May 12, 2019
To: Senator Burdick and members of the Senate Committee on Rules
From: Laurie Dougherty, Salem, on behalf of Coalition to Oppose SB 451

INCINERATING BIOGENIC CARBON VERSUS ANTHROPOGENIC CARBON:
BOTH CAUSE CLIMATE CHANGE AND TOXIC EMISSIONS

We oppose SB 451 and the awarding of renewable energy certificates for electricity derived from the incineration of ANY types of fuels at a solid waste incinerator. Not only should the incineration of municipal solid waste be denied renewable energy certificates for the portion of electricity produced from anthropogenic fuel sources, such as fossil-fuel-derived plastics, neither should electricity produced with biogenic fuel sources (including the biogenic portion of medical waste) be awarded renewable energy certificates.
When either biogenic (recently living) or anthropogenic (fossil fuel) carbon-containing substances are incinerated, nearly all of the carbon is immediately emitted into the atmosphere as a greenhouse gas, which will immediately begin having its global warming effects. **Greenhouse gases and air toxics produced from the incineration of <u>biogenic</u> sources**, such as food waste, paper, and lumber **are directly connected to**:

1) increased amounts of heavy metals and other toxins entering the bloodstreams of people downwind from the incinerator,
2) increased amounts of dioxin emissions,
3) reduced amounts of carbon being sequestered, and
4) greatly enhanced global warming above and beyond carbon in the "natural carbon cycle".

The amount of biogenic carbon dioxide reported in the smokestack emissions from the Covanta Marion incinerator in Brooks is determined by radiocarbon testing of four gas emission samples per year. Not only is this method of biogenic gas measurement flawed due to inadequate sampling techniques and unaccounted for fluctuations in the fuel mix (topics for a longer discussion that DEQ needs to have), it also does not account for the numerous negative effects of biogenic greenhouse gases that are often assumed to be relatively harmless because they are part of a "natural carbon cycle".

<u>Increased heavy metals and dioxin in people and the environment</u>

Some biogenic fuel sources that go into the incinerator contain heavy metals that are sent up the smokestack during incineration. For example, cardboard and paper often contain lead and cadmium.[1] Dioxins are described as the most toxic manmade substance known – even in minute amounts. The addition of certain food and other biogenic fuels to the incinerator waste stream helps generate additional dioxin emissions.[2]

<u>Reduced amounts of carbon being sequestered</u>

The incineration of carbon containing material sends nearly ***<u>all</u>*** of the resulting carbon dioxide into the atmosphere immediately (Sky Fill). If the biogenic materials are composted instead, much of the carbon will remain sequestered in the soil for decades or longer.[3] Burying fossil fuel plastics will sequester that carbon virtually forever.

<u>Biogenic carbon dioxide contributes to the climate "tipping point"</u>

The **speed** with which carbon is changed to carbon dioxide partly **determines its impact on climate change**. The **natural decay** of dead plants and animals emits carbon dioxide into the atmosphere **gradually** and gives the natural carbon cycle time enough to keep the **sequestered carbon** (*non-warming*) and **atmospheric carbon** (source of global *warming*) **in balance**. Conversely, the **incineration** of those same carbon sources **immediately releases nearly all of the carbon into the atmosphere as carbon dioxide** (Sky Fill) with no time to reach a natural balance. Biogenic carbon that is released as Sky Fill causes just as much warming while in the atmosphere as anthropogenic carbon emissions. This speeds us to a critical "tipping point" at which the process of global warming will accelerate much more rapidly than it is now because the melting of frozen tundra will begin releasing vast amounts of methane and other greenhouse gases.[4] The higher temperatures that are partly caused by biogenic greenhouse gases will also cause the oceans to stop absorbing greenhouse gas and will instead begin emitting it.[5] Biogenic greenhouse gas from incineration adds to the "kindling" of this rapid acceleration in global warming because it is emitted instantly. **Composting** will delay some of the greenhouse gas production for decades and also **sequester significant quantities of carbon**. **Waste reduction, reusing, and recycling can eliminate much greenhouse gas production entirely – while also generating many times more jobs than the incineration industry does.**

Footnotes:

1. https://bioresources.cnr.ncsu.edu/resources/the-effect-of-colorants-on-the-content-of-heavy-metals-in-recycled-corrugated-board-papers/ "The metals in the structure of the paper used in packages directly or indirectly in contact with foods are heavy metals. Mean values of 2.6 mg kg-1 Pb (lead), 2.8 mg kg-1 Zn (zinc), 0.094 mg kg-1 Cd (cadmium), 1.8 mg kg-1 Ni (nickel), and 25.4 mg kg-1 Cu (copper) were detected in test liner and fluting papers using inductively coupled plasma optical emission spectrometry (ICP-OES). The main sources of heavy metals are colorants, mainly consisting of conventional paint and pigments as well as spot and Pantone Matching System (PMS) colorants."
2. https://pubs.acs.org/doi/abs/10.1021/es030606y "Mixtures of commonly consumed food items produced ppb levels of total dioxins in exhaust gases upon combustion, suggesting that incineration of domestic food wastes is one of the sources of dioxins in the environment. A mixture containing some seasoned foods, such as mayonnaise spread on bread, produced more dioxins (29.1 ng/g) than a mixture without seasoned foods did (18.9 ng/g)."
https://pubs.acs.org/doi/abs/10.1021/es001210e
"Total amounts of dioxins found in the samples were 0.186 ng/g from newspapers alone, 1.42 ng/g from the branches of London plane, 102 ng/g from newspapers impregnated with sodium chloride (Cl wt % = 3.1), 101 ng/g from newspapers impregnated with sodium chloride mixed with PVC (Cl wt % = 2.6), and 146 ng/g from newspapers mixed with PVC (Cl wt % = 5.1). Samples with a higher chloride content produced more dioxins,"
3. https://www.sciencedaily.com/releases/2008/02/080225072624.htm
"Applying organic fertilizers, such as those resulting from composting, to agricultural land could increase the amount of carbon stored in these soils and contribute significantly to the reduction of greenhouse gas emissions, according to new research."
https://www.climate-policy-watcher.org/source-reduction/carbon-sequestration-by-compost-application.html
4. https://www.newsweek.com/arctic-permafrost-lakes-bubbling-methane-nasa-1119624

https://www.google.com/amp/s/www.forbes.com/sites/jeffmcmahon/2018/01/15/carbon-pollution-has-shoved-the-climate-backward-at-least-12-million-years-harvard-scientist-says/amp/
https://www.seas.harvard.edu/news/2019/04/trouble-with-thaw
5. Warmer oceans will increase atmospheric carbon dioxide and methane.
https://climatenewsnetwork.net/ocean-warming-speeds-up-cycle-of-climate-change/