

April 6, 2023
Re: HB 2613
To: The Joint Committee on Transportation

Dear Sirs and Madams:

The Engineers for a Sustainable Future wish to follow Metro Climate Action Team (MCAT) in congratulating the Oregon Legislature for creating and implementing a very successful EV incentive program. The program will avoid a significant amount of greenhouse gases from polluting our environment and causing unnecessary health issues in our communities.



We add some of our perspective on the importance of planning and executing what is needed for emissions reductions. Momentum is important!.

We applaud and support HB 2613, which we believe would fund this program in the future. But we ask the Committee to make every effort to have the funding restored for the full fiscal year, so there are no gaps in incentive availability. Perhaps an amendment might include a provision to pay buyers in May or June when funds become available in July?

Thank you for considering our request.

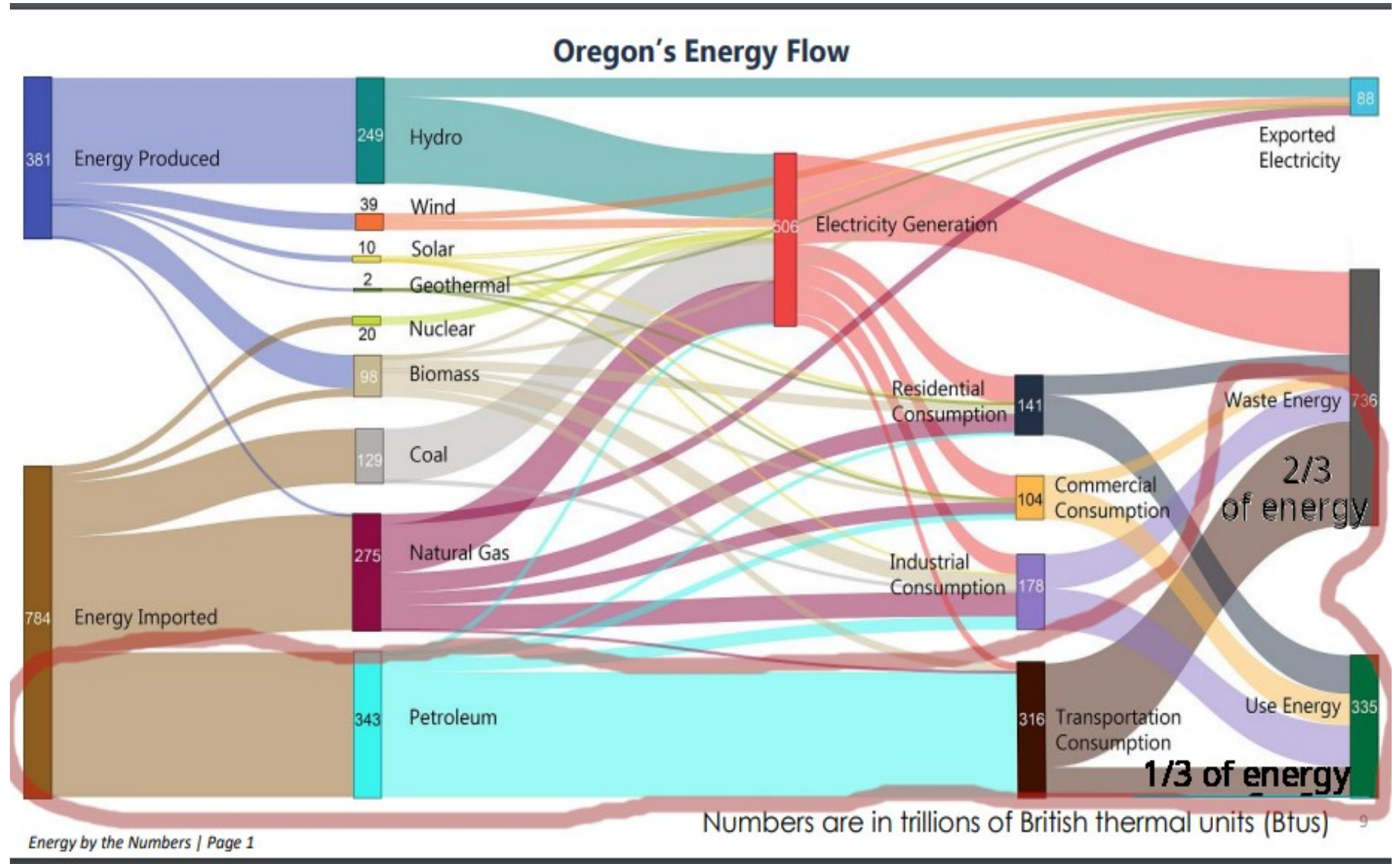
Sincerely,

Mike Unger, President
Robert James, Vice President
Dick Fay, Ed Averill, Carol Brown, Adam Ritenour, Board Members

The Importance and Opportunity of Having Oregonians Buying EVs, Soon.

It is important to concentrate on the climate issues that make a difference. **A very key area is emissions.** We need as strong an HB 2613 as possible to keep people buying EVs. Here is some context for that.

Oregon's Department of Energy described our Energy Flow like this:



We need to quickly reduce Transportation Emissions by approximately ½ by 2030. A very important part of accomplishing that is to take advantage of the fact that we buy a lot of energy that is not really useful to us because it ends up as waste heat. There is a broad line showing the area of the energy flow above of importance.

Notice that of our imported energy (purchased from outside the state), a large portion is Petroleum – more than 2/3 of it becomes waste heat because of the inefficiency of most combustion engines. Petroleum is largely used for automobiles.

The Department of Energy shows this breakdown of emissions in the adjacent Emission Breakdown.

Our largest problem of emissions is Transportation. Most of that is for personal passenger cars. Most of which carry only one passenger at a time.

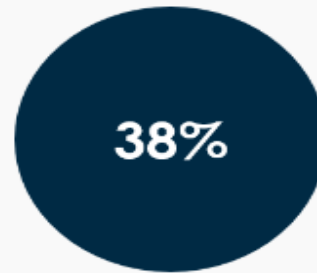
So, every replacement of a single passenger vehicle with an electric vehicle:

- Eliminates almost all of the emissions for that use, and
- Decreases the total energy used to approximately 1/3 of the energy bought in Petroleum.

The opportunity to reduce this major portion of our emission depends on:

- **Enthusiasm for buying EVs.**
- Available of charging stations
- Availability of the required energy
 - from owner's solar panels, or
 - from the electric grid.

Emission Breakdown



Transportation

Transportation accounts for about 38 percent of Oregon's 2016 energy consumption. This includes personal, passenger, and commercial vehicle fuels, both on and off the roads, plus airplanes, boats, barges, ships, and trains. Nearly all transportation-related sources of energy are imported from out of state for in-state use.

When it comes to the amount of money Oregonians pay for energy, the cost of transportation fuels makes up about half.



Electricity

Electricity is where most people begin when thinking about energy — the critical resource that powers our day-to-day lives. About 35 percent of Oregon's 2016 energy consumption was electricity, which comes from facilities across the western United States and in Oregon.

Hydroelectric power makes up the largest portion of Oregon's electricity resource mix, followed by coal and natural gas. With our Renewable Portfolio Standard, half of Oregon's electricity will come from renewable resources by 2040.



Direct Use Fuels

Direct use fuels include fuel oil and natural gas used to heat homes and commercial spaces, fuels used for other residential purposes, such as gas stoves, solar thermal heating, and fuels used directly in industrial processes. About 27 percent of Oregon's 2016 energy consumption was direct use fuels.

It is necessary to keep Oregonians enthusiastic about joining the rush to benefit from the long-term lower expense of EVs, and the Emissions Benefits both in the big Climate sense, and in the local health consequences.

Keeping the EV subsidies funded is an important part of keeping Oregonians active in the buying of new EVs!

We can make the energy picture work IF WE WORK AT IT and make appropriate plans!

EVs:

- **RawTotal 2020 Oregon energy:** 1085 Trillions of BTU x .293 Watt-Hours/BTU = 317,905,000,000,000 watt-hours = **318 MMWH (Million-Mega-Watthours)**
 - **Transportation:** (Actual energy consumed for “ICE” gas cars.) = RawTotal * 38% = **120 MMWH**
- **Needed electricity in EV** is smaller than (for fossil RawTotal * 38% = 120 MMWH) because EV is 3x more efficient.
So, EV newly needed from the grid., 120 / 3 = 40 MMWH

Savings: 80 MMWH

While we’re at it, a similar “electrify everything” situation is building heating:

Direct Use Energy for building heating: RawTotal * 27% = **86 MMWH**

- Air to Air heat pumps have seasonal efficiencies from about 2.4 to 4. Meaning that to get the needed 86 MMWH out, they only need to put about 1/3 that much, or 86 / 3 = **27 MMWH**
Savings: 59 MMWH

(Note this would be better by another factor of 2 or so if ground source heating was used.)

- Water to Air heat pumps have seasonal efficiencies from about 4 to over 5. Meaning that to get the needed 86 MMWH out, they only need to put about 1/3 that much, or 86 / 4.5 = **19 MMWH**

Savings Summary:

- **For EVs** there is a **80 MMWH** savings and for the Air-to-Air heat pumps, there is a **59 MMWH** savings of energy we don’t have to buy.

Extra Grid Load:

- EV new grid load: 40 MMWH
- **Building Heating new grid load** 27 MMWH
- **Total** 67 MMWH

The currently planned 3.1 GW coastal use of Offshore Wind is expected to provide annual energy of

$$\underline{3.1\text{GW} \times 60\% \text{ availability} \times 365 \text{ days/year} \times 24 \text{ hours/day} = 16 \text{ MMWH}}$$

The available wind energy near Coos Bay, if fully developed, would allow approximately 20x that amount. Providing additional 325 MMWH of the needed grid load. (see below)

Excerpt from NREL Oregon Offshore Wind Site Feasibility and Cost Study
<https://www.nrel.gov/docs/fy20osti/74597.pdf>

To accomplish any significant deployment in the Pacific region, and specifically in Oregon, floating wind energy technologies will be required. These technologies are needed because 97% of the **62 gigawatts of available technical offshore wind energy resource in Oregon** is in water depths greater than 60 meters (m). Although floating offshore wind energy technology is still in a nascent stage of development, it is advancing toward commercialization in both Europe and Asia. [note: 1 The first multiturbine commercial floating wind project was commissioned in Scotland in 2017 by Equinor.]

Converting GW to MMWH:

$$\underline{62 \text{ GW} \times 60\% \text{ availability} \times 365 \text{ days/year} \times 24 \text{ hours/day} = 325 \text{ MMWH}}$$

In Summary: (1) we need HB 2613 to keep the enthusiasm for EVs moving. (2) we need to support the grid with prompt planning to feed the “Electrify Now” path. And (3) the same path supports the other big electrification issue of building heating to mover from fossil fuel heating to heat pumps.