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Jordan Cove: one more step towards compromised life on this planet

Alan Journet Ph.D.

Co-facilitator, Southern Oregon Climate Action Now
541-301-4107; alan@socan.info
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I write as co-facilitator of Southern Oregon Climate Action Now, an organization of some 1500 Southern Oregonians who are concerned about global warming and its climate change consequences, to express our total opposition to this obscenely destructive proposal. In particular, I write to express concern about the life-threat and economic costs this proposal would impose on each and every resident of our precious planet.

The Pembina Claim

On one of its many glossy marketing circulars touting the environmental disaster we know as the Jordan Cove LNG Export Facility / Pacific Connector Pipeline, Pembina claims: "We are committed to doing right by our neighbors." There is no doubt that through bribes to regional entities and political candidates, Pembina is contributing funds to some of its potential neighbors. However, as far as the natural systems and most of the residents of Southern Oregon, and all life on our planet are concerned, the only right thing Pembina could do is return to Canada and terminate its campaign to destroy the livability of our planet for short-term greed. Pembina should simply leave it in the ground.

Natural Gas Replacing Coal

In relation to LNG exports from British Columbia, The Canadian Pembina Institute (no relation to the Pembina corporation project proponents as far as I can discern) pointed out that contrary to the claims of LNG proponents, exporting LNG to Asia will not likely reduce greenhouse gas emissions (https://www.pembina.org/blog/lng-global-emissions). The point they make is that the assumption driving the false conclusion is that LNG will replace coal in industry and utilities. The reality, however, is that LNG will simply compete in the market place of energy resources, and may well displace renewable energy generation. An additional concern is that fossil (natural) gas is not itself clean. It is worth noting that Pembina itself carefully claims only: "Natural gas is the cleanest burning fossil fuel, producing primarily carbon dioxide, water vapor and small amounts of nitrogen oxides" (https://www.jordancovelng.com/natural-gas-facts). While it is true that during combustion fossil gas is cleaner than coal and oil in terms of the carbon dioxide emissions per unit of energy generated, Pembina's subtle and duplicitous misrepresentation of the problem fails to tell the whole story. Like all fuel sources, fossil gas has a full life cycle that involves extraction, processing, and transmission. These steps are in addition to the liquefaction and final combustion components. It is hardly surprising that Pembina totally fails to acknowledge the rest of the life cycle and focuses only on the consequences of burning the fossil fuel. This is because the remainder of the life cycle involves leakage of the greenhouse gas methane which has a comparatively high Global Warming Potential (GWP) compared to carbon dioxide. Indeed, methane has a GWP 86 times that of carbon dioxide on a 20-year basis and 34 times greater on a 100-year basis. Since the 2018 Intergovernmental Panel on Climate Change report clearly

indicates we have to reduce greenhouse gas emissions 45% by 2030 (https://www.ipcc.ch/2018/10/08/summary-for-policymakers-of-ipcc-special-report-on-global-warming-of-1-5c-approved-by-governments/), it is only reasonable to focus on the 20-year comparison. With fossil gas emitting only about 50% of the carbon dioxide as coal per unit of energy generated, problems arise if the life cycle emissions of methane negate that combustion benefit. Unfortunately for life on the planet, assessments of the methane leakage indicate that these 'fugitive emissions' are, indeed, more than enough to negate that benefit.

Fugitive Emissions

Studies on the fugitive emissions of methane from fossil gas fracking have been conducted for many years. These studies either apply a top-down technology involving aircraft or satellite estimates of atmospheric methane concentrations over time, or bottom-up estimates derived from studies of fracking activities at the well, and the leakage occurring from these sites. As long ago as 2014, Robert Howarth and his team at Cornell University determined, using the 20-year warming value for methane, that the methane emissions necessary to negate the combustion benefits of fossil gas range from 2.4 - 3.2%, with a mean of 2.8%. They further assessed the actual fugitive emissions from conventional fossil gas extraction as between 1.7 and 6.0% (mean 3.8%), while that from shale-fracked fossil gas to range between 3.6 and 7.9%, with a mean of 5.8%. (http://www.eeb.cornell.edu/howarth/publications/Howarth_2014_ESE_methane_emissions.pdf) The message is that under no circumstances is fossil gas from fracked shale an improvement over coal as a source energy while even more conventionally extracted fossil gas offers no improv ement. Meanwhile, Schneissing (2014 https://pdfs.semanticscholar.org/ebb0/06c04b06ebdad36f967bcc9cb291d33743e1.pdf) reported 9.1% as the value for fugitive emissions and Howarth in a 2014 literature review (http://www.eeb.cornell.edu/howarth/publications/f_EECT-61539-perspectives-on-air-emissions-of-methane-and-climatic-warmin_100815_27470.pdf), indicated the value was probably closer to 12%. Many subsequent studies have endorsed these findings. The notion that fossil (natural) gas is 'the clean fossil fuel' has been completely debunked in the research literature, yet Pembina continues to make this claim. By carefully couching their promotions in the deceptive claim about combustion benefits ("Natural gas is the cleanest burning fossil fuel…"), they completely ignore the fugitive emissions throughout the life cycle.

Jordan Cove Greenhouse Gas emissions

While much attention has focused on emissions from the liquefaction facility proposed for Jordan Cove, such a focus misses the main problem. In offering this comment, I do not ignore the greenhouse gas emissions that would result from that facility, but stress that the real problem is the full life cycle emissions resulting from the extraction, processing, transmitting, and final combustion of this gas. Several years ago, I undertook an assessment of the Global Warming Potential or carbon dioxide equivalent emissions resulting from the project. My calculations produced an annual carbon dioxide equivalent emissions value of 32 million metric tons (MMT) of greenhouse gases. More recently, Oil Change International (2017 http://priceofoil.org/content/uploads/2018/01/JCEP_GHG_Final-Screen.pdf) calculated the full life cycle emissions resulting from this project at between 36.8 and 52.0 MMT. These values are critical because Oregon 's In-Boundary total greenhouse gas emissions are reported to be around 60 MMT range (https://www.oregon.gov/deq/aq/programs/Pages/GHG-Inventory.aspx). Thus,

if this project is completed, the overall global warming contribution would be a substantial proportion (maybe as high as 87%) of Oregon's annual emissions. The implication is clear: if Jordan Cove is permitted, any effort undertaken by Oregon to reduce its greenhouse gas emissions will be compromised by this single project. If Oregon is serious about reducing greenhouse gas emissions (not only the inadequate nut commonly addressed but commonly addressed gas carbon dioxide) and having an meaningful impact on global warming, the state cannot afford this project.

The Economic Consequences:

The social cost of the emissions of greenhouse gases has been assessed. Although the current administration denies the reality of global warming and its climate change consequences, and has determined unreasonably that the social cost of carbon dioxide equivalent emissions shall be designated as between $1 and $7 per ton of emissions (https://www.nytimes.com/2018/08/23/climate/social-cost-carbon.html), the EPA under President Obama calculated the 2020 cost of these emissions per metric ton as between $42 and $123 (in terms of 2007 dollars). Given the rate of inflation (http://www.in2013dollars.com/2007-dollars-in-2018), this translates to between $51 and$150 per ton of emissions today. Calculating the social cost of the annual emissions of greenhouse gases from the Jordan Cove project, we find this cost to be between $5 billion and $8 billion dollars depending on whether the 100-year or 20-year basis for calculating the methane impact is employed.

According to project proponents, the economic benefit to Oregon derived from the project would comprise tax revenue of some $100 million to state and local governments (https://www.jordancovelng.com/benefits/tax-revenues). According to the estimates of the project proposers, economic benefits from the project accrue to the state and Coos County. It is worth noting that the employment opportunities afforded by the project, once the temporary construction process is completed, are minimal and will probably be acquired mostly by experienced workers migrating from elsewhere rather than local residents. But, even if these benefits indeed occur, they comprise a drop in the bucket compared to the costs. Is it really legitimate that such un unbalanced equation of local economic benefit at the expense of such a huge national and global cost should be endorsed by the state of Oregon?

Other Concerns:

Although the global warming impacts undoubtedly represent the greatest environmental and social costs of the project, there are others that deserve attention. Even if the global warming impacts were non-existent, these should be enough to warrant project denial. As an ecologist and conservation biologist who has undertaken research in wetlands and bottomland hardwood forests, I am well aware of the potential for dredging and substrate disturbance to compromise the habitat for aquatic and wetland species. As we allow further and yet further destruction of wildlife habitat, we also further promote the sixth extinction, another event in the history of life on the planet that extinguishes 90% or more of the biodiversity. It is possible that, in time, evolutionary processes will re-populate the Earth's surface with an array of organisms the number of which is equal to that currently present. But each of the previous five mass extinctions has been followed by hundreds of millions of years of evolution before such recovery has occurred. Are we ready, as *Homo sapiens* (the thinking Homo), to be responsible for the next great extinction?

An Alternative

There certainly exists an economic need for investment in rural and coastal Southern Oregon. However, this need does not have to be met by a project as regionally destructive and globally dangerous as the Jordan Coe LNG export facility. Instead, the region could be assisted through a focus on investment in clean renewable energy that would serve the region instead of serving a Canadian corporation and its shareholders. Such a proposal is under development in the Joint Committee on Carbon Reduction. The proposal, previously known as the Clean Energy Jobs Bill would provide economic support not only for renewable energy, but also for agricultural and forestry activities that sequester carbon. Rather than promoting a project that is globally a huge economic and environmental cost, I urge promoting activities that are both regionally and globally beneficial. The next iteration of the Clean Energy Jobs Bill should provide such incentives.

The Moral Imperative:

Many of us alive today, whether through religious conviction or some other belief system, think that our moral imperative is to leave a planet that is at least as rich as when we arrived. Projects such as Jordan Cove collide with such a belief system and demand that we reflect on where we stand on that critical issue.

It is difficult to imagine that anyone associated with the development or promotion of the Jordan Cove proposal has children or grandchildren or cares one sufficiently about what life will be like on this planet if projects such as this are completed. It is certainly the case that economies are amoral, but humans making decisions should not be amoral. Those proposing projects that further their own personal economic status at the expense of all life on the planet should have sleepless nights until we all collectively reverse course. Those with the responsibility for assessing projects such as this, and deciding whether they should be permitted, have an equally profound responsibility to consider the total social and economic impact of such projects. By any social and global measure possible, the Jordan Cove project should not be permitted. When it comes to addressing the global warming crisis that confronts us, at some point in our lives, each of us will be called upon to make difficult decisions and either go with the flow towards mass extinction of life, or resist that flow. We ate Southern Oregon Climate Action Now urge the Department of State Lands to join us in rejecting this one further step towards our collective planetary suicide.

A corporation committed to being a good neighbor to other residents of planet would withdraw its application and ‘keep it in the ground.’ We know that we cannot afford any further fossil fuel extraction, processing, and combustion if we are to achieve the objective of the Paris Agreement to keep global temperature rise under 1.5°C above pre-industrial levels.