

Bioenergy

With the upward trend in energy-prices and the increasing concern about the CO₂ emissions, the interest in the use of biomass for energy is considerable in all the markets around the Baltic Sea.

The World Energy Council Committee estimates that by the year 2020 the share of renewable energy will grow to 21 – 30 % of the total energy consumption. In a shorter term the EU assumes that the share of renewable energy in the fuel and energy balance will rise from 6 % in 1998 to 12 % by 2010. (EU White Paper on Renewable Energy, 1997).

Solid biofuels

Solid biofuels are residues from forestry, industry and agriculture and – still to a very limited extent – energy crops grown especially for energy purposes.

The production of biomass is large in all Baltic Sea regions and a large part of it, cereal straws, wood waste etc. is still considered to be waste products. Therefore there are considerable potentials for an increased biofuel production.

According to an EU report – Increased Production and use of Biomass and Other Renewable Energy (Baltic 21, Energy, Joint Action 1, phase 1, april 2001) - the use and potentials of biomass as energy in the Baltic Sea states are as shown in table x.

Table x. Biomass (wood and straw) for energy. Potentials and current utilisation

GWh/year	Techn. Potential	Utilisation	Use in % of potential
Denmark	34.000	9.546	28 %
Estonia	9.730	7.196	74 %
Finland	117.200	67.300	57 %
Germany (Schleswig-Holstein/Mechlenburg-Vorpommern)	10.125	601	6 %
Latvia	41.139	12.576	31 %
Lithuania	8.815	3.999	45 %
Poland	187,777	15.285	8 %
Russia (St. Petersburg and Kaliningrad)	2.000	346	17 %
Sweden	165.000	78.200	47 %

It is seen from the table that especially, Sweden, Finland and Poland have large production potentials.

Energy prices of biofuels vary from country to country indicating a market for international trade. It might be feasible to establish small-scale briquetting or pelleting plants for wood and straw in the rural areas especially in the three Baltic States, where bio-fuel prices are very low compared to e.g. Denmark, Finland and Sweden. There seems to be good prospects in exporting such pellets or briquettes to the other Baltic Sea Countries, especially if a quality control system is established.

This control system should be centralised in order to reduce costs and secure a homogenous product.

The table below indicates European prices for forest residues, industrial by-products and fuel pellets and briquettes for district heating plants. The data are from 1999. Source: AFB Network:” Export and import possibilities and fuel prices” Interim report 2000, VTT Energy, Jyväskylä, Finland.

Table 2. Price (1999) of biofuels in the Baltic Sea countries and France

Energy price EURO/GJK	Forest residues	Industrial byproducts	Pellets and briquettes
Denmark	4,2	4,1	4,9
Finland	3	1	8,8
Germany	3,7	3	6,1
Sweden	3,4	3	4,8
Lithuania	1,5	0,8	3,1
France	4	1	10,5

In all countries around the Baltic Sea the use of solid biofuel has increased during the last years. The potential for further increase is however still very large, and the countries have very ambitious plans for the future.

Liquid biofuels

Another option is the production of liquid bio-fuels such as bio-ethanol and bio-diesel.

With the technology of today it would be rather costly to produce bio-ethanol in small units, while it has been shown e.g. in Germany that it is possible to establish competitive productions of rape-seed oil for energy, combined with a production of fodder cakes, in small plants placed in rural areas. A prerequisite for the competitiveness of bio-diesel is however an energy tax exemption.

Modern conventional oil-mills, producing products for food and non-food purposes are normally very large. For instance in Germany the central oil-mills have a capacity of up to 4000 tons of seed pr. day, and 14 oil-mills are together processing 7 million tons of oilseed. However in Germany there are also 80 small oil-mills, mainly situated in the Southern part of Germany with a capacity of up to 25 tons of seed pr day. The area from which these small mills are supplied is normally less than 50 km away from the plant.(F.Tack, University of Rostock, in:Landes Technologie Anzeiger, dec. 1999).In Denmark has in recent years been established micro (on farm) oil mills for production of rape-seed oil for food consumption and linseed oil for technical use.

The European gasoil market amounts to approximately 200 million tonnes pr year. Bio-diesel has been produced on an industrial scale in the EU since 1992, largely in response to positive signals from the EU institutions, Current production runs at 500.000 tonnes, mainly in Austria, France, Germany and Italy. It absorbs the oilseed production of some 500.000 ha of arable land and could represent a very important absorbing potential for additional acreage coming into the enlarged European Union from new East-European member countries.(from FEDIOL Manifesto, 2000)

Animal protein feed as a co-product

It might be feasible to establish small scale bio-diesel/protein-feed plants also in the regions around the Baltic Sea, especially in the view of the current high price of mineral oils and an increasing demand for “safe” protein feed. An increasing percentage of consumers are concerned about the new biotechnology, and they do not want to eat genetically engineered food products. This has made farmers reluctant to use gene-modified soy-cakes from the USA in their animal feed, and the demand for protein concentrates free from genetically manipulated components, such as European grown rape-seed cakes, is increasing. Also, the ban on the use of meat and bone meal in animal feed, due to the BSE crisis, has boosted the demand for vegetable protein. To this can be added that organic farmers find it still more difficult to find organically produced protein feed for their animals. All in all there might be scope for a number of units with a combined production of protein feed and rape-seed oil /bio-diesel for energy purposes. Experiments in Denmark and elsewhere have e.g. shown that rape-seed oil is excellent for application in oil heated furnaces and in micro heat and power plants.

The economy could be further considerably improved, if the by-products are used for production of high added value products such as bio-pesticides and pharmaceuticals (page xx).