

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

#	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)	Reviewed and affirmed by CAT during Aug 7 meeting
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)	Reviewed and affirmed by CAT during Aug 7 meeting
RCI-3	Promotion and Incentives for Improved Community Planning and Improved Design and Construction (Third-party Sustainability, Green, and Energy Efficiency Building Certification Programs) in the Private Sector (originally 2.2 and 2.4)	Reviewed and affirmed by CAT during Aug 7 meeting
RCI-4	Energy Efficiency Improvement in Existing Buildings, with Emphasis on Building Operations (originally 2.6)	Reviewed and affirmed by CAT during Aug 7 meeting
RCI-5	Rate structures and Technologies to Promote Reduced GHG Emissions (including Decoupling of Utility Sales and Revenues) (originally 5.3)	Ready for CAT Review
RCI-6	Provide Incentives to Promote and Reduction of Barriers to Implementation of Renewable Energy Systems (originally 6.1)	Prepared Jointly with ES TWG-- Ready for CAT Review (See option ES-2)
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)	Prepared Jointly with ES TWG-- Ready for CAT Review (See option ES-7)

#	Mitigation Option Name	Straw Proposal Development Status
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)	Ready for CAT Review
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)	Ready for CAT Review
RCI-10	More Stringent Appliance/Equipment/Lighting Efficiency Standards, and Appliance and Lighting Product Recycling and Design (originally 3.1 and 8.1)	Ready for CAT Review
RCI-11	Policies and/or Programs Specifically Targeting Non-energy GHG Emissions (originally 7.4)	Ready for CAT Review

Options previously reviewed and affirmed by the CAT are available on the CAT website under the most recent meeting of the RCI TWG.

http://www.ecy.wa.gov/climatechange/cat_twg_rci.htm

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

Straw Proposal Development Status: Reviewed and affirmed by CAT during Aug 7 meeting

Based on RCI Catalog Option 1.2

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: Reviewed and affirmed by CAT during Aug 7 meeting

Based on RCI Catalog Options 1.3 and 1.5

RCI-3. Promotion and Incentives for Improved Community Planning and Improved Design and Construction (Third-party Sustainability, Green, and Energy Efficiency Building Certification Programs) in the Private Sector

Straw Proposal Development Status: Reviewed and affirmed by CAT during Aug 7 meeting

Based on RCI Catalog Options 2.2 and 2.4

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

Straw Proposal Development Status: Reviewed and affirmed by CAT during Aug 7 meeting

Based on RCI Catalog Option 2.6

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

Straw Proposal Development Status: Ready for CAT Review

Based on RCI Catalog Option 5.3

Mitigation Option Description

Traditional regulatory frameworks tie a utility's recovery of fixed costs of providing service (for example, infrastructure costs) to the quantity of energy sold. There is thus a perverse incentive for utilities to increase sales in order to increase revenues and minimize investments in energy efficiency (which will simply lead to lower than anticipated sales). Most Washington gas and electric utilities do incorporate some form of rates that provide incentives to conserve energy and/or reduce loads in their rate structures, but there are opportunities to further use rate design and metering infrastructure to support the reduction of greenhouse gas emissions.

This option includes 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 of this option is to revise rate structures—and provide metering technologies to implement revised rate structures--so as to better reflect the actual economic and environmental costs of producing and delivering electricity as those costs vary over time.. These new rate designs provide consumers with information reflecting the impacts of their consumption choices.

Mitigation Option Design

Potential elements of this option could include:

- Implement rate structures and utility cost recovery rules that “decouple” the level of gas and electric utility sales from the net revenues earned by investor-owned utilities. Decoupling mechanisms have been implemented or are under consideration in a number of western states¹. (Note that decoupling is not, generally, applicable to the operations of municipal and cooperative utilities.) Decoupling, if introduced, should be geared exclusively to removing barriers to utility investment in programs to increase their customers' energy efficiency and reduce customer loads.
- Implementing, where not already used and as appropriate, tiered (increasing block) rates for electricity and natural gas use, which provide affordable base usage rates for residential consumers, but which increase with increasing consumption.

¹ A review of states' experience in decoupling is provided in the report [Aligning Utility Interests with Energy Efficiency Objectives: A Review of Recent Efforts at Decoupling and Performance Initiatives](#), by Marty Kushler, Dan York and Patti Witte of the American Council for an Energy-Efficient Economy, available as <http://www.aceee.org/pubs/u061.htm>.

- Implementing different types of rate structures and bases for rate structures, including rates based on the number of occupants of a home rather than its size. Any new rate structures, however, should be designed so as not to have a negative affect on low-income electricity and gas consumers, and/or should be coupled with the development of programs to allow low-income consumers to take advantage of opportunities to reduce their bills.
- In conjunction with other RCI options and existing initiatives in Washington, providing programs that offer incentives for consumer behavior that is more energy efficient (for example, energy-efficient customer rebate programs). The benefits of these programs are that they educate consumers on the impacts of their energy use and motivate them to conserve energy.
- Encourage demand response programs that provide incentives to customers to voluntarily reduce their load at times of system peaks, and implement time-of-use (TOU) rates provide an incentive for customers to shift their usage from peak to non-peak periods and thereby, reducing the need for utilities to have to utilize their least efficient, least environmental-friendly generation resources.
- Implement “Smart Metering”--consumer electric meters showing real-time pricing and the level of GHG emissions related to consumption at any given time. Smart meters are described as providing consumers with the information needed to make consumption choices, and can include the capability for consumers to adjust the type of power (for example, “green” versus conventional power) “on the fly”.²

Regulations and regulatory frameworks exist in Washington to develop and implement rate structures that provide incentives for energy efficiency improvement, and such rate structures are under discussion or being implemented in several utility areas (see “Related Policies and Programs in Place). Utilities, regulators, and other should work with and within these regulations and frameworks to develop additional rate structures that contribute to GHG emissions reductions.

- **Goals:**

- Develop and implement a pilot program of installation of smart meters at residential customers’ sites by 2009, with installations starting in 2010. The pilot program could target installation of smart meters in roughly one (1) percent of homes in Washington.
- Implement customer rebate and education programs, and changes in rate design, in a manner timed to support the introduction of smart meters and to support other RCI options.
- Remove regulatory and financial barriers to natural gas utility investments in cost-effective conservation, so as to better align the interests of utilities and customers,

² A study on “smart metering” was, as of late August, 2007, being contracted for by CTED, with results expected in late 2007. A brief description of Smart Metering, and its planned implementation by a utility in the Detroit (MI) area, is available at <http://www.detnews.com/apps/pbcs.dll/article?AID=/20070813/BIZ/708130348>.

and to support GHG emissions reduction goals set out in the Governor's Executive Order.

- **Timing:** As noted above.
- **Coverage of parties:** Washington Utilities and Transportation Commission, electric and gas utilities, and residential sector consumers.
- **Other:**

Implementation Mechanisms

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

Related Policies/Programs in Place

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

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]

Contribution to Other Goals

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

Key Uncertainties

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

Additional Benefits and Costs

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

Feasibility Issues

[Insert text here]

Status of Group Approval

TBD

Level of Group Support

TBD

Barriers to Consensus

TBD

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

Straw Proposal Development Status: Prepared Jointly with ES TWG--Ready for CAT Review
(See option ES-2)

Based on RCI Catalog Option 6.1

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: Prepared Jointly with ES TWG--Ready for CAT Review
(See option ES-7)

Based on RCI Catalog Options 6.2 and 5.2

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

Straw Proposal Development Status: Ready for CAT Review

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. 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. Education and certification programs for professionals involved in delivering services in support of RCI and other policy options considered by the CAT must also be developed and implemented.

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.

Mitigation Option Design

Potential elements of this option could include:

- Coordinating climate and energy efficiency education programs throughout the state, including education and energy-efficiency programs offered by utilities.
- Implementing requirements for retail education (on packaging or on a handout provided at the time of purchase), that will inform consumers about the energy consumption of the products and materials (including building materials) they buy, and how to operate or use products in the most energy-efficient manner. These requirements should take advantage of and build upon existing Energy Star initiatives and certification programs, and be implemented in coordination with retail sales organizations where applicable.
- Engaging industrial firms to promote LEAN manufacturing techniques and other practices to reduce unnecessary energy and material consumption, and engaging small businesses on GHG emissions reduction by using environmental impacts education materials.
- Enhancing the coverage of energy and environmental issues, including climate change, in public school curricula at all levels to shape long-term behavior.

- Work with community colleges, universities, labor organizations, governments, business organizations, and businesses to promote the development of programs for training of a much expanded “clean energy workforce” to work in fields like energy efficiency, distributed and renewable energy, and the “green building” (see below) trades.
- As noted in RCI-3, there is a need to provide suitably trained building professionals with “green building” certification so that potential purchasers and developers of green buildings can be assured that builders and designers so designated are equipped to produce green buildings. A preliminary step here would be to adapt, adopt, and/or develop a suitable set of qualifications that building professionals must meet to receive a green building certification. Certification programs should be offered for both individual builders and designers and for contracting and design companies, though specific rules will need to be developed for certified companies to assure that the individuals within a company who work on a given green building project are properly trained to do so.
- Implement “Carbon Labeling” of products. A labeling scheme would indicate to the consumer the total embodied carbon emitted during the life cycle of a particular product (including the product and the packaging). Life cycle analysis should consider the direct emissions including the phases of production: raw material, product manufacturing, distribution and retail, consumer use (is it refrigerated, etc), and recycling. The life cycle analysis would determine the total amount of carbon emitted during the creation and use of the product and that number would be put on the carbon label. This label would also indicate that the company has made a commitment to reducing the carbon footprint of the specific product over the course of two years. This type of labeling would inform consumers about the embodied carbon footprint of a particular product, giving them the opportunity to influence corporate practices through their buying power. Companies participating in the program would also be able to show that they are committed to reducing their carbon footprint and to mitigating climate change. Carbon footprint labeling could coordinate with programs related to disclosure of building energy use when a building is offered for lease or sale (as suggested in RCI-4)³.
- **Goals:** Consumer, K-12, and technical/professional education course should be developed so as to provide timely support to other options recommended by the CAT, and to support the GHG emissions reduction goals set out in the Governor’s Executive Order. The carbon labeling initiative described above would cover all products sold within Washington State.
- **Timing:** For the carbon labeling program, full implementation by 2020 with phased implementation starting with highest priority items identified by an advisory panel.
- **Coverage of parties:** Consumers, Retailers, Manufacturers, Government Agencies, K-12 Public Schools, Community Colleges, Universities, Technicians and Professionals in Building and related trades.
- **Other:**

Implementation Mechanisms

³ See “Related Programs/Policies in Place”, below, for references to carbon labeling programs being investigated elsewhere.

[Insert text here]

Related Policies/Programs in Place

[Insert text here]

Type(s) of GHG Reductions

[Insert text here]

Estimated GHG Savings (in 2020) and Costs per MtCO₂e

- **Data Sources:**

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

- **Quantification Methods:**

- **Key Assumptions:**

Contribution to Other Goals

- **Contribution to Long-term GHG Emission Goals (2035/2050):**

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

- **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-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: Ready for CAT Review

Based on RCI Catalog Options 7.7 and 7.8

Mitigation Option Description

In 1997, then chairman of the Council for Environmental Quality, Kathleen McGinty drafted an interpretation of NEPA for federal agency heads finding that NEPA provides an ‘appropriate and feasible mechanism for considering climate change drivers and consequences.’⁴ The option described below would require 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 (such as increasing GHG emissions). This option would additionally require SEPA (State Environmental Policy Act) review to quantify GHG emissions and identify measures to avoid, minimize or mitigate emissions for state-funded and/or privately funded projects, and would emphasize the incorporation of GHG emissions consideration in community planning and zoning decisions. Efficient community planning holds perhaps the greatest potential for future reductions of any mitigation strategy.

Mitigation Option Design

Potential elements of this option could include:

- Requiring SEPA review to quantify GHG emissions and identify measures to avoid, minimize or mitigate emissions for projects requiring government review.
- GHG emissions impact review requirements for significant development projects modeled after the program in place in Massachusetts, in which private developers are required to estimate the greenhouse gases their large-scale projects will produce and reduce them with measures such as energy-efficient lighting, alternative fuels, or commuter shuttles. Large housing developments, office projects, and mixed-use developments that combine retail, industrial, and residential uses will be affected.⁵
- Covered projects could include:
 - All state-funded or proposed projects

⁴ McGinty, K.A., 1997. Draft memorandum: Guidance regarding consideration of global climatic change in environmental documents prepared pursuant to the National Environmental Policy Act. *Council for Environmental Quality*.

⁵ Massachusetts guidelines were scheduled for completion on July 1. See http://www.boston.com/news/local/articles/2007/04/22/mass_steps_up_climate_rules_for_developers/

- Privately-funded projects that require a state air quality permit
- Privately-funded projects that result in more than 3000 vehicle-mile trips/year.
- A review of the energy intensity of the production of building materials used in projects, in order to provide incentives for use of low greenhouse gas building products.
- Requirements that all new projects reduce GHG emissions, with true mitigation of emissions preferred over off-site mitigation or offsets.
- A requirement that all government actions be reviewed for potential GHG impacts, with the review process designed to be efficient and low-cost.
- Add climate protection as a required element of local planning under the state Growth Management Act. It is much more efficient to consider climate impacts at the level of community planning, when synergies between land use, transport, and building energy use can best be identified and addressed, than at the level of individual projects, though the latter is important as well. Therefore, emphasis on incorporating evaluation of GHG emissions impacts in comprehensive zoning processes is a critical step in achieving significant emissions reductions. This element should be integrated/coordinated with similar initiative being considered by the Transport TWG and included in other RCI options
- **Goals:** Establish information disclosure requirements and data collection capacities enabling the state to quantify the impact of development on statewide GHG reduction targets to inform subsequent mitigation thresholds and target setting.
- **Timing:** King County’s two-phase model, which requires a year of information disclosure and data collection prior to developing specific mitigation thresholds and targets, has great potential for replication statewide.
- **Coverage of parties:** Government agencies, municipal and county planners and zoning boards, private developers of substantial projects.
- **Other:**

Implementation Mechanisms

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

Related Policies/Programs in Place

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

Type(s) of GHG Reductions

[Insert text here]

Estimated GHG Savings (in 2020) and Costs per MtCO₂e

- **Data Sources:**

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

Contribution to Other Goals

- **Contribution to Long-term GHG Emission Goals (2035/2050):**
- **Job Creation:**
 - Significant potential to increase consultant and government jobs.
- **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-10. More Stringent Appliance/Equipment/ Lighting Efficiency Standards, and Appliance and Lighting Product Recycling and Design

Straw Proposal Development Status: Ready for CAT Review

Based on RCI Catalog Options 3.1 and 8.1

Mitigation Option Description

This option is designed to advance policies and programs that result in improved life-cycle benefits of new lighting, equipment, appliances and consumer electronic products, that is, through increasing energy efficiency while also increasing product recycling and reuse and avoiding the generation of solid waste and the production and emissions of toxic materials.

Washington is one of 10 states that have standards for minimum energy efficiencies for specific products not covered by federal standards, or that go beyond federal standards. State standards fill gaps left by the federal government or encourage the adoption by manufacturers and others of higher standards than current federal standards. 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.

While there has been substantial progress in improving the energy efficiency of some consumer and commercial products, substantial energy conservation potential remains in products such as lighting, computers, servers and televisions. And equally important to moving the consumer electronic product industry to increased energy efficiency is to reduce the life-cycle environmental and economic impacts of the next generation of lighting, appliances and other electronic and electrical equipment.

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 recycle, and designs to improve product longevity.

Mitigation Option Design

Potential elements of this option could include:

- Develop and implement minimum efficiency standards for televisions⁶, digital TV adapters and other consumer electronic goods, working with US DOE or other parties.

⁶ Already, televisions account for about 4 percent of annual residential electricity use in the United States. By 2009, when half of all new TV sales are expected to be extended- or high-definition digital sets with big screens, according to NRDC, TV energy use will be about 50 percent higher than at present. Further, the move to high-definition TV requires sets to deliver more picture clarity, which uses more power. In addition, nationally it is anticipated that millions of old analog televisions will be no longer wanted and will need to be recycled. Using the best available

- Task CTED with analyzing the potential to apply efficiency standards to include lighting products. California is currently considering legislation requiring minimum lumen/watt standards for different categories of lighting as well as setting standards for reducing indoor residential lighting energy usage by no less than 50%, by 2018, as well as requiring a 25% reduction in commercial facilities by that same date.
- Task CTED to review and analyze efficiency standards already adopted by California (products not covered by federal standards) for application in Washington including walk-in refrigerators and freezers, residential furnaces, dry-type transformers, commercial hot-food holding cabinets and other electronic and electrical equipment.
- Require manufacturers to reduce the levels of toxins in lighting products, such as mercury in fluorescents, consistent with requirements already in place in the European Union.
- Require manufacturers to have an effective system in place for collecting and recycling end-of-life bulbs that contain hazardous materials that is easy and convenient for the consumer⁷. This can be done by including the cost of collection and recycling in the purchase price of the product and by working with retailers, recyclers, utilities, local governments and others to provide convenient collection opportunities. Manufacturer-designed and -financed systems would ensure the most efficient and effective collection programs.
- Concurrent with policies and programs to ensure safe recycling and/or disposal of lighting products that contain lead and mercury, phase out incandescent lighting and set a date for a ban on them (with appropriate exemptions such as surgeries.)
- With state, utility and private sector financial support, invest in research and development initiatives or incentive programs to accelerate the use of LED (light-emitting diode) and other least toxic, highly-efficient lighting technologies in all sectors.
- Require the preferential procurement of EnergyStar™ products if available (equipment, appliance or technology) if state funds are involved (e.g., state purchasing contracts, state grants or loans, etc.)
- Create state tax incentives to increase sales and use of EnergyStar™ appliances and equipment.
- Work with manufacturers, retailers, recyclers and energy and solid waste utilities to ensure that all program elements promote and incorporate the recycling and/or materials reuse of old products (including increasing the recycled materials use in manufacturing new products), and to implement lower-energy manufacturing processes. Energy efficient product promotional programs should be planned and coupled with corresponding recycling

technology, however, could reduce this new generation of big-screen TV "active mode" consumption by at least 25 percent, saving 10 billion kilowatt-hours per year, the NRDC estimates. In addition to chopping residential electric bills by \$1 billion, it would prevent 7 million extra tons of carbon dioxide from entering the atmosphere, according to NRDC.

⁷ For example, transitioning from incandescent lighting to CFLs in the residential sector offers enormous energy savings potential, but the fact that there is no comprehensive and effective system in place for recycling or disposing of old CFLs to avoid mercury contamination creates a barrier to achieving the full potential of CFLs.

programs for the old products and new products being promoted. Also consider encouraging manufacturers to design product/packaging for use as clean fuel if not reused or recycled.

- Substantially increase the use of green electronic products and reduce solid waste by promoting EPEAT™ through a consortium of state, local government and business procurement entities, and require the use of EPEAT in state and local government procurement⁸.

To achieve economies of scale and market efficiency, many of the most promising mitigation options would be most effective if planned and developed regionally, through, for example, the Western Climate Initiative. That said, however, it is important for Washington and other individual states to press forward with new appliance/equipment/lighting efficiency standards, and with related standards for the environmental impacts of products, as doing so will accelerate the move toward higher regional and national standards, and will play a key role in educating consumers.

- **Goals:**
 - Consistent with an option *under consideration by the Agriculture/Waste TWG (AW-3)*, the recycling/collection goal should be 50% at a minimum; the capture rate for toxic, banned or highly recyclable products should be higher; ultimately, the state's interest should be 100% capture rate for these products.
 - The energy savings goal for improved lighting efficiency is 50% in the residential sector and 25% in the commercial sector.
 - Goals for the other products should be set based on an analysis of the baseline energy use and conservation potential, except for TVs.
 - The goal for TVs should be to improve energy use efficiency of the new generation of TVs by 25%.
- **Timing:** To be determined. Implement analyses noted above by 20XX; design additional efficiency standards by 20YY and implement by 20ZZ; begin implementing coordination on recycling and take-back programs in 20XX.
- **Coverage of parties:** Consumers, Manufacturers, Retailers, Solid Waste Agencies, other State Government Agencies
- **Other:**

Implementation Mechanisms

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

Related Policies/Programs in Place

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

Type(s) of GHG Reductions

[Insert text here]

⁸ EPEAT is The Electronic Product Environmental Assessment Tool—see, for example, <http://www.epeat.net/>.

Estimated GHG Savings (in 2020) and Costs per MtCO₂e

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

Straw Proposal Development Status: Ready for CAT Review

Based on RCI Catalog Option 7.4

Mitigation Option Description

GHG emissions from RCI sources not directly associated with energy use are emitted in relatively small quantities but have proportionately much larger impacts on climate. The potency of sources are measured by a global warming potential (GWP), - a measure of the potential impact of different gases on climate in terms of CO₂-equivalent. Below is a chart that shows the GWP for frequently-emitted GHGs.

Greenhouse gas	Global Warming Potential (relative to CO ₂)
Carbon dioxide (CO ₂)	1
Methane (CH ₄)	23
Nitrous oxide	296
Hydrofluorocarbons (HFCs)	120 -12,000
Perfluorocarbons (PFCs)	5,700 – 11,900
Sulfur hexafluoride (SF ₆)	22,200

Third Annual Assessment, IPCC 2001

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.

Mitigation Option Design

The sources of GHG emissions not directly associated with energy use generally fall into five categories:

- CO₂ from non-fossil fuel combustion sources. One percent of Washington's CO₂ emissions come from the non-energy aspects of aluminum and cement production.
- Methane (CH₄) from landfills, coalmines, oil and gas operations and agriculture accounts for less than 3% of Washington's emissions currently, but are projected to increase slightly (less than 1 MMtCO₂e from 2005 to 2020.) Mitigation policies addressing CH₄ are addressed by the Agriculture TWG.
- Agricultural activities such as manure management, fertilizer use, and livestock (enteric fermentation) result in methane and nitrous oxide emissions that account for 6% of State GHG emissions in 2005. These emissions are projected to decrease by about 0.6 MMtCO₂e. Mitigation strategies are addressed in the Agriculture and Waste TWG.
- Hydrofluorocarbon (HFCs) and perfluorocompounds (PFCs) also known as Ozone

Depleting Substitutes (ODS), are potent greenhouse gases that comprise a small but growing source of GHG emissions in Washington state and nationally. ODS are used in refrigeration, air conditioning and in heat pumps. "Even low amounts of HFC and PFC emissions, for example, from leaks and other releases associated with normal use of the products, can lead to high GHG emissions on a carbon-equivalent basis." Washington's ODS emissions are expected to increase at an average rate of 6.1% per year from 2000 to 2020. The GWP of HFC-134a, one example of a HFC is 16,500 times more potent than CO₂ over a 100-year period.

- Sulfur hexafluoride (SF₆) is a GHG used for insulation in the electricity industry and is emitted mostly when electric power transmission and distribution systems malfunction. According to the Intergovernmental Panel on Climate Change, SF₆ is the most potent greenhouse gas ever evaluated. It has a global warming potential of **22,200 times CO₂ over a 100-year period**. SF₆ emissions have declined because of voluntary industry action in the 1990s. A continuing decline will depend on continued efforts of the electric industry to reduce these emissions.

The mitigation options for this policy span across different sectors and industries. A combination of voluntary reduction, requirements for key equipment, education campaigns, performance standards, and prescriptive measures can be used. Reduction strategies are divided by the industry and source targeted for mitigation.

Aluminum and Cement Production

The cement and aluminum industry are the highest emitters of non-energy CO₂. Large quantities of CO₂ are emitted during the production of lime, the key ingredient in cement. GHG emissions from these industries can be reduced in various ways, and can make a large dent in overall CO₂ reduction. Options for reducing emissions in the cement industry, for example, are inclusion of fly ash in cement, and use of innovative low-GHG cement fillers. Key elements of this option include:

- **Goals:** Reduce CO₂ emissions by the cement and aluminum industries. A 10 percent reduction in CO₂ emissions per ton of cementitious product produced or sold from a 1990 baseline by 2020.
- **Timing:** Implement policy in a reasonable timeframe to allow timely reductions.
- **Coverage of parties:** All industrial sources currently monitored by the GHG inventory, and emit over 100,000 metric tons of CO₂e, are covered by this mitigation option.
- **Other:**

HFCs and PFCs

Efforts to reduce the use of ODS products are necessary to decrease the potential growth of the powerful greenhouse gases. Refrigeration and mobile air conditioning (MAC) release the highest amounts of ODS. HFCs are also found in compressed gas computer keyboard canisters, which are 100% HFC-134a, and in novelty aerosols such as silly string. Key elements of state action should include:

- Overall provisions

- Provisions for Mobile Air Conditioning
- Provisions for refrigeration, air condition and heat pump equipment
 - **Goals:** Reduce the use of HFCs and PFCs
 - **Timing:** Implement policy in a reasonable timeframe to allow timely reductions.
 - **Coverage of parties:** Individuals and industry are both covered in this mitigation strategy.
 - **Other:**

Implementation Mechanisms

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

Related Policies/Programs in Place

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

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 MtCO_{2e}

- **Data Sources:**

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

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

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