAL.pdf](http://www.bpa.gov/energy/n/pdf/RED_Book_FY07_FINAL.pdf)

<sup>17</sup> Van Ashton, Idaho Falls Power, personal communication with Christine Grant, October 21, 2009.

<sup>18</sup> Dan Weldon, Umpqua Bank, personal communication with Christine Grant and John Healy, October 19, 2009.

- **Contractors and other energy services vendors provide an effective sales force for energy efficiency.** Contractors and energy services vendors play a significant role in program delivery because they often have established relationships with small businesses in their communities. A recent report by the Southwest Energy Efficiency Project on financing clean energy projects found that the most successful energy efficiency programs empower contractors and retailers to sell not only energy efficiency products, but to also connect customers to available financing.<sup>19</sup>

**Finding 10. Efforts to create a secondary capital market for energy efficiency loans are in their infancy.**

- **Currently, no established secondary market exists for commercial energy efficiency loans.** Creating demand for energy efficiency loans on the secondary market will provide liquidity to lending institutions—allowing lenders to issue and service more loans for energy efficiency projects. Many energy efficiency financing experts and policy makers recognize the importance of a *secondary* market for commercial energy efficiency loans, but they are focusing their present efforts on creating a *primary* lending market for energy efficiency loans. When asked about the creation of a secondary market for energy efficiency loans, Oregon House Representative and economic consultant, Jules Kopel-Bailey, remarked that “investors still need a better sense of risk and return. We need a data bank to prove concept to investors.”<sup>20</sup>
- A small secondary market exists for *residential* energy efficiency loans, which could indicate how the secondary market for commercial loans might develop. Residential energy efficiency loans have made a legitimate debut on the secondary market, though the demand from private investors for these loans remains tenuous. To date, Fannie Mae has purchased approximately \$225 million in energy efficiency loans from a handful of lenders in California, New York, Pennsylvania, and Wisconsin. Fannie Mae is charging lenders a relatively high interest rate (12 to 14 percent)—despite that default rates are low on these loans. To continue these lending transactions despite high rates, the four host states are covering a portion of the interest (up to 8 percent) to buy down rates for borrowers. Lenders also have an incentive to continue providing the energy efficiency loans because Fannie Mae pays the lenders an origination fee and a servicing fee.<sup>21</sup>
- **Early efforts are underway to expand the secondary market for energy efficiency loans in the Northwest.** For example, one regional financial institution, Seattle-Northwest Securities, is actively working with utilities, municipal governments, and state agencies to create mechanisms that provide a secondary market for energy efficiency loans.

**Finding 11. Interest in legislation that enables energy efficiency loans to remain with the property—rather than the property owner—is growing in the Northwest.**

- **Property Assessed Clean Energy (PACE) bonds offer a promising model.** With a more than a dozen programs now operating in the United States, PACE bond financing is gaining traction as an innovation that can address the upfront capital barrier. In this model, PACE bond proceeds

<sup>19</sup> Southwest Energy Efficiency Project, *Recent Innovations in Financing for Clean Energy*, October 2009.

<sup>20</sup> Kopel-Bailey, Jules, Oregon State House of Representatives, personal communication with Christine Grant, October 20, 2009.

<sup>21</sup> Howard Banker, Energy Programs Consortium, personal communication with Ann Grodnik, October 1, 2009.

are lent to commercial and residential property owners to finance energy efficiency retrofits. The owners then repay the loans through annual assessments on their property tax bills or in some cases through their utility bills. PACE financing is available either through municipal bond issue (as is frequently done for municipal capital investment projects) or through an alternative funder, such as the federal government or a private investment bank. With PACE financing, the risk of loss is minimized as property tax liens can be made senior to mortgage debt.<sup>22</sup> One investment banker explained that PACE “will provide lenders with the strongest collateral available in commercial energy efficiency transactions: the building itself. This will reduce rates and extend lending periods, allowing deep and comprehensive retrofits to be performed.”<sup>23</sup> PACE financing does raise concern from commercial banks that their mortgages would be subordinated by the senior position of an energy efficiency loan and from utilities worried that local governments could compete with them in the delivery of energy efficiency services.

- **Oregon has adopted its version of PACE.** In July 2009, the Governor of Oregon signed HB 2626, the Energy Efficiency and Sustainable Technology Act of 2009 (EEAST). A residential pilot program called Clean Energy Works: Portland using the EEAST financing mechanism is scheduled to begin in Portland later this year and will be funded initially with federal stimulus dollars. A commercial pilot is also scheduled to be introduced later in 2010 and is likely to be funded with federal stimulus dollars, as well. Oregon State Rep. Jules Kopel-Bailey, a primary sponsor of the law, reported that EEAST is a “huge first step in allowing for state bonding capacity and providing low-cost energy efficiency loans across building types.”<sup>24</sup>
- **Washington’s constitutional prohibition against the lending of credit creates challenges** for proponents of PACE. Alternative approaches such as establishing Conservation Utility Districts run by municipalities create a separate set of issues. Utilities raise concerns that municipally run Conservation Utility Districts would overlap with existing utility energy conservation programs, creating confusion for consumers and potentially make program delivery more expensive.
- **Idaho is considering its own version of PACE financing**—Idaho Energy Independence Districts. These districts would provide interested property owners with financing for renewable energy generation equipment and energy efficiency improvements that would be repaid through a special property tax assessment. Idaho policymakers have been stymied by regulations that limit the lending of public money for private purposes. Lane Packwood, Administrator of Economic Development for the Idaho Department of Commerce, reports that Idaho lawmakers and energy advocates are considering a variety of solutions to overcoming this barrier. Packwood is not optimistic that elected officials will amend the state’s constitution in the near term to allow for municipal financing, but he does believe that the PACE repayment method could be a viable option if loan funds originated from state bond issue, federal funds, or private funds.

**In early 2009, Montana State Representative Brady Wiseman sponsored PACE legislation—HB 361: Energy Improvements Districts.** The bill failed, but garnered support from the building industry, clean energy advocates, and other Montana politicians. Similar to PACE frameworks in other states, the bill

---

<sup>22</sup> PACENOW. <http://www.pacenow.org/>

<sup>23</sup> John Christmas, Hannon Armstrong, personal communication with Christine Grant, October 13, 2009.

<sup>24</sup> Kopel-Bailey, Jules, Oregon State House of Representatives, personal communication with Christine Grant, October 20, 2009.

would have authorized cities and counties in Montana to create Energy Improvement Districts and issue special assessment revenue bonds. Bond proceeds would be used to make loans to property owners within an Energy Improvement District for the purposes of installing renewable energy systems or energy efficiency improvements to residential, commercial, or industrial properties. Though the bill faced strong opposition from utilities and the Montana Banking Association for the reasons stated earlier, proponents are considering introducing a similar measure in the 2011 legislative session.

**Table 3** summarizes the most important—and most persistent—barriers to energy efficiency financing.

**Table 2. Summary of Key Barriers to Energy Efficiency Financing**

ENERGY EFFICIENCY FINANCING BARRIERS	
<b>Low energy costs</b>	The low cost of energy to businesses, relative to other operating expenses and/or revenue opportunities. This situation translates into a high opportunity cost for a business to use scarce capital and/or lending capital for energy efficiency rather than some other type of investment. Low energy costs generally reduce business interest in energy efficiency measures.
<b>Longer payback periods</b>	Investments with longer paybacks, as is the case with some energy efficiency projects, are inherently risky. Lenders demand a commensurately higher rate of return, which in turn, reduces the financial viability of the project to the business. This barrier was referred to by some interviewees as the “expectations hurdle.”
<b>Poor credit ratings</b>	The underlying poor creditworthiness of many smaller businesses, especially in today’s recessionary economy makes them bad risks. The small business sector has a notoriously limited borrowing capacity.
<b>Lack of collateral</b>	The lack of collateral associated with many types of energy efficiency projects makes lending for such projects unattractive to many financial institutions.
<b>Hurdles to on-bill or property tax financing</b>	There are legal, institutional, and political challenges associated with creating on-bill or PACE financing schemes in Idaho, Montana, and Washington.
<b>Lack of data on financial benefits</b>	The “Data Gap”—that is, the lack of data available that can demonstrate the actual financial benefits of energy efficiency lending. Many lenders interviewed cited this lack of information as a key barrier, translating into an inability to include operating savings calculations in their evaluation of the viability of energy efficiency lending.
<b>Lack of standardized financial products for energy efficiency</b>	The costs, time, and effort associated with developing standardized energy efficiency products and associated energy efficiency loan portfolios. Time and resources are required to assess opportunities and to develop appropriate financing products across financial institutions for energy efficiency lending specifically. In lean times, it is unlikely that commercial banks will invest the time and resources to understanding this emerging market.
<b>Insufficient track record of loan performance</b>	The lack of any real track record associated with energy efficiency loan performance makes many lenders hesitant to get into this market. Issues and concerns that lenders have relative to this lack of performance include pre-existing liens, difficulty securing actionable liens, term constraints, and limitations of many real estate ownership arrangements. <sup>25</sup>
<b>Delayed timing of utility incentives</b>	In most cases, utilities do not provide their incentives upfront, and most lenders are unwilling to consider utility rebates or tax credits as direct equity in underwriting loans. Consequently, businesses have to assemble more initial capital, which increases risks and financing costs and reduces the feasibility of such projects for poorly capitalized businesses.

<sup>25</sup> Natural Resources Defense Council, *Scaling Up Investment in Energy Efficiency with a Federal Energy Efficiency Financing Facility*, April 2009.

## II. Current Programs

---

Many new government-backed programs and initiatives are underway in the Northwest and elsewhere to stimulate lending and capital flows for energy efficiency projects. Several publicly sponsored programs in the region provide **credit enhancement** and **direct subsidies** that can help attract and leverage private capital to finance commercial energy efficiency projects. **Public loan programs** forgo the participation of private lenders all together or cover a portion of the financing in partnership with a private lender.

The programs highlighted below are not an exhaustive list of the publicly supported energy efficiency financing programs available to Northwest businesses. Rather, the programs listed below represent a subset of programs that are the most frequently cited for their high participation rates, unique structure, or ability to change how lenders perceive the risk, return, and liquidity equation.

### ■ ■ ■ ■ Credit Enhancement

- Washington State Department of Commerce: Credit Enhancement Program
- The Department of Commerce designed a \$5 million revolving loan program comprised of State Energy Program funds to provide credit enhancement—mitigating risk through loan loss reserves, loan guarantees or other financial commitments—for lenders and financial institutions that participate in energy efficiency financing. The loan program spans residential and commercial segments and is primarily focused on leveraging private capital toward energy efficiency lending. Funding will be distributed in early 2010. Washington is the first state to design such a program with federal stimulus funding under the American Recovery and Reinvestment Act (ARRA) of 2009.
- Small Business Administration 7(a) Loan Guarantee Program
- Under the 7(a) loan program, the Small Business Administration (SBA) itself does not provide loans; instead, the SBA guarantees all or part of loans made by banks and other lenders. The 7(a) program offers several individual types of loan guarantees. As part of the 7(a) program, the SBA created the *SBAExpress* Program which offers a 50 percent SBA-backed guaranty, and an average loan of \$35,000 with a maximum loan size of \$350,000. Recently the SBA and the U.S. EPA have collaborated to promote the use of the *SBAExpress* Program to help small businesses adopt more energy-efficient practices. *SBAExpress* loan funds can be used for the purchase of energy-efficient appliances, high-efficiency HVAC and heat pump units, lighting retrofits, and more. Over the last two years there has been a substantial decline in SBA lending because the secondary market for SBA guarantees has been frozen. Lenders have not been able to maintain liquidity and subsequently stopped making loans to small businesses. According to Mark Costello, an SBA Lender Relations Specialist, the secondary market is now making a slight recovery and lenders are beginning to sell SBA guarantees again.<sup>26</sup>

---

<sup>26</sup> Mark Costello, Small Business Administration, personal communication with Christine Grant, October 1, 2009.

- Department of Agriculture’s Rural Energy for America Program (REAP)—Loan Guarantee
- The United States Department of Agriculture (USDA) provides loan guarantees for renewable energy and energy efficiency projects for agricultural producers and rural small businesses through its REAP program. The REAP guaranteed program is lender-driven. USDA guarantees the loan rather than lending directly. A commercial lender seeks the guarantee, and, if approved, it makes (and services) the loan. The federal guarantee for lenders is between 60 and 80 percent of the total loan amount. The benefit to lenders is that there is an active secondary market for REAP guarantees and the guaranteed portion of the loan is protected against loss by a federal guarantee. Mary Traxler, a Washington State Business Programs Specialist for USDA, remarked that USDA staff has met with or actively marketed the program to all Washington State lenders. Since 2003, only two loan guarantees in Washington State have been processed through this program—both for renewable energy projects.

### ■ ■ ■ ■ Direct Subsidies

- Utility Rebate and Incentive Programs
- As noted previously, utilities throughout the Northwest sponsor numerous rebate and incentive programs for businesses. Typically, utilities provide incentives covering approximately 50 percent of total project costs for commercial energy efficiency upgrades or appliances. In some instances, utilities will cover the entire cost of the measure. For example, Seattle City Light covers the full cost of T8 light fixture replacement and installation for businesses through their *Quick Lighting Upgrade Initiative*. Innovative lenders are beginning to consider the rebates and incentives offered by utilities as equity that can help increase the creditworthiness of potential customers. Chuck DePew, the Seattle director of the National Development Council (NDC)—a national non-profit economic development organization—reported that nearly all utilities have energy efficiency rebates and incentives that lenders should be aware of. Any business borrowing from NDC for a capital or construction project is asked about the energy efficiency aspects of their projects. Typically, loans will not be approved until the borrower demonstrates that they are taking full advantage of all applicable utility rebates and incentives.
- Oregon’s Business Energy Tax Credit (BETC)
- Oregon offers tax credits for energy efficiency measures. The tax credit is equal to 35 percent of eligible project costs, generally meaning the extra cost associated with energy efficiency above and beyond the cost of standard, code-compliant systems or equipment. Eligible conservation projects include but are not limited to insulation, HVAC, commercial systems, and industrial process upgrades that reduce energy use. Most projects must save at least 10 percent of energy above the baseline level, but lighting retrofits must save 25 percent of energy above the existing installation. In 2007 and 2008, the Business Energy Tax Credit funded over 3,600 conservation projects.
- Montana Energy Conservation Tax Credit for Business

- Businesses can deduct up to \$3,600 from gross corporate income for a capital investment in a commercial building for energy conservation purposes that is not financed by state, federal, or private grant funds for energy conservation. To qualify for this credit, the taxpayer has to show that the investment will reduce the waste of energy or reduce the amount of energy required to accomplish a given amount of work.<sup>27</sup>

## ■ ■ ■ ■ Public Loan Programs

- Oregon's Department of Energy: Energy Loan Program
- Oregon's Energy Loan Program (known as SELP) offers low-interest loans to businesses to help fund energy efficiency and renewable energy projects. Rates are between 6 and 7 percent with terms between 5 and 15 years. In 2008, the program disbursed \$15.5 million for 31 conservation projects, or an average of about \$500,000 per project. The loan program is self-supporting, with funds raised through the sale of Oregon general obligation bonds. Commercial SELP loans must be fully secured. A first or second mortgage on the project's land, buildings, and equipment is usually pledged. The SELP program has seen only one default, producing a default rate of around 0.3 percent.
- Idaho Energy Efficiency Business Loan Program
- The Idaho Office of Energy Resources offers low-interest loans ranging from \$1,000 to \$100,000 to businesses for energy efficiency and renewable energy projects. Eligible efficiency projects in new buildings are limited to lighting systems, occupancy or daylight sensors, and building commissioning. Eligible efficiency projects in existing buildings include upgrading lighting, heating systems, windows and doors, and insulation. Projects must use existing, reliable technology and pay for themselves through energy savings within 15 years. Loans have a 4 percent interest rate and must be repaid within 5 years.
- Small Business Administration Certified Development Company 504 Loans
- The SBA's 504 Certified Development Company (CDC) loan program for small businesses funds real estate transactions, construction, renovation, and equipment purchases, including energy efficiency upgrades. Projects that incorporate efficiency features that reduce energy use by at least 10 percent qualify for up to a \$4 million loan. The SBA will fund up to 40 percent of the total project cost, a second lender must provide up to 50 percent of the cost, and the business owner must fund the difference with a down payment. Businesses that receive funds generally must create or retain one job for every \$35,000 provided by the SBA. In 2008, the 504 CDC program funded 430 loans totaling over \$235 million in Idaho, Oregon, and Washington.
- Department of Agriculture's Rural Energy for America Program (REAP) Loans

---

<sup>27</sup> State of Montana, Department of Revenue, *Energy Related Tax Relief: Energy Conservation Installation Credit*, <http://mt.gov/REVENUE/energyconservation.asp>

- Loans and grants for energy efficiency and renewable energy projects are available through the Rural Energy for America Program in addition to loan guarantees. REAP will provide funds to conduct energy audits and install energy efficiency measures such as lighting and insulation retrofits. In 2009, \$60 million was made available nationwide. States receive a formula-based allocation, for example, Washington State received approximately \$3.8 million to disburse—\$3 million in loans and approximately \$800,000 in grants. All agricultural producers and small businesses in a rural area meeting the SBA size standards are eligible to apply. Grants range from \$1,500 to \$250,000, up to 25 percent of total eligible project costs. Starting in 2009, eligible entities can also apply for grants that are less than \$20,000 directly to the USDA—these awarded grant monies will not be draw from the state allocation of funds. Loans range from \$5,000 to \$25 million, but can provide no more than 75 percent of total eligible project costs. Washington State has awarded five REAP grants in 2009 totaling \$755,000. Allocated funds that are not awarded must be returned to the USDA for reallocation to other states.

### Impact of Current Public Finance Programs

Public finance programs fill a funding gap, but they have had limited success to date leveraging private capital or achieving high participate rates in the commercial sector. Some government programs intended to help businesses finance energy efficiency projects do not always reach target markets, however. For some programs, application and reporting requirements may pose significant hurdles for smaller businesses.

- Credit enhancement programs** that provide loan guarantees, such as the SBA 7(a) Loan Guarantee program, are attractive to commercial lenders and result in the most leverage of private capital, but participation in these programs remains limited. For example, the 7(a) Loan Guarantee Program has been extremely popular with lenders and borrowers, however the use of loan guarantees for energy efficiency projects is a new addition to the program and is not marketed widely. The Department of Agriculture’s Rural Energy for America Program also has very low participation rates, despite the attractive credit enhancement options.
- Public loan programs** must adhere to many of the same lending principles that commercial lenders do. Consequently, public loan programs do not offer loan terms or rates that are substantially better than a loan from a bank.

### Options and Recommendations for Increasing Energy Efficiency Lending

The previous sections of this report described and documented current private-sector practices, barriers, and government-sponsored programs related to financing energy efficiency for small to medium-sized businesses in the Northwest. The key conclusions from this research are as follows:

- Financing for energy efficiency projects for small to medium-sized business sector is extremely limited at the current time.
- Multiple barriers limit energy efficiency financing, including the struggling economy and financial sector, the relatively poor creditworthiness of many smaller businesses, limited demand for such loans from businesses, the failure of lending institutions to attribute value to

energy efficiency, insufficient collateral, and extended payback periods for some energy efficiency investments.

- These barriers mean that for most businesses, lending institutions and investors, returns are too low and perceived risks are too high for energy efficiency investments to occur on a scale commensurate with either their potential or the need. Accordingly, this marketplace lacks both sufficient liquidity and capital.
- Despite these challenges, financial institutions, utilities, energy efficiency service providers, and governments are undertaking a number of innovative programs and initiatives to advance energy efficiency projects. These initiatives point the way forward, providing new approaches and solutions to increase capital flows.

### III. Proposed Solutions

---

This section of this report identifies and characterizes these options and solutions, with a focus on understanding how each alternative serves to reduce risk, improve return, or increase liquidity and capital flows. An additional key consideration is the extent to which solutions leverage capital. While all of these options could strengthen the marketplace for energy efficiency financing, in the final section, we recommend priorities for early action. These recommendations for early action are intended to lay the foundation for further change and help the marketplace function better on its own to drive energy efficiency action.

Table 3 provides an overview of 15 options that industry experts and the project team identified as potential solutions to increase energy efficiency financing in the Northwest. These proposed solutions are described in more detail below. Please note that the presence of a checkmark indicates that the option reduces risk, increases demand and improves return, or increases liquidity and capital flows **to financial institutions or lenders**.

Importantly, the experts we interviewed and the literature we reviewed emphasized that multiple solutions will be needed to address the barriers and increase capital flows. Interviewees stressed that no “silver bullet” exists, and a portfolio of solutions is the only practical strategy to increase energy efficiency financing across the diverse spectrum of small to mid-sized businesses. To that end, we have organized the alternative options into the following four categories:

- **Improvements to the performance of existing finance mechanisms.** These solutions aim to improve how current financing mechanisms and programs work, to deliver better outcomes with existing levels of capital investment.
- **Improvements to existing support services and systems.** These options focus on how to improve the services and activities essential for effective and efficient lending, including education, information sharing, standards, technical assistance, and program delivery.
- **Legislative and regulatory changes to alter the marketplace.** These solutions would require political action at the state and federal level to modify the current policy and regulatory framework to facilitate energy efficiency financing offerings. (Some options in other categories also include legislative and regulatory modifications, but they largely involve alterations to existing programs and mechanisms, rather than entirely new policy initiatives.)
- **New programs and institutions to add capacity.** These options include new government programs or institutions that could result in a significant infusion of new capital or credit enhancement to expand energy efficiency financing.

**Table 3. Proposed Solutions to Increase Energy Efficiency Financing in the Northwest**

CATEGORIES AND OPTIONS	Mitigates Risk for Lenders	Increases Demand/ Return to Lenders	Provides Liquidity/ Capital	Key Outcome, Benefit, or Barrier Addressed
<b>IMPROVEMENTS TO THE PERFORMANCE OF EXISTING FINANCE MECHANISMS</b>				
1 Encourage utilities to adopt on-bill repayment mechanisms.	✓		✓	Reduces risk of non-payment.
2 Encourage utilities to provide progress payments to businesses that qualify for energy efficiency rebates and incentives.		✓	✓	Reduces equity required from businesses; <i>increases</i> risks to utilities.
3 Dedicate a portion of existing Small Business Administration lending to energy efficiency projects.			✓	Increases funds dedicated for energy efficiency lending; stimulates banks to loan for energy efficiency.
4 Accelerate the development of secondary markets for energy efficiency loan portfolios.	✓		✓	Increases liquidity and reduces lender risks.
<b>IMPROVEMENTS TO EXISTING ENERGY EFFICIENCY FINANCING SUPPORT SERVICES AND SYSTEMS</b>				
5 Accelerate the adoption of commercial building energy performance tracking and disclosure.	✓			Provides better information for lenders to assess performance, risk, and return.
6 Facilitate information sharing among utilities, financial institutions, and contractors about energy efficiency opportunities and cost savings.	✓	✓		Provides better information for lenders, especially to incorporate the effect of rebates and incentives on energy efficiency project financial performance.
7 Create a utility-sponsored technical assistance program for lenders.	✓	✓		Provides better information for lenders, especially to incorporate the effect of rebates and incentives on energy efficiency project financial performance.
8 Launch an education and marketing campaign to small and medium-sized businesses to build demand for energy efficiency projects and associated financing.		✓		Increases demand for energy efficiency projects and financing.

CATEGORIES AND OPTIONS	Mitigates Risk for Lenders	Increases Demand/Return to Lenders	Provides Liquidity/Capital	Key Outcome, Benefit, or Barrier Addressed
<b>9</b> Promote trade ally networks and “one-stop shopping” for energy efficiency resources to small and medium-sized businesses.	✓	✓	✓	Increases demand for energy efficiency projects and financing.
<b>LEGISLATIVE/REGULATORY CHANGES TO ALTER THE MARKETPLACE</b>				
<b>10</b> Advance Property Assessed Clean Energy (PACE) financing in Washington, Idaho, and Montana—similar to Oregon’s existing law.	✓	✓	✓	Enables expansion of the secondary market; reduces risk for lender by providing a senior lien on property; increases return by allowing for lower cost financing.
<b>11</b> Provide utilities with more incentives and fewer barriers to invest their resources in deep energy efficiency retrofits.		✓		Lowers effective interest rates to borrowers.
<b>12</b> Support federal legislation to permit tax-exempt bond financing for clean energy and energy efficiency.		✓	✓	Provides new source of capital and low-cost financing.
<b>NEW PROGRAMS &amp; INSTITUTIONS TO ADD CAPACITY</b>				
<b>13</b> Create a federal Clean Energy Deployment Administration or “Green Bank.”	✓		✓	Provides new source of capital; lowers risk to lenders and investors.
<b>14</b> Use municipal, state, or federal bond-issuing authority to raise funds for energy efficiency projects.			✓	Provides new source of capital.
<b>15</b> Develop and expand revolving loan funds to support energy efficiency projects.	✓		✓	Provides new source of capital; lowers risk to lenders and investors.
<b>16</b> Expand credit enhancement efforts that leverage private capital.	✓	✓	✓	Provides new source of capital; lowers risk to lenders and investors.

## ■■■■ Improvements to the Performance of Financing Mechanisms

Experts, lenders, and vendors interviewed offered a variety of suggestions on how to increase energy efficiency lending using existing mechanisms or “tools in the toolbox.” The four options presented below do not involve major new government programs but, if implemented, would serve to increase capital flows for commercial energy efficiency projects.

### **Option 1. Encourage utilities to adopt on-bill repayment mechanisms.**

Both utility representatives and energy efficiency policy experts proposed this option as a way of simplifying loan repayment and reducing upfront capital outlays needed from property owners. In addition, some models of on-bill financing would allow for the loan to remain with the property, even if sold by the current owner, effectively sharing the cost of upgrades with future beneficiaries. Implementing on-bill financing would require varying degrees of effort and investment from utilities, depending on the capabilities of their current billing systems. Passed in 2009, Oregon’s Energy Efficiency and Sustainable Technology Act calls for on bill financing if an investor- and consumer-owned utility already has on-bill financing capability.<sup>28</sup> Accordingly, Portland General Electric will soon be offering on-bill repayment for the Clean Energy Works Portland pilot program for 500 homes. Northwest utilities outside of Oregon do not face this same legislative driver, however, and may be reluctant to invest in the software and system changes needed to upgrade their billing systems.

The intended outcomes of on-bill repayment systems are to provide a means to finance energy efficiency projects off of the borrower’s regular balance sheet, reduce transaction costs, reduce the upfront capital contributions required from businesses, facilitate loan repayment, and make a direct connection between energy and cost savings for the customer. These changes should increase lending for energy efficiency projects from both banks and, potentially, utilities. On-bill repayment reduces risks for banks, but those risks may be shifted to utilities, depending on how the system is structured.

Since utility bill repayment is essentially attached to the property’s electric or gas meter, this approach, unlike property tax repayment methods, does not require a lien on the property. As a consequence, the ability of banks to package these loans and sell them in the secondary market remains an issue with on-bill financing. Questions also remain about the ability of a utility to disconnect service if a customer has paid for its energy but not for the repayment on its loan.

### **Option 2. Encourage utilities to provide progress payments to businesses that qualify for energy efficiency rebates and incentives.**

Currently, most utilities do not provide rebate or incentive dollars to customers until measures are successfully installed, ensuring that utilities avoid the risk of paying for projects that do not get completed. Progress payments would allow for some of those dollars to be used as equity when a customer is seeking a loan from a commercial lender to finance the remainder of an energy efficiency project. The idea is that some percentage of the total expected rebate or incentive could

---

<sup>28</sup> Oregon Legislative Assembly 2009, Energy Efficiency and Sustainable Technology Act , House Bill 2626, Sections 32 and 33. <http://www.leg.state.or.us/09reg/measpdf/hb2600.dir/hb2626.c.pdf>

be applied to the equity portion of a customer's loan package, with the goal of resulting in a better loan rate and term.

For example, suppose a business is conducting a lighting and HVAC retrofit costing \$500,000 and its local utility will offer a total of \$150,000 in rebates and incentives. The business has \$50,000 available for the project, but it needs to provide a 20 percent down payment to obtain a desirable rate and term from a commercial lender. Through a progress payment, the utility offers a third of the total rebate and incentive dollars upfront. With the \$50,000 progress payment, the business is able to secure an attractive loan package. After all measures are installed properly, the utility awards the remaining \$100,000. This effort would help borrowers use utility rebates and incentives as part of their equity, allowing them to leverage more private capital than they would otherwise.

Several utilities reported that they do have some flexibility within their rebate and incentive programs to offer progress payments. Customers and lenders generally are unaware of this option, however, and request them infrequently. Utility representatives interviewed stated that they would consider offering their customers progress payments, especially for larger projects. Bob Stolarski, Director of Customer Energy Management at Puget Sound Energy, also noted that in addition to progress payments, PSE would be willing to work more closely with lenders, "so that they would have more faith in the incentive and rebate documents."

Implementing this effort would require internal policy changes on the part of utilities and support from regulators. Bonneville Power Administration recognizes the value of progress payments and their benefits to businesses. More advocacy may be needed, however, to increase the availability and marketing of progress payments. One lender noted that any utility tool that provides more equity upfront—like progress payments—would make projects less risky for lenders.<sup>29</sup> The intended outcome of this effort would be to leverage more private capital for energy efficiency investments by showing lenders that rebate and incentive dollars are low-risk equity.

### **Option 3. Dedicate a portion of existing Small Business Administration lending to energy efficiency projects.**

The purpose of this initiative would be to increase the volume of energy efficiency loans by mandating that a certain percentage of SBA loans finance energy efficiency projects. SBA holds a portfolio of roughly 219,000 loans worth more than \$45 billion, making it the largest single financial backer of small to medium-sized businesses in the United States.<sup>30</sup> Dedicating a percentage of SBA lending to energy efficiency would serve as a way to educate and introduce banks to energy efficiency lending. This initiative would also help spur the development of internal energy efficiency expertise within banks, particularly national commercial banks that generate the bulk of SBA loans.

Implementing this initiative would require SBA to change its policies for the loans it guarantees. According to SBA Lender Relations Specialist Mark Costello, "Energy efficiency is a new space for the SBA." Presenting compelling evidence to SBA administrators about the positive impacts such an

---

<sup>29</sup> Rachel Brombaugh, Shorebank Enterprise Cascadia.

<sup>30</sup> U.S. Small Business Administration, "Overview and History." <http://www.sba.gov/aboutsba/history/index.html>

initiative would have on small businesses would be essential to building support for this policy change.

#### **Option 4. Accelerate the development of secondary markets for energy efficiency loan portfolios.**

To increase access to capital for energy efficiency lending, several states are working together to expand leveraging opportunities in the secondary market. Currently, Fannie Mae purchases unsecured residential energy efficiency loan portfolios in the secondary market at interest rates of approximately 12 percent. This pricing is high and does not reflect the low default rates associated with the loans, below 2 percent. Not surprisingly, given the high interest rates, this program has been underutilized. Some states involved with this program use their own funds to buy down the interest rates for consumers, in some cases as low as 4 percent.

The National Association of State Energy Officials (NASEO) and the Energy Programs Consortium (EPC) are organizing states to increase the volume of standardized energy efficiency loan portfolios in the secondary market to attract new buyers, establish a portfolio performance track record, and drive down interest rates. Through this initiative, NASEO and EPC are asking states to introduce standardized underwriting criteria for energy efficiency lending programs. States are also asked to contribute cash to energy efficiency loan portfolios as additional collateral to increase the attractiveness of the securitized portfolio, homogenize the portfolios across the country, and attract new investors into the market. This arrangement creates an incentive for lenders to make energy efficiency loans by guaranteeing they will have buyers for the loans. While the program is in the early design process and currently focused only on unsecured residential loans, the plan is to expand to other types of loans, including commercial. Northwest states could also participate in the NASEO program as a way of supporting the expansion of secondary markets for energy efficiency loans.

### Improvements to Existing Support Services and Systems

The five options presented below provide new and better ways to inform and educate businesses and lenders about the financial performance and economic benefits associated with energy efficiency investing. These options aim to increase both the demand for and supply of energy efficiency loans. For businesses, these proposals are designed to stimulate them to prioritize energy efficiency projects. For lenders, these recommendations will help provide them with the data they need to evaluate energy efficiency projects properly, considering all factors, including the availability of utility rebates and incentives.

#### **Option 5. Accelerate the adoption of commercial building energy performance tracking and disclosure.**

For many building owners as well as lenders, the market value of having a highly efficient building is unknown. Rating a building's energy performance effectively serves to create a mechanism for market differentiation and valuation. Widespread use of a standardized performance rating system would also provide lenders with valuable information on operating cost savings associated with energy-efficient buildings, which would affect the capitalization rate of the property and ultimately could result in more favorable lending terms.

This effort has some momentum in the Northwest. In 2009, Washington adopted a law requiring commercial buildings of 10,000 square feet or larger to disclose Energy Star Portfolio Manager benchmarking data and ratings to prospective buyers, lessees, or lenders. The City of Seattle has passed a disclosure mandate to require annual energy performance data for all commercial and multifamily buildings over a certain size. The City of Portland is considering a requirement for commercial building owners to use the Energy Star Portfolio Manager rating system for buildings over 20,000 square feet.

**Option 6. Facilitate information sharing among utilities, financial institutions, and contractors about energy efficiency opportunities and cost savings.**

Teaming utilities and contractors together to provide prospective borrowers and lending officers with more information on the opportunities for and benefits of energy efficiency investments can stimulate activity. Several of the experts interviewed advanced this proposal. It addresses two of the key barriers identified in this study: the lack of knowledge on the part of small and mid-sized businesses and financial institutions about energy efficiency and the limited coordination between the finance, utility, and energy services sectors.

A state or regional economic development entity—or alternatively, a financial industry trade association—could organize a conference or series of workshops convening financial professionals and utility executives along with ESCOs, contractors, and other experts to focus on energy efficiency investments for small to medium-sized businesses.

A complementary initiative would be to establish a clearinghouse to track and disseminate information on the operating and financial performance of different types of energy efficiency investments in the commercial sector. Grant monies that involve credit enhancement for energy efficiency lending may create incentives for collaboration between lenders and contractors. For example, the Washington State Credit Enhancement program requires lenders and contractors to work together to create measurement and verification protocol for the energy efficiency projects that are funded through the program.

The ideal outcome of this collaboration and information sharing would be a much higher level of knowledge, leading to increased lending by financing entities and perhaps even the creation of innovative new financing mechanisms.

**Option 7. Create a utility-sponsored technical assistance program for lenders.**

This option targets the barrier many financial institutions face when trying to understand energy efficiency projects in financial terms. Without standardized valuation metrics or energy efficiency experts on staff, many lending institutions are hesitant to include the cost savings resulting from energy efficiency projects in their loan calculations. In addition, lenders do not necessarily incorporate the value of utility rebates into their loan decisions. Accordingly, utility-sponsored “energy conservation advisors” could work with financial institutions to assess the value of different energy efficiency projects, facilitate the use of rebates and incentives, and provide vital technical assistance when evaluating different projects.

An Energy Conservation Advisor program would likely begin as a pilot project between a utility and a regional lender. If successful, this model could lead to improved lending terms for projects that can demonstrate energy and associated financial savings, increased use of utility incentives and rebates, and a heightened awareness of the net present value of energy efficiency measures, for both lenders and their customers.

**Option 8. Launch an education and marketing campaign to small and medium-sized businesses to build demand for energy efficiency projects and associated financing.**

Demand from small to mid-sized businesses for energy efficiency projects is clearly lacking. The reasons are numerous, but one explanation that experts interviewed put forth is a lack of marketing and education targeted at small businesses. For example, Tina Vlasaty from the City of Seattle's Office of Economic Development has found that low-cost financing is not the only key barrier to increased energy efficiency. She has observed that "marketing and education are as important as low-cost financing. Small business owners need money and information waved in front of them in order to make energy efficiency upgrades."

Such a campaign—run by utility, government, ESCO trade associations, or a combination—would involve trained energy efficiency specialists conducting outreach to businesses in commercial sectors with a high potential for savings and the financial institutions that serve them. For example, the City of Seattle has found that energy-intensive small businesses tend to be those that use multiple refrigerators, dishwashers, or pneumatic tools in their operations, such as food service establishments, grocers, or manufacturers. Outreach efforts would allow specialists to demonstrate the cost-saving potential and competitive edge that customized energy efficiency measures could bring to individual businesses. In addition to direct outreach, implementation of this campaign could involve creation of a user-friendly website, the distribution of informative print media materials, promotional events, and a recognition program for businesses that achieved a specified level of energy savings.

The result of this campaign would not just be an increased demand for energy efficiency projects and associated supply of financing, but it would improve the bottom line for many small businesses that previously considered high energy bills as fixed costs.

**Option 9. Promote trade ally networks and "one-stop shopping" for energy efficiency resources to small and medium-sized businesses.**

Recognizing that small and mid-sized businesses have limited time and resources, this option proposes to bundle all necessary energy efficiency services into one offering through the trade ally network. The benefit of "one-stop-shopping" is that businesses would only need to work with one service provider to gain access to energy auditing, installation, and financing services. Approved contractors would be the sales force for the program and would help arrange utility rebates and financing from approved lenders. The local utility likely would be the facilitator of this program.

This option is similar to the services that ESCOs currently provide to larger businesses, but because of the relatively high administrative costs relative to the size and revenues associated with smaller business energy efficiency projects, ESCOs generally do not pursue this market.

A similar approach implemented through partnerships of local governments, CDFIs, and nonprofit organizations is in the early stages of development in Bellingham, Seattle, and Spokane in Washington. These programs appear to require public or foundation funding to be economically viable.

## ■ ■ ■ ■ Legislative and Regulatory Changes to Alter the Marketplace

The key findings section of this report identified several areas where legal and regulatory barriers are hindering energy efficiency financing in the Northwest and elsewhere. This section presents three energy efficiency-focused legislative proposals that, if enacted, could “change the game” and make investing in energy efficiency much more compelling for lenders, investors, small businesses, and utilities alike. Some options in the previous sections include legislative and regulatory modifications, but they largely involve alterations to existing programs and mechanisms; the new policy initiatives in this section are intended to produce broader changes to advance energy efficiency.

### **Option 10. Advance Property Assessed Clean Energy (PACE) financing in Washington, Idaho, and Montana—similar to Oregon’s existing law.**

PACE financing refers to programs in which local governments provide funding for private-sector energy projects that provide a public benefit (energy savings) and are paid back through an assessment on the property owner’s tax bill or, in some cases, the utility bill. As implemented in a handful of jurisdictions in recent years, PACE involves placing a senior lien on the property so that the loan is secured by the property and stays with the property even if sold. PACE financing is tied to the property, not the borrower, and it can substantially reduce the transaction costs typically associated with making an energy efficiency loan to a business or resident. With PACE financing, municipalities issue bonds at favorable rates secured by the senior lien to raise money for energy efficiency or other types of clean energy investments.

The key to obtaining legislative support for such a mechanism is that the programs must indeed provide public benefits, in this case defined as increased energy efficiency and reduced greenhouse gas emissions.

PACE financing has many advocates across the Northwest, most notably in Oregon, where the model is being implemented through utility bill repayment. Advocates in Idaho, Montana, and Washington have been exploring different legislative pathways that would allow for some form of PACE financing.

PACE is not a one-size-fits-all policy solution, however, and regulatory innovation will be needed to develop customized, workable strategies. Many legal and financial questions have been raised about how a PACE financing system would work, and advocates in all three states are working to address those questions. In both Washington and Idaho, for example, state constitutions restrict governments from the “lending of credit” to private entities. Ways to comply with constitutional requirements and finance energy efficiency exist, but they are complex and require creativity and key stakeholder support. Accordingly, many are looking to learn from the early adopters—like Boulder County, Colorado, and the city of Palm Desert and Sonoma County in California—to see how their successes can be transplanted to the Northwest.

**Option 11. Provide utilities with more incentives and fewer barriers to invest their resources in deep energy efficiency retrofits throughout their service markets.**

Currently, utilities in the Northwest have varying levels of incentives and disincentives to invest in energy efficiency. In general, utilities are either required or encouraged to implement cost-effective conservation measures. Utilities, regulators and stakeholders typically negotiate the level of conservation and associated annual expenditures on efficiency measures. This process is intended to result in utilities acquiring all of the cost-effective energy efficiency opportunities available in their service territories (i.e., opportunities whose costs are less than or equal to comparable supply-side resources). However, this is not always the case due to two significant disincentives inherent in the ratemaking process.

The first disincentive is that increased energy efficiency reduces utility revenues because the utility is selling less of its product. While the utility saves some money from not having to generate the electricity or purchase natural gas, other costs—power poles and lines, trucks, offices, computers, etc.—remain “fixed.” This means for a utility with an aggressive energy conservation program to remain “whole” it either needs to get more money per unit of energy sold or to recover these fixed costs in another manner. Otherwise there won’t be enough revenue to maintain profits and/or to cover fixed costs. Regulatory mechanisms should, at a minimum, make utilities neutral to increases or decreases in the energy use of their customers.

Investor-owned utilities face a second disincentive because of the way regulatory procedures establish a fair rate of return on utility investments. In general, regulators set rates that include a rate of return—profit—based on the utility's total “capital” investments (these assets are called the “rate base”). This mechanism allows utilities to raise the capital used for investments through borrowing and stock sales. However, most Northwest utilities choose to “expense” rather than capitalize their energy efficiency investments, which does not add to the rate base upon which the fair rate of return is calculated. So, while the utility can recover energy efficiency expenses from bill payers, it does not earn a profit on those investments. (Some utilities are subject to incentives for hitting or penalties for missing agreed-upon energy efficiency targets. Some object that the size of the reward does not adequately compensate for lost revenue and that the incentives fall short of the rate of return allowed for other investments.) As a result, utilities may be hesitant to support a significant scale-up in energy efficiency spending because this is providing energy service to its customers without a financial benefit to the company shareholders.

Regulatory mechanisms should ideally align the interest of the utility and its shareholders with those of its customers by making the benefit to the utility the same regardless of whether the utility invests in generation resources or energy efficiency. Many suggest that a utility should see greater benefits or receive an incentive for more investments in energy efficiency rather than power generation. While there is no single mechanism to reduce disincentives or create incentives, the need for new regulatory strategies to motivate utilities to pursue and support all cost-effective energy efficiency is clear.

## **Option 12. Support federal legislation to permit tax-exempt bond financing for clean energy and energy efficiency.**

At the federal level, U.S. Representative Mike Thompson of California recently introduced H.R. 3525, the Private Activity Bonds for Clean Energy Projects bill. If passed, this bill would amend the Internal Revenue Code to add additional categories of tax-exempt private activity bonds to finance energy efficiency and other clean energy projects. Additionally, the legislation would allow private companies to use both tax-exempt bonds and federal tax credits for these new categories. Tax-exempt bonds' interest payments are not subject to federal income taxes, and interest rates are therefore lower than rates for comparable taxable bonds or commercial loans. By granting private entities access to this low-cost financing, the bill would help stimulate investment in clean energy projects. The bill has received minimal attention.

### **New Programs and Institutions to Add Capacity**

The project team considered a range of options proposed by experts and referenced in the literature to establish significant new programs and institutions to provide additional public-sector capital for energy efficiency investments in the Northwest and beyond. Three options that appear to offer the greatest promise and provide for the best leverage of public funds with private capital are presented below. Other options that were considered but were not deemed as promising for the Northwest include issuing “victory bonds,” issuing tax-credit bonds, and stand-alone federal loan guarantees.

## **Option 13. Create a federal Clean Energy Deployment Administration or “Green Bank.”**

Pending federal climate legislation includes proposals to establish a Clean Energy Deployment Administration (CEDA), frequently referred to as the “Green Bank,” which would be federally funded with up to \$10 billion. CEDA would provide a federal guarantee of repayment for certain commercial energy efficiency loans that could be sold on the secondary market, thus providing liquidity to lenders. Analysts believe that CEDA could potentially guarantee up to \$200 billion in private investment.<sup>31</sup> CEDA's federal backing would also result in improved terms for borrowers and enable investment in efficiency measures that otherwise would not occur. According to the Natural Resources Defense Council, the goal of a federal institution like CEDA would be to provide a financing framework for lenders so that their organizations could greatly expand lending programs for energy efficiency retrofits.<sup>32</sup> For example, CEDA could help set underwriting standards and gather and disseminate data related to the performance of energy efficiency projects and loans for projects of all sizes.

Currently, both the U.S. House and Senate versions of the climate bill include provisions for CEDA, though much debate remains about the climate bill itself and CEDA's authority. One major issue of contention concerns the allocation of funds for different technologies. The House version of the bill

---

<sup>31</sup> Coalition for the Green Bank. <http://www.coalitionforthegreenbank.com/in-the-news.html>

<sup>32</sup> Natural Resources Defense Council, *Scaling up Investment in Energy Efficiency with a Federal Energy Efficiency Financing Facility*, April 2009.

mandates that no single technology—such as wind, nuclear, or conservation—could receive more than 30 percent of CEDA’s backing, while the Senate bill does not set such a cap.<sup>33</sup>

**Option 14. Use municipal, state, or federal bond-issuing authority to raise funds for energy efficiency projects.**

Where constitutionally permitted, issuing state or municipal bonds represents an attractive method for raising capital to fund energy efficiency projects. Bonds could be issued either against a state or municipal government’s general obligation taxing authority or tied specifically to the performance and energy cost savings of the energy efficiency portfolio. (The tax status of the bonds would depend on each state’s limitations on lending of credit.)

In addition, the 2009 American Recovery and Reinvestment Act introduced tax credit bonds known as Qualified Energy Conservation Bonds (QECBs) to offer reduced interest rates for municipalities financing energy efficiency and other greenhouse gas reduction projects. Oregon currently issues bonds backed by the state’s general obligation to fund its Small-Scale Energy Loan Program, and the state is authorized to issue tax-exempt debt to finance renewable energy development.

**Option 15. Develop and expand revolving loan funds to support energy efficiency projects.**

Revolving loan funds (RLFs) offer a mechanism to finance energy efficiency projects at small and medium-sized businesses, often with subsidized low-interest loans. Following their initiation with seed funding, RLFs are designed to be self-replenishing, with the principal and interest payments on existing loans providing capital to make new loans. RLFs offer an additional pool of funds for small and mid-sized businesses as they pursue financing for energy efficiency projects, and they can be used in conjunction with other financing options. For seed funding, revolving loan funds can draw on both public and private capital, including foundation funding and sources of “patient capital.”

A number of jurisdictions are creating new loan funds to finance energy efficiency, relying in large part on federal stimulus funds. Both Portland and Seattle, for example, are using federal block grant funding as seed money for their residential energy efficiency loan programs. Seattle’s Office of Economic Development is seeking competitive ARRA funding for a similar fund focused on small commercial properties.

**Option 16. Expand credit enhancement and other mechanisms that leverage private capital.**

Risk management and credit enhancement are critical to leveraging private capital for energy efficiency. The existing public loan programs, for the most part, lack the ability to leverage private capital. This restriction significantly limits the total number and size of loans that can be issued each year, since the loan programs can only revolve when loans are paid back. Loan programs that

---

<sup>33</sup> Peter Behr, “Green Bank Proposals Probe the Hostile Frontier of Politics and Finance,” *New York Times*, October 2, 2009. <http://www.nytimes.com/cwire/2009/10/02/02climatewire-green-bank-proposals-probe-the-hostile-front-86440.html>

incorporate credit enhancement, property tax assessments, or other mechanisms that increase the security of revenues for loan repayment are generally best positioned to gain access to private capital in the secondary market for take-out financing. Despite that default rates on energy efficiency loans have been very low, energy efficiency lending does not have a long enough credit history to attract significant amounts of private capital without credit enhancement. Washington State's Department of Commerce soon will be directing \$5 million in ARRA funds toward credit enhancement mechanisms to leverage public investments in energy efficiency.

## IV. Recommendations

---

Considering the multiple options presented above raises the question: **which options should be pursued and in what priority order to increase financing of energy efficiency projects for small and medium-sized businesses in the Northwest?** This concluding section of the report briefly describes the preferred near-term future for energy efficiency lending in the Northwest and the actions necessary to help realize this future.

### ■ ■ ■ ■ The Preferred Future

Ideally, within two to five years—with our economy recovered from recession and the financial sector fully back in the business of prudent lending—the Northwest will continue to lead the nation, taking energy efficiency investment to the next level. The Northwest will meet all its typical (that is, non-transportation) electric load growth and half its new natural gas demand by 2020 with energy efficiency.

- Commercial banks will be offering standardized loan products to qualified commercial customers to invest in energy efficiency upgrades. These banks will have followed the lead of the CDFIs that established a strong track record of successful lending and repayment for such projects. Banks will fully understand the economics of efficiency loans to their customers and will include utility-sponsored rebates and incentives in their calculations of capital requirements and cash flows.
- These banks will be selling their loans into a rapidly growing secondary market, where loans will be packaged and sold to investors seeking longer-term stable returns and those interested in funding the clean economy's growth.
- Loans will be readily available to qualified commercial customers at 2 to 3 percent below market rates, and the loan process is streamlined and easy to access.
- Utilities will have stronger incentives and fewer barriers to increase their investments in energy efficiency.
- On-bill payment schemes and property tax-based financing of energy efficiency projects will be widespread.
- Public-sector investment will be used primarily for credit enhancement and to seed revolving loan funds. These funds will be leveraged to the maximum extent possible with private-sector funds.

## Realizing the Preferred Future: Key Initiatives

All of the options presented would, if implemented, help to realize this preferred future. Several solutions stand out, however, in their ability to leverage resources, stimulate change in the marketplace, engage lenders, and consequently lead to rapid growth in financing for energy efficiency. These solutions are recommended for near-term action:

- **Early action #1. Market existing energy efficiency programs more effectively through coordinated efforts of governments, utilities, and organized trade ally networks.** This effort includes collection and dissemination of better information about the performance and financial benefits of energy efficiency upgrades for businesses. We recommend doing so through 1) widespread adoption of the U.S. Environmental Protection Agency's Energy Star portfolio manager or an alternative standardized rating system to track a building's energy performance and 2) implementation of a utility-sponsored Energy Conservation Advisor program for lenders. (This action draws on Options 5, 6, 8, and 9 discussed in the previous section.)
- **Early action #2. Advance Property Assessed Clean Energy (PACE) financing or a similar approach, where feasible,** providing the basis for emergence of a secondary market for energy efficiency loans, benefiting both commercial and residential sectors. (Option 10)
- **Early action #3. Encourage utilities to adopt on-bill repayment mechanisms, where feasible and cost effective,** to simplify loan repayment, reduce the upfront capital contributions required from businesses, make a direct connection between energy and cost savings for the customer, and increase lending for energy efficiency projects. (Option 1)
- **Early action #4. Provide utilities with more incentives and fewer barriers to invest in cost effective energy efficiency.** (Option 11)
- **Early action #5. Establish public energy efficiency funds dedicated to offering credit enhancement to leverage private capital** through the use of available municipal, state, and federal funds, including bonds. (This action combines elements of Options 14 and 16.)

Together, these solutions can provide the catalyst for lending institutions and investors to finance energy efficiency. Facilitating more low-cost financing adds another tool in the toolbox to help businesses reduce their energy bills and keep more dollars in the local economy.

## V. Appendix A. Literature Sources Reviewed

TITLE	SOURCE	DATE
Characterization and Analysis of Small Business Energy Costs	Small Business Administration, Office of Advocacy, prepared by E.H. Pechan & Associates	April 2008
Energy Efficiency and the Finance Sector: A Survey on Lending Activities and Policy Issues	UNEP Finance Initiative's Climate Change Working Group	Jan. 2009
Fifth Northwest Electric Power and Conservation Plan	Northwest Power and Conservation Council	2005
Financing Energy Efficiency: Lessons from Brazil, China, India, and Beyond	World Bank, International Bank for Reconstruction and Development	2008
Five Emerging U.S. Public Finance Models: Powering Clean-Tech Economic Growth and Job Creation	Clean Edge, Inc.	Oct. 2009
Innovative Energy Efficiency Financing Approaches	U.S. Department of Energy, Energy Efficiency and Renewable Energy	June 2009
Policy Framework for PACE Financing	Council on Environmental Quality	Oct. 2009
Portland Clean Energy Investment Fund and Building Retrofit Program	Tao Strategies	Nov. 2008
Process Evaluation Best Practices Research: New York Energy Smarts Loan Fund and Financing Program	New York State Energy Research and Development Authority, prepared by Research Into Action	May 2008
Property Assessed Clean Energy (PACE) Bonds: Innovative Funding to Accelerate the Retrofitting of America's Buildings for Energy Independence	PACE Now Website ( <a href="http://www.pacenow.org">www.pacenow.org</a> )	2009
Recent Innovations in Financing for Clean Energy	Southwest Energy Efficiency Project	Oct. 2009
Recovery Through Retrofit	Middle Class Task Force, Council on Environmental Quality	Oct. 2009
Scaling up Investment in Energy Efficiency with a Federal Energy Efficiency Financing Facility	Natural Resources Defense Council	April 2009
State Energy Efficiency Policies: Options and Lessons Learned—Energy Efficiency Loan Programs	Alliance to Save Energy	Jan. 2009
Tax Lien Financing for the Purpose of Facilitating Energy Efficiency Investments in Commercial Real Estate	Clinton Climate Initiative	July 2009
Unlocking Energy Efficiency in the U.S. Economy	McKinsey & Company	July 2009
Washington State's Green Economy: A Strategic Framework	Washington State Department of Commerce	Jan. 2009

## VI. Appendix B. Additional Supporting Data

The Northwest Power and Conservation Council's *Fifth Power Plan* identified energy efficiency measures with a positive benefit/cost ratio—that is, they would save more money than they would cost over a 20-year period. Table 4 shows cost-effective measures for commercial sector.

**Table 4. Commercial Energy Efficiency Measures with Positive Benefit/Cost Ratios**

COMMERCIAL END-USE MEASURES	Cost-Effective Savings Potential (MWa in 2025)*	Average Levelized Cost (Cents/kWh)	Benefit/Cost Ratio**
New & Replacement Lighting	245	1.2	9.1
New & Replacement Infrastructure	11	1.4	2.4
New & Replacement Shell	13	1.6	2.0
Retrofit Lighting	114	1.8	2.2
New & Replacement Equipment	84	2.2	1.8
Retrofit Infrastructure	105	2.2	1.8
Retrofit Shell	9	2.9	1.3
New & Replacement HVAC	148	3.0	1.5
Retrofit Equipment	109	3.4	2.1
Retrofit HVAC	117	3.4	1.3
<b>Total</b>	<b>955</b>	<b>2.3</b>	<b>2.6</b>

Source: Northwest Power and Conservation Council, *Fifth Power Plan*.

\* This column shows the total amount of conservation estimated to be cost-effective and achievable, given sufficient economic and political resources, over a 20-year period under the mid-range forecast of loads, fuel prices, water conditions, and resource development.

\*\* Benefit/cost (B/C) ratios are derived by dividing the present value benefits of each measure's energy, capacity, transmission and distribution, and non-energy cost savings by the incremental present value cost (including program administration) of installing the measure.