



About



Oregon Torrefaction, LLC (OTL) is an Oregon Benefit Company formed to develop and serve a market for biomass that supports forest restoration activities. Our mission is "To advance forest health and rural, forest-rich community vitality". As a Benefit Company, Oregon Torrefaction seeks to create a material, positive impact on society and the environment. To do this, OTL will develop the first, sustained, full-scale torrefaction facility to demonstrate commercial production that achieves the cost, quality and product volumes needed to allow the torrefied biomass market to fully develop. We are also focusing on the use of forest restoration residuals, which while it can be a difficult and expensive raw material -- achieves our mission and that of our partners the U.S. Endowment for Forestry and Communities (Endowment) and the USDA Forest Service (USFS). In addition to this first facility in the Pacific Northwest, OTL will also participate in the development of additional facilities throughout North America to grow the market. We will focus our efforts on forest restoration-based projects, but recognize that for a reliable, large volume market to emerge, forest based fuel sources and multiple facilities will be necessary.

Our Experience

In 2016 Oregon Torrefaction signed a purchase order with Portland General Electric (PGE) to be the sole supplier of torrefied biomass for testing at PGE's 600 MW Boardman Coal-fired Power Plant. We provided 5,000 tons of torrefied biomass fuel in a four-month period to support PGE's plans for a series of test burns, including a 100% test. These successful tests demonstrated that torrefied biomass fuel can be substituted 100% for coal in an existing power plant with few plant modifications. We tested six different technologies and processes allowing evaluations of integrated torrefier system performance and product quality. This in-depth experience puts Oregon Torrefaction at the forefront of this emerging industry. Moving forward, our well-rounded Board brings senior executive experience in forest products manufacturing and business development. Our operational partner, Ochoco Lumber, brings decades of local fiber sourcing and lumber mill experience including developing and operating an integrated biomass processing facility and pellet mill operation.

5,000 Tons of Torrefied Biomass at the Boardman Power Plant, December 2016

Quality	Kiln Torrefied Biomass	PRB Coal
Energy Density (Btu/lb)	8,700+	8,500
Bulk Density (lbs/ft ³)	40	60
Hydrophobic?	Yes	Yes
Grindability (HGI)	20-25	55+
Passing <200 mesh (%)	2	70
Moisture (%)	4 - 6	30
Color	Brown to Dark Brown	Black
Form Factor or shape	Cylinder pellet ≈ 10 mm	Irregular





Oregon Torrefaction Grant County Project

OTL will develop and operate its initial commercial-scale torrefied biomass fuel processing facility, in John Day (Grant County) OR. The facility will sustainably source biomass from national forest restoration activities on the Malheur, Ochoco and Deschutes National Forests as well as biomass from private land management and mill residuals. The torrefied fuel will be sold to domestic and off-shore utilities under long-term contracts and in smaller quantities to facilitate expanded power plant testing and market development. The location in John Day with nearby rail trans-shipment in Prineville, OR facilitates local, regional and international deliveries. Our operational partner, Ochoco Lumber, is headquartered in Prineville and there is an available workforce with experience in the forest products industry and the related skills needed for a torrefaction facility.

The rail trans-shipment facility will be located at Prineville's city-owned rail depot. The site provides existing warehouse and dedicated buildings, good site services and importantly -- the ability to load directly onto enclosed rail cars with enough rail storage for a full unit train to facilitate efficient and cost-effective transportation to The Port of Longview in Washington or other customer locations. The city owned railroad is served at a nearby junction by both BNSF and UP railroads. The facility in Grant County will be a 100,000 ton per year production capacity, but will undertake a phased ramp up with initial production beginning in 3rd quarter 2018 at 40,000 – 50,000 tons per year. OTL is finishing a detailed technology evaluation and project design phase and is in the process of making final component selections that will provide the optimal product to meet customer product requirements. Oregon Torrefaction is currently entering into letters of intent for fuel deliveries

Related Market Development Efforts

The Endowment and US Forest Service have made significant investments in jump-starting the torrefied biomass industry. They formed the Consortium for Advanced Wood-to-Energy Solutions (CAWES) to address knowledge gaps and to advance commercial status. This work is vital to the Industry's success. Through CAWES, we have engaged with most of the industry participants in an early stage, non-competitive manner to share learnings and avoid duplicating mistakes. Specific areas of investigation included optimizing densification, de-ashing techniques to extend the sources of raw material to lower-cost biomass, utility scale testing, safety evaluation, life cycle and techno-economic analysis. This knowledge base will help ensure OTL's and, most importantly -- our customers' success.

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