

On-bill Financing

POLICY DESCRIPTION

City Light (or potentially Puget Sound Energy) could facilitate the repayment of loans for efficiency upgrades on utility bills. Upgrades would be selected by the building owner (in coordination with the City) such that the efficiency savings would pay for the investment over a fixed period of time. Customers would “share” monthly energy efficiency savings with the utility until the loan is paid back, at which point all savings would be reflected in lower monthly bills.

POLICY OBJECTIVE

To simplify loan repayment and (in combination with a funding source) reduce upfront cash outlay by 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), thereby sharing the cost of upgrades over time with future beneficiaries of those upgrades.

SUMMARY OF CRITERIA RATINGS (★★★★ = best/most feasible)

Energy Efficiency Potential	★★	Cost of Policy Implementation	★
Economic Benefit	★★	Administrative Feasibility	★★

INDIVIDUAL CRITERIA RATINGS

ENERGY EFFICIENCY POTENTIAL

Rating: ★★

- **Applicable across sectors and to higher cost measures:** On-bill financing could be applied to all sectors, but is generally relevant for only those higher cost measures (e.g., window upgrades, insulation, heating system upgrades) that may require financing. CFLs, for example, are a measure that would not likely benefit from this policy. The policy by itself does not provide any guidance as to which measures should be installed.
- **Lack of financing hasn't been a primary barrier:** While this policy has intuitive appeal, other on-bill financing programs have shown that making financing available and convenient is not enough to encourage widespread upgrades. Given the recent credit crisis, however, the need for financing may re-emerge. Regardless, those that are in most need of financing are also those with poor credit, which adds risk to this policy.
- **Savings and repayment on utility bills could appeal to commercial and residential renters:** Tenants who pay their own utility bills may find this policy attractive, as it allows them to perform equipment upgrades with no up-front cost. Tenants who remain in the same building through the payback period would benefit from the full cost savings available from this policy, as opposed to renters who moved while they were still sharing savings with the utilities. Commercial renters typically stay in a building space for longer durations and are likely to have greater opportunity to benefit.
- **Costs and savings could potentially stay with the property:** Some models of on-bill financing can attach the cost/savings of energy efficiency upgrades to the meter, which provides continuity for benefit/payback from owner to owner.

ECONOMIC BENEFIT

Rating: ★★

- **Low economic potential:** Given the fact that lack of financing options has not been a large barrier for adopting measures, the energy efficiency potential for this option is low. Similarly, based on our modeling, this policy (on its own) ranked low in economic impacts.
- **Applicable to all sectors:** This policy is eligible to be implemented in both the residential and commercial sectors. Specific industries that would receive economic benefits would be installation contractors for the various measures (lighting, AC, heating, etc.). The general economy would also benefit from increased spending and business output resulting from reduced energy bills. There are little or no manufacturing benefits expected from this policy, as all measures are likely manufactured outside the Seattle city limits.

COST OF POLICY IMPLEMENTATION

Rating: ★

- **High initial costs to develop new billing system:** \$1,000,000 - \$10,000,000. City Light reports that a new billing system would be required in order for the City to administer on-bill financing. Installation of this new billing system would require a significant, three- to five-year effort that would cost tens of millions of dollars. Current plans are to upgrade the billing system in two to five years, and so implementing a policy that required a new system any sooner would likely require millions of dollars of additional funds.
- **Assessment of policy details:** \$20,000 - \$100,000: Apart from the billing system upgrades, the City would need to assess the various intricacies of on-bill financing models, including establishing procedures for dealing with non-payment.

On-bill Financing

(continued)

INDIVIDUAL CRITERIA RATINGS (CONTINUED)

ADMINISTRATIVE FEASIBILITY

Rating: ★★

-City Light's current billing system poses a technical challenge: The current billing system cannot handle true "on-bill" financing. Using the current system, the utility would need to establish another account for each property's loan. Accordingly, ramp-up for this policy would be slow, as City Light is not planning on a new system for two to five years.

-Legal concerns could arise from non-payment: Experience in other jurisdictions (and previously at City Light) has indicated that questions 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.

-Lenders may be wary of repayment allocation: When customers partially pay their bills the repayment allocation (e.g. who gets paid first) becomes important. If a third-party financier is used, the gas or electric bill will be paid first, increasing risk to the lender. For NW Natural Gas, this was a deal-breaker and effectively ended its program.

-On-bill financing is very scalable: On-bill repayment of loans could be used for all loan amounts, targeting all kinds of efficiency upgrades. State law limits utility loans to a ten-year term.

STAKEHOLDER IMPACTS

Though feasible, on-bill financing is likely to have the greatest impact on utilities.

-Utilities would be the primary implementers of this policy and would be expected to bear the costs of administering the on-bill repayment mechanism. While **PSE** believes its billing system could likely handle such a mechanism, implementing the change would still be a significant undertaking (including additional staffing and software needs). For **City Light**, on-bill financing would require a new billing system, likely in advance of its next scheduled upgrade. Depending on the capital source and administrative structure for the loan fund, at least one new staff person would be needed to manage on-bill repayment of loans.

-Building owners would enjoy a range of benefits, depending on how the policy is implemented. At the least, repayment of a loan on the utility bill is expected to provide a convenience to the customer, as a separate monthly loan bill is not needed. More importantly, the goal of on-bill financing is to help customers see net savings immediately, where utility bill savings offset loan repayment. Some models of on-bill financing also enable the loan to remain with the property.

-Investors/Banks. Financiers would likely be cautious if the energy portion of the bill was primary to the loan portion of the utility bill. This concern was a dealbreaker for a program by **NW Natural Gas** in Oregon. However, given that they are generally shorter-term utility customers, renters are also the least creditworthy borrowers for any financing option.

-Prospective buyers and their lenders could be wary of an additional financial obligation over and above the normal utility bill. However, the goal would be for the energy savings to be greater than the loan obligation, so this fact could instead be a benefit. Nevertheless, a clear and standard means of communicating this benefit would be needed.

ADDITIONAL LESSONS FROM OTHER JURISDICTIONS

The following jurisdictions have established, or are in the process of establishing, on-bill financing systems:

-Midwest Energy pays contractors directly to perform upgrades and adds the loan repayment charge to the residential customer's bill. Charges must be less than 90% of the estimated monthly savings, ensuring a net savings.

-San Diego Gas & Electric manages a commercial loan program with zero-percent interest rates and on-bill repayment. Minimum loan size is \$5,000 and maximum is \$50,000. Loans are unsecured; default on the loan results in meter shut-off.

-National Grid (New England): Small/Mid-Sized Business Energy Efficiency Program offers zero-interest loans with an on-bill repayment option. Found that loans >\$5,000 are more likely to use on-bill financing option and that on-bill financing results in lower arrears/defaults and increases the "close" rate (ratio of projects signed to proposals offered).

-Milwaukee Energy Efficiency (Me2) is developing a "Pay-As-You-Save" (PAYS®)-type financing program for commercial and residential owners. Me2 administers the program and repayment is a "savings charge" under the authority of the City.

The following jurisdictions were unable to successfully establish or maintain on-bill financing systems:

-NSTAR (the utility serving Eastern Massachusetts) has so far declined to implement on-bill financing for the Cambridge Energy Alliance because of billing system limitations.

-Sacramento Municipal Utility District (SMUD) canceled the on-bill repayment feature of its residential loan program due to lack of compatibility with the utility's new billing system and difficulties establishing a payment hierarchy.

Key Lessons Learned:

- While initial implementation can be challenging, on-bill financing makes loan repayment more convenient for customers and results in a lower default rate on loans.

-With guaranteed energy savings, on-bill financing allows the customer to see a savings on the energy bill while still paying back the loan that covered up-front costs of the upgrades.

-On-bill financing can also attach an energy efficiency loan to the meter, not to the property owner and holds potential for distributing the costs of energy efficiency upgrades across current and future beneficiaries of those investments.

Add-on To Property Taxes

POLICY DESCRIPTION

Financing for energy efficiency upgrades could be paid back as a special assessment on the owner's property tax bill. This repayment mechanism ensures that the loan repayment remains with the building, not the property owner.

POLICY OBJECTIVE

To provide immediate savings to customers, simplify loan repayment, and help distribute the cost of upgrades over time with future owners/beneficiaries of those upgrades.

SUMMARY OF CRITERIA RATINGS (★★★★★ = best/most feasible)

Energy Efficiency Potential	★★★	Cost of Policy Implementation	★★★★★
Economic Benefit	★★	Administrative Feasibility	★★★★★

INDIVIDUAL CRITERIA RATINGS

ENERGY EFFICIENCY POTENTIAL

Rating: ★★★

- **Broadly applicable measures and most sectors:** The policy applies equally to all fuels (gas, oil, steam, elec.) and measures within these sectors. Policy does provide a direct financial incentive toward the purchase of the measure, but does not provide any guidance as to which measures should be installed. Non-profits and public institutions that don't pay property tax would not benefit from this policy, although these owners represent a relatively small share of total building ownership.
- **Costs and savings stay with the property:** Attaching the cost/savings of energy efficiency upgrades to the property could provide a significant incentive for owners to make upgrades since the cost could be amortized over a period of many years and shared with future owners/beneficiaries of the upgrades.
- **Limited existing experience:** Given the limited experience of jurisdictions throughout the country with this policy, consumer acceptance of this policy is rated conservatively. Widespread adoption would raise the potential of this option.

ECONOMIC BENEFIT

Rating: ★★

- **Low to Moderate economic potential:** Based on our modeling, this policy ranked in the lower half of economic impacts among all the policies reviewed. Due to lack of existing experience with this policy, it is expected to have a low to moderate economic impact, although widespread uptake of the policy would enhance the economic benefits.
- **Applicable to all sectors:** This policy is eligible to be implemented in both the residential and commercial sectors. Specific industries that would receive economic benefits would be installation contractors for the various measures (lighting, AC, heating, etc.). The general economy would also benefit from increased spending and business output resulting from reduced energy bills. There are little or no manufacturing benefits expected from this policy as all measures are likely manufactured outside the Seattle city limits.

COST OF POLICY IMPLEMENTATION

Rating: ★★★★★

- **Less costly than on-bill financing:** Adding the cost of upgrades to property taxes would likely be less costly to implement than on-bill financing because the capacity for adding line items to billing and capacity for funds distribution already exist.
- **Technology and administration upgrades:** \$20,000 - \$100,000. Costs may be incurred for the integration of loan repayment charges or energy efficiency LID assessments into the existing system for property tax bill add-ons.
- **Policy assessment:** \$20,000 - \$50,000. Some further policy assessment would be needed to address applicability (or devise a work-around) for public institutions and non-profits.
- **Collection fee:** According to the RCW, King County has a right to charge a 1% fee on collection of fees for loading and distributing payments via the property tax system. For LIDs, the Treasury charges the District \$4 per account per year for collection and distribution of payments.

Add-on To Property Taxes

(continued)

INDIVIDUAL CRITERIA RATINGS (CONTINUED)

ADMINISTRATIVE FEASIBILITY

Rating: ★★★★★

-Implementing financing via property taxes appears to be feasible: Although the method has not been tested for energy efficiency upgrades, the County and the City have the capacity to add a charge to property taxes in a few different ways, depending on the source of capital:

1. **Bill as a line item to property taxes:** King County Treasury currently adds fees onto property tax bills and distributes fees to appropriate divisions. Fee amounts by property must be delivered to the Treasury each year by the administering division, as the County will not track amortization of loans. Payments are distributed as they are received (on a daily basis). Each fee has its own levy code, which identifies what division receives the payment.

2. **Bill via the existing Local Improvement District system:** The City currently maintains a separate billing system for LIDs. Pursuant to the RCW, the County or the City will collect annual payments after District has approved a series of resolutions and provided all information to the Treasury.

-On-bill financing is very scalable: On-bill repayment of loans could be used for all loan amounts, targeting all kinds of efficiency upgrades. State law limits utility loans to a ten-year term.

-May be challenging to implement if participation is low. Because of the resources necessary to set up a new fee on a property tax bill, there will be resistance to undertaking the effort if participation rates are expected to be low.

STAKEHOLDER IMPACTS

Because the repayment of loans through the property tax system is untested, stakeholder impacts cannot be fully anticipated. Impacts (both positive and negative) that may arise include the following:

-Building owners would benefit from the ability to attach loans for energy efficiency improvements to the property rather than to themselves as individuals or companies. This benefit is expected to significantly address a key barrier to making energy efficiency improvements—the perceived inability to recapture their investment upon selling the property. One potentially negative impact is that the loan being repaid would likely be added as a lien placed on their property. Such liens are standard practice in real estate loans, however. Some building owners could potentially have difficulty repaying the loans, but having solid borrower credit standards -- as well as solid standards for energy efficiency project standards that will reduce utility bills -- would prevent owners from taking on more debt than they can feasibly handle.

-Prospective buyers and their lenders could be concerned about the presence of a lien on the property that would be primary to the mortgage. They may be required by their lender to pay off the lien at time-of-sale.

-Lenders that provide the financing for such a program would be expected to have similar concerns as described under the funding source options. Those impacts are described further under options Private Financing Pool, Revenue or General Obligation Bond Issue, and others.

ADDITIONAL LESSONS FROM OTHER JURISDICTIONS

No jurisdiction has completely implemented this policy for energy efficiency upgrades.

-Berkeley, California has been pioneering research into the concept, and so far has had very little trouble implementing it in pilot form as part of its proposed Sustainable Energy Financing District. Berkeley will be starting its pilot this fall with between 40 and 60 residential homes and publishing a replication guide in partnership with the University of California, Berkeley, early in 2009.

-Boulder County, Colorado is modeling its proposed Clean Energy Options Local Improvement District off of the Berkeley pilot. If Boulder's LID is approved, all property owners who participate will be responsible for repaying their own individual debts through a special assessment on their properties.

-Oregon has drafted a legislative concept to allow local jurisdictions, and possibly the state, to establish energy efficiency investment districts that could involve repayment via the property tax system.

Key Lessons Learned:

- Repayment of energy efficiency loans over long periods via the property tax system holds significant potential for distributing the costs of energy efficiency upgrades across current and future beneficiaries of those investments, significantly lowering a common barrier to upgrades.

Low-Interest Loans

POLICY DESCRIPTION

The City, utilities, or private lenders could offer loans to property owners for pre-approved energy efficiency upgrades. Low interest rates could be guaranteed through volume or by City Light buy-down.

POLICY OBJECTIVE

To provide capital for energy efficiency upgrades at a discounted rate.

SUMMARY OF CRITERIA RATINGS (★★★★ = best/most feasible)

Energy Efficiency Potential	★★	Cost of Policy Implementation	★★
Economic Benefit	★★	Administrative Feasibility	★★★★

INDIVIDUAL CRITERIA RATINGS

ENERGY EFFICIENCY POTENTIAL

Rating: ★★

- Applicable across sectors and to higher cost measures:** Financing could be applied to all sectors and is generally most relevant for higher cost measures. The policy by itself does not provide any guidance as to which measures should be installed.
- Lack of financing has not been a primary barrier:** Lack of financing options has not typically been a major barrier for adopting energy efficient measures, in that making financing available and convenient is not enough to encourage widespread upgrades. Given the recent credit crisis, however, the need for financing may re-emerge. Owners most in need of financing may also have poor credit, which adds risk to this policy.
- Split incentives for landlord/tenants:** Building owners (particularly commercial owners) who lease their buildings and require tenants to pay the utility bills have less incentive to install measures, as energy savings benefits accrue to tenants rather than owners.
- Uncertainty around savings estimates may be too great to attract private capital:** If the City is looking to partner with private entities for these loans, it may be difficult to attract private capital without having a guarantee (from an approved contractor or from the City) backing the savings associated with the energy efficiency upgrades. Investors will likely require this guarantee on loans that may rely (in part) on bill savings for repayment.

ECONOMIC BENEFIT

Rating: ★★

- Low economic potential:** Given the issues discussed above, particularly with regard to attracting private capital, the energy efficiency potential and projected economic benefit is low for this policy. Based on our modeling, this policy ranked in the lower half in economic impacts among all the policies reviewed.
- Applicable to all sectors:** This policy is eligible to be implemented in both the residential and commercial sectors. Specific industries that would receive economic benefits would be installation contractors for the various measures (lighting, AC, heating, etc.). The general economy would also benefit from increased spending and business output resulting from reduced energy bills. There are little or no manufacturing benefits expected from this policy, as all measures are likely manufactured outside the Seattle city limits.

COST OF POLICY IMPLEMENTATION

Rating: ★★

- The cost to the City and its partners will depend on a) how much the City subsidizes interest rates, and b) whether the loan program is administered in-house or by bank partners, but is expected to be at least several hundred thousand dollars.
- Policy assessment: \$20,000 - \$50,000.** The City would need to assess strategies for maximizing the effectiveness of a low-interest loan program, educating a contractor/auditor network and addressing the split incentives between investors and energy end-users (e.g., between a landlord and tenant).
 - Development of billing and collection process: \$20,000 - \$100,000.** If the City manages the loan program in-house and intends to affix the loan to the property, then a repayment system akin to LID assessment payments can be arranged. Given the City's existing capacity to collect and distribute LID assessment payments, much of this work could be done within existing staffing levels, but some integration costs would be incurred.
 - City investment: \$100,000 - \$1,000,000+.** This investment is wholly dependent on how much the City intends to subsidize interest rates.

Low-Interest Loans

INDIVIDUAL CRITERIA RATINGS (CONTINUED)

ADMINISTRATIVE FEASIBILITY

Rating: ★★★★★

-**Few technical challenges appear to stand in the way.** There are currently 150+ loan programs for residential energy efficiency in the United States, and the vast majority are managed in-house by utilities. The more challenging part of a low-interest loan program is increasing customer participation through strong contractor/auditor networks that can market the program as a sales tool.

-**City Light is already exploring private sector funding options:** In its *Five-Year Conservation Action Plan*, City Light included plans to consider a privately-financed fund for energy efficiency upgrades (akin to the Clinton Climate Initiative). According to the Plan, this fund would be administered and financed by a private partner.

-**Basic administration could be outsourced or managed in-house:** If the City chose to partner with banks to provide loans, then the burden of administration would be lifted. Both Tacoma Power and Snohomish PUD manage in-house low-interest loan programs.

-**A method is needed to assess creditworthiness of borrowers:** Bill payment history is usually used to assess the creditworthiness of borrowers. If a customer is new to the utility, traditional credit checks can be carried out. Default rates in existing programs are generally very low, around 0.1% – 0.2%, in part due to a utility's ability to threaten power disconnection.

- **Security behind loan will be important.** To decrease default rates, a secured loan (e.g., a lien on the property) would be preferable to an unsecured loan.

STAKEHOLDER IMPACTS

This policy is expected to have few negative impacts. Some potential impacts are described below:

-**Homeowners:** Homeowners could benefit by lower interest rates and increased access to capital. While most existing energy efficiency loan programs offered by governments have been underutilized and the small interest rate discounts available have not provided a strong incentive, the current credit market could be tight enough that government-sponsored programs could have increasing appeal. If any utility funds are used to secure the loans, however, a lien would be required on the property. Loan administrators report that customers are deterred by such secured loans.

-**Nonresidential building owners:** Commercial building owners could similarly benefit. In the past, businesses have had ready access to financing and capital at favorable rates, but the current credit market could be driving businesses to new options, such as a government-sponsored program.

- **Lenders:** Despite the potential for energy efficiency projects to free up building owner income (thereby increasing their ability to repay the loan), no lenders to date have been willing to collateralize any of these future utility bill savings. Loans would likely be added as liens on the properties, which would help reassure borrowers, but could then raise concerns about borrowers' ability to pay their primary financing obligations (e.g., mortgages).

-**Contractors:** The availability of low-interest loans could be a useful sales tool for local energy efficiency contractors, who could potentially help their customers secure the financing.

ADDITIONAL LESSONS FROM OTHER JURISDICTIONS

Many existing low-interest loan programs exist. For example:

-**Tacoma Power** provides zero-interest loans to residential and multifamily residential customers to finance insulation measures and infiltration reduction measures. Approximately 75% of Tacoma's electrically-heated, pre-1988 homes have been retrofitted. The default rate on the loans issued by Tacoma Power has been less than 0.1%.

-**Snohomish PUD** provides loans at 2.9% interest to help its residential customers finance pre-selected energy efficient home improvement projects. The minimum loan amount is \$1,000 and the term can be up to 10 years.

-**Midwest Energy** offers free energy audits, recommends improvements and generates an estimated savings level. The customer chooses a contractor to perform the work, and Midwest pays the contractor directly and adds the loan repayment charge to the customer's bill.

-**Sacramento Municipal Utility District** launched a residential loan program in 1977, and since then has issued 135,000 loans, with an average loan size of \$8,750. It uses internal funds and charges an interest rate of 7.5%, which covers the cost of capital and all overhead.

-**The City of Chicago** offers a commercial sector low-interest loan program targeting a different industry each year. The City offers a very low interest rate to start (3%) and waives the interest if the business purchases green power.

Key Lessons Learned:

-Beyond providing capital, the most successful loan programs offer technical assistance and "hand-holding" to drive energy efficiency upgrades. This underscores the importance of education and contractor network-building.

- The tight credit market (and related higher interest rates) may drive more interest in low-interest loan programs.

Private Financing Pool

POLICY DESCRIPTION

The City could encourage the development of a pool of private capital assembled by investors to provide a privately-managed loan fund for energy efficiency upgrades. Loan applications and repayment could happen in partnership or independently of the City.

POLICY OBJECTIVE

To provide capital for energy efficiency upgrades.

SUMMARY OF CRITERIA RATINGS (★★★★★ = best/most feasible)

Energy Efficiency Potential	★★	Cost of Policy Implementation	★★★
Economic Benefit	★★	Administrative Feasibility	★★

INDIVIDUAL CRITERIA RATINGS

ENERGY EFFICIENCY POTENTIAL Rating: ★★

- **Applicable across sectors and to higher cost measures:** Private financing could be applied to all sectors, but is generally most relevant for those higher cost measures that may require financing. The policy by itself does not provide any guidance as to which measures should be installed.
- **Lack of financing has not been a primary barrier:** Lack of financing options has not typically been a major barrier for adopting energy efficiency measures, in that making financing available and convenient is not enough to encourage widespread upgrades. Given the recent credit crisis, however, the need for financing may re-emerge. Those that are in most need of financing also include those with poor credit, which adds risk to this policy.
- **Split incentives for landlord/tenants:** Building owners (particularly commercial owners) who lease their buildings and require tenants to pay the utility bills have less incentive to install measures, as energy savings benefits accrue to tenants rather than owners.
- **Uncertainty around savings estimates may be too great to attract private capital:** The costs and uncertainty associated with accurately measuring energy savings on a project-by-project basis may be too great for private entities to assume the risk on loans that rely on bill savings for repayment.

ECONOMIC BENEFIT Rating: ★★

- **Low economic potential:** Given that this option will likely have difficulty attracting private capital and that the lack of financing options has not been considered a primary barrier, the energy efficiency potential for this option is low. Based on our modeling, this policy ranked in the lower quarter in economic impacts among all the policies reviewed.
- **Applicable to all sectors:** This policy is eligible to be implemented in both the residential and commercial sectors. Specific industries that would receive economic benefits would be installation contractors for the various measures (lighting, AC, heating, etc.). The general economy would also benefit from increased spending and business output resulting from reduced energy bills. There are little or no manufacturing benefits expected from this policy, as all measures are likely manufactured outside the Seattle city limits.

COST OF POLICY IMPLEMENTATION Rating: ★★★

- The total estimated cost to City and partners of establishing this policy is \$20,000 to \$180,000.
- Financing partnership development: \$20,000 – 80,000.** Whether or not the City participates in the management of the fund, time and resources will have to be spent to engage a financing partner.
 - Technology upgrades: \$0 – 100,000.** If the City manages loan repayment and/or administration, there may be costs incurred in technology upgrades and development.

Private Financing Pool

(continued)

INDIVIDUAL CRITERIA RATINGS (CONTINUED)

ADMINISTRATIVE FEASIBILITY

Rating:

★★

-Identifying a lender can be difficult: Private lenders are hesitant to work across sector lines, though some promising partnerships have been formed that may serve as models in the future. Once an investor has been identified, this program would be relatively straight forward to establish and administer.

-City Light is exploring private sector funding options: In its *Five-Year Conservation Action Plan*, City Light included plans to consider a privately-financed fund for energy efficiency upgrades (akin to the Clinton Climate Initiative). According to the Plan, this fund would be administered and financed by a private partner. There is also funding for one staff person, who will focus on private sector financing.

-Basic administration could be outsourced or managed in-house: If the City partners with an investor to provide loans, then the burden of administration will be lifted. However, some oversight involvement from the City will be necessary and the repayment mechanism for the loans may also involve City resources.

-A method is needed to assess creditworthiness of borrowers: Bill payment history is usually used to assess the creditworthiness of borrowers. If a customer is new to the utility, traditional credit checks can be carried out. Default rates in existing programs are generally very low, around 0.1% – 0.2%, in part due to a utility's ability to threaten power disconnection.

-Savings guarantees from contractors will be necessary: Private investors will want some guarantee of energy savings, so that energy cost savings will be sufficient to repay the loan. For other jurisdictions, this requirement has led to ESCO partnerships.

STAKEHOLDER IMPACTS

Few negative impacts are anticipated by offering a private financing pool for energy efficiency. Several outstanding questions do remain, however, particularly in the current tight credit market.

-Lenders would have concerns about the credit worthiness of borrowers (both residential and commercial) and would want to use their own borrower assessment practices. Despite the potential for energy efficiency projects to free up building owner income (thereby increasing their ability to repay loans), no lenders to date have been willing to collateralize any of these future utility bill savings. Loans would likely be added as liens on the properties, which would help reassure borrowers, but could then raise concerns about borrowers' ability to pay their primary financing obligations (e.g., mortgages). Nevertheless, real estate loans are common practice, and given active lender participation in qualifying borrowers, credit concerns can likely be addressed.

-Building owners would likely welcome new sources of capital. However, high lender standards may prevent some from qualifying, potentially limiting the effectiveness of this policy.

ADDITIONAL LESSONS FROM OTHER JURISDICTIONS

Following are leading examples of efforts to bring private capital to energy efficiency upgrades:

-The Energy Efficiency Partnership of Greater Washington D.C. is a recently established partnership between Virginia Tech University, Hannon Armstrong, and Pepco Energy Services. Hannon Armstrong has committed \$500 million over five years for retrofitting at no capital cost to building owners and county governments. The company will see a return on its investment over a long-term period via accrued electricity savings. Virginia Tech is the facilitator, and Pepco (and other ESCOs) will provide performance contracting.

-The Clinton Climate Initiative has been working with lenders to offer loans for energy efficiency upgrades, primarily for commercial customers. So far, banks have been unwilling to collateralize any future savings and have instead used traditional financing criteria (e.g., credit). Financing has not been a barrier for many of their early-adopter commercial participants, but credit and financing would be an issue for some fraction of the market. While there is some momentum and interest in creative financing (involving private capital and creating bundled securities), this hasn't yet taken off, particularly given the current credit crisis.

-The Cambridge Energy Alliance was formed two years ago with the intention of accessing a pool of private investors for energy efficiency projects. The Alliance partnered with a local investment bank that specializes in real estate and energy efficiency projects, but an agreement was not reached and the Alliance has not yet been able to identify a financial partner. In the meantime, the Alliance has partnered with ESCOs and local banks to market its services to Cambridge residents.

Key Lessons Learned:

-Finding investors is challenging. Potential investors want to assess an already-packaged portfolio of projects, but identifying projects before a fund exists is difficult. The current credit crunch will likely make potential investors even more scarce.

-If a partnership is established, this option provides a source of capital to the City with a low administrative burden.

Energy Efficiency Mortgages

POLICY DESCRIPTION

Energy Efficiency Mortgages can provide owners additional financing (whether at time-of-sale or with a refinancing) for energy efficiency improvements at discounted interest rates. Energy efficiency upgrades could be chosen that would allow owners to realize a net monthly savings.

POLICY OBJECTIVE

To provide capital for energy efficiency upgrades at a discounted interest rate.

SUMMARY OF CRITERIA RATINGS (★★★★★ = best/most feasible)

Energy Efficiency Potential	★★★	Cost of Policy Implementation	★★★★★
Economic Benefit	★★★	Administrative Feasibility	★★

INDIVIDUAL CRITERIA RATINGS

ENERGY EFFICIENCY POTENTIAL

Rating: ★★★

- **Applicable across sectors and to higher-cost measures:** Energy efficient mortgages could be applied to all sectors and cover all measures (especially higher-cost ones) within these sectors. Policy would likely provide some guidance as to what measures needed to be installed to get the lower interest rate.
- **Efficiency upgrades lower priority than other building features:** Studies have shown that energy efficiency is generally a lower priority compared to other considerations (location, schools, building design features, amenities, etc.) at the time of purchase.
- **Incentive provided for landlords:** Unlike some of the other policies, the energy efficient mortgage does provide an incentive for landlords to purchase measures as they would benefit directly from lower mortgage interest rates.
- **Potential to integrate into traditional financing methods:** Energy efficient mortgages offer the potential to provide direct incentives for energy efficiency upgrades at time-of-sale.

ECONOMIC BENEFIT

Rating: ★★★

- **Moderate economic potential:** The energy efficiency potential for this option results in a moderate level of expected economic benefits. Based on our modeling, this policy ranked in the middle of the pack in economic impacts among all the policies reviewed.
- **Applicable to all sectors:** This policy is eligible to be implemented in both the residential and commercial sectors. Specific industries that would receive economic benefits would be installation contractors for the various measures (lighting, AC, heating, etc.). The general economy would also benefit from increased spending and business output resulting from reduced energy bills. There are little or no manufacturing benefits expected from this policy, as all measures are likely manufactured outside the Seattle city limits.

COST OF POLICY IMPLEMENTATION

Rating: ★★★★★

- **Partner development: \$20,000 – 50,000.** Costs to the City would generally be low because these products would be administered through private lenders, but the City would need to devote some financial resources to assisting with partner recruiting.
- **Technology upgrades: \$0 – 100,000.** Depending on the City's role in administration, there may be costs incurred in development of a database to track and verify energy efficiency upgrades in participating properties.

Energy Efficiency Mortgages

INDIVIDUAL CRITERIA RATINGS (CONTINUED)

ADMINISTRATIVE FEASIBILITY

Rating: ★★

-Enticing a partner to offer substantially improved terms or interest rates is expected to be a very significant challenge: Although energy efficient mortgages and refinancing products have been available for many years, the benefits they offer have rarely been substantial enough to attract widespread interest. In order to fulfill the potential of an energy efficient mortgage, the product would need to be widely available and have an interest rate discount of at least an eighth of a point below market rate.

-Technical and legal challenges appear largely absent, although lenders would need some means of verifying that energy efficiency upgrades were made or performance attained.

STAKEHOLDER IMPACTS

The offering of energy efficient mortgages is not likely to have negative stakeholder impacts.

- **Building owners** would likely welcome the availability of a product that gave an interest rate discount or other favorable terms for energy efficiency improvements. However, the benefits may not be great enough for the product to rise above other loans available in the market, and local mortgage brokers would need to be educated to pro-actively include such options in their normal searches. Furthermore, if an energy-efficient mortgage required a performance rating or other audit at time-of-sale, both owners and realtors could face extra hurdles (and costs on the order of \$300) in the closing process.

ADDITIONAL LESSONS FROM OTHER JURISDICTIONS

-Countrywide Home Loans has had an Energy Efficiency Mortgage product available for several years, but it has not been widely used because a) realtors/lenders are not aware of the product, or b) realtors/lenders are more focused on closing sales and do not want to take the extra time to complete a Home Energy Rating System (HERS) rating and determine necessary upgrades. However, if the HERS rating is done as early as possible during the loan process, it should not delay the close of the sale.

Key Lessons Learned:

-To date, most energy efficiency mortgages have not been popular because they offer only minimal (if any) interest rate discounts and any future savings of energy efficiency upgrades are relatively small compared with the cost of a new home and the perceived added hassle of complying with the energy efficiency mortgage requirements.

-The relevance of this policy would be increased if paired with time-of-sale disclosure or upgrade requirements.

Energy Efficiency Local Improvement District

POLICY DESCRIPTION

Publicly issued assessment revenue bonds, enabled by a local improvement district, to provide low interest and (potentially tax-exempt) assignable financing streams to energy efficiency upgrades.

POLICY OBJECTIVE

To provide capital for energy efficiency upgrades.

SUMMARY OF CRITERIA RATINGS (★★★★ = best/most feasible)

Energy Efficiency Potential	★★	Cost of Policy Implementation	★★★
Economic Benefit	★★	Administrative Feasibility	★★

INDIVIDUAL CRITERIA RATINGS

ENERGY EFFICIENCY POTENTIAL

Rating: ★★

-Applicable across sectors and to higher cost measures: Public financing could be applied to all sectors, but is generally relevant for those higher cost measures that may require financing. CFLs, for example, are a measure that would not benefit from this policy. This policy by itself does not provide any guidance as to which measures should be installed.

-Lack of financing has not been a primary barrier: Lack of financing options has not typically been a major barrier for adopting energy efficient measures, in that making financing available and convenient is not enough to encourage widespread upgrades. Given the recent credit crisis, however, the need for financing may re-emerge.

-Some finance risk with this policy: Those who are in most need of financing also include those with poor credit, which adds risk to this policy. A public financing pool may tolerate more uncertainty than a private entity concerning the measurement of energy savings, which is relevant if energy savings are being used as the means for paying back the loan.

-Split incentives for landlord/tenants: Building owners (particularly commercial owners) who lease their buildings and require tenants to pay the utility bills have less incentive to install measures, as energy savings benefits accrue to tenants rather than owners.

ECONOMIC BENEFIT

Rating: ★★

-Low economic potential: Given the fact that lack of financing options is not a large barrier for adopting measures, the energy efficiency potential for this option is low. As a result, based on our modeling, this policy ranked in the lower half of economic impacts among all the policies reviewed.

-Applicable to all sectors. This policy is eligible to be implemented in both the residential and commercial sectors. Specific industries that would receive economic benefits would be installation contractors for the various measures (lighting, AC, heating, etc.). The general economy would also benefit from increased spending and business output resulting from reduced energy bills. There are little or no manufacturing benefits expected from this policy, as all measures are likely manufactured outside the Seattle city limits.

COST OF POLICY IMPLEMENTATION

Rating: ★★★

The total cost to the City and partners of establishing this policy is estimated to be \$150,000 to \$500,000:

-Legislative development: \$50,000 - \$200,000. Since an amendment to the RCW is needed in order to make the LID a feasible option, legislative development is estimated to be a significant expense.

-Policy assessment: \$50,000 - \$200,000. If the City chooses to move forward with LID financing, districts will need to be defined, property owners will need to be educated and recruited and property assessments will have to be carried out.

-Billing and collection set-up: \$50,000 - \$100,000. The City already has an LID billing/collection processes in place, but some expansion may be necessary to integrate an energy efficiency LID into the existing system.

Energy Efficiency Local Improvement District

(continued)

INDIVIDUAL CRITERIA RATINGS (CONTINUED)

ADMINISTRATIVE FEASIBILITY

Rating: ★★

-LID financing process is familiar, but can be politically challenging: The City of Seattle has carried out several LID financings. Developing such a district for energy efficiency would be a similar process and would require the participation and cooperation of many different actors in the private and public sector. In a usual LID financing, 60% approval from affected property owners is required. It is assumed that an Energy Efficiency LID would take a "checkerboard" approach, where the district boundaries might be the entire City, but individual property owners would opt-in to participation.

-LID process not yet legal for energy efficiency projects. RCW 35.43.040 details the general authority of a city or town to initiate an LID for a specific list of projects, in which energy efficiency is not included. Thus, the Revised Code of Washington would need to be amended to allow for energy efficiency projects to be LID-financeable. The Energy Efficiency working group of the State Climate Advisory Team is working on enabling language to recommend to the Governor to accomplish this goal.

-Lack of flexibility / Requires property-owner buy-in before financing: The LID process bases financing on assessments of properties before and after improvements. With this structure, property owners need to agree to the upgrades, then wait for financing to go through (instead of being able to just get a loan immediately from a revolving fund). This challenge could be partially addressed by organizing a series of LID financings, with defined opt-in periods, to attract participants.

-Some question about overlap with federal IRS tax credits: Berkeley and San Francisco have both submitted requests for official rulings from the IRS on whether local financing for energy efficiency improvements would overlap with the IRS's Investment Tax Credit (ITC) offerings. Both cities expect the IRS to rule that there is no conflict, but San Francisco is waiting for an official ruling before proceeding.

-City ultimately backs the LID assessment revenue bonds, but the bonds do not use up the City's debt capacity: LID bonds are repaid with assessments that are made by each property included in the District. A guaranty fund is generally also created as a backstop for payment defaults. In the unlikely event that the guaranty fund is not sufficient, the City would have the ability to levy taxes to cover debt service payments.

STAKEHOLDER IMPACTS

The potential stakeholder impacts of an LID policy depend on the approach taken. If an LID is created using a traditional model where fees are assessed on all parcels in the district, then equity concerns (particularly for low-income owners) could be raised when funds from all owners are used to pay for improvements to select buildings. If, on the other hand, an LID is created using a voluntary opt-in approach, few negative impacts are anticipated.

-Building owners. Building owners would have voluntary access to financing, which could be a significant benefit in a tight credit market. Owners may object to having a lien placed on their property, but such liens are standard practice in real estate loans. Some building owners could potentially have difficulty repaying the loans, but having solid borrower credit standards -- as well as solid standards for energy efficiency project standards that will reduce utility bills -- would help owners from taking on more debt than they can feasibly handle.

ADDITIONAL LESSONS FROM OTHER JURISDICTIONS

No jurisdictions yet have an LID in place for energy efficiency projects. The following jurisdictions, however, are actively working out the details of this relatively new application of LIDs:

-Berkeley, CA is beginning a Sustainable Energy Financing District pilot project with 40-60 homes. Loans will be paid back as a 20-year assessment on the property tax bill. Berkeley will be issuing the bonds but will be packaging and re-selling them to a financial partner.

-Boulder County, CO will be voting this November to allow the County to issue bonds for the purpose of providing financing options for renewable energy and energy efficiency improvements via a Clean Energy Options Local Improvement District. The LID would be available to both residential and commercial property owners.

-Washington's Climate Advisory Team is exploring the option and is working on language to enable energy efficiency LIDs in Washington.

-Oregon has drafted a legislative concept to allow local jurisdictions, and possibly the state, to establish energy efficiency investment districts (EEDs). Assessment bonds - where the repayment stream is collected from the benefiting properties - would be issued.

Key Lessons Learned:

If appropriate amendments can be made to the RCW, LID financing could provide low-cost capital for energy efficiency upgrades and pair naturally with a property tax repayment mechanism. Since the LID repayments are based on assessments to actual properties, property-owner buy-in is needed before financing can occur.

Revenue or General Obligation Bond Sale

POLICY DESCRIPTION

Energy savings could be financed through a (potentially tax-exempt) municipal bond issue. The City would administer a revolving loan fund with the bond proceeds

POLICY OBJECTIVE

To provide capital for energy efficiency upgrades at the lowest cost of capital possible.

SUMMARY OF CRITERIA RATINGS (★★★★ = best/most feasible)

Energy Efficiency Potential	★★	Cost of Policy Implementation	★★★
Economic Benefit	★★	Administrative Feasibility	★★★

INDIVIDUAL CRITERIA RATINGS

ENERGY EFFICIENCY POTENTIAL

Rating: ★★

- **Applicable across sectors and to higher cost measures:** Public financing could be applied to all sectors, but is generally relevant for those higher cost measures that may require financing. CFLs, for example, are a measure that would not benefit from this policy. This policy by itself does not provide any guidance as to which measures should be installed.
- **Lack of financing has not been a primary barrier:** Lack of financing options has not typically been a major barrier for adopting energy efficient measures, in that making financing available and convenient is not enough to encourage widespread upgrades. Given the recent credit crisis, however, the need for financing may re-emerge.
- **Some finance risk with this policy:** Those who are in most need of financing also includes those with poor credit, which adds risk to this policy. A public financing pool may tolerate more uncertainty than a private entity concerning the measurement of energy savings, which is relevant if energy savings are used as the means for paying back the loan.
- **Split incentives for landlord/tenants:** Building owners (particularly commercial owners) who lease their buildings and require tenants to pay the utility bills have less incentive to install measures, as energy savings benefits accrue to tenants rather than owners.

ECONOMIC BENEFIT

Rating: ★★

- **Low economic potential:** Given the fact that lack of financing options is not a large barrier for adopting measures, the energy efficiency potential for this option is low. Based on our modeling, this policy ranked in the lower half of economic impacts among all the policies reviewed.
- **Applicable to all sectors:** This policy is eligible to be implemented in both the residential and commercial sectors. Specific industries that would receive economic benefits would be installation contractors for the various measures (lighting, AC, heating, etc.). The general economy would also benefit from increased spending and business output resulting from reduced energy bills. There are little or no manufacturing benefits expected from this policy, as all measures are likely manufactured outside the Seattle city limits.

COST OF POLICY IMPLEMENTATION

Rating: ★★★

Under normal market conditions (pre-September 2008), revenue and general obligation bonds generally carry interest rates of about 5%-6%, with a term of 25-30 years. Debt service is paid with City Light revenues or taxes paid by Seattle residents. Compared to LID financing (the other public financing method considered), revenue bonds may be a simpler and less expensive way to access capital.

The up-front cost to City and partners of enacting this policy is estimated to be \$60,000 to \$150,000.

- **Policy assessment: \$40,000 - \$100,000.** Further research would be needed to consider whether the City's internal funds would be a better (less expensive, more flexible) option than bonds.
- **Technology upgrades: \$20,000 - \$50,000.** Depending on the repayment mechanism and administrative system chosen by the City, some costs would be incurred for establishing a tracking system to manage the loan fund that results from the revenue bond issue.

Revenue or General Obligation Bond Sale

(continued)

INDIVIDUAL CRITERIA RATINGS (CONTINUED)

ADMINISTRATIVE FEASIBILITY

Rating: ★★★

-**Few technical or legal challenges appear to exist, as there is an established process to sell bonds.** Bond issues are regularly done by the City of Seattle, and are administratively feasible. The bonds would be special limited obligations of the City, probably included in a larger bond sale, and debt service on the loan fund would be pledged to the payment of the bonds (assuming they were issued on parity with outstanding debt).

-**Bond-funded conservation measures would likely be on behalf of the City, not City Light.** Since City Light has expended significant effort to include all cost-efficient conservation measures in its *Five-Year Conservation Action Plan* acquisition efforts, supplemental bonds to finance EE measures would likely be on behalf of the City, going above and beyond City Light's plans.

- **Revenue bonds require City Council approval and GO bonds require a public vote.** Obtaining sufficient buy-in from the City Council or the public may be very challenging.

STAKEHOLDER IMPACTS

This policy does have some potential to raise equity concerns associated with repayment by Seattle taxpayers.

-**City taxpayers.** Issuing bonds would increase the City's annual debt service requirement. In order to cover debt service, the City may have to raise taxes city-wide. All taxpayers would be subject to increased taxes to pay back a loan that may never benefit them.

-**Building owners.** Building owners would have voluntary access to financing, which could be a significant benefit in a tight credit market. Owners may object to having a lien placed on their property, but such liens are standard practice in real estate loans. Some building owners could potentially have difficulty repaying the loans, but having solid borrower credit standards -- as well as solid standards for energy efficiency project standards that will reduce utility bills -- would prevent owners from taking on more debt than they can feasibly handle.

ADDITIONAL LESSONS FROM OTHER JURISDICTIONS

-**Bond financing is the defacto mechanism for municipalities to access capital.** Several municipalities have financed portions of their conservation efforts through bond sales.

Key Lessons Learned:

-Bonds are a familiar and low-cost way to access capital for energy efficiency and conservation projects.

- Because the bonds will be backed by the City (or a City department), repayment of the loan may affect Seattle taxpayers or City Light customers.

Summary Assessment Matrix

10/21/2008

POLICIES	ASSESSMENT CRITERIA			
	Energy Efficiency Potential	Economic Benefit	Cost of Policy Implementation	Administrative Feasibility
FUNDING SOURCES				
Low-interest Loans	★★	★★	★★	★★★★
Private Financing Pool	★★	★★	★★★	★★
Energy Efficient LIDs	★★	★★	★★★	★★
Revenue or General Obligation Bond Sale	★★	★★	★★★	★★★
Energy Efficiency Mortgages	★★★	★★★	★★★★	★★
INNOVATIVE REPAYMENT MECHANISMS				
Add-on to Property Taxes	★★★	★★	★★★★	★★★★
On-Bill Financing	★★	★★	★	★★
OTHER FINANCIAL INCENTIVES				
Energy Efficiency Tax Credits	★★★	★★★★	★★	★★
Energy Efficiency Feebate	★★★★	★★★★	★★★	★★
DISCLOSURE MANDATES				
Building's Historical Energy Use	★	★	★★★	★★★★
Building Energy Performance Checklist	★★★	★★★★	★★★	★★★★
Building Energy Performance Rating/Label	★★★	★★★★	★★★	★★★
UPGRADE MANDATES				
Prescriptive Requirements	★★★★	★★★★	★★★	★★
Performance Requirements	★★★★★	★★★★★	★★★	★★