

BioEnergy Småland – Expo Växjö

The Iwate Case – an excellent example to follow

BioEnergy Småland – Expo Växjö Seeing is believing!

To best understand the steps made by Växjö, the methods used, the collaboration with manufacturers and others, now organised within BioEnergy Småland – Expo Växjö, the equipment in full use and the concept as a whole, a visit to Växjö is a must. The Expo Växjö Technical Visits organisation is fully geared up to conduct technical visits to the area and to show what we have achieved and how

we have achieved it. Växjö, with its own international airport and high-speed train connections is easily accessible, wherever you are coming from.

We firmly believe in what we are doing and really want to spread the word. Come and visit us, the installations, the manufacturers and the university – it will certainly be worth your while!

www.energiagentur-so.com/Bioenergy/Bioenergyeng/bioenergyindexeng.htm
www.vaxjo.se/english/fossil_fuel_free.html

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Unity

Political unity generating the power of growth



In 1996, the strategic decision was made by a unified council in Våxjö. It was decided:

- To make Våxjö a Fossil Fuel Free municipality and
- By the year 2010, to reduce the per capita emissions of CO₂ by 50%.

Over the last 8 years, we have succeeded in reducing per capita CO₂ emissions by some 20%. A level, which, in terms of time and progress, even goes beyond the ambitions of the not yet ratified Kyoto protocol.

I am firmly of the opinion that the political leadership of a municipality should show the way in such matters and establish the long-term goals to be achieved. Thereafter, both individual citizens and local businesses should be encouraged to find the "hands-on" solutions to the problems – something that we have certainly promoted. We have welcomed virtually all steps in the right direction, whether they be big or small.

The fact that Våxjö has been the first local authority to define and realise these environmental goals has meant that both national, EU and international financial support has been obtained for several of the projects involved. Being first though, is no great surprise – Våxjö has a history of being first. In 1887 Sweden's first ever electricity company was established in Våxjö and in 1980 the first district heating plant fuelled by bio-energy was started here in Våxjö.

You too are welcome to Våxjö to see and experience at first hand, the considerable strides we have already made in improving our environment.

Carl-Olof Bengtsson
Major of Våxjö



From water to Fossil Fuel free –one step at a time

Lake restoration

Over the years, the quality of the water in the seven lakes in Våxjö had deteriorated drastically. However, in the 1970s a major lake restoration programme was launched and today, after much effort, the lakes have become an environmental and recreational asset, greatly appreciated by local residents and visitors alike.

The success of the lake restoration programme proved to the municipality's leaders and citizens that it is possible, one step at a time, to solve severe environmental and ecological problems.

Consultation and discussion

Våxjö decided to consult the Swedish Society for Nature Conservation and entered into joint discussions with them to discover other areas where the municipality could make an environmental or ecological change for the better. After training, round table discussions and considerable debate, it was determined that climatic issues were the important area to concentrate on.

A unanimous council decision led to the launching of the Fossil Fuel Free Våxjö concept in 1996. It was further determined that, using 1993 as the base year (the year Våxjö started measurements), a reduction of 50% of CO₂ emissions per capita would be aimed for by the year 2010. Våxjö had already introduced biomass district heating and the CO₂ emissions in 1993 were approximately 4.7 tons per capita and year, compared to the Swedish average of around 6.5.

At the same time, local companies and private individuals were invited to suggest solutions to the problems – and more than 200 suggestions were received. Våxjö received grants from the government, which made it possible to financially support several local projects.

Reduced CO₂ emissions

Since the inception of the Fossil Fuel Free Våxjö concept, a large number of steps have been taken, both big and small. This has resulted, at the half-way mark towards 2010, in a reduction of some 20% of CO₂ emissions! The major contributor to this, of course, is the bio-energy plant for district heating and power generation – Sandviksverken – that supplies hot water, heat and electrical power to major parts of the City of Våxjö. But other, smaller scale efforts, such as the promotion of domestic heating powered by pellets and pellet or wood chip fired heating plants for smaller industrial applications and

small-scale district heating, have also contributed to the result.

International recognition

The success of the programme led, in 2000, to international recognition for Våxjö's efforts and the municipality received the ICLEI Award for Excellence in Atmospheric Protection.

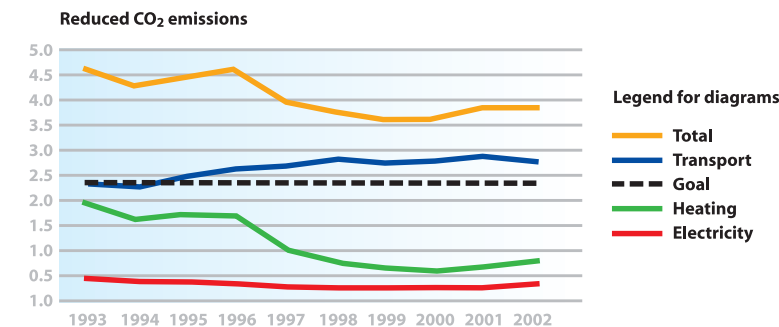
These reductions in emissions in Våxjö, relate almost exclusively to the heating and power generation sector. Emissions from road traffic are still very much a problem though Våxjö has managed to decelerate the increase of traffic pollution.

A European Centre for Biomass Gasification Research is planned for Våxjö, which will research and develop the manufacturing processes for various bio-fuel alternatives, such as DME (Di-methyl-ether), synthetic diesel and hydrogen.

Våxjö is the dedicated test arena for Volvo's heavy-duty DME vehicles.



▲ The Våxjö Energy Company's combined heat and power plant at Sandvik. Output: 66 MWh, 36 MWe



◀ Per capita CO₂ emissions in tons.

The reduction of CO₂ emissions in the heating sector is more than 60%, whilst the increase in the traffic sector has been limited to 20%.

N.B. Overall CO₂ emissions have been reduced beyond the ambitions of the yet to be ratified Kyoto protocol.

BioEnergy Småland, a resource centre

As previously stated, Växjö has actively encouraged companies and private individuals to become involved in the efforts to reduce CO₂ emissions.

Energikontor Sydost and the County Administrative Board have made similar efforts in the county, by promoting small-scale district heating in villages, for example.

With the experience and expertise we have gathered and built up in recent years, we are in a position to be an invaluable resource centre for other like minded organisations, whether the goal is to lower CO₂ emissions, to use regional energy sources or to create employment. We are more than prepared to share our experiences and skills with other cities and regions in order to help them reach their goals in these areas. With our experience, we can help others to avoid the pitfalls that do occur with such projects – we know, we've already experienced and solved many of them and we now have the expertise.

The BioEnergy Småland - Expo Växjö participants listed under www.energikontor-so.com/Bioenergy/Bioenergyeng/bioenergyindexeng.htm include:

- Manufacturers of specialised forestry machines for thinning, harvesting, chipping, pelletizing, etc., as well as of handling and storing equipment, burners and boilers, etc.
- Members of the Bioenergy Group in Växjö AB
- The Departments of Bio-Energy Technology and of Forest and Wood Technology of the University of Växjö
- The Municipality of Växjö, the political and Agenda 21 processes and Technical Visits, Expo Växjö and Energy Advisory Centre
- The Energikontor Sydost - the coordinator for the project, which is supported by the Swedish Energy Agency

The Bioenergy Group in Växjö AB, a group specifically formed to support bio-energy research at Växjö University, now involves consultancy and manufacturing company members. One company, Järnforsen, the prime manufacturer of 0.5 – 10 MW boilers, with no prior experience of Japan but as a direct result of the cooperation between BioEnergy Småland – Expo Växjö and the Iwate region, has already supplied a wood chip boiler to a forestry and ecology museum in Japan with more orders pending. Similar projects are going on or being prepared in continental Europe, the UK and in North and South America as well as in other regions in Sweden.

“By making use of the experience and skills established here in Växjö, we estimate that you could short-cut the whole process of starting such a project, by some 5 – 10 years.”

*Ulf Johnsson,
Technical Director
Växjö Energy AB*

Research

Research, development and collaboration

The young, dynamic, University of Växjö with some 14,000 students, is an invaluable resource for the Fossil Fuel Free project. The Department of Bio-energy Technology, in close collaboration with researchers from the Department of Forest and Wood Technology, researches all aspects of forestry, including bio-diversity, nature conservation, the whole spectrum of environmental considerations, re-forestation, raw materials and products that originate from the forest.

One of the most important raw materials is fuel, both in the form of residues and by-products generated during felling operations, by-products from saw-mills and other timber industries and in the form of pure, graded timber waste.



With professors and doctoral candidates the department operates on a broad base with particular focus on bio-fuel combustion techniques and the possible pollution generated during combustion. Specific research and study is carried out into particulate emissions, the emissions of nitric oxides and hydrocarbons – the most important pollutant groups. Emissions of sulphur- and chlorine compounds are not significant in bio-fuel combustion and are therefore not a major concern.

The department also studies the further processing of raw materials, such as, pellet manufacturing, controlled drying and the economics and techniques of the different solutions in bio-energy systems.

The department offers both on-campus and distance-learning courses in the use of bio-fuels and bio-energy technology.



The Wood House at Växjö University.
One of the largest multi-storied wooden buildings in Europe.

Green heat

Implemented in Japan – Conceived in Växjö

The Japanese view of the collaboration
between Växjö City and Iwate Prefecture



The Iwate Prefecture in north-eastern Japan has been cooperating with the city of Växjö in Sweden, learning about the use of wood for energy (biomass energy) and is now developing the use of biomass energy in the region. The cooperation started with the visit to Växjö in March 2000 by three representatives of Iwate forestry companies, where they met with representatives of the City of Växjö, and made study visits to local facilities.

In order to promote the use of wood-biomass energy in Iwate Prefecture, the three visitors established the Woody Biomass Iwate, a study group for research into biomass. The group consists of representatives from the forestry industry, local government, universities and researchers and today, has more than 200 members.

Since 2000 the cooperation between Iwate Prefecture and the city of Växjö has continued and developed with the support of JETRO (Japan External Trade Organization) in one of their Region-to-Region Initiative programs, introduced to promote international cooperation between regions in Japan and other countries.

The main actor in this cooperative program, the Woody Biomass Iwate, has functioned as an instrument of communication for local government, industry and universities to increase the knowledge and appreciation of the use of biomass energy among the population in Iwate, and to promote the use of biomass in the prefecture. The group has focused on activities such as:

- the mutual collaborative exchange with the city of Växjö
- the distribution of information and examples of Swedish technology and developments, in conjunction with activities on its homepage and mailing lists
- arrangements and exhibiting at local events
- seminars and presentations, where feasible

Iwate Prefecture has invited Swedish representatives of local power plants, producers of chip boilers and pellet

stoves and university professors to visit Iwate, with visits to the local government, companies, exchanging opinions and holding seminars and forums on the use of biomass energy.

Representatives from Iwate have also visited Sweden four times, conducting business matching as well as visiting biomass related sites in Växjö. The city of Växjö and Iwate Prefecture have developed a very close and mutually beneficial relationship.

As a result of this, a chip boiler made by Järnforsen, has already been installed in the Forestry Science, Museum in Matsuo village, Iwate and more installations are planned.

The Iwate Prefecture is now taking steps to promote the wider use of biomass energy using the experiences from the city of Växjö.

COMMENTS:

–The cooperation on biomass energy between the Iwate Prefecture and the city of Växjö could be seen as a model case for cooperative programmes in this new age, when environmentally friendly and effective uses of energy are of the highest global priority. The seed for very successful cooperation has been firmly sown and I am looking forward to seeing it blossom.

Masao Kobayashi
Executive Director
Jetro Stockholm Office



Mr. Hiroya Masuda
Governor of IWATE

The Iwate Prefecture started promoting the use of wood biomass energy in 1999, when the Chairman of Swedish Biomass Association visited our prefecture. I subsequently visited Sweden and together with Mayor Bengtsson held discussions about the field of biomass energy.

Since then, through the Region-to-Region JETRO project, our prefecture has had the opportunity of learning a great deal, thanks to regular visits and the exchange of ideas and information between experts and related persons from our two regions.

For me it is a great pleasure to see that, thanks to the support and helpful advice from the City of Växjö, the knowledge and understanding concerning the use of biomass energy in our prefecture is very much on the increase.

The Iwate Prefecture has a great deal of forest and wood. To enable us to utilize this rich natural resource in an effective way, we have started the introduction of an Iwate-style pellet stove as well as the local government's support for the development of the related facilities. For these facilities we are introducing chip boilers made by the Järnforsen company. Furthermore, we are also preparing for additional pellet production plants at one location. One such plant already exists. The very concrete promotion of biomass energy is now being actively pursued.

As a further step in promoting the concept, our country's first ever Woody Biomass Summit conference was held in our prefecture in January 2004. It gave us the opportunity to further enhance our fruitful collaboration with Växjö and raised the knowledge and promotion of the use of biomass energy to a higher level in our prefecture.