

DMG: DISTRIBUTED MODULAR GASIFICATION[®] WASTE-TO-ENERGY SYSTEM

Overview

PowerHouse Energy Group plc (PHE) is a leading provider of onsite clean energy systems and long term energy off-take services, using both traditional and renewable forms of fuel to generate both electric and thermal energy in an economically viable and environmentally responsible manner.

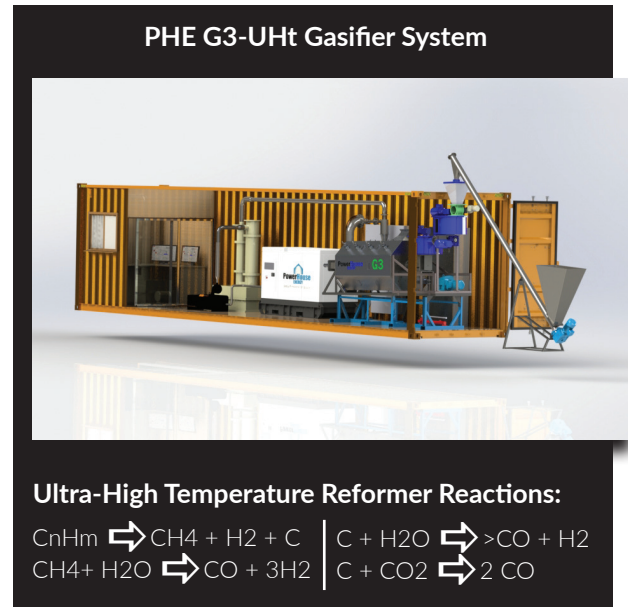
PHE serves commercial, industrial and governmental energy consumers providing reliable, efficient turnkey energy systems and supply using a portfolio of state-of-the-art power generation and waste/biomass-to-energy equipment. The PHE G3-UHt Gasification System is the most efficient, cost effective, and environmentally responsible unit available in the Waste-to-Energy Market.

The PHE G3-UHt Gasifier System is environmentally approved and permitted (Germany) to process 23 different organic waste materials and has the capacity to recover 95-97% of the embodied energy without any emissions. We believe the PHE G3-UHt is capable of converting other challenging resources such as lignite (brown coal), toxic waste, and used tyres into syngas fuel for power generation, reformation into a liquid synthetic diesel fuel (Syndiesel) for transportation, or becoming a source of distributed hydrogen generation.

Technical Application

The PHE G3-UHt System relies on standard waste pre-treatment equipment to sort, size and condition (25-30% moisture) the waste material feed stock. The pre-treated waste is fed into the Gasification reactor chamber in an almost air free environment. The reaction is driven by highly efficient, advanced design, heating elements to ultra-high temperatures of 1200c - 1700c in an oxygen controlled reactor chamber.

The syngas produced by this process is scrubbed before use to remove any contaminants. These are recovered as solid particulate matter and form vitrified slag or are disposed of according to local environmental compliance requirements. The PHE G3-UHt gasification process represents the ultimate organic materials-to-energy thermal conversion process- eliminating toxic residues and harmful emissions such as NO_x, SO_x, toxic ash, tars, dioxin or furans. Integrating significant advances in Computer Design, Materials Science, and Thermal Efficiencies, the G3-UHt is the most sophisticated, yet simple, unit available on the market today.



Environmental Advantages:

- ⚙️ Electric power or hydrogen generation with no ambient emissions
- ⚙️ No residual dangerous substances to dispose of post-treatment
- ⚙️ No environmentally harmful emissions
- ⚙️ Treats all types of organic waste, including hazardous and toxic material
- ⚙️ Meets the highest environmental compliance requirements

Syngas Uses:

- ⚙️ Syngas as a fuel can be substituted for natural gas in a turbine or engine for conventional power generation
- ⚙️ The production of electricity through a fuel cell using the hydrogen component directly
- ⚙️ Further reforming of syngas to syndiesel, other liquid chemicals, or transportation fuels.
- ⚙️ Heating and industrial applications replacing natural gas or oil in furnaces

Equipment Advantages:

- ⊗ Modular, upgradeable in 5 - 25 - 100 tonne per day modular configurations
- ⊗ 10-15% the size of common waste treatment plants
- ⊗ Suitable for small compact two level structures
- ⊗ Simple electric system with few moving parts
- ⊗ No smoke stack emissions generated or emitted
- ⊗ Syngas composition matches a variety of off-take requirements
- ⊗ Continuous feed - designed for 24 X 7 extended operation
- ⊗ A variety of energy recovery technologies possible

Economic Advantages:

- ⊗ Low energy consumption requirements
- ⊗ Reduced costs for treatment and maintenance
- ⊗ Lower capex investment cost compared to waste treatment plants
- ⊗ Greater power output per tonne than common waste treatment plants

Specifications for 25 Ton/Day Standard Unit

Typical Syngas Composition – 400Btu/Cu-Ft	50% H ₂ , 35% CO, 10% CH ₄ , 5% Inert gas
Other Syngas Compositions up to- 700Btu/Cu-Ft*	60% CH ₄ , 23% H ₂ , 12% CO, 5% Inert gas
Length X Width X Height (metres)	15'L X 4'W X 4'H
Weight Kilograms	1,630 Kg
Electrical Consumption All Components	300kW/Hour
Start-Up / N ₂ Purge Shutdown	6 Hours / 1 Hour

*Other Syngas concentrations are adjusted in a non catalytic methanation process to match generation products.

Waste2tricity Ltd is the exclusive Project Development Partner for the UK and Waste2tricity International (Thailand) is the Exclusive Distributor of PHE technology in Thailand.

CONTACT INFORMATION

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PHE G3-UHt Gasifier System



Ultra-High Temperature Reformer Reactions:

