Forestry 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.

#	Mitigation Option Name	Option Volunteers (lead in bold)[a]
F-1	Improved Forest Health (originally 2.6)	**H. Packard**, C. Partridge, M. Verner, K. Raymond, T. Williams
F-2	Reduced Conversion to Nonforest Cover (originally 2.1)	**K. Raymond,** E. Sonne-Hall, D. Pranger, H. Packard, C. Stanley, S. Stinson, J. Floberg
F-3	Enhanced Carbon Sequestration in Forests (originally 2.4)	**D. Pranger**, B. Kelley, C. Partridge, C. Stanley
F-4	Expanded Use of Wood Products for Building Materials (originally 3.3)	**S. Stinson**, E. Sonne-Hall
F-5	Expanded Use of Biomass Feedstocks for Electricity, Heat and Steam Production (originally 1.1)	**R. Gustafson**, L. Matthews, E. Sonne-Hall, S. Fluke
F-6	Improved Commercialization of Advanced Lignocellulosic Processes (hydrolysis, gasification, pyrolysis or other) (originally 1.4, with 1.2 as a subset)	**R. Gustafson**, L. Matthews, D. McEntee, S. Fluke
F-7	Enhanced Carbon Sequestration in Harvested Wood Products (originally 2.5)	**E. Sonne-Hall**

F-1. Improved Forest Health

Straw Proposal Development Status: In progress

Based on Forestry Catalog Option 2.6

Mitigation Option Description

Reduce catastrophic wildfire GHG emissions due to fuels buildup attributable to decades of fire suppression and related pest infestation and disease. Annually wildfire contributes at least 0.18 MMTCO2e/yr, or 0.2% of the state emissions total (Westcarb I, 2007[1]).

Implicit within this mitigation option is the recognition that:

- Wildfires play an important ecological function in the natural forest lifecycle yet millions of acres of Washington's forestlands are at uncharacteristic risk due to past management practices.
- Forests, depending on how they are managed, may be a net source or a net sink of CO2.
- Eastern and Western Washington have unique forestland types and forest health challenges and should be treated differently.
- Implementation methods must be balanced and integrated with other policy options including those focused on carbon sequestration, biofuels and feedstocks, conversion and afforestation.

Through incentive and regulatory programs that reduce uncharacteristic wildfire this proposed option will promote hazardous fuel reduction in forests, and subsequent use of fuels in biomass power plants.

Healthy, well-managed forests also provide other important public benefits, including durable wood products, fish and wildlife habitat, species biodiversity, clean and adequate supplies of water, and recreational opportunities.

Mitigation Option Design

Goals: Reduce the rate of wildfire volatized GHG emissions through 50,000 acres/year reductions in forestland acres "at-risk" of catastrophic wildfire;

Restore 25% (500,000 acres) of Washington's "at-risk" state and private forestland, including 50% (XX[2] acres) in NE Washington, to a characteristically healthy state by the year 2020;

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[1] *This figure was the average for the years from 1990 through 1996, a period which preceded the larger fire seasons recently experienced. Current and projected emissions are likely to be significantly greater in the baseline case, and validation is needed for the methodology.*

[2] *waiting for E vs. W side statistics from DNR's Karen Ripley, or Dwayne Vaugen to fill in XX's*

Restore 50% (1.0 million acres) of Washington's "at-risk" state and private forestland to a characteristically healthy state by the year 2035;

Restore 100% (2.0 million acres) of Washington's "at risk" state and private forestland to a characteristically healthy state by the year 2050.

- **Timing:** See goals above.
- **Coverage of parties:** Private forestland owners and managers, State-owned forest land managers, USDA Forest Service.

Other:

Implementation Mechanisms:

Jurisdiction of Implementation Mechanisms will cover private and state timberlands only, not Federal or Tribal.

Consideration will be given to opportunities to influence "forest health" on Federal Forestlands.

Final recommendations should provide qualitative estimates for GHG reductions based on USFS adopting similar goals to reduce "at-risk" Federal forestland.

While we **prioritize** recommendations focused on **thinning**, we do recognize all forms of "Forest Health Treatments" like prescribed burns, integrated pest management. We feel strategic thinning and similar treatments are most prudent in the climate policy context.

1. Enhanced Research and Information Dissemination*
    a. Education to landowners etc.
2. Technical Assistance*
    a. Pilot Projects
    b. Professional advise to land owner
    c. Modeling
3. Regulatory Forest Health Orders*
    a. For extreme risk situations
4. Financial Assistance
    a. For landowners to implement forest health treatments
5. Stimulate markets
    a. Seed demand for small diameter material through biomass and other markets
    b. Position forest health treatments to be sold as carbon credits in anticipated carbon cap and trade market
    c. Target areas that "pencil" in economic terms first to buy time for infrastructure and other economic limitations to be resolved

6. Public Works Project
    a. WA DNR gets into the business of improving forest health using savings from wildfire management season
7. Fire control protocols that reduce GHG emissions in fire fighting
8. Collaborative stakeholder planning processes
    a. E.g. NE WA Forestry Coalition developing consensus-based approaches to influencing policies on Federal Lands (Colville NF)

*Existing statutory authority, under way or under development but may benefit from additional resources/authority/incentives. Specifically, we recommend

- Maintaining or increasing base funding level for new forest health program at DNR.
- A broad range of pilot projects for silvicultural thinning regimes, evaluate these pilots and disseminate findings and appropriate models to landowners
- Establishing a strong staff/technical support presence in Eastern Washington

Related Policies/Programs in Place

DNR's Forest Health Program, RCW 76.06,
http://apps.leg.wa.gov/RCW/default.aspx?cite=76.06

as updated in 2007 with SSB 6141
http://www.leg.wa.gov/pub/billinfo/2007-08/Pdf/Bills/Session%20Law%202007/6141-S.SL.pdf

Types(s) of GHG Reductions

TBD

Estimated GHG Savings (in 2020) and Costs per $MtCO_2e$

Data Sources:

"At risk" acreage according to DNR website

www.dnr.wa.gov/htdocs/rp/forhealth.html

Total acres at risk:

2003: 1.9 million acres;

2004: 1.9 million acres;

2005: 2.5 million acres;

2006: 2.0 million acres. (The reduction from 2005 to 2006 may in part reflect fires removing "at risk" areas.)

This is about 10% of the state's roughly 21 million acres of forest land. The percentage is likely to be much higher in eastern Washington.

Forest Health Strategy Work Group reports in 2004 and 2006.

"A Desirable Forest Health Program for Washington's Forests". December, 2004

http://www.dnr.wa.gov/htdocs/rp/forhealth/fhswgc/pdf/foresthealthreport.pdf

"Forest Health Strategy Work Group Report to the Legislature". December, 2006

http://www.dnr.wa.gov/htdocs/rp/forhealth/fhswgc/fhrepttolegdec06.pdf

- **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

We recognize that this effort faces three classes of **limitations**:

1. Physical Limitations
    a. 35% slope or less
2. Economic Limitations
    a. Infrastructure
    b. markets
3. Policy Limitations
    a. influencing Federal lands
    b. Establishing a baseline
    c. Demonstrating additionality

Additional Benefits and Costs

TBD

Feasibility Issues

TBD

Status of Group Approval

TBD

Level of Group Support

TBD

Barriers to Consensus

TBD

F-2. Reduced Conversion to Nonforest Cover

Straw Proposal Development Status: In progress

Based on Forestry Catalog Option 2.1

Mitigation Option Description

Reduce conversion of forest lands to non-forest cover and to reduce the rate at which forested tracts are parceled and/or fragmented. The conversion of forestlands to other uses is a direct cause of carbon emissions due to the loss of biomass and soil disturbance. Non-forested areas contain lower amounts of biomass and associated carbon reserves. These areas also have less capacity to sequester carbon dioxide than forested areas.

Implicit with in this mitigation option is the recognition that forests, depending on how they are managed, may be a net source or a net reservoir of CO2. This proposed option will promote the development of incentive programs that maintain forestland by reducing conversion and promoting forests' ability to continue to sequester carbon.

Mitigation Option Design

- **Goals:** Reduce the rate of total acres of forestland expected to be lost to non-forest uses by XXXX. By XXXX, achieve no net loss of forested lands across all types.
- **Timing:**
- **Coverage of parties:**
- **Other:** Since the 1930's, Washington State has lost 2 million acres of timberland to other uses. But the trend has accelerated, over the next several years, 300,000 acres of Western Washington timberland is likely to be converted to other uses (Alig et al, 2003).

  Two demographic surveys conducted by Washington State University (WSU) and the Washington Farm Forestry Association also revealed that the average age of small forest landowners is between 57 – 67 years old. These figures imply that a large percentage of this land base will change hands within a generation, likely leading to increased fragmentation and conversion.

Implementation Mechanisms:

- State level goals for maintaining overall forestland on public and private forestland acres.
- WA to participate in the development of a regional regulatory Cap and Trade system that recognizes forestry projects that could provide carbon sequestration offsets, including avoided deforestation of forestland.
- Encourage conservation easements used to maintain working forestland that are threatened with conversion

- The expansion and development of Transfer of Development Rights (TDR) a market based mechanism that promotes responsible growth, while conserving more sensitive areas such as our working forest lands.
- Implementation of the Rural Villages concept will provide an alternative to large lot development. Each rural village, a receiving site for development right transfers, will permanently protect working forests by transferring currently allowed development potential to compact developments.
- New tax incentives that encourage forest management for greater forest sequestration and avoid conversion.
- Changes to project environmental review requirements (e.g. SEPA) to require analysis and mitigation of climate impacts, including those related to possible depletion of forest carbon stocks.
- The state to provide more analysis to help identify rates of conversion on a county by county level and credit the amount of carbon associated with maintaining the forest land cover as a percentage of the rate of conversion in the area (see CA Forest Protocols as reference).

Related Policies/Programs in Place

TBD

Types(s) of GHG Reductions

TBD

Estimated GHG Savings (in 2020) and Costs per $MtCO_2e$

- **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

TBD

Feasibility Issues

TBD

Status of Group Approval

TBD

Level of Group Support

TBD

Barriers to Consensus

TBD

F-3. Enhanced Carbon Sequestration in Forests

Straw Proposal Development Status: In progress

Based on Forestry Catalog Option 2.4

Mitigation Option Description

Washington forests have a significant role to play in decreasing net emissions of carbon dioxide (CO2) by removing CO2 from the atmosphere. Our forests are among the most productive in the world, and programs designed to encourage management of our forests for increased overall forest carbon stocks can be an important part of the state's climate action strategy. Special programmatic emphasis should be placed on opportunities to increase and maintain overall carbon storage in the most stable reservoirs in the forest environment, especially stems, roots, and soils.

This mitigation option is designed to promote the removal of additional CO2 from the atmosphere by increasing and maintaining overall carbon stocks in Washington forests relative to a "business as usual" baseline. Net storage of forest carbon is influenced by many factors, including the conversion of forests to non-forest uses, forest health, harvest practices, and the wood products manufacturing process. These and other important issues related to enhanced carbon sequestration in Washington forests are addressed in other forestry mitigation options. In addition, this mitigation option includes as a policy goal the preservation of our state's public and private working forests.

Mitigation Option Design

- **Goals:** Increase and maintain absolute levels of sequestered carbon in Washington forests relative to the business as usual baseline by __ percent by ____ and by __ percent by ____.
- **Timing:**
- Undertake and complete analysis necessary to determine business as usual baseline by _____.
- Develop accounting protocols to measure absolute changes in overall carbon stocks by _____.
- Adopt legislation and rules necessary to implement programs and incentives for healthy, native forests that support environmental values by _____.
- **Coverage of parties:** Washington Governor; Washington Legislature; Executive Departments (e.g. Ecology, DNR, CTED; OFM; Revenue); Climate Action Challenge stakeholders; large and small forest landowners; foresters and climate scientists; and general public.

- **Other:**

Implementation Mechanisms:

The design for this mitigation option includes the development of greenhouse gas accounting protocols to quantify and verify real, additional and durable emission reductions that provide emissions reductions exceeding business as usual forest management. The accounting protocols used to quantify emissions reductions should 1) quantify annual increases and decreases in forest carbon stocks above the baseline (live and dead carbon pools), 2) secure/account for the protection (i.e. "permanence") of overall carbon stocks and 3) quantify and verify removals/reductions of CO2 based on stock change accounting.

Any or a combination of the following (or other identified) forest management practices could be implemented to increase and maintain overall forest carbon stocks in Washington forests:

- Increased lengths of harvest rotation.
- Harvest limitations.
- Restocking of under-stocked areas/Reforestation of non-forested areas that were historically in forest cover, both utilizing native tree species.
- Appropriate thinning of over-stocked areas.
- Avoidance of conversion to non-forest uses.
- Widening of forested riparian corridor buffers.

Programs and incentives in support of these methods of practice could include:

- Participation in the development of regional and national carbon markets that allow participation by large and smaller forest landowners.
- Increased use of conservation easements to maintain working forests managed for enhanced carbon sequestration and environmental values.
- New tax incentives that encourage forestry and management for greater forest carbon stocks and that avoid conversion.
- Other identified forest landowner incentives that protect and preserve our forests and address the reality of increased ownership fragmentation.
- Changes to development project environmental review requirements (e.g. SEPA) to require analysis and mitigation of climate impacts, including those related to possible depletion of forest carbon stocks.
- Development fees that fund on-site and/or off-site mitigation for identified climate impacts of projects.
- New "Green Building" (e.g. LEED) standards that require use of wood products from managed and sustainable forestland sources that store additional carbon.

Additional analysis is needed to determine which combination of these or other programs and incentives would yield the most cost effective and environmentally sound absolute increases to levels of sequestered carbon in Washington forests.

Related Policies/Programs in Place

TBD

Types(s) of GHG Reductions

TBD

Estimated GHG Savings (in 2020) and Costs per $MtCO_2e$

- **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

TBD

Feasibility Issues

TBD

Status of Group Approval

TBD

Level of Group Support

TBD

Barriers to Consensus

TBD

F-4. Expanded Use of Wood Products for Building Materials

Straw Proposal Development Status: In progress

Based on Forestry Catalog Option 3.3

Mitigation Option Description

This policy seeks to enhance the use of long-lived wood products as a strategy for reducing GHG emissions. Wood products not only store significant amounts of carbon but they are also less energy intensive to manufacture than substitute materials. The climate benefits of using wood products as opposed to substitute materials have been documented in numerous life cycle assessments.

Mitigation Option Design

- **Goals:** To expand the use of wood products by 10% over current levels
- **Timing:** Increase usage by 5% by 2010 and 10% by 2020, above current trends
- **Coverage of parties:** Builders, building material suppliers, wood product industries, recycled building material sellers, home improvement stores and consumers. All state agencies should lead through example.
- **Other:** Wood products not only serve as long-term carbon storage but also require much less energy to manufacture than substitute materials such as concrete or steel. This difference in energy use is so significant that one study found a substitution for steel and concrete framing representing 6 to 8 percent of the total house weight resulted in an increase in greenhouse gas emissions of 26 to 31 percent respectively[3]. Other studies have echoed these same results. Eriksson's (2003) compilation of building life cycle assessments (LCAs) concluded that using wood-framed housing in the 1.7 million housing starts in Europe[4] would save 35-50 MMtCO2e, which would be enough to contribute 11-16% of the emissions reduction needed for Europe to meet the Kyoto requirement. Buchanon and Levine (1999) report that a 17% increase in wood usage in the New Zealand building industry could result in a reduction of 484,000 MMtCO2e. This reduction is equivalent to a 20% reduction in carbon emissions from the New Zealand building industry and roughly a 1.8% of New Zealand's total GHG emissions. Miner et al (2006) report that, according to the CORRIM work, if 1.5 million housing starts in the U.S. used wood framed houses rather than non-wood building systems, 9.6

[3] Taken from the CORRIM study, Perez-Garcia, Bruce Lippke, David Briggs, James Wilson, James Bowyer and Jaime Meil. 2005. The Environmental performance of renewable building materials in the context of residential construction. *Wood and Fiber Science* 37, CORRIM Special Issue: 3-17.

[4] Currently only 5% of new construction in Europe uses wood framing

MMtCO2e per year would be kept out of the atmosphere. This savings is equivalent to keeping roughly two million cars of the road for one year.

Implementation Mechanisms:

Including embodied energy/carbon footprint/life cycle assessment information for building materials in green building standards. This can be achieved through the deployment of material election LCI tools, such as the GBI's LCA tool for material assemblies (developed primarily for use in GBI's Green Globe environmental assessment and rating system for commercial buildings) or BREEAM (used in Ecohomes, the predominant UK green building standard)

- Include carbon footprint information/literature on materials in building supply and home improvement stores
- State adopted policies: the state should adopt policies that require wood products in the construction and maintenance of all state buildings when those products are feasible and relatively close in price (within 5%) to the alternative. Education/Outreach: Develop information and education programs to promote product substitution (using wood products whenever and wherever feasible) and the benefits gained through carbon sequestration and avoided emissions.
- Promotion of product life-time? (recycled stores, preservatives) New product development?

Related Policies/Programs in Place

TBD

Types(s) of GHG Reductions

TBD

Estimated GHG Savings (in 2020) and Costs per $MtCO_2e$

- **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

TBD

Feasibility Issues

TBD

Status of Group Approval

TBD

Level of Group Support

TBD

Barriers to Consensus

TBD

F-5. Expanded Use of Biomass Feedstocks for Electricity, Heat and Steam Production

Straw Proposal Development Status: In progress

Based on Forestry Catalog Option 1.1

Mitigation Option Description

F-5 seeks to encourage forest product manufacturing facilities to use biomass to produce power for their own use, with surplus fed back to the energy grid.

Mitigation Option Design

- **Goals:** Achieve co-generation capacity at 50% of Washington State forest products facilities by 2020; achieve co-generation capacity at 100 of Washington State forest products facilities by 2035.
- 2010: Complete assessment of co-generation capability for Washington State forest products facilities.
- 2020: All Washington State forest products facilities will have some co-generation capability. Pulp mills will replace aged recovery furnaces with high pressure systems or combined cycle gasification units.
- 2035: All Washington State forest products facilities will have state of the art co-generation capability. In particular all pulp mills have either high pressure recovery furnaces or combined cycle gasification units.
- **Timing:**
- **Coverage of parties:**
- **Other:**

About 70% of Washington State electricity comes from non-carbon emitting sources, including hydroelectric and nuclear. Electricity generation, therefore, should be considered as a lower pollution avoidance priority for forest biomass utilization than solid wood products, which can sequester carbon for many decades, or for transportation fuels, which must be made from biomass to be carbon neutral and displace reliance on fossil fuels. There are opportunities, however, where local circumstances may make generation of electricity from biomass a logical energy alternative and these should be developed to the maximum extent possible. In particular, many forest product manufacturing facilities, such as pulp and paper mills and lumber mills, have co-generation capability to produce steam for industrial processes and electricity for their own use with surpluses supplied to the grid. Boilers should be state of the art such that the maximum energy is recovered from each ton of biomass. Facilities that currently do not incorporate cogeneration capabilities represent low cost opportunities for new renewable energy investment.

- New conversion technology that is optimized for Washington State biomass may need to be developed. The timing for this type of development work would be longer than the horizon presented above.

Implementation Mechanisms:

Goal 1 can be achieved with grants to Universities to perform the assessment. Goals 2 and 3 would require industry to commit capital for construction of modern co-generation facilities. Incentives that may be required for this construction include:

- Grants for construction
- Tax breaks for biorefinery operations
- Subsidy of biomass cost in recognition of environmental benefit of using biomass for fuel.
- Subsidy ($0.10/kWhr) for bio-based electricity *including pulp mill black liquor*.

Related Policies/Programs in Place

TBD

Types(s) of GHG Reductions

TBD

Estimated GHG Savings (in 2020) and Costs per $MtCO_2e$

- **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

TBD

Feasibility Issues

TBD

Status of Group Approval

TBD

Level of Group Support

TBD

Barriers to Consensus

TBD

F-6. Improved Commercialization of Advanced Lignocellulosic Processes

Straw Proposal Development Status: In progress

Based on Forestry Catalog Options 1.4 and 1.2

Mitigation Option Description

F-6 seeks to develop and implement technology that can convert wood biomass to biofuels. These fuels could then be used for transportation or other uses, offsetting fossil fuel emissions that would otherwise take place. This option intersects with F-2, which seeks to reduce the buildup of fuels which can increase the risk of wildfire.

Mitigation Option Design

- **Goals:** Produce 1.36 billion gallons (50% of Washington State fuel demand in XXXX) of biofuels from wood by 2050.
- 2012: Construct 1st commercial scale lignocelluloses biorefinery production 100 million gallons a year of ethanol – utilizing 1.25 million tons of biomass per year. Operational 2015
- 2020: Produce 320 million gallons of ethanol per year, using 4 million tons of biomass per year.
- 2035: Produce 640 million gallons of ethanol per year (8 million tons biomass per year)
- 2050: Produce 1.36 billion gallon ethanol per year (roughly half of Washington State current consumption) using 17 million tons of biomass per year.

Road map to first commercial biorefinery.

- Research and analysis to support construction of 1st Washington State biorefinery.
    - Identify and assess lignocelluloses conversion technologies on Washington State biomass.
    - Perform techno- economic analysis of most promising candidates to assess technical economic feasibility
    - Assess broad environmental impact by means of life-cycle analysis or other encompassing mechanism

  Start 2008 – Complete 2011
- Construct demonstration scale biorefinery facility with best technology – 100 tons/day biomass (~ 3 million gallons fuel year)

  Start 2010 – Complete 2012

- Construction commercial scale biorefinery (3500 tons/day biomass) 100 million gallons of fuel/ year

  Start 2012 – Complete 2015

  Note this last point is inconsistent with goal above, which states completion and production of 100 million gallons/ year by 2012 (this says operational by 2015)

- **Timing**: See goals above
- **Coverage of parties:**
- **Other:** Conservatively there are 17 million tons of biomass that could be used for manufacture of fuels and energy available annually in Washington. About eight million tons of that is forestry biomass. Much more forestry biomass is available if you consider use of forest slash currently left in the woods, and all the biomass that should be removed for fire treatment. The US Forest Service estimates that a total of 240 million tons of wood biomass needs to be removed from eastside forests to reduce surplus fuel loads and forest fire hazard. Effective use of this biomass would significantly reduce Washington State green house gas emissions. Use of all eight million tons of forest biomass to produce 640 million gallons of transportation fuels would reduce Washington's greenhouse gas emissions by about 4 MMTCo2e (annually?). In contrast, if this 640 million gallons were produced from corn it would only reduce green house gas emissions by about 0.5 MMT CO2e (also annually?). Further, reducing incidence and magnitude of forest fires by removing forest thinning and slash for fuel production could avoid CO_2 releases from smoke equivalent to an additional 2 MMTCO2e per year.
- New conversion technology that is optimized for Washington State biomass may need to be developed. The timing for this type of development work would be longer than the horizon presented above.

Implementation Mechanisms:

Analysis work required prior to building the 1st biorefinery can be accomplished with grants to Universities and engineering firms. An industrial partner would need to take the lead on building the demonstration and commercial scale biorefinery. Universities and engineering firms engaged in the assessment would be part of the consortium to build and operate the demonstration unit.

Incentives for construction of biorefineries include the following:

- Grants for construction
- Tax break for biorefinery operations
- Subsidy of biomass cost in recognition of environmental benefit of using biomass for fuel.
- Subsidy of transportation fuel produced from biomass. Federal government is considering $1.06/gallon subsidy of ethanol produced from lignincellulosics.

Related Policies/Programs in Place

Policies:
http://www.sccd.org/policy/WashingtonBiofuelsIncentives.shtml

http://www.sccd.org/policy/RenewableFuelRequirement.shtml

Types(s) of GHG Reductions

TBD

Estimated GHG Savings (in 2020) and Costs per $MtCO_2e$

- **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

TBD

Feasibility Issues

TBD

Status of Group Approval

TBD

Level of Group Support

TBD

Barriers to Consensus

TBD

F-7. Enhanced Carbon Sequestration in Harvested Wood Products

Straw Proposal Development Status: In progress

Based on Forestry Catalog Option 2.5

Mitigation Option Description

This policy is focused on recognizing and improving the climate benefits of managing forests for wood production. Washington State is uniquely positioned to take advantage of the climate benefits of durable wood products, because the native Douglas-fir forests have high productivity rates and extremely desirable structural characteristics for long-lived wood products. Washington State can provide abundant sources of raw materials and has the infrastructure to manufacture these materials into products.

Mitigation Option Design

- **Goals:** To increase the production of durable wood products from Washington forests by XX% by 2050.
- **Timing:** See goals above. The demand for wood products should increase as the climate benefits of using a product with low embodied energy (in many cases a negative carbon footprint) is realized. See F-4 for more information on the expanded use of wood product for building materials.
- **Coverage of parties:**
- **Other:** The long-term carbon storage contribution of Washington State's wood product production is roughly 11.8 million metric tons CO2e/yr[5], which offsets more than 10 percent of Washington's greenhouse gas emissions.
- These goals assume no additional barriers to efficient management of timberlands and production capacity.

Implementation Mechanisms:

Full carbon accounting: all forestry assessments should include wood product carbon storage as a mandatory pool along with above and below-ground biomass etc… Without recognizing wood product storage as a carbon pool, an incomplete picture of the carbon cycle is given.

- Incentives for increasing productivity on Washington timberlands. These may include to increasing technical assistance for non-industrial private landowners, including funding for writing forest management plans (perhaps through the American Tree Farm System or Washington State's Forest Stewardship Program).

[5] From draft of state inventory

- Encouraging smart application of silvicultural treatments such as fertilization, thinning, and pruning.
- Incentives for increasing recovery rates at mills. This would result in more carbon storage in long-term wood products with the same input of raw material. The wood products that result from improvements in recovery rates should be considered additional carbon storage.

Related Policies/Programs in Place

TBD

Types(s) of GHG Reductions

TBD

Estimated GHG Savings (in 2020) and Costs per $MtCO_2e$

- **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

TBD

Feasibility Issues

TBD

Status of Group Approval

TBD

Level of Group Support

TBD

Barriers to Consensus

TBD