The global outlook for wood pellet markets

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The Outlook for Wood Pellets – Demand, Supply, Costs and Prices

Number 12 – Second Quarter 2017

US exports of heating pellets to Italy resume, while commissioning of EPFs’s Lysekmouth has been delayed

Tightness in the spot industrial pellet market and further disintegration of this达尔文 have pushed pellet prices up again in August. Our estimates of a dollar price of industrial pellets has therefore increased to just over $60, although three major buyers were said to be looking for spot cargoes for Q4 (mine interests). We do not appear to have been concluded. The upcoming commissioning of EPFs Lysekmouth plant (Kogi’s energy unit) and commissioning of Dalian’s new pellet mill with an initial capacity uncertainty into the short term supply balance for industrial pellets.

Given the tightness in the market, Kogi’s current tender for 1.6 million of pellets for delivery in 2019 and 2020 (as of 21st) seems challenging, but not impossible. The tender specifications in Brazil are relatively large and unrealistic. The tender specifications would be unreasonably challenging – for appliances in North America. As of 21st, 930,000 tonnes of pellets is 220 containers, indicating 350 containers per month. The logistical challenges associated with achieving this would obviously be huge.

In the short term, planned maintenance of their work has now begun and will run until November. The company’s other two converted units has prices of woodworking in selected European countries

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Global market overview
Global wood pellet production

- 2016 saw the lowest ever year-on-year growth (+6%)
- This resulted in closures and low capacity utilisation at many pellet mills
- However low-cost production capacity did grow in Asia

Sources: REN21, FAO and Hawkins Wright
Note: All figures are in million metric tonnes (Mt)
Global wood pellet production capacity, Q2 2017

- Total (industrial + heating) wood pellet capacity = 41.2Mt
  - EU = 19.5Mt
  - US = 12.3Mt
  - Canada = 3.6Mt
  - Asia = 1.8Mt

Source: Hawkins Wright, the Outlook for Wood Pellets, Q2 2017
Global wood pellet demand, 2016

- **Total global demand in 2016 = 28.6Mt**
- **Annual global demand growth of +6%**
  - +26% in Asia
  - +2% in EU28

Source: Hawkins Wright, the Outlook for Wood Pellets, Q2 2017
Top ten wood pellet consuming countries, 2016

Source: Hawkins Wright, the Outlook for Wood Pellets, Q2 2017
Asian wood pellet demand

- Wood pellet demand in Asia grew by +26%, (+0.5Mt) in 2016
  - +19% in South Korea
  - +37% in Japan
- Projects in Asia are getting bigger
  - Gunjang Energy began operating in 2016, requiring 0.35Mt/y
  - KOEN’s Yeongdong unit #1 conversion began operating this year, requiring 0.5Mt/y of pellets

Source: Hawkins Wright, the Outlook for Wood Pellets, Q2 2017
Wood pellet trade
European wood pellet imports, 2016

Source: Hawkins Wright, the Outlook for Wood Pellets

- Imports from outside the EU = 8.1Mt (of which Canada supplied 21%)
- Imports from within the EU = 5.6Mt
- Net imports rose to 7.3Mt in 2016 (+14%)
Asian wood pellet imports

Asian wood pellet imports have risen +46% in H1 2017 v. H1 2016
- Japan = 0.23Mt
- Korea = 1.04Mt
- TOTAL = 1.27Mt in H1 2017

Main suppliers are
- Vietnam (55%)
- Canada (12%)
- Malaysia (13%)

Japanese buyers prefer security and sustainability of Canadian pellets
South Korean buyers want lower cost pellets (i.e. Vietnamese)

Source: Customs data
Recent market trends
The European heating market rebalanced more quickly than anticipated

- Colder weather in late 2016 and early 2017 increased pellet demand for heating in Europe
- Persistently low, but volatile, oil prices weakened the economic argument for pellet heating and reduced customer confidence in 2015-16
- But this has improved over the past year. Pellets were 8% cheaper than heating oil in Germany on average over the last 12 months

Prices of heating oil vs pellets in Germany

Analysis based on delivered (retail) prices of heating oil and wood pellets, including taxes.

Sources: DEPV (pellets); EU Energy Portal (heating oil)
The industrial market has also rebalanced in 2017

• After months of depressed spot industrial pellet prices, with little trans-Atlantic trade

• Upcoming new sources of industrial demand and reduced pellet capacity growth have rebalanced supply-demand and lifted pellet prices

• The depreciation of the US dollar has improved the fortune of US producers

• BUT – spot trades are still very infrequent, contracted volumes account for majority of the market

Analysis based on delivered (CIF ARA) spot prices of industrial-grade wood pellets in US$ with currency conversion

Source: Hawkins Wright, Forest Energy Monitor
The outlook for demand
## New sources of industrial pellet demand - Europe

<table>
<thead>
<tr>
<th>Name</th>
<th>Location</th>
<th>Installed capacity, MW&lt;sub&gt;e&lt;/sub&gt;</th>
<th>Pellet demand, Mt/y</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dong Energy, Avedøre 1</td>
<td>Denmark</td>
<td>250</td>
<td>~0.4</td>
<td>Began operating end-2016</td>
</tr>
<tr>
<td>Dong Energy, Studstrup</td>
<td>Denmark</td>
<td>245</td>
<td>0.5-0.8</td>
<td>Began operating end-2016</td>
</tr>
<tr>
<td>RWE/Essent, Amer 9</td>
<td>Netherlands</td>
<td>340</td>
<td>1.2</td>
<td>Due online Nov 2017</td>
</tr>
<tr>
<td>Uniper Maasvlakte MPP3</td>
<td>Netherlands</td>
<td>1100</td>
<td>0.5</td>
<td>Due 2018</td>
</tr>
<tr>
<td>RWE/Essent Eeemshaven</td>
<td>Netherlands</td>
<td>1600</td>
<td>0.8</td>
<td>Due 2018</td>
</tr>
<tr>
<td>Engie Rotterdam 1</td>
<td>Netherlands</td>
<td>736</td>
<td>0.2</td>
<td>Due 2018</td>
</tr>
<tr>
<td>EPH, Lynemouth</td>
<td>UK</td>
<td>420</td>
<td>1.6</td>
<td>Due early 2018</td>
</tr>
<tr>
<td>MGT Power</td>
<td>UK</td>
<td>299</td>
<td>1.1</td>
<td>Due Q1 2020</td>
</tr>
</tbody>
</table>

*Source: Hawkins Wright, the Outlook for Wood Pellets*
# New sources of industrial pellet demand - Asia

<table>
<thead>
<tr>
<th>Name</th>
<th>Location</th>
<th>Installed capacity, MW&lt;sub&gt;e&lt;/sub&gt;</th>
<th>Pellet demand, kt/y</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>KOEN Yeongdong #1</td>
<td>Korea</td>
<td>125</td>
<td>550</td>
<td>Began operating 2017</td>
</tr>
<tr>
<td>Hanyang/KNHP Gwanyang Energy</td>
<td>Korea</td>
<td>220</td>
<td>500</td>
<td>Due online 2020</td>
</tr>
<tr>
<td>KOEN Yeongdong #2</td>
<td>Korea</td>
<td>200</td>
<td>1,450</td>
<td>Planned for 2020</td>
</tr>
<tr>
<td>KOMIPO Gunsan Bio</td>
<td>Korea</td>
<td>200</td>
<td>800</td>
<td>Due online 2020</td>
</tr>
<tr>
<td>Nakayama Nagoya 2</td>
<td>Japan</td>
<td>110</td>
<td>125</td>
<td>Began operating 2017</td>
</tr>
<tr>
<td>Summit Energy Sakata</td>
<td>Japan</td>
<td>50</td>
<td>100</td>
<td>Due online 2018</td>
</tr>
<tr>
<td>IHI Kagoshima</td>
<td>Japan</td>
<td>49</td>
<td>250</td>
<td>Due online 2018/19</td>
</tr>
<tr>
<td>Aioi</td>
<td>Japan</td>
<td>200</td>
<td>650</td>
<td>TBC</td>
</tr>
<tr>
<td>J-Power Takehara</td>
<td>Japan</td>
<td>600</td>
<td>250</td>
<td>Planned 2020</td>
</tr>
</tbody>
</table>

This is just a selection of the biggest pellet-fired projects, there are numerous other projects planned in Asia (Over 12GW<sub>e</sub> of biomass power capacity is certified under Japan’s Feed In Tariff and recent policy changes in Korea could result in greater renewable energy deployment)

*Source: Hawkins Wright, the Outlook for Wood Pellets*
The outlook for industrial wood pellet demand in the EU and Asia

- Asian demand expected to account for 31% of industrial market by 2021

Source: Hawkins Wright, the Outlook for Wood Pellets
The outlook for supply
## Additions to global wood pellet production capacity

<table>
<thead>
<tr>
<th>Company</th>
<th>Country</th>
<th>Production capacity, kt/y</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tanac</td>
<td>Brazil</td>
<td>400</td>
<td>Commissioning</td>
</tr>
<tr>
<td>SY Energy</td>
<td>South Korea</td>
<td>500</td>
<td>Commissioning</td>
</tr>
<tr>
<td>Plantation Energy</td>
<td>Australia</td>
<td>250</td>
<td>Restarted Q3 2017</td>
</tr>
<tr>
<td>Highland Pellets</td>
<td>United States</td>
<td>150 (4th line at existing mill)</td>
<td>Due online Oct 2017</td>
</tr>
<tr>
<td>Drax Biomass, Amite and Morehouse</td>
<td>United States</td>
<td>150 (75kt/y capacity expansions at each mill)</td>
<td>Due late 2017</td>
</tr>
<tr>
<td>Graanul, Broceni and OÜ Osula Graanul</td>
<td>Latvia</td>
<td>150 (new mill at Broceni) 110 (expansion)</td>
<td>Under construction, due 2017</td>
</tr>
<tr>
<td>An Việt Phát</td>
<td>Vietnam</td>
<td>200 (expansion at existing mills)</td>
<td>Under construction</td>
</tr>
<tr>
<td>Enviva, Hamlet</td>
<td>United States</td>
<td>600</td>
<td>Due late 2018</td>
</tr>
<tr>
<td>Pinnacle, Entwistle</td>
<td>Canada</td>
<td>400</td>
<td>Due late 2018</td>
</tr>
<tr>
<td>Drax LaSalle</td>
<td>United States</td>
<td>500</td>
<td>Due to restart 2018</td>
</tr>
</tbody>
</table>

*Source: Hawkins Wright, the Outlook for Wood Pellets, Q2 2017*

*Note: All figures are in thousand metric tonnes per year (kt/y)*
Additions to global industrial pellet production capacity

- Net capacity additions have slowed in the past year
- Some recent capacity closures or reductions
- Investment environment challenging: fewer projects reaching financial close
- From 2019, further volumes will need to be sought to meet industrial demand forecasts – either via transfer from heating pellet market or through new industrial-focused capacity additions

Source: Hawkins Wright, the Outlook for Wood Pellets Q2 2017
Industrial pellet supply-demand balance

- Approx 6Mt/y of new pellet supply will be needed by 2021 if demand is to rise as expected

Source: Hawkins Wright, the Outlook for Wood Pellets, Q2 2017
Conclusions

- After a difficult couple of years, supply and demand are now more balanced
  - New demand is coming online
  - Production capacity growth has slowed
  - Fewer spot volumes are being produced (pro or con?)

- Activity in the Asian market is ramping up fast, but how will this demand be satisfied?
  - Korean tenders are extremely challenging (logistics, price, specification)
  - Japanese buyers are diligent (long term supply security, sustainability, bankability)

- The market may noticeably tighten as new demand comes online
  - Significant additional pellet capacity will be needed if demand is to grow as expected
  - Lower inventories in the heating market (and/or cold temperatures) may mean smaller volumes available for transfer to industrial market
The Outlook for Wood Pellets
Demand, supply, costs and prices

A multi-client service comprising regularly updated forecasts of the wood pellet market’s development

- Two ‘main’ reports (Q1 & Q3)
- Two ‘update’ reports (Q2 & Q4)
- Workshop or presentation meeting
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