

Renewable Energy Solutions for Landfills



Turn your legacy landfill into a sustainable source of renewable power

Solid waste facility owners are looking for innovative ways to use their closed landfill sites. These inactive sites or “legacy landfills” carry costly, long-term operations, maintenance and monitoring (OM&M) responsibilities and often have limited redevelopment potential due to a combination of financial, geotechnical, environmental and regulatory concerns.

Legacy landfill sites are outstanding candidates for renewable energy platforms, giving owners the capacity to improve site sustainability, demonstrate responsible stewardship and generate renewable power for ready buyers.

Renewable Energy Program Approach

Chevron Energy Solutions and Project Navigator Ltd. have formed the “Landfill Renewable Energy Team” to help landfill owners develop their legacy landfills for renewable power generation. Our team possesses a unique and comprehensive breadth of experience in the construction of power generation facilities; the sales of generated power; landfill engineering, design and construction; geotechnical engineering; and landfill regulatory compliance. We have the combined expertise and capabilities to advise solid waste facility owners on the most appropriate energy generation technology for a particular landfill property and help the client navigate complex projects from planning to reality.

Possible renewable energy landfill strategies include direct landfill gas-to-energy systems, the capture of waste heat from existing landfill gas flaring facilities, stationary fuel cell generators, solar farms constructed on open landfill decks and slopes, and wind farms on geotechnically stable areas within landfill site property boundaries.

Generate renewable power on your “legacy landfill” site to:

- Generate revenue
- Lower OM&M costs
- Improve site sustainability
- Offset long-term financial liability
- Mitigate risk
- Promote positive community relations
- Demonstrate responsible environmental stewardship

Potential Power Applications

- Direct landfill gas to energy
- Waste heat capture
- Solar farms
- Wind farms
- Stationary fuel cell generators



Energy Solutions





Planning

The team's planning services include assessment of the power generation potential of a particular site or sites and presentation of detailed technical evaluations. We look at site size and geometry; location relative to potential power end users and/or power infrastructure facilities; solar/wind potential; landfill gas generation rates and quality; existing site facilities and energy usage; and site regulatory status and restrictions.

Funding

We help owners identify potential funding sources, assisting and advising on Competitive Tax Exempt Leases, Power Purchase Agreements (PPAs), Third Party Ownership options, Clean Renewable Energy Bonds (CREBS), and Certificates of Participation (COP). Our team can handle all of the details

involved with obtaining local, state, and federal grants and incentives.

Design and Regulatory Compliance

Once planning and funding are secured, we develop detailed engineering plans and specifications for the proposed renewable energy system(s). Our plans clearly outline for the owner and other parties each project phase and how the proposed improvements are protective of existing landfill environmental control systems. Our regulatory compliance specialists can also provide support to the owner with regulatory agency interactions, to ensure a smooth approval process.

Construction

Construction at any landfill site can be a complicated undertaking. The team

possesses a proven understanding of landfill systems and will focus on ensuring that construction activities are completed with minimal impact to ongoing site OM&M and in compliance with all regulatory and site-specific guidelines. Our power generation engineers work on making certain that the installed system performs as intended and to the satisfaction of the landfill owner.

Operations

If needed, the team can provide long-term OM&M of the installed systems. We will guarantee that the installed system is operated and maintained properly, in accordance with manufacturer's guidelines, and in a way that has the least impact possible to the landfill itself.

The Landfill Renewable Energy Team

Chevron Energy Solutions (CES)

designs, constructs and operates facility projects, including infrastructure and renewable power systems that increase energy efficiency and lower water consumption, reduce energy costs, and ensure reliable power for public institutions and businesses. Since 2000, CES has developed hundreds of projects involving energy efficiency or renewable power for education, government and business customers in the United States.

Project Navigator, Ltd. (PNL) is a

privately held, environmental project management company with offices nationwide. Since 1997, PNL's team of project managers, engineers and scientists have developed a strong track record of creative, strategic problem solving for complex remediation problems. PNL has led project management responsibilities at many Superfund sites. PNL works at "raising the bar" in terms of project performance, whether it is focused on cost, scheduling, scope or innovation.

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