



Distributed Energy Resources: Landfill Gas to Energy



FLATHEAD ELECTRIC
— **COOPERATIVE** —
Community. Innovation. Reliability.



FLATHEAD ELECTRIC CO-OP

Second Largest Electric Utility in Montana

- Member-owned, not-for-profit electric cooperative serving over 58,000 members founded in 1937.

Clean, Reliable, Affordable Power Supply

- The majority is generated by the Federal Columbia River Power System. FEC purchases that power from the Bonneville Power Association (BPA).
- Local generation: landfill gas, biomass, wind, community solar
- Helps FEC keep electric rates among the lowest in the nation.



71.64%
large hydro



12.34% unspecified



1.29% biomass



0.87% small hydro



1.05% landfill gas



0.39% wind



.00% solar



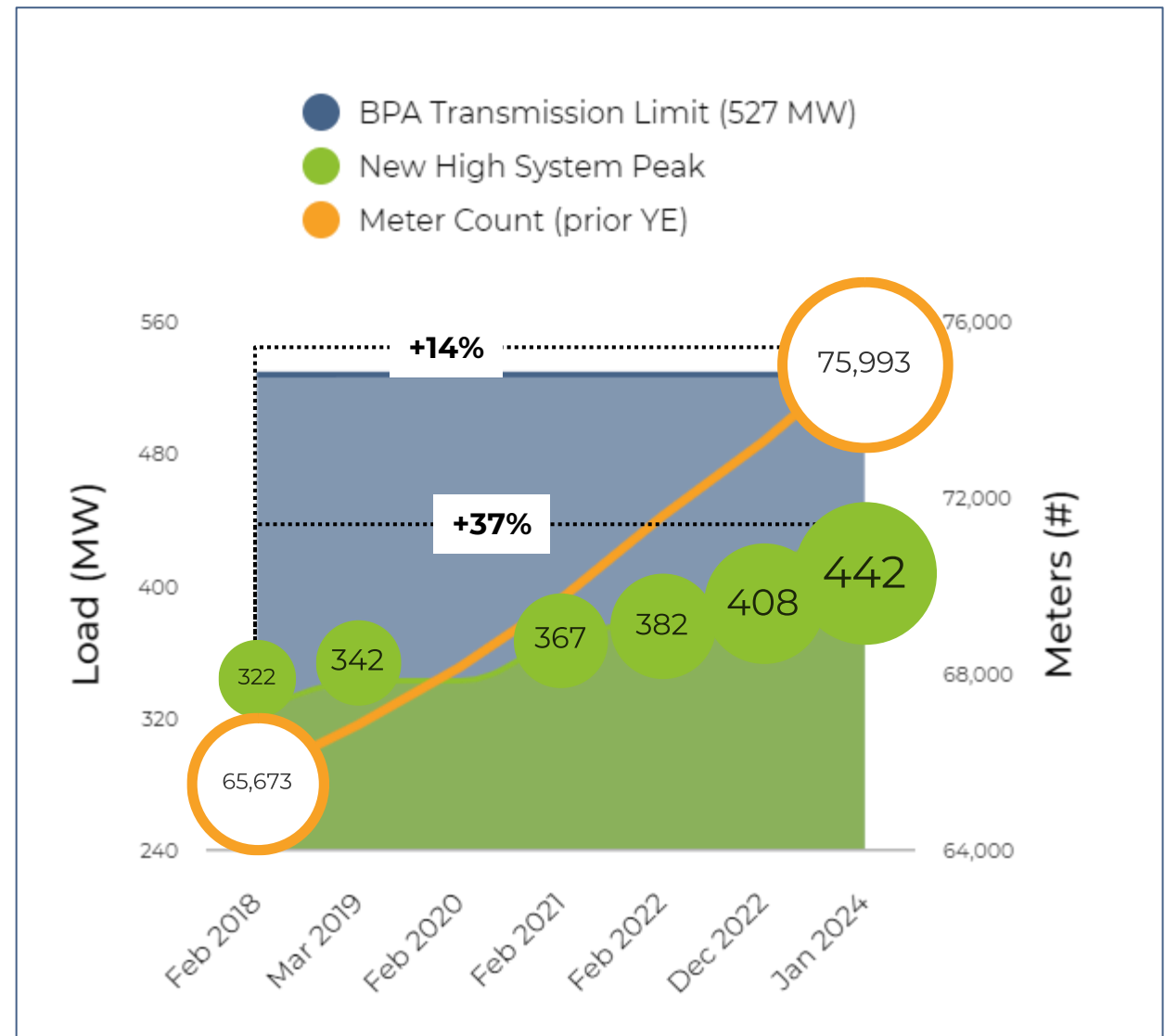
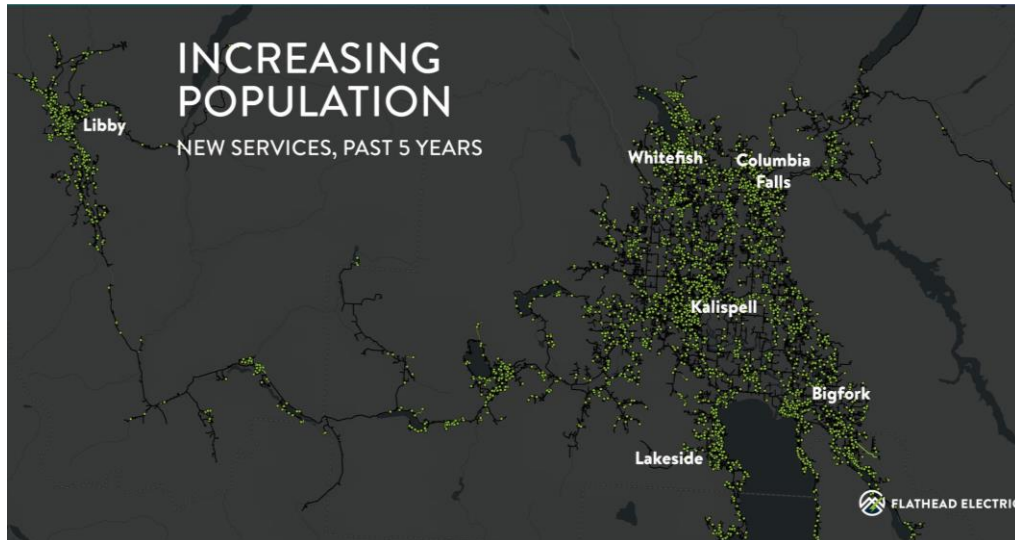
12.42%
nuclear



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FEC System Growth

driven by population growth and electrification



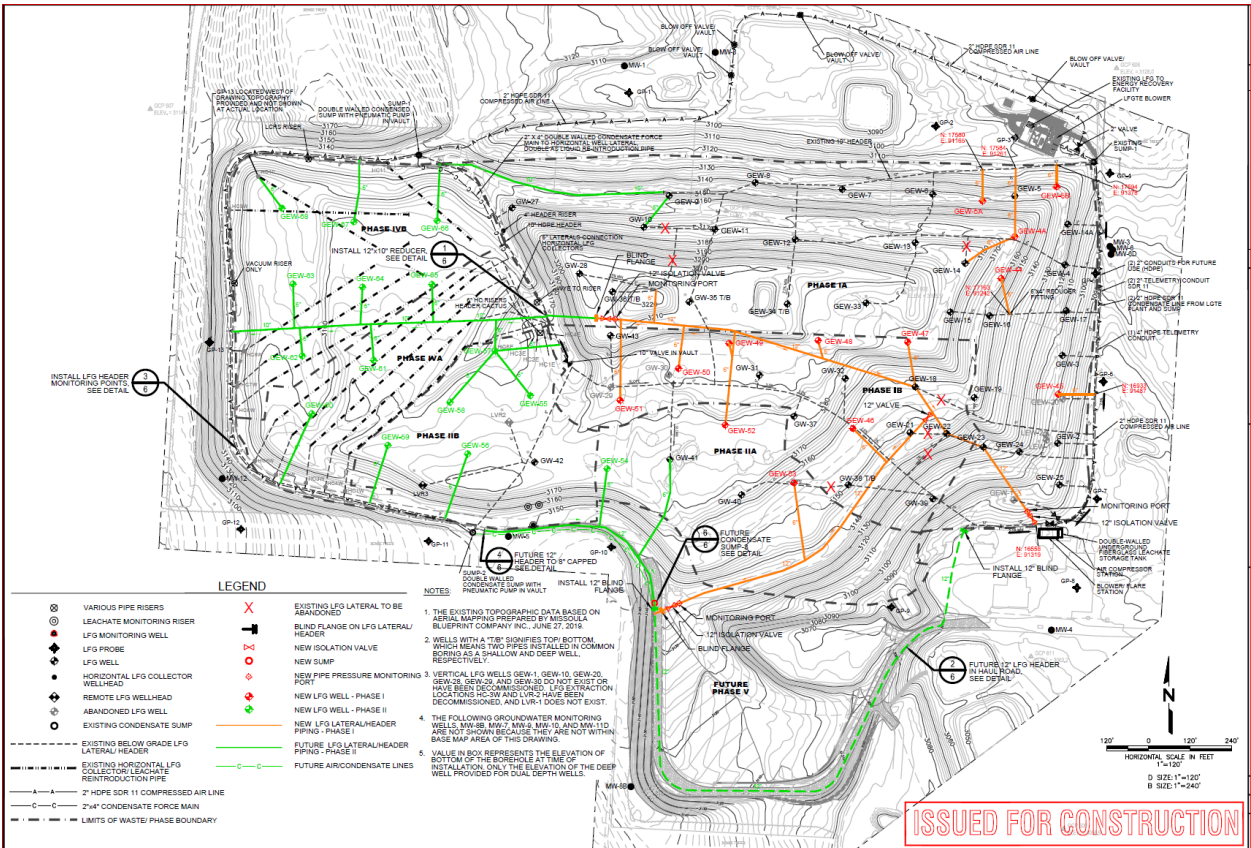
FEC System: Peak Load and Meter Count

Landfill Gas to Energy Plant

- Montana's first gas-to-energy plant.
- Done in partnership with Flathead County.
- Operated by SCS Engineers with 2 full time employees.
- Began producing power in 2009.
- Second engine added in 2023.
- Two 20-cylinder Caterpillar engines use methane gas fuel harvested from the landfill through a vacuum system to generate 3.2 MW (1.6 MW per engine) of electricity.
- Initial cost was \$3.5 million.
- Addition of the 2nd engine cost \$4.2 million.



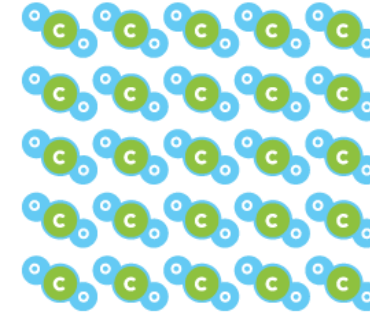
Landfill Gas to Energy Plant



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Methane to Energy Process

- Methane, a greenhouse gas from decaying garbage, is 21 times more potent than carbon dioxide.
- Landfills must prevent methane emissions to comply with environmental regulations.
- The Flathead County Landfill uses a vacuum system to extract methane from waste.
- Previously, the gas was burned in a flare system.
- Now, a biomass process captures and filters the gas, removing liquids and particulates.
- The cleaned methane is then burned in the engine.



1 methane
(CH₄) molecule is
as potent as
25 carbon
dioxide (CO₂)
molecules.

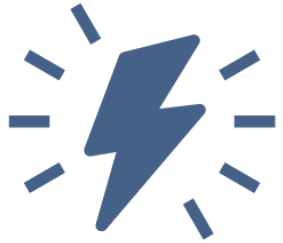


60 to 90%

Percentage of landfill
methane that is captured by
the LFG system.



Power Points: LFGTE Stats



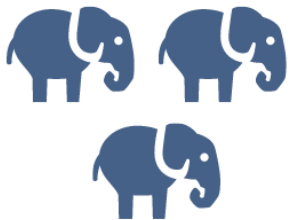
3.2 Megawatts (MW)

Combined, the engines can produce 3.2 MW of electricity.



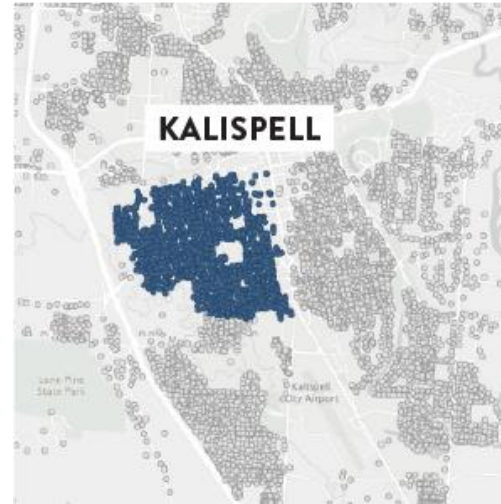
2 engines

LFGTE has 2 engines, each with 20 cylinders.



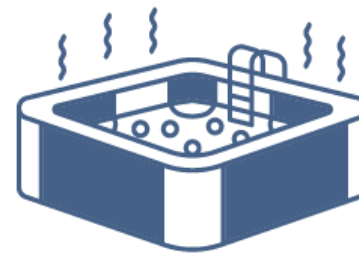
3 African Bush Elephants

Each engine weighs 40,437 lbs, which is the same as approximately 3 African Bush Elephants.



1,908 Homes

3.2 MW is approximately the same amount of energy needed to power 1,908 average-use residential homes. 1,908 homes is roughly equivalent to Kalispell's Downtown "Westside" Neighborhood."



143 Gallons

Each engine uses 143 gallons of oil. Combined, the amount of oil would fill a 3-person hot tub.



Thank you.

Knowledge *is* power.

Ron Catlett

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