

Southern Oregon Climate Action Now

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Confronting Climate Change

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February 21, 2021

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Colleagues:

I write on behalf of over 1500 Southern Oregonians who are Southern Oregon Climate Action Now. We are committed to promoting understanding and awareness about the science of global warming and its climate change consequences as well as promoting individual and collective action to address it. I offer the following comments regarding the 2<sup>nd</sup> Rulemaking Advisory Committee meeting held on February 17<sup>th</sup> 2021.

Before offering my comments and concerns, I would first like to re-emphasize our appreciation to DEQ staff for their concerted and transparent efforts to develop a meaningful Oregon Climate Protection Program to reduce emissions while promoting carbon sequestration and also to the members of the RAC, most of whom clearly come prepared to assist in this endeavor.

### **Accurate Science: Carbon vs Greenhouse Gas**

During discussions of the establishment of the DEQ Rulemaking Advisory Committee, I repeatedly urged that it include at least one scientist familiar with the basic science of global warming and climate change. Unfortunately, DEQ and the EQC were committed instead to ensuring representation from an array of stakeholder groups rather than including representation from science. The result has become evident during RAC meeting 1 and 2 discussions where it is clear that several members of the RAC do not understand the basic science, and thus are offering thoughts that reflect a lack of scientific understanding. This is particularly obvious as RAC members confuse carbon with greenhouse gases as though the terms are synonymous. The result of this confusion seems to be a focus in some minds on reducing carbon emissions rather than reducing greenhouse gas emissions.

To clarify the distinction between carbon and greenhouse gases, I offer the following extract from a discussion of the importance of this distinction, available in full at [The Carbon Mistake](#).

“In considering the issue of global warming, we should be very clear about what we are discussing, and adjust our language accordingly. The rule of thumb is to remember that our target is reducing the concentration of Greenhouse Gases (GHGs) in our atmosphere. Here are the basic concepts:

**“a) Fossil Fuels** – Since all fossil fuels are carbon-based, it is reasonable to refer to removing carbon or decarbonization when the subject is the fossil fuel resources that drive our energy economy.

**“b) Regenerative Agriculture and Sustainable Forestry** – Both activities rely on the process of photosynthesis which captures carbon dioxide from the atmosphere and sequesters it in plant biomass. Thus, it is quite reasonable to refer to carbon when discussing the benefits of regenerative agriculture or forest management that traps and stores carbon from the atmosphere and either builds up the organic component of soils or stores the carbon in the tissues of growing plants, such as trees.

Both activities rely on the process of photosynthesis to capture carbon dioxide from the atmosphere and sequester it in plant biomass. Thus, it is quite reasonable to use the terms “carbon capture” or “carbon farming” when discussing these practices.

**“c) Emissions** – First, not all greenhouse gases contain carbon, which is a frequent source of confusion. The greenhouse gas nitrous oxide (N<sub>2</sub>O), for example, contains no carbon. Although the other greenhouse gases contain carbon, the carbon is not equivalent. In reality, using a Kilogram-for-Kilogram or pound-for-pound comparison, Methane (CH<sub>4</sub>), is 86 times worse than CO<sub>2</sub> on a 20-year basis, and 34 times worse on a 100-year basis. Meanwhile, the Chlorofluorocarbons (CFCs) and Hydro-chlorofluorocarbons (HCFCs) are some 10,000 - 15,000 times worse. Finally, carbon-free Nitrous oxide is nearly 300 times worse. Stated another way, this means - for example - that releasing a ton of nitrous oxide into the atmosphere is equivalent to releasing nearly 300 tons of carbon dioxide. Thus, policies that attempt to reduce greenhouse gases by focusing exclusively on carbon completely ignore nitrous oxide, and do not sufficiently address other climate-warming gases, some of which are even worse. (Note: the values reported here constitute the carbon dioxide equivalent (CO<sub>2</sub>e) or Global Warming Potential (GWP) values for the other greenhouse gases as reported in the [Intergovernmental Panel on Climate Change Assessment Report 5](#), Table 8.7, p. 714).

It is relevant in the above context, that - like the Paris Agreement - Governor Brown’s Executive Order focuses not on carbon but on greenhouse gas emissions. This means the DEQ Climate Protection Plan as a cap and reduce effort, should be capping and reducing the emissions of greenhouse gases, not just carbon (or carbon dioxide).

Some 35 - 40% of global warming since the industrial revolution is a consequence of gases other than carbon dioxide. This means that we should neither ignore the other gases, nor engage in actions that reduce carbon dioxide emissions while simultaneously increase emissions of more destructive gases

### **Accurate Science: Electricity Use vs Electricity Generation**

Having noted the EO focus on greenhouse gas emissions, it is worth pointing out also the confusion that seems evident in terms of electricity emissions. Unfortunately, in many of its discussions of emissions from the various sectors, DEQ refers to, or depicts graphically, emissions from the electricity sector as ‘electricity use.’ This is confusing since the actual end-use of electricity generally results in zero emissions. The problem with electricity is largely the energy source employed (combusted) in the generating facility. Thus, the labels would be more accurate if they were ‘electricity generation.’ Since the Executive Order, consistent with all other efforts to address global warming, targets greenhouse gas emissions across sectors, it is unquestionable that this refers to the emissions from the generation of electricity not emissions from its end-use. To suggest that the Climate Protection Program’s cap and reduce effort should target only end users is thus illogical. Exempting electricity generation from the Climate Protection Program may have the effect of encouraging utilities to switch to fossil gas rather than employ genuine renewable sources. If electricity is exempt, the program will need some other mechanism for encouraging renewable energy use in electricity generation.

### **Accurate Science: The Fossil (Natural) Gas Conundrum**

While fossil gas burns more cleanly than coal and oil, the problem with this fossil fuel as an energy source is that we have an abundance of evidence suggesting the fugitive emissions from fossil gas extraction, processing, and transmission make it at least as bad as coal. For further discussion, visit [Fossil \(Natural\) Gas: A Bridge to Nowhere](#). It may well be that a new gas pipeline has lower emissions than aged infrastructure, but the gas must still be extracted from the ground (largely achieved by hydraulic fracturing producing fugitive emissions) and the reality is that new pipelines will likely be in use for 50 years (e.g. [WILLIAMS TRANSCO CENTRAL PENN LINE SOUTH: A CITIZEN'S GUIDE](#)). Thus, they will age, and likely will develop leaks at the rates reported for older pipelines. Furthermore, allowing the construction of such pipelines locks us into an energy economy for 50 years that is fossil gas dependent. Yet, we know that we have fewer than 30 years to solve the climate crisis and reach net zero emissions. Achieving the necessary state target would thus result in this infrastructure becoming a so-called ‘stranded asset.’ It is folly to develop a program that locks Oregon into an energy future that in any way involves fossil (natural) gas.

### **Accurate Science: Adequacy of the Executive Order 2050 Goal**

While the Executive Order targets at least 80% below Oregon’s 1990 emissions level by 2050, with an interim target of at least 45% below 1990 by 2035, we know that the 2050 stated goal of 80% is inadequate to meet what the best available science indicates we must achieve globally if we are to retain a livable planetary ecosystem.

First, the 2018 Intergovernmental Panel on Climate Change made a compelling argument (Global Warming of 1.5°C; <https://www.ipcc.ch/sr15/>) that limiting warming to 1.5°C above pre-industrial conditions is essential and would require our achieving net zero emissions by 2050.

Then, after nearly four years of climate science denial from the U.S. Administration and too many in our Congress, Spratt et al. from Australia's 'Breakthrough - National Center for Climate Restoration' evaluated recent trends and argued in a November 2020 report (Climate Reality Check 2020, [https://469804a7-ae0f-4ba4-926a-0f4778d88216.filesusr.com/ugd/148cb0\\_c4cb345518ad4669bafa7c31d205edf4.pdf](https://469804a7-ae0f-4ba4-926a-0f4778d88216.filesusr.com/ugd/148cb0_c4cb345518ad4669bafa7c31d205edf4.pdf)) that achieving net zero emissions by 2050 is inadequate. Rather, they suggested, we will have achieved the 1.5°C target above pre-industrial conditions by 2030 and therefore need to be at net zero emissions by then. Not only is the Executive Order overly optimistic in stating the effectiveness of its 2050 goals, it is considerably out of step with best available science. This places the onus on agencies to focus on the 'at least' element of the EO.

For these reasons, although we appreciate DEQ incorporating into its array of scenarios an option that takes us beyond the minimum prescribed in the EO, we suggest that this still fails to recognize what is needed if Oregon is to become a national and global leader in efforts to avert the climate chaos that global warming is leading us towards. Indeed, as Keep Oregon Cool, the Oregon Global Warming Commission's 2020 biennial assessment reports in its Table 1, many states across the U.S. have more ambitious goals than the Executive Order

<https://static1.squarespace.com/static/59c554e0f09ca40655ea6eb0/t/5fe137fac70e3835b6e8f58e/1608595458463/2020-OGWC-Biennial-Report-Legislature.pdf>).

Additionally, it is worth noting that one of the reasons our state now must impose a steep descent on emissions, if we are to contribute our fair share to the global effort, is that climate polluters across the state failed to heed and achieve the voluntary emissions reductions established by HB3543 in 2007. More recently, members of the Oregon legislature, at the behest of these same polluters, have refused for many years to act on proposals establishing a meaningful statewide greenhouse gas emissions reduction program. Hence, we have Executive Order 20-04.

### **My Offer to RAC Members**

Since I have spent many years teaching courses and offering presentations on climate science, I would like to offer my services to anyone on the RAC who would like to discuss or learn more about the basic science. A twelve-step summary of the basic science of global warming and its climate chaos consequences is available at [Global Warming - Climate Chaos: The Twelve-step Consensus](#). An expanded version of this is available on request: [Alan Journet](#).

**The Computational Errors**

Readers will possibly recall that, at the close of the RAC 2 meeting, I expressed concern about the accuracy of data in Slide 63. Subsequent conversations with Climate Policy Analyst Lauren Slawsky have resulted in the discrepancies being resolved. Thus, in case you have not seen this, I include the correct slide 63 here. Notice corrected values in the 1900 and 2018 cells for electricity. I understand the online slide set has been corrected.

**Reference Case: High-Level Results**

Sector	Emissions (Million MT CO2e)					Percent Change			
	1990	2018	2030	2040	2050	1990-2030	1990-2050	2018-2030	2018-2050
Transportation	20.5	24.1	21.7	16.5	14.3	6%	-30%	-10%	-41%
Natural Gas	5.5	7.5	7.1	6.7	6.2	31%	14%	-5%	-17%
Industrial	5.6	4.3	4.9	5.5	6.3	-12%	12%	13%	45%
Electricity	16.6	16.7	7.8	8.4	8.3	-53%	-50%	-53%	-51%
Residential and Commercial	3.5	4.4	5.1	5.5	5.9	48%	69%	17%	35%
Agriculture	6.5	6.7	6.6	6.7	6.8	2%	5%	-2%	1%
<b>Total</b>	<b>58.1</b>	<b>63.8</b>	<b>53.3</b>	<b>49.4</b>	<b>47.8</b>	<b>-8%</b>	<b>-18%</b>	<b>-16%</b>	<b>-25%</b>

Note: totals may not sum due to rounding.

**Reflections on RAC1**

Concern regarding the DEQ ‘leaning’ to exempt electricity from the program has been expressed many times. It is worth noting that the DEQ data for 2018 reveal that electricity (labelled ‘electricity use,’ but meaning ‘electricity generation’) accounted for some 26% of Oregon’s total regulated emissions while the 2019 estimate raises this percentage to 29%. The justification offered for this leaning is that if DEQ capped these emissions, utilities would simply flip a switch and instead of generating electricity in-state, import it from power plants elsewhere in states lacking any emissions limits. This would allow emissions of greenhouse gases from electricity consumed in the state but generated elsewhere to continue unabated. Yet, despite repeated requests for some evidence to substantiate the claim of imminent leakage, none has been forthcoming even as comments have frequently been offered to suggest the contrary. It seems highly incongruous that the agency would exempt from the program entities responsible for over a quarter of the state’s total emissions. Doing so potentially places an extra and unreasonable burden on the remaining sectors.

One potential consequence of exempting electricity generation is that this may encourage utilities to convert to fossil gas rather than genuine renewable energy sources. The result would be exactly the leakage of emissions out-of-state (i.e., the fugitive emissions from fracking, processing, and transmitting the gas) that DEQ claims to fear by including electricity generation in the cap and reduce program. Given this possibility, it is incumbent upon DEQ to develop a plan for addressing this potential conversion while promoting renewable generation.

While we urge DEQ to reconsider the exemption of electricity generation, we also urge that, if this exemption stands, there should be no other exemptions.

**Biofuels:**

We were disturbed to understand during the RAC 2 meeting that DEQ is encouraging biofuels as a renewable energy source. Although there are many kinds of biofuels, it is concerning that DEQ would consider these to be renewable and emissions-neutral. We understand perfectly the principle that

burning biomass results in the release of carbon dioxide captured from our current atmosphere as opposed to releasing carbon dioxide captured from an atmosphere hundreds of millions of years ago. Unfortunately, the evidence tells us that the length of time taken for a growing forest, for example, to recapture the carbon emitted from wood combustion is far longer than we have to address the greenhouse gas emissions problem. While there may be some circumstances under which biofuel comprises a reasonable option for generating electricity, this does not include harvested wood products. This is why 500 scientists wrote a letter to world leaders urging that wood not be included as a renewable energy source (<https://www.wwf.eu/?uNewsID=2128466>). Furthermore, encouraging investment in biomass combustion or biofuel production results in loss of investment funds for genuine clean energy sources and the risk of promoting combustion that results in the emissions of toxic co-pollutants that compromise the health of communities living near the generation facilities. We urge DEQ to avoid any suggestion that biomass combustion should be promoted within the Climate Protection Program, especially it should not be identified as a renewable option.

### **Health, equity, co-benefits:**

It is essential that development of the Climate Protection Program include achievement of equity as one of its top three priorities. While greenhouse gas emissions cap (and trade or invest) programs undertaken elsewhere have historically included provisions that allowed emitters to continue polluting the air with toxic co-pollutants, both HB2020 (in 2019) and SB 1530 (in 2020) included protections limiting this possible behavior. In the discussion of Alternative Compliance Options, I listed a number of requirements that should be imposed to protect neighboring communities from the threat of ongoing pollutants. These are merely the most obvious requirement, there likely are others. DEQ and EQC must be careful to ensure that any use of instrument trading or alternative compliance instruments protects communities from negative consequences.

### **How the Climate Protection Program will work: individual entities or groups:**

The statement in Slide 28 that the program would not assign limits to individual entities but rather would assign them to groups of entities seemed to be denied by all prior discussion, subsequent discussion, and the example of trading depicted in Slides 31 and 32. This is confusing.

### **Banking, Trading, Compliance flexibility, Compliance Period:**

#### ***Banking***

While not having a strong feeling about the banking provision, I am concerned that allowing unrestricted banking will permit entities to exceed their emissions reduction early in the sequence, when doing so is relatively easy, and then bank unused instruments for later in the cycle thus compromising the essential goal of the program to reduce statewide emissions by reducing the number of instruments issued. To prevent this from happening, I suggest the imposition of one of two solutions:

(a) assigning a life of, say, five years to the instruments or (b) imposing a decay schedule on them of, say 5% of their original 1-ton emissions value per year.

**Trading:**

Allowing polluters to trade unused compliance instruments seems to be a valuable mechanism for granting emitters who have difficulty reducing emissions the option of complying with the program goals by purchasing unused compliance instruments from other entities that find achieving emissions reductions easier. It is important, however, that entities engaging in the purchase of such instruments demonstrate that they have adopted, or have plans to adopt, the best available technology so trading doesn't become a strategy for evading the purpose of the program. Trading also should not allow polluters to continue unabated emissions of co-pollutants that threaten the air quality and health of neighboring communities.

**Alternative Compliance Options**

In the discussion of Alternative Compliance Options, the examples given were all greenhouse gas emissions reduction projects. There were no examples of sequestration option from the natural and working lands arena. If we wish to encourage carbon sequestration, as the EO indicates, the only source of incentive funds within the program is the Alternative Compliance Option that allows polluters to invest in carbon sequestration projects.

We presume that the Alternative Compliance Options, whether they involve projects that mitigate emissions or promote carbon sequestration, will not compromise the cap but will allow entities to achieve their assigned cap by promoting either emissions reductions projects or carbon sequestration projects where the certified Alternative Compliance Instrument project offers a ton for ton equivalent unless for some reason, an alternative equivalence is deemed appropriate.

However, as we have noted previously, the Alternative Compliance Options must be subjected to restrictions that ensure they are effective and they do not exacerbate social injustice problems.

- 1) To be eligible for these investments, polluting entities should not be permitted to invest in Alternative Compliance projects to achieve emissions reduction caps:
  - a. unless they have already installed the best available technology for reducing emissions or have solid plans for undertaking such installation,
  - b. that allow them to continue releasing co-pollutants that undermine the air quality and health of neighboring communities whether or not such emissions compromise the air quality attainment status of such communities.
- 2) Acceptable sequestration projects must:
  - a. be third-party certified as achieving carbon sequestration that is real, measurable, additional, long-lived, monitored and verifiable. The concept of 'permanent' is difficult in the case of carbon sequestration on our natural and working lands since the carbon in

forests and farms is in constant though slow flux through the system. Rather than demanding that the carbon should be permanently locked, as in a vault, we should expect that the overall carbon content of a system increases as individual carbon atoms flow through them much more slowly than previously.

- b. not allow leakage of the sequestered carbon in other projects. For example, forest carbon sequestration projects cannot be compensated by activities elsewhere on the property of the project manager that result in an increase in emissions similar to or greater than the carbon sequestered.
  - c. not generate conditions that compromise equity and social justice.
- 3) In order to prevent emitters from achieving their cap requirements by investing in Alternative Compliance Instruments and thus substantially evading their responsibility actually to reduce emission, a ceiling should be placed on the proportion of their compliance obligations that a polluter might achieve by investing in ACIs. As I recall, previous legislation placed a ceiling of 8% on ACIs with no more than 4% allowed out-of-state.

#### **Compliance Period:**

A multi-year compliance period seems an appropriate approach to allowing emitters time to plan and undertake emissions reductions.

#### **Point of regulation:**

Since the extraction, processing, transmission and combustion of fossil (natural) gas emits substantial greenhouse gases, I am confused as to why this is separated from other fossil fuels both here and in the scenarios.

#### **Zero-emitting RNG (Slide 60):**

I realize that this refers to Senate Bill 98, but I am concerned that Renewable Natural Gas (RNG) is being promoted as a zero emissions option.

Basically, the IPCC argues that we need to decarbonize our energy economy in order to avoid climate chaos, achieving net zero emissions by around 2050. This means anthropogenic CO<sub>2</sub> emissions are balanced globally by anthropogenic CO<sub>2</sub> removals. <https://www.ipcc.ch/sr15/chapter/spm/>

Unfortunately, a study of global warming emissions from RNG under different scenarios (Grubert 2020) revealed: "RNG is not inherently climate friendly. Based on consideration of both the source of methane used to produce RNG and the likely alternative fate of that methane, and using reasonable assumptions about likely system methane leakage, it is unlikely that an RNG system could deliver GHG-negative, or even zero GHG, energy at scale."

There is, furthermore, considerable doubt about the capacity of RNG to meet our current and foreseeable need. Indeed, in a study - admittedly ten years old, promoting the benefits of RNG, the American Gas Association indicated: "RNG could meet the natural gas needs of half of all American

homes...” and “16 percent of natural gas demand in the four states National Grid services (Massachusetts, New York, Rhode Island and New Hampshire) could be met by renewable gas....” (<https://www.aga.org/research/reports/renewable-natural-gas-rng/>) Rather than replacing fracked fossil (natural) gas with renewable natural gas, the plan seems to be to incorporate a percentage of the RNG into current and future pipelines. This would lock us into an energy economy for decades that relies on some proportion of fracked natural gas.

It is disturbing, also, that most RNG proposals involve use of manure from Confined Animal Feedlot Operations (CAFOs) which suggests the need for RNG might become an argument for promoting these obscene operations.

In terms of greenhouse gas emissions, RNG may be an improvement over conventional fossil (natural) gas, especially when the latter is extracted through hydraulic fracturing, and the RNG is not pumped through leaky pipelines. However, the likelihood that a conversion to RNG will lock us into years of gas infrastructure rather than promote genuinely clean fossil-free fuel and promote CAFOs is tremendously troubling. It seems that the benefits of RNG are limited meaning its use should be limited to those situations where it is a demonstrable improvement over current practice.

### **Modeling:**

Given the vast array of variables that deserve assessment, it is unfortunate that the modelling exercise is limited to three scenarios since optimal practice (following standard experimental protocol) would require that no model is different from the basis for comparison in more than one variable. Manipulating multiple variables concurrently makes it difficult to identify causal relationships with any confidence or clarity.

### **Scenarios:**

The inclusion of a scenario that exceeds the EO intermediate and final goal is appreciated though it is unfortunate that no scenario offers what best available science tells us we need: namely net zero emissions.

The main problem with the scenarios is that there are simply too few to assess the array of variables being adjusted among them with the result that it’s impossible to isolate the impact of any single adjustment.

I discussed under ‘Reflections in RAC1 the large proportion of statewide regulated greenhouse gas emissions resulting from electricity generation and how incongruous it is that this is eliminated from coverage under all scenarios. While appreciating that legislation in Salem has been proposed that would lead to 100% clean electricity in Oregon, I do not think that, in developing a Climate Protection Program DEQ should assume that this is successful. Given what has happened to climate proposals in the legislature in the last two years, this admonition is doubly underlined.

**Credit for efforts already undertaken:**

During the public comment period, a couple of Eastern Oregon farmers expressed their concern that they are already undertaking steps to sequester carbon in their soils, and should be awarded credit for what they are doing. While it may be difficult to assess to what extent soil carbon has already increased under such management, it should, at least, be possible to allow any future carbon sequestration that occurs as a result of their continued practice of regenerative agriculture. The problem that this generates is that a specific exception might be appropriate to the criterion of 'additional' for such practitioners in the certifying of Alternative Compliance Instrument.

This, of course, also points to the general question that surrounds credit being afforded to entities that have already undertaken some substantial action to reduce their emissions so they are not effectively penalized for having taken these steps as the emissions reduction requirement kicks in.