



Bluebox Energy Ltd

Hot air turbine systems
for Clean Energy

Q4 2019

Investment opportunity

Bluebox Energy is seeking £0.5m in an EIS investment round

Company overview

Tech: Hot air turbine power modules design and build

Sector: Renewable, Oil and Gas

HQ: Lee-on-the-Solent, UK

Incorporated: 2014

Highlights

- Cost competitive power generation technology
- Multi-fuel and controllable
- Made of proven turbo machinery components
- Designed for unmanned, 24/7 operation
- Modules available 50kWe—330kWe



100kW hot air turbine being installed onto the wood furnace



50kW hot air turbine during assembly at Bluebox facility



50kW hot air turbine being installed in the pyrochar facility

The problem

Most renewable energy is generated when the wind blows and sun shines. Electricity storage is still very expensive, so we are dependent on controllable power stations in the evenings, night-time and when the wind doesn't blow.

Technology solution

We design and build air-turbine units that convert any heat source into electricity using fresh air and releasing hot air which can be turned on and off at will. Since 2016, we have tested our air turbines with a waste wood furnace, biochar pyrolysis gas and direct combustion of raw shale gas. The wood furnace unit continues in 24/7 commercial operation during the winter season (2 years to date).

Goto markets

- Biomass and farm waste (CHP generation)
- Waste shale gas
- Waste to Energy (Power generation and Hot Air for drying)
- Energy recovery (from industrial processes)

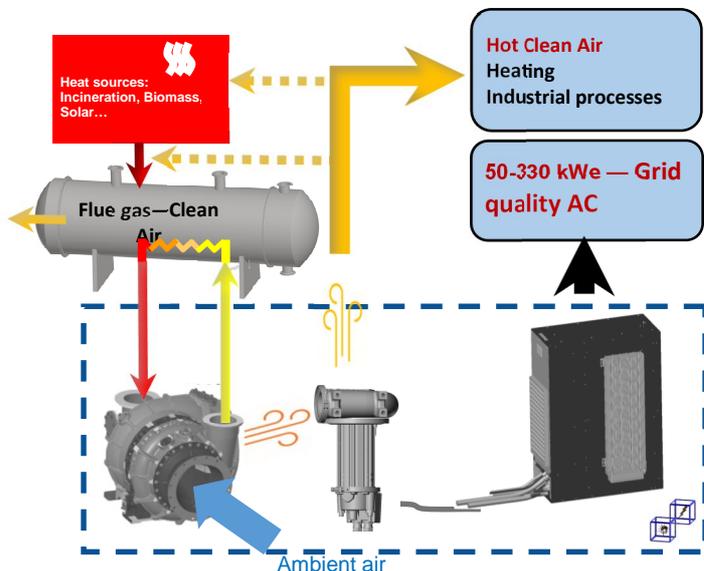
Near-term opportunities

- Swiss company developing Biochar plants for use in Agriculture (target annual sales of £0.9m) - demonstrator in operation
- Spanish company developing a biomass generation module for the growing Japanese market demand (expect to reach £1.4m within two years) - same module as above
- US shale gas generator developer for remote power to the shale gas wells (early potential of £6.5m over first three years) - First pass design work complete
- Companies specialising in energy from waste (potential of annual sales of £2m from each) - First pass design work complete



How it works...

Ambient air is compressed in a turbocompressor, heated in a heat exchanger and then expanded first through the turbocompressor turbine and then through a power turbine to produce electricity.



IP

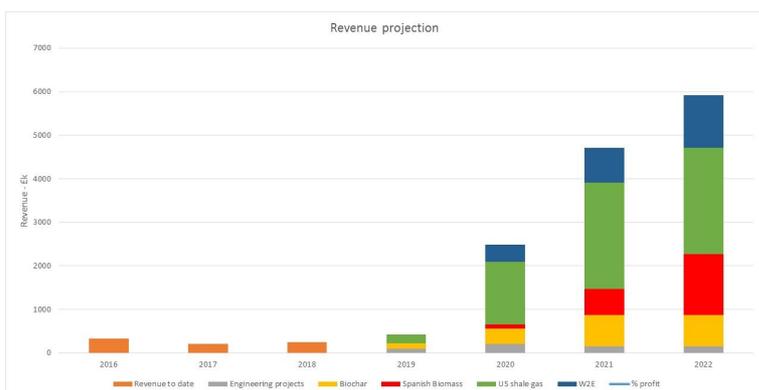
- 2 patents in draft
- None filed or granted
- IP surrounds thermodynamic matching process and turbine control algorithms

Barriers to entry

- Lack of awareness of air turbine technology
- As with all present energy recovery technologies, incentives are needed to make projects viable with present small systems
- Changing government financial incentive goalposts

Use of funds:

- Expand our current marketing activities
- Seek protection of IP
- Adapt our current 50kW design to suit the Spanish biomass combustion application and supply a demonstration unit for trials first at the Spanish factory, and then in Japan at their partner's facility
- Complete development of the low-cost 330kWe hot air turbine system



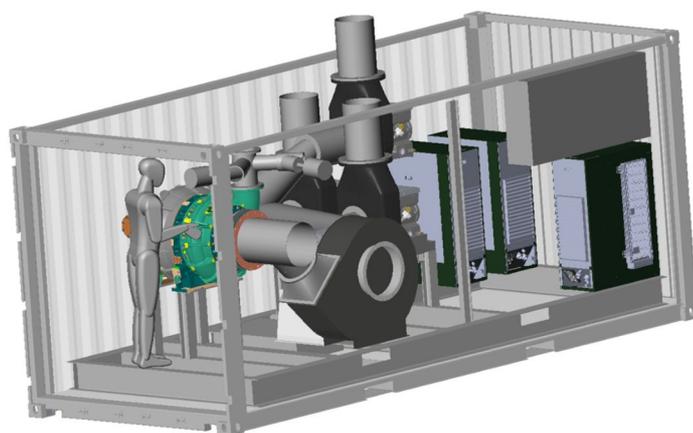
The Team

Jonathon McGuire—CEO

10 years in the electricity supply industry, followed by 20 years managing the development of turbomachinery solutions for small-scale power generation modules.

Flavien Berard—Principal

Specialised in programme management and control systems, Flavien joined the team in 2015. As well as managing our engineering projects, Flavien now leads mechanical and control system development activities.



3D sketch of 330kWe containerised hot air turbine

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