JOINT TASK FORCE ON REBuilding –

Proposing changes to Oregon's Building Code

Wendy Woods Testimony for 6.14.22

Chair and Committee, thank you for the opportunity to speak. My training includes a PhD in Ecology. Understanding of Ecology clarifies the importance of your work in the context of our looming climate crisis. The rapidly accelerating pace of global warming is alarming. I am going to suggest some ideas for policies you could implement that would slow emissions from buildings.

Scientists are certain that the main cause of global warming is burning fossil fuels. The solution is to STOP burning fossil fuels; and the sooner the better. Each day we emit more greenhouse gases, our climate gets warmer, and there is no cost-effective way to remove the carbon we are dumping into our atmosphere. We are making our planet uninhabitable. Knowing we are in a hole, why do we continue to dig deeper?

Buildings are Oregon's second largest source of greenhouse gas emissions next to transportation. Emissions from buildings are primarily due to burning natural gas (and other fossil fuels) to heat space and water. We can fix this problem. Better ways to heat buildings exist now. Electric heat pumps either heat or cool buildings efficiently without burning fossil fuels. Electric heat pump water heaters are several times more efficient than any other option. I have verified this in my own older home which is retrofitted to be all-electric and solar powered. New construction should be required to heat and cool with all-electric heat pump technology. Most existing buildings are residential. "Carrots and sticks" are needed to incentivize installation of heat pumps for heating space and water in existing buildings. For renters, portable heat pumps are a less expensive solution they can take when they move.

When the shell of a building is super-insulated over a continuous air-barrier, far less energy is needed to heat and cool the building. For example, in my own home, air-sealing just the attic floor with an inch of closed cell spray foam then covering that with 20 inches of fiberglass batt insulation, cut my energy usage **in half** to only 10 kwh/day --- and that includes charging an electric car. Now, the

inside of my home is more comfortable and my utility costs are lower. It has been two years since I purchased any fossil fuels.

PHIUS (Passive House Institute of the US) has a *Certification Guidebook* that details methods used to construct tight buildings. A PHIUS house is super resilient, it needs no furnace at all. These homes simply retain the heat that is already inside—body heat, heat from the stove or refrigerator. Further, this type of construction keeps out smoke from wildfires and other airborne pollutants.

See https://www.phius.org/standards/retrofit for an overview of retrofit methods and scroll down to a button to download the *PHIUS Certification Guidebook* for detailed methods. These could become standard in building code.

European countries have adopted Passive House building methods as code. The USA lags far behind, but **Oregon could lead our nation by adopting these methods in our building code for new construction and for some retrofit applications.** One of many regional experts on these methods is Eugene architect, Jan Fillinger, author of *Passive House Details*.

PHIUS uses a blower door test to measure performance, specifically how tightly a building is constructed. The standard is a maximum air leakage of 0.06 CFM/square foot of enclosure. Oregon could require that new or existing buildings meet this or a similar performance standard prior to sale. The old methods of building are no longer efficient enough to be resilient to climate events. Besides burning fossil fuels, they are wasting energy. The building code is the most effective tool for change when it sets a high performance standard for new construction, such as PHIUS.

The international group of scientists who wrote the IPCC report this year singled out natural gas, a fossil fuel composed mostly of methane, as the most effective lever we have in this moment to slow the pace of planetary warming. Methane is more than 80 times more potent at trapping heat in our atmosphere than carbon dioxide, a more familiar greenhouse gas. Methane leaks from the entire distribution system including from the pipes connected to your gas stove even when the stove is turned off. The very existence of a natural gas distribution system is cooking our planet. The sooner we shut it down, the better. And when methane is burned, what does it produce? Carbon dioxide. Methane warms the globe both before and after it is burned. Both fossil methane and renewable

methane (RNG) cause the same pollution. Methane is methane. The sooner we stop using either natural gas or RNG, the better for all living beings on this planet. Slowly phasing out natural gas is not an option if we want to mitigate the climate emergency. Electrification is the solution and we can do it now. Saul Griffiths book *Electrify* tells us how to transition to a clean energy economy.

To sum up a few policy ideas:

Require new construction be all-electric and air tight at 0.06 CFM/square foot of enclosure (as required for PHIUS certification). Disclose actual value on MLS information. This is the single most informative measure of building performance.

Incentivize existing buildings to be all-electric and air tight at point of sale after 2025.

Quickly phase in PHIUS building methods as standard in building code.

Quickly phase out burning of fossil fuels or wood products to heat buildings.

Require that new construction include fast chargers for EVs and be Solar PV ready.

Disallow sale of appliances powered by methane or other fossil fuels after a specified date (2025?)

New construction should be required to heat and cool with all-electric heat pump technology.

Carrots and sticks are needed to incentivize installation of heat pumps for heating space and water in existing buildings.

Uniform State Building Code should require very high performance standards, such as PHIUS, for both new construction and retrofits at point of sale.

For renters, portable heat pumps are a less expensive heating and cooling solution they can take with them. For low income renters, subsidize portable heat pumps, INDOW Windows (see www.indowindows.com) and other products which save energy and keep wildfire smoke from infiltrating buildings.

Incentivize community solar projects.

Implement retrofit projects like Bloc Power (a privately funded business that retrofits multifamily buildings) --- see https://www.blocpower.io

Regulate refrigerants; require to have low GWP. https://www.sanden.co.jp Sanden makes a heat pump that uses carbon dioxide (GWP=1) for a refrigerant.

Promote rainwater collection systems, greywater recycling systems and put these regulations in State Building Code. Water is already another dwindling resource as our planet warms, especially for Eastern Oregon.