Submitter: John Perona

On Behalf Of:

Committee: Senate Committee On Energy and Environment

Measure, Appointment or Topic: SB634

Thank you for the opportunity to submit testimony for SB 634. I write to OPPOSE the bill.

I am Professor (emeritus) of Chemistry at Portland State University and author of the climate change science/policy text for laypersons titled From Knowledge to Power, which has been widely circulated in Oregon.

I oppose SB 634 because it would undermine Oregon's goals to attain a zero emissions electricity sector. Large hydropower already represents about 40% of Oregon's electricity generation, and there is little potential for increasing this - because most of the power-intensive sites have already been exploited. For this reason, adding large hydropower to the list of power sources eligible for RPS credits does not advance our climate and clean energy goals. Instead, our existing large hydropower resource simply provides a baseline, to which genuinely new and zero-carbon power resources should be added. Those new resources, with tremendous potential for growth, are those intended to benefit from inclusion in the RPS.

It is also not well appreciated that hydropower is not a zero emissions resource, but leads to carbon dioxide and methane emissions from the upstream reservoirs, by a variety of mechanisms including (i) agitation to flush sediment that clogs upstream water intake and (ii) emanation of methane from both stirred-up sediments and from the fact that the upstream reservoirs can become partly anaerobic.

In 2020, reservoirs (including those associated with hydroelectric dams) contributed 5.2% of all human methane emissions. When adding CO2 and methane emissions for reservoirs together, for 2020, the global warming effect is found comparable to the aviation sector. This is not trivial. Please see https://doi-org.proxy.lib.pdx.edu/10.1038/s41561-022-01023-z

Other work describes very large variation among large hydropower facilities, in terms of their individual contributions to emissions. Poorly managed, older facilities generate more emissions. Please see https://pubs.acs.org/doi/10.1021/acs.est.9b05083

It is important to note that these greenhouse gas emissions arise as part of the normal operations of most of our aging hydropower resources. For smaller hydroelectric facilities the problem is less severe because the land area submerged by the upstream reservoirs is generally much less. This is some justification for

retaining small hydropower on the list of resources eligible for RPS credits.

The operation of other very low carbon resources, such as geothermal power plants, tidal power, wind power, nuclear power and solar photovoltaics does not generate significant amounts of greenhouse gas emissions. While nuclear power generation is, effectively, presently banned in Oregon, its ability to generate carbon-free power would justify its future inclusion in the RPS.

Thank you for the opportunity to testify in OPPOSITION to SB 634