



Picture credits: left: biomass power plant in Dangjin, South Korea, with kind permission of Sumitomo SHI FW; upper right: biomass power plant in Faridkot, India, with kind permission of Babcock & Wilcox Vølund A/S, lower right: biomass power plant in Polaniec, Poland, by courtesy of Sumitomo SHI FW.

Biomass to Power

The World Market for Biomass Power Plants 2020/2021

Extract

11th edition, 2020

ecoprolog GmbH

Biomass to Power 2020/2021

The standard reference for the global Biomass to Power industry. The 11th edition provides up-to-date information on:

- more than 4,400 units in almost 4,200 biomass power plants worldwide, including details on age, feedstock, capacities and competition
- more than 1,000 projects, including developer, status, fuel type and commissioning date
- market development forecast 2020-2029, by country, including new constructions, shutdowns and investment volumes based on 770 cost examples
- subsidisation schemes (feed-in tariffs, quota systems and auctions), by country, for the world's most important markets
- market factors, fuels, treatment technologies, investment and operational costs and revenues with an exemplary calculation
- important operators and technology providers and their market shares
- **In addition to the report, all customers will receive free access to ecoprolog's w&b Data (BtP module) for one year.** This is where detailed data on the plants and projects is available, related to, for instance, capacity, status, start of operation, technology, feedstock, plant manufacturer and operator. Current projects are described within the scope of a project tracker. All these data are updated on a weekly basis.
- Additionally, these detailed data can be purchased as MS Excel file.

The study is available in **English language, starting from 4,400.- EUR plus VAT**. Customers of our w&b Monitor will receive a discount starting from 600.- EUR. Further price reductions are possible within the context of a regular subscription. **Please find detailed price information at the end of this extract or at the [online order form](#).**

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Argentina

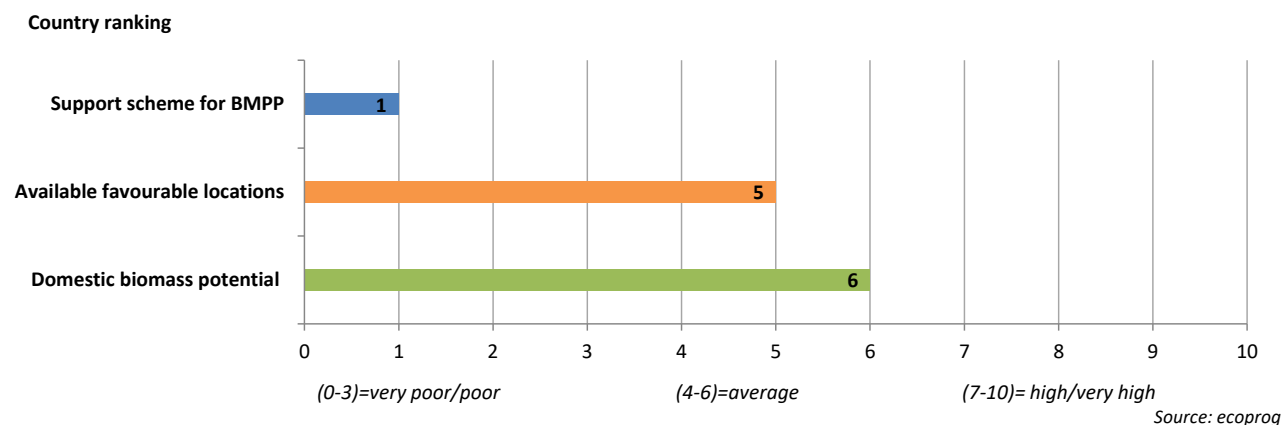
Update: 09-2020

Key figures			
Inhabitants 2020 [UN est. in million]	44.78	Number of BMPPs	30
Goal: biomass generation 2025 (2030) [GWh]	n/a	Installed electrical capacity [MW _{el}]	310
Electricity from biomass 2018 [GWh]	2,095	Share of total electricity generation 2018 [%]	1.44
<i>Forecast 2020-2029</i>		<i>Forecast 2020-2029</i>	
Total invest market [mn EUR]	736	Capacity of new commissionings [MW _{el}]	150

Management summary

The RenovAr auction scheme has led to a considerable project pipeline, with most of the projects starting operations in the next years. However, under the government elected in October 2019, no new auctions were awarded. Due to the weak economic situation, a market forecast is connected with great uncertainty. Because of the country’s existing biomass potential in the forestry and the agricultural sector, we have included a limited number of projects at favourable locations in our forecast after the impact of the auctions phased out.

Figure 295: Ratings for the biomass market in Argentina



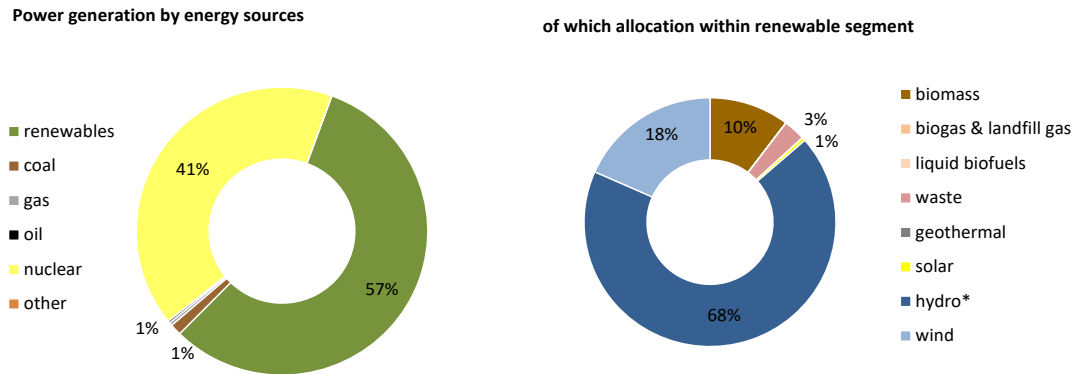
Background, market factors, legal framework

Electricity generation

- About 70% of Argentina’s electricity generation comes from using fossil fuels, with natural gas and petroleum being the most important among them.

[...]

Figure 1: Electricity generation in Sweden



*data for 2018, Source: IEA
with pumped storage, tide, wave and ocean

Market factors

- Sweden is, after Japan and Finland, the country with the largest forested areas in relation to its size. Sweden's forestry industry has the largest output in Europe.
- In line with the many forests and the geographical location of the country, generating heat from biomass traditionally plays a large role in Sweden. As in all other Scandinavian countries, biomass is an important fuel for the well-developed district heating grid.
- In April 2020, Sweden implemented a tax on waste combustion amounting to 10 EUR/t. In the long term, waste imports should be diminished, which could lead to an additional demand in district heating, e.g. for biomass.

Support scheme

- BMPPs are subsidised with a renewable energy certificate system with quota regulations. Furthermore, biomass cogeneration plants benefit from an energy and carbon dioxide tax exemption.
- Sweden implemented its certificate system in 2003. Norway joined the Swedish subsidisation system in January 2012, so that both countries may trade the certificates across borders. One important reason for the joint system is the fact that Sweden imports larger amounts of renewable electricity from Norway.
- Electricity suppliers, certain electricity consumers and energy-intensive companies demand certificates because they must prove a specific renewable energy quota of their energy mix. In Sweden, this quota amounts to 26.5% in 2020. Plants that have become operational since September 2009 may qualify for the certificate trading. In the biomass segment, certificates are also issued for electricity generation from peat if this takes place in a CHP plant. Qualified plants are entitled to subsidies for 15 years.

[...]

[...]

- Due to the rapid capacity growth especially of solar power, the REC market price amounted to an average of only 43,854 KRW/REC (32.90 EUR/REC, exchange rate November 2020) between January and October 2020, compared to an average of 63,784 KRW/REC in 2019. The sale of the certificates on the market is a surplus payment on the electricity market price.
- Different biomass fuels are entitled to receive different amounts of RECs per MWh generated. The factors were adjusted downwards e.g. for PKS and wood pellets in 2018. In January 2020, waste wood was excluded from the scheme. Factors for the most important biomass fuels are presented in the table below.

Figure 99: Certificates for biomass energy

New plants			
Certificates/MWh	Fuel	EUR/MWh	
0.25	Palm kernel shells	[...] more information is provided in the report	
0.5	Wood pellets, woodchips		
1.5	Domestic wood (co-fired)		
2.0	Domestic wood (dedicated biomass plants)		
Existing plants			
1	Palm kernel shells		
1.5	All types of wood pellets, wood chips		
0	Wood pellets, woodchips (co-fired, privately owned)		0.00
0.5	Wood pellets, woodchips (co-fired, publicly owned)		16.45

Source: Personal information of a local market insider, monetary figures based on the trading market price of REC in the period January 2020-October 2020 (43,854 KRW/REC), exchange rate as of November 2020).

- In 2015, South Korea launched its CO₂ certificate trading system. The system is part of the country's goal to reduce its greenhouse gas emissions by 37% below current levels by 2030. The certificates will make the burning of fossil fuels such as coal more expensive and favour renewables, e.g. the incineration of biomass. In October 2020, the certificate market price was around 23,000 KRW/Korean Allowance Units (1 ton of CO₂) (17.04 EUR/ton of CO₂).

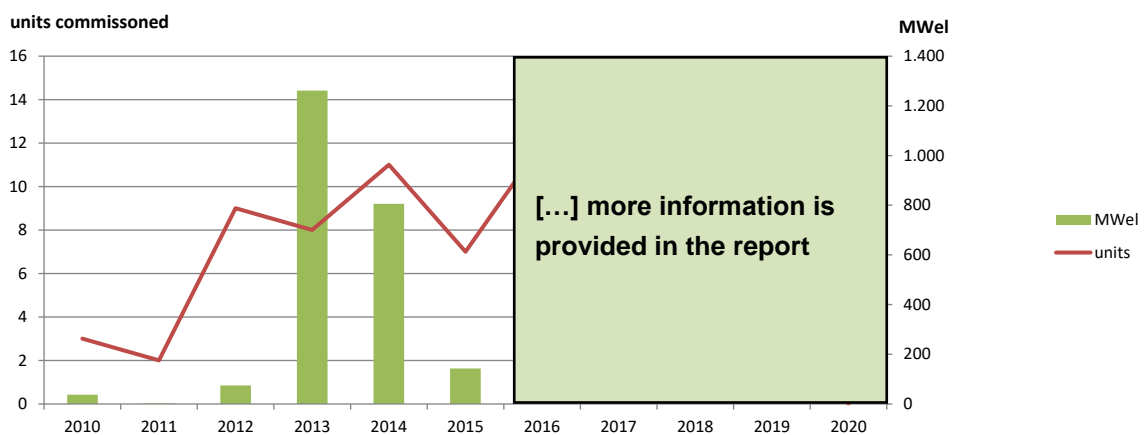
[...]

[...]

Plant asset

- As of October 2020, we know of 105 operational biomass mono-incinerators with an electricity generation capacity of approximately 4,500 MWel.
- [...]
- The structure of the mono-incineration plants generally reflects the subsidisation policy. Eight facilities with a capacity of about 180 MWel had been developed before the ROCs were introduced in 2002.

Figure 275: Commissioned biomass power plant units in the UK



Source: ecoprolog 2020

- As the British incentive schemes do not explicitly subsidise small-scale plants, the facilities in the country are quite large in a European comparison. They have an average size of around 16 MWel (large conversion projects excluded). As waste heat recovery only played a minor role for many years, heat recovery is low in the British plants. Some of them are power plants only.
- The UK has the largest mono-incinerator units in the world. British power and wood pellet producer Drax converted 4 of its 6 units at its formerly coal-fired plant in Selby to biomass. They have a capacity of 645 MWel each and were commissioned between 2013 and 2018. Unit 2, 3 and 4 operate under the ROC system (while unit 4 does not receive any ROCs through grandfathering) and unit 1 was awarded a so-called investment contract in the transition phase of the CfD scheme, which follow the same principles as the CfD scheme. The Lynemouth conversion was awarded such an investment contract as well.

[...]

Market development

Projects

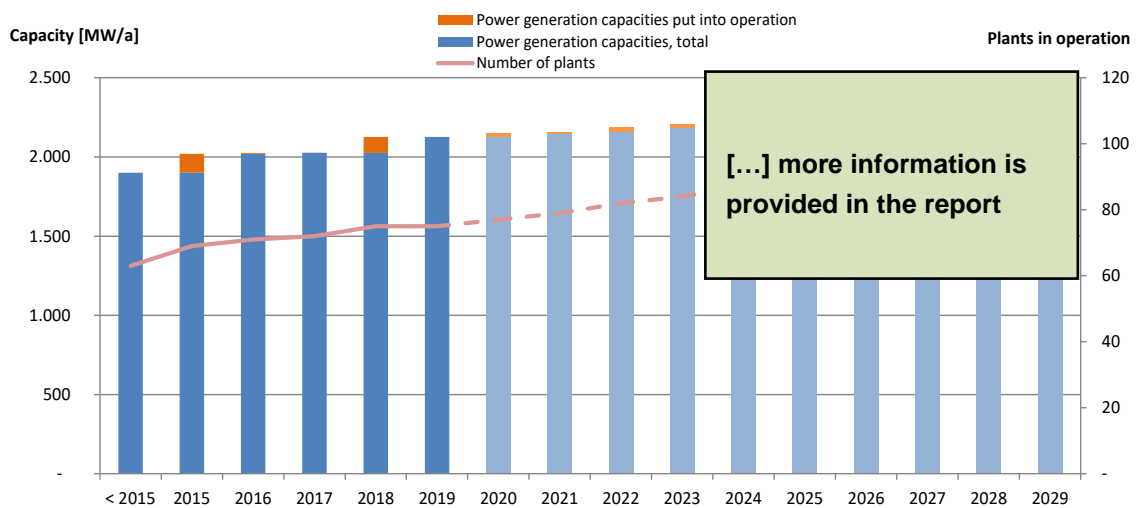
- Canada's project pipeline consists of small, individual projects at industrial locations or of indigenous communities.
- As of October 2020, we know of 12 projects. Four of the projects are of First Nations with smaller capacities. The 6.6 MW_{el} Meadow Lake and the Whitesand projects will also supply a sawmill or a pellet plant, respectively.
- Another 4 of the projects are smaller industrial plants at packaging, pulp or pellet facilities.

[...]

Forecast

[...]

Figure 287: Market forecast Canada



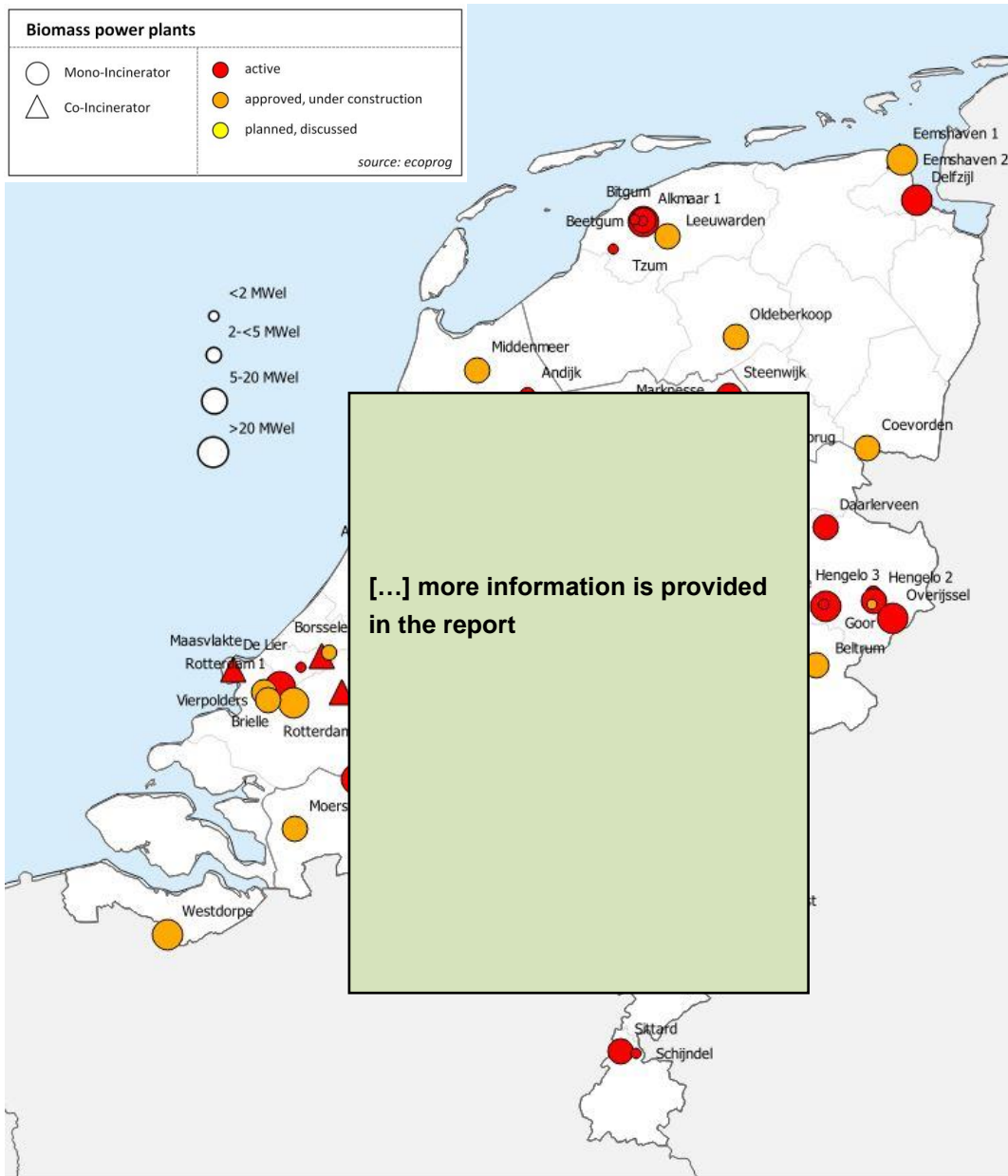
Data estimated up to 2019, from 2020 on: forecast, source: ecoprogram

Competition

- Most of the operators in Canada come from the forestry and pulp and paper industries. Among them, Resolute Forest Products (2 plants, 97 MW_{el}) and Canfor (1 plant, 118 MW_{el}) are the most important companies.
- Public utility Ontario Power Generation with its 200 MW_{el} Atikokan plant is an exception. Furthermore, US infrastructure and energy company Atlantic Power Corporation operates 2 plants with a combined capacity of 106 MW_{el}.

[...]

Figure 204: Locations of plants and projects in the Netherlands



[...]

Figure 2: Project outlook Netherlands

Plant	Country	Type	Plant unit	Cap. (MWel)	Start	Status
Heusden 1	Netherlands	mono-incinerator	1	n.a.	n.a.	under construction
Egchel	Netherlands	mono-incinerator	1	2	2020	approved
[...] more information is provided in the report						

Active plants

You can find further details for all plants, such as technical equipment, manufacturer, or fuel for 12 months at: <https://data.ecoprolog.com/ecopr/>. This data is updated every week. Please use username and password that have been provided by email.

Name	Operator	Capacity (MWe)	Type	Start
Aarhus	Burmeister & Wain Scandinavian Contractor A/S	37	mono-incinerator	2017
Amagervaerket	HOFOR	219	mono-incinerator	2010
Asnæs	Ørsted	25	mono-incinerator	2019
Assens	Assens Fjernvarme A.m.b.a.	5	mono-incinerator	1999

[...] more information is provided in the report



- 1 Waste-to-Energy
- 2 MBT plants (u.p.)
- 3 Sorting Plants
 - 3. 1 Dry Recyclables (u.p.)
 - 3. 2 Plastic (u.p.)
 - 3. 3 Paper (u.p.)
- 4 Recycling plants
 - 4. 1 Plastic (u.p.)
 - 4. 2 Paper (u.p.)
- 5 Biomass-to-Power
- 6 Biogas / Anaerobic digestion

Search

Country Filter

United Kingdom (153) ▼

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Plant

Name	Cheshire
Country	United Kingdom
Province/Region	Greater London, England
Status	active
Start of operation	2019
Input, capacity [t/a]	n.a.
Gross heat production [MW]	n.a.
Power generation capacity [MW]	22,0
Heat production capacity [MW]	n.a.
Heat use category	power production only

Remarks: The plant will be located at the Peel Energy Park, called Protos, near Ellesmere Port in Ince, Cheshire. The park is owned and will be operated by environmental technology company Peel Environmental. Total investment costs for the complete project will amount to about EUR 820 million. The facility received a loan from the Bioenergy Infrastructure Group (BIG) in October 2015. As of February 2020, the project is still under construction, two electricity substations and a grid connection have been installed recently.

Unit 1	
Status	active
Start of operation	2019
Mono-/Co-Incineration	mono-incinerator
Fuel	waste wood
Combustion technology	n.a.
Technology provider	n.a.
Power generation technology (PGT)	n.a.
PGT provider	n.a.
Gross heat production [MW]	n.a.
Power generation capacity [MW]	22,0
Heat production capacity [MW]	n.a.
Remarks:	n.a.

Operator

Peel Energy
Peel Dome, The Trafford Centre
M17 8PL Manchester

Downloads

- BtP Project Tracker
 692.00 KB
- BtP List Of Active Plants
 956.00 KB

BtP module of ecoprogram's w&b Data

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Current projects are described within the scope of a project tracker. All these data are updated on a weekly basis. Please find a [trial version of w&b Data](#) on our website.

Price and product information

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Price models: one-time purchase

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- Corporate version: POA

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Additionally, you can order a printed copy of the study: 150.- €*

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- Corporate version: POA

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- b. w&b Monitor (sent weekly) plus access to the w&b online archive
- c. access to w&b Data (BtP module) including project tracker

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