

# Bio Energy Medical Waste

A joint venture with G+N and Bio Energy Group LTD



Taking back control of your medical waste – Independence,  
Carbon footprint reduction, Cost effective

# Bio Energy Medical Waste

- Current situation
- Our solution – Bio Energy
- The benefits

# Current situation

- Increased reduction on reducing carbon emissions
- There is limited capacity within incinerators across the UK, due to ageing infrastructure.
- Little control on incineration costs offered by providers, retain control within own environment
  - Allows future proofing independently
- Reduce pressure on capacity at communal incinerators and alternative treatment sites.

# The Energy Vortex Reformer

Waste to energy vortex reformer, unlike wind and solar, providing renewable power to run itself or provide surplus power to the site or grid.

Operating at 1,100°C to 1,500°C the reformer is designed for the effective combustion of medical and other waste produced by a typical healthcare setting.

# The Energy Vortex Reformer

The Reformer temperatures can be programmed from 1100°C - 1500°C ideal for medical waste destruction, with less than 2-3% inert residue after the process

Available in four modular sizes:

- VB300 processes 100Kg/hour capable of processing 840 tons/annum
- VB1500 processes 500Kg/hr capable of processing 4,200 tons/annum
- The VB3000 processes 1000Kg/hr capable of processing 8,400 tons/annum
- The VB6000 processes 2000Kg/hr capable of processing 16,800 tons/annum

# Stage 1 – Feedstock Handling

- Bin unloading system
- Medical waste shredder – minimum 25kW
- Clean In Place washdown
- Auger feed to reformer
- HEPA filtration

## Stage 2 – Vortex Reformer

- Airflow minimum 750m<sup>3</sup> per hour
- Natural gas/LPG co-firing for wet feedstocks
- Stainless steel/hard faced refractory
- Multi-stage cyclonic ash recovery
- Waste reduced by 97% to inert ash



# Stage 3 – Emissions Control

- Multi-stage flu gas/cooling scrubber
- 99.9% HAP/VOC/Dioxins/Furans removal
- Continuous online monitoring of key emissions
- Potential for excess heat recovery
- Integrated PLC control system

# Advantages of the Vortex Reformer

- Cost reduction, carbon footprint reduction and independence
- Vortex Reformer turns waste into decentralized power
- Fast start up – circa 30 minutes
- Meets all IED emissions
- No VOC's, Dioxins or Furans
- Remote monitoring

# Vortex Reformer

- Feedstock moisture content (MC) up to 30% without co-firing (30-50% MC with supplemental firing)
- Maximum feedstock size 12mm x 12mm
- Can be integrated into existing boilers – co-firing gives flexibility for boiler owners to choose between fuels

# Waste

- Infectious waste: anything infectious or potentially infectious including swabs, tissues, excreta and lab cultures
- Pathological: human tissue, body parts, items contaminated with human blood or body fluids.
- Pharmaceuticals: all unused, expired and/or contaminated vaccines and drugs including antibiotics, injectables and pills
- Genotoxic waste: carcinogenic, teratogenic or mutagenic.
- Non-medical

### Advisory exclusions:

- Radioactive waste can not be processed through the Vortex Reformer
- Bulk liquids and chemicals cannot be processed

# Certification

All Reformers are designed to meet IED (Industrial Emissions Directive) for new plants and pollution control technology into 2030.

Directive 2010/75/EU on industrial emissions (IED): This establishes the main principles for permitting and control of large industrial installations based on an integrated approach and the application of best available techniques (BAT).

BAT is the most effective technique to achieve a high level of environmental protection, taking into account the costs and benefits.

Directive (EU) 2015/2193 on medium combustion plants (MCPD): The MCPD regulates emissions of Sulphur dioxide, nitrogen oxides and dust from the combustion of fuels in plants with a rated thermal input between 1 and 50 MW thermal.

# Benefits

- Future proofing the organisation.
- Business continuity
- Independence from fluctuating incineration prices.
- On site incineration eradicating road transport.
- Carbon footprint reduction
- Larger plant producing energy for the site or the grid.
- Ability to put through other waste streams to improve overall efficiency and reduce cost and environmental harm.

**What next?**