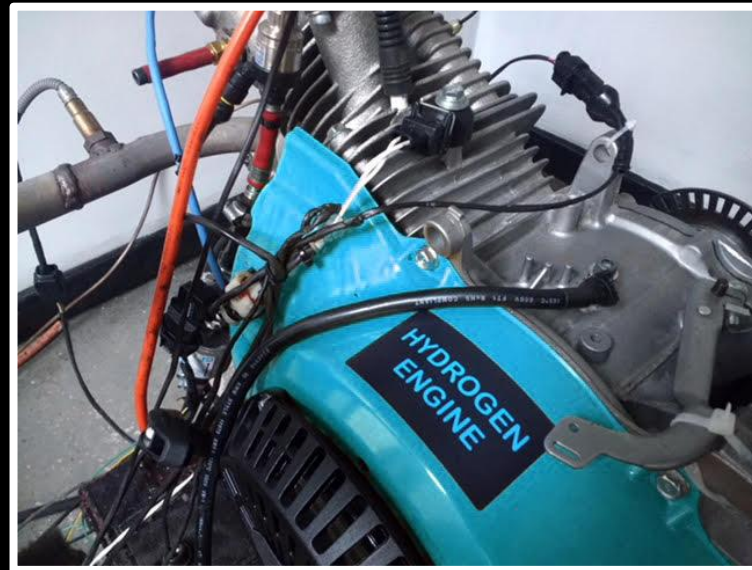


# CLEAN AIR GAS ENGINES CAGE



biogas, hydrogen, LPG, NG

# OAKTEC....WHO ARE WE?

Specialist in design and development of efficient, low emission gas engines. 7 years concentrated R&D into dedicated gas engine development.

Inventors of the Pulse-R engine technology ...now at late stage prototype

Focus on displacing diesel with equivalent small and medium ultra-clean gas engines with particular benefits in elimination of NOx emission for air quality

Current developments;

- Bio-gas Pulse-R engines for sub Saharan Africa and Asia to power off grid communities
- Small gas generators for domestic construction sector to improve air quality
- Developing world class engines for LPG, CNG, biogas and hydrogen

# CAGE OBJECTIVES

To displace diesel engines with ultra-low emission gas engines to power equipment in the construction and other sectors. Developing zero Nox combustion strategies.

## Current development projects

- Pulse-R Biogas generators for Africa. 5 trial units to be deployed to Kenya in late 2020 (Innovate UK/DFID Energy Catalyst 6)
- Small bioLPG engines for UK construction. Batches of sub 10kVA gensets to be deployed to large London construction projects in 2020/21 (BEIS Energy Entrepreneurs Fund)
- 25 kVA bioLPG gensets and hybrid welfare cabins using energy storage and waste heat (CHP) to be deployed to HS2 project sites in 2021. Engine development supported by major vehicle OEM (BEIS SBRI)

# SUSTAINABILITY

- LPG and CNG the current solution. Equivalent performance to diesel and petrol but greatly reduced emissions from dedicated gas engine technology.
- Bio methane/BioLPG. Vast opportunities for growth from genuinely sustainable fuels
- Hydrogen. The zero carbon fuel for the long term future of the combustion engine.

**All engines being developed by OakTec and partners can use any of the above fuels with high efficiency and ultra low emissions without modification to engine hardware.**



LPG



Biogas



OakTec hydrogen engine

# Partners and supporters

- Engine manufacture
  - Fuel supply solutions
  - Route to market
  - Generator manufacture
  - Biogas AD manufacturer
  - Welfare cabin manufacture
  - Emission measurement on site
  - Emission verification
- Autocraft Solutions Group  
Calor/SHV Energy  
EP Barrus  
Sutton Power Engineering  
Sistema Biobolsa  
Advante  
Kings College London  
Helical Technology Ltd





**Pulse-R**  
**Multi-Gas Engine**



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