

Supply Chain Challenges: **BIOMASS**



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CTRM Market Research, Analysis and Insights

INTRODUCTION

Over the last decade, biomass of various kinds has become an increasingly commonly used fuel for electricity generation, particularly in the European Union, which mandated ambitious threshold targets for the share of renewables in total electricity generation.

Wood chips and pellets have taken a large share of biomass production, not just in Europe, but also parts of Asia as well. In fact, according to the US International Trade Commission, production of wood pellets in the US for export to these locations increased 400% between 2008 and 2014 to help meet the increased demand. The US International Trade Commission further states that, *“estimates of global wood pellet consumption vary, but are currently in the range of 22 – 25 million metric*

*tons (Mt) annually. This projected to rise to between 50 and 80 million Mt by 2020. At 19 million Mt in 2013, the EU accounted for 85 percent of global consumption of wood pellets.”*¹

This white paper examines some of the challenges around managing and optimizing biomass supply chains and discusses Generation 10's Commodity Manager as a comprehensive software solution to these challenges.

1. https://www.usitc.gov/publications/332/wood_pellets_id-039_final.pdf

ENVIRONMENTAL REGULATIONS DRIVE THE MARKET

The rapidly increasing demand for wood pellets and other biomass sources, has been largely driven by environmental regulations. Within the EU, the goal to meet targets of a 20 percent reduction in GHG emissions, a 20 percent use of renewable energy, and a 20 percent improvement in energy efficiency, has been the core driver.

Biomass is projected to account for up to 80 percent of renewable energy used for heating and cooling, and nearly 20 percent of the electric power. Additionally, schemes like the EU ETS may have also aided the switch to large-scale biomass generation, although since 2012 the effectiveness of this “cap and trade” mechanism for driving down carbon dioxide emissions has been called into question. Consequently a number of EU countries and the UK have added their own incentives in the form of other green certificates and subsidies. However, these schemes are in some instances shorter than the investment horizon required for profitability in the long term regulatory and subsidy environment, which is subject to political risk and change, especially in an era of austerity.

Irrespective of these risks, the use of biomass has grown dramatically, both for macro scale projects such as Drax Power, and for much smaller and widely distributed retail “on premise” generators.

The use of wood pellets for power generation has been the catalyst for massive increases of

international trade and the development of biomass specific logistics and supply chains. In the UK, the majority of wood pellets are imported from overseas locations, primarily from the US, Canada, Latvia, and a small, but growing tonnage from Brazil. According to the US Trade Commission, *“in 2013, U.S. wood pellet exports to the EU exceeded \$358 million and 2.8 million Mt, up from just \$88 million and 0.5 million Mt in 2009. In 2016 this was forecast to grow to over 4 million tonnes. The four largest destinations for U.S. wood pellet exports in 2013 were the UK (accounting for 59 percent), Belgium (15 percent), Denmark (8 percent), and the Netherlands (6 percent). U.S. exports to South Korea have also been growing along with that country’s imports from other sources.”*

The political environment in the EU and the incentives provided, has resulted in significant fuel switching. Up to 80% less CO₂ is produced burning wood pellets than heating oil² and wood pellets have less environmental impact generally. Wood pellets are replacing coal as a generation fuel and facilities such as the Drax coal-fired generator in the UK are the

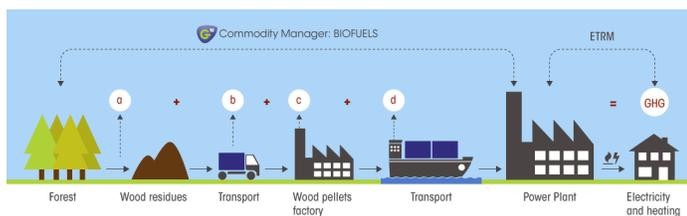
2. <https://www.woodpellets2u.co.uk/switching-from-heating-oil-to-wood-pellets>

world leader in these technologies and supply chains. The switch to wood pellets has also had an impact on supply chains making them longer and more complex. A 2015 UK Government publication demonstrates this, “In 2008, Russia was the UK’s largest single trading partner in wood pellets, with some 26 per cent of all UK imports; by 2014, these were almost negligible. Russian imports and those of several EU

countries (notably the Netherlands, Belgium and Spain) have been completely displaced by a large increase in wood pellet imports from the United States, whose share of total UK imports increased from five to 58 per cent between 2008 and 2014. The United States is now the largest exporter of wood pellets to the UK, ahead of Canada’s 21 per cent share of the market.”³

FUEL SWITCHING

Utilities and other generators that have switched to this form of biomass for generation have done so for a number of reasons including to meet renewable goals, produce and sell ‘green’ power at a premium, and obtain various credits and certificates that can defray costs and increase profits. The quantum and duration of the public subsidy required in the form of CFDs (Contract for Difference) are under attack from some quarters.



In order to be eligible for, and to process payments claims, proof is needed in the form of traceability and end-to-end GHG emissions documentation. In parallel there is a need to manage the supply chain effectively with respect to operational risk, logistics, and financial risks. Sufficient inventory needs to be acquired, shipped, and stored to meet the burn requirements of the generation facility. In turn, this has created a greater need for solutions that can help with the procurement, movement, inventory management, traceability, and use of biomass. To date there are few biomass logistics and traceability solutions available on the market that meet these “end to end” user requirements.

INCREASED COMPLEXITY AND LIQUIDITY

As supply chains grow more complex and longer, the operational risks increase. Being able to prove that wood chips were produced under mandated and

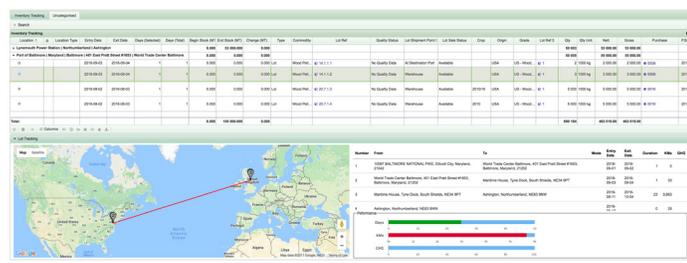
sustainable circumstances, and demonstrate proper end to end supply chain GHG accounting and audit trails, and that the resulting power generated is truly

3. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/462361/Trade_of_wood_pellets.pdf

'green' - impacts profitability and reputation. Ensuring green certificates are issued so that eligible subsidies can be paid is critical to cash flow and financial performance; and ensuring large scale stocks of wood pellets are available to keep the generation facility operational are all new aspects and challenges to managing fuel supply chains effectively.

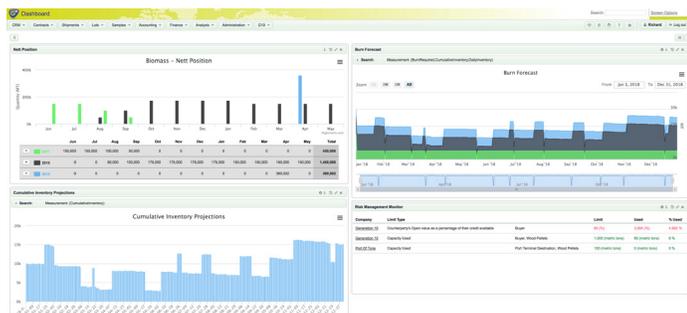
More complex supply chains increase planning, logistics, and data management needs. Monitoring, calculation, and reporting of GHG footprints and procurement activities are essential aspects of this issue.

Incumbent E/CTRM solutions on the market have not sought to meet these requirements and have focused on purely trading activities, which addresses only part of the spectrum of risk faced by power generators and their suppliers. At the same time, the number of companies involved in these activities is increasing. Major power plant operators are in some cases not just consuming biomass but also trading in the biomass market too. Specialist biomass supply and logistics firms as well as brokers are trading biomass supplies from multiple international locations.



Indeed, the supply chain security of electric power generation that uses biomass and liquid hydrocarbons for its fuel needs represents major operational risk.

A BIOMASS SPECIFIC E/CTRM SOLUTION



This absence of functionality was seen as an opportunity by Generation 10 when they looked at the market and so they subsequently invested in configuring their platform, **G10 Commodity Manager** to fill the gap. The solution provides many

of the requirements for traceability and supply chain optimization, specifically as it relates to biomass and other fuels. It provides all of the tools necessary to collate information, measure performance, and refine business processes. It can be used to track biomass from forest to generation through the entire supply chain, any certificates generated or traded in the process as well as the GHG footprint. This allows the generator to prove the power it generates meets the environmental and regulatory standards, and conforms to subsidy requirements. It can help manage sourcing, procurement, inventory forecasting, along

with all of the necessary reporting, analytics and KPI monitoring for managers and more.

Generation 10's focus has always been on the

SUMMARY

Biomass and the broader fuels side of generation is an area of increasing complexity and scale that necessitates a set of bespoke tools to manage operational risks and optimization of business-critical processes. Such tools have been unavailable in the market; however Generation 10's Commodity

supply chain in commodities and so the solution has been designed from day one to provide complete traceability and supply chain optimization for biomass.

Manager is highlighted as one solution developed to meet the demands of this sector, providing extensive supply chain management and optimization as well as traceability functionality in a modern, comprehensive package.

ABOUT GENERATION 10

Generation 10 provides commodity software solutions to various participants throughout the supply chain - from ags to zinc and from origin to industry. Their core competencies are in origination, through logistics supply chain tracking and optimization, to cost control and risk management.

They serve a diverse international client-base from producers, brokers, traders, importers and processors to banks, insurance and government institutions.

Solutions come pre-configured for a range of commodities on a web-based, device-friendly, modular platform that enables fast deployment with minimal overheads. These solutions are feature-rich, easy to use and highly configurable to individual user preferences.

Their flagship CTRM platform, Commodity Manager, is unique in the market offering seamless visibility and workflow between CRM, operations, risk and compliance through to e-commerce.

Available in the Cloud and en-premise.



quality
traceability
sustainability
e-commerce



**complete commodity
software solutions**

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ABOUT

Commodity Technology Advisory LLC

Commodity Technology Advisory is the leading analyst organization covering the ETRM and CTRM markets. We provide the invaluable insights into the issues and trends affecting the users and providers of the technologies that are crucial for success in the constantly evolving global commodities markets.

Patrick Reames and Gary Vasey head our team, whose combined 60-plus years in the energy and commodities markets, provides depth of understanding of the market and its issues that is unmatched and unrivaled by any analyst group.

For more information, please visit:

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