

Renewable Gas CHP Case Studies – Africa and United States

Cogen World Coalition Launch



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Agenda

- Introduction to Clarke Energy
- Renewable gases for Jenbacher gas engines
- Africa case study
- USA case study
- CHP heat pump case study - UK

Introduction



Global

Operates in 28 countries



Supporting net-zero

Our projects seek to support the transition to a zero-carbon economy



Experience

Over 7.4 GW_e of Jenbacher installed



Lower costs and carbon

Lower costs and carbon emissions through fuel efficient power



Turnkey

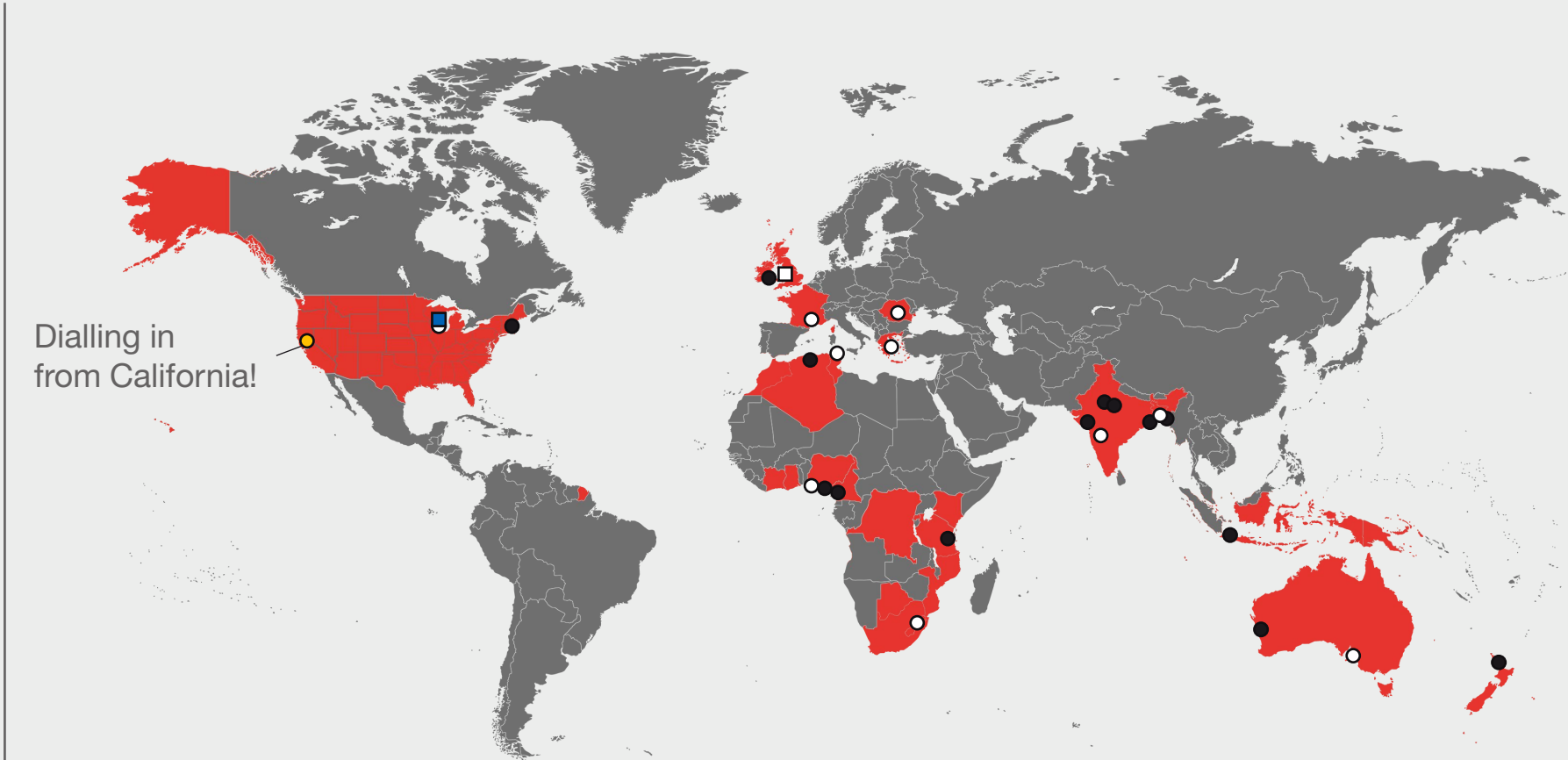
Turnkey EPC contractor with civil engineering capabilities



Maintenance

Full maintenance, operation and overhaul services maximising equipment availability

Geographical reach



Product Offering

INNIO's Jenbacher gas engines (0.25-10MW)



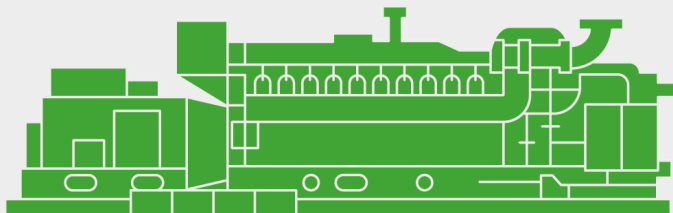
TPI's Biogas Upgrading Systems (Membrane and selective solvent)



Flexible delivery model

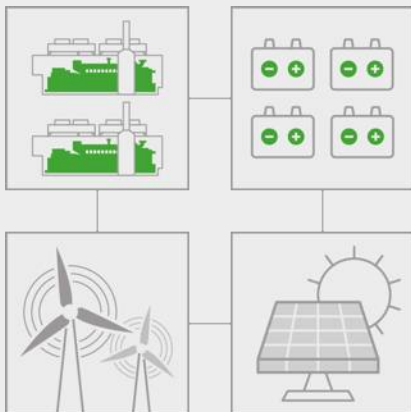
Gas genset

A Jenbacher genset is configured to produce electrical power only



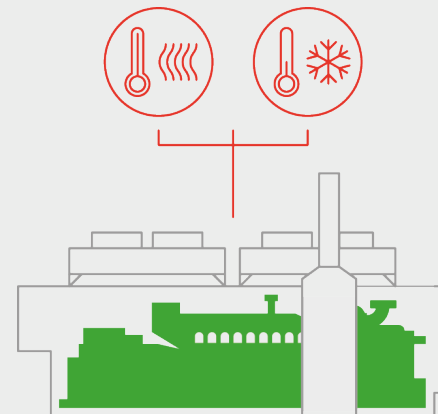
Hybrid solutions

Clarke Energy can take on a greater scope of project supply and incorporate different power generation technologies



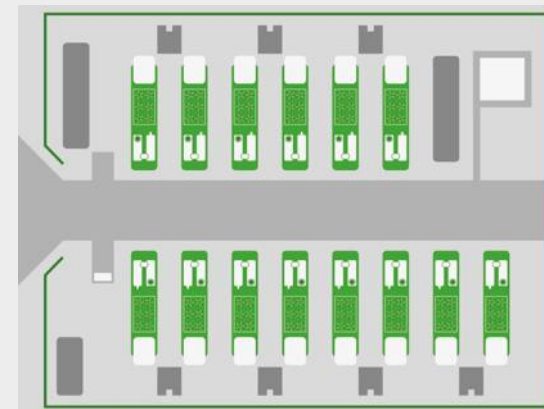
Power module

A Jenbacher gas engine module is configured for the recovery of both electricity and heat



Power plant

Clarke Energy can supply a turn-key installation of a multi-engine power plants



Key Jenbacher decarbonised fuel options

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Natural gas

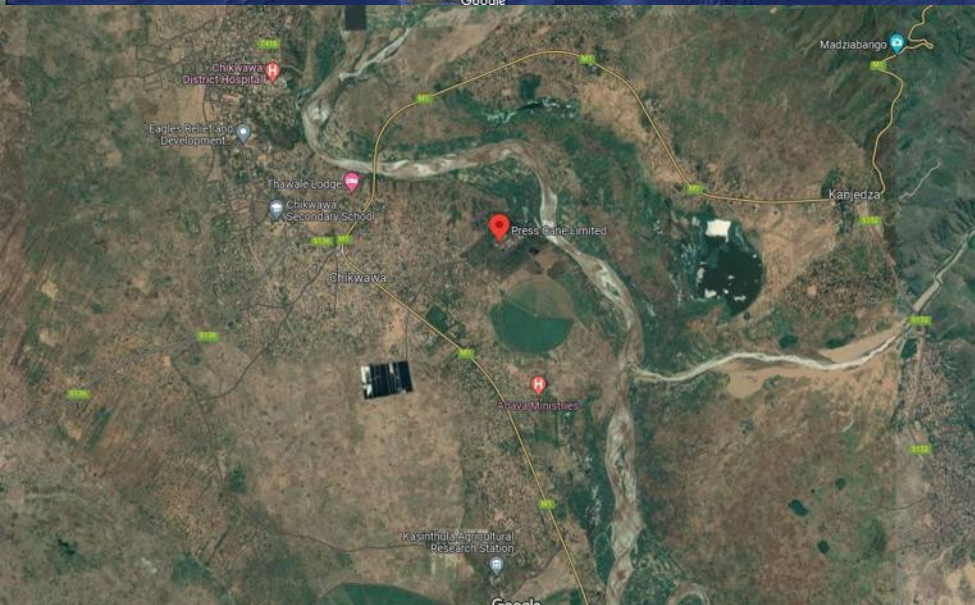
Biomethane / RNG

Hydrogen

Case studies



Presscane Biogas, Malawi, Africa



Presscane Biogas, Chikwawa, Malawi, Africa

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Ethanol distillery in Malawi, Africa
(producing domestic ethanol, reduce
petrol imports and reduce fossil carbon)

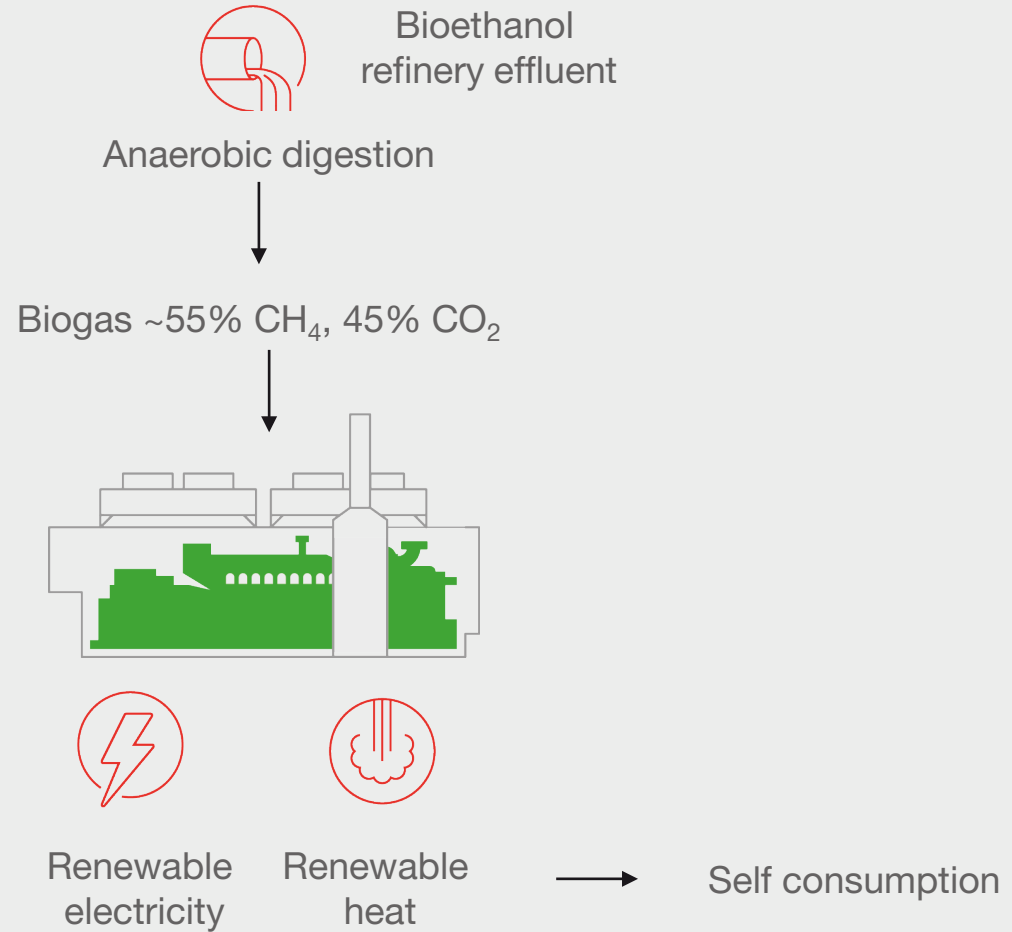
Effluent from distillery digested

Generation of biogas

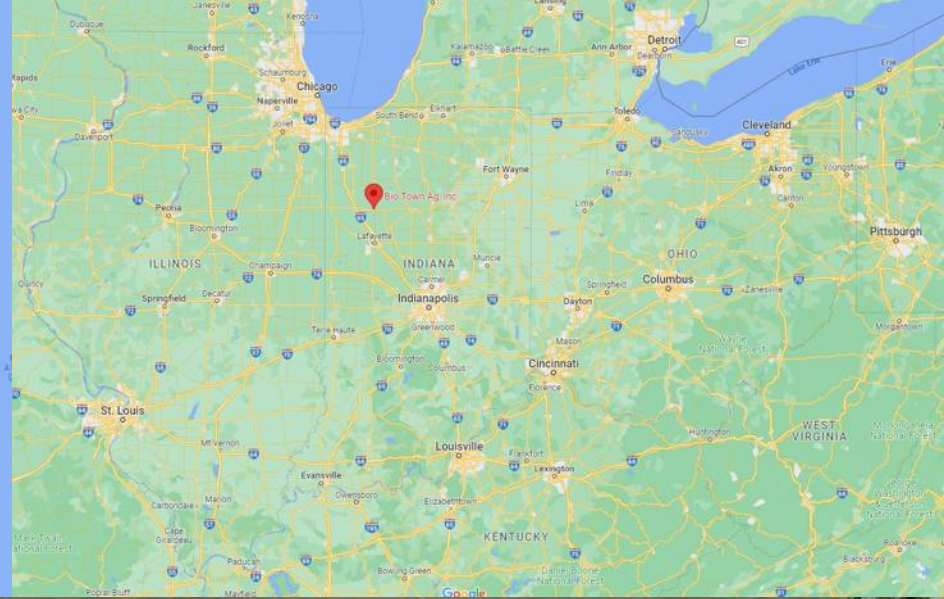
2 x INNIO J320 Jenbacher biogas
engines

$2\text{MW}_e +$
 2MW_{th}





BioTown, Indiana, USA



BioTown Biogas, Indiana, U.S.

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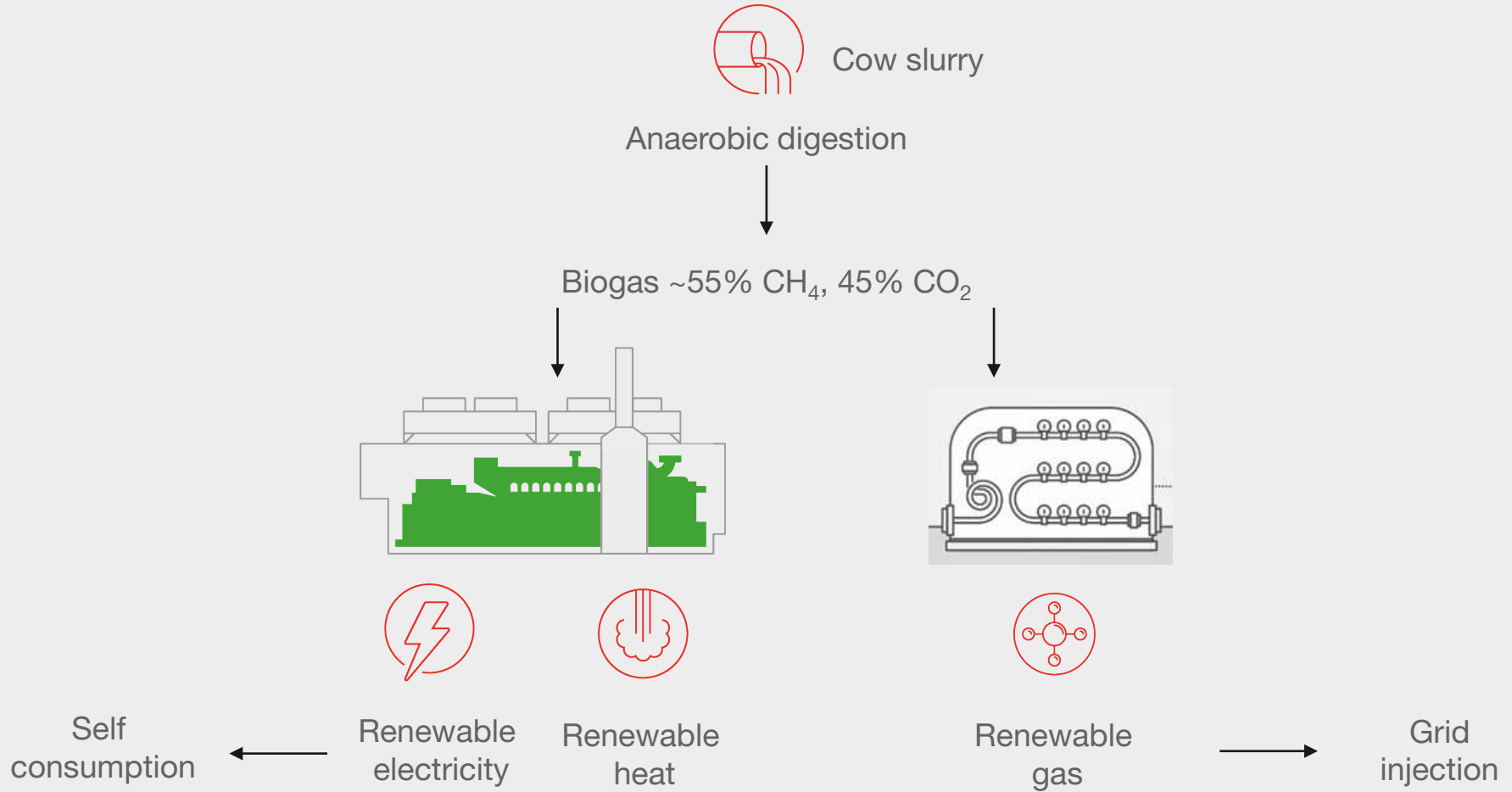
Sustainable farm waste treatment
600,000 gallons slurry from 25k cows
 $\frac{3}{4}$ s of biogas upgraded to RNG /
injected
 $\frac{1}{4}$ of biogas for renewable electricity
and heat

1,500scfm

Raw biogas to 1,000scfm RNG

1.4MW_e





Chear Farm Glasshouse, Chittering, England



Chear Farm Glasshouse, AGR Renewables and Greencoat Capital

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Hybrid gas engine CHP plus
water source heat pump



CHP, watersource heat pumps, carbon
dioxide recovery at 217,000m³
glasshouse

9MW_e +
33MW_{th}

1 x JMS624

1 x JMS620

1 x JMS416

+

6,000m³ thermal stores



Thank you



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