CASE STUDY 20:

Southeast USA Pellets

Title: Woody Biomass from the Southeastern United States used for Bioenergy in Europe
Year of project: 2020
Location: Southeastern United States, North America
Status: Operational
Source: Various (see citations)
https://www.mdpi.com/2071-1050/13/2/821/htm
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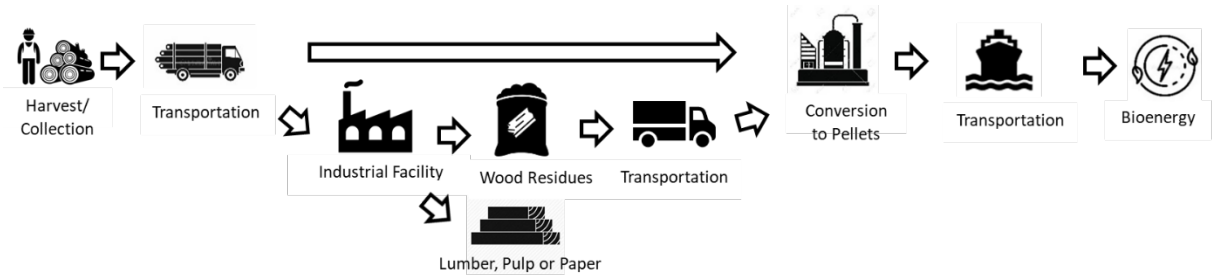
Bioenergy Supply Chain Summary	
Biomass Type:	Forest and wood residues and wood waste
Biomass Origin:	Forest and wood processing residues
Biomass Format:	Utility grade densified biomass pellets
Supply Chain Length:	Regional & International
Bioenergy Product:	Electricity and heat for Europe
Stakeholders:	Residents in communities sourcing primary biomass and providing labor, private forest landowners (family and corporate), foresters, truck drivers, pellet mill owners, shipping industry, utilities in UK and EU, forest certification groups, ENGOs

Overview of Case Study

Wood-based pellets are produced in the southeastern United States (SE US) and shipped to Europe for the generation of heat and power. Biomass is typically sold for wood pellets only if market conditions make it impossible to sell the woody biomass for higher-value products such as sawtimber, pulp, paper, fiber and composites. Hence, wood-based pellets produced in the SE US derive primarily from residuals of timber harvested and processed for other products. Virtually all biomass for pellets in the SE US was initially sourced from private forests, and 60% of those lands are owned by families where harvesting operations are typically conducted by professional loggers. Although production of these wood pellets for export to Europe and Asia has drastically increased in the past decade, biomass for wood-based pellets in 2019 comprised less than 5% of total harvest removals in the SE US.



Details of Biomass Feedstock Supply Chain.

Woody biomass for utility grade densified pellets derives from multiple sources. Wood is sourced from privately-owned forest lands for multiple higher-value products with residuals serving as feedstock for pellet mills. While about 80% of feedstock for pellets comes from secondary sources and other forestry industries, some otherwise unmerchantable timber is selected and collected at the forest harvest site

where it is then transported to a pellet mill. The mill processes (grinds, densifies) the feedstock into pellet form; this includes onsite chipping, hammering, drying and milling. From there, the pellet product is transported to a port facility where it is delivered by deep-water marine transportation to the end users, which are primarily in the UK and other European nations.

Drivers, Policies, Support Mechanisms

Primary drivers for this project were 1) sustainable development of a forest product and 2) reducing fossil fuel dependency in the UK and European Union (Renewable Energy Directive). Close cooperation between regional and local industry partners, including small forest operations, and reliable chain of custody for biomass, is critical for achieving sustainability goals.

Relation to Sustainable Development Goals

SDG	Type of Relation	Target, Explanation	Evidence
	Affordable & clean energy	**7.2**, Renewable energy share increased in the EU with bioenergy as the largest renewable energy source (59% of the EU's renewable energy consumption).	The proportion of energy from renewable sources that was consumed in the EU was 19% in 2018 (double that from 2004).
	Decent work & economic growth	**8.4**, Improved forest management and using wastes to produce pellets encourages economic growth without environmental degradation	More growth in sustainable green economy jobs relative to nonrenewable alternatives
	Industry, innovation & infrastructure	**9.3**, Small-scale (primarily family-owned) industries play an integral role in providing feedstock for the wood pellet industry **9.4** (also SDG 13), CO_2 emissions reduced relative to heating with fossil fuels; value added for timber company through creation of market for forest products and residues	60% of SE US timberland is family owned Overall GHG emissions are substantially reduced when wood pellets replace fossil fuel (i.e., coal)
	Responsible consumption & production	**12.2**, Bioenergy usage affects environmental, economic, and social sustainability through efficient use of natural resources	Feedstock collected at the forest harvest site is efficient use of wood and residuals
	Life on land	**15.2**, Forest area as a proportion of total land area is retained through the production of wood pellets, sustainable management, and ecosystem conservation	Demand for forest products helps retain land in forests and promotes good management in the SE US

Other Strengths, Weaknesses, Opportunities, Threats

Strengths

- Displacement of fossil fuels (primarily coal) with bioenergy supports renewable energy goals
- Conservation of forests through sustainable, green economy jobs and the efficient use of waste material

Opportunities

- Economic and social sustainability opportunities through transition to low carbon economy industries, local use, rural jobs, innovations
- Incentives for better management of SE US forests benefit water quality and wildlife while reducing risk of fires and insect outbreaks

Weaknesses

- Accounts for only a small portion of forest industry products
- US government does not currently support use of pellets for energy; inefficiency due to exports versus opportunities for local utilization

Threats

- Policies that exclude wood-based bioenergy from renewable energy and climate programs
- Public perspectives are being influenced by lack of understanding about SE US forest ecosystems

Other Sources

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US Energy Information Agency - data on densified biomass, including volumes produced and feedstock sources (Table 3) for wood pellets: https://www.eia.gov/biofuels/biomass/#table_data