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picture credits: Standardkessel GmbH, picture on the left: Wood Power Plant Eberswalde

The Market for Biomass Power Plants in Europe

Market Volumes – Projects – Strategies – Trends

Extract

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ecoprog / Fraunhofer UMSICHT

The Market for Biomass Power Plants in Europe

Generating heat from the incineration of biomass is spreading quickly in Europe. During the last five years, more than 350 biomass power plants with a capacity of more than 2,000 MW_{el} came into operation. A further growth by up to 3,000 MW_{el} can be expected for the next five years.

New plants are developed first and foremost because of the increased compensation for electricity fed into the grid for electricity from biomass. The EU member states have to drastically increase the proportion of electricity from renewable energies – due to the specifications of the Kyoto protocol and the EU Renewable Energy Directive. In contrast to water, wind and sunlight, biomass is the only energy source which does not depend on the weather and guarantees a stable energy production.

Considering this development, ecoprog and Fraunhofer UMSICHT evaluated the European market for biomass power plants in detail. In developing the survey, the project partners did not only contribute their own knowledge of the market, but did also integrate administrations, associations and companies from the fields of forestry industry and plant construction.

On the basis of our market knowledge and specific evaluations we offer an up-to-date analysis of numbers, facts, estimations and trends in the European market of operators and plants for the conversion of biomass. This analysis is of interest for disposal companies, suppliers, operators, associations, research institutes and consultants.

The market study on biomass power plants in Europe includes the following specific information:

- A detailed analysis of the most important political, economical, managerial and technical trends in constructing and operating biomass power plants.
- A precise definition of current and future market volumes up to and including 2014 by countries – on the basis of a transparent and comprehensible methodology.
- A listing of more than 160 new construction projects – over 40 of them are under construction, more than 20 are approved and over 70 are planned or under discussion.
- The presentation of almost 600 operational biomass power plants, including essential technical data like information on capacities, producers, start of operation and contact details. These plants constitute almost 90 % of the installed electrical capacities in biomass power plants in Europe.
- An analysis and presentation of the most important operators and plant manufacturers of biomass power plants in Europe.

The study is available **in German and English from € 2,900 plus V.A.T.**

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today, a part of the reforested tree population is cultivated for energy recovery. In doing so, types and cultures that produce as much biomass as possible in the shortest period of time possible are emphasised. In most of the cases, however, it is not possible to draw a distinct line between a forestry for energetic use and a forestry for other purposes.

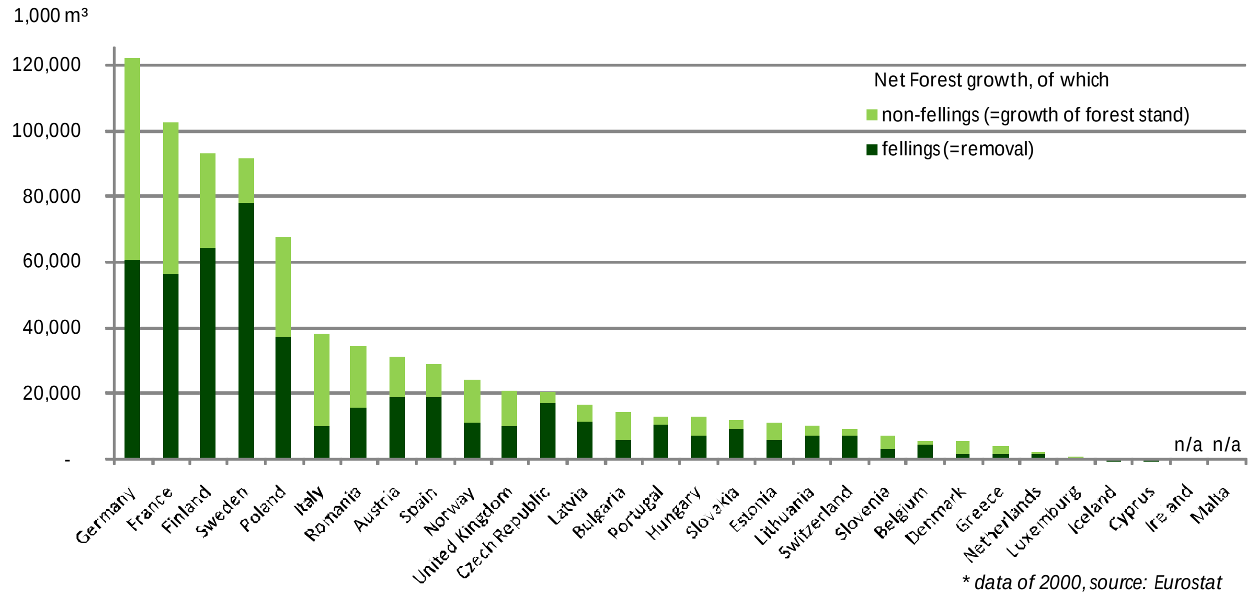
The utilisation of other fuel crops cultivated exclusively for the purpose of incineration does not play a considerable role so far. Up to now, there are only a few pilot projects in which the operation of biomass power plants depends on such a kind of biomass. One example is the cultivation of the fast growing “elephant grass” (Miscanthus giganteus). We do not expect a fundamental economic importance of such projects in the analysed period of time in this survey.

Accordingly, in the public (and sometimes political) perception, the incineration of solid material clearly differs from anaerobic fermentation (biogas) and synthesizing (biodiesel) – both using fuel crops to a considerably larger extent. The incineration of solid material benefits from the fact that the discussion of “electricity vs. plate”, which argues that food prices go up with the increased cultivation of fuel crops, did barely affect this technology so far.

1.1 The potential of biomass in Europe

The technical potential – and, consequently, the theoretical market – for the energy recovery of biomass in Europe clearly exceeds the existing activities in most of the countries.

Figure 4: Potential of scrap wood by countries

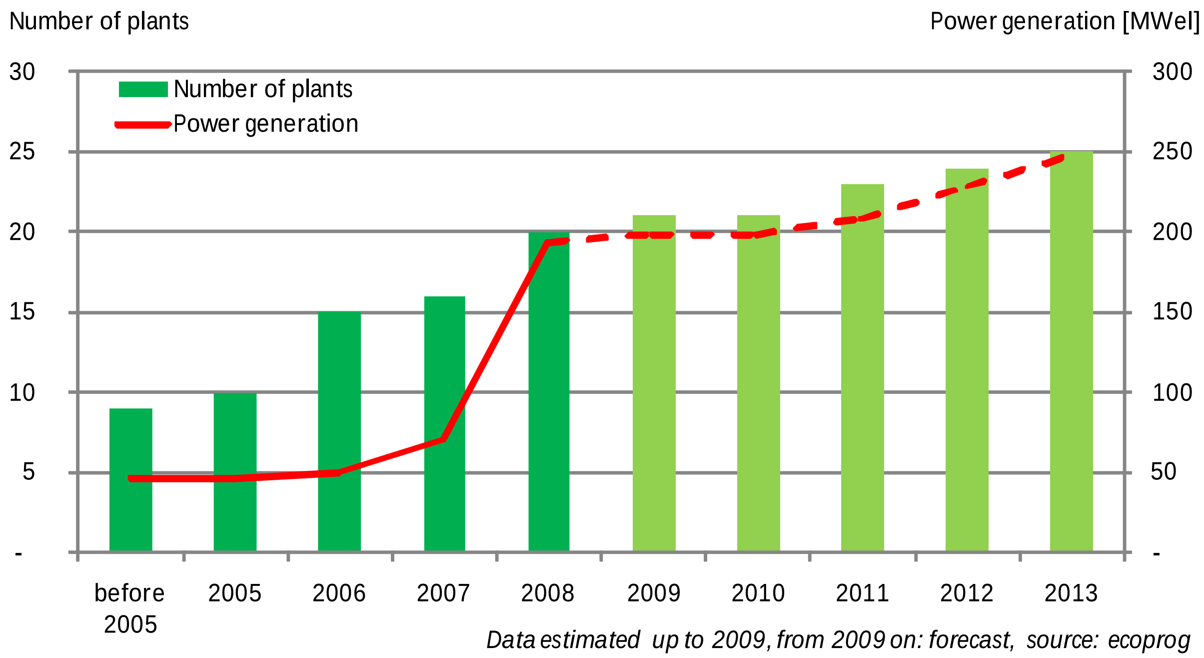


Netherlands

Inhabitants	16,493,156	Number of biomass power plants	20
Net forest growth (1,000 m³)	2,230	Electrical power from BMPP (MW)	190
Thereof proportion of felling (%)	70	Share of biomass at power generation (%)	1.87
Share of RE at final energy consumption 2005 (%)	2.4	EU-Goal: Share of RE 2020 (%)	14.0

In the Netherlands, prospects for biomass projects are good – especially since the new promotion scheme SDE was implemented in 2008. The Dutch government decided a support of renewable energies in 2003 already. The scheme at that time, called MEP, promoted the generation of electricity from renewable energy sources and the use of combined heat and power with subsidised feed-in tariffs for a guaranteed period of 10 years. However, this promotion was stopped in August 2006 – due to the large success of the scheme. The 10 approved projects did already achieve the national aim: a 9 per cent share of renewable energies of the total power generation until 2010. Consequently, no subsidies were left for the not yet approved projects.

Figure 1: Market forecast Netherlands

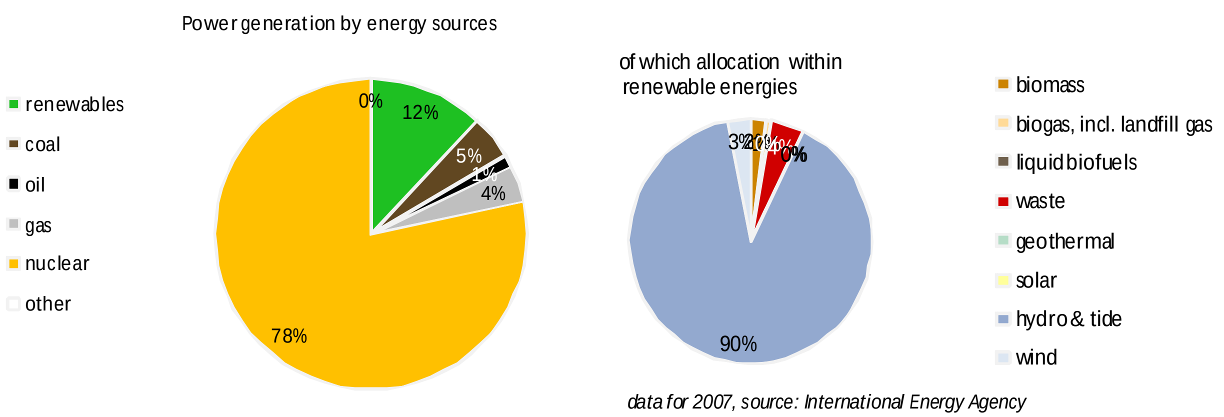


A subsequent scheme was not created until the end of 2007, when SDE ("stimulering duurzame energie" – "stimulation of sustainable energy") was decided. The reason was the goal of a 30 per cent reduction of CO_2 until 2020. The promotion of renewable energies seemed to be a promising way to achieve this objective, as the positive experiences with the MEP scheme had shown.

Electricity from biomass is currently subsidised with the additional amount of 6.2 cents per kWh. The Dutch energy agency SenterNovem pays this promotion for 15 years after the commissioning of the plant. SenterNovem is obligated to approve the applications, provided they meet the statutory renewable energies requirements. Hence, this is a case of conventional subsidies, there

Only the three plants in Saint-Gaudens, Tarascon and Grand-Couronne were actually implemented. All of the projects are located on timber industry sites with comparatively advantageous conditions for generating electricity from biomass. Additionally, they produce the fuel by themselves. The project in Marcillac is officially still in the planning process, however, it was not implemented yet.

Figure 2: Power generation by energy source in France



A second allocation round was carried out in 2007 – despite the disillusioning experiences in the first one. Essential mistakes made in the previous projects were supposed to be corrected. Accordingly, the project management organisations had to verify contractual commitments for at least 50 per cent of their fuel demand. In June 2008, the choice of 22 projects with a total capacity of about 320 MW_{el} was announced. These projects are described in the project outlook. All facilities are combined heat and power plants with a capacity between 5 and 18.4 MW_{el}. The feed-in tariff amounts to an average of 12.8 cents per kWh and is considerably higher than the one in the first allocation round. So far, we do not know about any abandoned project from the second round.

Figure 3: Project outlook France

Plant	Capacity (MW_{el})	Start	Status	Remarks
Marcillac	12.5	2010	planned	Winner of tender 2005
Golbey (Vosges)	9.0	2011	planned	Operator: GDF Suez
Arcis sur Aube	11.5	2010/2011	planned	Winner of tender 2007
Bazancourt	18.4	2010/2011	planned	Winner of tender 2007
Biganos	69.6	2010/2011	planned	Winner of tender 2007
Champdeniers	6.9	2010/2011	planned	Winner of tender 2007
Cleppé	7.0	2010/2011	planned	Winner of tender 2007
Corbenay	7.2	2010/2011	planned	Winner of tender 2007
Grand Couronne	9.0	2010/2011	planned	Winner of tender 2007
La Machine	5.7	2010/2011	planned	Winner of tender 2007

Biomass power plants in Sweden:

Älvsbyn
Status: active
Power production capacity (MW_{el}): 3,00
Operator: Älvsbyns Energi

Arvika
Status: active

Start of operation: 2009

Nordic paper Åmotfors
670 40 Åmotfors
Tel.: +46 (0)571 128 00
Fax: +46 (0)571 310 10
Owner: 37.5% Amotfors Bruk (100% Nordic Paper), 22% Keppel Integrated Engineering. The remaining shares are owned in equal parts by three financial institutions.

Aspabruk
Status: active

Start of operation: 2008
Power production capacity (MW_{el}): 25,20
Incineration: back-pressure turbine

Munksjö Aspa Bruk AB
696 80 Aspabruk
Tel.: +46 583 815 00
Fax: +46 583 503 35
+46 583 503 35
http://www.munksjo.se

Återbruket
Status: active
Power production capacity (MW_{el}): 4,50
Operator: Kraftringen Produktion AB

Billingsfors
Status: active

Start of operation: 2008
Power production capacity (MW_{el}): 4,50
Incineration: back-pressure turbine

Munksjö Paper AB
Strandvägen 7
660 11 Billingsfors
Tel.: +46 531 376 00
Fax: +46 531 305 17
info.spx@se.munksjo.com
http://www.munksjo.se

Boden
Status: active

Power production capacity (MW_{el}): 5,00

Bodens Energi
Slipvägen 7
961 38 Boden
Tel.: 0921-624 50
info@bodensenergi.se
http://bodensenergi.se

Bollnäs
Status: planned

Start of operation: 2011/12

Bollnäs Energi AB
Aseavägen 4
821 80 Bollnäs
Tel.: 0278-251 13
Fax: 0278-251 95
info@bollnasenergi.se
http://www.bollnasenergi.se/

Borås
Status: planned

Power production capacity (MW_{el}): 45,00
Fuel: wood

Borås Energi och Miljö
501 17 Borås
Tel.: 033 35 81 00
Fax: 033 35 71 61
kund@borasenergimiljo.se
http://www.borasenergimiljo.se/

Start of operation: 2010
Fuel: residual wood

Bad Saffelstein
Status: active

Start of operation: 2006
Power production capacity (MW_{el}): 0,55
Heat production capacity (MW_{th}): 3
Fuel: biomass materials
Manufacturer Incineration: Gammel Engineering GmbH
Power generation: additional power generation by ORC

Biomasse Heizanlage Bad Staffelstein GmbH
Mr. Robert Haselberger
Tel.: +49 9573 9619 11

Bad Tölz
Status: active

Start of operation: 2007
Power production capacity (MW_{el}): 0,36
Heat production capacity (MW_{th}): 2,2
Fuel: biomass materials
Manufacturer Incineration: V.A.S. Verfahrenstechnik und Anlagensysteme Gesellschaft m.b.H.
Power generation: additional power generation by ORC

Stadtwerke Bad Tölz GmbH
Mr. Michael Hofmann, Stadtwerksleiter
General Plattern Strasse
83646 Bad Tölz
Tel.: +49 8041 797 200
www.stw-toelz.de

Baden-Baden
Status: active

Start of operation: 2005
Power production capacity (MW_{el}): 4,4
Heat production capacity (MW_{th}): 3,5
Fuel: biomass materials
Incineration: rotating grate
Manufacturer Incineration: Wärtsilä Biopower

Stadtwerke Baden-Baden
Waldseestraße 24
76530 Baden-Baden

Baruth
Status: active

Start of operation: 2009
Power production capacity (MW_{el}): 8,365
Fuel: bark
Manufacturer Incineration: Urbas Energietechnik GmbH

Klenk Holz AG
Mr. Dr. Günter Hegemann, Vorstandsvorsitzender
Birkenpfuhlheide 1
15837 Baruth
Tel.: +49 7977 72 0
Fax: +49 7977 1577
info@klenk.de
www.klenk.de

Baruth/Mark
Status: active

Start of operation: 2002
Power production capacity (MW_{el}): 18,565
Fuel: wood
Manufacturer Incineration: Standardkessel Lentjes GmbH

Unitherm Baruth GmbH
An der Birkenpfuhlheide 3
15837 Baruth/Mark
Tel.: +49 33704 70700
Fax: +49 33704 70707

Bayreuth
Status: active

Power production capacity (MW_{el}): 0,32
Heat production capacity (MW_{th}): 2,66
Fuel: forest wood chips, saw mill residue
Power generation: additional power generation by ORC

BHB Biomasse Heizwerk Bayreuth GmbH
Mr. Johannes Scherm
Adolf-Wächter-Straße 1a
95447 Bayreuth
Tel.: +49 921 640 11

Beeskow

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Register of plants

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