

LMOP Workshop: Introduction & Program Overview

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EPA's Landfill Methane Outreach Program

- Established in 1994
- Voluntary program that creates alliances among states, energy users/providers, the landfill gas industry, and communities

Mission: To reduce methane emissions by lowering barriers and promoting the development of cost-effective and environmentally beneficial landfill gas (LFG) energy projects.



Landfill Gas 101

- LFG is a by-product of the decomposition of municipal solid waste (MSW):
 - ~50% methane (CH_4)
 - ~50% carbon dioxide (CO_2)
 - <1% non-methane organic compounds (NMOCs)
- For every 1 million tons of MSW:
 - ~0.78 megawatts (MW) of electricity
 - ~432,000 cubic feet per day of LFG
- If uncontrolled, LFG contributes to smog and global warming, and may cause health and safety concerns



Why EPA is Concerned about Landfill Gas

- Why is methane a greenhouse gas?
 - Methane absorbs terrestrial infrared radiation (heat) that would otherwise escape to space (GHG characteristic)
- Methane as a GHG is over 20x more potent by weight than CO₂
- Landfills are the *third* largest human-made source of methane in the United States
- Methane is more abundant in the atmosphere now than anytime in the past 400,000 years and 150% higher than in the year 1750



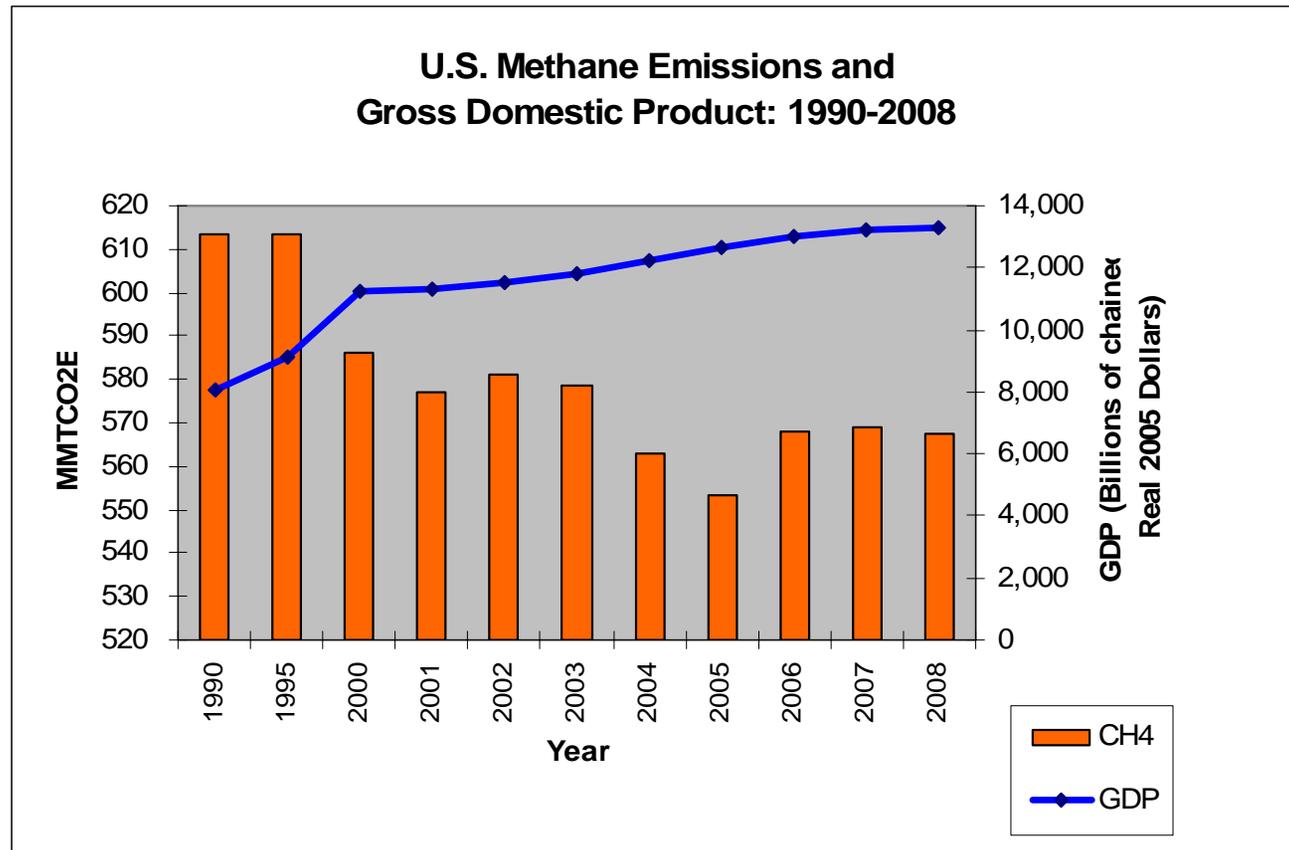
Landfill Gas and Green Power A Winning Combination

- Dual benefit → destroys methane and other organic compounds in LFG
- Offsets use of non-renewable resources (coal, oil, gas), reducing emissions of SO₂, NO_x, PM, CO₂
- LFG is a recognized renewable energy resource (Green-e, EPA Green Power Partnership, 36 states, NRDC)
- LFG is generated 24/7 and projects have online reliability over 90%
- LFG can act as a long-term price and volatility hedge against fossil fuels



Targeting Methane... Producing Measurable Results

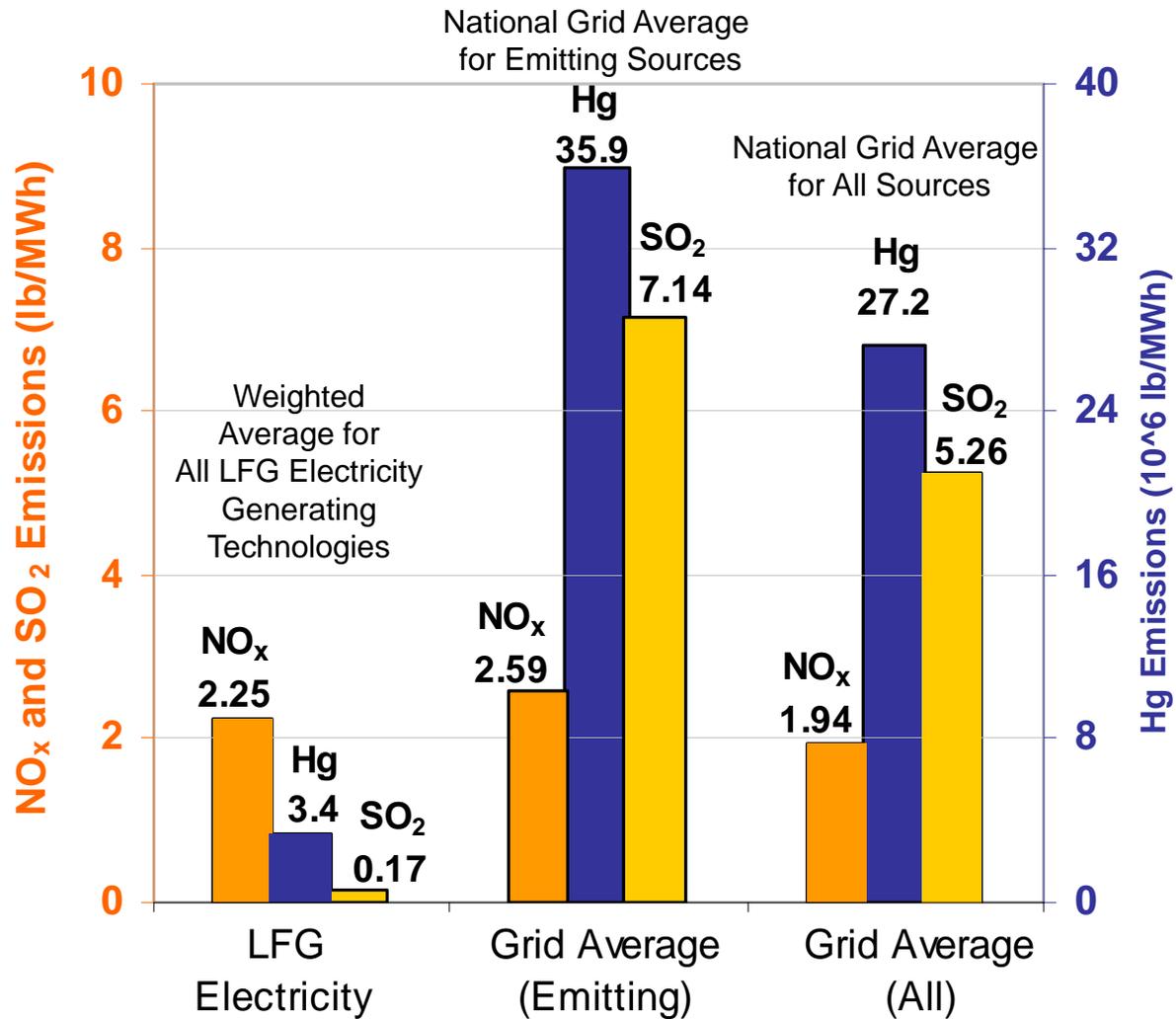
Since 1990, U.S. methane emissions have decreased by 7% while GDP increased by 65%



Sources: Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2008, U.S. EPA, April 2010; DOC/Bureau of Economic Analysis. Interactive National Income and Product Accounts Table. Last revised on March 26, 2010.



LFG Electricity Emission Reduction Benefits



Sources: LFG from AP-42 (1998); Grid averages from eGRID2007 V1.1



Jobs and Revenue Creation

- A typical 3 MW LFG electricity project is estimated to have the following economic & job creation benefits during the construction year:
 - Add more than \$1.5 million in new project expenditures for the purchase of generators, and gas compression, treatment skid, and auxiliary equipment
 - Directly create at least 5 jobs for the construction and installation of the equipment
 - Ripple effect: increase the state-wide economic output by \$4.3 million & employ 20-26 people throughout the state & local economies



Jobs and Revenue Creation (cont.)

- A typical 1,040 scfm LFG direct-use project is estimated to have the following economic & job creation benefits during the construction year:

	5-mile pipeline	10-mile pipeline
New project expenditures	\$1.1 million +	\$2.2 million +
Direct installation jobs	At least 7	At least 14
Ripple effect – economic output & employed people	\$2.9 million & 17-22 people	\$5.3 million & 32 to 41 people

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Integrated Solid Waste Management (ISWM)

- Solid waste management is a complex issue
- ISWM is key to effectively manage the MSW stream
- Each community's ISWM plan/strategy is unique
 - Technologies and processes utilized are highly dependant on a community's local conditions and economics
- ISWM helps a community meet important obligations, including:
 - Cost-effective management of MSW
 - Minimization of environmental impacts
 - Maximization of material recovery
 - Maximization of energy value (e.g., WTE, LFGE)
- Different ISWM components do not conflict or compete with each other – they are complementary!