From Selby to SCOTUS
Recent Developments and Growth Opportunities in the North Atlantic Pellet Market

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Drax Biomass

www.draxbiomass.com
Agenda

• Update on the Drax Transformation
• Drax Biomass Overview
• Global Power Sector Outlook and How Biomass Co-Firing/Conversion Fits
• Current Status of Industrial Pellet Market
• Potential Growth Opportunities in the Space
Drax Group Overview

Drax Group is an innovative energy company engaged in the generation and supply of electricity and the production of sustainable biomass fuel

Company Overview

• Drax Power – owner and operator of the UK’s largest and most efficient power station (4,000MW), providing 8% of the UK’s electricity
  – Transformed into predominantly wood pellet-fueled electricity generation using innovative technology and sustainably sourced wood pellets
• Drax Biomass – U.S.-based manufacturer of wood pellets produced from sustainably managed working forests
• Haven Power – UK retail & commercial electricity supplier
• Billington BioEnergy – UK wood pellet supplier to domestic and commercial customers using specialized boilers to generate heat

2015 Group Highlights

<table>
<thead>
<tr>
<th>Total revenue</th>
<th>EBITDA</th>
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<tbody>
<tr>
<td>£3,065m</td>
<td>£169m</td>
</tr>
<tr>
<td>Gross Profit</td>
<td>Underlying basic EPS</td>
</tr>
<tr>
<td>£409m</td>
<td>11p</td>
</tr>
<tr>
<td>Net debt</td>
<td>Total recordable injury rate</td>
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<tr>
<td>£187m</td>
<td>0.31</td>
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Our Transition To A Low Carbon Generator

Drax now a predominantly biomass-fired generator
Drax Power Station: Then (1975)

UK’s largest power station... 4 GW (6 x 645 MW units)
Major emitter of CO$_2$... 22mMT/yr at peak
Critical asset... 8% of total UK electricity supply
Drax Power Station: Now

3 of 6 units converted to biomass
No loss of output, negligible impact on efficiency
20% of UK renewable generation
Largest decarbonization project in Western Europe
Drax Power: Coal-to-Biomass Conversion

Significant environmental benefits from conversion to biomass generation

SO\textsubscript{x} emissions

85%\textsuperscript{1,2}

\textsuperscript{1}FGD-abated coal versus unabated biomass
\textsuperscript{2}Abated sulfur content of coal = 200-300 mg/m\textsuperscript{3}

NO\textsubscript{x} emissions

50%\textsuperscript{3,4}

\textsuperscript{3}Unabated coal versus unabated biomass
\textsuperscript{4}Normal operating conditions - Boosted Overfire Air system and low-NO\textsubscript{x} coal

CO\textsubscript{2} emissions

>80%\textsuperscript{5,6}

\textsuperscript{5}Fossil (geologic) emissions versus lifecycle (biogenic) emissions
\textsuperscript{6}Includes emissions from production and transportation of biomass fuel
Sourcing c7-7.5mMT annually
- Supply base spans across the globe
- Targeted anchor of long-term, secure contracts – 5-10 yr tenors
- Security of on-going supply key to Drax Power

Sustainable fiber
- Wood pellets manufactured from low-grade wood
- Sourced from sustainably managed forests
- Major carbon savings >80% vs. coal

Global logistical footprint
- In-house logistical expertise to solve the complicated problems when sourcing wood pellets from around the world

Notes:
Total of 5.9mMT sourced in 2015
Small quantities from Germany, Poland and Spain totalling less than 1%
Established in 2011, Drax Biomass is a leading manufacturer of compressed wood pellets with c.1mMT pa in current capacity

Company Overview

• Based in Atlanta, GA; current operations across U.S. Southeast
• Plants in well-established, industrial regions with abundant and growing fiber baskets
• Employ innovative manufacturing techniques to produce high quality, compressed wood pellets for use as a renewable, low carbon fuel
• Infrastructure in place to safely and efficiently ship wood pellets around the world

Strategically Located Operations

Drax Biomass has built a world class, vertically integrated biomass platform

Our Current Facilities

Corporate Headquarters…Atlanta, GA
• Leadership and support functions for 150 employees across business

Morehouse BioEnergy…Bastrop, LA
• Production Capacity: 450kMT pa
• Mode of transport: Rail

Amite BioEnergy…Gloster, MS
• Production Capacity: 450kMT pa
• Mode of transport: Truck

Baton Rouge Transit…Port Allen, LA
• 2mMT pa handling capacity; ability to expand additional 1m tpa
• Multi-modal receiving (truck & rail)
• 1.5mMT pa currently contracted on long-term basis
• Co-operated with Host Terminals
Why We Located in the US Gulf South

DBI benefits from the abundant fiber resource, proximity to deep-water ports and supportive local authorities in the US Gulf South

Sustainable Fiber Supply
• Forest covers >50% of landscape within c.50 mile catchment areas surrounding plants
• Excess feedstock due to mill closures
• Feedstock costs low and stable compared to other parts of U.S. South
• Proximity to large & small landowners

Regional Terminal For Aggregation and Export
• Purpose-built 2mMT pa deep-water port hub with 80kMT storage; potential to expand capacity to 3mMT pa
• Efficient logistics and opportunity to terminal third-party volume
• Capability to load Panamax-sized (c.60kMT) vessels

Strong Local Support
• Direct jobs created for skilled workers in struggling rural areas – many from pulp/paper and forest products industry
• New outlet for regional fiber lead to increased indirect local employment

DBI’s Gulf Cluster strategy provides superior accessibility to fiber and shipping resources
Global Power Sector Outlook

Setting the Stage for Further Decarbonization Opportunities
Coal Consumption Fell for Second Consecutive Year

Source: Enerdata
Global Coal Consumption Still Significant

However, Over 40% of Global Electricity is Still Produced from Coal

Source: International Energy Agency (IEA)
Global Carbon Emissions

$\text{CO}_2$ emissions from fuel combustion: 2015

$\text{CO}_2$ emissions stabilized for the first time in 40 years, but still remain at historical highs

Source: Enerdata
Carbon Emissions Reductions

Two Steps Forward…

“COP21: 195 countries adopt the first universal climate agreement”
http://www.cop21.gouv; December 2015

“China says it will cut power sector emissions 60% by 2020”
The Guardian; December 2015

“India Pledges to Reduce Carbon Emissions 33%-35% by 2030”
Time Magazine; October 2015

“Obama launches Clean Power Plan to cut emissions by nearly a third by 2030”
BBC News; August 2015
Carbon Emissions Reductions

One Step Back…

“COP21: Leaders Roll Up Sleeves on Climate, but Experts Say Plans Don’t Pack a Wallop”
New York Times; April 2016

“Don’t celebrate yet: Why China’s green shift could face delays”
Climate Change News; February 2016

“India’s needs [for external financial support] are going to be astronomical if we are going to succeed [in decarbonization agenda]”
New York Times; April 2016

“Supreme Court Puts The Brakes on The EPA’s Clean Power Plan”
Washington Post; February 2016
What We Know

It has been proven that coal-to-biomass co-firing and conversions can play a significant role in decarbonization of the energy sector.
Coal-to-Biomass: Good for the Grid

**Reliable**  
Renewable, low-carbon baseload generation

**Flexible**  
Output adjustable between 200-645 MW/unit

**Dispatchable**  
Responsive to changing load/generation patterns

**Essential**  
Balancing, freq. response, VAR support, black-start services
Coal-to-Biomass: Good for Ratepayers

✓ Utilizes existing grid infrastructure
✓ Reduces risk of stranded assets
✓ Offers alternative to costly pollution control upgrades
✓ Provides cost-competitive complement to wind and solar

<table>
<thead>
<tr>
<th>Technology</th>
<th>Levelized Cost of Electricity (DECC 2013)</th>
<th>System Integration Costs¹ (Average 2020-2030)</th>
<th>Whole System Cost (WSC = LCOE + SIC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Onshore Wind</td>
<td>100</td>
<td>10-14</td>
<td>110-114</td>
</tr>
<tr>
<td>Offshore Wind</td>
<td>132</td>
<td>10</td>
<td>142</td>
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<tr>
<td>Solar PV</td>
<td>123</td>
<td>12</td>
<td>135</td>
</tr>
<tr>
<td>Biomass Conversion</td>
<td>108</td>
<td>-1</td>
<td>107</td>
</tr>
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</table>

¹Includes costs of backing up intermittent generation and making the system flexible enough to adapt to fluctuations in demand; estimated relative to a benchmark technology (assumed nuclear power)

²Costs denominated in real 2012 prices for ease of comparison to the DECC (2013) levelised cost of energy

Source: UK Renewables Subsidies and Whole System Costs; NERA Economic Consulting/Imperial College London – Feb 2016
Coal-to-Biomass: Good for our Forests

Healthy markets = healthy forests

US South inventory and removals (1952-2011)

- Promotes adoption of land management techniques to increase yield + economic return
- Supports investment in R&D regeneration
- Discourages land conversion

Pellet mills replacing lost demand

US South mill closures\(^1\) and openings\(^2\) (1990-Present)

- Provides markets for low-value material (thinnings, residues, diseased trees)
- Sustains local forest-based economy
- Encourages adoption of sustainable land management practices among small landowners

Source: Forest Resources of the US, 2012: A Technical Document Supporting the Forest Service Update of the 2010 RPA Assessment

\(^1\)Includes pulp, paper and OSB mill closures
\(^2\)Includes pellet mills under construction or in permitting

The Bad: Current Industrial Pellet Market

- Current market overcapacity estimated at c.3M tons
  - Residential/ heating markets unable to absorb much of this oversupply due to demand downturn from mild winters and reduced adoption
  - No short-term (<18 months) solutions apparent
- Power prices significantly challenged due to low oil and natural gas pricing
  - Leading to higher cost/ lower incentive for renewables adoption
- Currency movements favor Russian volumes over US & Canada; European volumes maintain cost advantage due to freight

- Conditions have resulted in market turmoil, leading to pellet plant closures, bankruptcies and significant supply uncertainty
The Good: Current Industrial Pellet Market

• A light at the end of the tunnel?

• Positive announcements on new demand capacity made during 2016:
   In UK, both Lynemouth and MGT Teesside projects receive greenlight
   Belgian Langerlo plant sold to Graanul Invest – decision on conversion forthcoming
   Dutch SDE+ auctions award 2 biomass co-firing projects 8-year contracts; potential for additional contracts in Fall auction

• Drax receipt of CfD approval would provide additional positive momentum to market

• However, most newly-announced activity not expected to come online for another 18+ months; no short-term reprieve expected in market
Opportunities for Growth

How Does All Of This Translate Into Growth Opportunities in the Industrial Pellet Sector?
Opportunities in UK

Overview

• Most major projects already announced and moving forward
  ➢ Drax – 3 x 645MW units converted; awaiting EU State Aid approval of CfD; potential for additional unit conversions with government support
  ➢ Lynemouth – 420MW conversion; awarded CfD with EU State Aid approval – targeting early 2018 start
  ➢ MGT Teesside – 299MW new-build; awarded CfD with EU State Aid Approval and closed financing; targeting 2020 start

• Potential for additional small CHP biomass projects in upcoming CfD auction

• Significant uncertainty of future UK energy mix post-Brexit
  ➢ Appears business as usual for Drax
  ➢ New government assessing energy plan with results to be announced this Fall
  ➢ Hinkley Point nuclear project to move forward, a 3,200MW new-build facility targeted for completion in 2025
Opportunities in Europe

General

- Many countries have established renewables schemes that include biomass
- Delay in major additional European demand for another 18-24 months, though high probability for European countries to include biomass in renewables mix

Netherlands

- SDE+ auction scheme: first round of occurred in Spring 2016
  - RWE awarded subsidy to co-fire up to 50% of its 600MW Amer 9 unit
  - Engie awarded co-fire contract for 724MW Maaslavkte CHP facility
- Expectation for other projects to bid into upcoming Fall 2016 auction
- However, final decisions on conversions on hold due to uncertainty in Dutch government on its plan to phase out coal in its entirety

Belgium

- Green certificate scheme in place, though rule changes have created a more challenging investment climate
- Langerlo - 520MW conversion decision expected by end of 2016
Opportunities in North America

**US**

- US Clean Power Plan (CPP) provides runway for potential US coal station co-firing
  - Coal made up >1/3 of US electricity mix, or over 4,087 TWh of generation/ 340 GW of installed capacity
  - Supreme Court has stayed implementation of CPP pending review
  - If CPP is upheld, timing would be likely be ramp-up starting in early 2020s
- Many coal fired power plants in Eastern US, within close proximity to healthy, sustainable wood baskets
- Alternatively, coal to natural gas conversions will be strongly considered

**Canada**

- Alberta provincial government to remove coal from electricity mix by 2030 and in process of considering a carbon tax
  - Coal makes up 38% of electricity mix – Province currently has 18 coal-fired power plants with 6,300MW of capacity, some of which are <10 years old
  - Province targeting 2/3 renewables and 1/3 natural gas to replace coal generation
Opportunities in Asia

Japan

- Renewables to make up 24%, or 231 TWh of 2030 energy mix
- Renewables % could increase as nuclear target (22-24% of mix) may not be achievable given difficulty in restarting fleet post-Fukushima disaster
- Feed-In-Tariff (FIT) scheme established to incentivize renewable generation
  - 20 year, fixed price contracts to generators at ¥24/KWh for imported woody biomass; pricing re-confirmed in March 2016
- Japanese power markets deregulated in April 2016

Korea

- Currently focused on short-term, low-cost, low volume co-firing – no regulatory support for long-term contracting
- Plan to shut down 10 coal power plants by 2025; 2 of these plants plan to use biomass starting as early as 2017
Thank You