

Biomethane Market Overview

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John Baldwin
Managing Director
CNG Services Ltd

john.baldwin@cngservices.co.uk

www.cngservices.co.uk

07831 241217

Biomethane Market Overview

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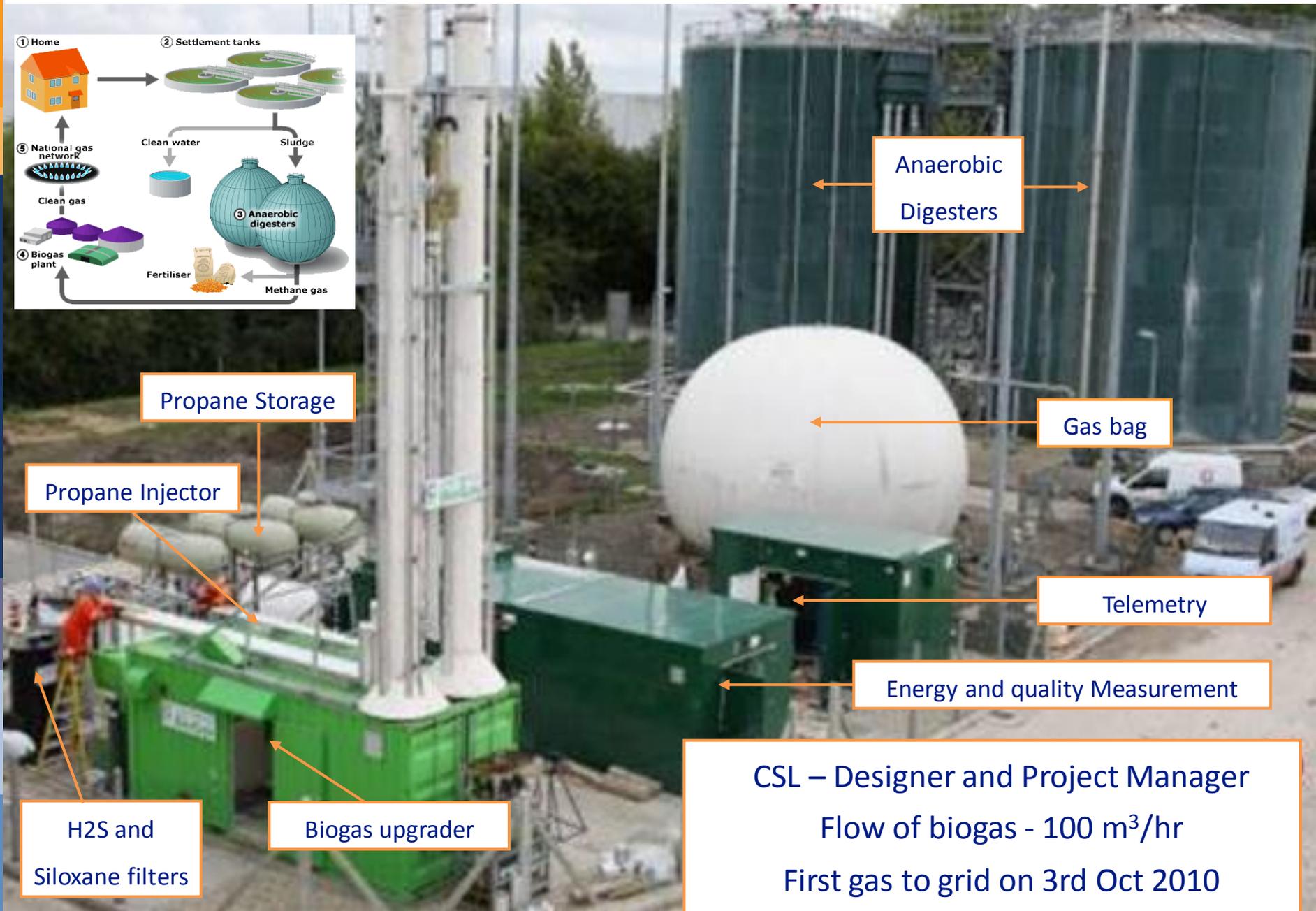
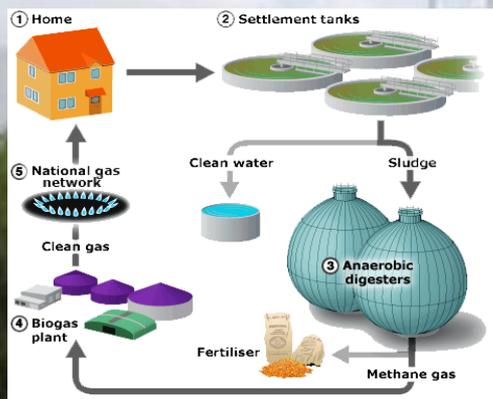
CNG SERVICES LTD

CNG Services Ltd

- Supports projects to inject biomethane into the gas grid
 - Didcot, Adnams, Stockport, Poundbury
 - Working on 30 further biomethane injection projects in UK
- CNG as a fuel for trucks
 - Own UK's largest CNG filling station
 - 'Organic waste to vehicle fuel' network
 - Focus on using gas supplied from 30 bar grid to give high flow and low CO2 option

We are independent from all makers of plant, vehicles, clean-up, compression....we help clients get the best solution for their projects

Didcot – UK's First BtG Project



Anaerobic
Digesters

Propane Storage

Propane Injector

Gas bag

Telemetry

Energy and quality Measurement

H₂S and
Siloxane filters

Biogas upgrader

CSL – Designer and Project Manager
Flow of biogas - 100 m³/hr
First gas to grid on 3rd Oct 2010

Crewe CNG Station

- Customers include GIST/M&S, John Lewis/Waitrose, Tesco, Tenens



Largest grid supplied CNG station in UK

BIOMETHANE JOURNEY

Why Biomethane Injection?

- UK has invested around £30 billion in its gas grid and same again in appliances and central heating
- To meet EU Renewable Energy targets, we need to use resources efficiently
- Biogas CHP often cannot use its waste heat
- So, take the renewable methane to where it can be used efficiently

2006 - 2008

- December 2006 – WRG – Wakefield
 - Proved that vehicles could run on biomethane but this was not practical due to vehicle fill patterns and far too much gas
 - needed gas grid injection
- Joined REA, initial concept was for “equivalence”
 - Otherwise no point injecting biomethane
 - Gaynor thought it seemed a good idea!
- Nov 2007 – Feb 2008 – United Utilities
 - Feasibility Study for Grid Injection
 - National Grid strongly in favour

Heat is on for regulatory change

The UK gas industry trade association – SBGI (formerly the Society of British Gas Industries) – together with the Natural Gas Vehicle Association (NGVA) and the Renewable Energy Association (REA) are lobbying for renewable natural gas – or ‘biomethane’ – to be given equivalent treatment to renewable electricity. John Baldwin, Managing Director of CNG Services, supports this campaign and explains what it’s all about.

What is the problem?

There are no regulatory barriers to injecting renewable methane into the gas grid. In fact, whilst it does not happen yet, the UK pipeline system welcomes it with open arms, not even charging a fee to accept it at the lower pressures that local gas pipelines operate at. The raw biogas has to be dried, cleaned, enriched and odourised, but this is straightforward with a range of technologies widely used in Europe. The problem is commercial. Without equivalent treatment, all green benefits are lost when the biomethane enters the mains. At present, power generated from biomethane taken from the gas network would not qualify for a premium payment under the Renewables Obligation or the Renewable Transport Fuel Obligation. However, there are positive signs that the government is interested in this idea, as BERR (Department for Business, Enterprise and Regulatory Reform) indicated in its response to the Renewables Obligation Consultation (issued 10 January 2008) that it is receptive to the idea and will call for

2008 - 2010

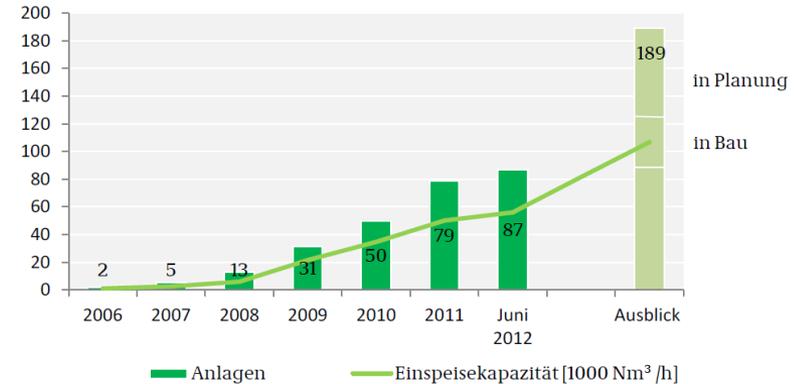
- Renewable Heat Incentive in Energy Act:
 - REA concept of a premium for biomethane injected into grid accepted by DECC
 - November 2008
- April 2009:
 - Proposal to Thames Water and SGN re Didcot flared gas project
- October 2010:
 - First biomethane injection from Thames Water's Didcot plant
- REA work with DECC on RHI tariff levels to be set to give equivalent returns to those from electricity generation
- Visits to other EU countries, especially Germany and Sweden
 - Sweden has not much gas grid and lots of hydro so misleading
 - Germany has 'expensive and slow' regulations

2011 - 2012

- REAL Green Gas Certificate Scheme launched:
 - April 2011
- Poundbury BtG Project identified:
 - Start in June 2011
 - SGN are on track for biomethane injection by Sept 2012
- Renewable Heat Incentive introduced:
 - November 2011 at a tariff of 6.7 p/kWh
- EMIB review to bring down costs of entry and simplify processes:
 - Sept 2011 – May 2012
- HSE Gas Quality:
 - Sympathetic to change in Oxygen limit to 1%, aim to be in place in Q3 2012
- NGN/NG Capacity project:
 - So if you have a gas grid, you have capacity
 - Probably the best gas network in the world for biomethane injection

2006 – 2012 Conclusions

- It has taken 6 years but we have:
 - Attractive RHI tariff for projects starting now
 - Good regime that reduces costs, saves time and supports innovation
 - ‘Not for profit’ Green Gas Certificate Scheme that facilitates biomethane sales
 - Potential for compression within grid to provide capacity to all projects
 - Likely change in O2 specification later in 2012 for biomethane projects
 - Competitive supply chains starting to develop



This is the growth in Germany from start in 2006...we can follow this path

OVERVIEW OF THE DAY

Overview of the Day

“Getting Connected”

- Engineering solution
 - Making biomethane in a way that keeps costs down
 - DECC likely to reduce tariffs in 2015 with degression so it’s important to bring down costs
- Commercial arrangements with the gas grid owner
 - The post ‘EMIB’ regime is simpler and allows the biomethane producer to put the project together
 - The Gas Grid’s key role is to take the gas away

Overview of the Day

“Securing Income”

- RHI Application Process
 - Ofgem
- Green Gas Certificate Scheme
 - Green Gas Certificates are key to helping sell biomethane
- Biomethane sales
 - What is being sold and how is it sold?

Overview of the Day

“EU Biomethane Projects”

- Green Gas Grids Project
 - Sustainability, trade, standards, market growth
- Biomaster
 - Promoting biomethane injection and vehicle use
- Biomethane Regions
 - Biomethane injection and vehicle use

Overview of the Day

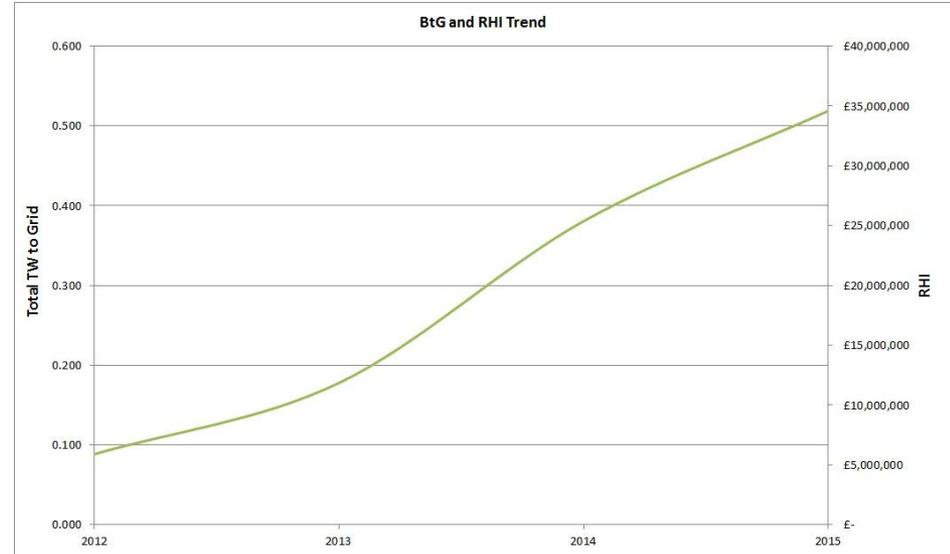
“Future Developments”

- Creating capacity
 - Within grid compression project
 - This can give UK leadership
- REA Biogas Group Work Programme
 - Lots achieved, but more still to do

MARKET FORECAST AND CONCLUSIONS

Market Forecast

- The are 5 main sectors:
 - Agricultural
 - Waste
 - Animal manure
 - Crops for Energy
 - Commercial food waste
 - Food manufacture
 - Biodegradable waste
 - Local authority garden/food waste
 - Sewage sludge



It is possible that there will be around 40 BtG projects in UK in period to 2014/15 when RHI tariff is reviewed
Forecast is for no biomethane as vehicle fuel projects

Biomethane to Grid Conclusions

- It has taken 6 years but the regime looks good – 40 projects in next 2 – 3 years is possible, all technologies
- UK has an extensive gas grid and the full support of UK gas distribution network owners
- 3% of domestic customer gas supply by 2020 is a reasonable target
 - 7TWh out of around 300 TWh demand (around 150 projects of 600 M3/hr biogas)
- Biomethane project economics are attractive
 - Lots of waste feedstock available in UK
- Green Gas Certificates
 - CNG for trucks and buses and CHP/District Heating for new housing
- Within grid compression can give UK market leadership

The biomethane market is set to grow, delivering significant benefits and helping meet 2020 targets – come and join us!