Organic Residuals and Greenhouse Gases

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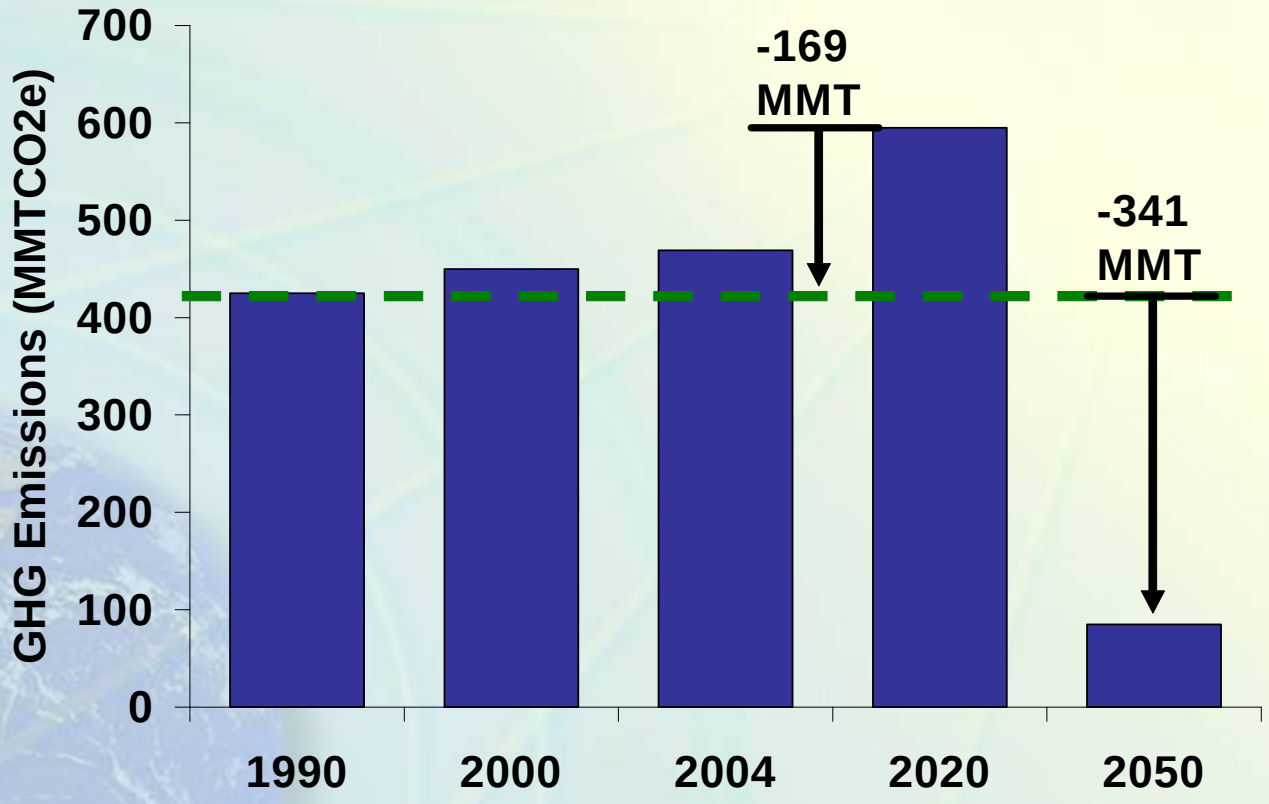
Climate Change Program

- Executive Order S-3-05 (2005) requires GHG emissions reduced to 1990 level by 2020 and 80% below 1990 level by 2050.
- The Global Warming Solutions Act of 2006 (AB 32) assigned GHG reduction to ARB.
- ARB prepared the Scoping Plan to identify measures that achieve the 2020 GHG reduction goal.

Required GHG Reductions



Scoping Plan Measures that include Organic Residuals

- Low Carbon Fuel Standard (LCFS)
- Renewables Portfolio Standard (RPS)
- Dairy digesters
- Landfill methane reduction
- Composting

Low Carbon Fuel Standard

- Reduce carbon intensity of transportation fuels at least 10 percent by 2020.
- Carbon intensity for heavy duty vehicles:
  - 95 gCO_2e/MJ Diesel Fuel
  - 75 gCO_2e/MJ CNG from pipeline
  - 28 gCO_2e/MJ Dairy digester biogas (LNG)
  - 13 gCO_2e/MJ Landfill gas (CNG)

Renewables Portfolio Standard

- Approx. 12% of California's retail electric load is generated with renewable fuels.
- The RPS requires the amount of electricity generated with renewable fuels increase to 20% by 2010 and 33% by 2020.
- Organic residuals combusted for heat to generate electricity or digested to produce fuel will help reach RPS goals.

Dairy Digesters

- Digestion produces gas (including methane) and the high temperature in the digester kills pathogens.
- Biogas is suitable for onsite use or retail sale.
- Solids from digester are pathogen free and better-suited for field spreading than manure.

Dairy Digesters - Suggested Priorities

ARB suggests the following priorities:

- Preferred use of biogas is as vehicle fuel and/or pipeline gas.
- If electricity generation is necessary, only ultra-clean technology, such as fuel cells, should be used.
- Unprocessed biogas can be conveyed to a regional clean-up and compression facility via a low pressure pipeline.

Dairy Digesters - Suggested Priorities

- New dairy digester projects should be designed with above-ground tanks rather than in-ground lagoons.
- Digester projects should be operated by a professional firm.
  - Professionals have training and experience with power production systems
  - Significantly reduces operating costs and issues

Dairy Digesters and Fuel Cells

- Stationary IC engines cannot achieve emission requirements in designated air quality nonattainment basins.
- Fuel cells provide an optimal solution. ARB recognizes that fuel cells are prohibitively expensive for most dairies.
- Financial assistance is available through loan and grant programs (Utilities, Investors, CEC and SWRCB)

Landfill Methane Reduction

- Diverting organics reduces emissions from landfills. CIWMB is conducting Life Cycle Analysis to quantify reductions.
- ARB adopted a landfill methane control measure in June 2009.
- Use of landfill gas helps achieve the goals of the RPS and LCFS.

Composting

- Composting converts organic wastes into marketable products.
- Composting reduces GHG emissions:
  - Fewer organic residuals in landfills reduce fugitive emissions.
  - Composted areas use less water and require less fertilizer.

Summary

- California is forging ahead with GHG reduction measures on many fronts. Organic residuals are a component of many GHG reduction measures.
- Development and implementation of GHG measures is a continuing process. Public participation and input are essential.
- Climate Change information, documents, and meetings are posted at:

http://www.arb.ca.gov