Jan. 22, 2013

Via electronic submission to
GPT/BNSF Custer Spur EIS Co-Lead Agencies
c/o CH2M HILL
1100 112th Avenue NE, Suite 400
Bellevue, WA 98004

Re: EIS scoping comments on the Gateway Pacific Terminal

Dear sirs:

Thank you for the opportunity to provide comments on the EIS scoping for the proposed Gateway Pacific Terminal. I am a concerned citizen living in White Salmon, Washington. I am a retired CEO, with an engineering and business background.

My comments are focused on international, national and regional issues which may not be covered by other commenters. My top concern is climate change data which has clarified that we are headed for irreversible climate impacts that will destroy civilization as we know it. That is not an exaggeration. The World Bank, that radical environmental organization, recently urged that we simply must redirect the course we're on. Nature doesn't negotiate. Yet in Washington, nothing is happening. If civilizational suicide isn't a significant adverse impact, I don't know what to think of this EIS process. Climate catastrophe is the topic of Section 1 below.

The economics of the coal business are grossly distorted, in that the US massively subsidizes coal in several ways, somewhere from three to ten times the market value of the coal. The coal business couldn't exist if you and I and our children weren't footing the bills. The economics of coal export are even more bizarre—by exporting coal the US would give away the energy benefits while also paying for about half of the subsidies. Section 2 below summarizes how the US loses money on coal, whether burned in the US or overseas. I also emphasize multiple practical and superior alternatives to burning coal.

In Section 3 I note how few jobs will be created with this project or other coal export projects, and how many more jobs will be lost if the Columbia Gorge is reduced to a coal chute.

Obviously the scope of the EIS must also include factors like air and water pollution impacts from thousands of coal trains losing 1% of their coal (540,000 tons spilled per year) throughout the Columbia River drainage.

1. Climate Catastrophe

1.1 Summary

- The proposed Gateway Pacific Terminal (GPT) would contribute significantly to global climate change.
- Beyond about 2°C of global temperature rise there are increased risks of irreversible environmental impacts, such as release of methane in Arctic permafrost or melting of the Greenland ice sheet. The

scientific community is worried that the 2°C target now looks too high to be safe, and is no longer feasible anyway.

- Due to the greenhouse gas (GhG) concentrations that are already in the atmosphere, global temperatures will increase beyond the 2°C danger point. Additionally, global GhG emissions are increasing every year. Thus I refer to the current reality of climate change as *climate catastrophe*.
- The World Bank states that "The projected 4°C warming simply must not be allowed to occur..." and "…there is also no certainty that adaptation to a 4°C world is possible."
- Nature does not negotiate. We don't know exactly how much GhG can be added to the atmosphere before irreversible changes will be triggered; in any case, nature's response isn't a matter of human policies or negotiations.
- Coal is our dirtiest source of energy, creating the most GhG per kilowatt-hour (kWh) generated, in addition to many other pollutants. The obvious alternative is to leave the carbon from coal sequestered in the ground.
- Leaving the coal in the ground is a superior alternative environmentally and economically. The nation and the world must and will accelerate new infrastructure construction to waste far less energy and to deploy more renewable energy sources; this will create far more jobs than the business-as-usual destruction of our life support systems, it will democratize energy sources, and it will enable expansion of energy supplies way beyond the obvious limits of fossil fuel extraction.
- Because of the recent scientific evidence of the increasing rate of climate change, the scope of this EIS must expand to include a re-examination of the EISs enabling BLM coal leases in the Powder River Basin (PRB).

"On planned policies, rising fossil energy use will lead to irreversible and potentially catastrophic climate change."-- International Energy Agency (IEA)

1.2 Adverse Climate Impacts of Coal

1.2.1 Introduction

In addition to the relatively minor direct greenhouse gas (GhG) emissions during the construction and operational phase of this project, the inescapable indirect impact of any coal project (including the related mining leases) is the burning of the coal somewhere in the world. It is well known that GhG emissions, as well as other pollutants, disperse in the atmosphere globally so it doesn't matter where they are burned. It is also widely accepted that practical carbon capture and sequestration (so-called "clean coal") technology for coal electricity plants is unlikely to be ready for deployment for at least a decade.

The GhG emissions indirectly enabled by this project would be part of global GhG emissions that now threaten the livability of our planet. The cumulative impact of all GhG emissions (predominantly from fossil fuel combustion) is potentially devastating and dwarfs all other human impacts on the planet short of a nuclear war.

1.2.2 Adverse climate impacts as understood in 2007

The adverse impacts of anthropogenic GhG emissions have been predicted for decades and the foreseen impacts are generally occurring, often earlier than originally anticipated. The most recent

comprehensive scientific assessment of the Intergovernmental Panel on Climate Change (IPCC) in 2007 noted, among other findings, that:

- "Global atmospheric concentrations of carbon dioxide (CO2), methane (CH4), and nitrous oxide (N2O) have increased markedly as a result of human activities since 1750 and now far exceed pre-industrial values determined from ice cores spanning many thousands of years."
- "Most of the observed increase in globally-averaged temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic greenhouse gas concentrations. It is likely there has been significant anthropogenic warming over the past 50 years averaged over each continent (except Antarctica)."
- "There is high agreement and much evidence that with current climate change mitigation policies and related sustainable development practices, global greenhouse gas emission will continue to grow over the next few decades."
- "Continued greenhouse gas emissions at or above current rates would cause further warming and induce many changes in the global climate system during the 21st century that would be very likely to be larger than those observed during the 20th century."
- "There is high confidence that by mid-century, annual river runoff and water availability are projected to increase at high latitudes and in some tropical wet areas and decrease in some dry regions in the mid-latitudes and tropics. There is also high confidence that many semi-arid areas (e.g., Mediterranean Basin, western United States, southern Africa and northeast Brazil) will suffer a decrease in water resources due to climate change."
- "Anthropogenic warming and sea level rise would continue for centuries due to the time scales associated with climate processes and feedbacks, even if greenhouse gas concentrations were to be stabilized."
- "Anthropogenic warming and sea level rise could lead to some impacts that are abrupt or irreversible, depending upon the rate and magnitude of the climate change."
- "There is high agreement and much evidence that all stabilization levels assessed can be achieved by deployment of a portfolio of technologies that are either currently available or expected to be commercialized in coming decades, assuming appropriate and effective incentives are in place for their development, acquisition, deployment and diffusion and addressing related barriers."

The above list of quotes was copied from a PRB coal lease EIS.

So the 2007 IPCC assessment said climate change could become significant, but we can handle it if we do the right things. In 2007 scientists didn't extrapolate to or study a 4°C world because they didn't think governments would be so shortsighted as to go there. Americans continued their party until it melted down in 2008; then we were struggling to keep our jobs and keep up with American Idol and the latest football. Meanwhile fossil fuel interests invested in casting doubt upon climate science, using the same tactics that the tobacco lobby used to cast doubt upon cigarette research and thereby shorten the lives of thousands of people.

Instead of deploying the mitigating changes scientists recommended in 2007, we have ignored the warnings and accelerated GhG emissions.

1.3 Unprecedented Significance: Hell on Earth

Since 2007 climate science publications have reported actual global temperature increases, intensity of extreme weather events, and ice sheet volume decreases in excess of model predictions from the 2007 timeframe. At the COP 15 climate conference in 2009, 200 nations set a 2 degree Celsius target as the

limit of average temperature rise to avert the worst possible consequences of global warming, but even the 2 degree limit may be a recipe for disaster. As we rapidly approach and are on track to exceed that limit, the need for GhG emission reductions has become increasingly urgent. http://theenergycollective.com/globalwarmingisreal/153056/climate-change-risk-looms-2-degree-limit-now-unlikely

In November 2012 The World Bank published a report titled *Turn Down the Heat—Why a 4°C Warmer World Must be Avoided.* From the Foreword and Executive Summary:

"This report spells out what the world would be like if it warmed by 4 degrees Celsius, which is what scientists are nearly unanimously predicting by the end of the century, without serious policy changes.

"The 4°C scenarios are devastating: the inundation of coastal cities; increasing risks for food production potentially leading to higher malnutrition rates; many dry regions becoming dryer, wet regions wetter; unprecedented heat waves in many regions, especially in the tropics; substantially exacerbated water scarcity in many regions; increased frequency of high-intensity tropical cyclones; and irreversible loss of biodiversity, including coral reef systems."

"…given that uncertainty remains about the full nature and scale of impacts, there is also no certainty that adaptation to a 4°C world is possible. [emphasis added] A 4°C world is likely to be one in which communities, cities and countries would experience severe disruptions, damage, and dislocation, with many of these risks spread unequally. It is likely that the poor will suffer most and the global community could become more fractured, and unequal than today. The projected 4°C warming simply must not be allowed to occur—the heat must be turned down. Only early, cooperative, international actions can make that happen."

In *The role of interactions in a world implementing adaptation and mitigation solutions to climate change,* Rachel Warren makes a crucial point that is all too neglected in most discussions of adaptation — it is the interaction of impacts that is likely to overwhelm, particularly when you consider the very real risk of eco-system collapse over large parts of the Earth:

"… a 4°C world would be facing enormous adaptation challenges in the agricultural sector, with large areas of cropland becoming unsuitable for cultivation, and declining agricultural yields. This world would also rapidly be losing its ecosystem services, owing to large losses in biodiversity, forests, coastal wetlands, mangroves and saltmarshes, and terrestrial carbon stores, supported by an acidified and potentially dysfunctional marine ecosystem. Drought and desertification would be widespread, with large numbers of people experiencing increased water stress, and others experiencing changes in seasonality of water supply. There would be a need to shift agricultural cropping to new areas, impinging on unmanaged ecosystems and decreasing their resilience; and large-scale adaptation to sea-level rise would be necessary. Human and natural systems would be subject to increasing levels of agricultural pests and diseases, and increases in the frequency and intensity of extreme weather events.

"In such a 4°C world, the limits for human adaptation are likely to be exceeded in many parts of the world, while the limits for adaptation for natural systems would largely be exceeded throughout the world. Hence, the ecosystem services upon which human livelihoods depend would not be preserved. Even though some studies have suggested that adaptation in some areas might still be feasible for human systems, such assessments have generally not taken into account lost ecosystem services." http://rsta.royalsocietypublishing.org/content/369/1934/217.full#T3

Nature does not negotiate. Anyone with an appreciation of science understands that no one breaks the laws of physics. We don't know exactly how much GhG can be added to the atmosphere before irreversible changes will be triggered—that may be 2°C or 4°C or even 1.5°C. So the precautionary principle would be prudent for a risk of such existential magnitude. In any case, nature's response isn't a matter of human policies or negotiations—we can't just ignore physics like we ignore wide portions of the electorate.

If seriously impairing the survivability of civilization on earth is not a significant adverse impact, please let the world know what is.

1.4 Alternatives

1.4.1 No action: Coal is best left in the ground

Coal is our dirtiest source of energy, creating the most GhG per kilowatt-hour (kWh) generated, in addition to many other pollutants. The obvious alternative is to leave the carbon from coal sequestered in the ground.

In March 2012 the Carbon Tracker Initiative released a report titled *Unburnable Carbon—Are the World's Financial Markets Carrying a Carbon Bubble?,* http://www.carbontracker.org/wp-content/uploads/downloads/2012/08/Unburnable-Carbon-Full1.pdf which surveys the global fossil fuel proven reserves. Combustion of those reserves would release 2795 $GtCO_2$ into the atmosphere, whereas the maximum emissions allowable to maintain the 2°C limit is 565 $GtCO_2$. This is the magnitude of the fossil fuel reserves that must be left in the ground. 65% of the 2795 $GtCO_2$ from proven reserves is from coal. Since coal generates almost twice as much CO_2 as natural gas per kWh, reducing the use of coal must be a top global priority. And even if we stopped burning any coal, we could not burn all of the proven reserves of oil and gas.

It is important to note that the existing excess concentrations of GhGs in the atmosphere will continue to increase average global temperatures for centuries, even if GhG emissions were stopped today. Because the world is continuing to increase GhG emissions, the need for action has become increasingly urgent. To have a chance at stabilizing global temperatures GhG emissions must peak and begin declining within 5 to 10 years.

1.4.2 Recent data imply re-examination of the PRB coal lease EISs

In light of the recent data confirming that current global policies will result in a 4°C warmer planet, we must re-examine the wisdom of the PRB mining permits. If the scientific and economic data gathered since 2007 were applied to BLM coal lease EISs in the PRB, the same conclusion would result: a top global priority must be the reduction of coal burning.

1.4.3 Coal can be phased out and the coal workers retrained

Leaving the coal in the ground is a superior alternative environmentally (and economically--see below). The nation and the world must and will accelerate new infrastructure construction to waste far less energy and to deploy more renewable energy sources. This will

- Create far more jobs than the business-as-usual destruction of our life support systems: Industries building out renewable-power, power transmission, and efficient building infrastructure will employ far more people than the coal industry, and the buildout will continue for decades. The proper attention to energy efficiency would obviate the need for any expansion in power generation, even in rapidly developing countries.
- Democratize energy sources: No longer will a few huge international companies or national energy companies control our energy supplies. The Departments of State and Defense agree that climate catastrophe would create tens to hundreds of millions of hungry and desperate climate refugees. The costs of international peacekeeping would skyrocket, and the US would likely continue to play a leading role in sorting out the messes. But renewable energy sources exist anywhere the sun shines or the wind blows, thus mitigating the world's ability to absorb and feed climate refugees.
- Enable expansion of energy supplies way beyond the obvious limits of fossil fuel extraction: Less than 1/5000th of the sun's energy incident upon the earth would power our civilization. This compares to increasing costs of oil due to conventional oil supplies peaking around 2008, the limited usefulness of coal reserves, and limited supplies and significant pollution problems of natural gas hydraulic fracturing. Prudent global governance would rapidly facilitate the rapid buildout of renewable energy sources, to enable more attention and resources applied to pollution reductions and to improving water, soil, and ocean resources.

1.4.4 Mitigation through biochar burial is not enough

There have been various geo-engineering proposals to decrease solar insolation, or to sequester more carbon, or other schemes to combat climate change by means other than reduction of GhG emissions. In general these entail new geophysical processes, the complete effects of which would not be known and mostly cannot be known unless they are globally deployed. The risks of such deployments are thus high and the stakes are existential.

Biochar is a possible exception. Biochar is any biomass that has been subjected to pyrolysis, which is the process of heating without oxygen. The only geo-engineering silver bullet being seriously discussed is the use of biochar to sequester more carbon in soils. The risks of scaling up a biochar deployment are thought to be manageable, since large biochar burials have been discovered in Brazil that date to be thousands of years old. "There is one way we could save ourselves [from global warming] and that is through the massive burial of charcoal." –*James Lovelock* New Scientist *24 Jan 2009*

Whether or not biochar burial turns out to be practical or scalable, the carbon inventory numbers imply that it will also be necessary to dramatically reduce GhG emissions. *At this point any expected deployment of a biochar strategy or any other geo-engineering proposal does not enable or justify any less urgency to reduce GhG emissions.*

More information is available in *Biochar for Environmental Management*, edited by Johannes Lehmann and Stephen Joseph.

2. Ongoing Economic Losses

2.1 Summary

- Coal business in the US enjoys freedoms from huge external costs that are borne by other people. The only reason coal can be used today is that others pay for their climate and health damage and coal companies do not.
- Estimates of the climate change costs from US coal production and usage range from 0.4 to 4 times the market value of the coal.
- Estimates of the costs of health degradation from air pollution resulting from coal combustion in the US or in other countries range from 1.5 to 6 times the US market value of the coal.
- If coal companies were forced to pay for the external costs of their coal, they could not sustainably afford to pay even a small fraction of their damage. A coal tax large enough to compensate for even the lowest damage estimates would triple the price of coal, making it uneconomical. The inescapable economic conclusion is that the coal is best left in the ground.
- Coal can be phased out and the coal workers retrained. In the US coal-fired power plants are already being replaced by plants powered by natural gas, because the fuel cost is lower, the greenhouse gas (GhG) and toxic emissions are much lower, and gas plants are much more effective for rapidly varying loads on the electric grid.
- In the case of exporting coal, most of the health degradation costs of combusting coal would be borne by the importing country, but the climate change and mining costs to the US still far outweigh the market value of the coal, while the US gets no benefit of the power generated by the coal. If the benefit of energy from coal is so strategic or important to the US that we effectively subsidize it by six times its market value, why would we give that benefit plus half that subsidy to another country by exporting it?
- Because of the overwhelming costs which the US and the world pays for climate change due to burning coal, the scope of this EIS must expand to include a re-examination of the EISs enabling BLM coal leases in the Powder River Basin (PRB).

"If you find yourself in a hole, stop digging." –Denis Healey

2.2 Adverse Economic Impacts of Coal

2.2.1 Introduction: External costs

To compare the costs of climate change vs. various mitigation scenarios, the economic costs of climate change have also been estimated over the past decade, and like climate predictions are becoming actual instead of predicted costs.

In economics an external cost, or externality, is a negative effect of an economic activity on a third party. When coal is mined and used to generate power, some of the major external costs are the impacts of air and water pollution, land disturbance, toxic coal waste, long-term damage to ecosystems and human health, and government subsidies. This section will summarize estimates of external costs from GhG emissions causing climate change and from air pollution degrading human health, because these are the overwhelming societal costs of coal.

2.2.2 The climate costs of burning coal far exceed the market value of coal

Temperature distributions: As global average temperatures have increased, temperature distributions have shifted with those averages and the distribution has spread out (Figure 1). While a few degrees of average warming sounds harmless, it is the extreme weather events that are costly. As seen in figure 1, extreme summer temperatures at least three standard deviations above the pre-industrial average previously occurred only one day a year, occurred about 16 days per year in the 1990s, and occur even more frequently now. Since storms are generally intensified by higher temperatures, statistically rare storms are becoming more common. And since the GhGs extant in the atmosphere will continue to warm the planet for centuries, storms, droughts, and other extreme weather events will continue to intensify for the foreseeable future.

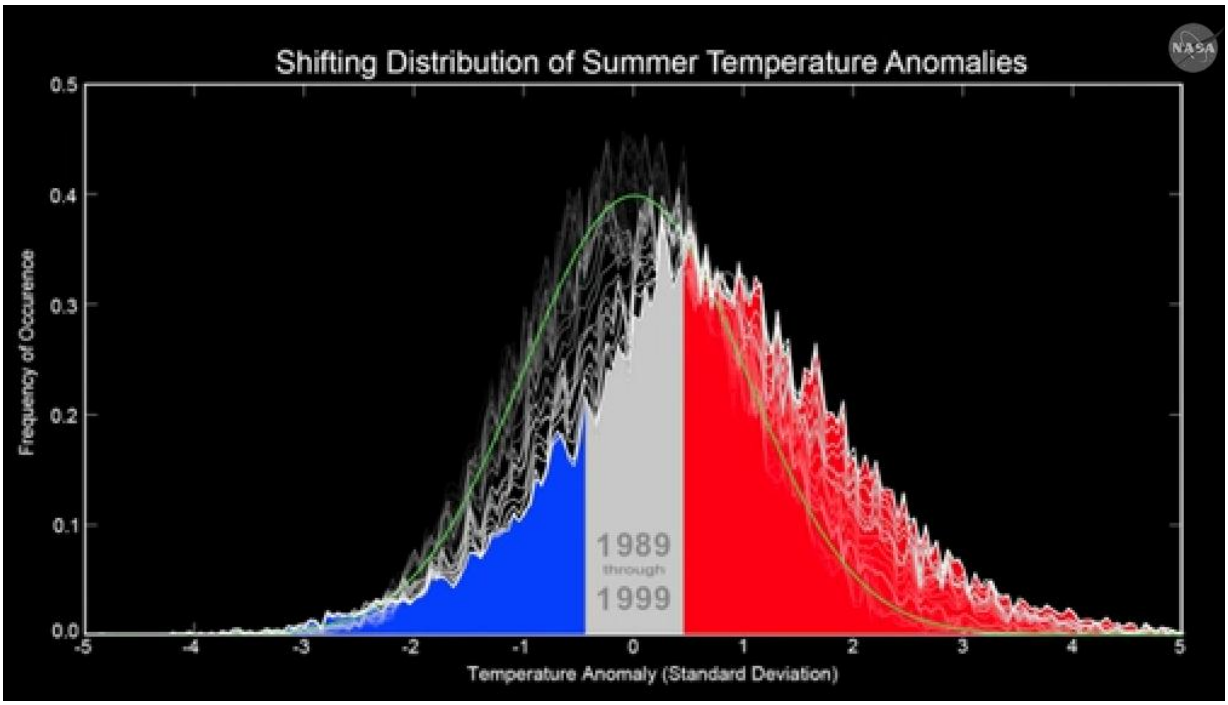

Figure 1. One frame in an animation that demonstrates the growing frequency of extreme summer temperatures in the Northern Hemisphere, compared to the 1951 to 1980 base period. The mean temperature for the base period is centered at the top of the green curve, while hotter than normal temperatures (red) are plotted to the right and colder than normal (blue) to the left. The red and blue curve shows data from 1989 through 1999, in which the curve shifts noticeably to the right, showing how hotter summers are the new normal. Credit: NASA/Goddard Space Flight Center Scientific Visualization Studio http://www.nasa.gov/topics/earth/features/warming-links.html

Costs of extreme weather events in the US: The US is already enduring major, near-term costs of climate change due to recent extreme-weather events. In 2012, the costs from the drought in the US Midwest (estimated $77B) and Hurricane Sandy ($72B request from New York and New Jersey) will likely top $150B, or about 1% of US GDP. http://thinkprogress.org/climate/2012/11/27/1244021/cost-of-superstorm-sandy-and-other-2012-extreme-weather-events-on-the-rise/

Figure 2 shows how the increasing and widening temperature distributions have mapped into costs of extreme weather events in the US since 1980, the first year that storm costs greater than $1B impact

have been logged by NOAA. Note that average costs are increasing, as predicted by the temperature distributions of figure 1. In the decade before 2012, the costs total nearly half a trillion USD.

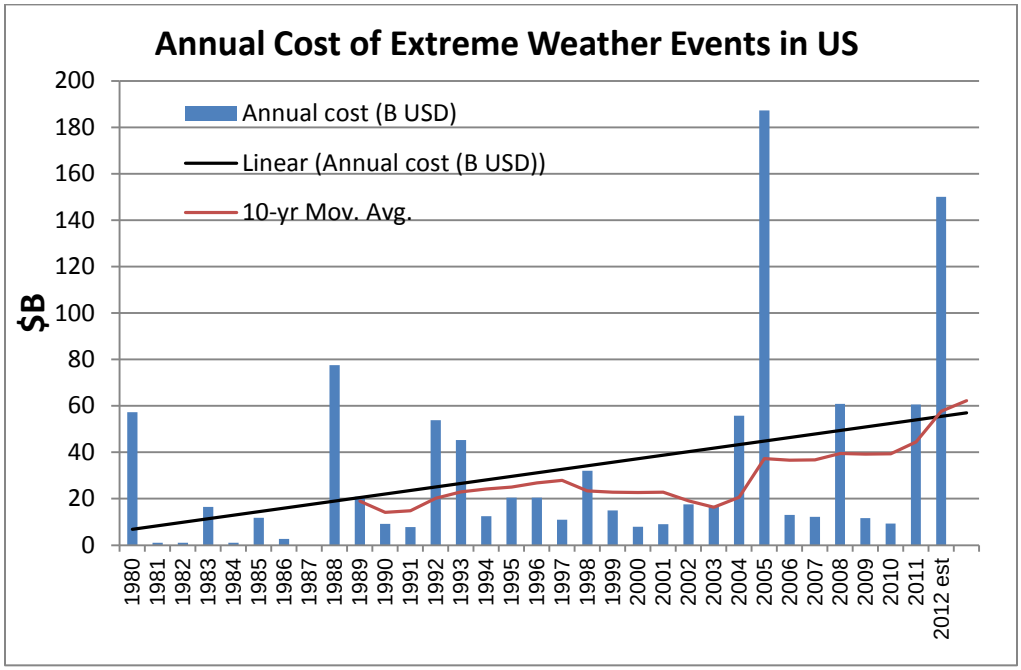

Figure 2. Annual costs of extreme weather events in the US, from http://www.ncdc.noaa.gov/billions/events. Both the linear fit to the annual totals and a 10-year moving average indicate about $60B annual costs today, growing roughly $20B per decade. (Given the statistics of extreme weather events, the rate of increase is likely to increase to more than $20B per decade in the near future.)

One of the obvious conclusions from figure 2 is that the federal government might as well create an Extreme Weather Trust Fund to pay for such disasters, since we know that they will statistically occur. The annual additions to the fund need to be about $60B now, increasing by about $2B per year. But that understates the future damages that will be caused by today's emissions.

Future costs: The bad news is that the climate costs in figure 2 are from GhGs emitted over the last 50 years all over the world, and those emissions will continue to warm the planet for centuries even if we stopped all emissions tomorrow. So the external costs have only begun. This is somewhat analogous to binge drinking, but on a much longer timescale. Instead of minutes to down vodka and hours for the intoxication effect to dissipate, GhGs emitted this year will overstimulate the greenhouse effect for 50-200 years. http://epa.gov/climatechange/ghgemissions/gases/co2.html

GhGs emitted this year will add to the pool of excess GhG concentrations in the atmosphere and cause a rate of warming that will continue for 50-200 years (just as a shot of vodka will increase your intoxication as your body initially reacts). A low-side extrapolation of the costs of extreme weather events in figure 1 would linearly extrapolate for 100 years, to ~$260B per year by 2112. To quantify the contribution from coal, the pool of excess GhG concentrations since 1900 is 321 GtCO2 http://www.carbontracker.org/wp-content/uploads/downloads/2012/08/Unburnable-Carbon-Full1.pdf. If the predictable annual US costs of the 321 GtCO2 pool thus average ~$160B over the first 100 years of those emissions (averaged from $60B to $260B), the total effect of the pool is ~$16T of US costs over

100 years of greenhouse effect. Thus the 2 GtCO2 of emissions from annual US coal combustion in 2012 contributed about 0.6% to the 321 GtCO2 in the pool and will cause damages ~0.6% of $16T, or ~$100B. The US coal burned in 2012 will cause ~$100B of climate damage in the US alone, yet its total market value was less than $50B.

Such a crude, back-of-the-envelope illustration lacks scientific credibility, but it compares well with serious analyses, illustrates the basics, and may explain some issues at the level of vodka drinkers. Note that this simple argument underestimates the effects and costs of any future GhG emissions, effectively assuming all GhG emissions will stop tomorrow. I also do not assume a discount factor for the cost of capital, because physics is much more predictable than interest rates.

DARA study: According to the Sept. 2012 report *Climate Vulnerability Monitor: A Guide to the Cold Calculus of a Hot Planet*, climate change is currently costing the world more than $1.2T annually, or 1.6% of global GDP. http://daraint.org/climate-vulnerability-monitor/climate-vulnerability-monitor-2012/report/ By 2030, the cost of climate change and air pollution combined will increase to 3.2% of global GDP with current policies. The least-developed nations are predicted to be affected much more than the average, but the 2030 effect on the US is estimated at 2% of GDP (~$400B), mostly from floods, droughts, and more severe storms. So the DARA study considers all GhG and air pollution costs, and calculates much higher costs than would be extrapolated from figure 2. The $400B compares to $336B of climate and health costs in Table 1 below, but also includes climate effects of fossil fuels besides coal.

2.2.3 The health costs of mining and burning coal far exceed the market value of coal

Health-related costs of pollution from burning coal include

- Reduction in life expectancy, due to particulates, sulfur dioxide, ozone, heavy metals, benzene, radionuclides, etc.
- Respiratory hospital admissions, due to particulates, ozone, sulfur dioxide
- Congestive heart failure, due to particulates and carbon monoxide
- Non-fatal cancer, osteroporosia, ataxia, or renal dysfunction, due to benzene, radionuclines, heavy metal, etc.
- Chronic bronchitis, asthma attacks, etc., due to particulates, ozone
- Mental retardation and cardiovascular disease, due to mercury

In 2009 the National Research Council released a report on the “external costs of coal" caused by various energy sources over their entire life cycle, from extraction to production to use and emissions, effects not factored into the market cost of the fuels. The report *Hidden Costs of Energy: Unpriced Consequences of Energy Production and Use* was released in October 2009. Requested by Congress, the report was sponsored by the U.S. Department of the Treasury, National Academy of Sciences, National Academy of Engineering, Institute of Medicine, and National Research Council make up the National Academies. Putting together a diverse committee of experts including scientists, economists, and geologists, the committee stated that “The aggregate damages associated with emissions of SO2, NOx, and PM from [95% of the US] coal-fired facilities in 2005 were approximately $62 billion” The estimate was derived from monetizing the damage of major air pollutants -- sulfur dioxide, nitrogen oxides, and particulate matter – on human health, grain crops and timber yields, buildings, and recreation. The figure does not include damages from climate change, harm to ecosystems, effects of some air pollutants such as mercury, and risks to national security, which the report examines but does not monetize.

A 2010 report from the Clean Air Task Force found that for the US "…fine particle pollution from existing coal plants is expected to cause nearly 13,200 deaths in 2010. Additional impacts include an estimated 9,700 hospitalizations and more than 20,000 heart attacks per year. The total monetized value of these adverse health impacts adds up to more than $100 billion per year."
http://www.catf.us/resources/publications/files/The_Toll_from_Coal.pdf

So these two partial analyses found external health-degradation costs of $62B and over $100B per year in the US.

2.3 Significance: Coal is a financial disaster

Perhaps the most complete compilation of coal's external costs to date is a Feb. 2011 paper in the Annals of the New York Academy of Sciences entitled *Full cost accounting for the life cycle of coal*. For each of various categories of external costs, a low, a best, and a high estimate was monetized. Of course various assumptions were made and other analyses cited.

External Costs ($M)	**Coal mined and burned in the US**			**Coal mined in US and burned in Asia**		
Category	**Low**	**Best**	**High**	**Low**	**Best**	**High**
Land disturbance	$54	$163	$3,349	$54	$163	$3,349
Methane emissions from mines	$684	$2,052	$6,841	$684	$2,052	$6,841
Climate damages from combustion emissions of CO2 and N2O	$20,560	$61,679	$205,597	$20,560	$61,679	$205,597
Climate damages from combustion emissions of black carbon	$12	$45	$161	$12	$45	$161
Climate total	**$21,310**	**$63,939**	**$215,948**	**$21,310**	**$63,939**	**$215,948**
Public health burden of mining communities	$74,613	$74,613	$74,613	$74,613	$74,613	$74,613
Fatalities in the public due to coal transport	$1,808	$1,808	$1,808	$1,808	$1,808	$1,808
Emissions of air pollutants from combustion	$65,095	$187,473	$187,473	$0	$0	$0
Lost productivity, excess mental retardation and cardiovascular disease from Hg emissions	$415	$5,523	$29,313	$4	$55	$293
Health total	**$141,931**	**$269,417**	**$293,207**	**$76,425**	**$76,476**	**$76,714**
Government subsidies	**$3,178**	**$3,178**	**$5,374**	**$3,178**	**$3,178**	**$5,374**
Total	**$166,419**	**$336,534**	**$514,529**	**$100,913**	**$143,593**	**$298,036**

Table 1. Estimated annual external costs for the life cycle of coal in 2008 USD (millions). The case of coal mined and combusted in the US is from the paper *Full cost accounting for the life cycle of coal.* The last three columns show an estimate of costs had all of the coal been mined in the US but burned in Asia; in

that case the costs of combustion pollutants is assumed to be borne by the importing country, except 1% of the mercury is assumed to be deposited back onto the US landmass.

The main climate damage estimates listed in Table 1 are based on carbon costs of $10, $30, and $100 per ton. The previous discussion which extrapolated the costs of past weather event resulted in ~$100B per year costs of burning US coal, which correlates to about $47 per ton.

In 2008 1,171,800,000 short tons of coal was mined in the US at an average delivered price of $41.32 per short ton for electric utilities, so US coal was about a $50B total market value. Thus the best estimated total external cost of the coal ($336B in Table 1) was more than six times its market value. If these costs were included in the market price of coal-generated electricity, the electricity price would double or triple and be higher than wind, solar, or geothermal sources. Even if some of these costs are grossly overestimated, it is highly unlikely that they are all grossly overestimated; thus it is virtually certain that the damages produced by using a ton of coal are higher than its market value. The point is that both back-of-the-envelope arguments and scholarly studies triangulate to similar estimates of external costs.

Even this compilation does not monetize many other significant costs of mining and combusting coal. The authors state, "Still these figures do not represent the full societal and environmental burden of coal. In quantifying the damages, we have omitted the impacts of toxic chemicals and heavy metals on ecological systems and diverse plants and animals; some ill-health endpoints (morbidity) aside from mortality related to air pollutants released through coal combustion that are still not captured; the direct risks and hazards posed by sludge, slurry, and coal combustion waste impoundments; the full contributions of nitrogen deposition to eutrophication of fresh and coastal sea water; the prolonged impacts of acid rain and acid mine drainage; many of the long-term impacts on the physical and mental health of those living in coal-field regions and nearby mountaintop removal sites; some of the health impacts and climate forcing due to increased tropospheric ozone formation; and the full assessment of impacts due to an increasingly unstable climate. The true ecological and health costs of coal are thus far greater than the numbers suggest."

Distorted economics: That such massive third-party costs are tolerated is simply insane. And the magnitudes are huge—underestimated at 2% of GDP! This distortion of coal economics keeps us from properly investing in cleaner energy sources, better energy conservation, or better energy transmission infrastructure. If a new type of energy source was proposed that required external costs six times its market cost, it would immediately be laughed out of the market. The external costs of coal and other fossil fuels are analogous to substance abuse, in that the costs of damages are far higher than the market price. The costs of addiction, drunken driving, incarceration, legal proceedings, and lost productivities exceed the substance costs by far.

2.4 Alternatives: The more coal we use, the more money we lose.

2.4.1 No action: not exporting coal would save us money

The operating income from a product line is the maximum a company could sustainably pay for the damage its product causes. In the case of coal companies, the damage clearly exceeds the revenue of the product, so even the reduction of all mining, transportation, exploration, and overhead costs to zero could not possibly fund a sufficient damage mitigation penalty or tax. Thus the unprecedented adverse impacts from burning coal—regardless of how efficiently it is mined or transported—cannot be

mitigated by the coal industry. You and I and our children will be paying for them for decades. This demonstrates what coal opponents have been saying--the coal is best left in the ground. This is true no matter where it is proposed to be burned or how it is proposed to be transported.

The economics of export coal is even more bizarre. The Gateway Pacific Terminal project now proposes to export 54 million tons of coal to Asia annually. Per Table 1, if all of the US coal were shipped to Asia, the best estimated total external cost of the coal ($143B in Table 1) would be about three times its market value. In that case the importing country would bear almost all the external costs of combustion, while the US would bear the external costs of mining and transporting it, deplete its coal resources, and get no energy benefits of that coal. If the benefit of energy from coal is so strategic or important to the US that we effectively subsidize it by six times its market value, why would we give that benefit plus half that subsidy to another country by exporting it? Only coal economics could justify such logic.

2.4.2 We could really save money by re-examining the PRB coal lease EISs

In light of multiple, recent studies concluding that the external costs of US coal greatly exceed the market value of the coal, we must re-examine the wisdom of the PRB mining permits. If the scientific and economic data gathered since 2007 were applied to BLM coal lease EISs in the PRB, the same conclusion would result: the best possible economic result is zero damage, which is achieved only by leaving the coal in the ground. The only reason coal can be burned today is that the world pays for the climate damage and health damage, while coal companies and coal users do not.

2.4.3 Coal can be phased out and replaced by other power sources

Just a year ago, coal companies were bullish about the long-term market for coal and emphasizing the importance of coal in our energy future. But since then natural gas plants have begun displacing coal-fired plants because the fuel is cheaper, the gas plants produce about half the GhG emissions and significantly fewer other air pollutants, and they can be started and stopped much more rapidly than coal plants, an important new requirement to balance grid demand with increasing solar and wind generation. http://www.huffingtonpost.com/2012/06/12/us-coal-industry-energy-alternatives_n_1590422.html US CO_2 emissions from coal dropped about 18% in 2012, mostly due to burning less coal. Kevin Parker, the global head of asset management for Deutsche Bank summarizes the economic problems of coal production: “Coal is a dead man walkin,’” he told the Washington Post. Regarding coal-fired power plants, he said, “Banks won’t finance them. Insurance companies won’t insure them. The EPA is coming after them. . . . And the economics to make [coal] clean don’t work.”

In addition to displacement by natural gas, the learning curves of wind, photovoltaic, and other renewable energy technologies indicate that other cleaner power sources will be available within a decade at grid-parity costs. The buildout of wind and solar power sources will last for decades and employ far more workers than the whole coal industry employs today.

2.4.4 Energy conservation obviates any need for growth in US energy generation, and has the quickest and highest paybacks

A vastly underappreciated factor in high-level energy planning is the magnitude of energy savings that is relatively easy and quick. The majority of US infrastructure was designed as if energy was free, as it indeed seemed in the past. Thus we have poorly insulated buildings; oversized, inefficient automobiles; limited public transport and no high-speed rail; suburban sprawl that most people don’t actually want;

myriad examples of products that are inefficient with energy; and Americans wasting vast quantities of energy due to their ignorance, their habits, and their desires for the next, bigger toys. All of the US energy needs for at least the next twenty years can be met by conservation and *decreasing* energy generation, with costs lower than today.

I remodeled our Portland, Oregon house to reach net-zero energy usage, and we achieved that (figure 3). I did the classic payback analyses and then considered the external costs of fossil fuels, after which the decision was very clear.

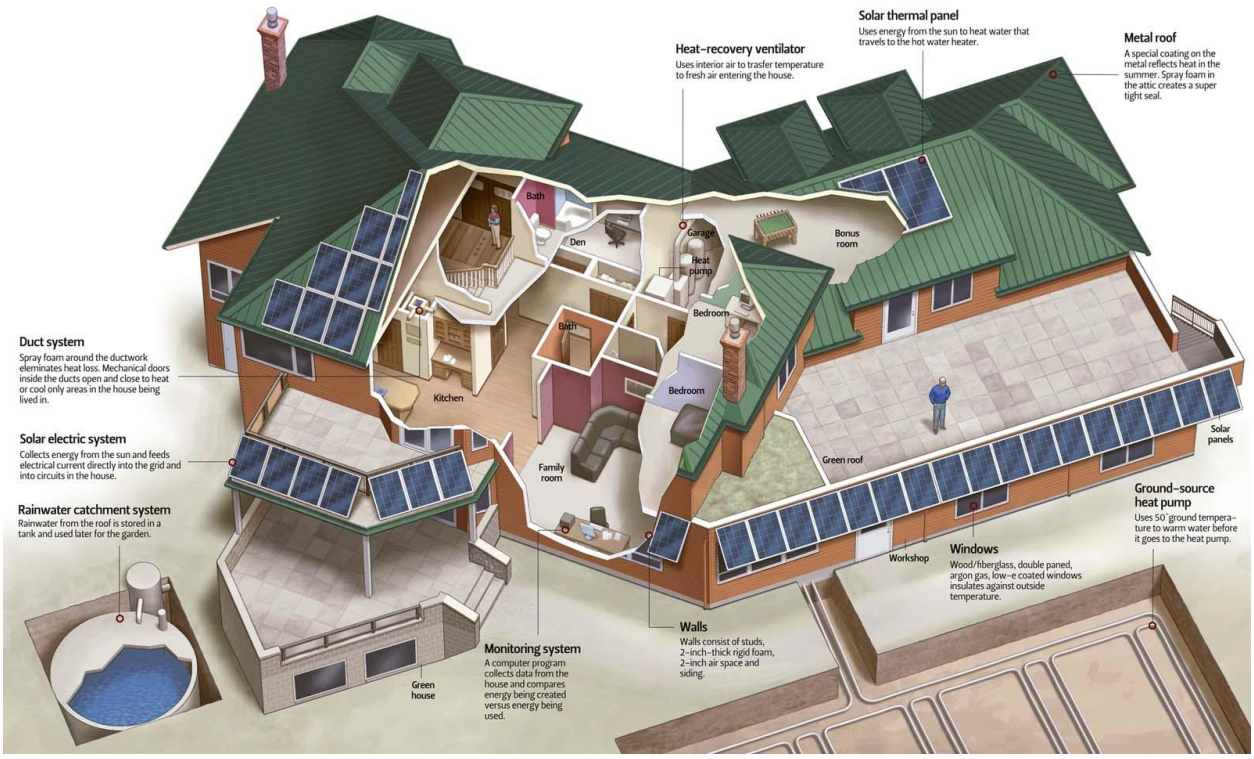

Figure 3. Net-zero remodel of our 1989 home. All of these features have been implemented except the catchment tank and monitoring system. From http://www.oregonlive.com/home-garden/index.ssf/green-living/home-remodel-saves-energy-money.html

I see this personal experience as a microcosm of the infrastructure deployment necessary on a national and global scale. The recipe for a net-zero house is straightforward: first make it much more efficient (like 60-90% less energy required), then add renewables to power the rest. Our house is a simple and real example of how conservation is the biggest and quickest payoff.

The simplest and highest leverage action the government can take is to straighten out the accounting and accountability for the external costs of fossil fuels. This would catalyze energy-saving investments, spur economic growth, and obviate coal. Of course, it is only the fossil fuel lobby in favor of the status quo.

Counter to claims that Americans would need to sacrifice our life styles to go green, our net-zero house is more comfortable than before and the air is fresher. We also bought a Leaf and have found it to be superior to internal combustion engine (ICE) cars in every way except range, so we use it for shorter

trips. Yes, we sacrificed by investing in some deployment (the Leaf battery is the only thing that could be called new technology), but we would have been spending on new cars or other consumption anyway (and without doing any "payback" analyses!). *The psychological payoff is the feeling that we are now part of the solution instead of part of the problem.*

Of course, there are many other considerations in designing physically sustainable infrastructure, not to mention the necessary changes to our governance and cultural mores.

2.4.5 Urgent direction changes needed

In their 2011 *World Energy Outlook* the IEA states that, "Delaying action is a false economy: for every $1 of investment in cleaner technology that is avoided in the power sector before 2020, an additional $4.30 would need to be spent after 2020 to compensate for the increased emissions." Those who counsel waiting for breakthrough technologies are urging us on a path that is unsustainable, irreversible, potentially catastrophic, and economically indefensible, according to the IEA.

It's like we just downed five shots of vodka in five minutes and are only starting to realize that something very bizarre is about to happen.

3. Net Job losses

3.1 Summary

- This project claims to create jobs, but the net effect is much more likely to destroy jobs in the affected region.
- Coal transportation through the region would cause environmental, health, safety, and productivity degradations that will negatively affect recreation and tourism business, decrease demand for living near a coal chute, drive away new businesses which would otherwise locate near the Columbia River, delay emergency services and commercial traffic, compete with other businesses dependent upon barge and rail traffic, and decrease property values.

"We could also create jobs by encouraging meth labs…" –Dec. 12 testimony in Vancouver, WA

3.2 Adverse impacts

I am a cofounder and retired CEO of Cascade Microtech (NASDAQ:CSCD), a public high-tech company in Beaverton, Oregon. That little company employs more operational people than all of the proposed export coal projects combined, and we didn't create an environmental disaster to do it.

Over the decades I've sized up hundreds of business opportunities and I've been burned by plenty of them that didn't work out. So I've looked at this coal export project skeptically, as any prudent investor would. My conclusion is that it would drive away many more existing jobs than it would create, and it would slow the growth of local economies.

The big upside to the GPT is supposed to be job creation. During the construction phase this project would employ thousands of people. Unfortunately these people would be constructing future Superfund sites, to be abandoned like the coal facilities in Portland and Long Beach after the coal market changed.

Who will pay to repurpose these facilities and clean them up? Who paid for the terminals at Portland and Long Beach? Instead of thousands of temporary workers building future Superfund sites, we need tens of thousands of permanent jobs in this region for upgrading our commercial and residential buildings and upgrading our energy infrastructure—to make America stronger, not to power Asia and pollute the planet.

During the operational phase this project would employ a handful of people per train and a handful of people per huge, automated loading facility. What the proponents don't talk about is how many jobs would be lost from people leaving the area due to the environmental, health, aesthetic, safety, or productivity degradations in the region.

3.3 Significance

The economies of small communities in the Columbia Gorge and all along the rail routes from PRB are fragile. For example, half of Stevenson, Washington's jobs are tourism-related. If fishing becomes more impaired or the visitor's experience is dominated by the noise, obstruction, or dust from coal trains, then Stevenson will suffer more than a handful of tourism job losses.

Anyone with capital will tell you that capital will follow talent, and the talent most wanted can choose their location--they don't need to put up with coal trains and coal dust. And each of those talented people will employ dozens of other talented people.

While the project proposers want environmental assessments "based on facts and science, not emotion", anyone choosing a weekend or vacation destination is choosing on emotion. In fact, the savviest investors admit that any capital decision is based on emotion. This EIS must include objective surveys of what existing and prospective Gorge residents would do if they had to live next to a coal chute. These are not people who can't afford to live elsewhere.

I believe there are several independent ways to show that the net job creation would be negative. How many fewer fishermen, windsurfers, kiteboarders, hikers, bikers, kayakers or sightseers would visit the area? How many businesses would move due to the daily delays from at-grade train crossings? How many entrepreneurs would choose to start a company elsewhere? How many people would leave the area because of real or perceived health effects? Objective conversations and surveys of residents are essential to seeing the economic impacts.

My wife has asked where we would move if Big Coal gets its way.

3.4 Alternatives Including Mitigations

For creating jobs almost any industry is better than coal export. RailAmerica recently shelved plans to develop a coal export facility in Grays Harbor, WA. After spending more than 18 months on a plan to ship coal abroad, the firm told a local newspaper that, "we believe that there are other uses and other opportunities for that terminal that are much more likely to generate jobs, economic development, tax revenues, (and provide a) general increase in business for the Port."

Conclusions

The clear conclusion from both Section 1 and Section 2 is that coal should be left in the ground. The scope of this EIS should expand to re-examine PRB coal leases for their climate and economic impacts, and catalyze planning for an orderly exit from coal as a business anywhere in the US, retraining programs for coal workers at all levels, and how to discourage coal usage in our trading partner countries.

As an engineer I am appalled by the ignorance of, and disrespect for, basic scientific processes and data. Never did I believe that the US government would reduce itself to being a pawn for fossil fuel interests, or that Americans would tolerate today's barrages of continuous lies from large corporations.

As a businessman I am certain that the economic effects of this project are negative on a regional, national, or global level. In Section 1 above I highlighted the increasingly disastrous effects of climate change and the contributions of our dirtiest fuel, coal. In section 2 I summarized how the real costs of climate change are becoming near-term costs, as evidenced by the increasing costs of the US extreme weather events, in addition to the health care costs of coal pollution. In Section 3 I argued that a coal chute would drive away tourists, residents, businesses, and entrepreneurs, resulting in many more job lost than jobs added near coal trains or barges.

As a parent I am much more scared about climate catastrophe than I've been about nuclear war. No one has been crazy enough to pull the nuclear trigger, but we've all been crazy enough to accelerate toward a slippery slope of civilizational suicide in the fog. I beg you to consider your contribution to a livable planet.

Thank you for the opportunity to comment on this EIS scoping process.

Sincerely,
Eric Strid
White Salmon, WA