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To: Oregon Legislature Joint Committee on Carbon Reduction

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Topic: Testimony Submission urging the Joint Committee to Include Caps on All Transportation Fuels.

I am submitting this testimony to urge the Joint Committee on Carbon Reduction to include all modes of transportation in their carbon reduction legislation and to delete the language in Section 10 of HB 2020 granting an exception to aviation, marine and rail fuel.[1] In light of DEQ's finding that transportation is the largest contributor to global warming in the state, every mode of transportation should be required to reduce its greenhouse gas footprint.

Transportation - Largest Contributor to Global Warming In Oregon

The 2018 Biennial Oregon Global Warming Commission report to the Legislature stated that "Transportation GHG [Greenhouse Gas] emissions have risen during each of the past three years and have grown from 35% of the statewide total in 2014 to 39% in 2016."[2]

A May 2018, Oregon Department of Environmental Quality (DEQ), report entitled *Oregon's Greenhouse Gas Emissions Through 2015: A Review of Oregon's Sector-Based and Consumption-Based Greenhouse Gas Emission* provides additional detail on this topic.[3] The document, a 5 year update to a 2013 greenhouse gas publication which will be discussed later in this testimony, stated that "The combustion of fossil fuels, whether occurring within Oregon or as a result of our consumption, is the key driver of greenhouse gas emissions," and further identified transportation as the largest contributor to global warming in the state.[4] The authors distinguished between two types of emissions - sector-based, "produced in Oregon from its transportation, residential, commercial, industrial and agricultural sectors, including electricity produced elsewhere but used in the state" and consumption-based, which are "produced around the world due to Oregon's consumption of energy, goods and services."[5] Per the 2018 publication,

> Oregon has statutory goals to reduce in-state emissions 10 percent below 1990 levels by 2020 and 75 percent below 1990 levels by 2050. These statutory goals apply to emissions that occur inside Oregon. Both sector-based and consumption-based inventories include portions of these in-state emissions, but also include emissions that occur outside of Oregon. Current trends in emissions are not moving in the direction of these goals. Both inventories compiled by DEQ are above their respective 1990 levels. Consumption-based emissions are rising, while sector-based emissions are no longer decreasing.
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> Oregon's emissions are approximately one percent of the world's second largest global emitter, the United States, emitting emissions equivalent to countries like Portugal and Ireland. Oregon has experienced an increase in emissions within the transportation, residential, commercial and agriculture sectors when compared to 1990 levels and a small decrease within the industrial sector within the same time period. While Oregon's emissions have decreased slightly since 2007 that trend has not continued in recent years and Oregon's 2015 emissions are still 10 percent higher than 1990 levels.[6]

It is worth noting that the population of Portugal is more than twice that of Oregon and the population of the Republic of Ireland and Northern Ireland combined exceeds that of Oregon by more than 2 million, thus the per capita global warming footprint in Oregon is significantly higher than in these countries.

In addition, it is important to recognize that China, with a population quadruple that of the United States, is the top emitter of greenhouse gases worldwide, while the U.S. holds the second spot. However, on a per capita basis the U.S. generates more than twice the CO2 footprint from the use of fuel than China does.[7] In light of this finding Oregon would be well-advised to investigate and determine why countries with a far larger population than Oregon's have a significantly smaller per capita global warming footprint.

Oregon's Emissions from Aviation and Marine Travel Continue to Rise

Aviation fuel emits more greenhouse gases than most other forms of transportation and the greenhouse gas emissions from this form of transport continues to rise. According to a 4/12/16 Reuters article by Valerie Volovici, "The United States accounts for half of worldwide CO2 emissions from aircraft. Emissions from the aviation sector are projected to triple by 2050 without regulations."[8]

In an article for Oregon Business following the release of the May 2018 DEQ greenhouse gas report, Linda Baker wrote about what she referred to as the Port of Portland's "dirty little secret."[9] Per Baker, the report pointed out that "greenhouse gas emissions from airline transport in Oregon grew from 1.3 million metric tons in 2005 to 1.7 million metric tons in 2015."[10]

Baker also referred to a study by the European Parliament environment committee finding that, "if left unchecked, aviation is on target to increase contributions to global carbon dioxide emissions from today's 3% to 22% by 2050. Emissions from marine activity show a similar trajectory." Yet as Baker points out, despite their significant contribution to climate change "airlines and ships are not included in local and international efforts to curb greenhouse gas emissions" nor are they "subject to reductions under the Paris Climate Agreement."[11]

DEQ Greenhouse Gas Reports Minimize Aviation CO2 Emissions

When addressing aviation, DEQ's *Greenhouse Gas Emissions Through 2015* report focused primarily on commercial passenger flights and international trade. However, the CO2 released by general aviation, including the extensive network of flight training airports in combination with recreational, corporate, air taxi and military training flights in Oregon, is not directly addressed. To insure accurate data collection, it is imperative that individual airports, flight training companies, Port authorities and other aviation business owners provide transparent and accurate information on the contribution of aviation to the global warming crisis.

Along a similar vein, an earlier DEQ report released in July of 2013, Oregon's Greenhouse Gas Emissions Through 2010,[12] was described as a collaborative effort by the Oregon Departments of Energy, Environmental Quality, and Transportation. This document focused its aviation transportation analysis primarily on commercial passenger flights and aviation freight. In so doing it failed to provide a comprehensive picture of the environmental impacts of other sectors of the aviation industry including flight training, recreational flyers, air taxis, corporate jets, and the military.

Regarding commercial flights, the 2013 DEQ report acknowledged that "Short-haul air trips (e.g. Portland to Seattle) produce more greenhouse gas emissions per passenger mile because taxi, take-off, and climb are a larger proportions of total trip emissions, and the aircraft type, often regional jets, are less efficient per passenger mile."[13] Short haul averaged 0.2477 kilograms of CO2 per passenger mile compared to 0.1818 for long haul.[14]

Unfortunately, neither DEQ greenhouse gas report provided emissions data for corporate and private jets such as those used by Intel, Nike, and other Oregon corporations, nor did it provide emissions data for general aviation flights, though most remain within state boundaries, and many engage in repetitive touch and go operations and training patterns both close-in and at a distance from their sponsoring airports.

The report did, however, acknowledge that air freight has the highest rate of carbon dioxide emissions of all forms of transportation - 1,472 grams of CO2 per ton mile, "over four times higher than the truck rate,"[15] and more than 52 times higher than shipping by rail, which came in at 28 grams of carbon dioxide emissions per ton mile.[16]

DEQ Reports Fail to Capture Foreign and Out of State Student Pilot CO2 Emissions

DEQ's greenhouse gas reports speak of estimating CO2 emissions by Oregonians. In discussing the consumption-based inventory in their 2013 greenhouse gas publication, DEQ stated,

> Estimates were made of the emissions resulting from the travel of Oregon households regardless of where they travel (in-state or out-of-state). Conversely, the emissions of the residents of other states were not assessed, even if those emissions occurred or are projected to occur within Oregon's boundaries.[17]

The 2013 report found that emissions from the expanded transportation sector which takes "An enhanced look at the emissions associated with travel by Oregonians and the impacts of inbound freight movement...increased 30% from 1990 to 2010. Proportionately, the biggest increase in emissions was from the air passenger travel market, which doubled during the period. Emissions from the freight market provided the largest increase overall."[18] There was no mention in this report of the contribution of general aviation aircraft which includes recreational flyers, flight training, corporate jets and air taxis. In addition the CO2 emissions released by the military were also overlooked.

It appears that DEQ's narrowly defined parameters for estimating greenhouse gases may have absolved the agency from accurately including the emissions released by student pilots recruited from outside the state and overseas of responsibility for their substantial contribution to global warming. It remains unclear as to whether or not this oversight was corrected in the May 2018 release. Thus the question arises: Were carbon dioxide emissions generated by the Hillsboro Airport (the largest general aviation airport in the state), where the majority of operations are training flights to accommodate foreign and out of state pilots, factored in? If so, how were these emissions calculated and by whom? Similarly, were the emissions generated by flight training and general aviation activity at the more than 450 airports located in Oregon addressed and, if so, where is the data on this mode of transportation?

Hillsboro Aviation and Hillsboro Aero Academy are both Hillsboro Airport tenants. Per their website "Hillsboro Aviation has logged over 1.2 million flight hours since 1980."[19] Similarly Hillsboro Aero Academy boasts of being one of the largest flight training schools in the U.S., with years of experience in training pilots from over 75 countries."[20] Yet the greenhouse gas

emissions generated by these companies were not mentioned in the transportation sector of Oregon's 2013 or 2018 greenhouse gas reports nor was detailed information provided specific to other Oregon airports that engage in similar activities.

Oregon's More than 460 Airports Should be Required to Reduce CO2 Emissions

According to the Department of Aviation, there are over 460 airports in Oregon. Ninety-seven are public use, 7 of which are classified as commercial. The remaining 360 are listed as private use. The vast majority of airports in Oregon cater to general aviation hobbyists, the for-profit flight training industry and corporate and private jet owners.

To add perspective, in 2018, the Port of Portland's general aviation airports - Hillsboro and Troutdale - which primarily serve Hillsboro Aero Academy's international flight training school, logged over 325,000 annual operations, 93,000 more than Portland International, the largest commercial airport in the state.[21]

In addition to the carbon dioxide emissions generated by the flight training activity, additional greenhouse gas emissions are released when students fly to and from their countries of origin, which further adds to their global warming footprint. It would be far more environmentally sustainable for these prospective pilots to train in their own countries. This would also ease the burden on area residents who are routinely pummeled by the noise, lead emissions, PM 2.5 and other pollutants emitted by the flight training industry.

Leaded Aviation Fuel Should be Reduced and Ultimately Eliminated

The majority of airplanes and helicopters flying in and out of Oregon's general aviation airports are piston-engine aircraft that continue to use leaded fuel. Nationwide, these types of aircraft are responsible for more than half of all airborne lead emissions. A review of the 2011 Environmental Protection Agency (EPA) National Emissions Inventory (NEI) revealed that airports are the largest facility sources of lead in the majority of Oregon's 36 counties.

In its 2008 airport study, the EPA ranked Hillsboro Airport 21st in the nation in lead emissions with .68 tons of lead emitted that year.[22] The actual emission levels are much higher as the estimates did not include ground run-up emissions which the EPA has identified as the largest source of lead released at individual airports. Yet despite this knowledge, HB2020, as currently written, places no cap or requirement to reduce emissions from this pollutant.

Lead is a pernicious neurotoxin and a probable carcinogen. It is linked to a host of negative health impacts including miscarriages, ADHD, birth defects, learning and behavior problems, increased violence, elevated risk of cardiovascular problems and a host of other serious medical conditions. According to the Centers for Disease Control (CDC) there is no safe level of lead in a child's blood.

A cap on general aviation activity would not only contribute to a decrease in CO2 but would simultaneously reduce airborne lead emissions that pose a serious threat to the health and well being of area residents.

Closing Statements

Clearly, the aviation industry has contributed to the perilous global warming threat now looming over the entire planet. Just as ordinary residents are encouraged to reduce their environmental footprint and, if HB2020 passes, will be required to pay a tax on their ground transport fuel usage, so too should the aviation sector. Prohibiting all international and out of state flight training is also a reasonable step to take to further reduce CO2 emissions.

In addition, it is essential that the cost of climate change and other environmental pollutants be factored into all decisions related to airport expansion and upgrade projects proposed by the Oregon Legislature, Port of Portland, other Oregon port authorities, the Department of Transportation, local governments and individual airports across the state. It is troubling that while Oregon residents are exhorted to reduce their carbon footprint by driving and traveling less, using public transport, and engaging in zero carbon generating activities such as bicycling and walking, the Port of Portland, Oregon Department of Aviation, and aviation enthusiasts continue to promote aviation growth and expansion while ignoring the significant costs and environmental impacts. In regards to these areas of concerns, all cost benefit analyses should include the significant expense and damage, both short and long term, inflicted upon the planet by this fossil fuel burning mode of transportation.

The 2018 Oregon Global Warming Commission report listed some of the costs of global warming already affecting Oregonians, "The 80,000 acre 'Substation Fire' near The Dalles, Oregon in July burned 1-2 million bushels of wheat at a cost of > $5 million...The Oregon Department of Forestry estimates gross state costs of wildfire control in 2018 at more than $100 million" and further stated that Oregon's net fire-fighting costs averaged $39 million per year over the last 6 years (2013-2018)..." The report also addressed the toll the fire season took on the Ashland Shakespeare Festival which "had to cancel or relocate 26 performances from its outdoor theatre in 2018..." This translated into an estimated loss of $2 million to the festival plus additional losses to the shops, restaurants, hotels and inns that suffered a downturn in business as a result of the drop in tourist visitors.[23] And these figures don't even begin to include the huge loss of life and property as well as financial losses resulting from the wildfires in California, Washington and other parts of the world due to global warming.

As stated by Oregon's Global Warming Commission,

> "...climate change is occurring in real time. Its effects are being felt in Oregon and around the world today, and not in some distant and uncertain future. If we ended GHG [greenhouse gas] emissions tomorrow, climate change effects would persist and worsen for decades to come. Cutting climate change off from its GHG is like stopping a ship's engines: it does not stop the inertial forward motion but only allows it to gradually slow. Our children, and theirs, will be living with the worsening consequences of our failure to take timely action when we knew we should. Bad as that is, further delay only makes it worse."[24]

Thank you for this opportunity to testify on HB 2020. The effort put forth by the Joint Committee on Carbon Reduction to address this very serious issue is sincerely appreciated.

[1] Section 10 Exclusions and Exemptions. Oregon House Bill 2020. Sponsored by Joint Committee on Carbon Reduction. Pg. 9. Lines 33-34. Last accessed on-line on 2/12/19 at https://olis.leg.state.or.us/liz/2019R1/Downloads/MeasureDocument/HB2020/Introduced.
[2] Oregon Global Warming Commission: 2018 Biennial Report to the Legislature for the 2019 Legislative Session. Pg. 6. Last accessed on-line at the Keep Oregon Cool website at https://static1.squarespace.com/static/59c554e0f09ca40655ea6eb0/t/5c2e415d0ebbe8aa6284fdef/1546535266189/2018-OGWC-Biennial-Report.pdf on 1/6/19.
[3] Oregon's Greenhouse Gas Emissions Through 2015: An Assessment of Oregon Sector Based and Consumption Based Greenhouse Gas Emissions. Oregon Department of Environmental Quality. (May 2018. Last accessed on-line on 12/10/18.at https://www.oregon.gov/deq/FilterDocs/OregonGHGreport.pdf .
[4] Ibid. Pg. 4.
[5] Ibid. Pg. 1.
[6] Ibid. Pg. 42.
[7] Each Country's Share of CO2 Emissions. Union of Concerned Scientists. Last accessed on-line at https://www.ucsusa.org/global-warming/science-and-impacts/science/each-countrys-share-of-co2.html#.XDPtOtQrLGg on 1/7/19.
[8] Volovici, Valerie. Environmental Groups File Lawsuit over Pollution form U.S. Aircraft. Reuters. 4/12/16. Last accessed on-line at https://www.reuters.com/article/us-usa-aviation-climatechange-idUSKCN0X92FB on 2/25/19.
[9] Baker, Linda. Elephants in the Room. Oregon Business. (5/21/18). Last accessed on-line on 12/4/18 at https://oregonbusiness.com/article/energy-environment/item/18338-elephants-in-the-room .
[10] Ibid.
[11] Ibid.
[12] Oregon's Greenhouse Gas Emissions Through 2010: In-Boundary, Consumption-Based and Expanded Transportation Sector Inventories. Oregon DEQ, Oregon Dept. Of Energy, and Oregon Sept. of Transportation. (7/18/13). Last accessed on-line on 12/3/18 at https://digital.osl.state.or.us/islandora/object/osl%3A369539/datastream/OBJ/view .
[13] Oregon's Greenhouse Gas Emissions Through 2010: In-Boundary, Consumption-Based and Expanded Transportation Sector Inventories. Oregon DEQ, Oregon Dept. of Energy, and Oregon Dept.of Transportation.(7/18/13). Pg. 60.
Last accessed on-line on 12/3/18 at https://digital.osl.state.or.us/islandora/object/osl%3A369539/datastream/OBJ/view .
[14] Ibid.
[15] Ibid. Pg. 58.
[16] Ibid.
[17] Ibid. Pg. 51.
[18] Ibid. Pg. 3.
[19] Hillsboro Aviation website. Last accessed on 12/3/18 at https://www.hillsboroaviation.com/.
[20] Why Choose Hillsboro Aero Academy. Hillsboro Aero Academy website. Last accessed on 12/3/18 at https://flyhaa.com/why-choose-haa/.
[21] Aviation Statistics. Portland International Airport. Last accessed on 2/19/19 at https://www.portofportland.com/FinanceAndStatistics#.
[22] Hoyer, Marion and Pedde, Meredith. Memorandum on the Selection of Airports for the Airport Monitoring Study. EPA. 11/18/10. Pgs. 2-4. Last accessed on-line on 2/27/19 at https://www.epa.gov/sites/production/files/2016-09/documents/memo-selc-airport-mon-stdy_1.pdf.
[23] Oregon Global Warming Commission: 2018 Biennial Report to the Legislature for the 2019 Legislative Session. Pg. 8. Last accessed on-line at the Keep Oregon Cool website at https://static1.squarespace.com/static/59c554e0f09ca40655ea6eb0/t/5c2e415d0ebbe8aa6284fdef/1546535266189/2018-OGWC-Biennial-Report.pdf on 1/6/19.
[24] Ibid. Pg. 5.