

# Energy Efficiency and Green Building Implementation Working Group (EE/GB IWG)

**Note to IWG members:** The five 2009 Action descriptions that follow are concepts developed by small groups following the EE/GB IWG teleconference of June 23, and reflects refinements and placement of the actions into a common template format by the small groups following the IWG teleconference of July 9<sup>th</sup>. Further refinements to EE/GB Actions 1 through 3 (Action 4 is in the process of being combined with Action 1) by the small groups, following the August 1st EE/GB teleconference and August 14<sup>th</sup> in-person meeting, are included in the text below, compiled with some clarifying edits by the EE/GB IWG facilitators, and represents the small groups' work as of August 29<sup>th</sup>. The text for each 2009 Action will be updated incorporating feedback from the Climate Action Team and based on continued discussion by the full IWG during our meeting on August 14th.

Note that in the text below, passages that appear **in yellow highlight** have been added or modified based on small group discussions since the August 14<sup>th</sup> IWG in-person meeting. Note that text deleted as a result of small-group discussion does not appear here. Text in **highlights and italics** are notes from or to group members, or reflect notes regarding ongoing discussions between IWG members, and most non-highlighted text in *italics* (other than some titles) are generic directions for parts of the action template that are to be completed as the IWG continues its work.

Please note also that in the July 9<sup>th</sup> teleconference the IWG agreed that the further development of Action #5, “Energy Efficiency for Natural Gas, Propane, and Fuel Oil”, should be placed at a lower priority than other actions, as it was felt that this option was likely to yield more limited emissions reductions than other actions before the IWG, and would in part be addressed by other actions that the IWG is moving forward with. In addition, at the suggestion of the EE/GB co-leads, during the teleconference call on August 1<sup>st</sup>, the IWG decided to combine the elements of EE/GB-4 with EE/GB-1, especially as they relate to financing of combined heat and power and distributed energy projects, thus Action 4 is in transition, and will not remain a separate Action.

## **EE/GB Action 1: Incentives for Higher-Efficiency Building Operations**

### **Initial Direction Provided to Small Group**

Develop targeted proposals for tax and other types of incentives that promote the construction, retrofitting, and long-term operation of buildings (both residential and commercial, including the typically underserved small-commercial segment) at substantially higher levels of energy efficiency. IWG members suggested that this action include discussion of innovative financing funds, means of benchmarking building operations at an escalating scale over time, an energy efficiency fund to further support the transition from BAU to high performing buildings, and incentives to upgrade/retrofit existing buildings.

### **Revised 2009 Action Concept (as produced by small group)**

### **Revised Title: Energy Efficiency Quality Investment Program (EEQUIP)**

#### **2009 Action Description:**

The derived public benefit from investments in superior energy efficiency in Washington is a superior quality-built environment for those using and operating buildings, as well a strategic attraction for additional investments in our economy. To this end, development assistance to provide incentives for quality improvements in building energy efficiency, by definition, must also ensure quality improvements in operations, performance, measurement, and the craftsmanship and training that go into quality buildings. In addition to alignment with the goals of Executive Order 07-02 and subsequent statutes, this rationale works to better ensure the transparency, accountability, and success of the program, from the perspective of the direct beneficiary as well as the public at-large.

This action provides a combination of sales tax rebates for new residential and non-residential buildings (and remodels) that meet energy efficiency standards, Public Utility Tax credits for non-residential buildings that attain and maintain high levels of energy efficiency, property tax incentives for the buyers of energy-efficient homes, and authority for local governments to fund of building energy efficiency improvements in all sectors through the use of state bonding capacity.

#### **Residential Buildings**

While homes built to meet the requirements of modern day energy code perform drastically better than the majority of existing homes, it is important to inspire even higher levels of energy efficiency in new homes through incentives.

A three-tiered approach to provide incentives for energy efficiency improvements beyond those required by codes will provide progressive incentives based on the level of green building measures/improvements included, and level of energy efficiency of new homes. In an attempt to engage builders state-wide, and those that have not yet engaged in energy efficient construction, this proposal includes a level that allows incentive for entry level green building as well as the highest levels.

The three constituencies addressed in this proposal are as follows:

1. Home builders.
2. Home remodelers/existing owners.
3. Home buyers.

The draft text below provides for sales tax incentives for the first two of these groups, and property tax discounts for home buyers.

### **New Home Construction:**

The incentive is in the form of sales tax rebate on certified green buildings. The total rebate offered is designed to be capped at each level of performance in order to not overly incentivize large homes. The proposed incentive levels are as follows:

### **Residential Remodels:**

Existing housing stock is far and away the biggest energy sink in terms of buildings in the region. Without addressing the inefficiency of the existing homes in our region, many without any sort of insulation whatsoever, any effort directed at new buildings will have minimal effect. This incentive mirrors the model for new home construction, and could potentially have the greatest climate impact of any incentive proposed in either the commercial or residential sectors.

### **DRAFT LEGISLATIVE TEXT SPECIFYING PROPERTY TAX REBATES FOR NEW HOME CONSTRUCTION AND RESIDENTIAL REMODELS (taken largely from original HB 3120 with some changes):**

- (1) Subject to the conditions and requirements of this section, the tax levied by RCW 82.08.020 does not apply to the sale of qualifying property and services. The exemption is in the form of a remittance and applies to part of the state portion of the sales tax.
- (2) A person claiming an exemption from state sales tax must pay the tax imposed by RCW 82.08.020. The builder may then apply to the department for remittance for part of the tax paid under RCW 82.08.020. For the sale of qualifying property and services used in the construction or renovation of a building with a silver, gold or platinum rating under the leadership in energy and environmental design (LEED) green building rating system or a three, four or five-star rating under the Washington built green program, the remittance, based on level of certification earned, equals:
  - (a) LEED Silver/3-star built green: equals 20 percent of the state sales tax paid.
  - (b) LEED Gold/4-star built green equals 35 percent of the state sales tax paid.
  - (c) LEED Platinum/5-star built green equals 50 percent of the sales tax paid.

- (3) The definitions in this subsection apply throughout this section.
- (a) "Construction" means the construction, repair, decoration, or improvement of new or existing buildings.
- (b) "Environmentally certified building" means a commercial or residential building: (i) With a silver, gold, or platinum rating under the leadership in energy and environmental design green building rating system; (ii) with a three, four or five-star rating under the Washington built green program; or (iii) with a rating for sustainable building that is equivalent to (b)(i) or (ii) of this subsection, verifiable, and approved by the department in rule.
- (c) "Qualifying property and services" means tangible personal property and labor and services used, or to be used, in the construction of environmentally certified buildings.
- (d) "Type of home" means single family or multifamily, as appropriate.

**NEW SECTION. Sec. 1)** A new section is added to chapter 82.12 RCW to read as follows:

- (1) Subject to the conditions and requirements of this section, the provisions of this chapter do not apply to the use of qualifying property and services. The exemption is in the form of a remittance and applies to part of the state portion of the use tax.
- (2) A person claiming an exemption from state use tax must pay the tax imposed under this chapter. The person may then apply to the department for remittance of all, or part of, the tax paid under this chapter. For the use of qualifying property and services used in the construction or renovation of a building with a silver, gold or platinum rating under the leadership in energy and environmental design green building rating system, a three, four, or five-star rating under the Washington built green program, or an equivalent rating as provided in section 1(4)(b)(iii) of this act, the remittance, based on level of certification earned, equals:
  - (a) LEED Silver/3-star built green: equals 20 percent of the state sales tax paid.
  - (b) LEED Gold/4-star built green equals 35 percent of the state sales tax paid.
  - (c) LEED Platinum/5-star built green equals 50 percent of the sales tax paid.
- (3) The conditions, requirements, and definitions in section 1 of this act apply to this section.

**NEW SECTION. Sec. 2)** By December 1, 2010, and by December 1st of the two following years, the department of revenue shall submit a report to the legislature. The report must: (1) Provide the amount of sales and use tax exempted under this act; (2) describe the commercial or residential character of tax exempt construction; and (3) identify the geographic location of tax exempt construction. The department may include any other information in the report that it deems necessary for the legislative evaluation of the sales and use tax exemption authorized in this act.

**[Existing (pre-8/14) text for this option related to residential sales tax incentives follows, provided here for IWG review/comparison with the above]**

Legislative action is recommended by March 1, 2009 to establish a tax incentive for newly constructed buildings (residential and non-residential occupancies) that meet or exceed specific levels of energy performance. Buildings that meet or exceed the LEED for Homes rating *[Note that several IWG members suggest that the reference to LEED for Homes should either be augmented by mention of other standards, such as Built Green and the NAHB Green Building Standard, or should be eliminated in favor of the reference to verified third-party standards]* (or other verified third-party or independently standardized indices of performance as defined by the Department) will qualify for a sales tax credit as applied to a portion of the cost of building construction. Qualifying new homes will be eligible for a sales tax refund equal to 10% of the total sales tax paid for the construction of the home.

**Revenue effect:** This program is estimated to reduce sales tax revenue by \$1.5M to \$2M per year during the biennium 2009-2010.

**Home Buyer of Highly Efficient Green Home:**

In addition to building and remodeling energy efficient homes, it is important to close the loop in providing a good reason for home buyers to ask for and purchase energy efficient homes. This proposal has not been discussed widely in the IWG, but one model for this type of incentive could come in the form of a property tax discount.

A buyer-directed incentive would both stimulate the market in the form of new purchases, and provide added value to the builders who have lowered the emissions of the homes they are building. This incentive would only apply to new home purchases, and could be amortized over a multi-year period to defray the annual cost to the state.

The proposed incentive amounts are as follows:

- Homes certified to Built Green 3-Star or LEED-H ratings: \$450 property tax incentive amortized over 3 years
- Homes certified to Built Green 4-Star, LEED Gold, or Energy Star (minimum 15% improvement over modern energy code) ratings: \$1,200 property tax incentive, amortized over 3 years
- Homes certified to Built Green 5-Star or LEED Platinum (minimum 30% improvement over modern energy code) ratings: \$2,400 property tax incentive, amortized over 3 years.

**PUT Credit and Benchmarking Requirement for Existing Commercial and Multifamily Residential Buildings**

Legislative action is recommended by March 1, 2009 to establish a tax incentive for buildings (non-residential occupancies) that meet or exceed a defined level of energy performance as determined by the ENERGY STAR Portfolio Manager program (or a comparable verified third-party or independent system of standardized accounting and benchmarking as determined by the

Community, Trade, and Economic Development Department). The Department will develop a program that provides the tax credit that initially (e.g. 2009-2010 biennium) provides incentives for buildings that meet or exceed a Portfolio Manager score of 75 or demonstrate an annual improvement of energy performance of at least 15% (regardless of baseline year Portfolio Manager score). Buildings that continue to meet or exceed the Portfolio Manager threshold score may claim the tax credit annually. Buildings that meet the 20% improvement target may claim the credit only one time. Thereafter, those buildings must meet the Portfolio Manager threshold score to claim the credit in other years

There are three mechanisms for qualification for the PUT credit. All three mechanisms begin with establishing a baseline score using the previous calendar year of energy use data).

1. If the score is 90 or above and that score is maintained or improved in the subsequent calendar year, the PUT credit for year 2 (year after baseline) is available for refund. The PUT refund is available for subsequent years if the score is maintained at 90 or above.

2. For buildings whose baseline year score is between 75 and 89, those buildings must demonstrate 5 points of improvement in year 2 to qualify for a PUT tax refund for year 2 (Note any building that exceeds a score of 90 in the second year will qualify for the process described above). If the 2<sup>nd</sup> year Portfolio Manager score is maintained or improved in subsequent years, the PUT refund will continue to be available.

3. For buildings whose baseline year score is below 75, those buildings must achieve a minimum score of 75 in any subsequent year to qualify for a PUT refund. If a score of 75 or above is maintained, the PUT refund will continue to be available.

After 3 years, the baseline score in mechanism #2 moves to a range of 80 to 89. All other features remain the same for the subsequent 3 years.

After 3 years, the baseline score for mechanism #3 moves to 80.

After 6 years, the baseline score for all buildings to qualify for a PUT credit will be 90. A score of 90 or above must be maintained in subsequent years to continue to receive the PUT credit.

This legislation should also require all commercial and multifamily residential buildings (buildings less than 5,000 square feet are exempt) to develop an ENERGY STAR Portfolio Manager benchmark score (or other metric as determined by the Department) on an annual basis and that information be made publicly available (for purposes of tenant lease considerations and prospective buyers at point of sale).<sup>1</sup>

The tax credit described here should be applied to the Public Utility Tax (PUT). The PUT is assessed to electric and natural gas utilities and passed through to energy end use customers. The Department will establish a mechanism in consultation with the state's public and private utilities and in collaboration with the Department of Revenue to minimize the transactional cost

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<sup>1</sup> A range of Portfolio Manager benchmarking requirements have already been passed in Denver, CO and West Chester, PA; the Minnesota Next Generation Energy Act sets a state goal of 1,000 ENERGY STAR labels for commercial buildings; the states of Ohio and Michigan established Portfolio Manager as the benchmarking tool for state-owned facilities; and California's AB 1103 requires all utilities to maintain commercial building data in a format compatible for uploading to Portfolio Manager and requires disclosure of energy benchmarking data from Portfolio Manager during sale, lease or financing of a building. New York City Council is considering a bill which would require ENERGY STAR benchmarking through Portfolio Manager for all commercial and multi-family residential buildings, over 50,000 SF.

of applying this credit to qualifying buildings. Buildings that meet the level of superior energy performance as described here will receive a full credit of the PUT.

**Revenue effects:** It is estimated that up to 28 million square feet of commercial property will qualify for a PUT refund in the second year of the 2009-2010 biennium (given the need for a baseline year, there will be no credits in 2009). The anticipated PUT refund with this level of participation is approximately \$1,500,000.

*[An IWG member raises the following point about benchmarking for discussion: "One alternative to current language would be to phase in the benchmarking requirement over time -- NYC has proposed this option in current legislation before their city council (city buildings starting in 2009, buildings over 250,000 SF in 2010, buildings over 100,000 SF in 2011, all buildings over 50,000 SF in 2012), but think this component is key and could be a second option if incentives fail to generate sufficient support in a tough budget year."]*

### **"Feebates" to Help Fund PUT Credit**

To offset the cost of tax incentives described above, the Legislature should enact a fee on commercial buildings that do not meet superior energy performance thresholds. This fee will be in the form of an increase to the Public Utility Tax. The PUT should be raised from 3.8% to 3.95% for all commercial customer rates. It is estimated that this increase will provide more than \$3,500,000 in additional revenue.

*[As a means to render the PUT tax credit programs revenue-neutral, a "feebate" feature that would apply the PUT tax penalty above to buildings that do not meet a benchmark threshold was considered by the IWG. Several IWG members reviewing the text for Action 1 have offered the opinion that such a feature was not likely to be workable, thus the inclusion of this feature should be discussed by the IWG.]*

### **Sales Tax Refund for Commercial New Construction**

Legislative action is recommended by March 1, 2009 to establish a sales tax incentive for buildings (non-residential occupancies) that meet or exceed LEED-NC Gold standards achieving a minimum of 4 Energy & Atmosphere (EA<sub>c1</sub>) credits. All projects that meet this rating will be eligible for a sales tax refund of 0.75% of the project's documented cost of construction. The Department will establish rules for documenting qualification under the LEED-NC rating system and for verification of qualifying cost of construction. Project owners will receive the incentive in the form of a sales tax refund.

**Revenue effect:** In the 2009-2010 biennium, \$500,000,000 of construction costs are estimated to qualify for the refund. This would translate to a tax refund of \$3,750,000. It is estimated that very few projects would be completed in 2009, so the majority of this tax refund would occur in 2010.

### **Innovative Financing, All Sectors: Local Government Funding of Building Energy Efficiency Improvements Through Bonding Authority**

Legislative action is recommended by March 1, 2009 to amend the statute governing Local Improvement Districts (LID) to add energy efficiency and distributed energy projects to those qualifying for local improvement district financing.

Legislative action is recommended by March 1, 2009 to provide for the sale of state bonds dedicated for financing energy efficiency projects in commercial, residential, industrial and agricultural sectors. The loans from this bond sale should be made available to borrowers at below market interest rates, carry low transactional costs, and the debt should be transferable with the property on which the loan is made. The Housing Trust Fund may serve as a model for this bond sale or used directly as the vehicle for creating the energy efficiency fund.

Revenue effect: This concept would have no revenue impact at the state level. However, local governments would need to assign a fee for the loan transaction to cover the administrative cost of the program.

*[Text describing incentives and other measures to increase the use of Combined Heat and Power and other Distributed Energy systems will be inserted here when developed, based in part on work done already on Action 4, which is being combined with Action 1]*

### **Basis for Selection:**

These legislative concepts are designed to use an incentive based approach to motivate and accelerate the design, construction, and annual operation of buildings to levels of superior energy performance. They are designed to work with familiar and accessible programs of merit (e.g. LEED, ENERGY STAR, Built Green or other verifiable third-party or independent certifications) that have gained acceptance by the commercial and residential buildings market. The reward through tax credits for actual demonstrated energy performance is innovative and critically important to achieving the state's overall greenhouse gas reduction and quality job creation goals, outlined in Executive Order 07-02.

### **Implementation Approach and Mechanisms:**

*The implementation approach/mechanism(s) should be identified, along with the following details:*

- ***Specific deliverable which the IWG will produce to accomplish implementation of the 2009 Action (e.g. draft legislative text) , along with who will produce it and by when***
  - *Note: the deliverable will likely incorporate the other elements contained in this template and developed by the IWG (e.g. the rationale for selecting the action can inform the preamble for legislation, and the description of the proposition may form the body of the legislation), but will be specific to the implementation approach/mechanism required for each 2009 Action.*
  - *Members of the IWG may choose to draft the deliverable, or state support staff may do the drafting, and members will review.*
  - *The deliverable needs to be in draft by the first week of September, and finalized by the first week of October.*

- **Brief description of potential barriers to implementation, and how the action has been designed to overcome them** (including upfront costs, potential externalities, negative leakage, etc.)

These tax credit proposals have a revenue impact on the state's general fund. However, the ideas can be scaled to both near term and long term budget realities. It is recommended that the complexities of tax credit program mechanics be left to a rule making process conducted by the Department.

### Supporting Information:

Include the following:

- **Description of how this option might interact with a regional or national cap-and-trade, or other economy-wide market-based system for greenhouse gases.**
- **Where quantifiable, IWGs should include the following:**
  - **GHG reduction potential of the action, and underlying assumptions** (if action is amenable to quantification) reported in common units,<sup>2</sup> using consistent approaches to geographic scope and lifecycle analysis<sup>3</sup>
  - **Costs or cost savings (net present value, cost-effectiveness) of the action** (if action is amenable to quantification), using consistent methods and perspectives<sup>4</sup>, and reported in consistent units.<sup>5</sup>
- **Distribution of costs and benefits.** Costs and benefits that fall disproportionately on specific groups or actors, should be noted qualitatively, especially where studies or other information are available.
- **Qualitative description of additional external benefits** (e.g. green jobs creation). Unless studies or other information exists, the monetized environmental or social benefits, quality of life improvements, other health benefits, energy security benefits, and macroeconomic impacts from shifting benefits will not be quantified and included.

<sup>2</sup> Net GHG reduction potential in million metric tons carbon dioxide equivalent (MMTCO<sub>2e</sub>) using IPCC 100 yr global warming potential, reported for 2012, 2020, and cumulatively 2009-2020. Where significant additional GHG reductions or costs occur beyond the project period as a direct result of actions taken during the project period, these will be indicated as appropriate.

<sup>3</sup> GHG impacts of policy options are estimated regardless of the physical location of emissions reductions. Where significant emissions impacts are likely to occur outside the state, this should be clearly indicated. These emissions reductions are counted towards the achievement of the state's emission goal, since they result from actions taken by the state.

Lifecycle analysis is applied wherever emissions impacts upstream (e.g., production, extraction) or downstream (e.g. waste disposal) from a specific activity constitute a significant fraction of a policy option's emissions impacts and studies are sufficient to enable estimation.

<sup>4</sup> The general approach of direct (NPV) cost and cost-effectiveness analysis is used, as widely applied to GHG mitigation policy options. Included are the direct, economic costs from the perspective of the state as whole (e.g. avoided costs of electricity rather than consumer electricity prices). Costs may include capital costs levelized (amortized) where appropriate, operation, maintenance and other labor costs, and fuel and fertilizer costs). This bottom-up approach is relatively transparent and is capable of reflecting the costs (and cost savings) associated with an individual policy option, in contrast to macroeconomic analysis, which aims to capture flows and interactions across all sectors of the economy.

<sup>5</sup> Net present value (NPV) cost savings for the period 2009-2020 in 2007 constant dollars, using a 5% real discount rate.

Cost-effectiveness - Cost per metric ton of CO<sub>2</sub> equivalent emissions reduced (or removed) in units of \$/MTCO<sub>2e</sub>. This figure represents the NPV cost divided by the cumulative emission reductions, both over the 2009-2020 period.

- *Implications/ engagement opportunities for individual action/behavior change (e.g. behavior change needed to achieve implementation and/or achieved through implementation)*
- *Implications/engagement opportunities for local and regional governments and private sector*

## **EE/GB Action 2: Public Building Operation and Building Standards**

### **Initial Direction Provided to Small Group**

Develop a proposal that will substantially upgrade the energy efficiency and sustainability of publicly-constructed and -operated buildings by policies that allow better linking of first and operating cost decisions, improve energy standards for construction of public buildings, and use other mechanisms to improve the energy-efficient design and operations of public buildings in an integrate fashion. This option may include elements such as providing case studies as examples to the private sector, and pursuing sustainable building practices more generally.

### **2009 Action Concepts (as produced by small group)**

#### **Revised Title:**

#### **Energy Efficiency in Existing, New and Renovated Public Buildings**

#### **2009 Action Description:**

##### **Background**

The overall effort would involve all of the public sector. It includes existing buildings and new construction. It would include state agencies, universities, colleges, school districts and local governments. Education and promotion of the program will need to be critical components to the success of the program. Implementation will emphasize the use of existing programs and funding in state and local governments.

Partnering with US EPA's ENERGY STAR program is also critical and has been initiated. The ENERGY STAR program is poised to help, for the most part, at no cost. Reporting will be through ENERGY STAR and the US Green Building Council (USGBC).

Affected state agencies will report activity to OFM, but for schools, universities, colleges and local governments will report internally. Energy performance of all buildings will be posted to a highly publicized web site. It is this program transparency and activating of stakeholders and constituents with information and awareness that will becomes the "carrot and stick" the program needs for success.

The program relies upon the well-established ENERGY STAR and US Green Building Council LEED programs for some level of training, third party verification, and reporting that will be accessible to the public. Additional training will also be coordinated by GA, Dept. of Ecology, and WSU Extension – Energy Programs.

Public entities affected by this proposal are encouraged to make operational refinements to improve the ENERGY STAR score prior to the July 2010 target date and thereafter. These could include scheduling equipment operation to coincide with occupancy and emphasis on energy efficient occupant behavior.

It is recommended that entities affected by this proposal that manage over 1,000,000 SF of conditioned building space consider the implementation of a Resource Conservation Management program utilizing dedicated staff. Seek assistance from your serving energy

utility(s) for financial support and technical assistance. Technical assistance will also be available through the WSU Extension – Energy Programs.

## PROPOSED LEGISLATION DETAIL

### Section A: Definitions

**Benchmark.** The energy used by a building as recorded monthly for at least one year. The building energy use and the building characteristics information are required inputs for ENERGY STAR's Portfolio Manager. Buildings on a campus served by a central plant or centralized metering can develop a prorated benchmark for the buildings served by the central plant.

**Conditioned and Occupied Building.** A building that is occupied more than 30 hours per week, on average, and meeting the definition of a Conditioned Space in the Washington State Energy Code.

**Cost-effective.** Energy conservation measures means energy conservation measures that the investment grade audit concludes will generate savings sufficient to finance project loans of not more than ten years.

**Department.** Refers to the Department of General Administration.

**ENERGY STAR score.** The score provided by the ENERGY STAR program, which indicates the energy efficiency performance of the building compared to similar buildings in that climate. ENERGY STAR is a nationally recognized EPA building energy rating system that is also used by LEED – EB O&M as the energy performance metric. Unrated building types will develop a benchmark using guidance and principles from the ENERGY STAR and LEED EB programs. The department will recommend methods to establish benchmarks for unrated buildings.

**Investment grade energy audit.** A detailed audit prepared by an Energy Service Company pre-selected by the department to provide an energy savings proposal that will guarantee of first cost and savings of the energy measures identified. The proposed measures must meet the customer's cost effectiveness criteria or the investment grade audit is free.

**LEED – EB O&M.** Refers to Leadership in Energy and Environmental Design – Existing Buildings Operations & Maintenance as developed by the United States Green Building Council.

**MACC.** The maximum allowable construction cost.

**Preliminary energy audit.** A quick evaluation by an Energy Service Company of the energy savings potential of a building. This is a free service through the department's energy savings performance contracting program.

**Resource Conservation Management program.** A program focused on tracking and conserving energy and water to save on expenses.

### Section B: Existing Public Buildings

#### *Part 1: State agencies, colleges, universities and school districts*

1. By July 1, 2010 each state agency, college, university and school district shall create an energy benchmark for each conditioned and occupied building over 10,000 square feet using the US EPA's ENERGY STAR Portfolio Manager program.
2. This baseline information will be posted on the ENERGY STAR website or other site as determined by Dept. of Ecology and will be open to public review.
3. For each building with an ENERGY STAR score below 50, state agencies, colleges, universities and school districts shall undertake a preliminary energy audit by July 1, 2011. Department of General Administration's Energy Performance Contracting program will provide the necessary technical assistance to meet this requirement.
4. If potential cost effective energy savings are identified, an investment grade energy audit must be completed by July 1, 2012.
5. Cost-effective energy conservation measures identified in the investment grade energy audit must be implemented by July 1, 2015.
6. All buildings under this section will be required to maintain an ENERGY STAR score of greater than 75 after October 1, 2016.
7. Recertification must occur every 5 years through the ENERGY STAR program with the revised ENERGY STAR score posted for public review at a site determined by Dept. of Ecology.
8. (a) By October 1, 2016 all buildings between 20,000 SF and 50,000 SF will use LEED – EB O&M as a guide for their operations and will self-certify based on guidelines developed by the department in consultation with a committee of affected agencies. These buildings must achieve the following standards:
  - i) ENERGY STAR score of 75 or better.
  - ii) LEED-EB-OM: WE credit 2 Indoor Plumbing Fixture and Fitting Efficiency – 1 point.
  - iii) LEED-EB-OM: WE credit 3 Water Efficient Landscaping – 1 point.
  - iv) LEED-EB-OM: MR credit 7 Solid Waste Management: Ongoing Consumables – 3 points
- (b) These standards will be evaluated for update by rule by the department in consultation with a committee of affected agencies in 2016 and every 4 years following.
- (c) The state reserves the right to audit said buildings to verify compliance with this section.
- (d) Results of this self-certification will be posted to a web site determined by the Dept. of Ecology.
9. (a) By October 1, 2016 all buildings over 50,000 SF under this section will be certified to LEED – EB O&M Silver or equivalent system as determined by the department, and will be re-evaluated every 5 years.
- (b) All buildings over 50,000 SF covered by this section must achieve the following standards:
  - i) ENERGY STAR score of 75 or better.

- ii) LEED-EB-OM: WE credit 2 Indoor Plumbing Fixture and Fitting Efficiency – 1 point.
  - iii) LEED-EB-OM: WE credit 3 Water Efficient Landscaping – 1 point.
  - iv) LEED-EB-OM: MR credit 7 Solid Waste Management: Ongoing Consumables – 3 points
- (c) These standards will be evaluated for update by rule by the department in consultation with a committee of affected agencies in 2016 and every 4 years following.
10. Buildings planned for demolition or major renovation by July 1, 2015 are exempt from the requirement to undertake a preliminary energy audit and subsequent energy audits and energy measure implementation.
11. New buildings will be required to comply with the Existing Public Buildings requirements 3 years after occupancy.
12. (a) All leased buildings over 20,000 SF occupied entirely by a state agency, university or school district must achieve the following standards by October 1, 2016:
- i) ENERGY STAR score of 75 or better.
  - ii) LEED-EB-OM: WE credit 2 Indoor Plumbing Fixture and Fitting Efficiency – 1 point.
  - iii) LEED-EB-OM: WE credit 3 Water Efficient Landscaping – 1 point.
  - iv) LEED-EB-OM: MR credit 7 Solid Waste Management: Ongoing Consumables – 3 points
- (b) These standards will be evaluated for update by rule by the department in consultation with a committee of affected agencies in 2016 and every 4 years following.
13. (a) Buildings that have lease agreements that predate this statute will be exempt, however, any renegotiation must comply within 15 months of the new lease inception.
- (b) Buildings planned for demolition or major renovation by July 1, 2015 are exempt from the requirement to undertake a preliminary energy audit and subsequent energy audits and energy measure implementation.

### ***Part 2: Cities, Counties, and other Public Taxing Authorities***

The provisions are the same for buildings owned and leased by cities, counties and other public taxing authorities as in Section B (Part 1), *except* the following timelines are extended:

1. By July 1, 2011 each city, county, and other public taxing authority shall create an energy benchmark for each conditioned and occupied building over 10,000 square feet using the US EPA's ENERGY STAR Portfolio Manager program.
2. For each building with an ENERGY STAR score below 50, each city, county, and other public taxing authority shall undertake a preliminary energy audit by July 1, 2012.
3. If potential cost effective energy savings are identified, an investment grade energy audit must be completed by July 1, 2014.
4. Cost-effective energy conservation measures identified in the investment grade energy audit must be implemented by July 1, 2017.

5. All buildings under this section will be required to maintain an ENERGY STAR score of greater than 75 after October 1, 2018
6. By October 1, 2018 all buildings over 50,000 SF under this section will be certified to LEED – EB O&M Silver or equivalent system as determined by the Department, and will be re-evaluated every 5 years.
7. The initial energy benchmarking efforts will be the responsibility of the local jurisdictions. This is good building operating practices and will help the owners identify buildings with savings opportunities. It would also help to identify no cost and low cost measures. The cost of a preliminary audit and investment grade audit, if working through the Dept. of General Administration’s Energy Savings Performance Contracting (ESPC) program, would be zero (if no cost effective measures are identified) or would be rolled into the cost of the qualified and contracted energy conservation measures identified. Utility incentives would be utilized to reduce the first cost of measures identified. The balance of the costs for implementation of the energy measures could come from low cost State Treasurer financing. Financing would be paid back from the guaranteed savings. Using this approach requires no capital outlay. The cost of the measures is completely paid off by the savings.
8. As for the cost of the LEED – EB O&M program for buildings over 50,000 SF, these would need to come from the local jurisdictions, however, savings in energy and water, and increase productivity of the workers would provide for a quick payback on costs. An estimate of the cost for documentation and submittal fees is \$10,000 to \$50,000 per building. Economies will be realized with multiple buildings and through a learning curve, subsequent buildings within an organization will cost less. The cost for Re-Evaluation would be minimal.

### **Section C: New Construction of Public Buildings**

#### ***Part 1: State agencies, colleges, universities and school districts***

1. All occupied and conditioned buildings over 5,000 SF going into design after July 1, 2011 will be required to certify to the LEED NC Gold level or equivalent as determined by the Department. This also applies to major renovation projects where the project construction budget is over 50% of the assessed value of the building. All affected buildings must achieve the following as prerequisites:
  - a) Meet “Architecture 2030” goals for energy performance.
  - b) LEED-NC Water Use Reduction – 2 points.
  - c) LEED-NC Water Efficient Landscaping – 1 point.
  - d) LEED-NC Construction Waste Mgt. – 2 points.
  - e) A minimum of 0.5% of the MACC must be spent on renewable energy systems as defined under LEED.
  - f) LEED-NC Regional Materials – 1 point.

**Part 2) Cities, Counties, and other Public Taxing Authorities**

1. (a) By July 2011, local governments state-wide shall adopt rules that are at least compliant with this section.  
(b) All occupied and conditioned buildings over 10,000 SF going into design after July 1, 2013 will be required to certify to the LEED NC Gold level.
2. The LEED NC Gold requirement also applies to major renovation projects where the project construction budget is over 50% of the assessed value of the building. All affected buildings must achieve the following as prerequisites:
  - a) Meet “Architecture 2030” goals for energy performance.
  - b) LEED-NC Water Use Reduction – 2 points.
  - c) LEED-NC Water Efficient Landscaping – 1 point.
  - d) LEED-NC Construction Waste Mgt. – 2 points.
  - e) A minimum of 0.5% of the MACC must be spent on renewable energy systems as defined under LEED.
  - f) LEED-NC Regional Materials – 1 point.
3. The added cost to implement LEED NC Gold for jurisdictions that have no LEED requirements would be 2.7%\*. For jurisdictions that already require LEED NC Silver, the costs should be 0% to 1%.

\* Davis Langston Adamson, Costing Green: A Comprehensive Cost Database and Budgeting Methodology, 2004.

**[Former “Section D: Building Materials”, has been deleted]**

**Procedural and administrative provisions and requirements**

It is recommended that this proposal be implemented through legislative action. As currently proposed, it is consistent with the Governor’s new Executive Order on Sustainability (expected to be released in Fall 2008). An Executive Order alone could achieve a portion of the desired emission reductions; however, the extent of the impacts would be far less.

Many existing programs will be utilized to implement this recommendation: the department, Dept. of Ecology, ENERGY STAR, US Green Building Council’s LEED program, NEEC (Northwest Energy Efficiency Council), and electric and gas utility conservation programs.

Currently the Dept. of General Administration is responsible for tracking and administration of new construction/major renovations of state and higher education LEED projects. This would remain in place. For the existing buildings, format for reporting will be established by a stakeholder group facilitated by the department (GA). Annual reporting by state agencies will be submitted to OFM. School districts and local governments will be responsible for administration of their own data through a web site identified by Dept. of Ecology.

Costs of implementation for existing buildings below 50,000 SF would be minimal. Energy savings will pay for improvements. There will be some administration related to energy data collection and interaction with the ENERGY STAR website, and if energy savings potential exists, administration of energy performance contracts with the Department would be needed. Often this expertise exists within public organizations and can be absorbed by current staff.

Cost of implementation for existing buildings 50,000 SF and higher to achieve LEED-EB O&M Silver would range from \$10,000 to \$50,000 per building. Economies will be realized with multiple buildings and through a learning curve, subsequent buildings within an organization will cost less. Some costs to achieve LEED-EB O&M Silver could come from the energy performance contracting activities. Cost savings from energy, water and recycling efforts will off-set the costs to achieve LEED-EB O&M Silver over time. Support from utilities may be possible though incentives and/or a reimbursement program.

The added cost for new construction to achieve LEED Gold may only be on the order of \$10,000 for current projects that must meet LEED Silver. The added construction cost to entities currently not building to LEED Silver would be 0.5% to 6% of the construction cost.

### **Basis for Selection:**

With the 2005 passage of Chapter 39.35D RCW High-performance public buildings, Washington State stepped forward as a national leader in public sector green building projects. As the mandate has seen implementation, areas that can increase the energy-conserving attributes of these buildings have become known. This proposal aims at increasing the strength of the legislation as it currently exists, ensuring that green public buildings are operated and maintained in such a way as to meet the energy goals of the projects, and set the stage to address issues related to embodied energy as focus shifts to building products.

Because this proposal builds on existing legislation that has seen success, it is primarily a revision to a statute with agency and public momentum. This proposal will ensure that public buildings (new/renovated) prioritize energy efficiency credits offered in green building standards and help to build the market for regionally produced green building materials.

### **Projected emission reductions:**

Emission reductions in existing buildings when buildings reach the ENERGY STAR level of 75 will result in an average reduction in CO<sub>2</sub> of 20% to 25%. This would be further reduced as buildings recertify with ENERGY STAR level of 75, because the overall building energy use will go down thus raising the bar for all buildings. As older buildings are replaced with new efficient buildings, this too will raise the average energy efficiency of the building stock as a whole.

LEED Gold projects for new construction and major renovations CO<sub>2</sub> reductions of 60% would occur by 2010. This would increase because the Optimize Energy credit within LEED would be tied to Architecture 2030 goals which call for Net Zero carbon buildings by 2030.

Overall the number of buildings will increase and so will overall square footage of buildings. It is for this reason that the Architecture 2030 goals be met to achieve the reductions we seek.

## **Implementation Approach and Mechanisms:**

**Draft legislation** will be prepared for the 2009 Legislative Session by **September 5, 2008**. The legislative text will be completed by a team consisting of: Rachael Jamison (Department of Ecology), Stuart Simpson (Department of General Administration), Ash Awad (McKinstry), David Van Holde (King County), Tony Usibelli (CTED), Becky Kelly (Washington Environmental Council).

### **Potential Barriers:**

The primary critique of the state's existing green building mandate is its lack of additional funding to ensure compliance. By revising the mandate to require a higher level of certification with currently optional credits made mandatory, agencies may have difficulty supporting the legislation due to its potential fiscal impacts and need for additional resources (education/staff/etc.).

### **Program Costs:**

Existing programs will be utilized as much as possible; however, it is recommended that a professional level FTE be provided to each of the following agencies: Dept. of Ecology (for local governments), Dept. of General Administration (for State agencies, colleges and universities), and Office of the Superintendent of Public Instruction (for K-12 Schools). This is needed to implement these efforts across all public sector entities.

## **Supporting Information:**

- *Description of how this option might interact with a regional or national cap-and-trade, or other economy-wide market-based system for greenhouse gases.*
- *Where quantifiable, IWGs should include the following:*
  - *GHG reduction potential of the action, and underlying assumptions (if action is amenable to quantification) reported in common units,<sup>6</sup> using consistent approaches to geographic scope and lifecycle analysis<sup>7</sup>*
  - *Costs or cost savings (net present value, cost-effectiveness) of the action (if action is amenable to quantification), using consistent methods and perspectives<sup>8</sup>, and reported in consistent units.<sup>9</sup>*

<sup>6</sup> Net GHG reduction potential in million metric tons carbon dioxide equivalent (MMTCO<sub>2e</sub>) using IPCC 100 yr global warming potential, reported for 2012, 2020, and cumulatively 2009-2020. Where significant additional GHG reductions or costs occur beyond the project period as a direct result of actions taken during the project period, these will be indicated as appropriate.

<sup>7</sup> GHG impacts of policy options are estimated regardless of the physical location of emissions reductions. Where significant emissions impacts are likely to occur outside the state, this should be clearly indicated. These emissions reductions are counted towards the achievement of the state's emission goal, since they result from actions taken by the state.

Lifecycle analysis is applied wherever emissions impacts upstream (e.g., production, extraction) or downstream (e.g. waste disposal) from a specific activity constitute a significant fraction of a policy option's emissions impacts and studies are sufficient to enable estimation.

<sup>8</sup> The general approach of direct (NPV) cost and cost-effectiveness analysis is used, as widely applied to GHG mitigation policy options. Included are the direct, economic costs from the perspective of the state as whole (e.g. avoided costs of electricity rather than consumer electricity prices). Costs may include capital costs levelized (amortized) where appropriate, operation, maintenance and other labor costs, and fuel and fertilizer costs). This bottom-up approach is relatively transparent and is capable of reflecting the costs (and cost savings) associated

- ***Distribution of costs and benefits.*** *Costs and benefits that fall disproportionately on specific groups or actors, should be noted qualitatively, especially where studies or other information are available.*
- ***Qualitative description of additional external benefits*** (e.g. green jobs creation). *Unless studies or other information exists, the monetized environmental or social benefits, quality of life improvements, other health benefits, energy security benefits, and macroeconomic impacts from shifting benefits will not be quantified and included.*
- ***Implications/ engagement opportunities for individual action/behavior change*** (e.g. behavior change needed to achieve implementation and/or achieved through implementation)
- ***Implications/engagement opportunities for local and regional governments and private sector***

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*with an individual policy option, in contrast to macroeconomic analysis, which aims to capture flows and interactions across all sectors of the economy.*

<sup>9</sup> *Net present value (NPV) cost savings for the period 2009-2020 in 2007 constant dollars, using a 5% real discount rate.*

*Cost-effectiveness - Cost per metric ton of CO<sub>2</sub> equivalent emissions reduced (or removed) in units of \$/MTCO<sub>2</sub>e. This figure represents the NPV cost divided by the cumulative emission reductions, both over the 2009-2020 period.*

## **EE/GB Action 3: State Energy Code Improvements, and Establishment of 2030 Building Goals**

### **Initial Direction Provided to Small Group**

Develop a path or detailed plan to significantly upgrade the state's energy code (residential and commercial) in 2009 to the highest levels among state codes (e.g. 30% above current levels), and develop a proposal that will drive Washington toward the construction of low-carbon, zero net energy buildings by 2030. This proposal should include, at a minimum, provisions for education/training, building benchmarking, and certification, but should also address financing of building improvements.

### **2009 Action Concepts (as produced by small group)**

**Revised Title: 2009 State Energy Code Improvements and the Establishment of the Washington State Continuous Energy Efficiency Improvement Program for Buildings**

***[The description below has not been modified since the IWG's 8/14 meeting by the small group of IWG members addressing this Action, but work on the supporting analysis for the Action is underway.]***

### **2009 Action Description:**

#### **Part 1**

In the 2009 Washington State Building Code adoption cycle, revise the Washington State Energy Code (WSEC) to achieve a 30 percent reduction in new building energy use compared to the 2006 edition of the WSEC. Provide substantial efficiency advances in the code as it applies to remodeling, retrofit and equipment replacement. The Office of the Governor is responsible for articulating the objective to SBCC, and will provide political and administrative support consistent with obtaining the objective. Technical support shall be provided by the Department of Community, Trade, and Economic Development (CTED) and the WSU Energy Program. Implementation education and training for local building department staff and the building community will be provided by the WSU Energy Program and CTED.

#### **Part 2**

Legislative action is recommended to establish a **Continuous Energy Efficiency Improvement Program for Buildings**. It is recommended the legislation include the following five components.

1. Targets for building energy efficiency and carbon reductions in both new and existing buildings for the years 2010-2030
2. Direction to develop and adopt future editions of the WSEC to meet the Targets for new buildings and help meet the targets for existing buildings through improvements as they are remodeled.

3. Action that adds 5 appliance categories to 19.260 RCW (HB 1062 - 2005-06) and directs the Department of Community Trade and Economic Development to participate in the federal appliance rule making process.
4. Tax incentive for buildings and building/community integrated power systems. (See action item: **Incentives for Superior Energy Performance in New and Existing Buildings**)
5. Establishes funding in support of university and community college public / private partnerships and building industry activities involved in building efficiency research, demonstration and education programs designed to support the achievement of the Targets.

**Targets for Building Energy Efficiency and Carbon Emissions Reductions:** The Washington State Continuous Energy Efficiency Improvement Program for Buildings will include specific targets for median building energy use, by building occupancy class and climate zone. For new buildings, target development will follow a schedule similar to the schedule developed the Architecture 2030 Challenge, but using current code levels as the starting point. By or before 2015, the target for new buildings will be 50 percent of the energy use of base code buildings built to the 2006 WSEC, with an incremental improvement in new building efficiency reaching net zero by 2030. Existing buildings will be improved over time to achieve a 50 percent reduction in energy use intensity (EUI) for the sector. CTED will be charged with determining the best methodology for establishing the 2009 baseline and monitoring future improvements. Sector improvements may include energy efficiency improvements, implementing innovative sustainable design strategies, generating with on-site renewable power and/or purchasing (20% maximum) renewable energy and/or certified renewable energy credits. The table, **Target Building Sector Median Energy Use Intensity (EUI)**, details the targets.

<b>Target Building Sector Median Energy Use Intensity (EUI)</b>							
Percent of Median 2009 EUI Building Occupancy Class and Climate Zone							
Target Year	2009	2010	2015	2020	2025	2030	
Existing Building Sector (2009)	100%	96%	85%	74%	63%	50%	
New Building Sector (2009)	100%	70%	50%	40%	20%	0%	

Legislative action is recommended that directs the Washington State Building Code Council through their established public process to achieve the energy savings targets.

Legislative action is recommended that adds 5 appliance categories to 19.260 RCW (HB 1062 - 2005-06) as noted in the table Proposed Appliance Standards.

Proposed Appliance Standards	
Appliance	Measure
Bottle-type water dispensers	< 1.2 kWh per day
Commercial hot food holding cabinets	40 Watts per cubic foot
Compact audio products	2 watts standby 4 watts standby with an illuminated clock display

Digital disc players and digital disc recorders	3-watt standby
Portable electric spas	Max. allowable standby energy

Legislative action is recommended that adds tax incentives for buildings and building/community integrated power systems. It is recommended that incentive programs follow the format outlined in EE/GB action item 1, **Incentives for Superior Energy Performance in New and Existing Buildings**). Reporting requirements detailed in action item 1 shall be modified to include evaluation of the tax incentive impacts on achieving the Targets detailed in the table, **Target Building Sector Median Energy Use Intensity (EUI)**

Legislative action, including funding, is recommended to support of university and community college public / private partnerships, and building industry activities involved in building efficiency research, demonstration and education programs designed to support the achievement of the Targets.

#### **Basis for Selection:**

**Part 1.** *In the 2009 Washington State Building Code adoption cycle, revise the Washington State Energy Code (WSEC) to achieve a 30 percent reduction in new building energy use compared to the 2006 edition of the WSEC.*

There is already recognition both in the state and at the federal level that a 30 percent is the appropriate target for improvement in both the residential and commercial building sectors. This level of efficiency is achievable and is necessary to meet the carbon reduction targets established by the Climate Action Team. Part 1 is being proposed separate from the legislative actions detailed in part 2. This is largely due to timing. It is also done in recognition of the existing State Building Code Council public process. The 2009 code revision cycle will be well underway during the legislative session.

#### **Part 2.** Legislative action is recommended to establish a **Continuous Energy Efficiency Improvement Program for Buildings**.

To achieve the proposed targets, it is essential to start early with substantial proposals. It is also important that the strategy be comprehensive and includes new and existing building construction, equipment, appliances as well as community heat and power systems.

In 2030, new buildings constructed in the preceding two decades will account for more than 30 percent of the commercial building floor area and add almost 30 percent to the number of housing units. Over the same 20 year period, it is expected that most buildings will undergo some level of renovation, install new equipment and will add or replace many energy using devices. The effectiveness of the State Energy Code as well as federal and state equipment and appliance standards will play a large role in the future energy use intensity of all buildings. The injection of state and utility incentives will move the existing building sector, as well as promote further innovation in new construction.

The change in the built environment occurs over time. Opportunities to capture the large efficiency improvements at a minimal cost occur only once or twice in the life of a structure. This opportunity occurs during the original design and construction of a building as well as during major renovations. Major building equipment replacements occur in a 15 to 25 year time frame. The development of community scale heat and power system occurs over long planning and implementation periods.

The implementation targets listed suggest a gradual improvement of all building over time. But for any specific project, it is important to achieve maximum technical potential when the prime opportunities occur. To achieve the energy efficiency targets for all buildings on average, improved energy efficiency standards and programs will need to be deployed early and be rigorous. This includes energy codes, efficiency incentives programs as well as minimum appliance and equipment standards. This is the rationale for immediate implementation of a substantial upgrade to the state energy code, implementation of additional appliance standards as well as the recommendation to add incentive programs. This will deliver the most building energy efficiency and emissions reductions at the lowest cost.

To meet the more aggressive targets in the final years, additional innovation and expertise will be required. Much of the progress in building efficiency in Washington has resulted from following a technology maturity progression that begins with research and development, moves through market entry and diffusion support efforts and culminates, where appropriate, in the adoption of common practices as minimum code requirements. Washington has been a leader in each of the elements of this progression and can take advantage of the economic development and job creation opportunity presented by additional work in these areas. Supporting university level research, participating in federal research and analysis projects, working with utilities and private sector partners within the state on market diffusion strategies and supporting effective technology transfer efforts should all be part of a comprehensive plan to continue bringing new technologies and efficiency strategies into the marketplace, into common use, and, where appropriate, into code.

### **Implementation Approach and Mechanisms:**

In the 2009 Washington State Building Code revision cycle, revise the Washington State Energy Code (WSEC) to achieve a 30 percent reduction in new building energy use of compared to the 2006 edition of the WSEC. Provide substantial efficiency advances in the code as it applies to remodeling, retrofit and equipment replacement.

Through the 2009 administrative procedures of the Washington State Building Code Council (SBCC), develop and adopt advances to the Washington State Energy Code (WSEC) to achieve a 30 percent improvement in building efficiency compared to the 2006 WSEC. The Office of the Governor is responsible for articulating the objective to SBCC, and will provide political and administrative support consistent with obtaining the objective. Technical support for local building departments and the building industry shall be provided by CTED Energy Policy Division and the WSU Extension Energy Program.

- **Brief description of potential barriers to implementation, and how the action has been designed to overcome them**
- A potential barrier to implementation is the lack of knowledge at the local government building departments and in the building industry. This proposed action includes a recommendation for funding to provide training and technical support for those implementing the revised code requirements. This assistance may include training workshops, supportive materials, and direct assistance through available phone technical advice. This approach has proven successful with past energy code changes.

### Supporting Information:

The following report outlines a strategy developed by the US Department of Energy for achieving Net Zero Energy Buildings in the Commercial Sector. It is important to note that not all individual buildings will meet this standard. But in the population of buildings, some will exceed net zero and offset the buildings that do not. This is in part the basis for establishing building sector median targets in the **Continuous Energy Efficiency Improvement Program for Buildings**.

B. Griffith, N. Long, P. Torcellini, and R. Judkoff, *Assessment of the Technical Potential for Achieving Net Zero-Energy Buildings in the Commercial Sector* National Renewable Energy Laboratory, 2007

Include the following:

- **Description of how this option might interact with a regional or national cap-and-trade, or other economy-wide market-based system for greenhouse gases.**
- **Where quantifiable, IWGs should include the following:**
  - **GHG reduction potential of the action, and underlying assumptions** (if action is amenable to quantification) reported in common units,<sup>10</sup> using consistent approaches to geographic scope and lifecycle analysis<sup>11</sup>
  - **Costs or cost savings (net present value, cost-effectiveness) of the action** (if action is amenable to quantification), using consistent methods and perspectives<sup>12</sup>, and reported in consistent units.<sup>13</sup>

<sup>10</sup> Net GHG reduction potential in million metric tons carbon dioxide equivalent (MMTCO<sub>2e</sub>) using IPCC 100 yr global warming potential, reported for 2012, 2020, and cumulatively 2009-2020. Where significant additional GHG reductions or costs occur beyond the project period as a direct result of actions taken during the project period, these will be indicated as appropriate.

<sup>11</sup> GHG impacts of policy options are estimated regardless of the physical location of emissions reductions. Where significant emissions impacts are likely to occur outside the state, this should be clearly indicated. These emissions reductions are counted towards the achievement of the state's emission goal, since they result from actions taken by the state.

Lifecycle analysis is applied wherever emissions impacts upstream (e.g., production, extraction) or downstream (e.g. waste disposal) from a specific activity constitute a significant fraction of a policy option's emissions impacts and studies are sufficient to enable estimation.

<sup>12</sup> The general approach of direct (NPV) cost and cost-effectiveness analysis is used, as widely applied to GHG mitigation policy options. Included are the direct, economic costs from the perspective of the state as whole (e.g. avoided costs of electricity rather than consumer electricity prices). Costs may include capital costs levelized (amortized) where appropriate, operation, maintenance and other labor costs, and fuel and fertilizer costs). This bottom-up approach is relatively transparent and is capable of reflecting the costs (and cost savings) associated

- ***Distribution of costs and benefits.*** *Costs and benefits that fall disproportionately on specific groups or actors, should be noted qualitatively, especially where studies or other information are available.*
- ***Qualitative description of additional external benefits*** (e.g. green jobs creation). *Unless studies or other information exists, the monetized environmental or social benefits, quality of life improvements, other health benefits, energy security benefits, and macroeconomic impacts from shifting benefits will not be quantified and included.*
- ***Implications/ engagement opportunities for individual action/behavior change*** (e.g. behavior change needed to achieve implementation and/or achieved through implementation)
- ***Implications/engagement opportunities for local and regional governments and private sector***

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*with an individual policy option, in contrast to macroeconomic analysis, which aims to capture flows and interactions across all sectors of the economy.*

<sup>13</sup> *Net present value (NPV) cost savings for the period 2009-2020 in 2007 constant dollars, using a 5% real discount rate.*

*Cost-effectiveness - Cost per metric ton of CO<sub>2</sub> equivalent emissions reduced (or removed) in units of \$/MTCO<sub>2</sub>e. This figure represents the NPV cost divided by the cumulative emission reductions, both over the 2009-2020 period.*

## **EE/GB Action 4: CHP and Distributed Energy Development**

**2009 Action Concepts as produced by the Action 4 small group, but not revised after the August 1<sup>st</sup> EE/GB IWG Call, as the IWG agreed that this Action be combined with Action 1, which also focuses on incentives.**

### **Initial Direction Provided to Small Group**

Develop a plan to better utilize Washington's biomass and other resources in distributed energy systems, with a focus on distributed small-scale (less than 30 MW) combined heat and power systems, but also including, for example, larger industrial CHP systems and district heating systems as applicable.

### **2009 Action Concepts (as produced by small group)**

**Suggested Revised Title: Expanded Implementation of Distributed Energy, Combined Heat & Power (CHP) and Renewable Energy**

### **2009 Action Description:**

CHP produces both heat/steam and power. The heat/steam can be used for industrial processes or to heat buildings/campuses. The heat/steam can also be used for cooling/freezing such as in the food processing industry by using technologies such as absorption chillers. Waste heat that often goes up the smoke stack can also be used on the "back end" of industrial processes (where heat is ejected from the process after use) to produce power and recover the waste heat. CHP system size can be based on: 1) Following the thermal demand for a facility; 2) Following the power demand for a facility; 3) Following both power and thermal demand, when seasonal variation occurs; and 4) High reliability. Prime opportunities for CHP application include forest products/pulp and paper mills, food processing with year-round operation, dairies, feedlots, wastewater treatment facilities, campus settings with district heating of multiple buildings, industrial process facilities with waste heat, natural gas compressor stations, and facilities with high power reliability, heating and hot water, and cooling requirements such as hospitals and data centers. Cogeneration is an older term for CHP. For additional information see the Northwest CHP Application Center website at <http://www.chpcenternw.org/>.

### **Program Design**

The proposed program would be to provide incentives for and encourage the use of CHP and district heating systems by doing the following:

- Providing tax incentives in concert with the bioenergy tax proposed by CTED. Options for these incentives include:
  - B&O tax credits;
  - Sales tax exemptions on machinery and equipment; and/or
  - Property tax exemptions

- Adoption of output-based emissions regulations; and
- Requiring CTED and the UTC to assess the regulatory barriers to CHP and recommend enabling changes

### Definitions

*Eligible CHP projects:* Combined heat and power systems that involve the recovery of waste heat in the form of useful energy. Combined heat and power systems shall be designed to have a projected thermal efficiency (the energy content of useful heat produced plus the energy content of electricity divided by the energy content of the input fuel) of at least 60 percent [Note that some IWG members favor raising the minimum thermal efficiency for CHP projects to 70 to 75 percent, while others favor using the 60 percent minimum, at least at first, given the substantial energy benefits of CHP over non-CHP heat- or power-generation systems.].

In addition, there is some disagreement [within the IWG] over the definitions of alternative energy/bioenergy with respect to spent liquor (a by-product of the process of making wood pulp). We are not sure if the IWG is the proper forum for this discussion, but wanted to point out that some IWG members feel that spent pulping liquor should be included in all definitions with respect to alternative energy/bioenergy.

### Basis for Selection:

Greenhouse gas reduction opportunity – CHP efficiencies range from 60% on the low end to 85% on the high end. This is in stark contrast to standalone fossil energy power plants (principally coal and natural gas) with efficiencies in the range of 30% to 36%. It is the double or triple use of the energy produced when fuel is combusted that gives CHP the extra efficiency boost. This makes CHP (even natural gas-based CHP) a greenhouse gas winner. See the summary of the ES-7 strategy (as prepared during the 2007 Climate Advisory Team process; the ES-7 option suggests expanding deployment of CHP) in the chart on page 47 of Leading the Way on Climate Change: The Challenge of Our Time (available as <http://www.ecy.wa.gov/climatechange/interimreport.htm>). In Washington State, most CHP projects are biopower/opportunity fuels-based. This further intensifies the greenhouse gas emissions benefits of CHP development.

CHP Potential in Washington – A 2004 report done by Energy and Environmental Analysis titled Combined Heat and Power in the Pacific Northwest: Market Assessment showed the technical market potential for CHP to be 7,721 MWc. See page 52 of the study [http://www.chpcenternw.org/NwChpDocs/Chp\\_Market-Assessment\\_In\\_PNW\\_EEA\\_08\\_2004.pdf](http://www.chpcenternw.org/NwChpDocs/Chp_Market-Assessment_In_PNW_EEA_08_2004.pdf). The use of waste heat to generate power would provide additional CHP opportunities not specified in this report. This same report also analyzed the major environmental benefits of CHP including reduced NO<sub>x</sub>, SO<sub>x</sub> and CO<sub>2</sub> emissions (see pages 73-75).

### Implementation Approach and Mechanisms:

#### Barriers to Implementation, and Strategies to Overcome Them

No significant CHP capacity has been built in Washington during the past 15 years due to a number of important economic and policy barriers that need to be overcome:

- Dispatchability. Control of the electrical output of a CHP system by utilities can be a concern for the plant owner. To address this barrier, mutually agreeable dispatch protocols should be negotiated between the plant owner and the host utility.
- Interconnection standards and requirements. Interconnection standards can vary by utility, and are sometimes a barrier to CHP development, as are other utility-related policies such as high standby rates, exit fees, etc. Washington State could seek to influence and streamline grid interconnection standards and associated costs, where applicable. Standards are set by FERC and NERC rather than the State.
- High transaction costs associated with CHP projects, and high financing costs because of lender unfamiliarity and perceived risk, and “split incentives” between building owners and tenants. These barriers can be addressed by consistent, long-term, clear incentives supporting CHP and waste energy recovery.

## Supporting Information:

### Interactions with market-based systems for greenhouse gas emissions reduction

CHP has been recognized in programs such as RGGI, Alberta, and is now being discussed within the WCI cap-and-trade design. The most likely outcome would be for CHP facilities to receive avoided emissions credits in a cap-and-trade program. The CHP facilities could either be awarded allowances or they could receive auction proceeds for their avoided emissions.

### GHG reduction potential of the action

By recovering waste heat and reusing it, the equivalent amount of new fossil-based energy will be displaced, resulting in a more energy efficient energy production program and significantly less GHG production per MWh generated.

Analysis done for the 2007 Climate Advisory Team indicated that CHP could result in a reduction of 12.1 million metric tons of greenhouse gas emissions between 2008 and 2020.

### Costs or cost savings of the action

Based on the analysis done for the 2007 Climate Advisory Team, the net present value of cost savings between 2008-2020 of CHP implementation would be \$317 million dollars.

*Include the following:*

- ***Distribution of costs and benefits.*** *Costs and benefits that fall disproportionately on specific groups or actors, should be noted qualitatively, especially where studies or other information are available.*
- ***Qualitative description of additional external benefits*** (e.g. green jobs creation). *Unless studies or other information exists, the monetized environmental or social benefits,*

*quality of life improvements, other health benefits, energy security benefits, and macroeconomic impacts from shifting benefits will not be quantified and included.*

- ***Implications/ engagement opportunities for individual action/behavior change (e.g. behavior change needed to achieve implementation and/or achieved through implementation)***
- ***Implications/engagement opportunities for local and regional governments and private sector***

## **EE/GB Action 5: Energy Efficiency for Natural Gas, Propane, and Fuel Oil**

### **Initial Direction Provided to Small Group**

Develop one or more model program design that can be used by natural gas, propane, and fuel oil suppliers or others, as appropriate, to capture all cost-effective energy efficiency opportunities for users of those fuels.

**2009 Action Concepts (as produced by small group, but not revised after the July 9<sup>th</sup> EE/GB IWG Call, as the IWG agreed that this action be assigned a lower priority for further development due to having more limited potential for GHG savings than other actions under consideration by the IWG, and because some of the energy efficiency resources potentially tapped by this action will be tapped by other actions under development by the IWG)**

#### **Scope:**

Do not address propane and fuel oil at this time - mechanisms for addressing this are not in place yet - needs further work.

#### **Options:**

1. Use a '937' requirement for gas utilities. Include cost recovery mechanisms. Decoupling/revenue neutrality should be provided.
2. Collect a charge on retail bills that is dedicated to conservation acquisition. (Determining the correct percentage for this could be problematic.) Provide revenue neutrality/decoupling.

#### **Questions to CTED staff from this group:**

What are current requirements for gas utilities to acquire cost effective efficiency?

What is the difference between this level of acquisition and the resource that could be achieved with options above.

Are there any carbon cost factors currently included in cost effectiveness calculations for gas utilities?

What impact would a carbon cost factor have on these figures?