February 7, 2020

Dear Chair Dembrow and Members of the Senate Environment and Natural Resources Committee:

Thank you for the opportunity to submit comments on SB 1530. We support the state's efforts to reduce GHG emissions. We are proud to be part of the solution. The facilities we operate, like the one located in Marion County, are internationally recognized as GHG mitigation tools, even after accounting for our stack emissions of fossil-based CO2. The IPCC called waste-to-energy a "key GHG mitigation measure." We do this by diverting degradable organics from landfills, the 3rd largest source of methane globally and in the United States, displacing grid connected fossil-fuel fired electrical generation, and recovering metals for recycling. Our GHG benefits relative to landfilling have been recognized by California's air and waste regulatory agencies, [i,ii,iii] U.S. EPA scientists,[iv] Columbia University's Earth Engineering Center,[v] U.S. EPA, [vi,vii] the Obama Administration's Clean Power Plan,[viiiix] the World Economic Forum, [x] and the Joint Institute for Strategic Energy Analysis ("NREL"). [xi]

The benefits of diverting waste out of landfills to recycling and energy recovery are clearer than ever. As currently estimated, landfills are Oregon's 2nd largest source of methane. Yet, across a series of recent studies employing direct measurement of methane plumes via aircraft downwind of landfills, actual measured emissions from landfills have averaged **twice the amount reported** in GHG inventories. [xii,xiii,xiv,xv,xvi,xvii] Correcting Oregon's GHG inventory to reflect these measurements would place landfills as the leading source of methane in the state.

Not only are methane emissions from landfills in Oregon likely underreported, the State's current inventory downplays methane's potency. The current 100-year methane GWP is 36% greater than the value used in Oregon's GHG inventory. [xviii] There is growing recognition that the 100-yr GWP does not accurately capture the climate impacts of SLCPs, including methane. For years, climate scientists have been calling for separate regulation of climate pollutants like methane owing to their potency and other differences relative to CO_2.[xix,xx,xxi]

In response, California uses a 20-year GWP in its *Short-Lived Climate Pollutant Reduction Strategy:*

> "The use of GWPs with a time horizon of 20 years better captures the importance of the SLCPs and gives a better perspective on the speed at which SLCP emission controls will impact the atmosphere relative to CO_2 emission controls."[xxii]

In its *Policy and Action Standard*, the WRI GHG Protocol recommends the use of 20-year GWPs in looking at the significant effects of policies or actions designed to reduce emissions of SLCPs:

> "Twenty-year GWP values may be used to focus on short-term climate drivers, and should be used if the policy or action accessed is specifically designed to reduce emissions of short-lived greenhouse gases, such as methane."[xxiii]

Most recently, New York State has adopted the 20-year GWPs in its ambitious legislation to reach net zero GHG emissions by 2050.

Yet, under the current version of the Bill, the Marion County WTE facility is the only waste management facility in the cap & trade program, required to purchase 100% of the allowances needed to cover its anthropogenic emissions. At the same time, landfills are ***not*** under the cap and do not have a requirement to purchase allowances. In effect, the legislature has imposed a cap & trade burden on one facility in the entire state, reflecting less than a tenth of one percent of the emissions from the waste management sector corrected for the latest science.[1]

Under the current version of the bill, landfills are subject to more stringent requirements around landfill gas collection and control; modeled after the California approach. however, California costs landfills **less than fifty cents a ton** and is not subject to any market risk. Unless addressed, the estimated cost to the Marion EfW facility would **start at $6 / ton** and will grow over time. This will create an economic incentive to landfill more, in direct contrast to the State's solid waste management hierarchy and the widespread recognition of WTE as a source of GHG mitigation. Third party expert review of last year's bill HB2020, identical to the current bill SB 1530 in its treatment of the waste sector, found that the "program invites intrastate emissions leakage and could raise overall emissions from the waste management sector."[xxiv]

Perhaps even more problematic, is that California's approach to controlling emissions from landfills isn't working. So far during the cap & trade program, California's recycling rate has dropped and landfilling has increased. New information provided by NASA has shown that California landfills are "super-emitters" of methane, even under California's strictest-in-the-nation LFG landfill gas requirements.

We are not asking for special treatment, only equitable treatment in the waste management sector. One approach would be to treat WTE facilities the same as landfills are currently treated, by excluding them from the cap & trade program. If parity in treatment cannot be achieved in the waste sector, the disparity could also be addressed by including the Marion County facility as an Emissions Intensive Trade Exposed (EITE) facility subject to the allocation of free allowances.

A properly designed cap & trade program can be an effective tool in reducing GHG emissions, but only if the economic signal delivered is proportional to the emissions. This system falls apart when only part of a sector is covered under the program. Unlike the issues around interstate leakage, this disparity of treatment within a sector wholly inside the state of Oregon is completely with the control of the design of the program. We urge the Oregon legislature to fix this design flaw and provide for equal treatment for the waste management sector under the cap & trade program.

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[i] CalRecycle (2012) CalRecycle Review of Waste-to-Energy and Avoided Landfill Methane Emissions. Available at: http://dpw.lacounty.gov/epd/conversiontechnology/download/CalRecycle_Review_of_WtE_Avoided_Emissions_07032012.pdf

[ii] See p90 of CARB (2014) Proposed First Update to the Climate Change Scoping Plan: Building on the Framework, Appendix C – Focus Group Working Papers, Waste Sector Working Paper https://www.arb.ca.gov/cc/scopingplan/2013_update/waste.pdf

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[1] Based on annual landfill methane emissions of 9.97 metric tonnes of CO2e reflecting recent direct landfill methane measurements in peer reviewed literature and the 20-year GWP of 86.

[iii] See Table D1-3 on page D-23 of California Air Resources Board (CARB 2010a) Proposed Regulation for a California Renewable Electricity Standard, Staff Report: Initial Statement of Reasons, Appendix D: Supporting Documentation for the Environmental Analysis, Available at: http://www.arb.ca.gov/regact/2010/res2010/res10d.pdf

[iv] Kaplan, P.O., J. DeCarolis, S. Thorneloe, Is It Better to Burn or Bury Waste for Clean Electricity Generation? *Environ. Sci. Technol.* **2009**, 43, 1711-1717. http://pubs.acs.org/doi/abs/10.1021/es802395e

[v] Matthews, E. & N.J. Themelis (2007) Potential for Reducing Global Methane Emissions from Landfills, 2000 – 2030, *Proceedings Sardinia 2007, Eleventh International Waste Management and Landfill Symposium*. http://www.seas.columbia.edu/earth/wtert/sofos/Matthews_Themelis_Sardinia2007.pdf

[vi] U.S. EPA Webpage, Energy Recovery from the Combustion of Municipal Solid Waste (MSW), accessed June 28, 2019. https://www.epa.gov/smm/energy-recovery-combustion-municipal-solid-waste-msw

[vii] U.S. EPA Archived Webpage, Air Emissions from MSW Combustion Facilities, accessed June 28, 2019. https://archive.epa.gov/epawaste/nonhaz/municipal/web/html/airem.html

[viii] Under the Obama administration's final 2015 Clean Power Plan, new EfW facilities were eligible to generate Emission Rate Credits (ERCs) and existing facilities were exempt from regulation. All power from new and existing facilities was considered zero carbon power. See pp.64950, 64953 of U.S. EPA (2015) Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units, Federal Register, 80, 205, 64662 – 64964 (October 23, 2015).

[ix] WTE identified as a "key mitigation measure" See Table 4.2 (p60) of IPCC, "Climate Change 2007: Synthesis Report. Contribution of Work Groups I, II, and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change" [Core Writing Team, Pachauri, R.K and Reisinger, A. (eds.)]. IPCC, Geneva, Switzerland, 104 pp. Available at: https://www.ipcc.ch/site/assets/uploads/2018/02/ar4_syr.pdf

[x] EfW identified as a key technology for a future low carbon energy system in World Economic Forum. *Green Investing: Towards a Clean Energy Infrastructure.* January 2009.

[xi] Joint Institute for Strategic Energy Analysis (2013) *Waste Not, Want Not: Analyzing the Economic and Environmental Viability of Waste-to-Energy (WTE) Technology for Site-Specific Optimization of Renewable Energy Options*. http://www.nrel.gov/docs/fy13osti/52829.pdf

[xii] Peischl et al. (2013) Quantifying sources of methane using light alkanes in the Los Angeles basin, California, *Journal of Geophysical Research: Atmospheres*, **118**: 4974-4990. https://doi.org/10.1002/jgrd.50413

[xiii] Wecht *et al.* (2014) Spatially resolving methane emissions in California: constraints from the CalNex aircraft campaign and from present (GOSAT, TES) and future (TROPOMI, geostationary) satellite observations, *Atmos. Chem. Phys.* **14**, 8173-8184. https://www.atmos-chem-phys.net/14/8173/2014/acp-14-8173-2014.pdf

[xiv] Cambaliza *et al.* (2015) Quantification and source apportionment of the methane emission flux from the city of Indianapolis, *Elementa: Science of the Anthropocene*, **3**:37. https://www.elementascience.org/articles/10.12952/journal.elementa.000037/

[xv] Cambaliza *et al.* (2017) Field measurements and modeling to resolve m^2 to km^2 CH_4 emissions for a complex urban source: An Indiana landfill study, *Elem Sci Anth*, **5**: 36, https://doi.org/10.1525/elementa.145

[xvi] Ren *et al.* (2018) Methane Emissions From the Baltimore-Washington Area Based on Airborne Observations: Comparison to Emissions Inventories, *Journal of Geophysical Research: Atmospheres*, **123**, 8869–8882. https://agupubs.onlinelibrary.wiley.com/doi/pdf/10.1029/2018JD028851

[xvii] Jeong, S., et al. (2017), Estimating methane emissions from biological and fossil-fuel sources in the San Francisco Bay Area, *Geophys. Res. Lett.*, **44**, 486–495 https://agupubs.onlinelibrary.wiley.com/doi/full/10.1002/2016GL071794

[xviii] The IPCC concluded that "it is likely that including the climate-carbon feedback for non-CO_2 gases as well as for CO_2 provides a better estimate of the metric value than including it only for CO_2." See p714 & Table 8-7 of Myhre, G. *et al.* (2013) *Anthropogenic and Natural Radiative Forcing. In: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Stocker, T.F., *et al.* (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. https://www.ipcc.ch/pdf/assessment-report/ar5/wg1/WG1AR5_Chapter08_FINAL.pdf

[xix] Jackson, S., (2009), Parallel Pursuit of Near-Term and Long-Term Climate Mitigation, *Science*, **326:** 526-527 http://science.sciencemag.org/content/326/5952/526.full

[xx] Weaver, A., (2011), Toward the Second Commitment Period of the Kyoto Protocol, *Science*, **332**: 795-796 http://science.sciencemag.org/content/332/6031/795.full

[xxi] See p2 of UNEP, WMO, (2011), Integrated Assessment of Black Carbon and Tropospheric Ozone: Summary for Decision Makers. https://wedocs.unep.org/rest/bitstreams/12809/retrieve

[xxii] CARB (2016) Proposed Short-Lived Climate Pollutant Reduction Strategy https://www.arb.ca.gov/cc/shortlived/meetings/04112016/proposedstrategy.pdf

[xxiii] See p64 of WRI GHG Protocol (2014) Policy and Action Standard: An accounting and reporting standard for estimating the greenhouse gas effects of policies and actions. http://www.ghgprotocol.org/policy-and-action-standard

[xxiv] Munnings Consulting LLC (2019) *Analysis of Implications of House Bill 2020 on Oregon's Waste-to-Energy Facility*