EER for an enhanced environment

EER Environmental Energy Resources Ltd.

21st Century Solutions to 21st Century Problems

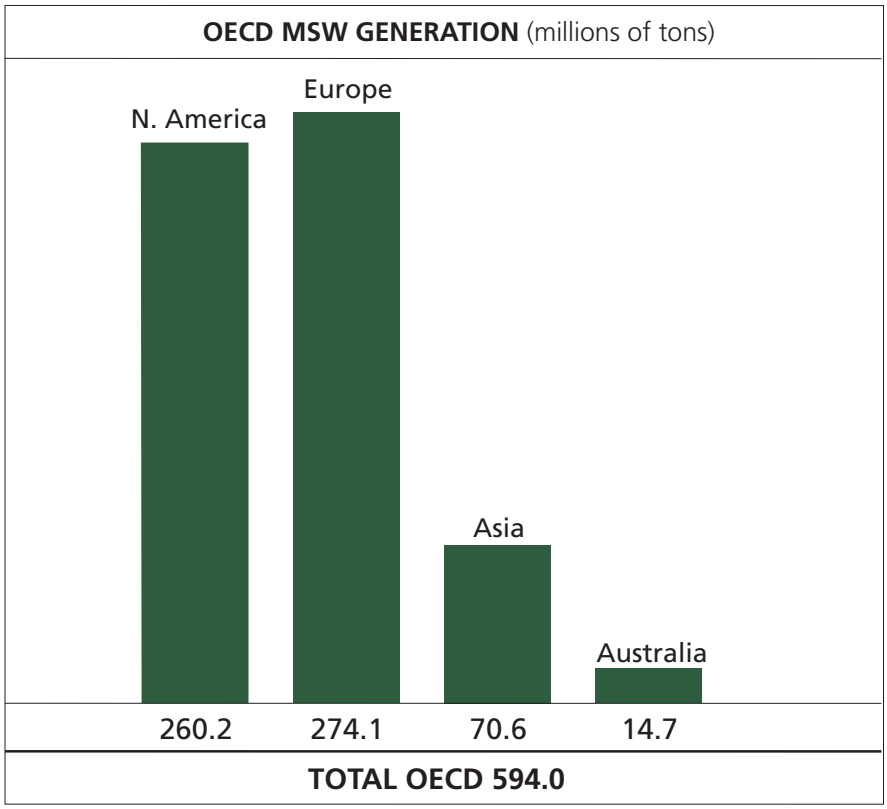
Rapid economic development and industrialization has its rewards and it also has its price. Some 600 million tons of municipal and industrial solid waste is generated annually in OECD countries. The challenge becomes how to dispose of this waste safely and effectively, without harming the environment. Current waste disposal solutions, such as the use of landfills or incineration of waste, still cause extensive land, water, and air pollution.

Improved solutions to solid waste management that are both environmentally safe and cost-effective are urgently required.

It is here that Environmental Energy Resources (EER) makes its mark by offering the solid waste management industry the most efficient, effective, and environment friendly waste treatment solution available today.

EER's technology is ideal for treatment of

- Municipal solid waste (MSW)
- Medical waste (MW)
- Low- and medium-level radioactive waste (LILRW)
- Municipal effluent sludge (MES)
- Industrial waste (IW)

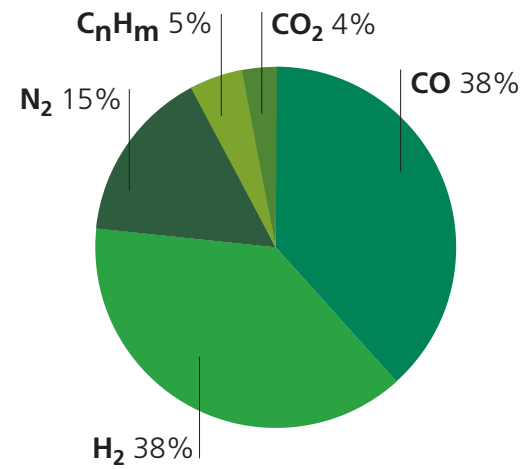


EER's Single-Step Solution Technologies

EER's unique PGM (plasma, gasification, melting) technology is a step ahead of traditional incineration and gasification/melting methods, as it successfully combines three processes into a single-step solution. The following processes occur simultaneously:

- Pyrolysis — the chemical breakdown of the putrescible organic components.
- Gasification of the carbonaceous residues of pyrolysis generates energy-rich gases such as H_2 and CO.
- Melting and vitrification of the inorganic components produce stable solids which lock in many of the hazardous components of solid waste such as heavy metals. The resulting vitrified material is inert and can be used as roadbed aggregate.

Composition of PGM Syngas



Approximate values

The conditions under which these processes occur produce gaseous fuel (syngas). By supporting and controlling these processes using the most advanced plasma torches operating at high temperatures (up to 7000°C), complete destruction of the waste material is achieved, the residual molten material is inertized and stabilized and the formation of many pollutants, including dioxins, is prevented.

Yblin Demonstration Plant

The EER Advantage

PGM one-step technology fits integrated solid waste management programs.

PGM is the environmentally friendly solution.

- **Energy efficient**. Plasma generated energy sustains the processes in the PGM reactor resulting in high calorific value syngas.
- **Very low atmospheric emissions.** Due to the reducing conditions, a significantly smaller amount of pollutants is produced (in particular dioxins). PGM's process produces about one-third of the volume of gas to be treated than produced by incineration. Accordingly, a smaller and more compact air gas treatment system is required and consequently, a smaller plant footprint
- **No groundwater, surface water, or soil pollution.** Due to its uncommonly stable form, PGM solid residues,the vitrified slag, are environmentally benign and therefore pose no threat to the environment.

PGM vs. Conventional Incinerators

Energy Balance kWh/metric ton of MSW (CV of 10,200kJ/kg)			
System	**Traditional incineration**	**Incineration with add-on ash melting**	**PGM with integral ash melting**
Thermal energy MSW	2,830	2,830	**2,830**
Plasma torch	—	—	**550**
Generated electric energy	620	620	**1,386**
Self-use	120	120	**766+120**
Vitrification	—	220	**—**
Net energy sale	500	280	**500**
Products	Electric power and hazardous bottom and fly ash	Electric power and inert vitrified slag	**Electric power and inert vitrified slag**

Yblin Facility

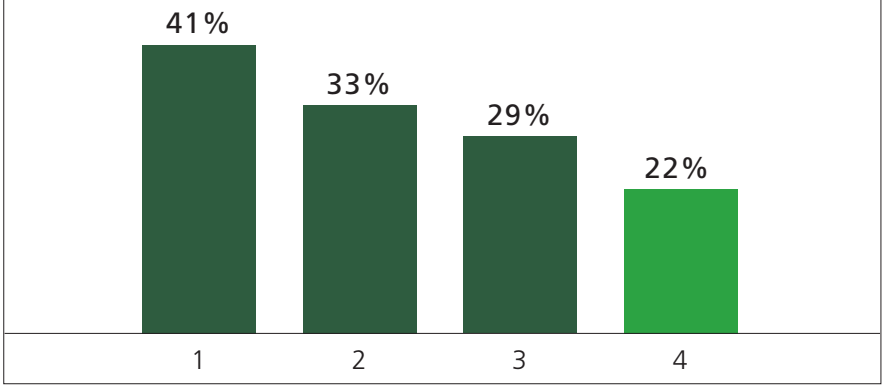
Details of the Demonstration Plant

PGM is the economically beneficial solution.

- **Lower capital investment**. The efforts of an expert engineering team and more than a decade of operating experience result in optimal and significantly smaller plant design that translates to a reduction in capital investment and long-term operating costs.
- **Enhanced environmental performance**. Proven environmental benefits enable a smoother and easier permitting phase to manufacturers and operators.
- **Elimination of landfill costs**. There is no residual ash to dispose of. In addition, the completely molten, vitrified slag can replace quarried materials for the road construction and building industries.
- **Lower operating and treatment costs**. PGM's operating and treatment costs are approximately 15% lower than conventional incinerators. Savings are substantially higher when the elimination of ash disposal costs is factored in — an estimated additional $35 million over the course of a 100,000 tpa typical facility's lifespan.

PGM technology achieves greater conversion efficiency and has a number of available energy recovery options.

Energy Recovery Options and Efficiencies



1. Syngas-Wet Cleaning, Gas Turbine, Generator I, Waste Heat Boiler, Steam Turbine-Generator II
2. Afterburner, Heat Exchanger, Hot Air Turbine-Generator
3. Syngas-Wet Cleaning, High Parameter Boiler, Steam Turbine-Generator
4. Combustion, Boiler, Steam Turbine-Generator

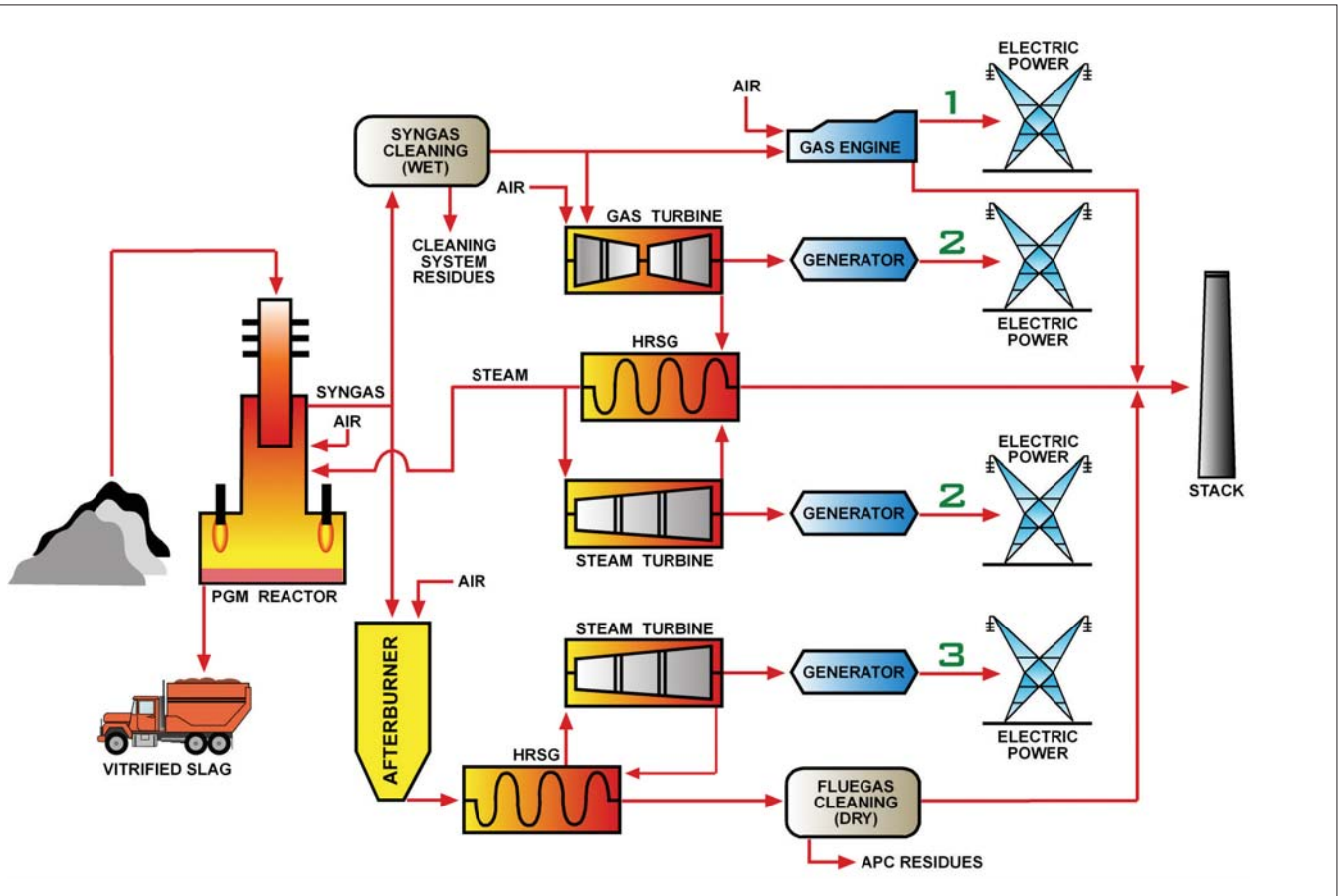
PGM Incineration

Cutting-Edge Technology Coupled with Experience

Today's cutting-edge PGM technology was first developed over a decade ago by Moscow's prestigious Russian Research Centre-Kurchatov Institute for treatment of LILRW. Since the early 1990s, a plant treating LILRW from research facilities and nuclear power plants has been operational outside of Moscow. A second, scaled-up plant was commissioned in the third quarter of 2002.

Currently a demonstration facility for the treatment of MSW, equipped with all the components of a commercial facility with energy recovery and state-of-the-art APC system, was bulit in Israel. After initial utilization as a demonstration facility, the plant will be converted into a commercial MW treatment plant.

- Environment friendly
- Low capital investment
- Low operating cost
- Renewable energy



Energy Recovery Options.

1. Syngas Cleaning / Gas Engine
2. Syngas Cleaning / Combined Cycle (GT / HRSG / ST)
3. Afterburner / Steam Cycle / Flue Gas Cleaning

Conventional Incineration vs. PGM Technology

Characteristics Conventional Incineration	Characteristics PGM Technology
Hazardous residues (ash) require disposal or treatment	Benign vitrified slag used in road construction and building industry
2% to 5% fly ash	Minimal amount of fly ash — Recycled into the reactor.
Dioxins that must be captured in APC system	Almost no dioxins generated
Gas volume requiring cleaning in APC system — 4,500 to 6,000 m^3/T MSW	Gas volume to be cleaned — 1,000 to 1,500 m^3/T MSW

PGM Technology Exclusive to EER

In 2000, EER acquired exclusive rights to further develop and globally commercialize PGM technology. Today, EER continues to work with leading Russian scientists affiliated with the Kurchatov Institute and other international experts to develop commercial-scale waste treatment applications for municipal solid waste, medical waste, certain industrial waste types, and municipal effluent sludge. EER is backed by a group of international investors from Israel, Russia, Japan, and Korea.

Vitrified Slag	
	

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