





ELECTRATHERM SOLUTIONS FOR SUSTAINABLE, RELIABLE AND AFFORDABLE RENEWABLE ENERGY

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WHATS NEW

Since our attendance last year at the Palau Conference significant changes have occurred

New Power Plant – BITZER HSE85 Twin Screw Expander

- Improved Performance
- Semi Hermetic Design
- Higher Output



Release of the Power+4400B providing outputs up to 75 kWe

Increased output of the Power+6500 to 120 kWe

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WHAT IS THE POWER+GENERATOR?

The Power+Generator in an ORC based system that captures waste heat to generate up to 120kWe of renewable energy.

- Commercially Proven
- Reliable 24 hrs Operation
- Good ROI
- Small Footprint
- Modular
- Simple Maintenance
- Effective



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FLEET PROFILE BY APPLICATION





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GLOBAL INSTALLATIONS



BY BITZER GROUP









Austria Czech Republic France Germany Italy Japan Romania Slovakia United Kingdom United States











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POWER+ GENERATOR CUMULATIVE FLEET

(Includes demonstration sites and R&D projects)



Fleet Exceeds 1,000,000 Hours



LEVELIZED COST OF ELECTRICITY

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WHAT DO WE BRING TO PPA MEMBERS

- A Practical Solution to improve Energy Efficiency of existing Generating Assets
 - The Ability to either Increase Electricity Supply or Save Fuel for the same Output
 - A Solution with a Small Footprint that can be installed within Existing Facilities
 - Access to a Leading Team of ORC Specialist Engineers
 - A Project Philosophy that provides 3 Pillars of Benefits
 - Installation of Latest Technology Equipment
 - Long Term Maintenance Support
 - Capacity Building through Skills Transfer
 - Equipment that can be used for different applications
 - All backed by the BITZER Group

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ENGINES – WASTE HEAT RECOVERY/EFFICIENCY GAINS

Waste Heat Recovery for Stationary Engines remains a significant benefit to PPA members despite the introduction of utility scale renewable energy sources. Diesel Power will continue to be a significant source of power generation providing both base load power and grid stabilization

Opportunities

- Prime Power Generation
- Remote Power Generation
- Biogas Installations
- CHP

Configurations

- Dual Heat Exhaust/ Jacket Water
- Single Heat Exhaust
- Radiator Replacement



Benefits

- Improved energy efficiency additional output for same fuel consumption
- Output from Power+Generator counts as renewable energy helping to meet emission reduction targets now.
- Will still contribute to energy efficiency when alternative fuels are introduced such as Hydrogen

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B ACTIVE COOLER – ENERGY EFFICIENT COOLING

The "B Active Cooler" is an energy efficient cooling system providing zero power cooling plus electricity production.

- Uses the waste heat normally rejected from the engine to the radiator generate power.
- The integrated heat to power technology provides enough energy to power the cooler and produce additional electricity.
- The technology suitable for heat sources 85°C and above.
- Effectively provides cooling for various types of engines with double cooler solutions for HT and LT Circuits available.
- Ease of installation and maintenance.
- Never just replace an old radiator again, upgrade to the zero power using "B Active Cooler" !
- Attractive payback vs. a cooler that will always cost you.

B: POWER



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BIOENERGY - BIOGAS

The generation of electricity from Biogas is a growing opportunity for achieving renewable energy targets. Combining the Power+Generator with an Industrial Boiler provides a cost effective solution for the generation of power at a lower capital and operating cost than alternative technologies.

Opportunities

- Dedicated Biogas Power Generation
- Waste Water Treatment
- Landfill





Benefits

- Reduction of emissions through release of methane to atmosphere
- Ability to use a waste product
- Contributes to emission reduction targets

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BIOENERGY - BIOMASS

The generation of electricity from Biomass is a significant opportunity supported by Green Fund providers Biomass applications include the use of dedicated biomass feedstock, forestry waste, agricultural waste and industrial/domestic organic waste.

Opportunities

- Dedicated Biomass Power Generation
- Cogeneration as part of Agriculture, Forestry and Timber Processing
- Cogeneration for treatment of Industrial/Organic Waste Streams



Benefits

- Small scale generation based on biomass
- Utilization or waste products for electrical power generation
- Contributes to Renewable Energy Targets

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MICRO GEOTHERMAL

Where there is volcanic activity then an opportunity exists for Micro Geothermal Power Generation. It is estimated that up to 70% of geothermal resources are suitable for small scale power generation often in combination with other beneficial uses such as District Heating, Food Production in Greenhouses, Cooling of Water Resource for Industrial/Domestic use.

Opportunities

- Power Generation Low Temperature Geothermal Resources/ Hot Springs
- Remote Power Generation
- Cooling of Water Resource



Benefits

- Power Generation from a renewable resource
- Less Capital Cost and Shorter Construction Period to achieve Power Generation
- Modular that can be expanded as additional resources added or additional power generation required

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FLARE GAS TO POWER

The mitigation and conversion of Flare Gases to Power is an opportunity to generate renewable energy that is being driven by regulatory changes to reduce flaring and emissions

Opportunities

- Flare Gas Reduction Waste Water Treatment/ Landfill
- Oil & Gas Fields
- Industrial Complex Process Flaring



Benefits

- Reduction in emissions and use of a waste product
- Output counts towards renewable energy targets

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INDUSTRIAL WASTE HEAT

Industrial Waste Heat is available and is now recognized as an energy resource that can be exploited. Power Generation from Waste Heat is considered to be Renewable Energy

Opportunities

- Wherever waste heat is available
- Industries using heat as part of process •
- Use of heat generated by process





Benefits

- Energy Efficiency Making Use of a waste resource •
- Counts towards renewable energy targets •

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WASTE TO POWER GENERATION

The disposal of Industrial and Domestic Waste in Landfills is being restricted due to limited landfill capacity and environmental considerations. Industrial High Temperature Incineration is being used to process waste streams with Power Generation included as part of the process.

Opportunity

 Where the waste stream does not support large utility scale power generation, the Power+Generator can utilize the waste heat from the incinerator flue system to generate electricity

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