Bioenergy Promotion 2

FROM STRATEGIES TO ACTIVITIES



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Bioenergy Promotion 2 - From Strategies to Activities aims to strengthen the development towards a sustainable, competitive and territorially integrated Baltic Sea Region by promoting sustainable production and use of bioenergy. Bioenergy Promotion 2 continues the work started during the Main Stage of the project. The objective is to extend the strategic outputs of the main stage project into the Baltic Sea Region and national political arenas including also local and regional administration and utility companies. The project will serve as a central Baltic Sea Region-wide

platform for cross-sectorial and transnational networking within bioenergy and related fields. Within the Bioenergy Promotion project seven demo-regions will utilize the results and experiences gained to improve the strategy development and implementation on local and regional scale. The demoregions will serve as good examples for others throughout the Baltic Sea Region. The activities are targeting awareness raising, mobilization of unused biomass potential, training of local stakeholders and decision makers and adopting of new strategies. In addition existing support schemes and policy developments related to the implementation of the strategies will also be addressed.

Transfer of experience, results and achievements between the demo-regions is also a vital part of the project.



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Greening of the industrial symbiosis

Denmark, Kalundborg

Danish energy system is being redesigned as fossil fuel is phased-out and replaced with renewable energy sources. The industrial symbiosis in Kalundborg, organized around the coal-fired power station, is under pressure to phase-out of fossil fuels. The system furthermore has to be compatible with an overall Danish energy system relying on huge amounts of fluctuating wind power that creates demand for flexibility in consumption and production. Alternative renewable energy sources are therefore needed in the industrial symbiosis. The greening of the symbiosis also requires integration between the industrial symbiosis and the renewable energy base in the region with a special focus on the agriculture.

The challenge is to find renewable energy alternatives to coal and to integrate it into the industrial symbiosis.

The Kalundborg industrial symbiosis is a system in which a group of nine public and private enterprises exchange waste and by-products and thereby reduce the total resource consumption and environmental strain. The greening of the industrial symbiosis refers to the process in which the energy (electricity and process heat) produced from coal at the power station is substituted with renewable energy.

The Bioenergy Promotion 2 project has assisted this greening-process by generating data on waste flows and greenhouse gas emissions from the companies involved in the industrial symbiosis. The project has furthermore generated data about local and regional bioenergy resources, as well as potential technological conversion routes. The close collaboration between the regional authority, the municipality, private enterprises and the knowledge institutions is vital for turning strategies into activities.



Thomas Budde Christensen Roskilde University Office: +4546742637 E-Mail: tbc@ruc.dk kalundborg@symbiosis.dk www.symbiosis.dk/en

Forerunner in sustainable and renewable energy use

Finland, North Karelia

In Finland, the use of wood chips for energy production is rapidly increasing, but logging/chipping entrepreneurs and small scale heat plant entrepreneurs still claim that some issues, such as logistics, small scale use, part time employment, wood chips quality or support policy (not linear at the moment) have to be solved to make the business more profitable.

The aim is to make a survey for North Karelia entrepreneurs and find out their opinion on entrepreneurship in this field, as well as to try to define the main obstacles for development of business.

A survey has been performed using an online survey tool.

The gathered data is analysed and presented at workshop in spring 2013 in North Karelia.

The aim is to involve the decision-makers from other regions to visit North Karelia as well as to exchange the good practices around the regions.

From all energy used in North Karelia 62.7 % come from renewable energy sources. The aim is to clarify what has been done right and whether there is something that could be improved. After the results are received from North Karelia, the use of these practices will be promoted in other regions in Finland.



Contacts:

Urpo Hassinen Niskantie FI-81200 Eno, Finland Office: +358 0500 186 612 E-Mail: urpo.hassinen@metsakeskus.fi www.pohjois-karjala.fi/Resource.phx/ maakuntaliitto/aluesuunnittelu/ilmasto.htx

Woody biomass from logging residues and landscape maintenance

Germany, Lower Saxony, Rotenburg

Main resources for woody biomass from private and municipal ground are logging residues in private forests and cuttings from hedgerow maintenance along municipal and county streets and roads and restoration of moor habitats.

Nutrient sustainability is a major challenge in whole-tree utilization, whereas technological approaches for landscape maintenance biomass harvest is a key issue ensuring economic feasibility even under unfavorable conditions, like low output per spatial unit.

> The problems and strategies are intensively discussed and practical demonstrations are carried out within the framework of the biomass working group at the County

administration, gathering local and regional stakeholders like forest owners and their associations, forestry consultants, technical contractors, sales organisations and environmentalists. Currently, a major issue is the integration of very recent research results, dealing with sustainability issues of the carbon and nutrient budget, a problem which touches a considerable number of factors like soil and forest inventories, certification, technology, extension services and environment. **Regional stakeholders** represent a broad range of goals and interests. However,

goals and interests. However, long-term sustainability of nutrient supply must be regarded as a limit by all interested parties, beyond economic interests. This needs a finetuning of logging residue extraction, based on actual research results. In detail, e.g. twigs and needles as a part of biomass provides a relatively small surplus in energy terms, but lead to a no-return depletion of the Ca, Mg, K and P budget. Return of noncontaminated processed wood ash can reduce this problem, but on many soil types not completely solve it.

Contacts:

N.D.Billioner

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Dr Alexander Rosenberg Mars-la-Tour-Str. 1 – 3, DE-26121 Oldenburg, Germany Office: +49 441 801 704 Mobile: +49 170 2379 952 E-Mail: Alexander.Rosenberg@ LWK-Niedersachsen.de

Replacing fossils with bioenergy: Tukums Municipality district heating system.

Latvia, Municipality of Tukums

Municipality of Tukums Sustainable Energy Action Plan is targeted to ensure 100% renewable energy sources use in district heating system. Until year 2011, 30% of black oil was used in boiler house. "Tukuma Siltums" is the largest heat energy supplier in the town of Tukums – with four boiler houses with the total installed capacity up to 42 MW. The aim was to replace fossils with renewable energy source in the district heating system. The decision regarding modernization necessity was established in the Sustainable Energy Action Plan of the municipality. The boiler houses have undergone several cycles of modernizations and upgrades. The last one was finished at the end of 2011, and since then all boilers are running fully on renewables wood chips. In addition,

fuel gas condensers have been installed in each of the new boilers, thus providing additional 15-25% efficiency in terms of heat energy production. Since 2011, the conversion efficiency reaches 80%. During modernization of the boiler house, two new building block constructions with extra two wood boilers (5 MW + 5 MW) to provide the total heat power of 20 MW using wood chips were established and 30% of black oil use were replaced with 100% RES. Before every heating season, the municipality-owned company is organizing a public tender for purchasing of wood chips as a result of which local biomass producers are contracted. The wood chips are obtained mostly from the region around towns and transportation distance does not exceed 50-60 km.



Actions implemented:

Cooperation:

The challenge is to settled down good cooperation of local decision-maker and energy stakeholder and reach common goal – use of local energy sources for energy production, good quality services available for inhabitants for reasonable price.

Planning:

the activity was implemented within the frameworks of the SEAP for Tukums Municipality and integrated regional development plan.

Support available:

The activity was implemented by the financial support of the EU funds.

Contacts:

Tukums municipality Anita Selunda Talsu iela 4, LV-3101, Tukums, Latvia Office: +371 63122707 E-Mail: anita.selunda@tukums.lv www.tukums.lv

Forerunner in sustainable and renewable energy use

Lithuania, Kaunas Region, Kaunas City

Kaunas City is one of the most natural gas dependant cities in Lithuania, which leads to the highest district heating tariffs in the country and high CO 2 emissions.

The aim was to introduce new independent and unregulated heat producers that use biomass fuel and provide cheaper heat for residents of Kaunas City using district heating.

> Sustainable development plan until year 2020 for Kaunas Region envisaged introduction of independent heat producers in heat sector that would be able to compete with the

largest existing producer Kaunas Combined Heat and Power plant that was owned by Gazprom at that moment. The new boiler house has two biomass boilers with capacity of 8 MW each and a condensing economizer with capacity of 4 MW. This capacity will cover 35% of summer and 8% of winter heat demand in Kaunas City. The first independent biomass boiler house was built using business initiative and funding of local private investors. The company is also one of the first stakeholders of the newly established Biofuel Exchange that purchases biomass fuel from Lithuanian producers.

Contacts:

Raimondas Streimikis Jogailos g. 4, LT-01116 Vilnius, Lithuania Office: +370 5 2661266 Integrated approach to use of biodegradable waste and other types of biomass for fuel production

Poland, Pomerania, Gdynia Municipality

The main approach related to municipal waste utilisation in Central European countries based on landfilling, leading to problems with odours and methane emission.

The aim is to implement the new EU strategy on waste (formulated in Framework Directive on Waste: 2008/98/ EC) which describes hierarchy of action in relation to waste management. Biodegradable municipal waste going to landfills must be reduced to 75% in 2010, 50% in 2013 and 35% in 2018 of the total amount of biodegradable waste produced in 1995. Segregated municipal biowaste is widely utilized in biogas installations in

other European countries. It is often used in Sweden to produce the biofuel for vehicles. This kind of municipal waste management (with dry fermentation), favoured in Polish legal system, is considered by Gdynia Municipality. There is also growing evidence of numerous new waste gasification systems being developed, especially for dry lignocellulosic biomass. The gasification technologies are advantageous in relation to those based on combustion as they allow treating even highly non-uniform substrates and leading to higher temperatures during syngas combustion (i.e. higher efficiency for electricity production).



Segregated municipal waste is an alternative energy source that is renewable, sustainable and eco-friendly and its proper management is of vital importance. Different methods for management of the municipal waste are analysed from the point of view of the waste hierarchy – the principal concept in the EU waste policy.

Waste-to-energy technology is an environmentally beneficial alternative to landfill. Gdynia Municipality is developing integrated approach to biodegradable waste and other types of biomass for fuel production.

Contacts:

Dr hab. Eng. Adam Cenian Fiszera 14, PL-80-952 Gdańsk, Poland Office: +48 58 6995 26 E-Mail: cenian@imp.gda.pl

Lidköping Biogas is one of the world's first plants for the production of liquefied biogas

Sweden, Skaraborg Region, Lidköping

Around Lidköping, there are many biogas plants operating with residues from local food production companies and other naturally degradable waste. The residues from these operations are in many ways considered to be waste or low value material for burning etc. At the same time there is a need and political will to develop sustainable vehicles and renewable fuels.

Lidköping Biogas is one of the world's first plants for the production of liquefied biogas. The plant is in operation and provides upgraded biogas for both light and heavy vehicles with renewable fuel. When replacing petrol and diesel with this amount of biogas, the reduction of greenhouse gases by 16 000 tonnes of carbon dioxide per year can be achieved.

Local vegetable waste products from grain trade and food production are used in the biogas production process. These substrates are macerated, mixed and heated to 38°C before pumping into the digestion chamber. New substrate material is continually being pumped into the process where biogas and biofertiliser are produced. The biofertiliser is pumped to a covered storage pool. Plant thermal capacity is planned for 7.5 MW with annual target of 60 GWh thermal. The production plant was designed by Swedish **Biogas International AB. The** biogas is upgraded in accordance with the Swedish standard for biogas as a vehicle fuel (SS 155428) in a water scrubber. Majority of the biogas is liquefied in condensation plant. The technology is supplied by Air Liquide. Energy cost of liquefaction is approximately 1 kWh/Nm³ of upgraded biogas, which equals to approximately 10% of the energy content of the biogas.

The distributor, FordongasSverige

AB (FGS), fills insulated 50 m³ trailers every second day and transports the gas to filling stations in Göteborg with more to come.

One of the main key success factors of this project is the public private partnership where all three partners use their expertise and know-how.

The municipality was the initiator and saw the potentials to solve problems with waste handling. They also wanted to be a forerunner in the field of climate and energy. It is the result of long proactive energy and climate planning. Thanks to introduction of new and emerging technologies, the project was awarded a grant from the Swedish government's Climate Investment Programme (KLIMP). It allowed the municipality to go further and form joint initiative with Swedish Biogas International and GöteborgEnergi which offer both expertise and experience, as well as possibilities for long-term investments.

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Contacts:

udkoping Biogas Christina Nilsson Office: +46 707 62 61 37 E-mail: christina.nilsson@goteborgenergi.se http://www.lidkopingbiogas.se/

.idköping municipality (vonne Träff Dffice: +46 510 77 01 93 E-mail: yvonne.traff@lidkoping.se Sven-Göran Sjöholm Dffice: +46 768 54 99 34 E-mail: sven-goran.sjoholm@swedishbiogas.con

Bioenergy Promotion 2 Partners:

- Baltic Eco-Energy Cluster (IMP-BKEE) Poland
- Chamber of Agriculture Lower Saxony Germany
- Agency for Renewable Resources Germany
- Environmental Policy Research Centre Germany
- Forestry Development Centre Tapio Finland
- Latvian Environmental Investment Fund Latvia

Total budget: 1.5 million € Duration: January 2012 - January 2014

- Lithuanian Energy Institute Lithuania
- Motiva Oy Finland
- Nordic Energy Research Norway
- Region Zealand Sweden
- Roskilde University Denmark
- Spektrum Poland
- Swedish Energy Agency Sweden



The Bioenergy Promotion 2 project partnership forms a "Virtual Bioenergy Promotion Secretariat", which assists and advises regions developing and implementing bioenergy strategies. Interested regions, municipalities and further stakeholders can contact the Secretariat via the secretariat e-mail address:

bioenergypromotion@motiva.fi www.bioenergypromotion.net

Lead Partner:

Fachagentur Nachwachsende Rohstoffe e.V. OT Gülzow Hofplatz 1 DE-18276 Gülzow-Prüzen Germany Ms Aino Martikainen E-mail: a.martikainen@fnr.de Phone: +49 38430 166 Fax: +49 38430 102