H.B. 2020 Should be Revised to Achieve the IPCC Goal of Net-Zero GHG Emissions by 2050, and to Include Fuels Used by Large Watercraft and Railroad Locomotives

By

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On behalf of Elders Climate Action

What We Know About How Humans Are Changing the Climate.

Thirty years ago scientists warned that adding CO2 and other heat trapping gases would warm the planet and disrupt the stable climate system that has supported the development of agriculture and the evolution of human civilization for the last 8000 years. Now changes in the climate system predicted a generation ago are happening: more massive floods, more powerful hurricanes, expanded tornado zones, hotter and longer droughts causing desiccation of crops in the field, die-off of forests, and unstoppable firestorms incinerating both wildlands and urban landscapes, and warming oceans that have bleached more than one-third of the planet's coral reefs. CO2 is also acidifying the oceans threatening the survival of all shell-dwelling critters, putting the entire marine web of life at risk.

Most of these changes have come much more rapidly with more severe consequences than scientists expected two decades ago. An ice-free Arctic Ocean was not expected for another generation, but it will likely occur this summer. Massive melting of Antarctic glaciers was not expected for a half-century or more, but is happening now. Damage from climate events in the U.S. alone exceeded $300 billion in 2017. The Climate Assessment released by 13 U.S. agencies in December 2018 reports that damages from climate disasters will soon routinely exceed $500 billion annually, contributing to a significant contraction in the national economy.

Many of these effects were not expected to occur until after the global temperature had warmed at least 2 degrees (C) above pre-industrial levels, but climate disasters are happening even though the global average has climbed only 1.1 C. Heeding warnings that allowing the planet to warm 2 C might result in crossing irreversible tipping points that will cause a run-away climate catastrophe beyond human intervention, global leaders meeting in the 2015 Paris Conference asked the International Panel on Climate Change (IPCC) to determine what must be done to limit climate change to 1.5 C.

What Must Be Done to Stop a Run-away Climate Catastrophe?

IPCC reported in October 2018 that because no notable progress has been made in reducing global greenhouse gas emissions, it might be too late to avoid exceeding 1.5 C. But if some of the unknowns work out in our favor, it might be possible to avoid exceeding that limit if –

- CO2 emissions are cut to net zero by 2050;
- CO2 emissions are cut in half by 2030, *AND*
- a large portion of the land surface currently dedicated to raising beef and other domestic animals were reforested to grow the planet's capacity to remove CO2 from the atmosphere.

To achieve these emission targets, almost all energy uses that rely on the combustion of sequestered carbon (fossil and biomass) must be stopped or converted to zero emission technologies by 2050. Half of those reductions must be achieved within the next 11 years to avoid the total atmospheric loadings that will drive temperatures above the 1.5 C target over the next 1000 years while we wait for forests and phytoplankton in the oceans to restore stability to the climate by extracting CO2 from the air.

We Must Achieve Zero GHG Emissions from Transport.

Worldwide over 1 billion cars, vans, trucks, buses, tens of thousands of aircraft and many thousand ships at sea and railroad locomotives together combust roughly 50 million barrels of the 100 million barrels of petroleum extracted from the Earth *EVERY DAY*. The petroleum burned to provide the motive power to move people and goods accounts for nearly one-quarter of all CO2 emitted daily into the atmosphere. In the U.S. where coal burned to generate electric power was once the largest source of CO2, emissions from power generation has been reduced during the last decade by switching to natural gas, wind and solar. Transport is now the largest source emitting 35% of U.S. CO2 from a sector of the economy where emissions are growing, not declining. The IPCC global emission targets cannot be achieved without reducing transport emissions to net zero by 2050.

Transport Is the Largest source of U.S. and Oregon GHG Emissions.

The IPCC emission targets cannot be reached without eliminating the use of petroleum fuels in the transport sector. International Energy Agency (IEA) data show that petroleum fuels account for nearly half of global GHG emissions, and

that 60% of GHG emissions from petroleum fuels are emitted from powering the transport sector.[1] The International Transportation Outlook published by the Organization for Economic Development estimates that --

> CO2 emissions from transport could increase 60% by 2050, despite the significant technology progress assumed in the Outlook's baseline scenario. If no additional measures are taken, CO2 emissions from global freight could increase by 160%, passenger air traffic could grow between 3% and 6% annually, [and] [m]otorised mobility in cities is set to double between 2015 and 2050, rising 41% to 2030 and 94% by 2050 in the Outlook's baseline scenario.[2]

This magnitude of economic development cannot be accommodated within the Earth's climate system unless GHG emissions from transport are eliminated.

The global trend described by the OECD Transportation Outlook is occurring in the U.S. The Energy Information Administration (EIA) reports that 92% of the energy used to power transport is obtained from petroleum fuels. The remaining 8% is obtained from natural gas, ethanol, hydrogen and electricity. With the decommissioning of some coal plants and annual growth in petroleum fuel use by on-road vehicles and aviation, transportation has become the largest source of GHG emissions (35.9%) in the U.S.[3] Since 2011, emissions from the transport sector have increased 2-3% annually and are expected to continue to grow despite the sale of more fuel efficient petroleum fueled vehicles. If this annual increase in emissions from transport continues, emission growth from transport will cancel out all the gains made by decarbonizing the electric power grid.

Replacing Internal Combustion Engines with Zero Emission Vehicles.

The climate crisis demands that the use of fossil fuels in the transport sector must end. This calls for the accelerated replacement of fossil fueled (FF) internal combustion engines (ICEs) throughout the transport sector. Electric and hydrogen

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[1] Global crude oil production is approaching 100 million barrels/day (mm bbl/d). Approximately half (50 mm bbl/d) is refined into fuels combusted to power on-road vehicles, trains, ships and aircraft to transport people and goods; 35% (35 mm bbl/d) is combusted to provide energy for industry and commercial/residential space heating; 15% is not used as a fuel but as feedstock for chemicals and plastics, or as lubricants. Fifty million of every 85 million barrels burned every day (60%) is used to power transport.

[2] International Transport Forum, Transport Outlook (OECD 2017), available at: https://www.oecd-ilibrary.org/docserver/e979b24d-en.pdf?expires=1548796341&id=id&accname=guest&checksum=1C79106261143806F5CBDFC76FC2574B.

[3] EIA Monthly Energy Report (Jan. 2019). CO2 emissions from transportation fuels (1,842 million metric tons) as share of total U.S. CO2 emissions (5,131 million metric tons) in 2017 (full year 2018 data not available).

powered vehicles emit no GHGs from the vehicle. Zero emissions are achieved if the electricity or hydrogen are generated using renewable sources of energy. The global and U.S. trend of increasing emissions from transport need not be our destiny.

To date only Norway has adopted policies designed to eliminate petroleum fuels for powering on-road vehicles. China and California recognize the need to transform transport to zero emission technologies, but neither has yet adopted policies to achieve this result. The approach taken by the US in the 2011 Obama fuel efficiency standards will not even come close to zero emissions in the on-road transport sector. Reducing per mile fuel consumption in internal combustion engines (ICEs) is a dead end for the planet because global emissions will continue to grow as more people acquire more petroleum fueled vehicles and efficiency gains are overwhelmed by increased vehicle miles travelled. No matter how efficient petrol fueled vehicles become, burning oil is not a strategy for reducing CO2 emissions to zero.

Zero Emission Alternatives Are Available.

The recent development of battery technologies has resulted in commercially available zero emission vehicles (ZEV) that can replace ICEs to power passenger vehicles, vans, transit and school busses, passenger and freight rail.

Tesla has shown the way with its new Model 3 with a 230 mile range priced under $40,000. Sales exploded since the first units became available in September. December sales topped 25,000 units which is 400,000 annually, compared to a few thousand sold by all EV manufacturers in December 2017. Tesla is now on the path to joining the ranks of the major manufacturers and is challenging their market dominance. GM announced in December it is closing plants to facilitate a broad conversion to ZEV technologies. Chevy has stopped production of the hybrid Volt, and replaced it with the all-electric 230 mile per charge Bolt. Nissan has extended the battery range of the Leaf and is committed to ramping up its production of EVs in the US. Ford joined VW in announcing a partnership to develop advanced ZEV technologies.

New electric pick-up truck and 18 wheeler models were commercially introduced in 2018 and Tesla will release a long-haul truck by 2020. Hydrogen fuel-cell vehicles are also in use in California, Europe and Asia. With just 50- 60 hydrogen fueling stations strategically located along the interstate system, the hydrogen fuel cell could become the ZEV technology of choice for long haul truckers.

The challenge is how these technologies can be deployed quickly enough to replace over 1 billion ICEs by 2050.

Public Policies Must Be Adopted to Change the Course of our Future.

Currently more than 60 million new passenger vehicles and a few million new trucks are sold annually worldwide. In the next 20 years between 1.5 and 2 billion new vehicles will be produced to both replace the existing global fleet and add vehicles to meet growing demand. The average useful life for a passenger vehicle is 15 years; 25 years for most trucks. Assuming this replacement rate continues, most vehicles on the road today will be replaced before 2050. If they are replaced with more ICEs, the IPCC CO2 targets cannot be met. As of 2018, less than 1% of global new vehicle sales are ZEVs. But to meet the IPCC zero emission target from the transport sector, within a few years 100% of sales must be ZEVs to replace all ICEs by 2050.

This could be accomplished if every new car buyer insisted on buying a ZEV. Public demand, if consciously guided by the choice needed to protect our planetary home, could transform the world's vehicle population by 2050. But that is not happening, either because people are not making conscious choices or their choices are not guided by planetary consciousness.

Norway is demonstrating another path for how this transformation can be achieved. Thirty percent of new vehicle sales are ZEVs, and 40% of miles driven are in ZEVs. How has Norway created broad public demand for ZEVs? By investing in a ubiquitous electric vehicle (EV) charging network where power is often free at hours when there is excess capacity in the grid, by creating tax benefits that offset the incremental purchase price of a new EV, and by setting 2025 as the deadline for ending the sale of new ICEs. Clearly the public will respond if the price signals are set and a national decision is made to stop using petroleum fuels.

Capital costs of new EVs are dropping rapidly as advances in battery technology reduce their cost and weight. Bloomberg estimates battery EVs will achieve costs comparable to new ICEs by 2023-25; California estimates comparable costs by 2030. Soon special tax incentives may not be needed to make EVs price competitive, but competitive pricing will shift only some market demand. Not 100%. To achieve the IPCC targets, the sale of all new ICEs must end within the next decade. This can only be accomplished by national legislation that prohibits the production and sale of new ICEs.

States Can Make a Major Contribution to Shaping Consumer Choices.

States have a major role to play in creating the market and policy environment that favors ZEV technologies, and the infrastructure needed to support convenient use of EVs and other ZEV technologies. State policies can be designed to create strong incentives for vehicle owners to replace their ICEs with ZEVs without enacting mandates that require owners to abandon ICEs.

California is considering legislation to develop a plan for achieving 100% ZEV sales. *See* AB 40 (2018). Some states are choosing to invest public resources to purchase only zero emission technologies for public fleets. Clunker replacement programs can provide incentives for owners to scrap, rather than sell, gas guzzlers. State building codes can ensure that all new dwelling units include charging station access for EVs. This is especially important for multiple dwelling unit properties where residents do not own or control common spaces outside their unit. Fast charging stations are also important along major intercity traffic corridors and highways that serve rural areas. States also can create strong incentives by adopting the California ZEV mandate requiring auto manufacturers to achieve minimum sales targets, providing licensing, fee and sales tax rebates, preferential access to HOV lanes and toll exemptions for ZEVs, and exclusive access zones for ZEVs in high air pollution zones. States can also use tax policies to encourage business and industry to invest in ZEV technologies. For example, tax credits for the purchase of new ZEVs can be paired with restricting recognized capital investments to ZEVs for tax purposes, and limiting operating expense deductions for vehicle fuels and maintenance to ZEVs. In addition, publicly funded or licensed transport services that involve high mileage vehicles, such as commercial bus and taxi services, and hail-a-ride services, can be restricted to ZEVs.

State climate legislation, state and local building codes, parking policies and HOV access rules should all be evaluated based on the support they provide for encouraging owners to accelerate the replacement of ICEs with ZEVs.

Oregon H.B. 2020.

A. 80% GHG Reduction Not Sufficient to Prevent Climate Disaster and Not Consistent with IPCC 2018 Report.

The 80% reduction target is likely a carryover from the 2018 draft of the bill before the latest IPCC report was released in October, 2018. The 2007 IPCC report had called for an 80% reduction by 2050 based on the 2 degree (C) that was

subsequently adopted by the Parties at the 2009 Copenhagen conference. The 80% target also was linked to avoiding the atmospheric loadings that would be achieved by reducing GHG emissions to 1990 levels by 2020, and that further reductions would be achieved annually thereafter through 2050.

The 2018 IPCC report evaluates the GHG reductions needed to avoid exceeding a 1.5 degree (C) increase in global temperatures. The 1.5 C target is based on observed changes in natural systems that exceed the expected changes at the current stage of climate disruption. The science cannot be certain regarding the magnitude of global temperature increase that will trigger tipping points that cause a runaway climate disaster, such as unstoppable firestorms that release into the atmosphere the carbon currently stored in forests that burn continuously through the winters, methane releases from vast reservoirs currently trapped below arctic permafrost that is now thawing more rapidly than previously expected, sudden sea level rise from the collapse of massive Antarctic and Greenland glaciers, and the death of plankton populations that are responsible for the greatest sequestration of carbon on the planet. To avoid these potential consequences at temperature increases above 1.5C, the IPCC developed its best estimate of the emission reductions needed to keep warming from exceeding 1.5 C.

The IPCC report also noted that global emissions since its 2007 recommendation for achieving the 2 C target exceed the recommended reductions. Total atmospheric loadings of CO2 are now significantly greater than is necessary to meet the 2 C target. Thus an 80% reduction by 2050 is no longer considered sufficient to maintain global temperatures within the 2 C target.

An 80% reduction is no longer sufficient to prevent a climate disaster. The bill should be revised to reflect the current state of the science. The 80% emission reduction "goal" declared in section 1(b) is not an enforceable standard for which any public or private entity will be held accountable. It serves primarily as a planning target for developing policies and determining the number of "allowances" to be sold. Given the exemptions for fuels used in aviation, watercraft and railroad locomotives, plus the exemption for a large number of small sources (emitting less than 25,000 metric tons of CO2 equivalent, and the exclusion for emissions related to the sale of energy to users outside Oregon, the percent target omits from regulation a significant share of emissions. Thus the 80% target is misleading. Actual reductions will likely be only 70 – 75%.

For all these reasons, section 1 of the bill should be revised to establish 98% reduction of regulated emissions as the ultimate "goal" of the legislation.

Section 7 (2) (d) (B): "consistent with federal law."

This section should be revised to read: "not in conflict with federal law." The legislative declaration that the bill shall be interpreted in a manner "consistent with federal law" can be argued to, and construed by a state or federal court to narrow the State's discretion to those actions, policies or regulations in effect under federal law. The Supreme Court has recognized that states have broad discretion to exercise the police power to protect health, safety and the environment except when such actions are in conflict with federal law. The language of the bill should assert the maximum authority for states to act under the Constitution, and not invite litigants to ask a court to limit state actions to those that are explicitly authorized by federal law.

Section 10 (2)(d): Exclusion from "regulated emissions" fuels used in watercraft or railroad locomotives.

Watercraft. Commenters object to the permanent exclusion of emissions from these sources. Large watercraft using Oregon ports are significant users of bunker and diesel fuels. New zero emission technologies are being developed for powering watercraft including vertical wind vanes that drive generators to produce electric power on board, and hydrogen fuel cells that power engines without GHG emissions. Emissions from large watercraft fueled in Oregon should not be permanently excluded from regulated emissions.

Alternative options include either a time limited exclusion which will allow the shipping industry additional time beyond 2021 to adopt and install lower or zero emission technologies, or adopt a fuel volume exclusion that allows smaller craft such as coastal fishing craft with few affordable alternatives to be excluded from treatment as regulated entities or users of included fuels.

Pre-emption provisions of the Clean Air Act do not apply to the inclusion or exclusion of fuels from "regulated emissions" for two reasons. First the bill does not establish a standard limiting the emissions of GHGs from a vessel. Rather it affects the price the vessel must pay to acquire the fuel instead of establishing measurable limits on vessel emissions of GHGs. Second the bill regulates the conduct of the person producing or transporting the fuel into the state rather than the conduct of the person owning the vessel. Thus federal pre-emption in § 209 of

the CAA do not bar inclusion of fuels used by watercraft when determining whether the person selling the fuel has an allowance that authorizes the lawful sale of the fuel.

Railroad Locomotives. The same objection applies to the permanent exclusion of fuels used by railroad locomotives. Railroads have the option to use diesel fuel to power the electric motors that drive locomotives or use electricity from the grid through the installation of catenary systems that deliver electric power to the engine through overhead lines. Throughout most of Europe, the railroads have been electrified and diesel emissions eliminated. Railroads in Oregon have the same opportunity to exempt themselves from the effects of including their fuels within the scope of "regulated emissions." Their fuels should be included to create an incentive for railroads to eliminate GHG emissions from their operations.

CONCLUSION.

Elders Climate Action supports passage of the bill with changes designed to assure that the result of the legislation is to achieve reductions to bring Oregon GHG emissions close the net zero objective defined by the latest IPCC report as necessary to prevent a runaway climate catastrophe.

Respectfully submitted on behalf of Elders Climate Action

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Robert E. Yuhnke is a former Assistant Attorney General who served as legal counsel to the Pennsylvania Department of Environmental Resources with responsibility for developing regulations and litigation strategies for cleaning up air pollution from the steel industry. Later he created the clean air program at Environmental Defense Fund with primary focus on stopping the acidification of forests and watersheds from acid rain. He also created the transportation program at EDF and played a major role working with key members of Congress in drafting or negotiating provisions of the 1990 Clean Air Act Amendments. After EDF ended its transportation program, he created the transportation program for the Southwest Energy Efficiency Project (SWEEP) where he worked with legislators in six states to enact electric vehicle legislation, and with metropolitan planning organizations to coordinate land use policies with transportation investments to reduce regional VMT growth and congestion. Currently he co-chairs the committee assembled by the U.S. Climate Action Network to develop a strategy for reducing CO2 from the transportation sector to achieve the current IPCC CO2 goals for 2030 and 2050. He is a graduate of Yale Law School ('72).