Innovative Futures……

Innovators for a low carbon future

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British Gas New Energy

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British Gas

Centrica in low carbon Energy

Upstream

- 8 wind projects in operation, construction or under development (98 MW onshore, 1640 MW offshore)
- A range of power purchase agreements with renewable electricity developers
- Developing biomethane – early stages

Downstream

- We provide microgen to both homes and businesses
- Selling integrated low carbon solutions to businesses – microgen and energy efficiency (www.semplice.co.uk)
- Install a broad range of technologies both directly and via partners, often backed by LCBP or CERT funding (heat pumps, biomass, PV, solar thermal, wind)
- Major UK installer of PV (Solar Technologies)
- Exclusive arrangements in micro CHP with Ceres

  (fuel cell) & Baxi (stirling engine)
- Pay as you go trials -- More to come

British Gas New Energy

Our purpose is to help homes and businesses in Britain:

Use less energy

Use cleaner energy

We want to take ‘low carbon’ from a niche activity and make it mainstream lifting Britain to the top of the environmental league tables

Current drivers of growth in microgeneration

Economics:

Costs falling
Energy prices rising
CO2 price in power
FiT and RHI

Legislative:

Financial Support
Planning (Merton)
Zero Carbon Homes

Consumer:

Corporate
Public Service
House Builders
Individual Dwellings

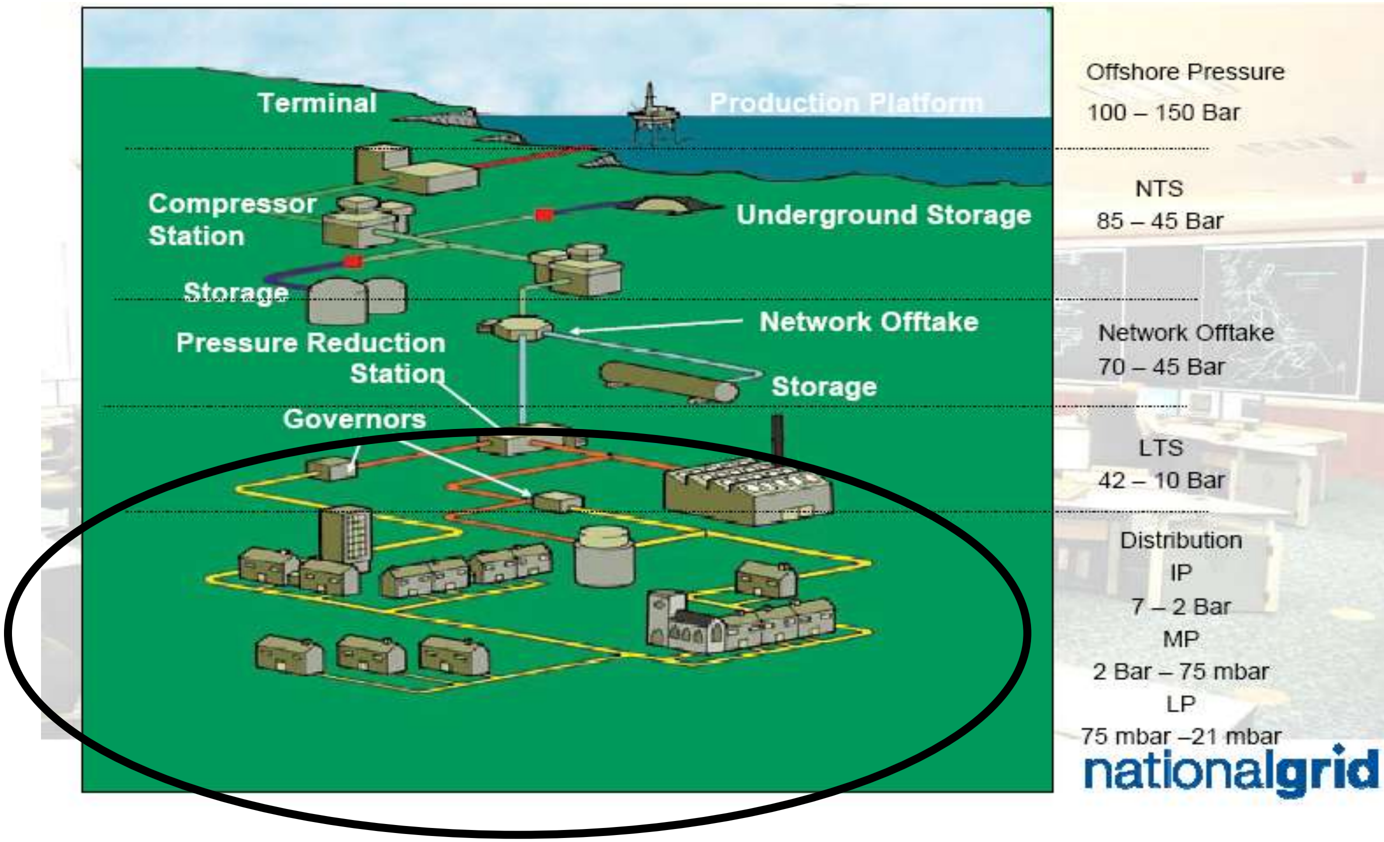
Biomethane – a renewable gas opportunity?

Biomethane quick facts……..

- Gas produced from biomass upgraded to grid spec and injected into the existing gas network
- Potential to be a material source of fuel for the UK – 48% of Domestic demand in the UK and contribute to the UK target of 15% renewables by 2020
- 2008 Energy Act gave HMG powers to make payments to producers of biomethane, could be game changing for biomethane
- The current technology for making bio-methane, as already used by EON and RWE in Germany, is known as anaerobic digestion (AD). In the longer term, Pyrolysis (gasification) could potentially increase the scale of the opportunity significantly
- An AD plant using 85,000 tonnes p.a. of biomass feedstock can produces 1,000 m3/hour of grid quality bio-methane, equivalent to c. 9 m therms/day.
- The principal feedstocks for bio-methane are abundant – e.g. cattle slurry, food waste (inc supermarket chains) agricultural waste and landfill especially given recent restrictions on waste to landfill

Examples of “Wet” AD plants in the UK

Biomethane injection to the Grid……..



Widespread consensus that gas grid injection is attractive because of absence of uses for waste heat where renewable methane is made -Take the gas to where customers exist

Microgeneration technologies in focus

Electricity



Photovoltaic Microhydro Wind turbine

Heat



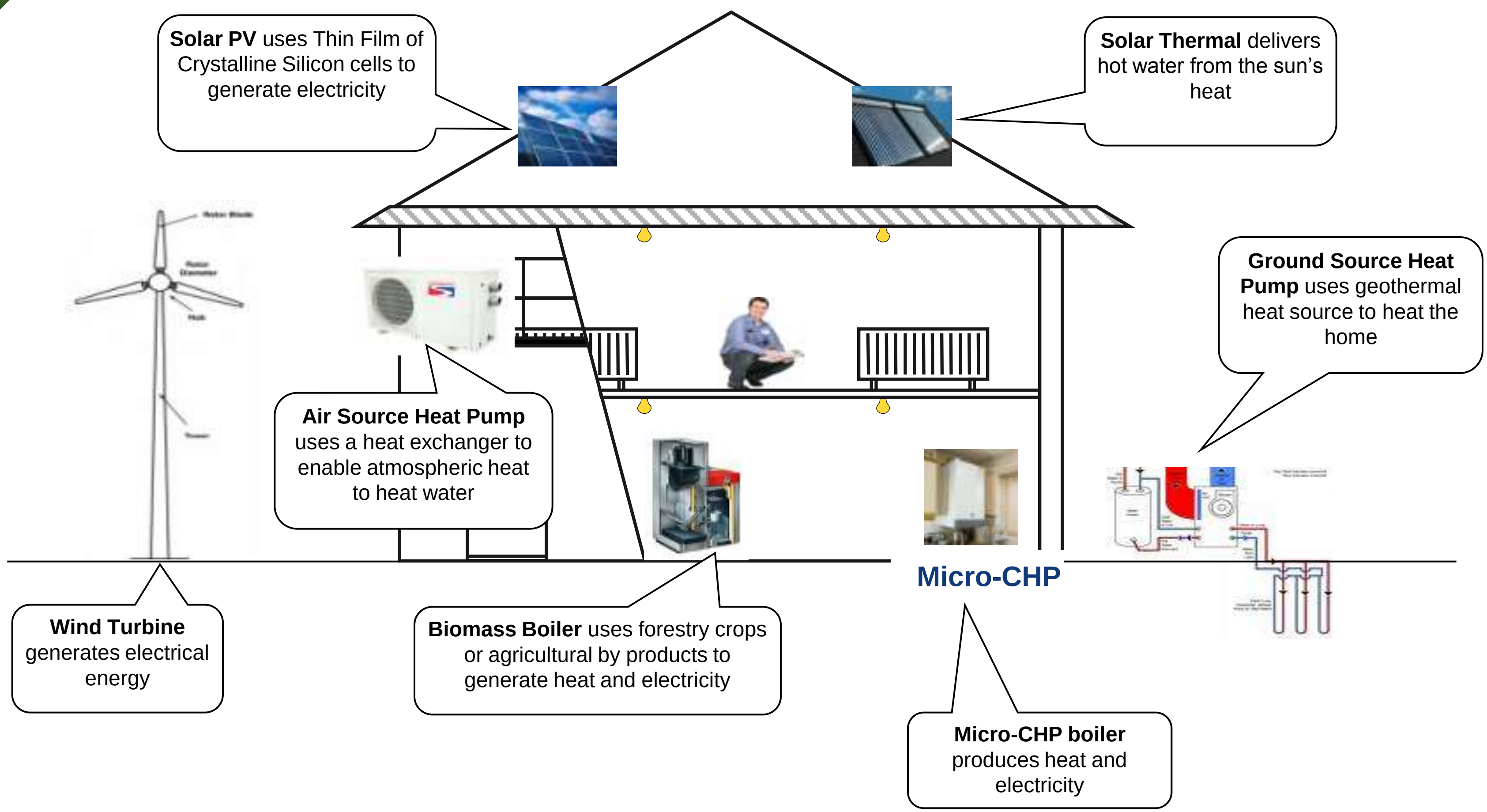
Heat pumps Biomass Solar Hot water

Heat and Power

Stirling Engine

Solid Oxide Fuel Cells

How does microgeneration fit round the home?



Microgeneration initiatives by BGNE

Baxi Ecogen Stirling engine boiler

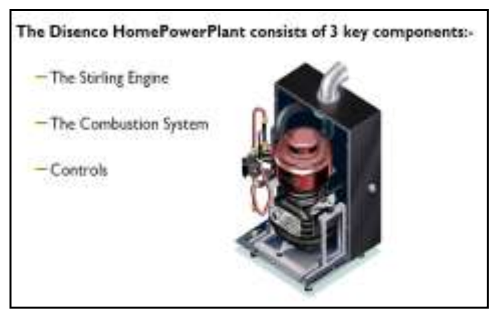
Solar PV acquisition (PV Installer)

Cerespower SOFC boiler

Smart meters

Solar Thermal

Air source heat pump trial



Disenco Stirling engine

The market is currently tiny…

Technology	UK Installations
Solar thermal	90,000
Air-source heat pumps	>150
Ground-source heat pumps	745-2,000
Solar photovoltaics (PV)	2,300
Micro-wind (<50kW)	1,100
Micro-hydro	65-75

Source: DECC Renewable Energy Strategy June 2008

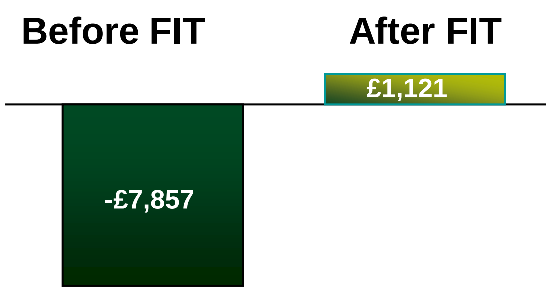
However policies are transforming the economics

Strong political drivers…

- **Binding UK targets**
  - renewable energy, driven by EU
  - 5 yr carbon budgets
- **Consensus across UK political parties**
- **Feed-In Tariff for electricity microgen April 2010**
  - Solar PV
  - Wind
  - Micro CHP
- **Renewable heat incentive April 2011**
  - Solar thermal
  - Heat pumps
  - Biomass

… are transforming the economics of microgeneration

Solar PV, 2.5kW installation



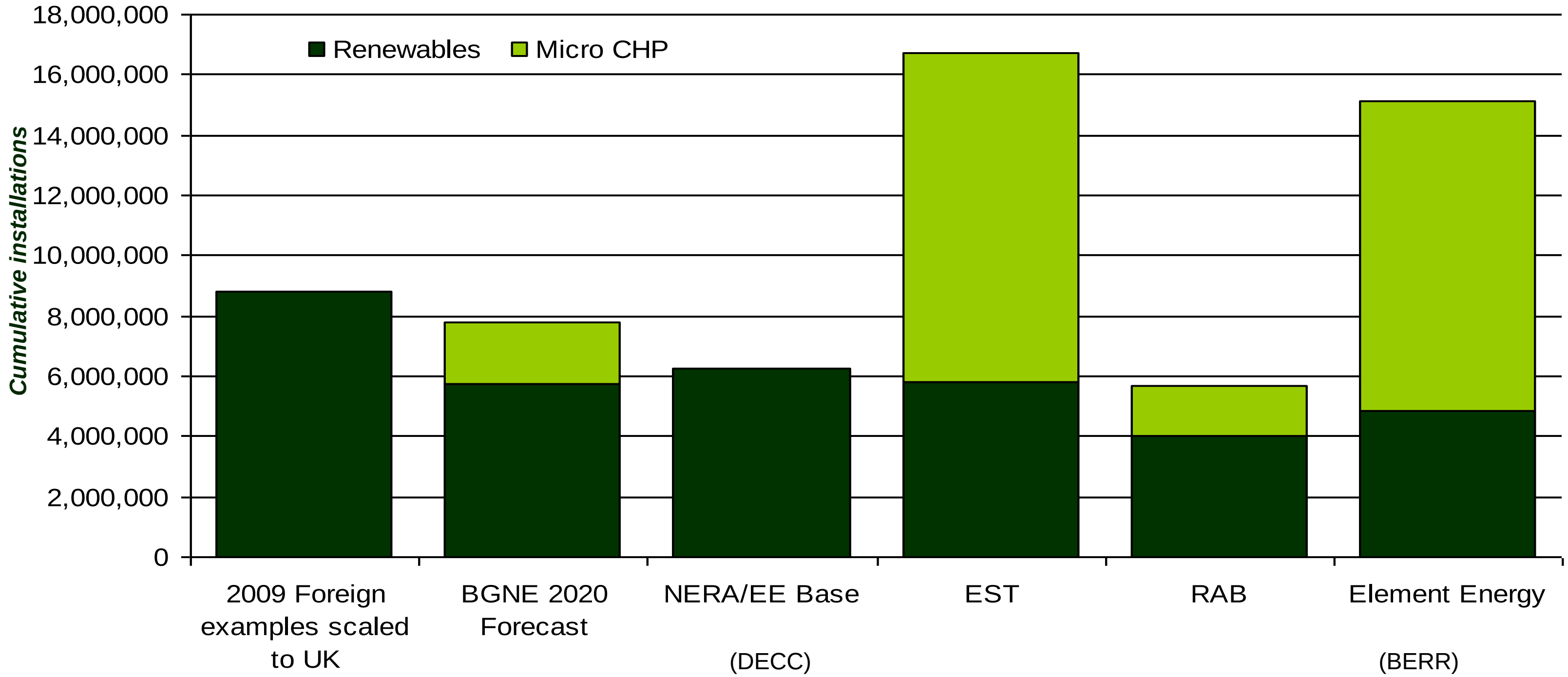
25 yr cashflows discounted at 5%

Capital cost (£13,250) and FIT levels (36.5p/kWh)*

* Both from “Renewable Financial Incentives Consultation”, July 2008

Our view is reflected by others

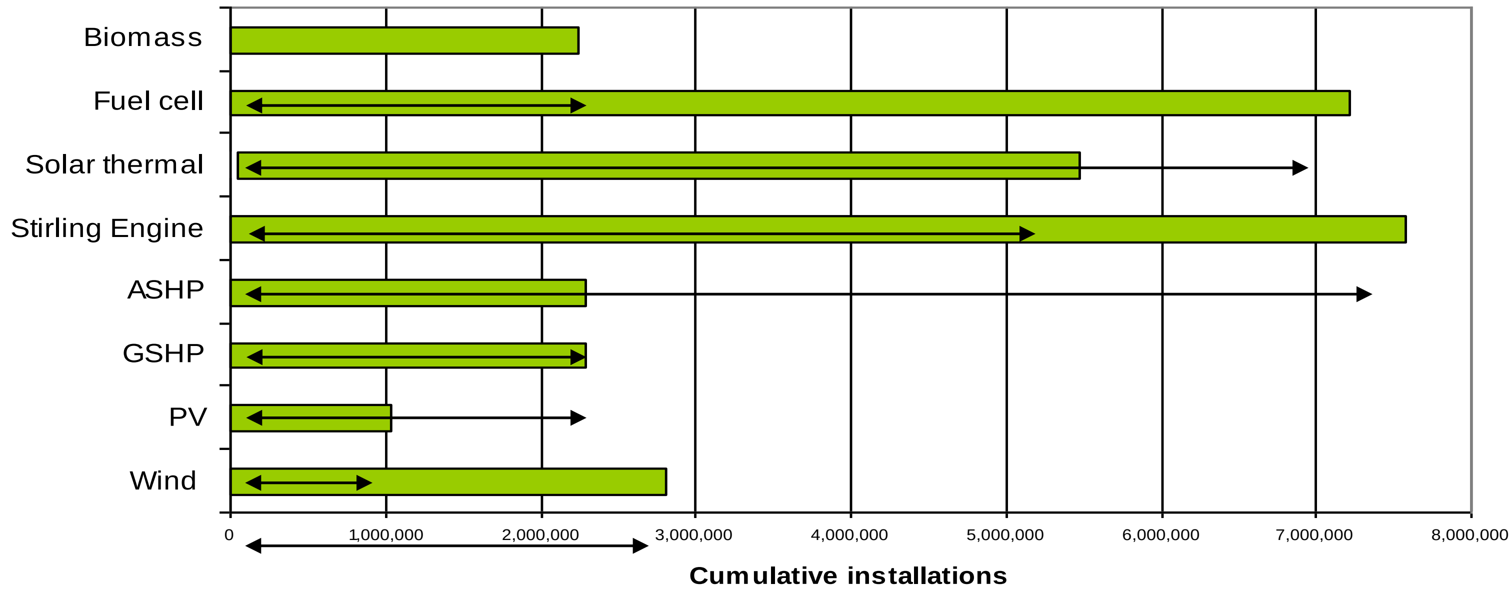
UK uptake of micro electricity and heat in 2020



Foreign examples include German solar thermal and PV, Austrian biomass & Swedish heat pumps – scaled by size of population
Source: DECC, EST, BERR, RAB, NERA, Element Energy, UK national statistics, Micropower Council
Includes residential and business markets

Broad range of possible outcomes

Forecasts for 2020 installed base

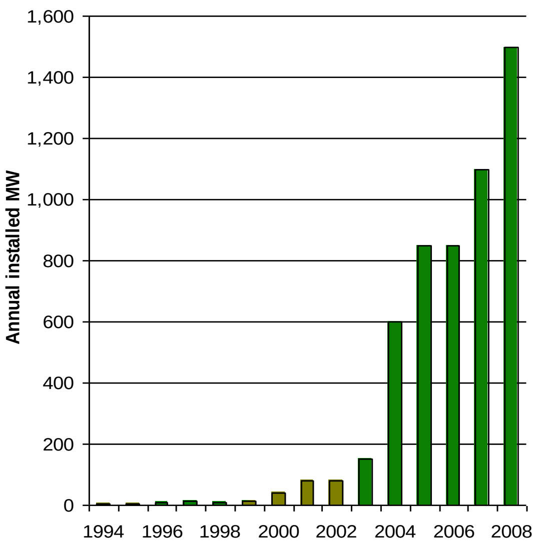


Source: EST, BERR, RAB, E&Y, Element Energy, Micropower Council

Regulation: Statutory incentives will catalyse growth

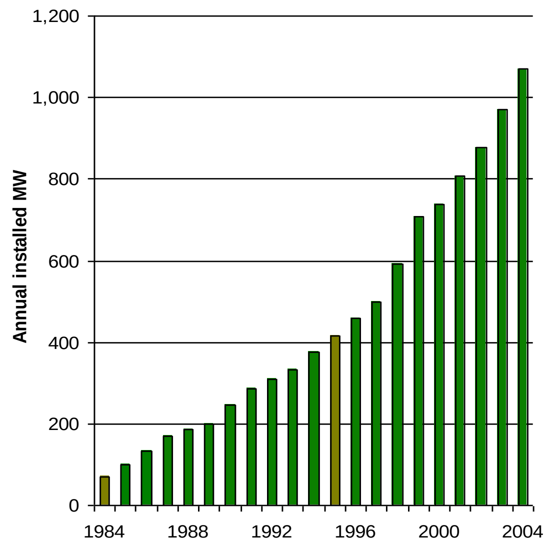
Evidence from other European markets suggests that statutory incentives act as the tipping point in mainstream adoption

German PV



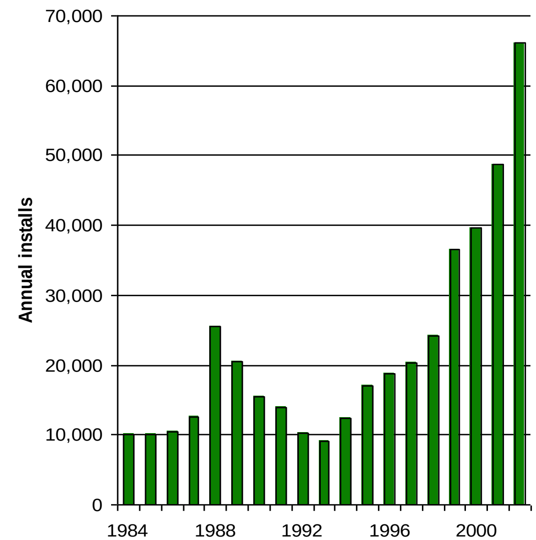
- Low level support since early 90's
- Introduction of FIT in 2004 transformed market
- Tariff increase in 2008

Austrian biomass heating



- Favourable conditions – plentiful wood, high gas prices
- Grant funding available
- Steady market growth

Swedish heat pumps



- Favourable conditions – high fossil prices
- Market has grown via regulation rather than financial support
- 90's dip due to recession

There is no one size fits all solution

What is the right microgeneration solution?

Customer need
What will I use it for?

Property need
What type of dwelling?

Existing system
What is my start point?

What are the practical realities for a customer to purchase Microgeneration?

- Do I really need this?
- Whats the best one to buy?
- Do I need an export meter?
- Who owns my meter ??
- Do I have to change energy supplier?
- Who trades my exports?
- Can my local “man” do this?
- What is the planning requirements?
- Who notifies the DNO that I am now a generator?
- Who can do all this for me?........................

Conclusions………..

- We have set huge overarching targets:
  - 15% of all energy from renewable sources by 2020
  - 60% reduction of GHG emissions by 2050
- Mistake to think that big targets can only be delivered by big projects – <u>remember conversion</u>…..
- Half of UK energy demand is heat, half of this is domestic
- The more renewable heat delivered the more attainable the target for renewable electricity becomes

With the right support, Biomethane and Microgeneration will make a huge contribution and **<u>British Gas</u>** will be at the forefront of delivering it