

Residential, Commercial and Industrial Technical Work Group Summary List of Recommended High Priority Mitigation Options

Please note that the option descriptions and straw proposals are initial drafts. They are under development, and will receive further consideration by TWG members in upcoming meetings. Additional draft material for options not ready for CAT review can be viewed at the CAT website (http://www.ecy.wa.gov/climatechange/cat_twg_overview.htm) under the most recent TWG meeting.

#	Mitigation Option Name	Straw Proposal Development Status
RCI-1	Demand-Side Management (DSM) Energy Efficiency Programs, Funds, or Goals for Natural Gas, Propane, and Fuel Oil (originally 1.2)	Developed by TWG; Ready for CAT Review
RCI-2	Targeted Financial Incentives and Instruments to Encourage Energy Efficiency Improvements (Business Energy Tax Credit and Private/Public Efficiency Funds) (originally 1.3 and 1.5)	Developed by TWG; Ready for CAT Review
RCI-3	Promotion and Incentives for Improved Community Planning and Improved Design and Construction (e.g. LEED, NAHB, Green Globes, Architecture 2030, and other guidelines) in the Private Sector (originally 2.2 and 2.4)	Developed by TWG; Ready for CAT Review
RCI-4	Energy Efficiency Improvement in Existing Buildings, with Emphasis on Building Operations (originally 2.6)	Developed by TWG; Ready for CAT Review
RCI-5	Rate structures and Technologies to Promote Reduced GHG Emissions (including Decoupling of Utility Sales and Revenues) (originally 5.3)	Not yet developed by TWG
RCI-6	Provide Incentives to Promote and Reduction of Barriers to Implementation of Renewable Energy Systems (originally 6.1)	Joint consideration with ES TWG in progress (See option ES-2)

#	Mitigation Option Name	Straw Proposal Development Status
RCI-7	Provide Incentives and Resources to Promote and Reduction of Barriers to Implementation of Combined Heat and Power (CHP, or “cogeneration”) and Waste Heat Capture, Including Net-metering for Combined Heat and Power (originally 6.2 and 5.2)	Joint consideration with ES TWG in progress (See option ES-7)
RCI-8	Consumer Education Programs, Including Labeling of Embodied Life-cycle Energy and Carbon Content of Products and Buildings (originally 4.1 and 8.2)	In progress
RCI-9	Identify GHG Emissions Impacts and Measures to Avoid, Minimize, or Mitigate them for Projects Requiring Government Review, and in Designing Government Rules and Regulations (originally 7.7 and 7.8)	Not yet developed by TWG
RCI-10	More Stringent Appliance/Equipment/ Lighting Efficiency Standards, and Appliance and Lighting Product Recycling and Design (originally 3.1 and 8.1)	Not yet developed by TWG
RCI-11	Policies and/or Programs Specifically Targeting Non-energy GHG Emissions (originally 7.4)	Not yet developed by TWG

RCI-1. Demand-Side Management (DSM) Energy Efficiency Programs, Funds, or Goals for Natural Gas, Propane, and Fuel Oil

Straw Proposal Development Status: Developed by TWG; Ready for CAT Review

Based on RCI Catalog Option 1.2

Mitigation Option Description

This policy is designed to use a number of different funding and incentive mechanisms to increase the investment in natural gas, propane (or liquefied petroleum gas—LPG), and fuel oil demand-side management programs. These DSM activities shall be designed to work in tandem with other strategies recommended by the CAT that also encourage energy efficiency gains in the residential, commercial and industrial sectors.

Mitigation Option Design

In order to implement DSM programs for natural gas and LPG/fuel-oil consumers, a number of funding and incentive mechanisms could be considered, analogs of many of which are in place for electric-sector DSM programs (including the recently enacted I-937¹), while other mechanisms are being considered by the CAT for this and other policy options. Candidate mechanisms for increasing the efficiency with which these fuels are used in the RCI sectors include revising existing statutes to enable investments in energy efficiency, potentially including not only investments that are now cost-effective on the basis of fuel costs alone, but also eligible programs that are cost-effective when the value of avoided GHG emissions are considered.

Key potential elements of this option follow. See the “Implementation Mechanisms” section below for additional possible tools for achieving the goals of this option.:

- I-937-like requirements for gas utilities to acquire all cost effective conservation; Initiative 937 requires that “Each qualifying [electric] utility shall pursue all available conservation that is cost-effective, reliable, and feasible.”
- For propane and fuel oil consumers, which are served largely by local distributors (and thus are part of a fundamentally different market than gas consumers) a surcharge and/or incentive fund could be established to fund DSM activities.
- A program such as Oregon’s Business Energy Tax Credits system could be a useful tool to make more efficient use of natural gas, propane, and fuel oil.

¹ Initiative 937, “The Energy Independence Act”, “... requires large utilities to obtain fifteen percent of their electricity from new renewable resources such as solar and wind by 2020 and undertake cost-effective energy conservation.” Text of the initiative can be found at <http://www.secstate.wa.gov/elections/initiatives/text/i937.pdf>.

- A program of low-cost loans for efficiency improvements and to encourage performance contracting, as well as other financial options such as reinvestment funds should be considered to support energy efficiency investments.
- Programs and incentives for natural gas and LPG/fuel oil efficiency improvement should be available and provide significant opportunities for efficiency improvement in all customer classes, with special emphasis on, for example, low-income customers.

Goals: Gas utilities should obtain 100 percent of cost-effective, achievable DSM savings in their service territories by the year 2020. DSM programs for LPG and fuel oil customers should be instituted so as to achieve a similar level of performance.

- **Timing:** Apart from the overarching savings target mentioned above, the wide variety of potential implementation mechanisms will likely result in various implementation schedules for specific elements of this option.
- **Coverage of parties:** All parties currently involved in energy policy, regulation and implementation plus the providers and users of these fuel sources.
- **Other:**

Implementation Mechanisms

Additional potential implementation mechanisms and considerations for this option include the following:

Considerations in Program Design

- Analysis of DSM potential should be prepared to assist in directing the legislative and regulatory processes to set targets and fund programs.
- High-volume transportation gas customers (those directly served by pipeline, rather than by utilities) should be required and provided with incentives to install efficiency measures.
- Implementation/administration of efficiency programs may be carried out, as appropriate, by utility (including municipal utilities and cooperatives), state agency, or third-party actors.
- Energy end-use surveys should be used to help determine efficiency potential and target DSM activities.

Program Options

- Subsidized energy audits for homeowners, businesses, and industries
- Consumer education (see also RCI-8).
- Focus on specific market segments that are often under-served by DSM programs (low income residential, small and medium businesses).
- Energy efficiency reinvestment funds to provide capital for efficiency improvements in specific sectors

- Incentives for specific technologies, potential including (but not limited to) white roofs/rooftop gardens/ landscaping, ground-source heat pumps, lighting, water heating, plug loads, networked personal computer management, power supplies, motors, pumps, boilers, customer-side transformers, water use reduction, appliance recycling/pick-up programs and others.
- .Incentives for customer-sited renewable electricity and heat including solar photovoltaic (PV), passive solar space heat, and solar water heat (SWH). (Renewable energy incentives will be covered in more detail in RCI-6 and other options.)
- Incentives to convert fossil fuel based heating systems to biomass based heating systems, while also increasing the overall system efficiency. (Fuel-switching will likely be covered in other RCI-options as well.)

Related Policies/Programs in Place

Integrated Resource Planning

In 2006, the Washington Legislature passed the Electric Utility Planning Act (ESHB 1010), requiring each consumer-owned or investor-owned electric utility, with more than 25,000 customers, to develop or update an integrated resource plan by September 2008. All plans are reviewed by CTED and must include an assessment of conservation and efficiency resources, an evaluation of renewable and nonrenewable generation, and recommendations for development of new policies and programs to obtain conservation and efficiency resources.

The Northwest Power and Conservation Council (NPCC) 5th Plan calls for reduction of 2,800 MW in electricity consumption through conservation in the next 20 years (through 2025) in the Northwest. WA State consumes about 50% of the energy in the Northwest (based on WA population compared to the rest of the region).

Type(s) of GHG Reductions

[Insert text here]

Estimated GHG Savings (in 2020) and Costs per MtCO_{2e}

- **Data Sources:** [TWG has begun to provide input; to be discussed at next CAT meeting]
- **Quantification Methods:** [TWG has begun to provide input; to be discussed at next CAT meeting]
- **Key Assumptions:** TBD

Contribution to Other Goals

- **Contribution to Long-term GHG Emission Goals (2035/2050):**
- **Job Creation:** As with the existing DSM efforts on the electric side, expanded efforts work create significant numbers of jobs throughout the market from manufacturing to installation.

- **Reduced Fuel Import Expenditures:** Unknown

Key Uncertainties

Uncertainties include the rate of development of the markets to achieve efficiency installations for these fuel sources, including the rate of acceptance by end users, and the development of training and education programs to expand the capacity of the energy management industry.

Additional Benefits and Costs

Replacing aging boiler systems will also provide the added benefit of creating safer buildings, and therefore decrease insurance costs. In schools statewide a focus on replacing aging boiler systems with new, more efficient systems will also lead to a better more consistent standard of comfort, therefore an improved physical learning environment.

Feasibility Issues

DSM activities on the electric side indicate that there are no significant barriers to achieving significant savings results.

Options RCI-5 ("Rate structures and Technologies to Promote Reduced GHG Emissions (including Decoupling of Utility Sales and Revenues)") could help to make actions/requirements related to natural gas conservation more feasible by enabling utilities to recover costs and/or by decoupling sales from revenues.

Status of Group Approval

TBD

Level of Group Support

TBD

Barriers to Consensus

TBD

RCI-2. Targeted Financial Incentives and Instruments to Encourage Energy Efficiency Improvements (Business Energy Tax Credit and Private/Public Efficiency Funds)

Straw Proposal Development Status: Developed by TWG; Ready for CAT Review

Based on RCI Catalog Options 1.3 and 1.5

Mitigation Option Description

Targeted financial incentives and instruments, through two primary vehicles 1) business energy tax credits and 2) private/public efficiency funds, can be used as means of encouraging energy efficiency improvements that will affect the development, design, and building of new and existing energy-using systems in the RCI sectors. This option is designed to offer financial mechanisms to support and encourage energy-efficiency improvements in both entire buildings and in stand-alone energy systems.

Mitigation Option Design

Business energy tax credits and private/public efficiency funds are two key mechanisms for encouraging consumers in the residential, commercial, and industrial sectors, and the building sector professionals that serve them, to implement measures to improve the efficiency of new buildings and building energy systems, as well as the efficiency of existing buildings. As such, this option is designed to work in concert with options RCI-1 (DSM for gas, LPG, and propane users), RCI-3 (targeting building and community energy efficiency), and RCI-4 (focusing energy efficiency improvements in existing buildings and their operation). Brief descriptions of the business energy tax credit and private/public efficiency fund concepts are provided below. The section that follows suggests potential implementation mechanisms and other details for these concepts.

Business Energy Tax Credits can provide incentives for businesses to invest in energy efficiency and/or customer-sited renewable energy systems. Washington lacks an income tax, but has business and occupations taxes, typically on gross receipts, that apply to a number of different categories of businesses; a business energy tax credit would be applied to these taxes. Applying these tax credits to both new construction and retrofit projects would be a goal. Specific types of tax credits for energy-efficiency/renewable energy applications in Washington might include

- **Energy Performance Contracting Sales Tax Exemption:** Provide an exemption from retail sales taxes (~6.5%) for those projects electing energy savings performance contracting services.
- **Superior Energy Efficiency Sales Tax Exemption:** Provide exemption from a portion of sales taxes to projects that produce buildings that have superior energy performance.
- **Clean Technology Businesses B&O Credit:** Provide a B&O tax credit for businesses that deliver energy efficiency related services.

The overarching intent of these tax credits would be to yield a nearly neutral revenue position for the State while reducing the use of fossil fuels and their climate change impact. Tax credits applied to energy efficiency or renewable energy projects will generate additional government revenues through increased local market activity and job creation, and through re-spending of energy cost savings.

Public/Private Efficiency Funds would provide zero- or low- interest loans for energy efficiency applications in both retrofit and new construction. These loans would be used to fund the remaining portions of energy efficiency projects that are not addressed by utility rebates or business energy tax credits. Zero- or no-interest loans offer building owners and their professional service providers the opportunity to construct substantially more energy efficient buildings within their budget. Loans repayments can be made from of shared savings via energy performance contracting or through other mechanisms; public and private building projects may use different repayment models.

Goals: Provide funding mechanisms sufficient to support the energy efficiency and building energy use improvement goals of RCI-1, RCI-3 and RCI-4, including attaining new building energy efficiency goals consistent with Architecture2030, LEED, or other suitable “green building” energy efficiency certification.

- **Timing:** Implement funding mechanisms so to support goals above.
- **Coverage of parties:** Commercial and industrial energy users in the private and public sectors (including those responsible for mixed-use projects), public agencies, utilities, building design and construction professionals, and lenders.
- **Other:**

Implementation Mechanisms

Specific implementation mechanisms for **business tax credits** might include:

- **Energy Performance Contracting Sales Tax Exemption:** Provide an exemption from retail sales taxes (~6.5%) for those projects electing energy savings performance contracting services (RCW 39.35a) carried out on public buildings in the state, including schools, universities, community colleges, and state and local government buildings and energy savings performance contracting services in private buildings meeting the intent of RCW 39.35a.. In a retrofit project the system energy use is clearly defined and therefore the tax credits should apply to the overall project for those projects improving energy efficiency by a minimum of 20% over the building’s existing energy performance.
- **Superior Energy Efficiency Sales Tax Exemption:** On new construction in public and private buildings, tax credits would be targeted at reducing the differential between the project costs for energy code rated systems (systems meeting or only modestly exceeding the level of energy performance required by codes) versus those systems that exceed the collective energy efficiency of the building by 20% over that of the energy code in effect at the time, to 1% of the total project construction costs for those projects that exceed the collective energy efficiency by 50% over that of the energy code in effect at the time, and to 2% of the total project construction costs for those projects that are net-zero buildings, meaning that they consume no more energy than they produce.

- **Clean Technology Businesses B&O Credit:** To compel job creation and the growth of clean technology businesses, a B&O tax credit will be provided to those businesses that deliver energy efficiency related services, to include professional services, construction services, and highly efficient products. This B&O credit will be applied to those business revenues associated with those projects and systems that also qualify for the retail sales tax credit.

For **public/private efficiency funds**, low or no-interest loans would be used to fund the remaining portion of a project that is not addressed by utility rebates or a business energy tax credit. It is expected that this funding option would cover 30 to 70% of a total project costs. In new construction, this fund would only be applicable to the differential between the project costs for energy code rated systems versus those systems that exceed the collective energy efficiency of the building by 20% over that of the energy code in effect at the time.

The State of Washington Treasurer's program does have both a COP and LOCAL loan program that provides tax-exempt financing to municipal and state entities. And many commercial financial institutions provide a variety of equipment and system tax-exempt and commercial grade lease-back options. Tax exempt interest, even at 4%, over a 10 year loan term reduces the possible energy efficiency project scope by up to 30%. Nearly 50% of the project scope is eliminated if commercial rates of 7.5% are used to finance energy efficiency projects. Therefore, a no-interest loan program would yield significantly more energy efficiency project scope since public and private organizations that choose to secure outside financing will be able to direct more funds at projects improving energy efficiency versus interest charges.

For public entities, the loan obligation could be guaranteed to be paid out of the annual energy savings through an energy savings performance contracting (ESPC) model. Legislation already exists that enables an ESPC delivery in existing building, and a minor modification to RCW 39.35a would allow for the use of ESPC in new construction projects and systems. There is precedent for the national and international adoption of the ESPC model. For instance, through the Clinton Climate Initiative Energy Efficiency Building Retrofit Program (C40) an international effort is in motion to leverage ESPC programs with public/private funding to complete \$5 billion in energy efficiency work internationally. For private entities the loan obligation could also be paid out of the annual energy savings through direct owner payment, micro-utility, a public/private resource management association (RMA,) a condominium association, or the energy savings performance contracting (ESPC) model.

There are different potential models for the organizations that would coordinate public/private efficiency funds, including government agencies and not for profit independent organizations.

Related Policies/Programs in Place

Washington

In 2005, the Washington legislature enacted the Renewable Energy System Cost Recovery (RCW 82.16.110) and Tax on Manufactures or Wholesalers of Solar Energy Systems.

Other States (provided for reference)

A business energy tax credit (BETC) scheme similar to the one being successfully implemented in Oregon would serve as a good model for Washington State.

The combined spending on the BETC and RETC (residential energy tax credit) programs for 2003 totaled \$30.9 million for tax credits and program administration. The effect of these tax credits combined with spending by businesses and residences taking advantage of these tax credits had the following net impacts on the Oregon economy in 2003:

- Output in Oregon's economy increased by \$42.5 million
- 182 new jobs were created in Oregon
- Oregon wages increased by \$8.6 million
- Tax revenues for state and local government increased by \$2.7 million
- Oregon commercial and residential energy costs decreased by \$27.9 million

From http://www.oregon.gov/ENERGY/CONS/docs/EcoNW_Study.pdf

In Oregon, the tax credit is 35 percent of the eligible project costs - the incremental cost of the system or equipment that is beyond standard practice. You take the credit over five years: 10 percent in the first and second years and 5 percent each year thereafter. If you can't take the full tax credit each year, you can carry the unused credit forward up to eight years. Those with eligible project costs of \$20,000 or less may take the tax credit in one year.

Trade, business or rental property owners who pay taxes for a business site in Oregon are eligible for the tax credit. The business, its partners or its shareholders may use the credit. The applicant must own or be the contract buyer of the project (the project owner). The business must use the equipment for the project or lease it for use at another site in Oregon. A project owner also can be an Oregon non-profit organization, tribe or public entity that partners with an Oregon business or resident who has an Oregon tax liability. This can be done using the Pass-through Option. Many projects qualify. They include: Conservation, Lighting, Recycling, Alternative Fuels, Hybrid Vehicles, Rental Dwelling Weatherization, Transportation, Efficient Truck Technology, Sustainable Building. The tax credit can cover all costs directly related to the project, including equipment cost, engineering and design fees, materials, supplies and installation costs.

Tax credits can apply to retrofits, new buildings, co-generation projects, and renewable resource projects.

There are a number of schemes currently being implemented, which bring together public and private investment to encourage energy efficiency in new and old buildings. Most 'efficiency funds' are being implemented on the local/city level but could be adapted to Washington State. Taking parts of each of the schemes may be the best approach for a state-wide fund.

Using the Cambridge Energy Alliance as a model, form a independent non-profit that will assist residents, businesses and institutions and provide technical experts with figuring out what to do, finding the right people to do it and obtaining the funds to pay for energy efficiency programs, including low-interest loans that will be repaid out of documented energy savings. The fund could apply to retrofits, but also to new construction to help market driven projects achieve significantly higher levels of energy efficiency than the market will currently support. This organization could have a roster of banks that have bought into the idea that can provide low interest loans for energy efficient strategies and can be paid back through the energy savings provided by the loan (as in the case of the Clinton Climate Initiative Energy Efficiency Retrofit

program). As with both the CEA and the Toronto Atmospheric Fund, start-up money for an organization of this type could come from private sources or the sale of state owned land.

Type(s) of GHG Reductions

[TWG has begun to provide input; to be discussed at next CAT meeting]

Estimated GHG Savings (in 2020) and Costs per MtCO₂e

[TWG has begun to provide input; to be discussed at next CAT meeting]

- **Data Sources:**
- **Quantification Methods:**
- **Key Assumptions:**

Contribution to Other Goals

- **Contribution to Long-term GHG Emission Goals (2035/2050):**
 - Provide financing strategies beyond what the private sector market will support today for long-term benefits
- **Job Creation: [TWG has begun to provide input; to be discussed at next CAT meeting]**
- **Reduced Fuel Import Expenditures:**

Key Uncertainties

[Insert text here]

Additional Benefits and Costs

- Consider impact on government revenues and stimulation of economy through market creation.

Feasibility Issues

The business tax exemption faces the typical challenges related to issuing a tax break, however since this initiative would generate projects, save energy costs in public facilities, and create jobs it is expected that a fiscal note (looking at all factors, not just lost tax revenue) would yield a positive economic impact to the State.

Feasibility issues might lie in the public/private funding initiative that relies on public money to support private investments. This issue would need to be worked through appropriately. Important key element of this is to create mechanisms that allow payment of loans in both retrofit and new construction through the savings from energy efficiency for both public and private entities. Also, to make sure that Washington state law allows condominium associations and other entities to guarantee the loan, as well as allowing the formation of resource management associations, ESPC, and micro-utilities at the project level.

It will be important to set the correct improvement benchmark to receive the economic incentive benefits. Having a sliding scale for greater efficiency will be very useful.

Status of Group Approval

TBD

Level of Group Support

TBD

Barriers to Consensus

TBD

RCI-3. Promotion and Incentives for Improved Community Planning and Improved Design and Construction (e.g. LEED, NAHB, Green Globes, Architecture 2030, and other guidelines) in the Private Sector

Straw Proposal Development Status: Developed by TWG; Ready for CAT Review

Based on RCI Catalog Options 2.2 and 2.4

Mitigation Option Description

Energy used in residential and commercial buildings contributed roughly 20% of Washington's GHG emissions in 2005. As such, it is recommended that goals be set to encourage all new construction, both residential and commercial, to meet significantly higher energy efficiency standards in the near future. Efficiency standards should take into account all the energy required in the entire building process, including the amount of energy needed to make building materials along with the performance of the building through its use. This combination of building performance and embodied energy will produce a metric for life-cycle GHG emissions that designers and builders can look to improve upon.

Improved community planning² aims to create communities that are, among other attributes, livable, designed for reduced use of energy both within homes and businesses and in the transport sector, and have a reduced environmental impact relative to typical developments. Variants on the smart growth concept exist, but many call for clustering living units with easy access (often walking distance) to shops, schools, and entertainment and recreational facilities, incorporating elements of energy efficient design and renewable energy in buildings, sharing energy facilities between buildings (for example, district heating systems), and preserving open spaces.

These two concepts—significantly improved building energy performance and improved community planning—offer significant synergies for Washington. This policy suggests a combination of incentives and targets to induce the owners and developers of buildings and the communities in which they are located to produce and operate buildings and communities that produce markedly lower GHG emissions than existing buildings and communities..

Mitigation Option Design

Improved Building Design and Construction

This policy provides incentives and targets to induce the owners and developers of new and existing buildings to improve the efficiency with which energy and other resources are used in those buildings, along with provisions for raising targets periodically and providing resources to building industry professionals to help achieve the desired building performance. This policy can include elements to encourage the improvement and review of energy use goals over time, and to

² See, for example, http://www.epa.gov/smartgrowth/about_sg.htm for additional information about Smart Growth.

encourage flexibility in contracting arrangements to encourage integrated energy- and resource efficient design and construction. Several design standards exist that can be drawn upon to promote improved design and community planning, including LEED³, Architecture 2030⁴, National Association of Home Builders (NAHB) Green Home Building Guidelines⁵, Built Green⁶, Energy Star Homes Northwest and Green Globes⁷. This policy could also include consideration of the concepts of embodied energy and “renewability” of building materials.

Improved Community Planning

Like construction of buildings and facilities themselves, land use decisions have a significant impact on regional and statewide greenhouse gas emission profiles. Research in California, NYC and elsewhere has begun to quantify this impact. California building energy researchers estimate that 10-15% of potential statewide reductions can be achieved through land use planning changes. New York City is estimating 15.6 million metric tons will be reduced through smart growth planning and design (accounting to approximately 30% of *their* total reduction strategy). Efficient community planning holds perhaps the greatest potential for future reductions of any mitigation strategy.

Potential design elements for this option, addressing, separately and together, these two major concepts, include the following (see “Implementation Measures” below for further details and possible approaches):

- Create tax incentives for new and rehabilitated energy-efficient commercial and residential buildings, as well as new master planned communities.
- Tie state economic development funding to meeting building and community design standards.
- Provide incentives that encourage and promote the use of climate friendly products in both commercial and residential buildings and building materials.
- Support and provide incentives for programs that recognize embodied energy and operational energy in the building process. This would include using informational approaches, support for certifications, and other means to support the consideration of life-cycle emissions in the building sector.
- Develop programs for and provide education and training to consumers and in schools, as well as targeted professional training, to support the elements of this option.
- Develop and continue to refine tools and standards to measure the GHG implications of different building approaches.
- Use a variety of policy and administrative levers to promote and provide incentives for community planning that incorporates GHG emissions considerations, and to discourage the construction of communities that do not.

³ See, for example, <http://www.usgbc.org>.

⁴ <http://www.architecture2030.org/home.html>

⁵ <http://www.nahbrc.org/greenguidelines/>

⁶ Built Green is a Washington-based program that includes green building guidelines and certification. Built Green works closely with the National Association of Home Builders on the latter’s programs. See, for example, <http://www.builtgreen.net/checklists.html>.

⁷ <http://www.greenglobes.com/fitup/Non-Flash/index.htm>

- **Goals:**
 - A target percentage of GHG emissions reductions from the buildings sector should be set so as to be consistent with the Governor’s goals.
 - Expand the use of climate-friendly products in building materials.
 - Consider going beyond existing certification programs to Architecture 2030-level goals for new buildings, providing energy consumption performance (energy intensity) that is 50% of the regional average for each building type, or define goals as the higher levels of LEED (Gold/Platinum), higher levels of Built Green (4-Star, 5-Star), or similarly-stringent certifications in other systems of standards.
 - Explicitly identify the link between GHG reductions and land use planning decisions, as well as the reduction potential and target(s) for Washington state⁸
- **Timing:** As stated above, the timing of the goals should track the goals set by the Governor’s Executive Order.
- **Coverage of parties:** All builders, building material suppliers, recycled building material sellers, and home improvement stores. The aforementioned should be considered for both private and public construction projects.
- **Other:**

Implementation Mechanisms

A number of potential implementation elements of this option are offered below and are grouped into several general categories:

Improved Design and Construction

General incentives and promotion:

- Create a tax incentive for new energy-efficient commercial and residential buildings, as well as new master-planned communities, using the Oregon incentives as a model. To maximize effectiveness, tax incentives should target cutting-edge, very high-efficiency technologies or practices that customers might not find otherwise. The incentives should be large enough to affect decision-making, while reporting requirements should be just stringent enough to make fraud insignificant.
- Support and provide incentives for programs that recognize embodied energy and operational energy in the building process.
- Encourage state agencies to utilize the LEED rating system or the Green Globe rating system to promote the construction and design of energy-efficient buildings.
- Provide tax credits for construction of a green building or rehabilitation of an existing structure to green building standards.

⁸ Note that this is a category more easily measured on a regional or statewide basis than at the local government level because it includes things like “avoided sprawl” which has statewide reduction impact but may result in increased density (and emissions) locally.

- The state could provide incentives that encourage and promote the use of climate friendly products in both commercial and residential buildings and building materials.
- Implement policies that encourage utilities to make renewable energy more widely available (note that this implementation measures likely will overlap with those of other RCI and ES options).
- Increase and extend the tax credit for PV, biomass and wind that are mandated in SR 5101 to meet the standards of other states.

Consideration of life-cycle emissions:

- Consideration of concepts of embodied energy in and “renewability” of building materials⁹
- Include embodied energy/carbon footprint/life cycle assessment information for building materials in green building standards such as LEED, Built Green, NAHB, Energy Star Homes Northwest, or Green Globes.
- Targeting reduction of emissions from diesel engines used in new construction developments.
- Develop and support a business assistance program to help identify and achieve GHG goals and life-cycle cost analysis of buildings and building components.
- Promote measures to reduce urban “heat island” effects through integrated strategies, including - green roofs, white roofs, plantings.
- Include carbon footprint information/literature on materials in building supply and home improvement stores.

Education and training:

- Provide training and certification of building professionals in green building-related specialties.
- Provide consumer and primary/secondary education related to green building and green communities.
- Increase private sector education to promote high performance green buildings.
- Provide incentives for building operator certification.

For tools and standards:

- Set up a clearinghouse for information on and access to software tools to calculate the impacts of energy efficiency and solar technologies for buildings.
- Encourage, through promotions and incentives, private standards for green building and sustainable forest management (such as SFI, CSA, PEFC, FSC), as well as green building product certification for other building materials, such as Greenseal.

⁹ See, for example, CORRIM (Consortium for Research on Renewable Industrial Materials), [Life Cycle Environmental Performance of Renewable Building Materials in the Context of Residential Construction](http://www.corrim.org/reports/2005/final_report/index.htm), available from http://www.corrim.org/reports/2005/final_report/index.htm.

- Set a cap on consumption of energy per unit area of floor space for new buildings.

Improved Community Planning

- Create incentives to encourage smart growth and support the GMA (Growth Management Act) by meeting Built Green Community certification, or LEED-ND gold level, with minimum energy and location criteria.
- Improve planning to reduce sprawl modeled after efforts by the Center for Clean Air Policy¹⁰, the state of California, and the Institute for Local Government¹¹ including the “California Communities Climate Action Plan” and the “California Green Community” rating tool.
- Condition approval of hook-ups to city, county and utility services upon GHG emissions reduction plans.
- Implement administrative changes to enhance integrated design of communities and transport systems.
- Promote consideration of location as part of a building’s GHG “footprint”.
- Reinforce the importance of Growth Management and conservation easements linked to Transfer of Development Rights.
- Implement or adjust hookup fees for new developments to provide incentives for smart growth.
- Move from a State Dept. of Transportation to a State Department of Urban, Rural, and Regional Mobility.
- Establishing a State Department of Urban Design.
- Tie disbursement of transportation funds to collaborative planning at a regional level.
- Utilize key State government leverage points to push smart land use planning approaches: including SEPA, housing elements, and others.
- Require that all projects requiring government review identify GHG emission impacts and reduction options: Require that SEPA reviews quantify GHG emissions and identify measures to avoid, minimize or mitigate emissions for projects requiring government review.
- Add climate protection as a required element of local planning under the state Growth Management Act.
- Facilitate a coordinated long-range local government planning process to better coordinate land use, transportation and economic development.
- Consider restricting financial and technical assistance to priority growth areas (as in Maryland).

¹⁰ <http://www.ccap.org/>

¹¹ <http://www.cacities.org/index.jsp?zone=ilsg>

- Participate in multi-state efforts to qualify and quantify the impacts of land use on energy and environmental systems.
- Support growth of localized agricultural food production and community-supported agriculture programs.

Related Policies/Programs in Place

LEED

Executive Order 05-01, directs the adoption of green building practices in the construction of new or renovated existing state buildings (>25,000 ft²), as well as mandates a 10% reduction in State Agency energy purchases from 2003 levels by September 1, 2009 and LEED silver standards for WA public buildings.

High-Performance Public Buildings bill (Chapter 39.35D RCW), requires all new state-funded facilities over 5,000 sq. ft. to meet green building standards. Major office and higher education facility projects will be required to achieve the US Green Building Council Leadership in Energy and Environmental Design rating standards (referred to as LEED™ Silver certification). New K-12 schools will be required to meet the Washington Sustainable Schools Protocol (WSSP) or LEED certification. The Department of General Administration's Sustainable Design and Construction program oversees the construction or reconstruction of state and state funded facilities built to LEED standards. The Department of Community, Trade, and Economic Development is required to adopt sustainable building standards by July 1, 2008. The legislature prioritized the use of locally extracted and manufactured products in all state building projects. LEED requirements do not apply to affordable housing projects that receive state funding.

Several local governments offer [LEED Incentive Programs](#). The City of Seattle's LEED Incentive program offers incentives to commercial projects based on LEED certification level achieved. Seattle's Built Green Incentive program assists with green residential single and multi-family projects. There are several tax incentives available in Washington State for solar and renewable energy products, which can be incorporated into green buildings.

Ecology's Solid Waste and Financial Assistance Program is actively involved in promoting Green Building (GB) by training architects, builders, and lenders on Green Building and working with governments, communities, schools, commercial and residential sectors on GB initiatives. Some of the activities include:

- Working with some counties to adopt GB in Solid Waste Plans.
- Maintaining the Website developed at Ecology.

Smart Growth Strategy for the 21st Century (<http://smartgrowth.wa.gov> CTED)

Type(s) of GHG Reductions

[TWG has begun to provide input; to be discussed at next CAT meeting]

Estimated GHG Savings (in 2020) and Costs per MtCO₂e

[TWG has begun to provide input; to be discussed at next CAT meeting]

- **Data Sources:**
- **Quantification Methods:**
- **Key Assumptions:**

Contribution to Other Goals

- **Contribution to Long-term GHG Emission Goals (2035/2050):**
 - Would have a significant impact on GHG emissions reduction over the long term
- **Job Creation:**
- **Reduced Fuel Import Expenditures:**

Key Uncertainties

[Insert text here]

Additional Benefits and Costs

[Insert text here]

Feasibility Issues

[Insert text here]

Status of Group Approval

TBD

Level of Group Support

TBD

Barriers to Consensus

TBD

RCI-4. Energy Efficiency Improvement in Existing Buildings, with Emphasis on Building Operations

Straw Proposal Development Status: Developed by TWG; Ready for CAT Review

Based on RCI Catalog Option 2.6

Mitigation Option Description

Existing buildings will continue to consume the bulk of the energy used in the residential and commercial sectors in Washington for many years. This option would promote and provide incentives for the improvement of the energy efficiency of the existing building stock. Key to reducing energy use and GHG emissions in existing buildings are building operations, maintenance, and occupant behavior (for example, via total resource management systems).

Mitigation Option Design

This option is designed to facilitate substantial improvements in the efficiency of existing buildings in Washington through a combination of measures related to building design, code enforcement, energy performance review, and improvements in building operations. Elements of this option are expected to work in concert with lending/financing elements of RCI-2, and with energy efficiency incentive and building/community design elements of RCI-1 and RCI-3.

Potential elements of this option could include:

- Promoting retro-commissioning and Building Operator Certification (BOC) in all facilities of large-portfolio organizations.
- Supporting code enforcement, retro-commissioning, and building operator certification, as applicable, when buildings are sold.
- Support for energy efficiency lending.
- Encouraging free market economy functions that achieve performance standards rather than imposing specific types of costs.
- Commercial benchmarking and retro-commissioning consistent with 2030 Challenge baseline work (and/or with other green building certification systems).
- Focusing on building operations, maintenance, and occupant behavior.
- Requirements for upgrading the energy efficiency of buildings at the time of resale
- A requirement that a full time resource conservation manager be located on the premises of all medium to large business or agency.

Note that some of these elements will be more applicable to commercial and industrial buildings than to residential buildings, and vice versa, and in many cases flexible application of requirements and incentives will be needed in projects, such as mixed-use residential and commercial projects, that do not fall readily into specific consumer categories.

- **Goals:**
 - Propose energy performance metrics that help define and communicate energy use and environmental impact
 - Identify systems that can accelerate savings and lower cost of implementation
 - Reduce energy use in the existing residential, commercial and industrial building stock by an average of 50% in the near term, with long term target of carbon neutrality.
- **Timing:**
- **Coverage of parties:**
- **Other:**

Implementation Mechanisms

More specific possible implementation mechanisms for some of the elements of this option include:

Promote retro-commissioning and BOC in all facilities of large portfolio organizations:

- Require benchmarking and commissioning whenever buildings are financed or refinanced.
- Require utilities to establish comprehensive program to promote and facilitate retro-commissioning of existing buildings, in particular regular inspections of boilers and air conditioning systems
- Voluntary lighting upgrades supported by state technical assistance (see

Focus on building operations, maintenance, and occupant behavior:

- Provide consumers with real-time information on their energy consumption: provide incentives for in-home displays (concept of an energy “dashboard” or “speedometer”) of energy use, energy costs, carbon consumption, water use, etc., and include context, e.g., how are you doing compared to your neighbors. Couple with information on products/services available for investment
- Job development and career training: one constraint to deep energy savings is the lack of trained professionals and trades people that can provide solutions and implement strategies. There is a need for additional educational and training opportunities aimed at the construction industry.
- Consider a ban or requirement to eliminate inefficient lighting fixtures (San Francisco is considering an ordinance to eliminate all existing T-12 lighting within City limits; California is considering a ban on sale of incandescent light bulbs)
- Conduct a state-wide campaign aimed at encouraging behavioral changes. Models in California (e.g. Flex Your Power) have had significant success at reducing statewide residential energy demand.

Requirements for upgrading the energy efficiency of buildings at the time of resale

- Establish minimum energy performance standards and/or cap energy budgets at the time of sale.
- Establish (or facilitate by opening up legal pathway) point of sale and point of rental requirements for energy efficiency audits and upgrades. Models developed by Berkeley, San Francisco and Oakland; and Austin.
- Provide assistance to affordable housing to meet same.
- Secure commitment of state and local government entities to undertake energy efficiency upgrades and operational changes in government owned and operated facilities as a first step in moving the market.

Related Policies/Programs in Place

LEED requirements apply to some remodeled building, see RCI-3.

LEED-EB is applicable to the existing commercial building stock and provides a good guideline for achieving operational savings.

The Built Green program and others certification standards may also be applicable to energy efficiency upgrades of existing buildings as supported by this option.

Type(s) of GHG Reductions

[Insert text here]

Estimated GHG Savings (in 2020) and Costs per MtCO_{2e}

[TWG has begun to provide input; to be discussed at next CAT meeting]

- **Data Sources:**
- **Quantification Methods:**
- **Key Assumptions:**

Contribution to Other Goals

- **Contribution to Long-term GHG Emission Goals (2035/2050):**
- **Job Creation:**
- **Reduced Fuel Import Expenditures:**

Key Uncertainties

[Insert text here]

Additional Benefits and Costs

[Insert text here]

Feasibility Issues

[Insert text here]

Status of Group Approval

TBD

Level of Group Support

TBD

Barriers to Consensus

TBD

RCI-5. Rate structures and Technologies to Promote Reduced GHG Emissions (including Decoupling of Utility Sales and Revenues)

Straw Proposal Development Status: Not yet developed by TWG

Based on RCI Catalog Option 5.3

Mitigation Option Description

This option could include various elements of utility rate design that are geared toward reducing greenhouse gas emissions, often with other benefits as well, such as reducing peak power demand. The overall goal is to revise rate structures so as to better reflect the actual economic and environmental costs of producing and delivering electricity as those costs vary by time of day, day of the week, season, or from year to year. In this way, rates provide consumers with information reflecting the impacts of their consumption choices.

RCI-6. Provide Incentives to Promote and Reduction of Barriers to Implementation of Renewable Energy Systems

Straw Proposal Development Status: Joint consideration with ES TWG in progress (See option ES-2)

Based on RCI Catalog Option 6.1

This option will be pursued jointly with the ES TWG

Mitigation Option Description

Distributed electricity generation sited at residences and commercial and industrial facilities, and powered by renewable energy sources (typically solar, but also wind, small hydroelectric power sources, or biomass or biomass-derived fuels), displaces fossil-fueled generation and avoids electricity transmission and distribution losses, thus reducing greenhouse gas emissions. This policy can also encourage consumers to switch from using fossil fuels to using renewable fuels in applications such as water, process, and space heating, as well as to supply new energy services using fuels that produce low or no GHG emissions. Increasing the use of renewable energy applications in homes, businesses, and institutions in Washington can be achieved through a combination of regulatory changes and financial incentives.

RCI-7. Provide Incentives and Resources to Promote and Reduction of Barriers to Implementation of Combined Heat and Power (CHP, or “cogeneration”) and Waste Heat Capture, Including Net-metering for Combined Heat and Power

Straw Proposal Development Status: Joint consideration with ES TWG in progress (See option ES-7)

Based on RCI Catalog Options 6.2 and 5.2

Mitigation Option Description

This policy option involves the consideration and adoption by state regulatory authorities of rate designs, coupled with the necessary metering technology, that promote reduction in GHG emissions by encouraging consumers to install distributed generation systems—especially those based on renewable fuels—and combined heat (and or cooling) and power systems that offer the opportunity to improve the overall efficiency of fuel use.

Combined heat and power (CHP) systems reduce fossil fuel use and greenhouse gas emissions, both through the improved efficiency of the CHP systems, relative to separate heat and power technologies, and by avoiding transmission and distribution losses associated with moving power from central power stations that are located far away from where the electricity is used.] Opportunities to recover (“recycle”) thermal energy from local waste heat or renewable energy sources include recovery of waste heat from power generation (through combined heat and power or CHP), industrial processes, or municipal operations, and tapping local renewable resources such as bio-energy, geothermal and natural sources of air conditioning such as cold lake or ocean water. District energy systems provide the infrastructure for conveying this energy from the sources to energy consumers. Implementation of CHP systems by residential, commercial, institutional, and industrial energy consumers could be encouraged through a combination of regulatory changes and incentive programs.

RCI-8. Consumer Education Programs, Including Labeling of Embodied Life-cycle Energy and Carbon Content of Products and Buildings

Straw Proposal Development Status: In progress

Based on RCI Catalog Options 4.1 and 8.2

Mitigation Option Description

The ultimate effectiveness of emissions reduction activities in many cases depends on providing information and education to consumers regarding the energy and GHG emissions implications of consumer choices. Public education and outreach is vital to fostering a broad awareness of climate change issues and effects (including co-benefits, such as clean air and public health) among the state’s citizens. Such awareness is necessary to engage citizens in actions to reduce GHG emissions in their personal and professional lives. Public education and outreach efforts should integrate with and build upon existing outreach efforts involving climate change and related issues in the state. Ultimately, public education and outreach will be the foundation for the long-term success of all of the mitigation actions proposed by the Washington CAT, as well as those that may evolve in the future.

This option would additionally include elements to estimate the embodied life cycle energy use and carbon emissions associated with products and buildings, to label products and buildings being sold so as to provide feedback to consumers on their “carbon footprint”, and to encourage the use of lower-carbon products and building materials.

RCI-9. Identify GHG Emissions Impacts and Measures to Avoid, Minimize, or Mitigate them for Projects Requiring Government Review, and in Designing Government Rules and Regulations

Straw Proposal Development Status: Not yet developed by TWG

Based on RCI Catalog Options 7.7 and 7.8

Mitigation Option Description

This option would require an identification of the net impacts on GHG emissions of new government rules and regulations, and would require the identification measures to avoid, minimize or mitigate increases in emissions due to the implementation of those rules and regulations in order to prevent the unintended consequences (e.g. increasing GHG emissions). This option would additionally require SEPA review to quantify GHG emissions and identify measures to avoid, minimize or mitigate emissions for state-funded and/or privately funded projects.

RCI-10. More Stringent Appliance/Equipment/ Lighting Efficiency Standards, and Appliance and Lighting Product Recycling and Design

Straw Proposal Development Status: Not yet developed by TWG

Based on RCI Catalog Options 3.1 and 8.1

Mitigation Option Description

The overall goal this option is to reduce the life-cycle greenhouse gas (and other) emissions “footprint” of products and their packaging, additional benefits include reduction of non-GHG pollutants, savings of materials. This option would include appliance and lighting products recycling; design issues including inclusion in products of “smart chips”, design of products to make them easy to recycling, and designs to improve product longevity. [Appliance, equipment, and lighting efficiency standards reduce the market cost of energy efficiency improvements by incorporating technological advances into base appliance and equipment models, and lighting devices, thereby creating economies of scale. Appliance/equipment/lighting efficiency standards can be implemented at the state level for appliances and other devices not covered by federal

standards, or where higher-than-federal standard efficiency requirements are appropriate¹². Regional co-ordination for state appliance/equipment/lighting standards can be used to avoid concerns that retailers or manufacturers may (1) resist supplying equipment to one state that has advanced standards or (2) focus sales of lower efficiency models on a state with less stringent efficiency standards.

RCI-11. Policies and/or Programs Specifically Targeting Non-energy GHG Emissions

Straw Proposal Development Status: Not yet developed by TWG

Based on RCI Catalog Option 7.4

Mitigation Option Description

GHG emissions from RCI sources not directly associated with energy use include emissions of both major GHGs such as carbon dioxide, but also a number of specialty gases—such as refrigerants, fire retardants, and solvents—that are emitted in relatively small quantities but have proportionately much larger impacts on climate. A combination of voluntary agreements with industries and of new specifications for key equipment can be used to reduce the emissions of process gases that have high global warming potentials (GWP, a measure of the potential impact of different gases on climate in terms of “CO₂-equivalent”).

¹² *In recent years, Arizona, Oregon, and Washington, among other states, adopted state standards for several appliances; this led to the inclusion of standards for these appliances in the 2005 federal Energy bill.*