

## LEGISLATIVE CONCEPT

**Concept subject or title:**

### **Public Financing for Energy Efficiency in Existing Buildings**

**Brief description of proposal:**

**Amend current statutes to allow local jurisdictions, and possibly the State, to establish energy efficiency investment districts that can use capital raised through bond sales to make possible relatively large energy efficiency investments in existing buildings. The bond repayment revenue stream is designed to be generated by assessments against each individual property benefited based on the value invested in each property from the bond fund.**

**What does the proposal intend to do? What are the proposed actions, conditions, or criteria?**

- Use the Local Improvement District (LID) concept to raise and invest capital in dramatically upgrading the energy efficiency (by 60% or more) of existing single family and multifamily dwellings and small commercial buildings.
- Maintain the fortunes of the building trades sector of the Oregon economy, preserving local jobs and investing in some of our most critical existing infrastructure – our homes and local businesses.
- Use existing city and county financial infrastructure to deliver the financing part of the program, and provide for bond repayment.
- Dramatically increase the investment in the efficiency of our existing building stock and dramatically reduce the energy and carbon footprint of our homes and small businesses.
- Relieve the ever-increasing burden of monthly home and small business energy bills.

**What problem does concept this address?**

It's nearly axiomatic in the energy efficiency world that existing buildings represent the single largest challenge to acquiring large energy savings in the residential and commercial sectors. This is no surprise. It's far more difficult to retrofit an efficiency measure than to provide it in the first place. This is especially true in the case of shell measures – wall insulation, windows, roof/ceiling insulation, etc. It's not just more difficult – it's significantly more expensive.

In 2002, Oregonians spent about \$6.3 billion on energy. By 2006, a short 4 years later, the bill came to about \$10 billion. It's gone nowhere but up since then. A significant fraction of this money left Oregon and its economy. A significant fraction of this loss flowed through our existing building stock, particularly those buildings that are more than 15 years old. This program would invest in making a typical existing building of this type more efficient than a new building built to Oregon's current energy code (effective July 1, 2008).

**The most significant barrier to the necessary investments is lack of capital (or access to sufficient capital) for most building owners. This proposal is designed to rectify this problem to a significant extent.**

**What elements of the current policy context are necessary to understand the concept?**

- Current law does not allow cities to create LIDs for this purpose. It does not allow counties to create this sort of district at all. Several of the mechanisms and rules for LIDs need to be adjusted or reinvented for the purposes proposed here.
- Current and past energy efficiency programs (mostly weatherization programs), operated now and over the past 25 years or more, have barely scratched the surface of the energy efficiency and carbon reduction potential in the existing building stock.
- The collapse of the housing bubble has dealt a severe blow to the building trades. Housing starts are way down, and the commercial building sector is also suffering a major downturn in activity. In most economies, the building trades comprise a significant fraction of total economic activity. When there's a downturn in this sector, the entire economy suffers.
- Large parts of the U.S. financial sector are at the edge of meltdown. The housing bubble brought to us in the early part of this decade by extraordinarily low interest rates, and no small amount of housing investment speculation, is collapsing. Foreclosures are breaking records and there has been a significant reduction in the availability of private capital for real estate investment. Levels of perceived risk are high, and even when capital is available, interest rates may place it out of reach for many home and commercial building owners.

**What happens if this concept isn't implemented?**

- One of the largest sources of energy and carbon savings in Oregon will be left largely untapped.
- The building and development sector will suffer a continuation of the serious downturn now evident.
- Many families will be unable to afford to heat their homes; some may lose their homes. The physical condition of many of our homes and commercial buildings will continue to deteriorate as monthly energy bills consume the capital required to maintain them.
- Large amounts of capital will continue to leave Oregon's economy, costing us jobs and the ability to invest in renewable energy resources.

**Would you characterize energy and GHG benefits of this proposal as a major, medium, or minor? What data are needed to quantify these benefits?**

MAJOR, if implemented at the level recommended here.

**Who is affected by this proposal? Who will support it? Who's likely to oppose it?**

The Oregon economy. (most people should support this in concept)

Home and small commercial building owners, including apartment building owners. (Home and building owners whose buildings are in need of a significant upgrade should support this.)

The building and development sector. (The building trades should support this.)

The financial sector. (The bonds envisioned here should provide a relatively secure investment in a healthy economy – a welcome refuge in today’s financial circumstances. The financial sector should support it.)

The planet. (If this is taken up by many jurisdictions, on a sufficiently large scale, over a long enough period, there will be *significant reductions* in greenhouse gas emissions.)

**Will there be a fiscal impact? Order of magnitude estimate?**

There will be a moderate fiscal impact if the bond repayment streams are certified to the property tax rolls in the jurisdictions where the program is run. It isn’t possible to estimate it at this time.

**What are the likely training and infrastructure needs?**

There will be significant scale-ups required for both the financial/jurisdictional infrastructure (to run the programs and in the building trades and certification infrastructure to deliver the program in the field. There already exist a significant number of trade allies who would help provide this infrastructure (home energy efficiency program providers like the ETO and the Northwest Energy Efficiency Alliance and their contractors, Earth Advantage, existing city and county programs, etc.).

## Appendix

### Governor's Energy Efficiency Work Group

#### Public Financing for Energy Efficiency in Existing Buildings

The proposal herein presumes that the combination of rising energy prices, the need to address climate change in a serious way, and the precariousness of financial markets requires that we act in a bold way to allow a level of investment in the energy efficiency of our existing buildings that has never been considered before.

While there have been numerous programs over the last 25 years that have provided incentives for the weatherization of existing homes and for the upgrade of existing commercial building systems, it's clear that these programs have not delivered substantial savings, nor have they been applied to a very large fraction of our existing building stock. We need to change this in a dramatic way.

New USEPA data confirms that our building stock is one of the two largest sources of U.S. carbon emissions – 31% of the total.<sup>1</sup> With an appropriate level of investment, over time, we could reduce carbon emissions from buildings by at least two-thirds. Indeed, this is the level of effort required if we are to seriously address the imperatives of climate change.

***The single largest barrier to achieving this goal is the availability of capital.***

The term “availability” is used broadly here, covering such constraints as the literal amount of capital made available for investment in building energy efficiency upgrades, the affordability of capital for various segments of society, and the structural restraints imposed by the ways in which building owners acquire capital, repay loans and value investments. The best solution to this large barrier will address all of these constraints.

#### *The Legislative Proposal*

**“Amend current statutes to allow State and local jurisdictions to establish energy efficiency investment districts that can use capital raised through bond sales to make possible relatively large energy efficiency investments in existing buildings, with the bond repayment revenue stream generated by assessments based on the value invested in the upgraded buildings from the bond fund.”**

An initial assessment of the legislative changes needed suggests that at a minimum, some adjustments to ORS 223 will be needed to allow this kind of local improvement district (LID) financing to be implemented. In addition, it would be prudent to do some analysis of “the math” to ensure that financial markets will be pleased to see the resulting bonds on the market. In the following sections of this document, we explore the issues embedded in this proposal.

---

<sup>1</sup> In its new statistics, EPA breaks out U.S. carbon sources in a new way. The largest source is the “provision of goods and materials” at 38%.

## *Background*

It's nearly axiomatic in the energy efficiency world that existing buildings represent the single largest challenge to acquiring large energy savings in the residential and commercial sectors. This is no surprise. It's far more difficult to retrofit an efficiency measure than to provide it in the first place. This is especially true in the case of shell measures – wall insulation, windows, roof/ceiling insulation, etc. It's not just more difficult – it's significantly more expensive.

In examining the Northwest Power & Conservation Council's existing homes weatherization measures list, one finds that bringing an existing home up to code levels, or a little better, can require \$25,000 to \$50,000 of investment in the building.<sup>2</sup> By using our [long outdated] common methods of determining the cost-effectiveness of such investments, we typically find that such measures would have been cost-effective had they been installed when the building was built, but in a retrofit situation, the cost renders them non-cost-effective. If only we had had perfect knowledge of our energy future when the buildings were built.

But we didn't. And given our current energy and climate change circumstances, we now face an enormous investment challenge to bring tens of thousands of homes and businesses up to and beyond an energy efficiency standard for new buildings that is probably not yet at cost-effective levels of specification.

In the meantime, the U.S. financial sector is at the edge of meltdown. The housing bubble brought to us in the early part of this decade by extraordinarily low interest rates, and no small amount of housing investment speculation, is collapsing. Foreclosures are breaking records and there has been a significant reduction in the availability of private capital for real estate investment. Levels of perceived risk are high, and even when capital is available, interest rates may place it out of reach for many home and commercial building owners.

The collapse of the housing bubble has dealt a severe blow to the building trades. Housing starts are way down, and the commercial building sector is also suffering a major downturn in activity. In most economies, the building trades comprise a significant fraction of total economic activity. When there's a downturn in this sector, the entire economy suffers.

Nationally, the momentum of initiatives focused on mitigating climate change is rapidly building. As each month passes, it becomes more clear to those paying attention to the science that we have precious little time to act – dramatically, if we hope to ward off the worst effects of climate change. Carbon accounting schemes are proliferating and many people assume that some sort of carbon trading system will emerge soon from the maelstrom of debate on the issue. For most people, this debate is confusing at best and highly misleading at worst.

The fossil fuel circumstances of the American economy are more dire than hardly anyone realizes. Oil and natural gas availability are set to decline significantly

---

<sup>2</sup> See the attached Appendix for an estimate for a typical home.

after 2010, and with coal-fired power plants being the single largest source of North American carbon emissions, we can ill afford to burn the supplies to which we have access. A combination of North American oil and natural gas production declines, post-peak production declines in a growing number of the world's other producing countries, and export declines from the world's largest remaining exporters (they're using more and more of their own declining production), have combined to paint a very bleak near-term picture for North American energy supplies.

In 2002, Oregonians spent about \$6.3 billion on energy. By 2006, a short 4 years later, the bill came to about \$10 billion. It's gone nowhere but up since then. A significant fraction of this money left Oregon and its economy. We need to stem this loss immediately. Many of the dollars kept in the economy will be available for further investment in further reductions.

Given the foregoing, one of the most important responses we can make is obvious – invest in using less energy. ***A lot less.***

### *Existing Building Efficiency*

Society's response to the last energy "crises" in the 1970s was short-lived, throttled by low energy prices brought on by a decade-long recession. The recession inflicted some other damage here in the Pacific Northwest. Based on the optimistic economic and load growth predicted by electric industry forecasters,<sup>3</sup> the region set out to build, more or less simultaneously, seven nuclear generating plants. The collapse of the Washington Public Power Supply System (WPPSS) led to the largest (at the time) bond default in history. The region is still paying for the forecasting failures.

One fortunate result of the WPPSS disaster was what is called in shorthand the Northwest Power Act of 1980. The most salient element of the Act for our discussion here was the one that mandated that the region's utilities purchase all cost-effective conservation resources before building new power generation. While this sounded promising on paper, the low energy prices extant at the time meant that relatively little in the way of conservation in existing buildings was deemed cost-effective. To some extent, this is still true today.

Despite the contrary opinions of a few policy technocrats, energy prices were projected to rise very little in real terms over the typical planning horizon (20 to 30 years). Most sources of energy price and demand prognostication engaged in the usual forecasting behavior – look backward and then project the same going forward. Energy supplies would be plentiful and prices would rise very little and they might even fall a bit.

So the Northwest sailed through the 80s and most of the 90s dramatically under-investing in energy conservation, especially in existing buildings. To be fair, this under-investment wasn't due just to unrealistic forecasts of energy prices. It was

---

<sup>3</sup> Load forecasts in that era appear to have consisted mostly of looking backwards in time and projecting the trends found there indefinitely into the future. To a great extent, this is still how forecasting appears to be done.

also due to the fact that serious efficiency investments in existing buildings are relatively expensive. This is why a failure to upgrade energy code provisions for new buildings is often regarded as creating lost opportunities – it's relatively cheap to invest when the building is designed and built, but unfortunately expensive to go back and do later.

### *Solutions*

Today we face an enormous challenge. It is stated policy that Oregon must reduce its greenhouse gas emissions by three-quarters by 2050. There is no possible way to achieve such reductions without significant reductions in electricity consumption, given that the source of more than 40% of Oregon's current electricity production comes from coal-fired power plants. Carbon sequestration technologies, if they ever prove feasible, are unlikely to contribute to these reductions in the next 20 years. In addition, these technologies will have an unfortunate effect on our overall Energy Returned on Energy Invested ratio (EROEI). We have, at most, ten years to make major reductions in our greenhouse gas emissions.

The good news is that the solutions to our carbon emissions problem go a long way toward resolving our future energy availability problems, and as we shall see, they also mitigate the worst impacts of our impending economic downturn.

Existing buildings are at once one of the largest remaining sources of carbon emissions, and by extension, one of the largest potential sources of reductions. However, due to the capital-intensive nature of the upgrades required, the work faces a huge barrier – lack of sufficient capital, and just as important for many building owners, lack of access to sufficient capital. This barrier is the one addressed by this proposal.

### *Public Financing*

The essence of the proposal is the use of Local Improvement District (LID) financing, funded by bonds issued by a city or county. A jurisdiction would form energy efficiency districts (EEDs) for the purpose of upgrading property within the district for energy efficiency. Similar to the financing mechanisms used by cities to upgrade services and neighborhood infrastructure, the revenue stream to pay off the bonds comes from assessments, often based on the assessed value of district properties. In a typical LID, all property owners whose property benefits from the improvements are assessed to pay off the bonds that provided the capital to finance the improvements. For the purposes of this proposal, it would be far preferable to assess only the individual properties that are upgraded for energy efficiency the program, in proportion to the share of the bond funding invested in the individual property.

It would also be ideal if these assessed payment amounts could be certified to the jurisdictional property tax assessor for inclusion on the property tax bill (as a line item). Schools, fire districts and libraries, whose bond measures are approved by the voters, impose *ad valorem* (according to value) taxes as line

items on property tax bills, and thus these payments become income tax-deductible.

Technically what is proposed here is a specific kind of *revenue bond* (bond repayment from a specified jurisdictional revenue stream) called an *assessment bond* (the repayment stream is collected from the properties within the jurisdiction that benefit from the investments), but it would not be structured in an ad valorem way. Ideally, the assessments against each benefited property would be calculated based on the amount of bond funding used for that property's improvement, and would be designed to pay off its proportionate share of the bond amount, plus interest, over the period of the bond. The ability to make this happen will require some adjustments to current law.

This kind of financing offers several compelling advantages for our time:

- In a time of rapidly contracting private sector capital pools and high levels of perceived risk in privately financed real estate markets, public bond financing backed by an assessment revenue stream will appear relatively secure, and in combination with other factors to be discussed shortly, should provide low levels of perceived risk, and therefore relatively low interest rates.
- The mechanisms by which a large investment in building upgrades can be translated into a monthly or annual payment stream are already well established, and require no new financial instruments or processes to be developed for the program. They do, however, require changes in current law in order to use them for this purpose and in this way, and will require scaling up for the level of activity expected as part of the program.
- Any eligible building owner in the district can participate, including low-income households.<sup>4</sup> Most weatherization loan programs exclude low-income households simply because they aren't able to qualify for financing.
- The only limits to investment per building are defined by what is needed for energy upgrades for any given building and the bonding limits within each jurisdiction.
- The amount of bond fund repayment incurred from the investment in a particular building is ideally automatically tied to the building and all subsequent owners of the building. Regardless of how the repayment charges are billed and paid, the obligation for repayment resides with the current building owner for the period of the bond, regardless of how many times the building changes hands during this period. For a couple of reasons (explained in more detail below) the best and fairest way to assess and bill for bond repayment is through the property tax billing system. Ideally, the LID jurisdiction would be allowed to *certify* these

---

<sup>4</sup> This proposal has residential and small commercial property in mind, but eligibility can be defined however the bonding jurisdiction chooses.

amounts to the jurisdictional tax assessor for inclusion on the tax rolls. The alternative is to bill for these amounts separately – a more resource-intensive approach. The other method by which special districts assess for improvements is by a flat charge per property or per acre, based on the degree to which a property is benefited. In this case, no other property would be benefited directly, and so the bond repayment amount should be linked to the amount invested in a particular building, plus interest, and the payment amount assessed should attach to that property only.

- Assuming the math works as expected, and assuming current law is changed to allow certification of assessments to the property taxing authority, the annual increase in property tax expense for the building owner (the amount of the assessment) will be offset by the annual reduction in energy expenses, and the deductibility of property tax expenses on state and federal income taxes.
- Given the potential scale of the overall program (\$1 billion or more per year, once scaled up) and the significant per-building investments (we are assuming \$25-50,000 per single family home), this program could keep a sinking building trades industry very busy for decades.
- The private and non-profit sectors are by no means excluded. Significant economies of scale are possible, and any private or non-profit organization or consortium could organize the work by geographic area and standardize approaches to achieving required levels of building performance. Low-income weatherization programs could also participate, significantly leveraging their own funds. The possibilities for partnerships and consortia here are endless.
- There is ample opportunity for synergies with other programs such as carbon trading, utility energy efficiency programs and building performance rating schemes (EPC concepts). It could be most helpful to our progress if entities engaged in buying carbon offsets or leveraging their own program funds were to buy down the amount of bond funding needed for any given project. And a functioning EPC system could provide a significant boost to the demand for the investment program.

Each of these elements is important enough to merit some additional discussion.

### *Benefits of a Public Capital Program*

*Even in a rapidly contracting private capital sector, capital will likely be available, even in large quantities.*

As most people now recognize, the collapse of the mortgage lending bubble has not yet fully played out.<sup>5</sup> This means that private capital will likely become increasingly difficult to obtain, even for those who would have qualified for

---

<sup>5</sup> For more reading on this subject, check out:

1. <http://www.nakedcapitalism.com/2008/06/bis-warns-of-deepening-contraction-not.html>
2. <http://ml-implode.com/>

conventional financing in past years. If left strictly to private sector-financed projects, the pace of weatherization and upgrades for existing buildings might actually *slow* in the near term. While the availability of public sector capital can also be adversely impacted in an economic downturn, we believe that public sector bond financing, on a very large scale, will be needed to enable the kind of investment in existing buildings now required.

As will be discussed in more detail below, there is reason to believe that if such financing is accomplished, on the scale described (\$1 billion per year or more), the positive impacts on the region's economy would have the effect of making much more capital, both public and private, available in each succeeding year.

Because of the relatively low perceived risk of such bonds in the marketplace, interest rates on the bonds, relative to the cost of private capital, should be very attractive and serve to make this method of financing large-scale investments possible. Some alternative methods of financing, such as using utility capital, with payments made through the utility billing system, would likely be more costly and provide less in the way of capital.

*The process infrastructure by which investments in existing buildings result in a repayment stream are already in place.*

As typical city process infrastructure now works, when LID investments are made in a way that benefits a group of properties, assessments against the properties are made and billed to repay the investment, with interest. This requires the concurrence, in advance, of at least half of the properties in the district. The kinds of improvements funded are usually infrastructure (sidewalks, streetscape improvements, street lighting, etc.) that benefits multiple properties.

Certain kinds of special districts are allowed to certify such assessments to the tax assessor for inclusion on the tax rolls, such that the assessment becomes an increment on the properties' tax bills. In the energy efficiency LID case proposed here, the new assessment is a monthly or annual payment that pays back, over 30 years, the full value of the energy remodel elements added during the remodel, plus interest, but is assessed only against individual properties as they participate in the program.

Property taxes in subsequent years would likely rise slightly to reflect the major remodeling investment in these properties, subject to the limits imposed by Ballot Measures 5 and 50. Given the way property tax adjustments based on remodeling investments are now structured, this impact is likely to be quite small, and given the complications involved in exempting these investments from this common mechanism, it would probably be better to accept this effect of the program. We also note here that energy costs will likely rise and offset some or all of these increases over time, but that lower income households may require some additional financial assistance to avoid this additional financial burden.

This part of the proposed program (translating the bond repayment streams into a certified property tax line item) would clearly require the existing jurisdictional processes to be scaled up to accommodate a greatly increased number of

transactions. However, before the remodel permit is applied for, we envision that the homeowner would make a simple application to the jurisdiction for funds from the program to pay for the energy efficiency-related elements of the remodel. In many cases, this might include re-siding or re-roofing where access for wall or ceiling insulation is from the exterior of the building. It might also include new trim for windows as part of a window replacement. Outside of the sale of the bonds, the project application for LID funding, along with a small amount of additional contractor work to separate energy- and non-energy-related parts of the project, is the only direct program-related administrative burden we anticipate before assessments are calculated. The project contractor, as the source of much of the information required on the paperwork, might ultimately do most of this work for her/his client. A relatively small application fee (\$100 to \$250) would likely be enough to cover the costs of the additional administrative burden created by the program.

How the finance math will work for any given project will vary some by the nature of the project. Not all remodels are equal, and costs for the same work may vary from jurisdiction to jurisdiction. When energy upgrades that qualify for program funding are combined with other remodeling work, there will be both an assessment and an increase in the RMV and MAV (see the footnote below) for the property. And market data suggests that a different fraction of the direct investment is recovered in any given time period for different kinds of upgrades. For instance, according to Remodeling Magazine's 2007 Cost vs Value Report (<http://costvalue.remodelingmagazine.com/index.html>), on average, about 83% of the cost of siding replacement can be captured in the sale of a home (assuming "recent completion"). About 80% of the cost of window replacement can be captured at sale.

It is intended in this proposal that the program-funded upgrades be excluded from a recalculated MAV for the life of the assessment, but that other elements of a project, funded from other sources, be subject to the usual jurisdictional processes that would most often lead to an increase in the MAV for the property.

*Anyone can participate.*

Once the boundaries of the energy efficiency district and the classes of buildings eligible for bond fund investment are set, any building owner in the district can participate. This has tended not to be true at all in the case of conventionally financed projects. Building owners have to qualify for private sector loan funding. This has tended to exclude significant numbers of low-income households and small businesses – the very people most in need of help from a program purporting to deliver significant monthly energy savings.

Since the financing in this program does not result in a new mortgage on the property and qualification does not depend on income, every building owner, including all low-income building owners, should be able to participate. ***It's not possible to over-emphasize the importance of this point.***

Alternative financing proposals, such as using utility capital for project lending, would leave increasing numbers of low-income households unable to qualify for

such financing. **Note, however, that this does not mean that additional grant funding will not be required for low-income households, particularly those who are already on energy bill assistance. Considerable creativity and ingenuity may be required to allow the participation of any and all households in Oregon.**

Large per-building investments are possible.

Most existing buildings, especially older homes, need major amounts of investment to bring their energy and carbon performance above current code levels. This is largely due to decades of what amounts to what's referred to in the energy-efficiency business as "cream-skimming" – investing in only the cheapest and easiest measures, while leaving more expensive ones until later. The fact that it was our unfortunate concept of "cost-effectiveness" that drove this behavior is no longer important; it's time to step up to the plate and make these investments.

Fortunately, the only practical barrier to investment in this program is jurisdictional bonding limits. We are free to invest the funds necessary, per building, to bring performance up to a specified level for each building component or system, incorporating all measures. When we look at appropriate levels of performance (see the Appendix), and the Northwest Power & Conservation Council's list of existing building measures, we see a range of \$25 – 50,000 per single family home and perhaps \$10-30,000 per small commercial building. This level of borrowing can be challenging for the private sector to deliver to all of the homes and buildings that need it. Again, it's highly unlikely that low-income households could be served at this level by the private sector.

But successful funding at this level per building can result in dramatic reductions in energy use and carbon emissions in our existing building stock, while creating no lost opportunities. This is critical, as these investments will become more difficult as time goes on, as more and more of the capital we need for the investments has been siphoned from Oregon's economy in the form of ever-increasing annual energy bills.

The proposed LID financing concept automatically ties repayment of the investment to the building's owners and all subsequent owners.

While this may seem obvious to some, it's important for at least a couple of reasons. First, it will seem highly appropriate to most people that, perhaps with the exception of low-income households, the beneficiaries of the investments financed by the program pay for those benefits. The alternative might be a bond issue that's repaid with a revenue stream derived from all of the citizens in the district (a *general obligation bond*). While this would work, it would not be perceived as fair by many people. During the life of the bond issue, each month, the people who derive the energy savings from the investment make the payments on the investment, directly or indirectly.

If the math works properly, the incremental costs are balanced by the incremental benefits.

If this concept works as envisioned, the added annual assessment costs are offset by a combination of the annual energy savings and the income tax deductibility of the incremental property tax amounts. This assumes, of course, that the assessments can be certified to the tax assessor. If the math works in the early years of the bond period, it only gets better as energy costs go up.

Note that any proposal that uses utility billing systems as the channel by which financing payments are made takes away the potential tax deductibility of the payments and adversely affects the building owner's financial balance as a participant in the program. A city or county jurisdiction operating its own energy efficiency LID would most effectively structure the bond payments as a revenue stream from property tax roll-certified assessments. If another entity formed the district (e.g. the State), the bond payments would either have to come from another revenue stream, or also be certifiable to the property tax rolls (structured similarly to the payments for a fire or parks district). More informed minds will have to explore those possibilities.

In the case of rental housing, the energy bill beneficiaries would most often be the tenants, while the assessment payments would be made by the building owner (who would also be the party responsible for making the decision to invest in upgrading the building). In theory, the solution to this problem is for the building owner to raise rents by the amount required to balance the assessment amounts, minus depreciation on the investment. Again in theory, the increase in the monthly rent for a tenant should be offset by the tenant's reduction in their energy bills. There is no way to guarantee that this is how the program will work in the case of rental housing, but there's no doubt that the value of the rental property will increase substantially when serious energy efficiency upgrades are completed.

*The building trades are one of the biggest beneficiaries of this program.*

If one examines the scale of the investment in existing buildings required for serious climate change mitigation and compares that to the amount of building trades material and labor to do the work, it's safe to assume that this program could keep our region's building trades and building-related businesses busy for decades. This is all the more important in view of the serious downturn in new building construction now extant.

The building and development sector comprises a significant fraction of the regional economy. And most of the jobs created by this kind of program are not of the sort that can be outsourced overseas. Given the effect on the local economy of an investment proposal on this scale, it would not be an exaggeration to suggest that the program could serve as a core strategy to maintain the vibrancy of Oregon's economy through whatever economic downturn now threatens the national and international economy.

Indeed, a significant amount of tertiary economic activity is likely to be generated by investments of this scale in our local infrastructure. The macroeconomic effect is to stem the outward flow of capital from Oregon's economy while at the same time investing in a significant amount of local and regional economic

development and dramatically reducing Oregon's carbon footprint. Because most of the jobs created are local, the economic multiplier effect is likely to produce or maintain 2 to 3 additional jobs outside the building trades sector.

A recent paper by Skip Laitner of the American Council for an Energy Efficient Economy (ACEEE) suggests that for each \$1 million directly invested in energy efficiency, 5.5 jobs are created.<sup>6</sup> In the case of a major weatherization and remodeling program gearing up in the face of an economic downturn, it might be more appropriate to consider how the program *preserves* household incomes in the wider economy. A number of economists have explored the economic multiplier effect of dollars spent at local businesses and suggest that such dollars recirculate a minimum of 2 to 11 times in the local economy, supporting the maintenance of many other jobs, many of which are not directly related to building activity. If this program can be scaled up to the level required to achieve appropriate levels of carbon emissions reductions in the near term, the new capital is likely to support a significant fraction of the local economy well into the future.

If Oregon is strategic about forming program partnerships, many good family-wage jobs can be preserved and even grown in our economy. For instance, one of the most effective ways to optimally add insulation to the walls of an existing building is to use a product called nailbase, which is in turn made of oriented strand board (OSB) or plywood and rigid insulation. The OSB or plywood could very well come from Oregon mills, by choice, as part of a partnership brought into being to serve the ramp-up in demand created by the program. While the program-generated demand for dimensional lumber may not be as great as that generated by the new construction sector in recent years, it could certainly help support local mills. Many retailers of other products used in home and commercial building remodels will see support for their revenues as well.

*Private sector capital will also play a role.*

Many projects funded with bond revenues will involve more than energy efficiency upgrades. But the program capital is earmarked for only the efficiency upgrade portion of the work. So for many projects, some private sector lending from traditional sources will have to be tapped for non-energy-related work. In an economy that is reasonably prosperous, the scale of private lending could be significant when leveraged by the public financing.

In addition, other kinds of sustainability-related upgrades such as storm water management measures (green roofs, bioswales, rainwater harvesting, etc.), water efficiency measures and renewable energy systems might also involve private sector or other third-party capital.

One of the more interesting sources of private sector capital might come from carbon markets, depending on how these develop. Entities looking for places to

---

<sup>6</sup> See Karen Erhardt-Martinez and John A. "Skip" Laitner, *The Size of the U.S. Energy Efficiency Market: Generating a More Complete Picture* (ACEEE, Report Number E083, May 2008), pp. vi, vii, 24ff., 46f.

purchase offsets or credits might be able to buy down the amount of funding required from bond revenues for individual projects or for large groups of projects aggregated by third-party providers of energy efficiency remodeling services.

*There are ample opportunities for partnerships and collaborative approaches to projects.*

There are other parties that could participate in the program, bringing their own capital to projects, or providing services to the program. Many such entities already exist. The Community Action Program (CAP) agencies that currently provide low-income weatherization services could leverage their funding dramatically and utilize their existing infrastructure to deliver the program to low-income households.

Utilities could also bring funds and program management to projects, perhaps adding load management measures as part of their own program(s). Organizations like the Climate Trust or the Bonneville Environmental Foundation (BEF) could invest in the program's potential for major carbon emission reductions.

Building energy performance rating systems might also bring great value to the program, as each building would be rated as part of the program and performance targets for each project might be specified in terms of a rating outcome. To the extent that there is some sort of rating requirement (for instance, at time of building sale), this would probably add demand for the program over the long haul.

### *Other Considerations*

#### *Scale*

While it might take a year or two to scale up the program infrastructure, it is meant to be very large when fully funded, with annual program investments of \$1 billion or more. At \$50,000 per single family home, \$1 billion would retrofit 20-25,000 homes per year. If we add multi-family buildings and small commercial buildings (perhaps phased in), annual investments might exceed \$1.5 billion.

At this rate of investment, it would take about 25 years to complete the program. More annual investment, assuming adequate infrastructure, could easily shorten the period by a third.

#### *Program Infrastructure*

In spite of much financial infrastructure already being in place, there is still a need for program management. Projects and project elements need to be qualified for participation (verify project scope of work and remodel measure eligibility for funding), a minimum amount of follow-up inspection would need to be done, generally prior to disbursement of funds, and there would be an incremental amount of financial management associated with actually handling the funds. In addition, the jurisdictional LIDs must generate the assessments and certify them to the tax assessor. The tax assessor's office must process these to the tax rolls.

It is the intent of this proposal that the bond funding be invested only in energy efficiency measures, and in building elements that are replaced as a necessary part of installing the energy efficiency measures. For instance, if access to wall cavities for insulation or adding wall insulation requires removal and replacement of siding, the cost of the re-siding would be eligible for funding. This part of the program could be contracted out to various for-profit or not-for-profit entities, many of which already exist in our community. There are a number of firms that have marketed, managed and evaluated many energy efficiency programs in the Pacific Northwest over the last 15 to 20 years, and many of them could manage all or part of this kind of program.

The costs of the program management function and incremental jurisdictional admin costs imposed by the function of the LID would have to be built into the overall funding from the bond sales, or could be provided by other funding mechanisms within the jurisdiction. A minimal fee (\$100-250) could be assessed to help cover these costs. Given the level of funding on offer for a major upgrade in the building, a fee in line with that imposed by lending institutions for inspections should be considered quite reasonable.

#### *Financial Characteristics*

While the bond issues contemplated here would be of the general category of municipal bonds, the interest earned by investors might not be tax-exempt. Bond proceeds invested in such a way as to benefit private parties, wholly or in part (private activity bonds) are not generally tax-exempt, though we would certainly leave that determination to more knowledgeable people. We mention it here to note that the interest rates obtainable for these bonds might be slightly higher than other kinds of municipal bonds, and this should be taken into account when doing “the math” to understand the financial flows generated by the program.

However, we do reiterate here the fact that for a building owner, the incremental property tax payments would be tax deductible if we can get the law changes necessary to allow the assessments to be certified to the jurisdictional tax assessor. If another method of funding and repayment is used (such as through a utility bill payment), this would not be the case.

As energy costs go up, the value of the investment, and the amount of the investment captured in the market value of the home, will rise while a homeowner’s cost of home ownership will stay relatively flat. This is a highly desirable outcome, especially for low-income households.

In fact, the ability of low-income households to participate is a key feature of this proposal. There are no private or non-profit sector programs or concepts for which this is true, at least on the per-building scale of investment contemplated here. For the lowest income households however, the funds provided by this program will not be sufficient. As is the case now, grant funding will need to be used to buy down the amount of capital drawn from the bond proceeds to complete these projects. This should be less in the case of multi-family buildings (rental property) where the investment per unit required to hit efficiency targets should be much smaller.

### *Performance Specifications*

While there is plenty of time to discuss the minimum level of building performance required for program participation, we urge a high level of specification. See the Appendix for suggested component-by-component numbers. At this point in time, it is critical to avoid creating lost opportunities by failing to retrofit all program homes to a minimum level of performance – a very high level of performance. In the end, short of creating statewide specifications, it will be up to local jurisdictions to create these for their individual programs. In that case, we can only urge a stringent spec.

## APPENDIX

### ENERGY EFFICIENCY<sup>7</sup>

<b>Measure (single family, 1,600 square feet)</b>	<b>Installed Cost</b>
Building shell investment can include roof and siding replacement in some cases. Insulation: Wall R20-25, Attic R50, Vault R38, Floor R30, Basement Walls to R21, Class 30 Windows, Insulated Exterior Doors	\$35,000
Duct sealing. Heating system replacement Air Sealing with Heat Recovery Ventilator.	\$12,500
Lighting: Replace all incandescents w/CFL or equivalent efficiency.	\$500
Appliances: Replace with best available Energy Star models. But replacement cost is assumed as part of normal life-cycle, and is not included here.	
High-quality audit and meter/monitoring	\$800
Total Installed Cost (2006\$)	\$48,800
<b>OTHER COSTS</b>	
<b>Solar Hot Water</b> (from Energy Trust) or heat pump.	\$3,500 \$1,200
<b>Total cost, single-family unit:</b> (w/o solar water heating)	<b>\$50,000</b>

---

<sup>7</sup> Northwest Power & Conservation Council discussions and memos.