



HAWKINS WRIGHT

Forest Energy Monitor

Monthly analysis of the global woody biomass
heat and power industries.

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What Forest Energy Monitor offers...

The bioenergy market continues to grow extraordinarily quickly. Countries around the world are encouraging the deployment of wood-based bioenergy for the generation of heat, power and CHP. As a result, wood pellets have become an internationally traded commodity. The trading of woodchips for energy is also increasing. In many countries achieving ambitious targets for renewable energy generation and greenhouse gas emissions reductions will not be possible without a significant increase in bioenergy. This will require ever larger quantities of forest biomass to be mobilised.

For organisations operating in this field, the disparate regulatory frameworks and fragmented individual markets can be difficult to penetrate. Forest Energy Monitor helps to overcome this by providing a well-informed and digestible overview of recent market developments.

In Forest Energy Monitor we use an analytical approach to assess the trends in global biomass and pellet markets. Rather than simply reporting the news at face value, we investigate the implications for the wider market of each new development.

Each monthly issue of Forest Energy Monitor addresses four key topics:

- **Market analysis.** Expert analysis of recent developments in wood chip and pellet markets, including market prices for energy wood, pellets and fibre. It also covers the availability of wood fibre in major biomass supply regions, activity in other wood-using industries and trends in energy and carbon markets.
- **Industry news - investment and technology.** New investments in biomass heat, power and CHP, including analysis of the feedstock requirements of new plants under development in Europe, Asia and North America. Other subjects include wood pellet capacity growth; the status of the wood heating industry; and investments in shipping and logistic infrastructure.
- **Industry news - policy and legislation.** Regular updates on national and international renewable energy policies, including any upcoming changes to incentives or regulations that may have an impact on wood chip and pellet demand and supply.
- **Market data.** The following data series are provided on a monthly basis: wood pellet trade statistics; fossil energy and carbon prices; power and heat generation economics; currency movements; freight rates; and the pipeline of new wood pellet mills and biomass power/CHP plants.

Forest Energy Monitor is an essential tool for biomass producers, traders and suppliers; energy companies and utilities; forest owners; shipping companies and port operators; equipment suppliers; financial institutions; policy makers and academics.

The scope of the Forest Energy Monitor service

An annual subscription to **Forest Energy Monitor** includes the following:

- twelve **Forest Energy Monitor reports**, published at the end of each month, providing in-depth analyses of the market's short and medium-term prospects
- **no limit on distribution** of the reports within a subscriber's organisation
- access to **historic data**, charts and analysis upon request (e.g. wood pellet prices)
- access to a **personalised client area** at www.hawkinswright.com, where both current and historic reports can be accessed at any time
- the **on-call support** of Hawkins Wright consultants throughout the year, by phone or email



Forest Energy

monitor

BIOMASS & PELLETS — MARKETS — INVESTMENTS — LEGISLATION

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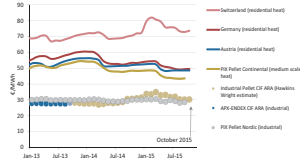
SDE+ 2016 budget hike boosts Dutch co-firing prospects

The publication of the SDE+ 2015 auction results in mid-October has confirmed that biomass co-firing activities in the Netherlands will not restart for at least another 12 months, probably longer. None of the co-firing applicants were successful in this year's auction due to it being heavily oversubscribed (see p.10). However, the later announcement from the Ministry for Economic Affairs that the SDE+ budget for 2016 will be more than doubled to €3 billion (from €3.5bn this year) has significantly improved the outlook for the Dutch market. Biomass co-firing and industrial pellet steam boilers will now have a much better chance of securing support in the next auction in March 2016.

Industrial market feels effects of Drax unit #2 downtime

In the meantime, the impacts of extended downtime at Drax's unit 2 (which was offline for maintenance from July-September) coupled with exchange rate pressure continue to be felt in the industrial pellet market. European producers have retained the upper hand as US producers stay firm in their unwillingness to drop their prices. But the bearish market sentiment has been reinforced by a short term market surplus and the as yet unseen increase in seasonal demand from the European utilities. As a result, spot trade – both transatlantic and intra-Europe – has all but dried up. Stocks of industrial pellets in ARA fell by 6.7% (to 46,000t) in September, but industrial pellet prices remain unchanged from last month, at \$158-162/t (€142.5/t).

Prices of wood pellets in selected European countries



Sources: See the footnotes beneath the Price Indications table, page 3.

Forest biomass and wood pellet price indications

	Q314	Q315	Aug15	Sep15	Oct15*	Change on Oct14
WOOD PELLET PRICES						
Industrial wood pellets - CIF Amsterdam, Rotterdam, Antwerp (ARA)	US\$/tonne	180.30	163.00	162.165	158.162	-20.50
	US\$/MWh	38.21	34.53	34.64	33.90	-4.34
	€/tonne	137.25	145.19	142.73	142.40	-1.89
	€/MWh	29.08	30.76	30.24	30.17	-0.40
Industrial wood pellets - PIX Pellet Nordic Index ¹ - CIF Baltic Sea or North Sea port	\$/tonne	268.00	269.34	266.53	266.78	-
	\$/MWh	139.76	137.23	134.88	136.85	-
	€/tonne	29.12	28.59	28.10	28.51	-
	€/MWh	225.94	205.04	204.46	205.46	-
Heating wood pellets - PIX Pellet Continental Index ¹ - Medium-scale commercial heat in Germany/Austria	€/tonne	47.87	43.44	43.32	43.53	-
	€/MWh	248.03	232.84	231.84	233.01	-18.40
Heating wood pellets - Germany (residential heat) ² - delivered, bulk - 45 tonnes, incl. taxes	€/tonne	52.55	49.33	49.12	49.37	-3.90
	€/MWh	242.87	229.30	229.20	229.30	-16.20
Heating wood pellets - Austria (residential heat) ² - delivered, bulk - 5 tonnes, incl. taxes	€/tonne	51.45	48.58	48.56	48.58	-3.43
	€/MWh	278.50	-	-	-	-
Heating wood pellets - France (residential heat) ² - delivered, bulk - 5 tonnes, incl. taxes	€/tonne	59.0	-	-	-	-
	€/MWh	399.2	374.3	373.7	375.1	-27.80
Heating wood pellets - Switzerland ²	CHF/tonne	327.21	344.13	346.02	344.13	+14.25
	€/tonne	69.46	73.91	73.31	72.91	+73.65
	€/MWh	266.76	279.48	279.58	279.99	+8.11
Heating wood pellets - US, Maine ³	US\$/tonne	56.52	59.21	59.23	59.32	+1.72
	US\$/MWh	272.62	277.10	-	290.13	-
Heating wood pellets - US, New Hampshire ³	US\$/tonne	57.76	57.71	-	61.47	-
	US\$/MWh	-	-	-	-	-
WOOD FIBRE / BIOMASS PRICES						
Pine pulpwood (Average US South) ⁴	US\$/ton	29.40	29.81	-	-	-
	US\$/MWh	-	-	-	-	-
In-woods pine chips (Average US South) ⁴ - fob-woods (Timber Mart-South)	US\$/ton	17.35	18.99	-	-	-
	US\$/MWh	-	-	-	-	-
Pine process residuals (Average US South) ⁴ - fob-woods (Timber Mart-South)	US\$/ton	15.76	18.12	-	-	-
	US\$/MWh	-	-	-	-	-
Energy wood/biomass - Sweden ¹⁰ - delivered to heating plant	\$/MWh	192.00	180.00	-	-	-
	€/MWh	21.22	20.30	-	-	-
Forest biomass Finland - PIX ¹¹ - industrial by-products and forest residues, delivered, excl. taxes	€/MWh	-	18.21	-	-	-

Sources: 1. Hawkins Wright estimate; 2. FODC: delivered within 50km in bulk, excluding taxes. Lot size: 20t Germany; 17t Austria; 3. DEP/V; 4. proPellets Austria; 5. proPellets France; 6. Pellet Price; 7. Maine Governor's Energy Office; 8. NH Office of Energy and Planning; 9. Timber Mart-South; 10. Swedish Energy Agency; 11. FODC.

Notes: a) Where the original data is weekly or daily, the monthly and quarterly figures shown here are simple averages of the original. b) Oct-15 averages are based on data available up to 29 October 2015. c) All wood pellets are assumed to have a calorific value of 4.72 MWh/t (17 GJ/t), except the PIX Pellet Nordic Index where the assumption is 4.8 MWh/t.

Developments in other forest product industries

Graphic paper production (including newsprint and printing & writing paper) continues to fall in both North America and Europe as electronic media increasingly displaces printed media.

During the first eight months of this year, graphic paper production in the US fell 7.4% to 11.3Mt from 12.2Mt in the equivalent period of 2014. Meanwhile in Europe, January-August graphic paper production was 3.5% down on the same period of 2014. In the past few years more than 2Mt of graphic paper capacity has been closed permanently in the US alone. Further closures will be necessary to balance the declining market.

Newsprint production has been hit hardest. US newsprint production was 19.6% lower in January-August 2015 than the previous year, while in Europe it was down 8.1% in the same period.

However, the decline in graphic paper production is being offset by an increase in packaging paper and board production. Statistics in the US and Europe show an increase in packaging production in the first eight months of this year. Output is higher by 1.3% and 1.5% respectively compared with 2014.

This increase is being driven by the rise in industrial production and consumer spending, and in particular by the increasing dominance of online retail spending. The latter has been a boon for suppliers of high grade containerboard, for example.

With packaging paper and board production now a much bigger market overall (45.6Mt production in 2014 in the US and 43.3Mt in Europe), the increase in this market means total paper and board production in the US and Europe is only marginally lower than in 2014.

In brief...

Canfor Corporation will permanently close its sawmill in Canal Flats, British Columbia, on 9 November. The mill has a two-shift production capacity of 1.8Mt board feet/y. The company cites a lack of economically-available fibre supply in addition to depressed conditions in the oil, gas and lumber markets as reasons for the closure.

WestRock (created following the merger between MeadWestvaco and RockTenn in July) has announced that it will shut its newly-acquired 207ktpy paper mill in Newberg, Oregon, on 15 November. The mill was one of the assets taken over by WestRock when it acquired previous owner SP Fiber Solutions. The deal was completed on 1 October, with the mill closure being announced only two weeks later.

Georgia-Pacific has announced a \$110M upgrade to its Alabama River Cellulose (ARC) mill. It will replace one wood yard, upgrade another, and upgrade one of the plant's pulp machines. Work at the mill is expected to start next year and take 18 months to complete. The company has spent more than \$2.2 billion across Alabama in the past 10 years.

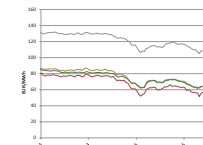
Pulp, paper and paperboard production						
	Total production in 2014 (Mt)		Change over the same month a year ago		Cumulative change over previous year	
	USA	Europe	USA (August)	Europe (August)	USA (August)	Europe (August)
Wood pulp (total)	48.3	36.5	na	-3.1%	na	-1.8%
Graphic papers	16.6	35.9	-7.3%	-1.8%	-7.4%	-3.5%
Packaging paper & board	45.6	43.3	+1.5%	+2.2%	+1.3%	+1.5%
Total paper and board	72.1	91.1	+0.7%	+0.4%	-0.8%	-0.4%

Wood panel production						
	Total production in 2014 (Mm ³)		Change over the same month a year ago		Cumulative change over previous year	
	USA	Canada	USA (Oct)	Canada (Oct)	USA (Oct)	Canada (Oct)
Oriented strand board (OSB)	11.5	6.1	+0.9%	+2.8%	+1.5%	+3.4%
Plywood	8.0	1.6	-2.1%	+5.1%	-2.4%	+8.2%
Total structural panels	19.5	7.7	-0.3%	+4.2%	-0.5%	+4.8%

1. Europe includes only the countries whose industry associations are members of CEPF (Confederation of European Paper Industries, www.cepi.org). 2. Total includes other grades of paper and board, predominantly tissue. Sources: CEPF, PPEC, APP, AP, AB.

European pellet heating economics

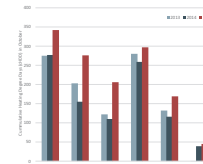
Retail heating oil prices (including taxes)



Differential between heating oil and pellet prices



Cumulative heating degree days (cHDD) in October



Heating oil prices									
	Units	Aug15	Sep15	Oct15	€/MWh	\$/MWh	\$/t	\$/B	\$/B
Austria	€/t	0.67	0.68	0.67	-0.01	-0.01	-0.01	-0.01	-0.01
Denmark	€/t	1.18	1.18	1.18	0	0	0	0	0
France	€/t	0.67	0.68	0.68	-0.01	-0.01	-0.01	-0.01	-0.01
Germany	€/t	0.59	0.59	0.58	-0.01	-0.01	-0.01	-0.01	-0.01
Italy	€/t	1.15	1.15	1.13	-0.02	-0.02	-0.02	-0.02	-0.02
Sweden	€/t	1.06	1.06	1.05	-0.01	-0.01	-0.01	-0.01	-0.01
UK	€/t	0.50	0.50	0.50	0	0	0	0	0
New England, USA	\$/t	-	-	-	-	-	-	-	-

Sources: European Weekly Oil Bulletin, UK: Source: UK Energy Research Centre, US: Source: EIA

Notes: Prices for New England are only published from October-March

Heating oil versus pellet price differential						
	Aug15	Sep15	Oct15	€/MWh	\$/MWh	\$/t
Austria	22.8%	23.8%	23.8%	-0.7%	-0.7%	-0.7%
France	14.5%	9.8%	-	-	-	-
Germany	21.8%	12.3%	8.2%	-0.6%	-0.6%	-0.6%

Sources: ProPellens Austria, ProPellens France, CEPF, Weekly Oil Bulletin

Notes: There is a lag in the publication of the French data

Cumulative Heating Degree Days (cHDD) show the heating requirements of a location over a period of time. This graph represents the cumulative number of degrees below room temperature aggregated over the month or, more accurately, the cumulative number of degrees of heating needed to keep a certain location at room temperature.

Pellet suppliers will be heartened by the fact that, although the 2015/16 heating season has barely started, October 2015 was cooler across the board – and therefore the heating requirements will have been greater – than the same month in the previous two years.



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