

Exhibit 13

Green House Gases Analysis



Green House Gases Analysis

Biomass is Carbon Neutral

Sustainable biopower is considered carbon-neutral by major institutions like the Environmental Protection Agency (EPA), Washington State, the U.S. Department of Energy and the United Nations Intergovernmental Panel on Climate Change because the same amount of carbon dioxide emitted during biopower generation is absorbed by new tree growth. The U.S. grows more trees than it harvests. The standing inventory of (volume of growing trees) in U.S. forests has grown 49% between 1953 and 2007. Additionally, biopower recovers the energy potential of forestry byproducts that would otherwise be burned in slash piles or left to decompose in the forest or a landfill.

CO₂ from biomass is part of the short term natural carbon cycle. As long as the forests from which the biomass is harvested are not diminishing in biomass, they will continue to absorb an amount of carbon equal to the carbon that has been harvested. Biomass fuels contain “biogenic” carbon which is part of the natural carbon cycle. The Intergovernmental Panel on Climate Change, an organization established the United Nations, agrees that the combustion of biomass fuels will not increase the level of CO₂ in the atmosphere so long as the biomass is harvested in a sustainable fashion and as long as there is no conversion of land use resulting from the biomass harvest.¹ The CO₂ released in the combustion of biomass was originally absorbed during the plants’ growth cycle, and would have been released back into the atmosphere through natural decay.

The generation of energy from biomass wastes is thus a productive use of this material that does not add new carbon to the atmosphere.

The US DOE has also addressed this issue, concluding that,

“Carbon dioxide emissions from the combustion of biomass fuel, including discarded forest products, should not be included in either direct or indirect emissions and their quantity should not be included in combination with any other emissions category nor appear in totals or net quantities. Carbon dioxide emissions from the non-combustion oxidation of biomass, such as forest floor litter, biomass products, or discarded forest products such as mill shavings, are similarly considered carbon neutral.”²

Washington State law also distinguishes between emissions from biofuel facilities and energy facilities using fossil fuels. Specifically, the Washington State Greenhouse Gas Emissions Performance Standards deems electric generation facilities powered exclusively by renewable resources, including biofuels, to comply with state GHG emissions performance standards (Revised Code of Washington 80.80.040). In addition, the State’s regulations for carbon dioxide mitigation applies only to electric facilities generated by fossil fuels which do not include biofuels (WAC 173-407-010&020).

¹ Intergovernmental Panel on Climate Change. Greenhouse Gas Inventory Reference Manual: Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories, Vol. 3, Pg. 6.28, (Paris France 1997).decomposition.

² Technical Guidelines: Voluntary Reporting of Greenhouse Gases (1605(b)) Program. Office of Policy and International Affairs, US Department of Energy, January 2007.

Green House Gases Analysis

ADAGE Mason County Project

Baseline CO₂ emissions associated with power generation for the project include both direct and indirect sources. The direct sources are the Bubbling Fluidized Bed Boiler, the emergency generator and emergency water pump. The primary fuel for the proposed BFB boiler will be limited to clean woody biomass, with natural gas, propane, or ultra low sulfur distillate (ULSD) fuel to be utilized only for boiler startup and boiler bed stabilization.

The indirect sources of CO₂ are associated with transportation, which consists of truck trips to deliver fuel to the facility and remove ash, employee commuting trips, and other deliveries. The largest contributor is trucks delivering wood fuel to the facility. The biomass fuel for the ADAGE facility will come from sustainable forest management activities within an approximate 50-mile radius of the project site.

ADAGE is committed to sustainable forest management and is working with experienced forest landowners who conduct their harvesting activities in accordance with comprehensive state regulations and independent third-party certification systems aimed at protecting the environment and ensuring the sustainability of supply. These regulations include the Washington Forest Practices Act (RCW Title 76) and implementing rules and regulations (WAC Title 222). Washington's forest practice rules are arguably the most stringent in the U.S., if not the world. In developing this suite of laws and ever-changing regulations, the Washington Legislature expressly acknowledged that forest land resources are among the most valuation of all resources in the state, that a viable forest industry is of prime importance to the state's economy, that it is in the public interest for public and private commercial forest lands to be managed consistent with sound policies of natural resource protection, and that coincident with maintenance of a viable forest industry it is important to afford protection to forest soils, fisheries, wildlife, water quantity and quality, air quality, recreation, and scenic beauty. All forest practice operations and permitted and regulated by the Department of Natural Resources.

The ADAGE Mason project will provide an alternative forest management option for landowners providing revenue for material which otherwise would be managed through open pile burns, left to decompose in the forest or trucked to a landfill. Therefore combustion can actually reduce total emissions of greenhouse gases. In the absence of oxygen, decomposing organic material releases methane, which, according to the Environmental Protection Agency, is over 20 times more effective in trapping heat in the atmosphere than CO₂ over a 100-year period.³ The National Renewable Energy Laboratory (NREL) conducted a study in 2004 looking at the total contribution to global climate change from the combustion of biomass. Emissions of CO₂ and methane from typical disposal methods are avoided and credited to the system.

Even after accounting for GHG emissions associated with the delivery of fuel to the facility, the production of ammonia for use in the SCR, and the construction of the plant, NREL found that biomass power facilities such as ADAGE have net negative greenhouse gas emissions, meaning

³ <http://www.epa.gov/methane/>

Green House Gases Analysis

that their operation reduces the amount of greenhouse gases entering the atmosphere.⁴ According to this same report, the combustion of biomass residues will actually reduce GHG levels in the atmosphere by 410 g/kWh. This translates to a reduction of as much as 213,000 tons per year of CO₂ as a result of the 60 MW ADAGE facility.

While the combustion of biomass at the proposed project will account for stack emissions of nearly 600,000 tons per year of CO₂, the net impact of wood combustion on the concentration of GHGs in the atmosphere will be zero.

The table below summarizes potential emissions from fuel truck and delivery trucks associated with the proposed project.

CO₂ Emissions	Tons/Yr	Tons/MWh
Fuel Trucks	6,881.1	0.0145
Ammonia trucks	515.7	0.0011
Sorbent Truck	187.5	0.0004
Sand Trucks	703.2	0.0015
Total	8,287.5	0.0175

The Plant will require an emergency generator and emergency fire water pump. These pieces of emergency equipment will be fueled with ultra low sulfur distillate fuel oil (diesel) and operate only a limited number of hours (250 hours per year or less) for testing purposes under normal conditions. A portable biomass grinder/chipper that is diesel powered will be operated on an as needed basis. Hours of operation will be limited to 480 hours per year

CO₂ Emissions	Horse Power	Max Hours	Tons/year
Emergency Generator	500	250	71.9
Emergency Fire Pump	250	250	35.9
Portable Biomass Grinder/Chipper	1200	480	334.1
Total		980	441.9

As described above, the combustion of biomass at the proposed facility is considered carbon neutral and will have a net zero impact on CO₂ levels in the atmosphere. All direct and indirect sources will lead to combined CO₂ emissions of 8,729.4 tons annually. Avoided emissions from the open burning of biomass and disposal of biomass residues in landfills or on the forest floor are credited to the project and have a substantial net negative impact on CO₂ levels.

The table below shows the summary of total CO₂ emissions for the proposed facility.

⁴ National Renewable Energy Laboratory, "Biomass Power and Conventional Fossil Systems with and without CO₂ Sequestration – Comparing the Energy Balance, Greenhouse Gas Emissions and Economics" January 2004.
Available online at <http://www.nrel.gov/docs/fy04osti/32575.pdf>

Green House Gases Analysis

CO2 Emissions	Tons/Yr
Bubbling Fluidized Bed Boiler	0.0
Fuel Trucks	6881.1
Delivery trucks	1406.4
Emergency Equipment & Grinder/Chipper	441.9
Credit for avoided biomass disposal emissions	-213000.0
Total	-204270.6

While the above analysis shows that the ADAGE Mason County project will result in a significant net decrease in GHG emissions to the atmosphere, the proponent will continue to seek ways to further reduce the emission of greenhouse gases through additional operating efficiencies within the facility.