NCSPA Feasibility Study

September 28, 2012
Contents

- Wood Pellet Feasibility
  - Executive Summary
    - Overview
    - Demand
    - Supply
      - Investment Evaluation
  - System Volumes
  - Review of Financial Forecast
  - Review and Conclusion
Executive summary
Wood Pellets provide a viable business opportunity to NCSPA if risks are managed properly

• The Global Market
  – The EU represents 75% of world imports with North America supplying 16% of world exports (Canada 12%, US 4%), 81% of which are destined for the EU.
  – Policy driven growth (GHG, energy security) is expected to result in 6% annual growth in EU renewable energy consumption through 2020, with substantial wood pellet growth in the UK.
  – Through 2020 EU consumption is projected to exceed its production of pellets.
  – US production is expected to exceed US consumption through 2020.

• NCSPA’s Market
  – The US East Coast is geographically and resource-wise well positioned to supply EU/UK.
  – Port choice is strongly dependent on production location and economical transportation resources.
  – There are sufficient and appropriate forest resources in NCSPA’s catchment area.

• NCSPA Business Model
  – A preliminary cash flow analysis for the MHC project indicates that the estimated required investment can be recovered in approximately 11.2 years, based on proposed terms for three customers at MAG volume levels at each terminal.

• Risks
  – The success of producers is influenced by the security of their contracts with their customers and their ability to produce and deliver at contract rates and within stated criteria (i.e. carbon foot print).
  – MAG for the proposed facility is a notable portion of South East US current production capacity.
  – This is a relatively new market and is subject to technological and regulatory change.
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Global flows of renewable energy
Europe is the primary destination for global flow of renewable energy

- **Importers**
  - EU is the top importer of wood pellets (75% of total import);

- **Exporters**
  - 16% of world exports originate in North America
    - Canada is the biggest exporter of wood pellets with market share of 12%
    - United States accounts for 4% of the market
    - EU accounts for 81% the export which is mainly delivered to EU

Source: UN Comtrade
Biomass Market Drivers
Growth in biomass usage in Europe is primarily policy driven

• Policy Drivers
  – EU 20-20-20, by 2020:
    • 20% reduction in GHGs compared to 1990
    • 20% of EU consumption must come from renewables
  – UK’s Renewable Obligation requires 15% renewable energy contribution in electricity production by 2015;

• Policy Objectives
  – Contribution to global energy demand
  – Reduction in green house gases
  – Energy security

• Market Drivers
  – Low natural gas prices have negative impact on growth of biomass as an energy source.
    • US$4/GJ\(^1\) (4.22 $/MMbtu) is often regarded as an upper limit if bioenergy is to be widely deployed today in all sectors.
  – Higher natural gas prices along with potential in supply disruption have made biomass a viable source of energy in Europe;
    – Europe is fast growing biomass users;
    – Close to 50% of the world biomass electricity is generated in Europe

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\(^1\) Bioenergy – A Sustainable and Reliable Energy Source Main Report

**Natural Gas Price**

**Biomass and Waste Electricity Net Generation**

Source: EIA

Business Model

- Production Cost
- Availability of sustainable resource

- Transportation Cost
- Pipeline reliability
- Alternative gateways

- Policies
- Drivers
- Segments
  - Electricity;
  - CHP/HP
  - Industry
  - Households
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Market Review – European demand
Demand for renewable energies is growing

- EU is projected to have an average annual growth of 0.6% for total energy consumption;
- The average annual growth of renewable energies is projected to be 6.0%
- Share of renewable energies is projected to grow from 12% in 2010 to 20% in 2020

- High-growth high-demand countries are more desirable as a target market;
- Germany is a large market with low growth;
- UK is relatively small compared to Germany however with a high growth
- Denmark and Belgium don’t fall into the highly desirable markets;

Source: National Renewable Energy Action Plans of the European Member States
## Key Markets Summary

<table>
<thead>
<tr>
<th>Country</th>
<th>2010 share of total global imports of pellets</th>
<th>Current share of energy production by renewables</th>
<th>Target share of energy production by renewables (2020)</th>
<th>2010 pellet imports (Million MTs)</th>
<th>2020 Expected pellet imports (Million MTs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belgium</td>
<td>15%</td>
<td>3.2%</td>
<td>13%</td>
<td>2.2</td>
<td>5.0</td>
</tr>
<tr>
<td>Denmark</td>
<td>11%</td>
<td>20.2%</td>
<td>28%</td>
<td>1.7</td>
<td>2.2</td>
</tr>
<tr>
<td>Germany</td>
<td>11%</td>
<td>12.2%</td>
<td>20%</td>
<td>1.6</td>
<td>2.9</td>
</tr>
<tr>
<td>UK</td>
<td>4%</td>
<td>3.7%</td>
<td>15%</td>
<td>0.6</td>
<td>3.2</td>
</tr>
</tbody>
</table>

Source: Multiple Sources, see future slides

- Diversity and stability of supply sources is key driver of EU market
Belgium
Wood pellets will remain a fast growth sector in Belgium

- Average 5 years growth in total energy consumption: -1.6%
- Average 5 years growth in renewable energy consumption: 14.5%
- 2009 share of renewables of total consumption: 3.2%
- Historical driver: Kyoto; Reduce the GHG by 7.5% in 2008-2012 from the base year of 1990

- If there is no major change in domestic production, Belgium’s wood pellet import will be more than 5 million MTs by 2020;
- Top suppliers for Belgium are:
  - Netherlands
  - Germany
  - France
  - USA

![Historical Energy Consumption (Belgium)](image)

![Expected Wood Pellet Import to Belgium](image)

Source:
IEA BIOENERGY – TASK40, Country Report for Belgium
Comtrade – Moffatt & Nichol
Denmark
Denmark is a slow growth market and might lose it’s position as a dominant importer

- Average 5 years growth in total energy consumption: -1.5%
- Average 5 years growth in renewable energy consumption: 3.1%
- 2011 share of renewables of total consumption: 20.2%
- Historical driver: Kyoto, Reduce the GHG by 21% in 2008-2012 from the base year of 1990

- Solid biomass has maintained a 33% share of total renewables over past 5 years;
- Denmark is projected to have an slow growth and it’s total import is expected to reach 2.2 million MTs by 2020;
- Top suppliers for Denmark are:
  - Estonia
  - Latvia
  - Russian Federation
  - Portugal

Source: Danish Energy Agency statistics

Expected Wood Pellet Import to Denmark

Source: Comtrade – Moffatt & Nichol
Germany

Germany will remain a moderate growth country

- Average 5 years growth in total energy consumption: -0.5%
- Average 5 years growth in renewable energy consumption: 7.6%
- 2011 share of renewables of total consumption: 12.2%
- Historical driver: Kyoto; Reduce the GHG by 21% in 2008-2012 from the base year of 1990

- Solid biomass had average share of 33% of total renewables over past 5 years;
- Germany is projected to have moderate growth and it’s total import is expected to reach 2.9 million MTs by 2020;
- Top suppliers for Germany are:
  - Netherlands
  - Poland
  - Czech Republic
  - Denmark

Expected Wood Pellet Import to Germany

Source: Comtrade – Moffatt & Nichol
United Kingdom
UK is expected to be fast growing country

- Average 5 years growth in total energy consumption: -2.7%
- Average 5 years growth in renewable energy consumption: 11.1%
- 2011 share of renewables of total consumption: 3.7%
- Historical driver: Kyoto; Reduce the GHG by 12.5% in 2008-2012 from the base year of 1990

- Woody biomass has maintained a constant share of above 40% in proportion to total biomass in heat and energy productions;
- UK is projected to have a high growth and it’s total import is likely to reach 3.2 million MTs by 2020;
- Top suppliers for UK are:
  - Canada
  - USA
  - Portugal
  - South Africa

Source: UK’s Department of Energy and Climate Change

Source: Comtrade – Moffatt & Nichol
United Kingdom - Future of Biomass and Trade

UK will be highly dependent on the import of biomass

- UK will remain an import oriented market;
- Most of the planned biomass electricity generation capacity is located close to ports;
- The planned capacity for biomass power plants is currently close to 4.2 GW

Source: UK Renewable Energy Roadmap

Source: IEA BIOENERGY – TASK40, Country Report for UK
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Biomass Supply
United States is projected to be one of major biomass suppliers

- EU’s pellet consumption is expected to be higher than its production capacity;
- China is expected to be a self sufficient market;
- The wood pellet consumption is expected to exceed its production capacity in Japan and South Korea;
- North America’s production capacity is expected to be higher than its consumption;
- US east coast is advantaged over Brazil and West Coast Canada from the ocean transportation cost perspective for exporting to Europe;
- West Coast Canada is advantaged over Brazil and East Coast US from the ocean transportation cost perspective for exporting to Japan and South Korea;

Source: Pellets – Becoming a Global Commodity: Global market, players and trade to 2020 (Pöyry 2011)
United States – Supply and Demand
Domestic consumption of biomass is less than its production capacity

• Biomass is becoming the dominant produced source of renewable energy;

• US biomass sector has a production surplus capacity which can be used for the export;

• Biomass production will maintain an average 30% surplus over consumption through 2020 (export oriented)
North Carolina Resource Availability
North Carolina has enough resources for 2.1 million tons of logging residues, 1.2 million tons of forest thinnings and 12 million green tons

- At 2.1 million dry tons, North Carolina has 10th highest availability of logging residues ($80/dry ton road side);

- At 1.2 million metric tons North Carolina has the second highest availability of forest thinnings ($40/dry ton road side)

- Using current forest growth and removal rates it is estimated that another 12 million green tons can be removed from NC (source: FIA, Moffatt & Nichol)
Southern Production Facilities
Minimum Annual Guarantee for proposed facility is a notable portion of current production capacity

- Southern US production capacity in 2012 is about 7.2 times its 2007 level;
- Currently there is about 3.5 Million MTs of wood pellet production in proposal and planning phase;

- MHC MAG is approximately 30% of current and 15% of future southern production capacity
Wood pellet export is a new market
Panama City is the largest exporting port;
Export volumes have not stabilized
Export volumes have strong dependency to production locations

According to census the average FAS (Free Alongside Ship) price for a metric ton of wood pellets and wood chips has risen 15% a year between 2008 and 2011;
Among top exporters Beaumont, TX has the highest price ($236/MT) followed by Panama city ($233.42/MT) and Gramercy, LA ($151.77/MT)
Almost all of the export through Norfolk is containerized as $172.71/MT

Source: USATradeOnline
United States – International Price Competitiveness

US export prices were higher than most EU countries in 2010 but expected to be more competitive as demand increases

- US has relatively high export prices;
- According to Comtrade average FOB price per ton export from US was $219/MT followed by Austria ($205/MT) and Canada ($197/MT)
- Low price exporters are Switzerland ($46/MT), France ($92/MT) and Russian Federation ($96/MT)

- US has relatively high export prices;
- In 2010 US FOB price was higher than CIF price of all top importers;
- UK’s average import price is close to $200/MT for its high dependency on US and Canadian wood pellets
- UK is paying higher price for wood pellets due to its dependency to US and Canadian markets
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Cash Flow Projection – MHC (Base Case)

- Based on proposed terms for three customers and volume at MAG levels of 1.1 Million Metric Tons;
- Project life: 31 years, 21 years plus two 5 year extensions;
- MAG-Weighted handling charges: $6.75/MT escalated at 3.4% annually
- MAG-Weighted capital recovery charge: $4.5
- Dockage revenue: $11.20 per foot per 24 hours, average vessel size 715 LOA;
- Operating expenses: $2.25/MT for direct expenses and $1.25 for indirect expense;
- 6.75% discount rate;
  - Borrowing rate: 5%
  - Debt service coverage: 1.35
- Present value of cash flow available for investment is approximately $108 M over full term and extensions;
- Estimated required investment recovered in about 11.2 years;
Cash Flow Projection - MHC

• Scenario analysis was performed for different rates of borrowing, opex and growth

<table>
<thead>
<tr>
<th>6.75% discount rate</th>
<th>8.1% discount rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAG</td>
<td>2% growth</td>
</tr>
<tr>
<td>opex base</td>
<td>$108</td>
</tr>
<tr>
<td>opex plus 25%</td>
<td>$93</td>
</tr>
<tr>
<td>opex plus 50%</td>
<td>$77</td>
</tr>
<tr>
<td>opex less 10%</td>
<td>$114</td>
</tr>
</tbody>
</table>
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North Carolina Ports’ Regional Markets & Commodities

The majority of trade volume through the Ports either originates from or is destined to locations within North Carolina.

- General cargo shipments of woodchips/wood pulp, phosphates, feeds and fertilizers, which account for some of the largest tonnages handled at the ports are associated with demand in the eastern counties (east of I-95).

- The central and western counties are large sources of demand for containerized commodities – these regions are highly contested by neighboring-state ports.

Source: Moffatt & Nichol
North Carolina Trade Demand Sources
There are four broad economic sectors which drive trade through the Ports:

<table>
<thead>
<tr>
<th>Sector</th>
<th>Commodities</th>
<th>Sector Outlook</th>
<th>Trade Outlook</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Agriculture</strong> * (Including Forest Products)*</td>
<td>Woodchips &amp; pulp; feed; meats; fertilizers; kiln dried lumber</td>
<td>[Green up]</td>
<td>[Green up]</td>
<td>[Green up]</td>
</tr>
<tr>
<td><strong>Manufacturing</strong></td>
<td>Chemicals; rubber; machinery; steel; DRI; paper</td>
<td>[Yellow up]</td>
<td>[Red down]</td>
<td>[Yellow up]</td>
</tr>
<tr>
<td><strong>Construction</strong></td>
<td>Lumber; cement; steel products</td>
<td>[Green up]</td>
<td>[Yellow up]</td>
<td>[Green up]</td>
</tr>
<tr>
<td><strong>Consumer</strong></td>
<td>Containers</td>
<td>[Yellow up]</td>
<td>[Yellow up]</td>
<td>[Yellow up]</td>
</tr>
</tbody>
</table>

Source: Moffatt & Nichol

- The agriculture sector has the most favorable profile for increasing trade demand through the ports. This includes shipments of fertilizer and feed; as well as forest products including woodchips and wood pulp.
- A rebound in regional construction activity is also estimated to support trade volumes.
- The manufacturing and consumer sectors are estimated to remain under pressure in the near-term.
Trade Volumes Have Grown as a Result of Investment
Capital Improvement Projects (CIP) have led to incremental increases in trade volumes at the Ports; particularly with containers - *Trade grows with the right infrastructure in place*

- The outlook from the “non-containerized” sectors (Agriculture & Forest Products) is the strongest, and therefore investment targeted at accessing these sectors is likely to be the most effective at adding incremental volumes through the ports

Source: NCSPA

### Woodchip Exports at Morehead City

![Woodchip Export Graph]

**Source:** NCSPA

### Containers at Wilmington

![Container Import Graph]

**#1** – Channel deepening & new post-panamax cranes lead to CKYH bringing larger vessels and adding a 2nd service.

**#2** – ICL and Maersk add services to Wilmington
General Cargo Forecasts
The outlook for general cargo (bulk, break bulk and RoRo) indicates long-term stability, as growth for some of the largest commodities, including phosphates and chemicals, is estimated to continue to be less volatile. Minimum annual guarantee contracts (MAGs) are in place for some of the newer commodities being handled, including woodchips.

General Cargo Tonnage at Morehead City & Wilmington

- Breakbulk volumes of lumber and wood pulp declined dramatically in the last half of the decade
- These volumes have stabilized and are assumed to rebound, as higher construction activity drives demand for lumber, and break bulk shipments of wood pulp increase
- Additionally, near-term strength is likely to come from:
  - Grain Imports
  - Chemical Imports
  - Fertilizer Imports
  - Woodchips Exports

Source: Moffatt & Nichol
**Container Forecasts**

The outlook for container volumes through the Port of Wilmington will be determined by the Port’s ability to retain existing, and attract new services, as opposed to underlying demand growth. The same determining factor experienced over much of the past decade.

**High:** Market share rises to 29% of North Carolina’s total – The Port attracts four additional services adding incremental volumes of 25,000 TEU each by 2022

**Base:** Market share is maintained (25% of North Carolina’s total demand) – The Port attracts two additional services which can add incremental volumes of 25,000 TEU each by 2022. Port volume increases to approximately 420,000 TEU.

**Low:** The Port loses 10% off the base estimate through 2015 (does not get back to 2011 volumes), at which point CKYH pulls one of its services – resulting in a loss of 35% of total throughput.
Container Forecast Conditions

Investment in infrastructure which improves the efficiency of the logistics system has a proven track record of increasing container volumes at the Port of Wilmington.

- No single investment can guarantee that incremental container volumes will come.

- The likelihood of new liner-services being added increases if Wilmington continues to improve its ability to serve North Carolina’s container demand.

- Without improved connectivity to regional markets (either via rail, road, port improvements, or combination of) the likelihood incremental volumes being added decreases, and the loss of an existing service increases.

- Moffatt & Nichol did not set explicit conditions on specific pieces of infrastructure to develop the container forecasts.

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Infrastructure</th>
<th>Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>![High Graphic]</td>
<td>![High Graphic]</td>
</tr>
<tr>
<td>Base</td>
<td>![Base Graphic]</td>
<td>![Base Graphic]</td>
</tr>
<tr>
<td>Low</td>
<td>![Low Graphic]</td>
<td>![Low Graphic]</td>
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Source: Moffatt & Nichol
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Operating Revenue and Expenses – without wood pellet

- Operating revenues:
  - CAGR = 6.3%;
  - from $45 million to $77 million in FY 2022;
- Container terminal revenues
  - CAGR = 9.1%;
  - from $14 million (31% of total) to $31 million (40% of total)
- General terminal revenues
  - CAGR = 5.8%
  - from $19 million (43%) to $32 million (31%)

- Operating and maintenance expenses (not including depreciation)
  - CAGR = 3.9%
  - from $31 million to $44 million
- Container terminal expenses
  - CAGR = 3.9%
  - from about $8 million to $13 million
- General terminal expenses
  - CAGR = 6.1%
  - from $11 million to $15 million
Wood Pellet Impact on Operating Revenue and Expenses

- Wood Pellet will increase the CAGR of the operating revenue to 8.2% (compared to original 6.3%);
- Wood Pellet will increase the operating revenue in FY 2022 to $91 million (compared to original $77 million)

- Wood Pellet will increase the CAGR of the operating expenses to 5.2% (compared to original 3.8%);
- Wood Pellet will increase the operating revenue in FY 2022 to $61 million (compared to original $54 million)
- Wood pellet will increase the margin between operational and revenue CAGRs by %0.11
Wood Pellet impact on Net Revues Available for Debt Services

• No-wood pellet option - Net revenue will increase at CAGR of 10.8% from $13.6 million in 2013 to $34.1 million in 2022;

• No-wood pellet option - The CAGR will increase to 13.7% and the 2022 net revenue will increase to $43 million

![Most likely Case Net Revenues available for debt services with Wood Pellet at MAG](image-url)
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System Volumes
Review

• Bulk, Break Bulk and RoRo
  – Stable outlook;
  – Largest commodities, including phosphates and chemicals; are going to continue a less volatile growth
  – Newer commodities, including woodchips, have contracts with MAGs in place;

• Container Volumes
  – The outlook depends on ports ability to retain existing, and attract new services, as opposed to underlying demand growth.
Wood Pellet

The Global Market

- The EU represents 75% of world imports with North America supplying 16% of world exports (Canada 12%, US 4%), 81% of which are destined for the EU.
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Risks

- The success of producers is influenced by the security of their contracts with their customers and their ability to produce and deliver at contract rates.
- MAG for the proposed facility is a notable portion of South East US current production capacity.
- This is a relatively new market that and is subject to technological and regulatory change.