



# Restoration Fuels



## AT A GLANCE

### WHAT

Restoration Fuels LLC, a wood torrefaction plant

### WHERE

Co-located at the Malheur Lumber Company in John Day, Oregon

### WHEN

Plant commissioning expected late 2019

### WHO

Restoration Fuels is a subsidiary of the U.S. Endowment for Forestry and Communities

### MARKET POTENTIAL

Energy generation world-wide

### INVESTMENT

\$15.5 million

### JOB POTENTIAL

18-20 employees  
hired locally

### PLANT MANAGER

Joe Koerner  
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## ABOUT US

Restoration Fuels is a torrefaction facility co-located with the Malheur Lumber Company in John Day, Oregon and surrounded by the Malheur National Forest. We use tree thinnings and low-value wood materials primarily coming from stewardship projects in national forests to produce environmentally-friendly fuel for energy.

Torrefaction is the roasting of wood in a low-oxygen environment - like roasting coffee beans - and produces a renewable biomass fuel that is a direct replacement for coal at existing power plants. The market demand for this product has the potential to meet our forest health needs both in the near- and longer-term.

The facility is comprised of individual operations that are nearly identical to the current pellet mill operations at Malheur Lumber. The plant consists of a wood-fired boiler, a belt dryer, a rotary kiln torrefaction reactor, and a briquetting system.

The plant is being designed for a production capacity of 100,000 tons of product annually. The first few years will be a ramp-up period; we anticipate achieving full production capacity by the third year of operations. Restoration Fuels is a subsidiary of the U.S. Endowment for Forestry and Communities, the nation's largest public charity dedicated to keeping forests as forests and advancing family-wage jobs in forest-rich rural communities. Almost everything the Endowment does to advance its North American mission is rooted in market-based solutions.

## TORREFACTION: A SUSTAINABLE SOLUTION

Restoration Fuels is committed to ensuring healthy and productive forest ecosystems for generations to come. By providing a revenue stream for forest thinnings and forest restoration byproducts, Restoration Fuels aids public and private landowners in mitigating the risk of catastrophic wildfire, disease, pest infestation and the effects of climate change.

Wood fiber, roasted in the absence of oxygen at very high temperatures (between 400-750 degrees Fahrenheit), becomes a material that is similar to coal. The resulting product looks, feels and acts like coal, but is made from wood instead of fossilized carbon that is millions of years old. The resulting product has a similar energy content to coal, is easily grindable, is very dry and resists water and doesn't easily degrade so it can be stored outside – a win-win for both the world's environmental and energy demands today.



Torrefied wood pellets ready for energy generation.

## RELATED MARKET DEVELOPMENT

The Endowment and U.S.D.A. 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 Restoration Fuels and, most importantly, our customers' success.

## TIMELINE

- Endowment and the U.S.D.A. Forest Service establish Wood to Energy (W2E) Fund. Torrefaction is a top priority. Pilots are identified.

**2010**

- Endowment forms Oregon Torrefaction, LLC (OT) with Bonneville Environmental Foundation and Ochoco Lumber as partners.
- OT produced >5000 tons of torrefied material for Portland General Electric.

**2016**

- Endowment Board approves project and investment.
- Restoration Fuels, LLC formed.
- OT kicks off full engineering and project development activities.

**2018**

**2014**

- Endowment and the U.S.D.A. Forest Service form Consortium for Advanced Wood-to-Energy Solutions (CAWES).
- Work is funded at multiple research institutions.

**2017**

- Completed full-scale testing at PGE Boardman Power Plant - 100% biomass & multi-day co-firing.
- Endowment approves initial investment in OT-Grant County Project.
- OT completes technology evaluation and proof of concept runs.

**2019**

- Restoration Fuels, LLC project construction begins with completion expected end of year.

## CONTACT US

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