Flathead Electric Cooperative
1.6 MW LFGE Project
Montana's First LFGE Project

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Outline

- FEC

- Flathead County Sanitary Landfill

- 1.6-MW Project
  - Feasibility
  - Funding
  - Agreements
  - Design/Construct
  - Operations
Flathead County, Montana

- Located in northwestern Montana
- Gateway to Glacier National Park
Flathead Electric Cooperative

- Established in 1937 to bring electric service to rural areas of the Flathead Valley
- Locally owned and operated cooperative
Flathead Electric Cooperative

• Unlike investor-owned utilities, a cooperative is owned by its members – its customers
• FEC buys electricity from some other entity and transmits the electricity through its distribution system to homes and businesses
• Second largest electric utility in Montana
• 47,000 members
• Annual power sales of ~ 1,300,000 MWh/year
Flathead Electric Cooperative

- Purchases power from the Bonneville Power Administration (BPA)
- FEC has been the beneficiary of relatively low cost federal hydropower through the BPA
- Starting in October 2011, this will change, as BPA will cap the amount of low cost hydropower power available to FEC
Flathead Electric Cooperative

- Montana has an RPS enacted in 2005:
  - 5% for compliance years 2008-2009
  - 10% for compliance years 2010-2014
  - 15% for compliance year 2015 and for each year thereafter
Flathead Electric Cooperative

- The RPS in Montana is not mandatory for Electric Coops.
- However, the larger coops are required to operate with the intent of the law in mind.
- The FEC Board decided to meet the intent as much as possible.
- The renewable energy is not mandatory for anyone if it costs more than 15% of what they can otherwise get.
Flathead Electric Cooperative

- What can we do locally?
- Flathead County Landfill was flaring LFG
- FEC & County partnership
Flathead County Sanitary LF

- The landfill contained over 2MM tons of waste, and has a capacity of 12MM tons
- The landfill had a partial LFG extraction system and a blower/flare station (BFS)
Flathead County Sanitary LF

- Installed for migration control purposes

- LFG collection at the time was 263 cfm at 44.2% CH₄ (=233 cfm @ 50%)
Feasibility Study

- Feasibility study
  - Estimate recoverable LFG
  - Recommend facility capacity/configuration
  - Estimate capital & annual O&M costs
  - Calculate cost of power
  - Develop preliminary schedule
  - Estimate greenhouse gas reductions
Feasibility Study

• Recoverable Landfill Gas Estimate
  - With comprehensive system 2007 estimate was 367 cfm at 50% CH₄
  - Will gradually increase to over 2,000 cfm at landfill closure after 2040
Feasibility Study

Figure 1. LFG Recovery Projection
Flathead County Sanitary Landfill - Kalispell, Montana

- Recovery Potential
- Recovery from Existing/Planned System
- Actual Recovery
Results

- Facility Capacity/Configuration
  - 2007 extraction was 233 cfm
  - 2007 potential was 366 cfm
  - 800-kW genset needs ~ 270 cfm
  - Two 800-kW gensets or one 1.6-MW genset needs ~ 540 cfm
  - 2016 potential
    - is 539 cfm
FEC Implementation

- Select facility capacity/configuration
- Negotiate gas usage agreement with County
- Modify site air permits
- Community outreach
- Negotiate greenhouse gas credit monetization agreement
- Select EPC and O&M contractor
- Design interconnect
Facility Capacity/Configuration

- Upgrade LFG Extraction System

- Option 1
  - Install one 800-kW genset now
  - Design/construct facility to accommodate 800-kW expansion in 2016

- Option 2
  - Install one 1.6-MW genset now
Option 2 – Facility Configuration

- A 600-cfm fuel pressurization and cooling system
- One 1.6-MW CAT 3520 LFG-fueled genset
- Switchgear, switchgear controls, and step-up transformer
- SCADA system
- Building
Funding

- Clean Renewable Energy Bonds (CREBs)
- The Energy Tax Incentive Act of 2005 authorized up to $800,000,000 in CREBs to be issued for certain projects by certain, qualified issuers
Funding & Agreement

• To use CREBs for wellfield expansion the FEC had to own the wellfield
• FEC & County negotiated transfer of system
• FEC completed bonding process in 2008
FEC Design/Construction

• EPC contract:
  – LFGE facility design
  – Wellfield expansion design
  – Permitting
  – LFGE facility construction
  – Wellfield construction
  – Start-up
  – LFGE facility and wellfield O&M
FEC Design/Construction
FEC Design/Construction
FEC Operational Status

• Commissioning and start-up work began in April 2009

• Commercial operation began in June 2009
FEC Operational Status

- Has produced 10,800 MWh of renewable power
- Achieved an uptime of over 96%
- 13,000 hours of operation