Bioenergy Region Mecklenburgische Seenplatte (DE)

Location
North- eastern Germany, in the south of the province Mecklenburg-Vorpommern

Short summary
The region of the Mecklenburgische Seenplatte covers an area of 0,58 Mio. ha, whereof 0,35 Mio. ha (60%) are arable land, 0,14 Mio. ha (24%) forest and 0,05 Mio. ha lakes. There are 300.000 inhabitants living (51 inhabitants/ km^2) in the region, but average age and migration (approx. 20% in the last 20 years) are increasing.
The most important branches of economic activity of the region are agriculture and forestry. The economic utilization of ground is restricted by the existence of one national park, several natural parks and protective areas (e.g. lakes). The majority of inhabitants is working in the service sector (tourism) or they are commuting to other regions.

"Bioenergy Region Mecklenburgische Seenplatte" is a result of a competition of 210 bioenergy regions nationwide (federal program since May 2009). Based on a SWOT- analysis (Strengths, Weaknesses, Opportunities, Threads) need for action was found in following fields:
1. Identification, assessment and impact on the attitude with regard to production and consumption of energy,
2. Demonstration and identification of sustainable alternative solutions of production and processing of bio- resources: concepts of land use, plant species, technology and innovation,
3. Impact on the regional purchasing power by extension and immersion of value chains,
4. To arouse interest and mobilize individuals and funds for sustainable regional (energy) supply systems,
5. Integration of education and strengthening awareness for sustainability and energy in a process of lifelong learning.

These main subjects are to meet the key projects, which are supplemented by further subjects and flanked by attended projects.

Key projects:
There are local projects, which have been receiving transregional prominence since foundation, but which are still slightly networked and among themselves without any energy management yet:
Stadtwerke Neustrelitz GmbH
Arge Bioenergie Bollewick GbR
Müritz Biomassehof GbR
Kompetenzzentrum Regiostrom Ivenack GmbH

Near- and medium termed aims:
1. Collecting key data of bioenergy production, energy consumption and climate awareness,
2. Increase of the demand for bioenergy products and power-heat coupling, saving incentives,
3. Creation of awareness, motivation of one´s own acting, network.

Baltic Sea Region Programme 2007-2013
Part-financed by the European Union (European Regional Development Fund and European Neighbourhood and Partnership Instrument)

Biomass used
Bio-wastes, Agricultural crops, Woody biomass (waste wood, energy wood)

Sustainability criteria
Enhancement of energy efficiency, Energy savings, Regional matter and energy flows, Job creation in the region, Sustainable tourism

Initiation
Four regional companies with tight municipal liaison,
Actors and partners from science, economy and administration, Associations,
Federal program: bioenergy regions competition

Policy instruments:
Demonstration projects
Education/Information
Networking and Clustering

Situation before and after
In energy economy the supply of electricity, gas and fuel made from fossil resources is dominant. More than 50% of energy requirements (electricity and biofuel) have already been produced by the in a sustainable way, but are not consumed by itself. 12% of the arable land are integraded in production of energy crops (including oil seeds).
For energy production there are already existing:
1 energy wood- biomass- thermal power station
2 waste wood- biomass- thermal power stations
1 ORC- power plant (energy wood)
2 biomass- heating systems
44 biogas plants with cogeneration unit
1 biodiesel refinery

Development potential:
- Not practical to a greater extent (any more): recycling wood, biogenic part of household waste and biogenic wastes from food processing and utilization of leftovers,
- Very low number of livestock, therefore utilization of organic farmyard manure possible only locally,
- Development potential of agricultural biogas plants: 160 GWh electricity and 191 GWh heat (when consequently power-heat coupling) and 20 GWh from landscape conservation; arable land use would increase to 15% (up to 20% will be without concurrence with food supply (reference: government of Mecklenburg- Vorpommern)),
- Energy wood potential: 28.000 t/a

Aims:
1. Economy in favor of climate protection: strengthening of the private purchasing power by replacing the imported fossil energy sources,
2. Bioenergy will be integrated in a citizen provided, regional supply network. Consciousness-raising, cultural, touristic and structural development will be connected.

Baltic Sea Region Programme 2007-2013
Part-financed by the European Union (European Regional Development Fund and European Neighbourhood and Partnership Instrument)

Measures for engagement and acceptance in the fields of climate, sustainability, renewable, biofuels:

1. Regional consultancy for biofuels in agriculture and forestry,
2. Mobile educational offerings dealing with sustainable energy use (www.anu-mobil.de), teacher´s regular table,
3. Importance of developing, communication (Kolleg für Management und Gestaltung nachhaltiger Entwicklung GmbH)

Contact details	**Regional responsible person**
Bettina Eichler-Löbermann, Stefanie Busch University of Rostock, Institute for Land Use J.-v.-Liebig-Weg 6 D-18059 Rostock, Germany Phone: +49 381 498 3064 Fax: + 49 381 498 3062 E-mail: bettina.eichler@uni-rostock.de stefanie.busch@uni-rostock.de	Falk Roloff-Ahrend ARGE Initiative Bioenergieregion Mecklenburgische Seenplatte GbR, C/o Stadtwerke Neustrelitz GmbH Wilhelm-Stolte-Str. 90 D-17235 Neustrelitz, Germany Phone: 03981 - 474 124 Fax: 03981- 474 138 E-mail: roloff-ahrend@seenplatte-bioenergie.de Web page: www.seenplatte-bioenergie.de

Baltic Sea Region Programme 2007-2013
Part-financed by the European Union (European Regional Development Fund and European Neighbourhood and Partnership Instrument)

Natural Rügen – full of Energy (DE)

Location
North-eastern Germany, Island of Rügen

Short summary
Rügen is the smallest county of Mecklenburg- Vorpommern (province in northern Germany) with a total area of 97.456 ha and 69.716 inhabitants (2007). Productive area of Rügen consists of 61.021 ha arable land, including 11.025 ha Grassland and 15.400 ha forest. Most important sector of the island of Rügen is tourism.
With the project "Natural Rügen – full of Energy" Rügen participates in a bioenergy regions competition (federal program since may 2009). Aim of the project is to increase bioenergy production to 30% of total demand, due to increase efficiency. Emission of CO_2 will be reduced by 40% as a consequence of bioenergy production and additional energy saving.
Several projects in Rügen are taking part in "Natural Rügen" with a view to use all biomass resources for bioenergy, changeover to biogas for transport sector, implementation of sustainable tourism, networking and publicity.

Biomass used
Wastes, Sewage sludge, Agricultural crops, Woody biomass

Sustainability criteria
Reduction of waste, Increment of energy efficiency, Regional matter and energy flows, Job creation in hinterland, Sustainable tourism

Initiation:
Association of craftsman, Federal program: bioenergy regions competition

Policy instruments:
Demonstration projects supported by region/municipality
Education/Information/ Promotion/ Awareness raising activities
Networking and Clustering

Situation before and after
In Rügen there were already existing: 3 combined heat-and-power plants based on biogas, 1 biomass boiler plant, 1 petrol station for natural gas, 135 photovoltaic facilities and 1 solar collector.
In Addition the project`s aim is to use the bioenergy potentials of wastes and cultivated land: about 7550 t/a municipal bio wastes, about 2150 t/a sewage sludge, about 2.000 t/a of sea weed and algae, 20.000 t/a straw, 1.885 solid m^3/a wood from the forests and 900 t/a wood from landscape fostering.

Baltic Sea Region Programme 2007-2013
Part-financed by the European Union (European Regional Development Fund and European Neighbourhood and Partnership Instrument)

Contact details	**Regional responsible person**
Bettina Eichler-Löbermann, Stefanie Busch University of Rostock, Institute for Land Use J.-v.-Liebig-Weg 6 D-18059 Rostock, Germany Phone: +49 381 498 3064 Fax: + 49 381 498 3062 E-mail: bettina.eichler@uni-rostock.de stefanie.busch@uni-rostock.de	B.Sc. Dominique Diederich Dr. Gehrig Management- & Technologieberatung GmbH Escherstraße 23 30159 Hannover Phone: +49 511 35 77 16 15 +49 3838 315 98 55 Fax: +49 511 35 77 16 19 E-mail: diederich@gehrigonline.de Web page: www.bioenergie-ruegen.de

Baltic Sea Region Programme 2007-2013
Part-financed by the European Union (European Regional Development Fund and European Neighbourhood and Partnership Instrument)

Muhu municipality (EE)

Location
Western Estonia, in Saare County, on the island of Muhu

Short summary
The island's (Muhu) territory is 206 km^2. There are 52 villages of different size in Muhu with total the population of 1926.

In 1976 the municipality owned district heating system was built in Liiva village (administrative center of the municipality). During the period of 1976-1996 the coal was used as a fuel. In 1996 the boiler plant was renovated using World Bank loan. A new REKA (Denmark) 500 kW boiler was installed and imported coal was replaced by locally harvested biomass. Initially, sod peat was fired as well.

The average annual heat production is 1600-1700 MWh. Approximately 80% of heat is supplied to consumers in public and social sector: schoolhouse, kindergarten, sporting center, care center for elderly people, etc. The rest 20% is supplied to residential buildings.

Biomass used
Wood (chips)

Sustainability criteria
Emission reduction
Creation of jobs
Cost-effectiveness
Sustainable use of local resources

Initiation
Municipality administration

Policy instruments
Municipal economic incentives
The initial investment in boiler plant was supported by soft loan from the World Bank secured by the Government.

Situation before and after
The district boiler plant was renovated. As a consequence of using biomass for energy generation, emission into the air was reduced. Emission of CO_2 was reduced by 900 t annually. The fuel supply security was increased due to the use of only local fuels. Also 15 new jobs were created locally for collection and processing of woody biomass.

Contact details	**Regional responsible person**
Inge Roos, Sulev Soosaar Tallinn University of Technology Ehitajate tee 5 19086 Tallinn, Estonia Phone: +372 662 1612 Fax: +372 661 3653 E-mail: inge@staff.ttu.ee	Raido Liitmäe Liiva village Muhu municipality 34701, Saare county Estonia Phone: +372 454 8985/ +372 508 2776 E-mail: vald@muhu.ee Web page: www.muhu.ee

Baltic Sea Region Programme 2007-2013
Part-financed by the European Union (European Regional Development Fund and European Neighbourhood and Partnership Instrument)

Eno district (FI)

Location
North Karelia, in the province of Eastern Finland

Short summary
Eno is one district of Joensuu and covers 1 088.63 km^2, (939.33 km^2 land, 149,3 km^2 water) and has 7.000 inhabitants. There are two population centers located in Eno district – the actual village of Eno and Uimaharju. Eno district heating scheme is a success story of developing small and medium scale woodfuel supply chains.

Biomass used
The energy consumption is together about 15 000 MWh and it equals the annual consumption of 750 private homes. Over 24 000 loose-m^3 forest chips is required per year.

Sustainability criteria
Cost-effectiveness
Emission reduction
Job creation (more than 20 jobs)
Energy independence

Initiation
Eno Energy Cooperative

Policy instruments
The beginning of the co-operative required a long development and consultation process among the forest owners and decision-makers in the municipality. The first meeting dealing with the topic took place in February 1996. Eno Energy needed also the Metka and ROIHU development projects, carried out by the Forestry Centre of North Karelia. The meeting that led to the formation of the Eno Energy Cooperative was held on the 15th of September 1999 and there were only 12 members. This number has since increased to 51.

Situation before and after

Heat produced using wood energy (46 €/MWh) is remarkably cheaper for consumers compared to oil (61 €/MWh, March 2010). Three plants of Eno substitute every year about 1,7 million litres oil for ships. Over € 1 000 000 (year 2010) were saved by the local economy. As a result carbon dioxide emissions were reduced by over 4 million kilos annually. Eno Energy Cooperative also takes responsibility for the operation of three pellet boilers in Joensuu and one chip boiler in the municipality of Kontiolahti but the Cooperative doesn't supply the raw material to them. So together this company runs a total of 9 bio boilers and 9,5 MW_{th}. The switching to local energy sources has created jobs for over 20 persons. The local energy source brings safety and energy independence.

Baltic Sea Region Programme 2007-2013
Part-financed by the European Union (European Regional Development Fund and European Neighbourhood and Partnership Instrument)

Contact details	**Regional responsible person**
Pradipta Halder School of Forest Sciences, University of Eastern Finland Borealis Building FI-80101 Joensuu, Finland Phone: +358 13 251 111 Fax: +35813 251 3634 E-mail: pradipta.halder@uef.fi	Urpo Hassinen Eno Energy Cooperative Niskantie 17 FIN-81200 ENO FINLAND Tel +358 207 728 256 Mobile + 358 500 186 612 Fax +358 207 728 250 E-mail: urpo.hassinen@metsakeskus.fi http://www.enonenergia.fi/

Baltic Sea Region Programme 2007-2013
Part-financed by the European Union (European Regional Development Fund and European Neighbourhood and Partnership Instrument)

Kaunas County (LT)

Location
Lithuania

Short summary
Kaunas County is one out of 10 Counties in Lithuanian Republic with an area of 8.089 km^2 and 673.706 inhabitants (2008).
In the year 2007 Development Council of Kaunas County, Kaunas County Governor's Administration and Kaunas County Development Agency had prepared a Development Plan of Kaunas County till year 2013. Among priorities of the County the following tasks were defined: promotion of biofuel production businesses on the country side, looking for alternative waste management methods, improve energy efficiency of public buildings and of residential blocks, installation of biomass boilers in existing boiler-houses, use of landfill gas for electricity and heating, purchasing of new public transport with priority to ecological characteristics, cost-effectiveness etc.

Biomass used
Agricultural crops, Waste, Landfill gas, Biogas for transport sector

Sustainability criteria
- Emission reduction
- Increment of energy efficiency/ saving
- Cost-effectiveness

Initiation
Authority of municipality

Policy instruments
Development Plan (municipal)
Funded by County and municipal means, environmental funds and EU structural funds
Projects implemented through public-private partnership

Situation before and after
In 2009 there were 18.812 ha of crops grown for bioenergy purposes in Kaunas County. A feasibility study for waste incineration plant in Kaunas County was prepared. Operating district heating companies of Kaunas County are using approximately 18% of biofuels (wood and straw) and 3,3% of peat. There were 16 multistorey residential houses renovated in Kaunas City for better energy efficiency. Four schools are to be renovated in 2009-2012 in Kaunas. The Lapes Landfill Gas Utilisation project was a Joint Implementation project developed between Lithuania and the investor countries and companies of the Baltic Sea Region Testing Ground Facility. 55 new more economic buses "Solaris URBINO 12" were bought by Kaunas JSC "Kauno autobusai" (Kaunas buses) since 2004.

Baltic Sea Region Programme 2007-2013
Part-financed by the European Union (European Regional Development Fund and European Neighbourhood and Partnership Instrument)

Contact details	**Regional responsible person**
Sigitas Lazauskas Lithuanian Institute of Agriculture Instituto aléja 1, Akademija LT-583447 Kédainiai, Lithuania Phone: +370 347 37271 Fax: + 370 347 37096 E-mail: sigislaz@lzi.lt	Arūnas Karlonas Head of Regional Development Department Kaunas County Governor‘s Administration L. Sapiegos str. 10, Kaunas Phone: +370 37 322688 E-mail: arunas.karlonas@kaunas.aps.lt

Baltic Sea Region Programme 2007-2013
Part-financed by the European Union (European Regional Development Fund and European Neighbourhood and Partnership Instrument)

Daugavpils district (LV)

Location
Southern Latvia

Short summary
The project `Heat plan for Daugavpils district` started in 1998 on the base of an agreement between Ministry of Economy of Republic of Latvia, Danish Ministry of Environment and a municipal energy cooperation. The project involved ten rural municipalities (30,000 inhabitants). Within the scope of the heat plan a pilot study of regional and local level heat supply was elaborated. During 1998 and 1999 Danish experts and a group of local consultants took account of the success of the first stage of the project. Municipality of Daugavpils district decided to continue the implementation of the project.

Biomass used
Wood

Sustainability criteria
- Reduction of CO_2, NO_x and SO_2
- Cost efficiency
- Job creation (20-30 jobs in rural area)

Initiation
1998 Agreement between Ministry of Economy of Republic of Latvia and Danish Ministry of Environment and Energy cooperation of municipal, state and international bodies involved

Policy instruments
Agreement between ministries and energy cooperation
State and international bodies involved
Investment provided by national government

Situation before and after
Daugavpils district is up to now the largest by scale district heating development project in rural area of Latvia and also most successful example of cooperation of municipal, state and international bodies.
Before reconstruction municipalities involved in the project used mainly coal and heavy fuel oil, after reconstruction 75% of fuel consumed in district heating was biomass (21.000 t of dry biomass). As the result of the project emissions of sulfur were reduced by 90%, emissions of nitrogen by 50% and carbon emissions by 75%.

Contact details

Andis Lazdins
Latvian State Forestry Research Institute "Silava"
Riga Street 111
LV- 2169 Salaspils, Latvia
Phone: +371 67976713
Fax: +371 67901359
E-mail: andis.lazdins@silava.lv

Baltic Sea Region Programme 2007-2013
Part-financed by the European Union (European Regional Development Fund and European Neighbourhood and Partnership Instrument)

Bioenergy Region of Hadeland (BIOREG)

Location
The region Hadeland lies approximately 60 km north of Oslo (Norway). The region is in the County of Oppland, and consists of the three municipalities Gran, Lunner and Jevnaker.

Short summary
In 2003 the region Council for Hadeland established the Bioenergy Region of Hadeland ("BIOREG") with the following ambition (BIOREG Project document, 2008 in Norwegian):

> *"Hadeland have in 2020 developed bioenergy as ground for a society where the use of energy is in balance with the nature carrying capacity"*

This ambitious goal is supported by the following sub-objectives:
- Double the use of bioenergy in Hadeland in the period 2003-2015 from 54 to 108 GWh
- Contribute to industrial and commercial development in the field of bioenergy in the region
- Continue the development of Hadeland as demonstration region and as a region with expertise in bioenergy
- The Region of Hadeland will provide and collaborate closely with the implementation of Arena Bioenergy Inland (www.arenabioenergi.no).

The Hadeland region has a total population of approximately 28.000 habitants. Agricultural land covers about 10 % and productive forest area covers about 64 % of the total area (127 500 hectares). In the forests of Hadeland there is all together 7.4 mill m^3 standing timber. The annual increment in the forests is about 280.000 m^3 and the annual harvest is about 170.000 m^3. Thus biomass from forestry is a major biomass resource in the region.

Biomass used
Forest residues, timber from commercial thinning, residues from wood processing, pulpwood and municipal waste.

Sustainability criteria
Providing greenhouse gas savings and other environmental benefits, contributing to energy security, improving trade balances, providing opportunities for social and economic development, and improving the management of resources and wastes

Initiation
The three municipalities Gran, Lunner and Jevnaker, Hadeland Energi AS, Regionrådet for Hadeland, and some private initiatives (the community-owned common land institutions in the region and The Energy Farm). The Energy Farm was one of the main driving forces in the process.

Policy instruments
The aims of BIOREG will be reached trough systematic and goal-oriented work towards:
A) Industrial and commercial actors in the Hadeland region
B) Arena Bioenergy Inland (they have their administration at Hadeland)
C) Networking and clustering, experience exchange and information dissemination
D) The development of competence in the field of bioenergy in the municipalities

Baltic Sea Region Programme 2007-2013
Part-financed by the European Union (European Regional Development Fund and European Neighbourhood and Partnership Instrument)

Lobbyism has been an important tool the first years, later also the following up on initiatives and projects. Grønne energikommuner (Green Energy Municipalities programme) and Arena Bioenergy Inland are also important tools.
Green Energy Municipalities programme was initiated in 2007, by the Ministry of Local Government and Regional Development, the Ministry of Petroleum and Energy, the Ministry of the Environment and the Norwegian Association of Local and Regional Authorities. The aim is to focus on energy efficiency, renewable energy (like bioenergy) and to reduce greenhouse gas emissions in the municipalities.

Arena Bioenergy Inland was established 1.1.2008, and cover the Inland region (the two counties Hedmark and Oppland), and thus also the region Hadeland. The expectations for outcome from Arena Bioenergy Inland are high: by 2010 the cluster will contribute to reduce the emission of CO_2 by 130,000 tons, increase the production of bio-heat from today's 20 to 30 %. In addition, the Inland regions shall supply 30 million litres of biodiesel annually and start exporting biofuels to the rest of Norway and the Nordics. The initiative will create between 300 to 500 new jobs, and an additional 500 by 2015. And Hadeland will be an important piece in the puzzle to reach these ambitious aims.

Situation before and after
The region of Hadeland was leading in the field of bioenergy also before BIOREG. Hadeland was the first region in Norway to make a regional bioenergy plan ("Bioenergiplanen for Hadeland" 1986). In 1991 The Energy Farm concept was established by Erik Eid Hohle. And in 1996 and 1994, respectively, two companies were established in the region aiming to produce heat (Økovarme-1996-2002) and biofuels (Habiol - 1994).

The already positive development in the field of bioenergy has been further strengthened by the establishment of BIOREG. After its start in 2003 BIOREG has been an important driving force behind both public and private bioenergy projects. One example from the public part is the use of biodiesel on cars owned by the municipalities. Regarding private bioenergy projects in the region the latest project have been a central heating concept for the new business park Mohagen, which will be based on local biomass resources ('Hadeland' 19.2.2010).

Bioenergy is today an important element of the regional identity in Hadeland. An approval of the work on bioenergy in the region was when the three municipalities of Hadeland in 2007 were among the 21 municipalities selected to participate in the Green Energy Municipalities programme. The regional interest is also showing through the local newspaper, where regional developments regarding bioenergy are a common topic.

Contact details	**Regional responsible person**
Dr. Gunnhild Søgaard Norwegian Forest and Landscape Institute PO Box 115, NO-1431 Ås Phone (+47) 64 94 90 51 Email: gunnhild.sogaard@skogoglandskap.no ---------- www.skogoglandskap.no	Mr. Helge Midttun, BIOREG Project Leader Gran rådhus, NO-2770 Jaren Phone: (+47) 61 33 84 87 Email: helge.midttun@gran.kommune.no ---------- www.bioreg.no

Baltic Sea Region Programme 2007-2013
Part-financed by the European Union (European Regional Development Fund and European Neighbourhood and Partnership Instrument)

Extra contact info (for the Energy Farm and Arena Bioenergy Inland):

Contact details the Energy Farm	**Contact details Arena Bioenergy Inland**
Mr. Erik Eid Hohle The Energy Farm Røykenviklinna 611, NO-2760 Brandbu Phone (+47) 61 33 60 90 Email: erik.hohle@energigarden.no ---------- www.energigarden.no	Mr. Ole Helmer Bjørlien Arena Bioenergy Inland Project leader Røykenviklinna 611, NO-2760 Brandbu Phone: (+47) 95 23 69 11 Email: ohb@arenabioenergi.no ---------- www.arenabioenergi.no

Baltic Sea Region Programme 2007-2013
Part-financed by the European Union (European Regional Development Fund and European Neighbourhood and Partnership Instrument)

Nowa Dęba (PL)

Location
Northern part of the Podkarpackie Voivodship (a province situated in the far south-east of Poland)

Short summary
Nova Dęba is an urban-rural municipality. It is extended over area of 142 km^2 (one town and 7 villages) with a population of 19500. Over 50% of the municipality area is covered by forests. The municipal development plan, which was based on a sustainable ecological development concept results in constructing ca.8 MW wood chips fired boiler plant connected to the district heating system for the city of Nowa Dęba, along with fuel preparation plant and launching of willow biomass production. Converted sludge from the municipal sewage treatment plant is used for fertilizing the willow plantation.

It is the first project in Poland, which joins biomass production on plantations, utilization of green wastes and sludge from local sewage treatment facility as fertilizer and utilization of the acquired biomass as a fuel in a district heating system. In the nearest future, the willow grown on the plantations will become the main fuel used in the boiler. The project also included constructing new, pipe network allowing some extra savings in heat transferring.

Biomass used
Wood chips, willow biomass

Sustainability criteria
Energy efficiency improvement
Diversification of energy supplies
Development of local energy systems based on local resources of biomass
Use of uncultivated land for energy crops
Residues and by products used for energy
Positive impact on the environment, significant reduction of greenhouse gases emission
Positive effects on local economy, creation of employment

Initiation
Authority of municipality

Policy instruments
1. 'Energy Law' - the Act of 1997 (and its later amendments) defines the obligations of municipalities, including tasks and duties to promote energy efficiency and renewable energies (the plans prepared by municipalities ought to be made in accordance with the national energy policy guidelines and the local spatial management plans)
2. Programme for Supplying the Nowa Dęba Municipality with Heat, Electricity and Gas Fuels.
3. Strategy for Sustainable Development of the Nowa Dęba Municipality
4. National and Regional Programs and Funds supporting initiatives for rural area development and for RES promotion and implementation
5. Education/Information/ Promotion/ Awareness raising activities

Baltic Sea Region Programme 2007-2013
Part-financed by the European Union (European Regional Development Fund and European Neighbourhood and Partnership Instrument)

Situation before and after

The new wood chips fired boiler plant has allowed a significant reduction of CO_2 and almost complete elimination of SO_2 emission. Compared to the old coal –fired boiler, the dust emission from the new boiler is reduced by nearly 90% and nitrogen oxides by 70%. The use of the sewage sludge for fertilization of the willow plantations helped to solve the crucial problem of the municipality sewage utilization. The cost and difficulties of sludge treatment are considerably reduced. Additionally, realization of the project solved the problem of utilization of green wastes from the city by their combustion in the boiler.

Nova Dęba municipality was awarded by the Minister of Environment with the prestigious title Leader of the Polish Ecology in 2004 for the protection of the environment.

Contact details	**Regional responsible person**
Adam Cenian, Grazyna Rabczuk Baltic Eco-Energy Cluster (IMP-BKEE) Fiszera 14 PL-80-231 Gdansk, Poland Phone: +48 58 6995276 Fax: +48 58 3416144 E-mail: cenian@imp.gda.pl	Robert Wdowiak Municipality of Nowa Dęba Rzeszowska 3 PL 39-460 Nowa Dęba, Poland Phone: +48 15 8462671 Fax: +48 15 8465137 E-mail: promocja@nowadeba.npl.pl

Baltic Sea Region Programme 2007-2013
Part-financed by the European Union (European Regional Development Fund and European Neighbourhood and Partnership Instrument)

Przechlewo (PL)

Location
South western part of the Pomorskie Voivodship (a province in north central Poland)

Short summary
Przechlewo - a rural municipality is extended over 244 km^2 (33 villages, 6300 inhabitants). Its seat is the village of Przechlewo. Over 50% of the municipality area is covered by forests and 30% by cultivated land. Project initiated and implemented by the authorities of the municipality resulted in construction of a modern straw-fired boiler plant that replaced an inefficient and harmful for environment a coal–fired boiler. The biomass fired boiler providing heat to public buildings and to residential houses resulted in a significant reducing the amount of pollution emitted into the atmosphere. In the municipality Przechlewo, Polish-Danish enterprise Poldanor S.A - the largest pig producer in Poland has built two modern biogas plants producing electricity and heat by utilizing animal liquid manure and other types of biomass. Biogas plants producing clean energy are beneficial to the environment; contribute to the reduction of the greenhouse effect and to the diversification of energy supplies.

Biomass used
Straw, animal liquid manure, maize silage and other types of agriculture biomass

Sustainability criteria
Energy efficiency improvement
Diversification of energy supplies
Development of local energy systems based on local resources of biomass
Residues and by products used for energy
Combined production of electricity and heat
Positive impact on the environment, significant reduction of greenhouse gases emission
Positive effects on local economy, creation of employment

Initiation
Authority of the Municipality and Poldanor Company

Policy instruments
1. 'Energy Law'- the Act of 1997 (and its later amendments) defines the obligations of municipalities, including tasks and duties to promote energy efficiency and renewable energies (the plans prepared by municipalities ought to be made in accordance with the national energy policy guidelines and the local spatial management plans)
2. Programme for Supplying the Przechlewo Municipality with Heat, Electricity and Gas Fuels.
3. Strategy for the Development of the Municipality Przechlewo
4. National and Regional Programs and Funds supporting initiatives for rural area development and for RES promotion and implementation
5. Education/Information/ Promotion/ Awareness raising activities

Baltic Sea Region Programme 2007-2013
Part-financed by the European Union (European Regional Development Fund and European Neighbourhood and Partnership Instrument)

Situation before and after

About 2000 tons of coal dust were burnt in the coal-fired boiler plant each year. The coal dust was transported from location of 600km away. Most of straw produced locally was burned in the fields what had a negative impact on people health and environment. A straw–fired boiler plant uses only 1.25 more fuel by weight than a coal-fired boiler plant. The new boiler plant reduced annual emission of CO_2 by around 7000 tones. The content of nitrogen oxides is three times lower than in the case of a coal –fired boiler and SO_2 emissions are extremely low.

Biogas plants reduce environmental problem associated with animal wastes in pigs farms and provide added value to manure as an energy source.

The Przechlewo municipality was awarded by the Minister of Environment with the prestigious title Leader of the Polish Ecology in 2008 for the actions in protection of the environment.

Contact details	**Regional responsible person**
Adam Cenian, Grazyna Rabczuk Baltic Eco-Energy Cluster (IMP-BKEE) Fiszera 14 PL-80-231 Gdansk, Poland Phone: +48 58 6995276 Fax: +48 58 3416144 E-mail: cenian@imp.gda.pl	Anna Czarnecka Municipality of Przechlewo Człuchowska 26, PL 77-320 Przechlewo, Poland Phone: +48 59 8334301 Fax: +48 59 8334631, E-mail: ochrona.srodowiska@przechlewo.pl

Baltic Sea Region Programme 2007-2013
Part-financed by the European Union (European Regional Development Fund and European Neighbourhood and Partnership Instrument)

City of Växjö (SE)

Location
The City of Växjö is situated in the southern part of Sweden, the main municipality in the region of Kronoberg.

Short summary
About 70 % of Växjö's 83 000 inhabitants live in the city, while the rest live in the countryside or smaller villages. Geographically, Växjö's 1 925 km^2 is mostly characterized by forests (70 % of the area) and about 200 lakes.

In 1980, the municipally owned energy company Växjö Energy Ltd, became the first energy company in Sweden to start using biomass in the production of district heating. In 1983, it was also used for electricity production. Nowadays, 90-95 % of the district heating is based on biomass, and biomass-based district heating systems are also available in four smaller villages. In 1996, the Fossil Fuel Free programme was established, meaning that Växjö will no longer contribute to the greenhouse effect. The main strategies to reach that are to reduce the total use of energy and increase the use of renewable energy.

Biomass used
In the CHP plant and the smaller district heating plants, wood chips is the most common biomass, but also pellets and briquettes are being used. In households, firewood and pellets are most common. Except for the wood fuels, there are also other biological energy sources used in Växjö (biogas, straw, ethanol and FAME). In 2009, the biological energy sources stood for nearly 42 % of the total energy supply to Växjö (including the energy for transport). Of this 967,8 GWh came from wood fuels, 23,8 GWh from ethanol, 13,4 GWh from FAME, 5,3 GWh from biogas and 0,4 GWh from straw. The biomass is mainly used for heating and electric production, but some of the fuels are also used for transports.

Sustainability criteria
By using biomass from local/regional areas in an efficient way we contribute to reduced climate impact, increased share of renewable energy sources, reduced use of energy, fewer transports, increased local economic growth, creation of local jobs, local tax income, higher level of local energy security, low energy costs for end-users etc.

Initiation
The City of Växjö and our energy company, Växjö Energy Ltd took the first steps.

Policy instruments
The Fossil Fuel Free Växjö with its targets is the main steering policy instrument for Växjö. The more detailed targets are:

- To reduce the fossil CO2 emissions per capita by 55 % between 1993 and 2015, and by 100 % until 2030 (34 % achieved 2009)

Baltic Sea Region Programme 2007-2013
Part-financed by the European Union (European Regional Development Fund and European Neighbourhood and Partnership Instrument)

- To reduce the use of energy per capita by 15 % between 2008 and 2015 (2 % achieved 2009)

Situation before and after

One of the reasons for why the City of Växjö has taken so many steps towards a higher use of renewable energy sources is that the politicians feel that it is important that even we as a small city take our responsibility to mitigate global challenges. Thanks to good experiences in using biomass at an early stage, and the knowledge available among local companies and at the university, Växjö has a solid base to lean upon.

The City of Växjö has succeeded in receiving subsidies from the government and the EU for developing further towards a biomass based community. This has of course been helpful, but could probably not have come true unless there was such a big political commitment in the issue. Cooperation with many actors are necessary, and during the years different clusters have been established to highlight the biomass industry – such as the Bioenergy group. Currently, the City of Växjö is working with regional actors within environmental technologies to establish a "Climate center", hoping to contribute to the exports of biomass knowledge and technology throughout the world.

Contact details	**Regional responsible person**
Sonja Ewerstein Swedish Energy Agency Box 310, SE-631 04 ESKILSTUNA, Sweden Phone: (+46) 16 5442207 Fax: (+46) 16 5442271 Email: sonja.ewerstein@swedishenergyagency.se	Henrik Johansson, environmental controller City of Växjö, Strategic Planning, Box 1222, 351 12 Växjö, Sweden Phone (+46) 470 413 30 Email: henrik.johansson@vaxjo.se ---------- www.vaxjo.se

Baltic Sea Region Programme 2007-2013
Part-financed by the European Union (European Regional Development Fund and European Neighbourhood and Partnership Instrument)