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Above You can see the Info - Navigator that is used in the internet version of the Bioenergy International.

Articles there are distributed in two ways. Either through the Editorial where all articles are produced or judged by an editor or through the Connection section, where professional can publish information concerning bioenergy. It is also possible to publish information in many major languages.

Welcome to participate in the Bioenergy International

The Map of Pellet Producers

The list of 115 European pellet producers together with a map is placed inside this number.

Moreover there are also some good examples of large and small scale production as well as the use of the fuel.

It is amazing how fast todays development of the production of pellets is.

This presentation is an extended part of our ongoing serie of the pellets technology and market presentations. ... PAGE 3

Combine Heat and power

Always try to be as effective as possible. One ineffective technology is the condensing system of power production, where the heat is just wasted. A better way is of course the combined heat and power production, CHP or cogeneration.

The important factor is of course to search for a heat users.

A district heating system and/or a large industrial user is needed.

In Pfaffenhofen, Germany, a CHP - plant has been running for two years and we published two full pages detailed story ... PAGE 10



Biofuel Pellets - now traded world wide

Shipping and trading of biofuel, especially the new pellets fuel has become very important. Rotterdam is one of the largest harbours in Europe and functions as a hub, for example for the international pellets trade.

.....PAGE 7



The basic bioenergy fuel will be probably based on forest residues. Finland presents its resukts ...PAGE 12

Large scale Pellets production

6,5 million Euro is invested in Härnösand, in Sweden.

Other, even larger project Køge, outside of Copenhagen will be finalized very soon

..... PAGE 4-5

Welcome to another issue of the Bioenergy International, paper version. As You probably know, we do also have an internet based magazine which You will find at www.bioenergyinternational.com

Since the Bioenergy International is a commercial product it has to be financed by advertisers. In this number we have 26 participating companies. We look forward to following issues based on good cooperation with readers

and advertisers. Please share with us Your ideas and views either directly on www.bioenergyinternational.com or contact me or Ms Dorota Natucka on mail or phone. You will find necessary contact adresses and telephone numbers on the back cover.

Lennart Ljungblom Editor and Publisher

PS Do You want a subscription? Just contact us and You will get the magazine direct by A-mail.



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 Telephone activated control for pellets stoves
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Contact:

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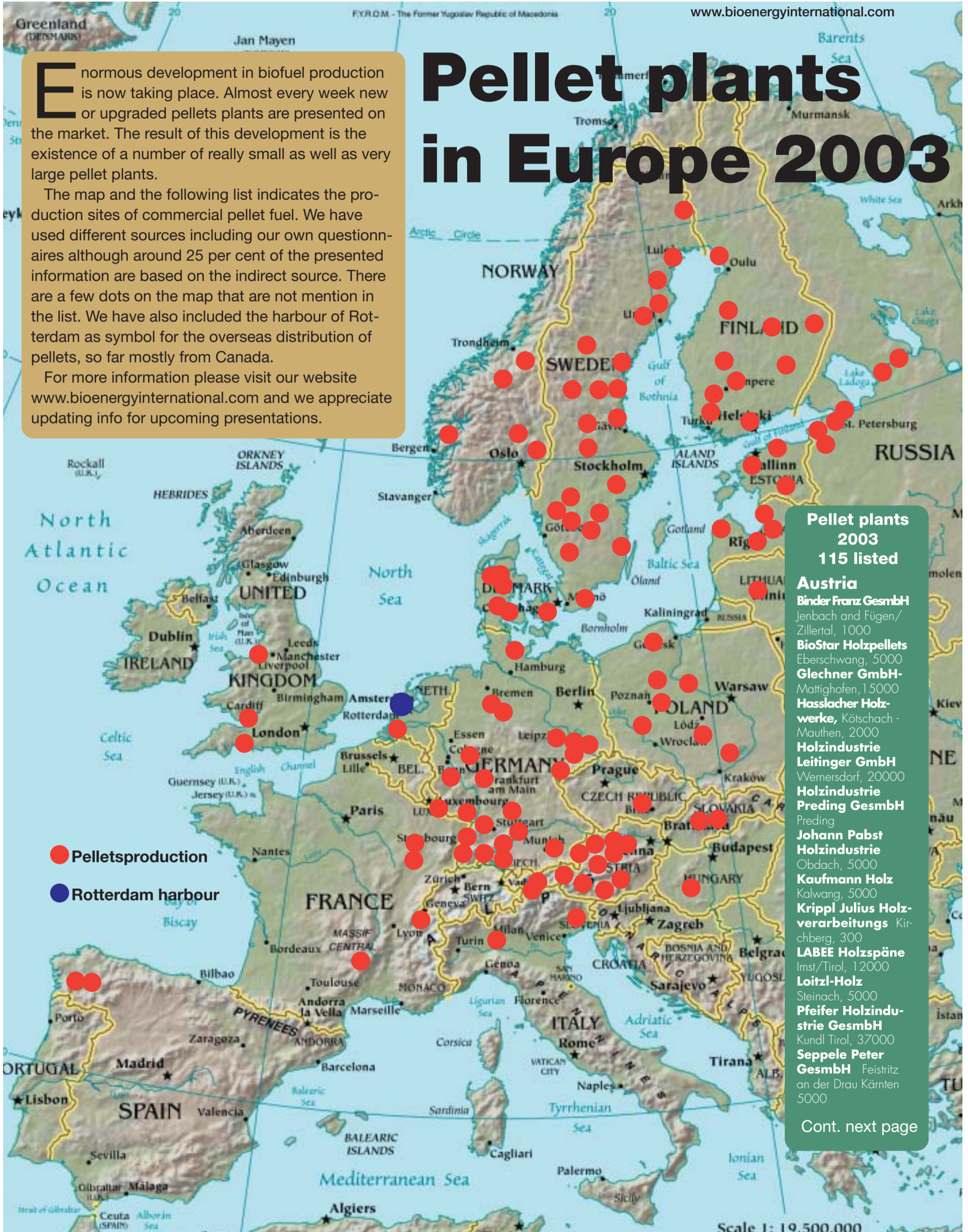
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Enormous development in biofuel production is now taking place. Almost every week new or upgraded pellets plants are presented on the market. The result of this development is the existence of a number of really small as well as very large pellet plants.

The map and the following list indicates the production sites of commercial pellet fuel. We have used different sources including our own questionnaires although around 25 per cent of the presented information are based on the indirect source. There are a few dots on the map that are not mention in the list. We have also included the harbour of Rotterdam as symbol for the overseas distribution of pellets, so far mostly from Canada.

For more information please visit our website www.bioenergyinternational.com and we appreciate updating info for upcoming presentations.

Pellet plants in Europe 2003



● Pelletsproduction
● Rotterdam harbour

Pellet plants 2003
115 listed

Austria
Binder Franz GesmbH
 Jenbach and Fügen/ Zillertal, 1000
BioStar Holzpellets
 Eberschwang, 5000
Glechner GmbH
 Mattighofen, 15000
Hasslacher Holzwerke, Kötschach - Mauthen, 2000
Holzindustrie Leitinger GmbH
 Wernersdorf, 20000
Holzindustrie Preding GesmbH
 Preding
Johann Pabst Holzindustrie
 Obdach, 5000
Kaufmann Holz
 Kalwang, 5000
Krippel Julius Holzverarbeitungs Kirchberg, 300
LABEE Holzspäne
 Imst/Tirol, 12000
Loitzl-Holz
 Steinach, 5000
Pfeifer Holzindustrie GesmbH
 Kundl Tirol, 37000
Seppel Peter GesmbH Feistriz an der Drau Kärnten 5000

Cont. next page

Pelletsproducers

The List of Pelletsplants 2003

Umdach AG
Amstetten, 5000
Ökowärme
Waldneukirchen, 10000

Bulgaria
Axis Ltd.
Sofia, 1500

Denmark
A/S Spanvall
Vejen and Neesund,
50000

Bodilsen
25000

Dangrønt
75000

Hp briketter A/S
Vildbjerg, 120000

Junker-E2
Køge, 330 000

Lerche-Heinrichsen & Møller
Vejle, 1000

**Neesund Bio-
brændsel ApS**
Hurup, 20000

**NordjydskMink-
korn A.m.b.a**
Frederikshavn, 2500

Treka
50000

Esthonia

Hansa Graanul
Paküla, 100 000

Flex Heat AS
Rakvere 80000

Tootsi Granul,
Vapo joint venture
Tootsi - Pärnu, 20000

Delcotek AS
Paide, 20000

Finland

Finnambi Oy
Vöyri, BiowattiOy
and Vöyrin Sähköla
40000

**Haminan Puun-
jalostus Oy**, Vapo
Partner, Vahkalahti
7000

Hehkupelletti Oy
Saarijärvi, 5000

Keurak Oy
Keurak, 3000

Lapin Ekolämpö
Keminmaa, 14000

Luoman Puutuote
Ylistaro, 25000

**Länsi-Suomen
Biopower Oy**
Vammala, 7000



Bionorr goes for 140 000 tonnes/year



The large Swedish pellets producer Bioenergi i Norrland AB, Bionorr, is doubling its capacity upto 140 000 tonnes pellets per year in their plant in Härnsöand, 500 km north of Stockholm. The production replaces around 65 000 m³ heating oil that has been used each year.

The plant is owned by one of the largest forestry

industries in the world SCA. Their main activity lies in forestry and production of timber, pulp and paper worldwide.

New investment of 6.5 million Euro is followed in Härnsöand right now. Two more Sprout Matador's - 5 t/h - presses are installed together with their own patented milling dryer.

Now the pellets plant

is equipped with 5 presses, two mill-dryers and large storage facilities for the products which are delivered mainly in bulk but also in big or small baggs. The bagging equipment for small baggs is delivered by Dansih Fisker Pakke Maskiner A/S.

The heat for the dryer is provided with wood-powder burners from Swedish VTS Värmetek-

nisk Service AB.

Sixty five percent of the production is delivered to the large scale users, such as district heating plants, located mainly in the Stockholm area. Pellets are transported using vessels and trucks.

An increasing share is delivered locally to small houses and medium size heating centrals.

Kent Johansson, ma-

nager of the plant has 22 employees helping him with the production and administration. The next step, he says, is to arrange a better rawmaterial handling system. Today the sawdust that is used for the pellets-production is handled by a frontloader.

The sawdust is delivered from two large sawmills located in the neighbour.

By Lennart Ljungblom

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Pelletsproducers



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Køge "Probably the largest pellet plant in the world"



The pellet plant in Køge with the straw storage to the left.

The pellet plant in Køge south of Copenhagen is starting up its production. On a yearly basis the plan will produce 130 000 tonnes of straw pellets and 180 000 tonnes of wood pellets. The straw pellets will be transported on ships and used in the Amager plant, an old coal fired plant. The wood pellets will be used in the new and advanced Avedøre plant.

Energi E2 is the owner of six heat and power plants that use 445 000 tonnes of biomass annually. Calculations has showed that the cost for using dry biomass is only one third when using existing plants compared to build new plants for biomass.

The pellets plant has two production lines, one for straw pellets

with a capacity of 17 tonnes per hour and one for wood pellets with a capacity of 30 tonnes per hour. The twelve presses from Bühler will run 6000-7000 hours per year and produce in total 310 000 tonnes of pellets annually.

Most of the process is based on known and proven technology. The dryer from GEA will reduce the water content in the wood from 45 per cent down to 10 per cent. The dryer will use steam from the existing power plant. In the process 85 per cent of the energy in the steam from the dryer is recovered. In this way only a few per cent of the energy content in the pellets is used in the production process.

The straw pellets do not need any drying before pelletising since the

material is dry as it is.

From the pellet plant the pellets are transported on a 700 meter conveyor to the storage in the harbour. No adhesive is used to start with but might be used later on.

The plant is located on the site of Junkers' wood working industry, producing wood floor. The existing heat and power plant is combined with the production of the pellets. The pellet plant is located next to the storage area for the wood industry, where 50 000 tonnes of wood can be stored. The major part of the raw material for the wood pellets is residues from the floor production. To that some part of raw material will be imported.

By Anders Haaker



Seen from the harbour with the 700 meters conveyor connecting the production plant with the storage of the ready made pellets.



Storage of pellets before shipping to the users.

Paahtopuu Oy,
Ruovesi, 20000
Punkaharjun Pelletti ky Punkaharju, 2500
Puu Prisma Oy
Kesälahti, 2500
Scanpell Oy,
Kärsämäki, 14000
Turengin tehdas
Biowatti Oy, Turenki, 70000
Umacon Oy
Kupio, 2500
Umacon Oy
Anjalankoski, 2500
Vapo Group
Haukineva, 70000
Vapo Group
Ilomantsi, 50000

France

Cogra 48
Mende, 100000
Fontaine des Auges
Gendrey 2000
Savoie Pan SA
Tournon, 27000
SOFAG
Arc sous Cicon, 2000

Germany

WEAG&Mohr
Trier
Assenmacher
Ormont
Blankenburg
Mainzholzen
Blieninger
Vilsbiburg
Clause Meyer
Hilgermissen
CompacTec
Zeitlarn/denthal
Drechserei Spiegelhauer
Pfaffroda-Hallbach
FireStix
Regen, 15000
Gras Aufbereitungsgesellschaft
Calau
Holzenergie Klaus Fallert
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Holzindustrie Leitinger GmbH
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Weingarten

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Kék Bolygó
Bioenergia KFT
Nagyecsk

Italy
C & B CALOR
Limbiate, 44000
La TIESSe s.r.l.
S. Michele di Piave

Latvia
CED
Drabesi, Cesu, 8000
Latgranula
Incukalna, Riga, 12000
Latvall
SIA Iecava, 15000
SBE Latvia Ltd.
Laučiena, Talsu, 40000

Lithuania
UAB Gairelita
Radviliskis, 10000

Norway
Cambi Bioenergi
Vestmarka, 30000
Norsk Trepellets
Brumunddal, 8000
Vaksdal Biobrensel
Dalekvam, 12000
Vi-Tre AS
Røros, 3000

Poland
Agrolas Co s.j.
Max-Parkiet.
3600
Pellets Sp. z o.o.
60000
Inwesteam
18000
Lonscy-Kolczyg-
towy Sp. z o.o.
60000
Toreco Sp. z o.o.
Zacisze
5000
Energobiotech Sp.
z o.o. Poznan, 5000

Russia
Biofuel LTD
10000
Biotek LTD
EcoreSources Comp.
14000
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25000
RosPoliTechLes
50000
Salloti LTD
20000

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Fuel Trading

Advantages of centralised European Biomass distribution

Since 2002 the port of Rotterdam has witnessed a rapidly growing flow of imported biomass. European Bulk Services (EBS), operators of two terminals in Rotterdam, discharge more than 25,000 tons of biomass per month, mainly consisting of wood pellets.

EBS have witnessed some very interesting developments in the market over the last two years:

* The growth in imports is tremendous and still continuing: from less than 5000 tonnes per month in the beginning of 2002, a monthly import level of more than 40,000 ton-

nes is foreseen as from January 2004 onwards.

* Originally Rotterdam only witnessed the arrival of wood pellets from West Canada. Now there is a much larger variety in biomass, including wood and bark pellets from USA east coast, wood pellets from the Baltic states and various types of, sometimes experimental, pellets from destinations in the Far East and the US, made from clean agricultural residues of corn, rice, palm and citrus.

* EBS receive strong indications that large scale wood pellet production for export to Europe is about to start

up from South America and South Africa.

* Biomass used to arrive in vessels of maximum 10,000 tonnes. Now biomass frequently arrives as part cargoes in Handymax and Panamax vessels up to 60,000 tonnes.

* EBS now permanently store more than 30,000 tons of biomass for various international sellers, traders and buyers who use the storage facilities for just-in-time distribution purposes and strategic stocks.

Transshipped

Perhaps the most interesting development, however, is the fact that the arriving biomass in

Rotterdam is no longer exclusively destined for electric power producers in The Netherlands but is increasingly frequently transhipped to other European destinations as Belgium, the UK and Denmark by coastal vessels and river barges.

The economics behind this development are very interesting. It seems that biomass is developing like many large commodities did in the past. Instead of only using local (European) biomass and shipping it in small coastal vessels, now the users of biomass in Europe start buying large quantities from overseas origins,



making use of the advantages of economies of scale: the freight costs per mile or kilometer for a panamax vessel with e.g. 60,000 tonnes are only a fraction of the freight costs in a coastal vessel.

Often it seems worthwhile to import biomass pellets from cheap over-

seas production countries and have them transhipped in a large deep sea port, when such a port can offer the choice between direct transhipment and use of storage facilities.

European Bulk Services (E.B.S.) BV - Roeland Reesinck

Slovakia

Doka
10000
Faba
4000

Spain

ECOFORST SA
Villacañas, 15000
Empa SA
Vigo, 20000

Sweden

Larger than 6 000 t/y!!
AB Forssjö Bruk
Forssjö, 50000

Agropellets AB
Sölvesborg, 45000
Bioenergi i Luleå
Luleå, 90000

BioNorr
Härnösand, 140000

Bure Pellets AB
Bureå, 8000

MBAB Energi
Robertfors, 25000

MEBIO
Främlingshem, 60000
MellanskogsBränsle

Valbo, Ljusne and Orsa,
40000+15000+40000

SBE
Norberg, Sexdrega,
Malmbäck, Ulricehamn

SCA, Skog AB
Edsbyn, 53000

Skellefteå Kraft AB
Skellefteå, 130000

Statoil Pellets AB
Säffle, 40000

SÅBI Pellets AB
Vaggeryd, Forsnäs,
135000

Södra Cell
Mönsterås, 50000

Switzerland

Bürli Trocknungsanl.
Gettnau, 5000

The Netherland

Tlabee Group
Moerdijk Moerdijk

Tjeckien

Ekobrikety s.r.o.

Ukraina

Modis Ltd

United Kingdom

Envirofuel Ltd.

Birkenhead
Welsh Biofuels Ltd

Western Wood
Pellets Ltd



Stocka Pellets Small scale production

Pellets can be produced in many different sizes of plants. In Sweden also small local pellets production, using dry rawmaterial, has become very popular.

During one and a half year the company SPC - Swedish Power Chippers has delivered more than 30 pellets plants.

The capacity of those systems varies from 1000 up to 4000 tonnes per year. The largest capacity, as it is showed above from Stocka Pellets AB, can be achieved by putting two presses in parallell.

The Stocka plant is arranged with a storage-bin for rawmaterial, dry chips, with a capacity

sufficient for three days long production. The chips are feeded using a handler placed above!! the system and futher fed into the hammermill delivered by company Fransson. Following, the material is passing by two fine mills integrated with the two pellets presses which each also have a sieve for dustrem-

oval and a cooling tower. Next, seven large bags are automaticly filled up. When the last bag is filled, pellets are redirected automaticly to a 50 m³ (30 tonnes) bulk storage bin.

The production is fully automatized. The things that are not automatized are filling up the rawmaterial, taking

away and check the weight of the big bags, delivering the pellets to the customer and sending the invoices, says manager Bernt Wallin.

Soon, he adds, they are going to ad one half-automatic small bag unit. Then, the pellets-plant with is completed.

*Text and photos:
Lennart Ljungblom*

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Ask for Mr Roeland Reesinck, account manager Biomass.

Fuel trading



www.bioenergyinternational.com

Russian wood pellets The producers are approaching the European market

Biomass development in Russia

The Russian federation possesses great facilities with regard to bioenergetics.

However the impetus given to the development of this direction is still not enough for its successful advancement.

The main negative factors are following:

- higher earning yield in individual industries and mining operations that makes bioenergetics less attractive commercially.

- the absence of the legislation incentive the development of bioenergetics

- the availability of the comparatively cheap fuel in almost all the regions of the Russian federation

- the absence of financial mechanism and loan institutions interested in provision of finance of the such projects, high lending rates in the Russian banks and short terms of the reimbursement of credit

- the fact that foreign investors beware of putting up the capital into the Russian enterprises.

A positive change

At the same time Russian market is becoming more and more attractive in connection with the political and economical stabilization in the Russian Federation.

European investors who deals with wood working industry, slowly but steady move to the Russian forests, to the places of logging.

Development of industrial facilities causes the increase of the problems connected to the reclamation of the logging waste and industrial wood residue.

Pellets

One of the promising technique of the reclamation is the production of the biofuel in the form of the wood pellets.

During the last three years six enterprises (see the map) reclaiming the logging waste and producing wood pellets appeared in the Leningrad region. And the number of such plants are increasing.

However the above mentioned negative factors haven't disappeared. The basic stock of all these 6 companies is

the facilities of Russian investors.

None of the foreign companies has taken a dare to invest of such a project, notwithstanding the shown interest. It caused that the first enterprises could not afford to acquire modern high-tech equipment suggested on the European market due to the limited means and tight rates.

In the beginning the second hand agrarian equipment has been used and this reflected upon the quality of the product and on the factory load.

Investors participate

However the beginning of the trade operations and the receipts from sales of products afford an opportunity of development even to these enterprises.

The new plants are being created with the usage of European producers equipment.

The granulation lines produced by such well-known companies as Munch, CPM and SM were also bought and it hold out a hope of improving the product quality, increase of out-

put and effectivization of the production process.

Transport and logistics

In view of the transport remoteness of the producers from the main consumers of the biofuel and much of the Russian Federation, great transportation charges arise.

Because of this fact all the first plants were located in a short distance from the Saint-Petersburg port, some of them were built on the shores of the navigable rivers

and this allows to make rivermarine vessel shipment.

The problem of transportation makes the remote forest regions unattractive for biofuel production. It would become possible only with the development of the international transportation corridors, more consistent attitude of the government toward the reclamation of the logging waste and appearance of the native biofuel market.

By Vladimir Bazhin
"Ecotech" Ltd, RBA

Russian Biofuel Association (RBA)

In the described above situation the pellet producers made a decision to team up, in the end of august the memorandum of RBA was signed. The main objects of the association are:

- adoption of the quality standards and the order of certification of the product, the product quality control;
- the assistance to the members of the Association in the line management, in the receipt of necessary technical information and advice;
- close cooperation with the scientific institutes working in this field;
- biofuel native market grouping and promotion of the Russian product on the international market;
- lobbying of the producers interests at government level and legislative bodies;
- communications with other European associations, assistance to them in solving all the questions of the work connected to the Russian Federation;
- assistance to the members of the Association in attraction of the credits and investments.

The headquarters are located at the following address: Saint-Petersburg, 199026, Bolshoy prospect V.O., 87.

All the known producers of the pellets in Russia became the members of RBA and the total capacity is 115 000tonnes.

Company	Phone/fax	Annual capacity tonnes
SALOTTI" LTD,	+7 812 314 38 37	20 000
Ecotech LTD,	+7 812 322 66 34	25 000
Ecoresources Comp	+7 812 380 21 68	15 000
Biofuel LTD	+7 812 324 65 88	15 000
Biotech Ltd	+7 812 249 56 19	15 000
RosPoliTehLes LTD	+7 812 273 04 16	25 000

The bioenergetics in Russia made its first, the most difficult steps, and it continues its development.

Russian producers use the experience of the European countries, where it is possible, and from the very beginning they began to act in cooperation and try to implode into already existing European structures.

They altogether accumulate the experience in new biofuel industry engineering, set the relations with the final buyers, work out the transportation schemes, work on the creation of the domestic market of biofuel.

The costs for the success are high what one enterprise can't fulfill, the members of the associations will do together.



The producers of Russian pellets were active during the Holz Energie in Augsburg in september this year. They were promoting their new established RBA.

Photo: Dorota Natucka

Suppliers

New large Pellet plant in Poland

The Krojanty pellet's plant is considered to become one of the largest production plant (60 000 tonnes/year) in Poland.

The plant will have the capacity of 10 tonnes per hour.

The pellets will fulfil all the standardisation rules - 8 mm in diameter, caloric value of 17.5 kJ/kg and ash content lower than 0.5%.

The plant in Krojanty, next to Chojnice in the northern part of Poland will start to operate in December 2003.

Three Swedish equipment suppliers;

- **VTS** - manufacturer of wood powder burners,
- **Firefly** - preventive fire protection systems,
- **Styromatic** - automatization system joined German
- **Amandus Kahl** - supplier of modern pelleting equipment, to establish the new plant.


The raw material will consist of pure pine sawdust that will be transported to the plant from the nearby situated sawmills.

Pellets produced in Krojanty will be sold to Scandinavia and western Europe.

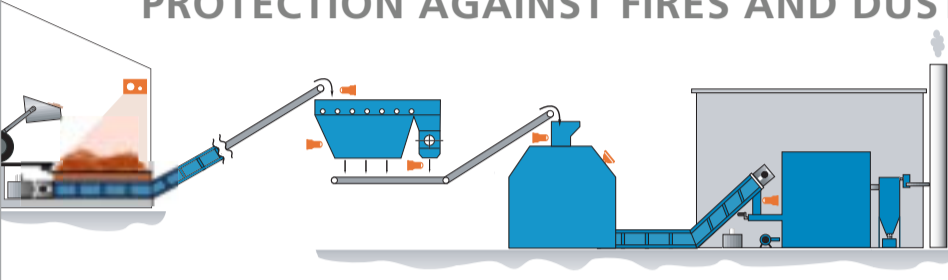
By Dorota Natucka



Part for the new pellets plant on the way to be properly installed.



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Pelleting of biomass and waste products for fuel

Pre-treatment of raw materials

To achieve efficient pelleting the raw material moisture content must be reduced to approx. 10 percent. If the moisture content exceeds the recommended 10%, the material must undergo a drying process.

Both drying and crushing of raw materials are of great importance to the pellet quality.

Grinding

It is recommended to grind the raw materials in a hammermill.

The Sprout-Matador hammermill type Multimill meets the requirements to efficient crushing of both fine and coarse particles. The hammermills have magnet/air separators for collection of foreign matters.

Cascade mixer

The ground raw material is pre-treated with steam in a cascade mixer before pelleting resulting in homogeneous pellets, as the larger material surface and open fibres promotes steam absorption. Steam and increased temperature

softens the wood lignin allowing pelleting to go on without binders.

Pellet mill

The new generation of Sprout-Matador PM30 pellet mills ensures high output and efficient monitoring of the pellet quality. The pellet mill is equipped with a two-step gearbox dimensioned for high loads.

Roll tightening can be adjusted from the outside during operation.

The pellet diameter is determined by the different perforation dimensions of the die.

Cooling and final treatment

Heat develops in the pellets during the pelleting process. This heat must be taken away from the pellets before they are sifted and stored.

The pellets are cooled by ambient air flowing through the cooler, and for that reason the pellet temperature will always be 5-10° C above room temperature.

Wear resistant and environment-friendly equipment

All conveyors and process equipment is manu-

factured from corrosion resistant material to resist i.a. tannic acid given off by the heated wood mass. The process line is working at under-pressure to minimize dust escape and to improve the working environment.

Process control

Efficient process control results in high flexibility and optimum energy utilization. The energy consumption for operation of the pelleting process and steam heating corresponds to 2.5-3 percent of the energy content of the wood.

Process flow

By a frequency operated screw dry wood chips are dosed into the hammermill separator separating foreign matters by means of an opposing air stream and a magnet (201).

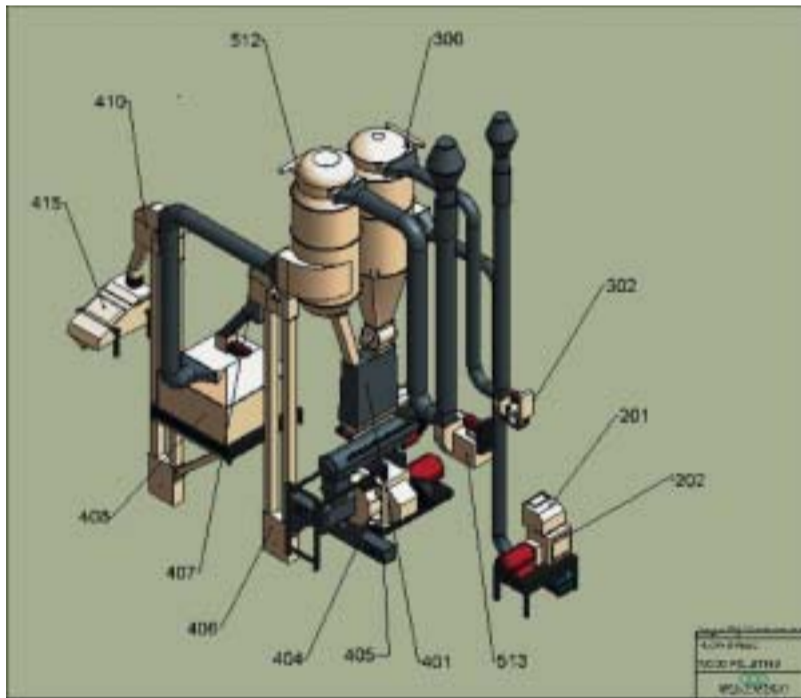
The hammermill (202) is working with an air flow, which optimises the grinding process and carries the wood powder to separation in a cyclone, alternatively a filter (300).

From a pre-bin (401) the powder is dosed to the cascade mixer (403), where steam is added.

The pellet mill (404) forms the pellets when the material is pressed through the ring die by means of two sturdy rolls.

The warm pellets are conveyed to a cooler (408) with air passage where they are cooled to a little above room temperature.

Finally the pellets are cleaned of dust in a sieve (415). The dust is returned to the process for reuse. By Tove Isaksen, Sprout Matador.



Biological waste and industrial and agricultural surplus products can be transformed to environment-friendly and economical products to be used as fuel or reused in production.

Compression of biomass through pelleting results in essential increase in the density of wood chips corresponding to a rise from 150 kg/m³ to 650 kg/m³.

Together with a number of environmental advantages a considerable limitation of costs of transport, storage and handling is achieved. The process is here described by one of the suppliers **Sprout Matador A/S**, Denmark with its sister company UMT, Holland with 25 years of experience in the business.

In Bioenergy International No 4 the process of **Amandus Kahl** is described, while in No 2 **Bionorrs** system was introduced. To read more concerning the system that **Bühler** provided for Luleå please come back to No 1. All these information and our previous numbers can be found on the internet or ordered directly from us!

Small scale Waste gasifier

New gasifier for biowaste, the 25 meter tall "Blue Tower" in Herten, Nordrhein Westfalen, NEW, Germany. The biomass is turned into a high-grade gas.

The technology is developed by Dr Mühlen GmbH & Co. KG.

There are two more projects decided, one in Herten (10MW) and one smaller (2,5 MW) in Niedersachsen.

According to the company, negotiations are ongoing with around 25 other partners.

The technology is also licensed and so far five projects have been signed abroad.

The gasification technology is counterstream and a rather large amount of charcoal (20%) production.

Ambitions region

The projects in the biomass sector in (NEW) saves 1,1 billion kWh fossil energy per year and carbon dioxide is reduced by 265 000 tonnes.

The region is one of the most important regarding technology development in the environmental sector.



Renewable energy and particularly wood - derived fuels play a key role in Finnish energy and climate strategies.

In order to reduce the emissions of greenhouse gases, the annual use of fuel chips produced from residual forest biomass is to be raised to 5 million solid cubic metres (10 TWh) by 2010.

Annually, this means a reduction of about 3 million tons of CO₂ depending on the fuel replaced.

The Wood Energy Technology Programme launched in 1999 by Tekes, the National Technology Agency of Finland, has helped to promote the use of forest fuels by means of research and development.

Since the limiting factor in reaching the objective is fuel production, rather than combustion capacity, the programme has focused on production technologies. The emphasis has been on developing systems for large plants with combined heat and power production (CHP).

Cost reduction, improved fuel quality and reliable deliveries have been essential in achieving the programme's objectives.

The two guiding principles of the programme have been close cooperation between scientists and enterprises and the application of the results to forestry, forest industries, energy production and machine manufacturing.



Efficient Technology Production of

Integration, a key to cost reduction

During the first four years of the programme, the annual use of forest chips has increased from 0.5 million to 1.7 million cubic metres. This growth, based mainly on the use of logging residues from regeneration cuttings, has created new requirements and expectations for production organisations. A total of five different production systems have been developed, comminution at landing still being the prevailing technology.

Integrating chip deliveries with the existing timber procurement process provides flexibility and reliability. To facilitate the management of a large-scale procurement process, comminution of biomass is partially being moved from forest to the plant.

Logistics is becoming increasingly important, since transport distances grow along with the increased use of forest fuel. Process control is promoted by the introduction of bundling technology, the development of which has been one of the core areas of the programme.

When using bundling, logging residues are baled at site into logs 60-70 centimetres in diameter and 3 metres in length, which can be transported with conventional forwarders and

timber trucks and subsequently comminuted by stationary crushers.

Broadening the raw material base

Thanks to the development of production machinery and systems, the cost of logging residue chips has become competitive when site conditions are favourable and the trucking distance less than 100 kilometres.

However, additional sources of biomass are essential, since demand is growing rapidly. The production of whole-tree

chips from early thinnings is becoming attractive due to new, suitable technology, such as multi-tree handling.

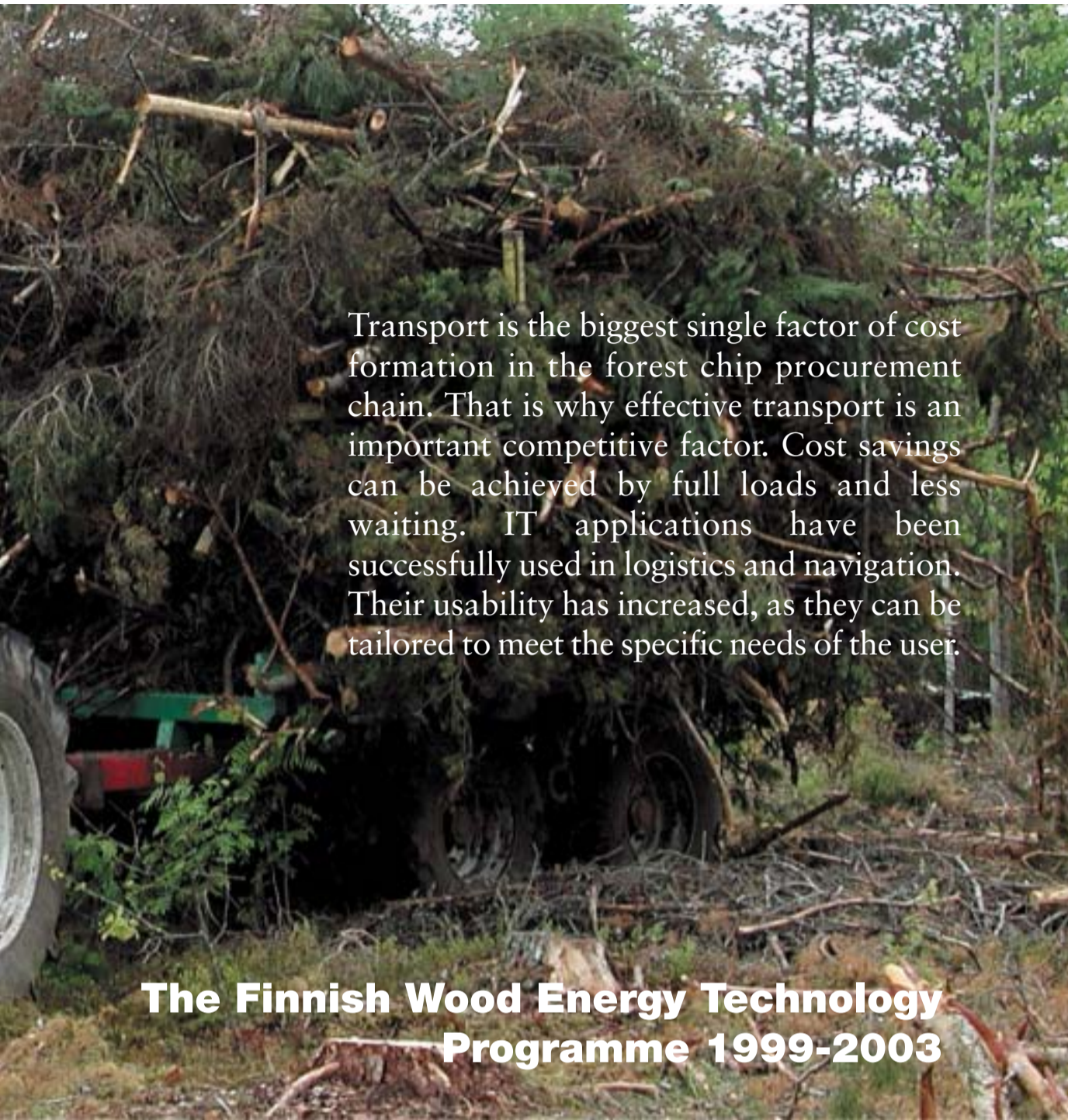
Stumps and roots are the third major unexploited reserve of forest biomass. A fledgling procurement system is comprised of extraction with excavators, off-road transport with conventional forwarders, on-road transport with large-volume special trucks and size reduction with mobile or stationary crushers.

In regeneration cuttings, the fuel yi-

eld from stumps has turned out to be as high as the yield from above-ground residues. The technology is becoming cost-competitive, and the quality of these chips meets the requirements set for fluidised bed boilers.

Reliable fuel deliveries

As the share of forest chips in the fuel blend grows, homogenous quality and reliable and timely deliveries become very important. The programme has supported networking of independent machine entre-



Transport is the biggest single factor of cost formation in the forest chip procurement chain. That is why effective transport is an important competitive factor. Cost savings can be achieved by full loads and less waiting. IT applications have been successfully used in logistics and navigation. Their usability has increased, as they can be tailored to meet the specific needs of the user.

The Finnish Wood Energy Technology Programme 1999-2003

Technology for Competitive Forest Chips

preneurs to develop local organisations for chip procurement. It has also addressed topics such as the reduction of moisture in chips, buffer storage, cofiring and the technology for receiving, handling and blending of wood fuels.

Since the mid-1990s, a large number of heating and CHP plants have been refitted for handling and burning large amounts of various wood fuels. Today, there are about 400 forest chip-fired power or heating plants in Finland.

Future prospects

During the last few years, the average annual growth of forest chip production in Finland has been about 300,000 cubic metres. However, in order to achieve the objectives set by the energy and climate strategies, the growth should be 400,000 cubic metres during each year of this decade.

This requires more investments in the development of technology, new supply organisations, and active participation of private forest owners and their organizations.

Research areas

- Planning and organisation of chip production
 - Production systems, including logistics
- Quality control, handling and storage of solid biofuels
 - Impacts on forestry
- Small-scale production and usage

A total of more than 100 projects have been funded within the five-year programme. The total cost of the programme was EUR 35 million. The majority of the funding has come from companies participating in the programme. Tekes has funded the programme with EUR 11.5 million.

In 2002, the programme was extended towards small-scale production and use. This specific activity focuses on solutions for small-scale (usually under 1 MW) wood fuel production, storage, processing and distribution as well as for energy production while the other part of the Wood Energy Technology Programme will end in early 2004, this specific topic will continue to the end of the year. Programme is co-ordinated by VTT Processes.

Wood Energy Technology Programme 1999-2003

The bundling method is a solution for boosting the large-scale use of forest biomass.

It is already in wide use in Finland and has, for example, provided the Alholmens Kraft power plant, the largest biomass plant in the world, with a dependable and an effective forest chip production system. Bundling provides a more effective way to manage and control the procurement process. The transport of biomass as bundles integrates industrial and energy wood logistics, since bundles can be transported by standard timber trucks.

Text by Ejia Alakan-gas, VTT

Photo: Timberjack

Additional information:
www.tekes.fi/english/programm/woodengy

Germany: Improvements for power from biomass announced

The German government is planning improvements for the production of power from renewables

The actual German "law about the priority of renewable energy" says, that the owner of the mains supply have to buy power from certain renewable energies at a fixed price.

For power from biomass there are three steps of prices:

- power plants under 500 kW get 10,23 Cent per kWh,
- power plants between 500 kW and 5 MW get 9,21 Cent and
- power plants between 5 MW and 20 MW get 8,7 Cent.

Beginning with January 2002 these prices are falling each year by 1 % for new plants.

Higher guarantee price suggested

The recently announced plan to change this law says, that the fixed price for power from biomass will rise for small power plants.

Up to 75 kW 12,5 Cent and up to 200 kW 11,5 Cent.

Bonus

Besides there is scheduled a additional bonus for using natural biomass like plants and the excrements of livestock.

Up to 500 kW the plan is to pay a bonus of 2,5 Cent.

And last but not least there is a bonus of 1 Cent planned for using certain innovative technologies.

-> 15

25 deliveries Bundling has a proven record



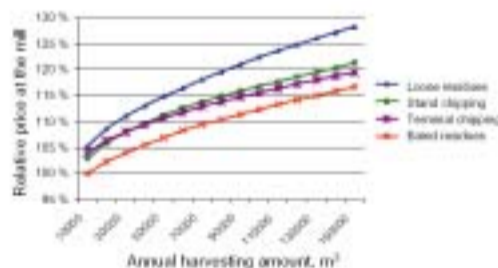
Bundles in Finland

In Bioenergy International No 5 Allan Bruks stated that mobile chipper systems are better for slash-harvesting than bundling. Now Arto Timperi from Timberjack, the leading supplier of slash-bundling systems, presents the facts about bundling.

Timberjack has delivered 26 bundlers since 2000. Among these deliveries there are 19 units operating in Finland, 3 in Spain, one in the USA, one in Sweden, one in Switzerland and one in Italy. The delivery of the machines has been accelerating during 2002-2003. There have to be some reasons to this sales increase, on the contrary than what is presented on the Bioenergy International No 5. July 2003 issue. In the following, I would try to point out some reasons for this increase of machine sales:

"Will wood slash bundling have a chance"?

1) In Finland there have been several tests arranged by the various research institutes. Figure 1 depicts one result performed by Finnish Forest Research Institute (METLA). This analysis is based on fairly large amount of measured data.



Picture 1. Relative costs of the different production methods.

The production numbers of bundles/h vary from 15 to 35. The medium value over the year is > 20/h. The annual production can exceed 60,000 bundles i.e. > 60 GWh. Also the energy content of the bundle is today higher than it was in the earlier tests.

2) The terminal crushing of bundles is up to > 3 times cheaper than the mobile chipping in relation to the MWh. The quality control of the fuel produced is more stable at the stationary plant than in the forest.



Bundles in France



Bundling in Italy

3) When bundling method is used the forest transport and long distance transport is easy to arrange, mainly by the same machinery as the solid wood. This is economical and convenient. The log trucks can enter into the forest roads much better than the chip trucks. The bundling system is simple and easy method when the logistics is concerned

4) Bundling is an environmental friendly system that is fully accepted by the different interest groups

5) When fuels storage is as bundles, it is cost effective. The material can be kept in the forest as long as there is the need or the transportation can be arranged. This way the power plant can always be supplied by the large volume of good quality fuel. No other method can provide such a large flexibility.

6) Summer 2003 showed that the bundles fuel was so dry that for the smaller power plants the fuel was watered in order not to achieve to high temperatu-

res in combustion.

7) For smaller power plant the bundling system is very beneficial, because it provides an cost effective way to control the fuel inventories. The bundles can be chipped at the terminal or at the plant by effective mobile chipper. Bundle chipping is up to three times more productive than the loose material chipping. It has been measured that the chipper can produce over 340 m³ of chip when the bundles are fed in.

8) The quality of the wood energy supply can be lifted significantly higher level by using the bundling technology. The long term experiments have shown that the bundles provide significantly dryer fuel than the forest chips. Bundles are drying on stacks.

During the year 2003 there was a survey done by Finnish VTT of forest chip quality. As a conclusion of this survey it was clear that mobile chippers produced chips with very high moisture content. Often the chip deliveries included also a visible snow and ice. As a biggest problem it was seen that the mobile chipping is done from the small raw material inventories, which could be under snow or right after the felling. All the interviewed power plants pointed out that the increasing number of stationary crushers improve the quality control of fuel.

Bundling method fits also very well in the modern information systems, because it is easy control, measure and handle. When utilizing the bundling technology more and new users can be found for renewable energy. Bundling is attractive and will certainly widen the bioenergy business significantly.

Timberjack Energy
Technology
Arto Timperi

BioPower for Finnforest's sawmills



In May 2003 Finnforest Corporation and Wärtsilä Biopower signed an agreement to deliver two BioPower CHP plants and one BioEnergy plant for the Vilppula and Renko sawmills.

The plants are up and running before the end of the year.

Track record decisive

This breakthrough was the result of trust, feasibility, technology and

environmental values combined with innovative plant concepts. Finnforest Oy bought the first BioGrate technology from Sermet already in 1994. Today with those new orders the number of BioGrate-plants is totalling seven, five of them operating at full satisfaction of the owner and two under construction.

Finnforest is a foregoing wood product company with a 1.8 billion Euro turn-over and about 7500 employees. Finnforest are present in 21 countries and they belong to the large Finnish Metsäliitto Group as its mechanical timber processing arm.

Towards self sufficiency

The recent history of unexpected energy price development was one of the reasons for Finnforest's decisions to control that cost and produce the energy themselves.

Besides the main product, which is 600 000 m³ of timber, the mill produces almost the same amount of chips and saw powder for fibre production and over 300 GWh of bark which is most feasible to convert into energy at the sawmill.

Vilppula sawmill is one of the largest in Europe and they process around 1.35 million m³ of spruce every year, which roughly correlates to 140 truck (18-wheeler) loads every day, year around if all timber would come on trucks. To handle, cut and dry such amount of wood they need not only the latest cutting technology but also reliable power and thermal energy. In fact, their energy bill is around 2.5 % of their 120 million Euro turn over and it is clearly the largest production cost item after timber purchase.

CHP for the sawmill - heat for the community

The new plant with BioPower 5 and BioEnergy 9 will consume 180 GWh bark annually, which is around 60% of that total bark production and convert it to 22 GWh electrical and 132 GWh thermal energy. This covers 70% of the mill's electrical consumption and 100 % their thermal energy need for drying the lumber and heating a nearby Vilppula town with 5 000 inhabitants. District heating energy sales brings valuable additional income and thus improved the feasibility of the project.

Fast delivery on all markets

Both BioPower 5 and BioEnergy 9 plants are scheduled to be in full production this December and they will be handed over in the beginning of 2004. With the same schedule Wärtsilä Biopower is constructing a BioPower 2 CHP plant for Finnforest's Renko sawmill.

By Marika Repka, Wärtsilä.

Reducing the risk of fire and explosion

Identifying and cooling hot particles in a biomass fuel handling system can prevent fire and explosions.

Bioenergy International looks closer on how it can be done in practice.

Using biomass material is combined with a certain risk of unwanted fire or explosion. This is well known in the food industry as well as in wood working industry.

Starting from a board making industry more than 30 years ago a technology and system aiming at preventing this risk was developed.

- The way of thinking of safety aspects and risk management varies between different markets and different countries, says Anders Bergström, market manager at Firefly in Stockholm, Sweden.

Not many security systems can handle the

heavy streams of biomass material before a large boiler in a heat and power plant or in a pellet plant.

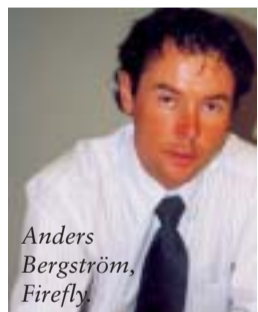
The system has to detect a potentially dangerous hot particle and cool it down before it develops to a fire or explosion and at the same time doing this without interrupting the process.

Risk analysis

- To do this we usually start with a risk analysis of the process, says Anders Bergström. In this we can identify the sources of dangerous particles, e.g. machines as mills, pellet presses that can generate ignition sources.

The effect is often not seen in these machines but in a risk zone with a mixture of dust and air that is explosive.

In the risk analysis we



Anders Bergström, Firefly

study drawings and look at the process to be able to design a system that detects the ignition source, cool it or divert it from the risk zone via a valve.

High speed detection

The essential part of the solution is a sensor with infrared cells which detect if something with a certain temperature and mass is passing by at high speed. In pneumatic transport ducts the speed of the material can reach 30 meter per second and in a matter of



Different detectors for different applications

milliseconds the detector has to react and identify if the particle is dangerous.

Another important aspect is that the sensors should not give unnecessary false alarms. By using a detector that is insensitive to daylight this risk can be kept to a minimum.

Efficient extinguishing

Downstream the detector there is an extinguishing zone, e.g. Diverting valve, isolation valve, CO₂ extinguishing.

In most cases water is

injected during 2 seconds. After this the hot particle is cooled down and the process continues without interruption.

Many biomass fuel-handling systems today are handling very heavy material flows. This puts extra demand to the water extinguishing system.

A high water pressure 7-9 bar and full-cone nozzles gives large water droplets and a high momentum of the extinguishing water. This in combination with the location of the nozzles, that must be located from different directions into the chute, is the key for successful extinguishing.

The new heat plant in Solna, Sweden is a good example of how the system can be implemented. Bioenergy International will come back to this in a near future.

By Anders Haaker

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God for biogas

If these plans are realised, it's expected, that there will mainly be more power produced in small biogas plants.

The use of natural wood however won't benefit much. As a consequence, the technic of biogas plants could "mature" by mass production. So the biogas sector could benefit internationally by this law.

There is still an expected half of a year, until the law will pass the German parliament with a majority built by Labour and the green party.

Right now there are many discussions, whether the conditions for power from biomass should be even more improved.

The prospects for even better conditions are good.

This is due to the fact, that the farmers, who can deliver the fuel for the biogas plants, traditionally vote mainly conservative.

The main obstacle for these improvements could however be the fears of the industry of higher power prices.

The main argument of the secretary for the environment from the green party, Jürgen Trittin, against these fears is the expectation, that the prices for power from renewable energies could fall within ten years to a economically appropriate level.

This expectation is fueled by the hope of a "technical revolution" induced by the law.

by Jens Dörschel, collaborator of a MP of the Green party in the German parliament, Berlin

Biomass for supply of heat and electricity will be of increasing interest in Germany since the Renewable Energy Act has come into force in the year 2000.

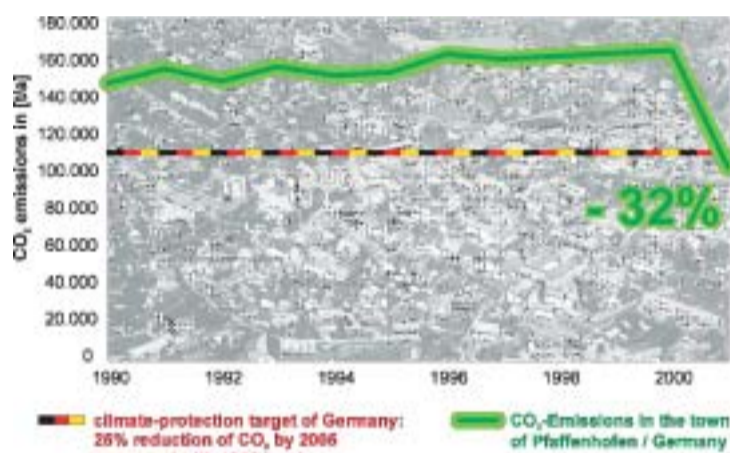
Attractive feed-in tariffs let become biomass a serious competitor in the energy market, particularly in connection with the ecological tax reform introduced in Germany in 1999 and also with the EU directive on energy taxes.

The most promising deployment of biomass in the future will be achieved in regional dimensions, using local and regional special conditions like farming and forestry and thus i.a. avoiding large distances of transport.

Furthermore are the reduction of emissions of CO₂ as well as the creation of employment very desirable side effects.

As a prototype example for successful planning, building and running of an economically and ecologically sound enterprise of this kind the biomass co-generation plant of Pfaffenhofen, Bavaria will be described here.

Co-Gen in Pfaffenhofen an Economic and Ecological Success



The declining of carbon dioxide emissions in Pfaffenhofen has reached the national target for Germany according to the Kyoto Protokoll.

Customers

The plant, erected in the years 2000 to 2001, is producing electricity, steam, district heating and cooling.

The location of the biomass cogeneration plant allows to deliver energy to the connected customers very easily.

The plant supplies steam to a producer of baby-food at a temperature of 180°C / 356°F by a special conducting pipe.

A district heating system for more than 150 customers on two levels of temperature (130°C / 266°F and 85°C / 176°F) and a low-temperature grid for neighbouring customers (up to 40°C / 104°F) has been installed.

Moreover absorption chillers run by district heating provide cooling for air conditioning and for low-temperature applications.

Due to the fact that the demand of heat is rather constant over the year, the degree of effectiveness of a co-generation plant is very high.

Combustions

Wood chips are burned in a special biomass boiler on a water-cooled vibration grate. The maximum heating power is 26.7 MW.

In addition, there are two steam boilers with 10,5 MW and 21 MW respectively heating power for supporting biomass-furnace during high loads and to ensure safe heat delivery. The main fuel is gas.

Capacity

In total up to 120 GWh heat are sold every year. With a capacity of about 7.5 MW electrical power, the steam turbine is supposed to supply an amount of more than 42 GWh electricity per year into the grid.

Fuel

The annual fuel demand is about 80,000 tonnes: 30% natural wood and bark; 70% wood waste of sawmills.

The continuous demand of 250 tonnes per day requires efficient logistics for harvesting, processing and transport

of wood.

Forest owners can supply wood of any kind and quality from intact stems to wood chips. All species of trees are suitable for wood chips production for which mobile as well as stationary chippers are in operation.

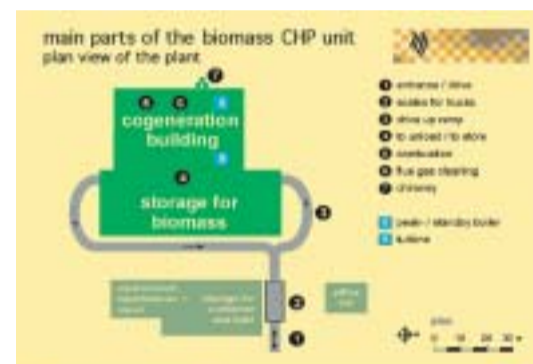
Container trucks carry the fuel to the cogeneration plant.

It is possible to use wood with a water content between 15 and 55 per cent. So seasonal fluctuations of water content of the used biomass will not cause problems.

Ashes recirculates

The use of the ashes arising from the firing process is circulated back to agriculture sector where it is used as fertilizer.

This is not yet in line with the German Fertilizer Ordinance from 1999 or with the Biomass Ordinance from 2001, but with the amendment to the Fertilizer Ordinance having passed Parliament and being now in Federal



Layout plan for the CHP plant in Pfaffenhofen



The overview of the Pfaffenhofen project

Council (of the Länder) the use of furnace ashes for farming and forestry will be allowed.

Labor policy

The co-generation plant in Pfaffenhofen offers not only energy efficiency but also labor policy advantages. So during the construction phase 200 persons were employed, and now since being in operation 25 persons have permanent jobs in the plant itself and in wood procurement.

Planning, Building and Operating the Plant

Pfaffenhofen is a district town with 22.000 inhabitants and a good infrastructure.

How it started

At the beginning of the nineties a farmer had the idea to build a biomass plant for which he ordered several preliminary studies and even managed to get the approval for the location to build it.

But he had to face too many problems so the project almost failed.

In 1997 five private investors engaged themselves financially to save the project. They asked eta-energieberatung to check framework conditions and elaborate a concept for a co-generation plant producing energy, i.e. power, steam, district heating and cooling on an ecologically sound basis.

Heat & Power



www.bioenergyinternational.com



The combined heat and powerplant i Pfaffenhofen in the summer and in the winter.



Fig. 3 Steps to a successful project

Only wood from the region was to be used as a sustainable energy source.

At that time oil prices in Germany were not very high (16 ct/l HEL), whereas biomass (at that time only wood waste was in use) was regarded as not economic.

This required a usable and cost-efficient fuel logistics and also a sound sale structure. So eta-energieberatung elaborated a draft concept which foresaw:

- evaluation of the location (infrastructure, distance to costumers),
- estimation of the heat demand and actual prices,
- dimensioning of important system components (boiler, turbine),
- estimate of wood demand and prices for wood chips,
- calculation of pro-

fitability and financing concepts.

Furthermore there was a very detailed concept needed in many othe areas which is presented in fig 3 above.

Finding acceptance of the plant with inhabitants

First of all some big customers of energy like Hipp, the Ilmtal Hospital and a few other enterprises, as well as commune and district administration of Pfaffenhofen could be won for long-term contracts to buy energy from the co-generation plant at the same price as they were used to buy oil or gas.

A little later the enterprise Müller-Bräu, a big brewery, signed a contract to buy cooling which they need during summer time.

Rather difficult tur-

ned out to be winning private customers for heat and power. Up to this time in Pfaffenhofen no district heating net existed, and people were rather sceptical.

Strong reservations existed particularly against possible emissions like air pollutants and noise, as well as against a sustainable fuel supply through natural wood. The opposition of a group of inhabitants of the town against the plant had to be taken seriously.

So the planners and constructors engaged themselves in convincing people of the economical and comfort benefits of using heat, power and chill supplied by the biomass plant, and with permanent information in town meetings, seminars, promotion stands on street corners they

succeeded in winning a considerable number of citizens to support the erection of the plant and to agree buying heat and power from it.

Referendum

Two citizen initiatives formed themselves: one was pro plant, the other contra.

In the end the supporting votes had the majority in a referendum.

Finally the biomass plant could be erected in the years 2000 and 2001 and parallel to it the district heating net was built.

In July 2001 the plant was put into operation in a formal ceremony with a speech of the Parliamentary Secretary of State, Mrs. Probst.

In the meantime the biomass plant has found an increasing acceptance among the population of Pfaffenhofen. So more and more private consumers show their interest in getting connected to the district heating.

Know-how transfer to prospective project developers

With new developments in German energy and environmental policy, i.a. the Renewable Energy Act from April 1, 2000 which grants attractive feed-in tariffs for energy from renewable

sources, an increasing interest in building and running biomass plants is to be seen.

In the Pfaffenhofen plant a technique was used which was available on the market and could be combined with a detailed concept to cope with the special demands of location, fuel supply possibilities, consumer structure etc.

Its practical applicability could be proved together with a solid economic operation and environmentally effective results. These experiences can be taken over in other planned installations. So particularly parts of the project like fuel logistics, fuel handling and use of ashes are of great interest for all professionals dealing with that matter like universities, experts from regional and local administrations and from enterprises from Germany as well as from other countries. So many lectures concerning the technique of the plant, thermal production of chill and economy of operating such a plant have been held on national and international conferences. A considerable number of politicians, experts, interested persons and groups have visited the Pfaffenhofen plant.

4. Conclusion

Biomass plants for producing energy for power, heat and chill are economical!

This statement is valid even without taking into account the comparably high German feed-in tariffs for renewables.

But planning, building and operating plants of this kind are more complex and more difficult than those run with other renewable energies.

Efficient fuel logistics and fuel supply, sale of power and heat during the whole year with maximal output as well as finding the optimal and reliable technique have to be carefully planned and harmonized especially in regard to specific local conditions.

This makes cooperation of experts from different disciplines necessary.

Three main columns are important for an economically sound running of the plant:

1. efficient fuel supply,
2. a technique adjusted to the demand and
3. long-term secured energy sale.

The Pfaffenhofen biomass co-generation plant as a pilot project was supported with a government grant from the "Investment Program for Reduction of Environmental Loads" by the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety and with an investment grant by the Bavarian State Ministry for Agriculture and Forestry.

But with an appropriate concept biomass plants are nowadays successful even without any financial support.

For detailed information on technical data and functioning of the plant please contact

Mr. Volkmar Schäfer
Volkmar.Schaefer@eta-energieberatung.de

Suppliers



First Biogas Production in Slovenia opened the 12th of September 2003

Janez Kopač, the Slovenian Minister for environment and energy (second from the left) opened together with director of Slovenian Agency for Energy Efficiency (first from the left) in Letus, in the farm of Flere Anton (third from the left) the first Slovenian biogas production with 120 kWh capacity of electricity production. The Government support the project with 26 million SIT - 32 % of the investment value.

Martina Sumenjak
info@slobiom-zveza.si

Co-firing in UK

Two UK plants has been authorized to co-fire biomass and coal according to news agency Reuters.

It is Ofgem, the regulator for Britain's gas and electricity industries which has authorised Innogy's 475 MW plant in Wales and UK's largest power station Drax in north Yorkshire.

Fuels planned to be used are wood and milled palm nuts. The plants will be able to earn green certificates after the switch./LLj

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- Byggelit Laxå Sweden 4 x 5 MW
- Particle Planner Thailand 11 & 5 MW
- Fortum Nordic Paper Säffle Sweden 25 MW
- BioNorr Härnösand Sweden 10 MW
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- Metso Panelboard Masisa Brasil 28 MW
- New Order: 4 x 20 MW Norrenergi Solna Sweden

Up till today VTS has supplied 27 woodpowder burners from 0,1MW up to 30 MW. VTS can supply woodpowder burners up to 50 MW for upgrading of existing as well as new installations. VTS burners operates today in steamboilers, hotwaterboilers, incinerators, burnerchambers for hot gas production to dryer-systems. VTS design the burners with oil and/or gas fuel as back up fuel. The burners can also be used for incineration of liquids or gases when operating on wood powder. VTS woodpowder burners operates without any pilot fuel from min to max load.

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SWEDEN

Phone: +46 155 284915
Fax: +46 155 283315
E-mail: info@vts.nu
Internet: www.vts.nu

VTS AB

How to use biomass in large scale in the city

In Solna, in the central great Stockholm area a large oil fired heating plant is converted to biomass. Two 50 MW boilers will use pulverised dry biomass from the start of 2004.

The investment is estimated to 22 million Euro. Taking into account the heavy taxation on fossil fuels used for heating, 3-4 million Euro will be saved annually.

No land available

The plant, located in Solna by the sea, is surrounded by water on one side, a major road on one side and offices on another side. A few hundred meters away are a number of multi-family houses. The surroundings are densely populated and there was no land available for building a biomass plant fuelled with wet biomass.

– The message from our leading politicians was that we must use the site we already have, says Sven Jonsson, product manager at Norrenergi, supplying Solna and Sundbyberg with heat and power. When this finally was clear to us, the decision was easier to make. Dry biomass was our choice, says Sven Jonsson.

Fuel by train, ship and trucks

The yearly supply needed is approximately 60 000 tons. This will be transported by train from HMAB in northern part of Sweden and by boat from SBE to a terminal for reloading. Trucks will feed the plant from a close by storage site. Mebio will also supply smaller volumes. The Saxlund handling equipment will feed the two Champion mills



Solna heat plant with the new fuel handling and flue gas cleaning system. Photomontage: Scheiwiller Svensson Arkitektbyrå.

with briquettes and pellets. The powder will be burned in four burners from VTS with a capacity of 20 MW each.

The boilers were changed two years ago, tailor-made by Aker Kvaerner for using both

oil and biomass as fuel. Alstom of Växjö makes the flue gas cleaning system with ash handling from Saxlund. The limits for dust emission are low; the maximum allowed emission is 10 mg per MJ.

– This is like an adventure for us since we have not worked with biomass before, says Sven Jonsson. However we can see that others have done this before and made it work out.

By Anders Haaker

New system for small scale storage of pellets

The new storage system for wood-pellets with integrated withdrawal (delivery-system) for boilers for family-houses is called Geobox.

It is developed by Geoplast, an Austrian company, which is specialised in producing tanks for storage.

The Geobox is supplied in separate parts, which makes it very easy to assemble in most rooms.



By the variable container height the box adapts individually to the room height, and thus a maximum space utilization.



The Geobox can be set up also in the upper floor or effected at the attic, the withdrawal by means of fall-pipe or suction system.



A further possibility is the location outside the house.

It is possible to store in the Geobox between 3.2 and 6.7 tonnes pellets.

For pellet stoves: Telephone activated control system

Control via mobile phone or fixed network helps save up to 25-30% of primary heating costs.

The new control system is supplied by the Austrian manufacturer Rika.

The novelty is that the pellet stove is able to be activated by an external call.

This new kind of flexibility allows you e.g. to keep all rooms at a constant temperature of 15°C via your primary heating source, and create

the individually desired cosy warmth with your pellets stove at precisely the required time.

Just by lowering your primary heat source by one degree you will save around 5 per cent on fuel costs.

This specific kind of control system meets one of the most essential current customer needs for independency and flexibility, thus providing an excellent business opportunity for the specialised trade.

In the new development, special attention

was paid to serviceability, user friendliness and operational safety, also to a broad ability range with a high efficiency level in all capacity ranges from 2-8kW.

The control system is available in all Rika pellet stoves.



Rika's Premio - presented with the new control system at the International Trade Fair ISH Frankfurt.

A system for efficient wood chipping

A hydrostatic 180 PS tool carrier with hydraulic PTO, a wood chipper equipped with crane and a trailer: this is the solution proposed by Tre Emme to everyone who see opportunities in wood chipping.



The MM180B tool carrier reveals its main advantage in the front hydraulic linkage, where the TP250 wood chipper with crane finds its lodging.



The operator has god visibility, both on the work field and when transferring on road. No need of a reversed seat, the tool is already at the front of the machine.



The MM180B is ideal for bearing a TP250 woodchipper with crane. (280 PS).
For more information
www.treemme.info

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poleko 2003

International Ecological Fair
18-21.11.2003 Poznań, Poland

The motto of the fair: Environmental protection in the European Union – benefits and challenges for Poland



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Events

- 7th International Ecological Congress - 17-18.11.2003
- conferences and seminars
- Cooperation Exchange - business meetings organized by World Trade Center Poznan
- environmental paintings and photography exhibitions, festival of environmental films

We offer our assistance

- we organize meetings with Polish and foreign exhibitors
- we reserve cheap accommodation
- we organize admission to the fair and provide information materials

More information on <http://poleko.mtp.pl>

The fair is held under the auspices of the Minister of the Environment, the Minister of Economy, Labour and Social Policy and the Minister of Agriculture and Rural Development.



Poznan International Fair
Chopynska 14, 60-734 Poznan
phone: +61/ 869 23 55, 869 25 52, 869 29 52
fax: +61/ 869 29 52; e-mail: poleko@mtp.pl, <http://poleko.mtp.pl>

Services for foreign guests:
World Trade Center, Bukowicka 12, Poznan
phone: +48 61/ 865 10 50, fax: +48 61/ 866 61 34
e-mail: wtc.poznan@wtc-poznan.com.pl

The effect is fact Investment needed now

What's up with the weather, natural variation or greenhouse gas, is for meteorologists to debate. Yet, the growing consensus amongst global leaders is the effect of global warming is fact and that it's time to go for renewable energy sources, big time.

Many countries have, by ratifying the Kyoto agreement, obliged themselves to decreasing their emission levels of carbon dioxide. The deadlines for meeting these obligations is running out.

This is the background for the World Bioenergy 2004 international conference and tradeshow to be held in Jönköping, Sweden. This international event is expected to attract more participants than any other comparable conference. For the first time the tradeshow itself is of paramount importance. It is no longer enough to discuss the challenges and possibilities facing bioenergy solutions tomorrow, it is time to invest in the leading technologies available today.

Make sure that your company is part of the picture when buyers of bioenergy technology and solutions arrive in Jönköping next June. Register your interest on www.elmia.se/worldbioenergy or phone +46 36-15 20 00.



WORLD BIOENERGY 2004
Conference & Exhibition on Biomass for Energy
2-4 JUNE 2004 - JÖNKÖPING - SWEDEN
SVEBIO Elmia

Events



Opening speech by minister of internal affairs of Croatia Sime Lucin

Zagreb, Croatia
First intern. Symp. on Environmental Management - SEM 2003.

Zagreb Fair, October 1-3, 2003.

The conference was organised by Faculty of Chemical Engineering and Technology and Slovenian Biomass Association, under the Auspices of Ministry of Environment protection physical planning, Ministry of Science and technology, assembly of Una - Sana Canton, Bosnia and Herzegovina, National institute of Chemistry in Slovenia and city Zagreb.

There were more than 200 participants and representatives from all Europe, America and other continents.

The conference was concentrated on the most actual problems of



environment in general as well as specific problems for example: municipal solid waste management, transboundary pollution, transmission and prevention, land resources remediation, as well as energy and environment.

The bioenergy represented the main topic, regarding the future possibilities of Croatia and it neighbouring countries. They also presented the pilot project of Croatia in the bioenergy use.

Martina Sumenjak,
info@slobiom-zveza.si



Libramont show 2003

Last July the 69th Libramont Show took place. For all six days visitors from all over the Europe, not only Belgium, were taking part in many competitions, presentations and seminars.

Libramont this year changed a bit its character from being purely agricultural oriented to more forestry focused event.

The theme for Libramont 2003 was "Forest- wood-enterprises: economical energy, ecological energy"

Very good organization and planning of the event in Libramont contributed to high popularity among the visitors of both places, the fairground in Libramont and demonstration in the forest that was placed around 20 km outside of the town itself.



Text and photo Dorota Natucka



Slobiom 2003



The conclusions of the conference presented: Josef Nagy, representative of Hungarian Ministry of Agriculture; Rudolf Placil, Reiffeisen Leasing GmbH, Austria; Branko Bosnjakovic, University of Rieka, Croatia; Dan Asplund, AEBIOM President; Josef Plank, Technical Director of Austrian Biomass Association and Martina Sumenjak, SLOBIOM president. (from left to right)



The opening speeches of the 5th SLOBIOM Conference had Janez Susnik, President of the Slovenian National Council (first from right), Borut Pahor, President of the Slovenian Parliament (first from left) and Franc Beraus, Director Slovenian Agency for Energy Efficiency (second from the left).



"How to keep house warm with 50% cheaper energy" is the message from the company Ferroterm, a boilers producer in Selnica ob Dravi in the NE part of Slovenia.

At the end of this month the production of pellets also started, beginning with 7000 tonnes per year.

In front are AEBIOM - members from Poland, Slovakia, Tjeckia and Germany and editor Lennart Ljungblom.

Marcus Kurtsiel explained the system of the German RES politics which is one of the most progressive in Europe.



During the Euro Biomass Days of the Regions Scouts in SE Slovenia many local people were invited to see the modern lock boilers which are installed in the church of the small city Lenart from Slovenske Gorice.

The oldest supporter members Slavica and Martina Sumenjak together with the priest of the Church in Lenart, Martin Bezgovsek and scouts with the invitations for Biomass Days.

Martina Sumenjak,
info@slobiom-zveza.si

Success for Bioenergy 2003 Jyväskylä Finland



The conference general prof. Dan Asp-lund could in his opening statement look out over a crowd of 600 participants from 37 countries.



The conference was held in the middle of Finland's bioenergy region, Jyväskylä.

In this area bioenergy dominates totally.

The conference had also a nice post-exhibition, a commercial exhibition as a part of the larger wood forest exhibition.



Four study tours to large and small scale applications in forests as well as at end users and research institutions finalised the event.

Bioenergy International will in upcoming issues publish parts of the interesting informations that were presented in the event.

*Text and photo
Lennart Ljungblom*

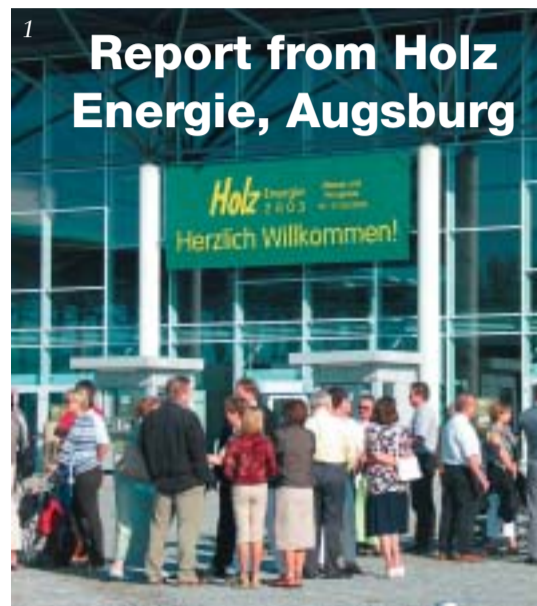
Biomass Technology in Victam International 2004 Exhibition and Conference

Victam International 2004 is the world's largest dedicated fair for the animal feed, flour milling and grain processing industries. For the first time this major international event has been broadened so as to encompass "Biomass Technology".

Not only will the event see the largest concentration of pelleting technology and equipment manufacturers ever held. A conference will also be held on Thursday, 13th May 2004 that is to be organised by AEBIOM on the important subject of "Pellets for bio-energy".

Victam International 2004 will take place at the Jaarbeurs Exhibition Halls, in Utrecht, The Netherlands from the 11th - 13th May 2004. The last Victam event to be held in Europe, in 2001, attracted almost 11,000 industry executives, and these came from 112 countries. The Victam International 2004 show will comprise some 200 international exhibitors with over 8000m² of actual show area.

For further information on the exhibition visit the Victam website - www.victam.com. Additional details on the conference, together with the full technical programme and registration fees can be obtained from AEBIOM at their website - www.ecop.ucl.ac.be/aebiom or Tel/Fax: ++ 32 10 47 34 55, e-mail: jossart@ecop.ucl.ac.be



From September 18th to 21st, more than 6,100 visitors gathered information about woodenergy from 150 exhibitors.

"We have established a meeting place which is now a must," says Bernd Geisen, CEO of BBE (German Biomass Association).

The organiser of the trade fair is content:

"We were able to rise the number of exhibitors comparatively to last year. We are especially happy about our quota of 25% international companies.

"HolzEnergie 2003 is on its way to an international leading fair!", says Johann-Georg Röhm, CEO of Erneuerbare energien Kommunikations- und Informations-service GmbH.

In 2004, HolzEnergie will be held at the same time as RENEX-PO from October, 21st to 24th.

1. Friendly and nice atmosphere combined with nice summer weather

Some of the stands were often well occupied by the visitors:

2. HDG Bavaria
3. Biomat Germany
4. Konrad Raab and Joachim Fischer from German Biomasse Info-Zentrum
5. The stand of Bioenergy International



European Pellets Conference

Markets & Technologies 3/4 March 2004
Wels/Austria

Call for Papers Deadline:
30 October 2003

World Sustainable Energy Days 2004

www.esv.or.at/pellets04

D.Ö. Energiesparverband
Landstraße 45, A-4020 Linz, Austria
T: +43-732-7720-14380
E: office@esv.or.at
I: www.esv.or.at



2nd World Conference and Technology Exhibition on Biomass for Energy, Industry and Climate Protection

10-14 May 2004, Palazzo dei Congressi, Rome, Italy

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EUBIA European Biomass Industry Association

www.conference-biomass.com

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For further information please contact the organisers:

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Calendar



www.bioenergyinternational.com

21 - 23
Sustainable Energy Expo 2003
London, UK
www.sustainable-expo.org

22 - 23
Supervisory control and Data Acquis.Syst. for the Energy Sector
London, UK
www.smi-online.co.uk/energysec9.asp

28 - 31
3rd International Conference for Renewable Energy; Energy Saving and Education
Havana, Cuba
www.ispjae.cu/eventos/cier

November
2 - 4
World Summit on Ethanol for Transportation
Quebec, Canada
www.bbithanol.com/worldsummit

4 - 6
Renewable Energy 2003 - Modern Situation, Problems, Trends
St Petersburg, Russia
www.lots.spb.ru

5 - 6
5th Annual Dutch Energy Conference
Amsterdam, The Netherlands
www.smi-online.co.uk/dutchnrg9.asp

5 - 8
SINERGY - the International Energy Forum
Rimini, Italy
www.riminifiera.it

7 - 9
EnergieTage Hesens 2003
Wetzlar, Germany
www.energie-server.de

12
Baulehrschau Fachtag "Biogas"
Sächsische Landesanstalt für Landwirtschaft
Köllitsch, Germany
Burkhardt.Puhlmann@fb08.lfl.smul.sachsen.de

12 - 13
Energy in the New Europe
Brussels, Belgium
www.ecinformenergy.com/conferences

12 - 14
Energy In the Sugar Cane Industry
Havana, Cuba
www.icidca.cu

12 - 14
26th World Energy Engineering Congress
Atlasnta, Georgia, USA
www.energycongress.com

13
Die Initiative "Biomasse und Energie" des Landes Schleswig-Holstein-Zwischenbilanz
Neumunster, Germany
Akademie für Natur und Umwelt
anmeldung@umweltakademie-sh.de

13 - 14
European Legislation to Promote Bioenergy
Brussels, Belgium
www.ecop.ucl.ac.be/biom

13 - 17
CIEMA'03 - 1st International Convention for Energy and Environment
Santiago de Cuba, Cuba
www.uo.edu.cu/eventos/CIEMA2003/ciema2003.html

18 - 19
Sustainable Energy Asia
Singapore,
www.energyasiaexpo.com

18 - 21
POLEKO 2003
Poznan, Poland
www.poleko.mtp.pl

20 - 21
12 Symposium Energie aus Biomasse
Bad Staffelstein, Germany
www.otti.de

20 - 23 Bois Energie
Cahors, France
www.itebe-expo.com

24 - 25
The Environmental Performance of EU Industry
Brussels, Belgium
ENTR-ENV-PERFO-CONF@cec.eu.int

24 - 26
4th European Motor Biofuels Forum
Berlin, Germany
www.europoint-bv.com/events/biofuels2003

26 - 27
5th Annual Irish Energy Conference
Dublin, Ireland
www.smi-online.co.uk/irishenergy9.asp

27 - 28
Biomasse-Tagung am Umwelt-Campus Birkenfeld
Birkenfeld, Germany
tel:0049 6 782 171569

28 - 29
Dezentrale Pflanzenölnutzung
Aulendorf, Baden - Württemberg, Germany
Dieter.Spielberg@t-online.de

December
08 - 10
Bioenergy Australia 2003 - Sustainable Energy for Our Future
Sydney, Australia
www.conferenceaction.com.au

2004
January,
17 - 21
EUFORES - The European Conference for Renewable Energy
Berlin, Germany
www.eufores.org

19 - 21
European Conference For Renewable Energy "Intelligent Policy Options"
Berlin, Germany
www.wererec-renewables.org/berlin2004.htm
www.europa.eu.int/comm/energy/res/index_en.htm

21 - 23
ICORE 2004 - International Congress on Renewable Energy
Bangalore, India
www.icore2004.com

22 - 24
Clean Energy Power 2004
Berlin, Germany
www.energiemessen.de

February,
5 - 7
Renewable Energy and Water Technology Fair
Aguadulce, Almeria, Spain
www.fenergia-agua.com

17 - 20
SMA 2004
6th Environment Exh.
Zaragoza, Spain
www.feriazaragoza.com

March,
3 - 4
European Pellets Conference
Wels, Austria
www.esv.or.at/pellets04

3 - 5
World Sustainable Energy Days 2004
Wels, Austria
www.esv.or.at

5 - 7
Erneuerbare Energien 2004
Böblingen, Germany
www.erneuerbareenergien.com

31 - 2 April
Globe 2004
Vancouver, Canada
www.globe2004.com

April,
7 - 9
REAsia 2004 - Asia Renewable Energy Conference and Exhibition
Beijing, China
www.gracefair.com

19 - 24
Hannover Fair 2004
Hannover, Germany
www.messe.de

May,
5 - 7
Energetika 2004
9th Int. exhib. of electrical engin., energy supply and equipment
Riga, Latvia
www.expo-rasa.lv
www.prima.lv

10 - 14
2nd World Conference and Technology Exhibition on Biomass for Energy, Industry and Climate Protection
Palazzo dei Congressi, Rome, Italy
www.wip-munich.de
www.etaflorence.it

11- 13
Victam International 2004, Exhibition and Conference
Jaarbeurs Halls, Utrecht
The Netherlands
www.victam.com

30 - 31
World Renewable Energy Forum 2004 - Global Benefits and Policies
Bonn, Germany
www.wcre.org

June
1-4
International Conference for Renewable Energies
Bonn, Germany
www.renewables2004.de

2 - 4
World Bioenergy 2004
Conference and exhibition on biomass for energy
Elmia - Svebio, Jönköping, Sweden
www.elmia.se/bioenergy
www.svebio.se/worldbioenergy

16 - 19
14th KWF Forest Machinery and Innovations
Groß-Umstadt, Germany
www.kwf-online.de

23 - 25
2 international Fair of Devices and Technologies for the Wood Pellets Industry "PELLETS-EXPO"
Bydgoszcz, Poland
info@ctpik
www.ctpik.com.pl

August
28 - 3 September
World Renewable energy Congress VIII
Denver, Colorado, USA
www.nrel.gov/wrec

September,
5 - 9
19th World Energy Congress and Exhibition
Sydney, Australia
www.tourhosts.com.au/energy2004/

October,
21 - 24
HolzEnergie 2004
Augsburg, Germany
www.holz-energie.de

21 - 24
RENEXPO 2004
Augsburg, Germany
www.energie-server.de

GEF project in Slovenia

GEF project in Slovenia is going on very fast. To avoid the obstacles of the Biomass implementation in Slovenia, Slovenian Agency of the Energy Efficiency organised in the frame of GEF project, 2 seminars for the Biomass District Heating in Slovenia.



First seminar took place on the 29 and 30th September in Kulinarika Jezersek, Sora. The seminar attended 40 participants from different institutes, companies and municipalities.

The lecturers were prominent experts from Great Britain, Netherlands, Austria and Slovenia.



Franc Beravs, director of Slovenian Agency for Energy Efficiency held the opening speech at the first seminar Biomass for district Heating in Slovenia, 29 and 30 September, Hisa Kulinarika, Sora.

Text and photos:
Martina Sumenjak,
info@slobiom-zveza.si

World leader in biofuels



Vapo Pellets are produced at more than ten plants in Finland, Sweden and Estonia. Total production capacity will exceed 300,000 tonnes in 2004.

The product range consists of wood pellets, peat pellets, cat litter wood pellets and industrial wood and peat briquettes. The pellets are available in bulk, big bags, and small bags for retail.

Vapo Pellets are produced according to rigorous quality criteria in carefully controlled conditions.

The network of pellet plants, extensive storage capacity and flexible logistics ensure that Vapo can provide reliable deliveries all over Europe.

Vapo seeks to work with its customers to build solid, long-term business relationships. It already has more than 60 years of experience as a producer and supplier of biofuels.



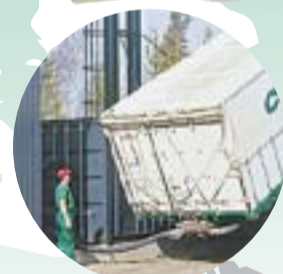
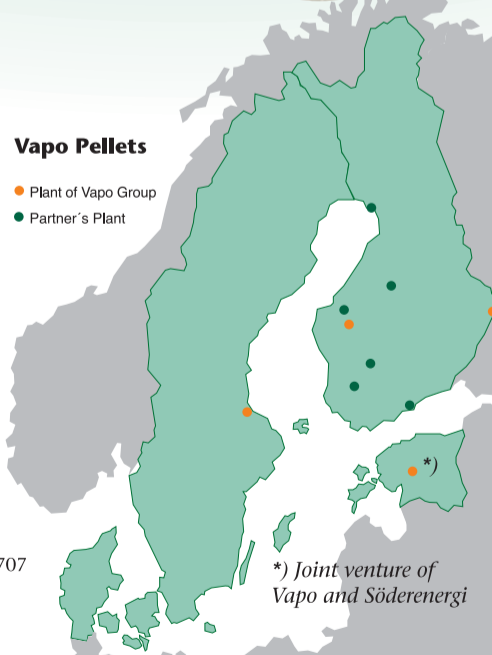
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Contact us

info@novator.se
+46-8-4417090 (tel)
+46-8-4417089 (fax)
Bioenergy International
Torsgatan 12
S-111 23 Stockholm
Sweden

Staff:

Editorial

Lennart Ljungblom
Anders Haaker
Dorota Natucka
Sofie Samuelsson
Martina Sumenjak
Marketing
Lennart Ljungblom
Dorota Natucka

Material and subscription

Jeanette Fogelmark
Internet
Mattias Ljungblom

Printing

Tabloidtryck, Norrtälje
Sweden

Advertisement

Please contact
Dorota Natucka
Sofie Samuelsson
Jeanette Fogelmark
dorota@novator.se
sofie@novator.se
jeanette@novator.se
+46-8-4417092 (tel)
+46-8-4417089 (fax)
Bioenergy International
Torsgatan 12
S-111 23 Stockholm

You can also find information on the web www.bioenergyinternational.com

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