Biofine Developments Northeast Inc. (BDNE)

BDNE, formed in 2019, is a biorefinery development company focused on establishing a biofuels and renewable chemicals industry in Maine. BDNE is the exclusive licensee of a suite of patents that enables the economic production of biofuels and chemicals identified by the DOE as key to developing the industrial bioeconomy.

BDNE is currently in the final stage of a multi-year development program that will culminate in the financing and construction of our first commercial biorefinery. This development effort has been supported by the heating oil industry, Maine Technology Institute, and The University of Maine, where, the B2P2 pilot plant utilizes the patented Biofine technology to produce biofuels from Maine biomass at the Emerging Technology Center in Old Town.

BDNE’s lead product, ethyl levulinate (EL), is a third-party verified CO₂ negative heating fuel¹ produced from woody biomass and other cellulosic wastes including municipal solid waste, recycled paper, and cardboard. EL use is widely supported by the 5 billion gallon per year heating oil industry, which, at the 2019 Northeast Industry Summit, pledged to decrease carbon emissions by 15% by 2023, 40% 2030, and establish net-zero-carbon emissions by 2050.²

BDNE has worked closely with the heating oil industry, State of Maine, and University of Maine to establish EL as a fuel that is, “at least five years ahead of other renewable heating fuel products”.³ As a result of our work with National and State Industry groups and our fuel development partners demand for EL in the Northeastern US over the next 10 years is estimated to exceed 250 million gallons annually.

To satisfy this demand BDNE would look to build 8 large-scale biorefineries in Maine by 2030, positioning the State as a hub of innovation and a global leader in the industrial bioeconomy. This development plan falls directly in line with the Maine Climate Council’s recommendations and also the 10-year Economic Development Strategy. Development of a biofuels and biochemicals industry has the potential to generate huge economic and environmental benefits for the State.

These include:

- **Total Industrial Investment ~$1.7 billion**
  - Repurpose underutilized industrial assets throughout Maine

- **Annual Revenues of ~$1.3 billion**
  - Significant contribution to local and state tax base

- **~1,850 New Jobs⁴**
  - Focus on Rural Maine
  - Job Security for the 9,000 families currently employed by heating oil industry in ME.

- **Revitalization of Forest Industry & Post-Consumer Waste Paper Markets**
  - BDNE Demand for Woody Biomass and/or Post-Consumer Paper/Cardboard ~4 million green tons/year

- **Total CO₂ Equivalent Emission Reductions ⁵**

---

¹ 2019 EarthShift Labs GREET Study
² Providence Resolution Northeast Industry Summit 2019
³ John Huber, President of the National Oilheat Research Alliance
⁴ INRS Jobs Study
⁵ EarthShift GREET Report
- 2.9m tons/year
- 30% of Maine’s 2030 Total Reduction Goal
  - 45% below 1990 Levels = 9.7m tons/year reduction

- CO₂ Equivalent Reduction Equivalency (yearly)⁶
  - 636,881 cars off the road
  - 636 wind turbines (operating at 100% efficiency)
  - 3.85 million acres of forest sequestration
  - 6,82 million barrels of oil imports avoided

The below graphic is from the 2019 EarthShift Labs GREET Study – This report shows GHG emissions reduction of over 100% when using EL produced via the Biofine Technology when compared to Ultra Low Sulfur Diesel and Biodiesel.

The action steps in the Economic Development Strategy that are most relevant are:

1. Action F3 – control and reduce energy costs,
2. Actions C1 & C2 related to investing in innovation,
3. All of the workforce development efforts to grow local talent and attract new talent.

While we have been working hard to ensure success, there are still some barriers that could derail our development. These include:

1. Access to capital: Financing industrial biorefineries is not easy and is expected to be even more difficult as capital markets tighten due to COVID-19. Any financial support through incentives, FAME, or any other venue would be very beneficial to any biomanufacturing company looking to develop in Maine.

2. Regulatory Hurdles: Support from the Maine Fuel Board to ensure that EL is able to be used as a substitute for home heating and commercial fuels prior to securing ASTM and UL certification.

Recommendation for Support

1. Create a FAME Program that Results in a Technology Wrap – Developing a validation and efficacy program for new technologies would reduce engineering risk and make project investment more attractive to lenders and investors.

2. Establishing a Rebate Program to Cover the Cost of EL Conversion: Include biofuel infrastructure conversion in the Efficiency Maine rebate program.

3. Incentivizing Production and Use of Bioproducts: LD1698 provided huge support for biochemical production but limited the benefit provided to biofuels. It would be hugely beneficial to expand the

---

⁶ EPA Equivalency Calculator
biofuel credit to incentivize production for energy rather than chemicals. In addition, it may be attractive for the State to create a credit program that could be used to offset emissions.

4. **Use the State’s significant purchasing power to advance the goals of the Economic Development Strategy**: Purchase of biofuels would advance the goals related to Climate Commission and the Economic Development Commission by expanding the market for biofuels. Additionally, an offtake agreement with the State of Maine would significantly reduce project risk and increase ability to attract investment.

5. **State support for Expansion of RINS qualified feedstocks**: This would create valuable new markets for products that are currently considered waste. Suggested materials for inclusion are sawmill waste, paper sludge, recycled paper and cardboard, and municipal solid waste.