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MASSACHUSETTS CHAPTER

NEW LANDFILL REGS NEEDED

EPA gas-to-energy policy worsens global warming

1. Common practices at commercial LFGTE (landfill gas-to-energy) facilities INCREASE methane release to the atmosphere, where it contributes to global warming.

- Landfill gas is a mix of gases (methane, carbon dioxide, and other toxic compounds in much smaller amounts). Methane forms only in moist, airless spaces. In landfills, more moisture means more methane. Oxygen, on the other hand, prevents methane from forming. Therefore, **the proportion of methane in landfill gas depends on the percentage of moisture and the absence of oxygen in any given landfill, or portion of a landfill, at any given time.**
- There is not always enough methane in landfill gas to run internal combustion engines for producing electricity. Incoming Municipal Solid Waste has 20-25% moisture, with rain accumulating in pockets. Often more moisture is needed for the operation to be profitable.
- To increase the proportion of methane in the gas, many LFGTE operators use the following methods, which ***increase the volume of gas that escapes from the waste mass into the atmosphere*** in the following ways:[1]

  I. *Turning off or turning down gas collection wells on a rotating basis to recharge each field with moisture.* The suction of gas collection dries out the waste so that less methane forms. When suction is absent or reduced to increase moisture (and methane), gas rises into the atmosphere.

  II. *Reducing the suction in collection wells to limit oxygen from being drawn into the waste mass, where it would inhibit the formation of methane*. Reduced suction allows more gas to rise into the atmosphere.

  III. *Delaying installation of the final cover and grading slopes to encourage moisture infiltration by rain, snow, and runoff.* Precipitation causes more methane generation in the waste, and lack of cover allows more landfill gas to escape into the atmosphere.[2]

  IV. *Recirculating leachate to increase moisture.* Leachate is liquid that accumulates in landfills. Regulations require that it be drained away from the waste mass. If instead, leachate is recirculated, saturated conditions and subsidence of the waste can damage or reduce the effectiveness of the collection pipes, thus allowing more gas to rise from the waste into the atmosphere.

- These practices increase the percentage of methane in the waste, and decrease gas collection efficiency. The waste industry does not deny using these methods to increase methane formation.[3] The US EPA must evaluate the impacts and regulate landfills accordingly, to reduce global warming emissions.

2. US EPA regulations overestimate the amount of landfill methane captured, and underestimate the global warming impacts of escaped methane.

- No satisfactory methods have been developed to measure fugitive landfill emissions; all claims are estimates. [4] The Intergovernmental Panel on Climate Changes reports that over the lifetime of a landfill, the percent of gas captured may be “as low as 20%.” [5]
- Calculated over a 20-year period-- the time-frame critical for combating climate change

--methane is 72 times more potent than carbon dioxide. Therefore, the impact of methane released from the LFGTE practices described above, dwarfs the CO_2 offset from electricity production that is the rationale for operating these facilities.

3. Organic material should be diverted from Municipal Solid Waste (MSW) landfills to curtail production of landfill methane and its global warming impact.

- Between half and two-thirds of our discards are organic: yard trimmings, soiled paper and food scraps, with lesser quantities of pet waste, diapers, textiles and wood. When these organics are buried in landfills, the lack of air causes methane to be formed as the material decomposes. Landfills without organics would not produce methane.
- Organic materials now going to MSW landfills can be safely composted instead. Compost facilities do not release methane to the atmosphere.[6] If anaerobic digestion is used prior to composting, methane can be collected and used for energy. Read about collection and processing of organics in 121 North American communities at http://beyondrecycling.org/pdf_files/FinalReport.pdf, and track new programs at www.beyondrecycling.org.

4. US EPA should regulate landfills to reduce current and future methane release.

While diverting organics from MSW landfills is critical, that step alone does not address organic waste already landfilled, or the period of transition from landfilling to composting. At a minimum the EPA should require the following measures to reduce climate impacts:[7]

a) To curtail methane generation:
(1) **Installation of vertical collectors, maximum slopes and final cover.** Each landfill cell should be designed to reach final grade in not more than two years from first waste emplacement, and then capped within another year; (2) **Leachate recirculation prohibited,** at least until after an expandable low-permeability cover and active gas collection system have been installed; (3) **De-watering of flooded vertical wells.**

b) *To capture methane that has been generated:*
(4) **Horizontal collectors installed early,** with each elevation change, spaced to overlap each pipe's zone of influence, and operated as soon as possible; (5) **No co-utilization of collectors for gas and liquid;** (6) **Vertical well density:** should not be more than every 150 feet; (7) **Multiple wells in the same bore holes** to allow for distinct and optimal negative pressures at each level; (8) **Gas collected at leachate take-out points;** (9) **Multiple seals around bore holes**, where collection wells penetrate the final composite cover; (10) **Optical remote scanning (ORS**) should be researched, and considered for leak detection over all surface areas of the landfill.

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[1] Peter Anderson, "Comments to the California Air Resources Board" (Center for a Competitive Waste Industry, 2007).
[2] Don Augenstein, "Landfill Operation for Carbon Sequestration and Maximum Methane Emission Control: Controlled Landfilling Demonstration Cell Performance for Carbon Sequestration, Greenhouse Gas Emission Abatement and Landfill Methane Energy," (Final Report, Institute for Environmental Ma*nagement,* February 26, 2000).
[3] For example, "...*applied vacuums are limited* to prevent air intrusion and only collect the amount of high quality LFG necessary to meet energy needs." [Emphasis added.], SCS Engineers, Inc. for Solid Waste Industry for Climate Solutions, *Current MSW Industry Position and State-of-the Practice on LFG Collection Efficiency, Methane Oxidation, and Carbon Sequestration in Landfills* (July 2007), at p.2.
[4] Ibid, at p.1
[5] Intergovernmental Panel on Climate Change, 2007. *Mitigation of Climate Change: IPCC Fourth Assessment Report, Working Group III Report*, Chapter 10: Waste Management, page 600.
[6] Sally Brown, et al., "Greenhouse Gas Balance for Composting Operations," *Journal of Environmental Quality* 37:1396 (2009), at p.1407.
[7] For details see, "Sierra Club Landfill Gas to Energy Task Force, Report to the Board," Appendix B, 2010 (Sierra Club)