Carlow Kilkenny Energy Agency / info@ckea.ie / www.ckea.ie

Carlow Office: Castle Hill, Carlow
Tel: +353 (0)59 9143871
Fax: +353 (0)59 9143290

Kilkenny Office: 8 Patricks Court, Kilkenny
Tel: +353 (0)56 7752111
Fax: +353 (0)56 7752333

Re: Bio-En-Area Inter Regional District Heating Exchange 4th and 5th October 2011 - Vaxjo Sweden

bioenarea
Improve regional policies for bio-energy and territorial development

INTERREG IVC
INNOVATION & ENVIRONMENT
REGIONS OF EUROPE SHARING SOLUTIONS

European Union
European Regional Development Fund

CKEA Report

The key aim of the Regional Biomass Business Development (RBBD) project is to support biomass business development in the South East Region of Ireland; South East Region of Sweden and Voru Region Estonia through support and development of enterprises along the bioenergy supply chain.

In October, Carlow Kilkenny Energy Agency were participants in the District Heat exchange programme to Växjö Sweden which included regional partners from Ireland, Sweden and Estonia.

Policy makers, planners, developers and local authority engineers attended the exchange in the sharing of experience, knowledge and skills.

Carlow Kilkenny Energy Agency had an accompanying municipality representative Mr. Seamus O'Connor, Director of Housing, Recreation and Amenity & Special Projects, Carlow County Council.

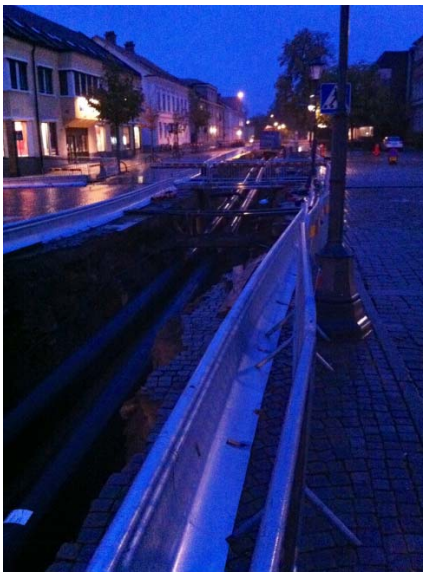
Day 1 - District Heating Seminar: 4th October 2011

Location: Videum Conference Centre - Vaxjo

In total 25+ participants attended with representatives from Energy Agency for Southeast Sweden, Tipperary Energy Agency, Carlow Kilkenny Energy Agency, Waterford County Council, Wexford County Council, NGO Borderland Energy Development Agency, Magnifica Comunità di Fiemme, Växjö Energi AB, Södra Skogsägarna and Hotab Group.

Eva Gustafsson, Energy Agency for Southeast Sweden commenced the seminar with an introduction to bioenergy and district heating in Sweden. District heating is at an advanced stage in Sweden in comparison to our region in Ireland. In Sweden, bioenergy is the largest energy source contributing to almost 32% of the energy use. Almost every village with 1000-2000 inhabitants has a distribution network. By 2020 Sweden hopes to achieve 50% of total energy use from renewable sources, 10 % of the energy use in the transportation sector and 40% reduction in green-house gas emissions in comparison with 1990 levels. Sweden is working towards a goal that they will have no net emissions of greenhouse gases to the atmosphere by 2050.

Following a good synopsis of Southeast Swedens' biofuel potential, presentations were made on district heating from a municipal energy company's viewpoint and the success of district heating in Vaxjo to date. Also in comparison to a municipal energy company, Albin Andersson, Energy Coordinator of Södra Skogsägarna presented district heating industry from the point of view of a producer. Sodra is owned by 51,000 forestry producers, employing over 3,900 staff and aims to be free from fossil fuel production in 2014. Mats Johansson Södra Skogsägarna presented on the quantity of biofuels in Sweden and Magnus Hermansson, HOTAB Group presented on biomass-fired boilers. The seminar provided a great understanding and footing for the following day field visits.



District Heating Network extension in Vaxjo

Day 2 - Field Visits: 5th October 2011

Site Visit 1: Lagan district heating plant – a 2 MW boiler fired with wood briquettes
Mats Uddbäck, Group Manager, E.ON Värme Produktion Öst

Lagan District Heat plant was established 10years ago in 2000 with a project investment of 2million euros. It was an initiative from the local municipality as they wanted to change the communities heating system from oil to biomass. The municipality invited E.ON to consider building and operating the district heating network. E.ON wrote to householders in the various areas to assess how many houses wanted to convert and connect to the DH network. Upon reaching a feasible number of participants, E.ON were able to build. The district heating (DH) network provides heat to the municipality buildings in the area, a school, a home for elderly people and approximately 180 houses. The facility consists of 15km of piping network.

In addition to a 2MW boiler fired by wood briquettes, there is a 500kW pellet boiler for peak load, backup and low-load. The site also contains an electricity generator if there was a failure of electricity supply the plant could still operate. The 2MW boiler operates at over 90% efficiency. Upon full load the network pumps 50 cubic meters per hour.

Each house is fitted with a heat exchanger and heat requirement in the house is controlled by a thermostat. For a new customer connection to the DH network, costs €7,000 which includes connecting the piping from the main network to the house and installing heat exchanger and meter. The heat exchanger unit on its own approx. cost €1000 per unit. There is no hot water storage in the houses, hot water is supplied on demand.

Heat Exchanger unit fitted into houses

Heating costs supplied by the district heat network is approximately 8c/kWh incl VAT including standing charges. Costs are at a fixed price for 1 year. In comparison oil costs approximately 15c/kWh incl VAT. This is mainly due to the cost of carbon tax on oil. In Sweden there is a policy of 'polluters pay'.

On average in the region, the cost to heat a typical house from the district heating facility is €1,700 per year. The running cost for an oil boiler system would be double this figure. A typical house consumes approximately 20,000kWh for heating purposes and 5,000kWh for hot water requirements.

http://www.bioenarea.eu/practices/lagan-district-heating

Site Visit 2: Ljungsjoverket - 34 MW combined heat and power plant fired with household waste, wood chips and peat.
Bo Schönbeck, Heat Production Manager, Ljungby Energi AB

80% of the town of Ljungby is connected to the district heating network. For households wood pellets, wood chips, heat pumps and electricity are the alternatively forms for heating. The plant fuel mix consists of 65% waste, 24% peat, 8% wood chips and 3% oil and LPG. Waste consists of approximately 85 % renewable material. In Sweden it is illegal to dump combustible waste to landfill.

Household waste arrives to the plant and tipped into a bunker, an automatic crane transfers the waste from the bunker into the storage facility. When the boiler calls for fuel, the crane fetches waste for the furnace. Waste usually enters the facility at 40-50% moisture and before it enters the furnace it is held in a drying stage to reduce moisture. Temperature in the furnace is kept at over 850deg C at all times to eliminate dioxins. The plant operates for 11 months of the year with 1 month shutdown for maintenance. During shutdown periods, household waste is bailed and diverted to a holding facility. During operational periods of peak heating loads, bailed waste is utilized.

Bailed Waste during scheduled maintenance period

In 2012, Vaxjo will be separating household organic waste from biogas production. Ljungby operated a district heat facility since since 1977. In 1984, they diverted from oil to peat and wood chip. In 2000 the municipality built this existing waste to energy facility costing 11million euro, ETK plant designer and Babcock & Brown built the plant. Currently the facility has an operating profit of 4million euro per annum and employs 18people.

The facility requires 58,000 tonnes of waste per annum and receives a gate fee for the waste at €45 per tonne

District heat is delivered at 6c/kWh to the household. It costs €3,000 per customer to install heat exchanger and connect to their house.

In the plant they produce electricity to the grid. Electricity is a by product. Viability of the plant is on district heat. In 2010 the facility produced 187 GW of heat
Plant is currently in profit within 10 yrs of being built.

http://www.bioenarea.eu/practices/ljungby-combined-heat-and-power-chp-plant

Site Visit 3: Sodra Ljunga nearby heating plant – a 300 kW boiler fired with wood chips and pellets.
Lars-Erik Karlsson, Södra Ljunga Närvärme

Small scale nearby district heating scheme operated by farmers and forestry owners. The heating network consists of a school, a church, four houses and six apartments Before the implementation of the nearby district heating facility, these facility's consumed approx. 60,000 litres of oil per year. In 2010 the nearby district heating plant sold 600MW hours of heat to these customers.

The plant began operation in December 2008, with the school as the first customer. The idea first came from the farmers, they came together to do something about the energy in the area, it was local initiative. There are 4 owners, an electrician, excavation contractor, a farmer and maintenance contractor. Build investment of 200,000 euro. The plant is fuelled by woodchip and woodpellet and supplied by local neighbours and their own forestry.

http://www.bioenarea.eu/practices/sodra-ljunga-nearby-heating