CONSOLIDATED OREGON INDIVISIBLE NETWORK

April 15, 2025

Co-Chairs and Members of the Joint Committee on Transportation,

My name is Jeff Hammarlund. I am a semi-retired professor of climate and energy policy in Oregon, but I am testifying today in my role as co-chair of the Climate, Energy and Environment Team of the Consolidated Oregon Indivisible Network. As you probably know, COIN is a network of over 50 grassroots Indivisible groups located throughout our state.

COIN is proud to support the Zero-Emission School Bus Act (HB 2945) with the -1 amendment. At first, some of our rural members had concerns about the costs involved given the lack of infrastructure and other resources in many rural parts of our state. However, as we learned more about the exemption opportunities and flexibility options, especially those included in the -1 amendment, these concerns were resolved.

I am retired now, but for many years, I was a member of a three-professor team that taught a course for graduate students and mid-career professionals called the Smart Grid and Sustainable Communities. Beginning in 2010, I was also part of a team hired by Portland General Electric, the Energy Trust of Oregon, and NEEA to lead workshops for large commercial, industrial and institutional customers in Oregon, including school bus fleet managers of Oregon school districts. We told school district facilities managers that an exciting new opportunity would be coming. That opportunity is now before us.

Of course, the first phase of this exciting opportunity involved transitioning to zero emission buses. According to the EPA under the current administration, if half of all school buses in the country switched from diesel to electric, about 2.1 million tons of carbon dioxide (CO_2) could be reduced annually. Kids would be protected from harmful diesel exhaust, a known carcinogen. I explained to the school bus fleet managers, that these benefits, combined with the other benefits you are hearing from folks today, mean that they would earn them a solid grade of A from the students, parents, and school boards.

However, I also told them that they would soon be able to take one more step for "Extra Credit", a step that would lead to a truly stellar grade of A+. This involves the use of Vehicle-to-Grid (V2G) technology. On average, school buses are parked for up to 18 hours a day during the school year and nearly three months over the summer. Why not give them another assignment when they are sitting idle? When they aren't being used to transport

students, electric school buses can be used as mini, mobile sources of power via their battery storage. V2G technologies make use of bidirectional batteries (meaning energy goes in and out) that can store surplus energy and then return it to the grid during peak times of use. This provides a valuable service as more renewable energy sources are added to the grid.

School buses are in many ways ideal for V2G. There's no doubt about when the buses will be used for transporting kids and when they will be available to help the grid. They tend to run on the same schedule twice a day, five days a week. The specific schedules will vary depending on the school district. However, in general, school buses start operating at 6 or 6:30 am, drive kids to school, and finish up by 9 or 9:30 am. While the kids are in class—when there's the most solar energy flowing into the grid—the school buses can plug into fast-chargers. The buses then unplug and drive the kids home in the afternoon. They have large batteries, typically four to six times a Tesla battery, and most drive very few miles so there's a lot of charge left in the battery by end of the day.

After the kids are dropped off, the buses plug in again, just as folks are returning from work and power demand begins to spike on the grid. But instead of further increasing that demand by charging, the buses will send their surplus power back to the grid. Once demand has waned, around 10 pm, the buses start charging, topping themselves up with electricity from other sources, so they're ready to pick up kids in the morning.

On weekends, holidays, or over the summer, the buses will spend even more time sitting unused—a whole fleet of batteries that would otherwise be idle. Given the resources needed to make batteries and the need for more grid storage, it makes sense to use the available batteries as much as possible. The batteries are being used for the clean transportation of children during set times during the day while in the evening, the same batteries are being used during the peak hour for stabilizing the grid.

The school bus fleet managers like getting an A+ grade for being good citizens, but they also like the fact that their buses can become revenue producers. When parked at the depot, these buses can feed energy stored in the battery to the grid, earning revenue from the local utility for the school district. This additional income can help offset the cost of the bus and the V2G charging system.

The best part is that this is no longer a pipe dream. There are many success stories, but one case study that I have been following involves the Oakland Unified School District in Northern California. In 2024, that school district introduced 74 electric buses to transport children with disabilities and protect their health. The district leverages and

integrated V2G platform to let the buses send power to the grid through the local utility's demand response program, thus offsetting operating costs.

I encourage the members of the committee to support this bill so you can also earn an A+ grade. I realize that the critical federal support that has been available appears no longer to be available. However, we should still start with $20 million in a revolving fund so more successful demonstration projects can show how valuable zero-emission school buses can be for our kids, our schools, our grid, and our health.

Sincerely,

Jeff Hammarlund, co-chair, COIN Climate, Energy and Environment Team and member, COIN Legislative Team