Renewable Energy from “Waste”

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Presentation Overview

• Innovation through partnerships.
• Small steps lead to long-term success.
• Local solutions to local problems.
• MRWMD infrastructure for “zero waste” and energy recovery.
Managing Waste on the Peninsula: Early 1900s
Managing Waste: 1920 - 1955
The MRWMD Today
MRWMD Public Infrastructure for Managing Waste & Resources

- Last Chance Mercantile Reuse Store
- Household Hazardous Waste Collection
- Drop-off Recycling Center
- Material Recovery Facility
- Monterey Peninsula Landfill
- Landfill Gas Renewable Energy
- Public Education and Outreach Program
What’s in your trash?

MRWMD Landfill Gas-to-Electricity Facility

How the Monterey Peninsula Landfill Works

- 4000kW Electricity to Power Company
- 600kW Electricity to District Facilities
- Landfill Gas-to-Energy Plant
- Landfill Gas Recovery Wells
- Landfill Gas Collection Pipes
- Synthetic Liner
- Cap
- Soil
- Clay
- Subsoil
- Leachate Recirculation
- Leachate Storage Tank
- Groundwater Monitoring Well
- Landfill Gas Monitoring Probe
- Groundwater

MRWMD Landfill Gas Renewable Energy Program Benefits

- Landfill Gas Most Controllable of Green House Gases
- Captures more than 9,000 tons of methane per year, removing emissions equivalent to 33,760 vehicles
- CO2 Offset from avoiding use of fossil fuels more than 27,000 tons per year
- Project Revenue, Tax Credits
- California Energy Commission Renewable Energy Credits
- U.S. Department of Energy Renewable Energy Production Incentives
Landfill Gas Generation

The four engine generators now consume 10,000 tons of methane gas annually.
Origin of the LFG Energy Project

1983
Trailer mounted engine generators
The LFG Yesterday & Today
Gas Production & Project Revenue

1983:
• 1.3 MW, 2 units, 9,000 MW generated / yr
• Power sales at 1-2 cents / kw-hr
• $180,000 / yr in project revenue
Gas Production & Project Revenue

FY 2012 Budget:
- 5 MW, 4 units, 37,300 MW generated / yr
- Power sales at 10 cents / kw-hr
- $3.5 M/yr (16.5% of Operating Revenue),
- 2,200 MW used onsite
MRWMD Operations Have Diverted > 1.1 Million Tons from Disposal Since 1996
New Diversion Frontier: Food Scraps
Food Scrap Composting

• Program began in October 2008, 20 tons per month.
• Now 175 tons per month including collection routes from Monterey, Pacific Grove, Pebble Beach, Santa Cruz County, UCSC and special events.
Renewable Energy at the MRWMD
Converting Waste to Energy

Challenges
- Political
- Technological
- Financial
- Regulatory

Opportunities
- Permits
- Land
- Location
- Track record of success
- Supply Regional Water Project with Renewable Energy
Looking to the Future: “AD”

• The process of anaerobic digestion consists of three steps:
  • The first step is the decomposition (hydrolysis) of plant or animal matter. This step breaks down the organic material to usable-sized molecules such as sugar.
  • The second step is the conversion of decomposed matter to organic acids.
  • Finally, the acids are converted to methane gas.
Organics Diversion: the Next Frontier

- Anaerobic Digestion pilot project to launch at MRWMD in FY 2011-12.
Recipient of the 2007 SWANA 2007 “Gold Landfill Gas Utilization Award”
Helping create and maintain a sustainable community