



## Hannover-Bristol Green Energy Summit – Friday 10<sup>th</sup> June

### Workshop 3: District Heating & Biomass

Facilitated by: Josh Thumim Centre for Sustainable Energy

Reported by: Jodie McGregor , Low Carbon South West

Attendees:

- Tony Norton, Centre for Energy & Environment, Exeter University
- Dirk Goeman, Emission Partner
- Michael Strecker, Ares Technology
- David Strecker, Ares Technology
- Mareike Schmidt, Bristol City Council
- Sam Whatmore, Forever Fuels
- Andrew Baker, C&C Green Energy
- James Ford, Hoare Lea
- Dr Laurence Ketteringham, University of Bristol
- Paul Isbell, Bristol City Council
- Prof Martin Bigg, SW Environmental iNet
- George Ferguson, Ferguson Mann Architects
- Alan Bailey, Low Carbon South West
- Christian Peters, hannoverimpuls GmbH

The workshop consisted of a 'warm up' introduction session followed by four presentations given by Tony Norton, Michael Strecker, Dirk Goeman and Sam Whatmore.

The first presentation by **Tony Norton** from the **Centre for Energy and the Environment** was on District heating & CHP in Cranbrook and Exeter. Tony explained the plans for a district heating project for a new development of over 2900 new homes in a new community, East of Exeter. The project, largely driven by private sector, is a collaboration between the public and private sector and includes:

- £28m public sector infrastructure funding package
- £4.1m HCA low carbon infrastructure grant
- Private sector ESCo proposition
- Renewable Heat Incentive (RHI)
- Skypark commercial development included in scheme

The benefits of the scheme are:

- Reduce developers exposure to tightening CO<sub>2</sub> standards at little extra cost
- Demonstration of a private sector ESCo model
- Biomass CHP using recycled wood
- ~£45m low carbon investment

**Michael Strecker** from **Ares Technology** gave a presentation about a rumen-based

process for the sustainable production of biogas. He explained that their new double-stage fermenter system, containing an artificial rumen (decomposition of cellulose and creation of SCFA) and a fermenter for SCFA-degradation (creation of CH<sub>4</sub> and CO<sub>2</sub>) would mean an increase in the performance of fermentation through a higher daily decomposition rate of between 10-25%. The type of waste that can be used to process high-quality multipurpose biogas can include agriculture waste; hay, straw, maize, rape, grass and sunflower trade / industry waste paper /cardboard, draff, bran, beet and from landscape conservation / disposal ; nettle / pest plants and foliage. The reduction in the size of the plant to a tenth of the size means that the process is much more achievable in a wider range of places and can work on a much more competitive level.

The third presentation given by **Dirk Goeman** of **Emission Partner** looked at the Emission Control for Energy from Biogas, using catalysts. The advantages of using catalyst technology includes ; No Biogas DeSulfation needed to reduce the emissions ; reduced formation of SO<sub>3</sub>, high likelihood of long durability due to sulfur resistance and the reduced overall cost to meet regulatory standards. With energy from Biogas due to increase in the UK, regulatory standards for Biogas Power Plants will mean there is a potential need for catalysts. Sulfur resistant catalysts are the most efficient and cheapest way to meet regulatory standards!

**Sam Whatmore** from **Forever Fuels** presented about the innovation in woodfuel products, systems, and supply chains in South West England. They are suppliers of premium grade wood fuel; Wood chip and wood pellet. With 10 years industry experience they originally started in the South West England and are spreading nationally. Forever Fuels have a low carbon footprint with local depots – local woodlands – local people. The company has 150 customers including 2 NHS hospitals. Their main source of material used to make the wood chip and wood pellets come from Small Diameter Roundwood, Sawmill Residues, Reclaimed material, Forestry Residues, and Arboricultural Arisings. Forever Fuels have different delivery mechanisms; Tipped, Scissor lift, Hook bin, Blown....and each site needs a bespoke solution and this will be an issue for the next 25 years! A connection was made between Forever Fuels and Ares Technology Company. The forest residues that Forever Fuels deal with are exactly the type of fuel that can be used in the fermenting processes, if the Ares Technology company set up plants in the UK.

The attendees of the workshop were asked to consider the presentations given throughout the day and share ideas about potential or collaborative projects that Hannover and Bristol could pursue. The workshop was made up of people from different sectors in the environmental field including policy, project management, developers and research /funding. Three small subgroups, containing a mixture of the sectors were formed and some good ideas were presented at the afternoon plenary.

In the plenary, **sub group A** expanded on the idea from Forever Fuels and Ares Technology looking at combining the two. Using waste material from the parks that Bristol City Council manages, this can potentially feed in as an energy source to a combined heat and power system or biomass system used by a developer. The group expressed the idea of a demonstrator project in Bristol and a duplicate project in Hannover.

**Sub group B** expressed several ideas:

- A collaborative research project between Bristol and Hannover looking into the idea of electrical storage systems, where energy has come from renewable energy sources and stored for later use.
- The need for a more 'joined up approach' and 'area based approach' during planning procedures. For example at the master planning stages, energy efficiency

initiatives should be taken into account and ideas are linked up. The UK planning system can learn a lot from the German planning system.

- Marketing energy efficiency initiatives – Bristol can learn from Hannover and the way they promote initiatives on a larger scale. Bristol has started to do this through ‘Green Doors’ but could do more to encourage awareness and uptake.

**Sub group C** looked into an integrated system approach to energy and got creative, presenting the Summit with a flip chart diagram of their idea and two slides explaining this.

Their idea was titled **Reducing CO<sub>2</sub> footprint in Bristol Industrial Area**

**Overviewing a complete local industrial area -**

- Recording the heat and power needs of the companies in this area by amount and time.
- Clustering those needs and finding synergies between excess heat in one company and heat needs in a neighbourhood company.
- Developing a heat grid where heat is sold into and taken out.
- Understanding the electricity needs in this neighbourhood and adding combined heat and power plant to generate the electricity and perhaps the heat can be used as well. Supplying biomethane to these combined heat and power plants which comes from a nearby biogas plant
- Biogas plant produces electricity and has its own heat sink with the production of the biomethane. Heat is completely used. Biomethane is sent to the combined heat and power plant in the local industrial area.
- Search for new companies in this industrial area which fit into the electricity and heat needs of their neighbours.

NB: A technical feasibility study is currently underway for a large-scale Thermal Energy Grid in the Avonmouth and Severnside area, which would serve the various organisations in that area. Low Carbon South West are driving this project and working with a number of technical and financial contributors.