



U.S. Department of Energy
1000 Independence Avenue, SW, EE-4A
Washington, D.C. 20585

April 18, 2011

Dear Ms. Summerson,

Please accept the following comments on the Draft Environmental Assessment for the Nippon Paper Industries Biomass Cogeneration project in Port Angeles, Washington. Excepting a couple of observations on criteria pollutant emissions at the facility, we are chiefly commenting on the issue of biogenic carbon emissions and the non-carbon neutrality of biomass as a source of fuel. We have attached some documents that demonstrate the latest science on the carbon impacts of biomass power.

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Project overview

To summarize, The DOE is providing federal funding to the State Energy Program in the State of Washington. Nippon has applied for a \$600,000 grant and a \$1.4 million loan under the SEP to install and operate a biomass-burning boiler at its paper mill in Port Angeles. The new boiler would replace a smaller boiler that is currently fueled oil and biomass. The new boiler would supply steam to the paper mill and operate a 20-MW turbine that would produce electricity that was sold to the grid. The potential use of federal funds to finance this project triggers NEPA.

Background: biomass is not carbon neutral

The environmental assessment (EA) frequently repeats, often verbatim, the statements prepared by the project developer to the effect that burning biomass is *assumed* to be carbon neutral. This assumption is of course false, and it is the purpose of a NEPA EA to critically examine claims made about a project by its proponents, and evaluate their impacts, not uncritically repeat incorrect assertions that occur in other project documents. A critical evaluation by the government is essential in order to avoid damage to the environment and a waste of taxpayer funds. Perhaps DOE is

unfamiliar with current science around biomass and the issue of carbon neutrality. Stated most briefly, current science, carbon modeling and evolving policy reflect the fact that biomass combustion is not carbon neutral, and indeed emits more CO₂ per unit energy than burning fossil fuels.

There are two main arguments generally used to support the now discredited notion of biomass carbon neutrality: the “waste” argument and the “resequestration” argument.

The “waste” argument: “It would have decomposed anyway”

Biomass fuel is often portrayed as being derived from “waste” materials, particularly the tree branches and other material left over after commercial timber harvesting (“forestry residues, slash”), as well as sawdust and chips generated at sawmills (“mill residues”). Because these materials are expected to decay eventually, emitting carbon dioxide in the process, it is argued that burning them to generate energy will emit the same amount of carbon as if they were left to decompose. However, this claim only works if the time element is ignored, and if there is actually enough waste to power the proposed facilities without resorting to cutting living trees that are in fact absorbing carbon dioxide.

Parity between combustion emissions and decomposition emissions is clearly impossible. It takes years and even decades for trees tops and branches to decompose on the forest floor, and during that process, a portion of that decomposing cellulose is incorporated into new soil carbon. In contrast, burning pumps the carbon stored in this wood into the atmosphere instantaneously. Hence the released carbon remains in the atmosphere for many decades following the immediate emissions from burning residues, relative to the slow release of carbon from natural decomposition.

The “resequestration” argument.

The other main argument used to justify the idea that biomass energy is carbon neutral is that re-growing plants recapture, or “resequester” an amount of carbon equivalent to that released to the atmosphere by burning biomass fuels, and therefore net carbon emissions are zero.

When trees are used for fuel, it is obviously not possible for the system to be “carbon neutral” in a timeframe meaningful to addressing climate change. It takes seconds to burn a tree, and many decades to grow it back, and in the meantime, the rate of carbon sequestration in an area of cut forest has been reduced dramatically, which has the same effect as increasing emissions. Over long enough time periods, forests cut for biomass fuel can ultimately regrow and recapture the carbon released by burning, but the inescapable conclusion of doing carbon accounting correctly is that burning biomass instead of fossil fuels always represents an extra burst in carbon emissions over some multi-year or multi-decadal period, and in some cases for more than a century. These conclusions are supported by robust modeling from the US (the Manomet study¹) and Europe (the Joanneum “carbon bomb” study²).

Given this background, the following statement is misleading and should be removed from the Nippon EA, if only because it contains a logical impossibility:

¹ Available at <http://www.manomet.org/node/322>

² Available at http://www.birdlife.org/eu/EU_policy/Biofuels/carbon_bomb.html

The increased use of biomass would not result in increased GHG emissions because biomass is considered a carbon-neutral fuel. (The SEPA EIS describes the carbon-neutral position as being consistent with the guidelines of the EPA Mandatory GHG Reporting Rule and Climate Leaders Program; the Clean Development Mechanism and Joint Implementation programs of the United Nations Framework Convention on Climate Change; The Climate Registry; California Climate Action Registry, Climate Action Reserve; and American Carbon Registry.)

It does not matter how many organizations “believe” something, or happen to have repeated an initial error in analysis, that does not make a statement true. Basic laws of physics dictate that carbon dioxide emissions increase when fossil fuels are replaced with biomass. The statement is additionally in error because in fact, the IPCC does not treat biomass combustion as carbon neutral – it counts the carbon emission under either land-use emissions at the point of wood harvest, or when it is burned. To avoid double-counting of emissions IPCC does not count carbon efflux when the material is burned if it has been counted under land use change.

Greenhouse gas emissions at the Nippon facility will be significant

The EA contains other statements objectionable to those who would expect a NEPA analysis to contain a critical and objective evaluation of developer claims:

The carbon in biomass was removed from the atmosphere by photosynthesis in recent history and is, therefore, part of the natural carbon cycle. Without being used as fuel, the material would decompose on the forest floor or be burned in place and the carbon would be released to the environment. Emissions of methane and nitrous oxide from burning of biomass are, however, included in the calculations. Including methane and nitrous oxide, while excluding carbon dioxide, is consistent with requirements [40 CFR 98.2(b)(2)] established under EPA’s Mandatory GHG Report Rule for determining if a source involving combustion of biomass meets the GHG reporting threshold.

The fact that biomass carbon was “recently” removed from the atmosphere has no bearing on the fact that when wood is burned, it emits CO₂ and increases atmospheric concentrations of CO₂. Burning the equivalent of 200,000 bone-dry tons of biomass per year (the equivalent of about 364,000 green tons) will produce about 367,000 tons of CO₂. Incredibly, this fact does not appear to be mentioned in the EA at all. Additionally, speculating on the alternative fate of the carbon from the biomass is not appropriate or even relevant, since the objective of an emissions analysis is to determine what the immediate emissions are from the facility. In fact, no evidence is presented to support the claim that significant quantities of residues are being burned in fact, and no analysis is presented to show what emissions from decomposition are, but in either case, CO₂ emissions from decomposition are delayed relative to the timeframe of burning these materials in a furnace. Further, it does not do the NEPA process credit to demonstrate such credulity in repeating, practically verbatim, statements whether true or false from the biomass developer.

Emissions will disproportionately impact the States power sector carbon footprint

The error in logic displayed by DOE in accepting Nippon’s flawed reasoning is particularly egregious considering that Bonneville Power Administration’s power supply has a relatively low

carbon footprint, a fact that is noted in the EA. Feeding biomass power into the Bonneville grid will increase stack emissions of CO₂ disproportionately compared to the amount of power supplied by the plant.

Given that about 70% of Washington State's power generation came from hydroelectric sources in 2009,³ there is little justification for assuming that the project will displace fossil fueled power. Yet, the EA presents the following statement as if it is self-evident:

A decrease (or avoidance) of 93,500 tons of carbon dioxide equivalent per year as a result of producing 20 megawatts of electricity for the electric grid from renewable sources that otherwise would have come from burning of fossil fuel.

There does not appear to be any agreement to operate some nearby coal plant less as a result of the Nippon plant feeding power to the grid. How can it be assured that total fossil fueled power generation will decrease?

It is in fact shocking that normal mill operations at the Nippon plant require 50 MW of power. This is a huge amount of power to be consumed by a single facility. Federal funds would be far better spent increasing efficiency and reducing power demand at the mill. This is a definitive example of the false dichotomy of the action and no action alternatives presented in the EA. There are many other alternative courses of action for changing power production and consumption patterns at the Nippon mill.

The EA attempts to put the alleged "decrease" in emissions in perspective with the following statement:

The release of anthropogenic GHGs and their potential contribution to global warming are inherently cumulative phenomena. Under the premise that combustion of biomass is carbon neutral, the proposed project would result in a net decrease in GHG emissions, but the decrease would be relatively small compared with the 8,026 million tons of carbon dioxide equivalent GHGs emitted in the United States in 2007 (EIA 2007) and the 54 billion tons of carbon dioxide equivalent anthropogenic GHGs emitted globally in 2004 (IPCC 2007). However, emissions from the proposed project, in combination with past and future emissions from all other sources, would contribute incrementally to the climate change impacts described above. At present there is no methodology that would allow DOE to estimate the specific impacts (if any) this increment of climate change would produce in the vicinity of the facility or elsewhere.

We have rewritten this to reflect reality and make it appropriate to the situation in Washington State:

The release of anthropogenic GHGs and their contribution to global warming is an inherently cumulative phenomena. Taking into consideration the obvious physical reality that biomass combustion emits greenhouse gases, particularly CO₂, the proposed project would result in a relatively large net increase in GHG emissions from Washington State's power sector. Not including power currently generated from

³ http://www.eia.doe.gov/cneaf/electricity/epa/epa_sprdshts.html

biomass in the state, Energy Information Administration data for 2009 indicate the average CO₂ emissions rate for power generated in Washington is 0.163 tons per MWh. Power generated by burning wood at the Nippon plant would emit 1.58 tons of CO₂ per MWh, or almost ten times the amount of CO₂ per unit energy emitted by the rest of the power sector. While emissions from this particular project, in combination with past and future emissions from all other sources, would contribute only incrementally to greenhouse gas emissions globally, building the project would significantly add to Washington State's power sector carbon footprint, increase the likelihood of forest degradation and increased harvesting, and encourage development of the biomass industry nationally and internationally. In contrast, a rejection of this project in favor of assistance to the Nippon plant to decrease its energy use and greenhouse gas emissions would demonstrate that DOE is serious about allocating federal funding to projects that will decrease emissions in reality, and not on the basis of flimsy and outdated assumptions.

Projections of fuel availability are overly optimistic

The EA appears to accept projections that abundant forest “residues” exist to fuel the Nippon plant, but a review of existing data suggests that this conclusion is highly questionable. Most plants claim they’ll source fuel from a 50 mile radius, but because the Nippon plant is on the water, 50% of its sourcing area is null. Therefore, per acre pressure to source fuel will be doubled in the land-based portion of the sourcing area.

The biomass availability report conducted by the Washington State Department of Ecology and Washington State University⁴ concluded that the counties of Clallam, Grays Harbor, Jefferson, Kitsap, Mason, Thurston generate around 835,000 tons of residues and 37,000 tons of wood from forest thinning annually. Assuming WA DNR does the minimally protective thing and requires 50% of residues to be left to maintain soil fertility, how much of the remainder is truly available to the Nippon plant? If the plant assumes that because of existing uses for residues and issues of access and logistics it will have access to 50% of this remaining amount (consistent with other fuel sourcing studies) this means the plant will annually have access to 218,000 green tons, considerably less than the 364,000 green tons that it needs for fuel.

This estimate does not account for the emerging demand for biomass at other facilities, which the EA mentions only in passing. However, even taking into account the fact that the Shelton plant no longer appears to be going forward, the EA’s statement is astoundingly weak. It states:

However, these projects could possibly be considering the same sources of biomass, so there could be cumulative impacts, as discussed below, to forest areas where the biomass is generated.

“Could possibly be considering”? These projects are obviously competing for the same wood, by definition.

⁴ Frear, C., et al. 2005. Biomass inventory and bioenergy assessment. Washington State Department of Ecology and Washington State University.

The Port Townsend project, being closer to Port Angeles and also being located on the northern coastal area of the Olympic Peninsula, would be more likely to involve impacts cumulative with those of the Nippon proposed project.

Good statement. But where is the additional analysis?

On a regional scale, all of the biomass projects are expected to provide opportunity for additional jobs, particularly during construction activities and also in biomass collection activities. Each of the projects would also represent minor positive impacts on the electricity generating capacity of the region, but even in combination, the 140 megawatts of additional generating capacity would be only about 0.5 percent of the 30,000 megawatts of generating capacity within the state. All of the projects would have the benefit of off-setting energy production that would otherwise come from a power plant using fossil fuel.

This is the extent of the discussion of potential cumulative impacts on forests. And again, where is the evidence that any energy production will be offset by this plant? No such agreement appears to exist. And in any case, as outlined above, the power produced by the Nippon plant will have a greenhouse gas footprint nearly ten times that of Washington's existing power sector.

Trees will be cut to fuel this plant

Given the high likelihood that forestry residues are not sufficient to fuel this plant, it is extremely likely that forest cutting will increase. It is important to note that nothing in the definition of biomass fuel in the EA prohibits the use of whole-tree harvesting for fuel:

BIOMASS FUEL

Material referenced in this document is forest biomass, generally consisting of byproduct from forest management or forest health treatment activities and does not include lumber products, wood treated with preservatives, or municipal solid waste. Typically, forest biomass includes residual branches, needles, and tree tops ("slash") from logging operations; saplings from thinning actions; tree stems and tops from forest health treatment; and unused materials from lumber mills (DNR 2010a). It may also be referred to as hogged or hog fuel as a result of going through a hog chipper or disintegrator to produce a more easily handled, uniform-sized material. Other fuel that would be used in the new boiler consists of sludge from the mill's wastewater treatment plant and ultra-low-sulfur diesel fuel as a secondary fuel; the diesel would be used only during boiler start-ups or wood fuel delivery malfunctions.

Alternatives analysis should include additional options

It is clear that the massive investment required for this plant - \$71 million – is almost wholly so that the plant can sell power to the grid. The EA states that plant capacity will not increase, therefore the majority of construction is associated with building a combustion power plant that will have significant air pollution emissions that will represent large increases over current levels. Given these impacts, and given the stated objective that DOE funds go to supporting increased efficiency and reduced impacts from power generation, the EA should include at least one other alternative, such as replacing the facility's boiler with a new, high-efficiency unit of the same size.

Yet instead, the EA simply offers

2.3.2 NO-ACTION ALTERNATIVE

Under the No-Action Alternative, DOE would not allow the State of Washington to use its SEP funds for this project. DOE assumes for purposes of this EA that the project would not proceed without SEP funding. This assumption allows a comparison between the potential impacts of the project as proposed and the impacts of not proceeding with the project. Without the proposed project, Nippon operations would continue as otherwise planned, but without the proposed cogeneration system. Nippon would continue to use biomass in Boiler 8, but there would be no efficiency increase in the use of that energy source and there would be no co-generation of electricity. Boiler 8 would continue to emit air pollutants that, in most cases, are higher than under the proposed project, and the 20 megawatts of electricity not produced would continue to be produced at some other location using fossil fuel, so there would be no reduction in greenhouse gas emissions. Also, there would be no infusion of construction dollars and jobs into the area.

The EA has endorsed the false dichotomy put forward by the developer, which in the simplest language translates to “either you give us money to build a plant with massive greenhouse gas impacts, and major resource consumption that will increase emissions of air pollutants over current levels, or we will continue polluting like we were before.”

Criteria pollutant emissions will increase significantly over current levels

While this letter has focused on carbon and forest impacts issues associated with the use of biomass as fuel, it is important to emphasize that a very real increase in air pollution emissions will occur if this plant is built, with emissions of CO, NO_x, SO₂ and VOCs all increasing over 2009 emissions.

And because no third party verification of air modeling has been carried out, DOE can be assured that air modeling performed by the developer, showing that atmospheric SO₂ concentrations will be at 99% percent of the health standard, and NO_x emissions will be at 94% of the health standard, are certainly underestimates.

Conclusion: the Nippon project does not meet DOE goals for SEP funds

DOE states in the EA that Departmental oversight should ensure that goals for the SEP program are met:

1.3.1 DOE'S PURPOSE AND NEED

DOE's purpose and need is to ensure that Federal SEP funds are used for activities that meet congressional statutory aims to improve energy efficiency, reduce dependence on imported oil, decrease energy consumption, create and retain jobs, and promote renewable energy. Providing funding as part of Washington's SEP grant to Nippon would partially satisfy the need of this program to assist U.S. cities, counties, states, territories, and American Indian tribes to develop, promote, implement, and manage energy efficiency and conservation projects and programs designed to:

- *Reduce fossil fuel emissions;*
- *Reduce the total energy use of the eligible entities;*
- *Improve energy efficiency in the transportation, building, and other appropriate sectors; and*
- *Create and retain jobs.*

Congress enacted ARRA to create jobs and restore economic growth through measures that, among other things, modernize the nation's infrastructure and improve energy efficiency. Provision of SEP funds for the proposed project would partially meet these goals.

In fact, this project will do the opposite. Facility carbon emissions will increase dramatically if this project is built; there is no evidence that total energy use at the mill will decrease; there is no evidence that efficiency will significantly increase, and in fact given the extremely low efficiency of electricity generation using biomass as fuel, the overall efficiency of power fed to the grid will decrease because of this plant. The large increase in the number of trucks hauling very wet, low-energy-density wood to the plant every day for the next 20 to 30 years is likewise wasteful of fossil fuels. Finally, construction of the facility may create jobs, but they are not permanent jobs, and no analysis has been presented to show that new forestry jobs will be created to provision this plant with fuel.

The merits of this project exist only as assertions on paper and depend on incorrect outdated assumptions about biomass carbon neutrality that collapse in the face of physical reality. DOE should deny SEP funding to the Nippon facility.

Thank you for the opportunity to comment,

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