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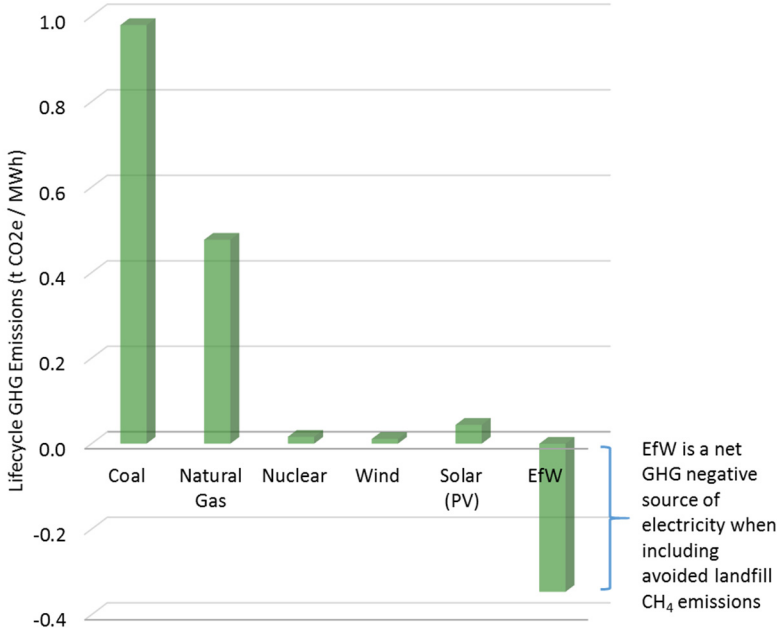
Is Energy-from-Waste Worse Than Coal?

Opponents of Energy-from-Waste (EfW) facilities sometimes make the claim that EfW facility emissions are "worse than coal." However, the reality is that EfW facilities are not only cleaner than coal, but represent an important tool in reducing greenhouse gas (GHG) and other emissions from landfills and serve as an important source of carbon mitigation in the process. In fact, the EPA's recent Clean Power Plan includes EfW as a compliance option.

EfW is a Source of GHG Mitigation

In 2013, coal generation alone accounted for 29 percent of our nation's total CO_2 emissions.[4] In stark contrast, EfW is a widely recognized source of GHG mitigation. According to the U.S. EPA, EfW facilities actually reduce the amount of greenhouse gases expressed as CO_2 equivalents (GHGs or CO_2e) in the atmosphere by approximately one ton for every ton of municipal solid waste (MSW) combusted when evaluated on a lifecycle basis.[5] A prominent peer-reviewed study written by U.S. EPA scientists, aptly named "Is It Better to Burn or Bury?" found GHG emissions from EfW to be significantly less than landfills, concluding "if the goal is greenhouse gas reduction, then EfW should be considered as an option under U.S. renewable energy policies." [6]

Lifecycle GHG Emissions – Electricity Sources[1-3]



In addition, many other governmental and nongovernmental organizations have formally recognized EfW for its role in reducing world-wide GHG emissions including the World Economic Forum (WEF)[7], the European Union,[8,9] the Clean Development Mechanism of the Kyoto Protocol,[10] Voluntary carbon markets,[11] and the Center for American Progress.[12] The Intergovernmental Panel on Climate Change ("IPCC") called EfW a "key GHG mitigation technology."[13] It is recognized as a source of credits under the United Nations' Clean Development Mechanism (CDM) where over 40 projects have been registered with a combined annual GHG reduction of 5 million metric tonnes of CO_2e a year.[14] On a more local basis, two recent facility expansions in Florida, eligible because they represent new incremental EfW capacity, have been selling carbon offsets into the voluntary market. [15,16] An additional facility in Honolulu has been successfully validated as an eligible project.

Those who assert that EfW is worse than coal typically substantiate their claim by looking only at total stack CO_2 emissions on a per MWh basis, without consideration for the difference between biogenic and fossil CO_2, and failing to recognize that EfW facilities are multi-purpose, supplying both electricity and fulfilling a need for solid waste management. By managing solid wastes concurrently with generating energy, EfW facilities avoid significant landfill emissions of methane, a potent GHG 28 – 34 times as strong as CO_2 over 100 years.[17] In contrast, coal plants, together with all fossil fuel fired electricity generation, do one thing, and one thing only: combust a fossil fuel for electrical generation.

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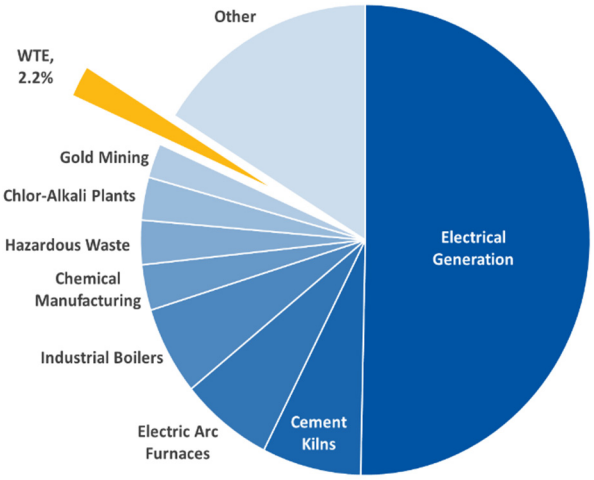
Other Emissions

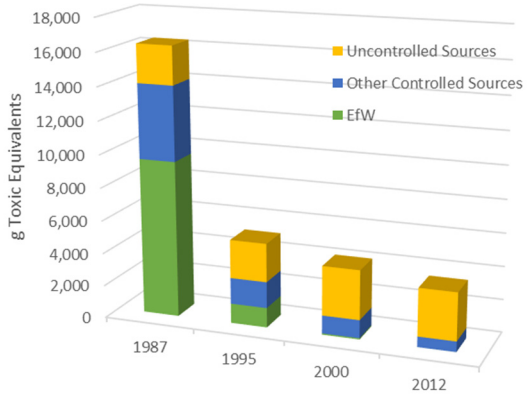
EfW outperforms coal on other emissions as well. The aforementioned paper authored by U.S. EPA scientists found lifecycle emissions of EfW facilities to be lower on average than those for coal-fired facilities for SO_2, NO_x, and PM, even before the benefits of avoided landfill emissions were considered.

With regard to hazardous air pollutants, mercury emissions from U.S. EfW facilities are a fraction of those from coal plants. Over the period from 1990 to 2005, municipal waste combustors, as EfW facilities are called by the U.S. EPA, reduced their mercury emissions by 96 percent down to 2.3 tons per year, representing only 2.2 percent of the total U.S. mercury emissions in 2005.[18,19] In the following years since 2005, emissions have declined further: current day U.S. EfW facility mercury emissions are estimated to be less than half a ton per year.[20]

U.S. Anthropogenic Mercury Emissions, 2005



U.S. Dioxin Emissions, 1987 - 2012



Historically, municipal waste combustors were a leading source of dioxin emissions. However, advancements in boiler design, operations, and air pollution control equipment have drastically reduced the footprint of the industry. In fact, according to recent peer-reviewed research by Columbia University scientists, the total dioxin emissions of all U.S. Energy-from-Waste plants in 2012 represented just 0.54 percent of total controlled combustion sources and just 0.09 percent of total controlled and open burning sources of dioxin.[21]

Contact us at 800.950.8749 or info@covanta.com for more information.

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[5] U.S. EPA Office of Solid Waste, *Air Emissions from MSW Combustion Facilities*, http://www.epa.gov/osw/nonhaz/municipal/EfW/airem.htm#7

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[19] U.S. EPA (2010) Memorandum: Emissions Overview: Hazardous Air Pollutants in Support of the Final Mercury and Air Toxics Standard, Table 4. http://www.epa.gov/airtoxics/utility/emis_overview_memo_matsfinal.pdf

[20] Based on the 2010-2012 average mass Mercury emissions calculated from annual stack test data and U.S. EPA factors from 40 Covanta energy facilities operating in North America, including 39 in the United States which process roughly 2/3 of all MSW sent for energy recovery in the United States.

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