These assessments were projects of the Northwest Advanced Renewables Alliance (NARA).

Using residual biomass from logging operations as feedstocks, NARA aims to create a sustainable industry to produce aviation biofuels and value-added co-products.

November 2016: Alaska Airlines made the first commercial flight powered in part by renewable fuel made from wood waste salvaged from tribal and private lands in Washington, Oregon, and Montana.

NARA was funded from 2011 through 2016 by the Agriculture and Food Research Initiative competitive grant no. 2011-68005-3016 from the USDA National Institute of Food and Agriculture.

USDA is an equal opportunity provider, employer, and lender.
A wood-fueled biorefinery: What would it produce?
A case study—Longview, Washington

**SUSTAINABLY PRODUCED PRODUCTS FOR REGIONAL, NATIONAL, AND INTERNATIONAL MARKETS**

Products include:
- Biofuel blend for refueling planes at regional airports.
- Lignosulfonates, used by the concrete industry around the world.
- Activated carbon, used in air filters at U.S. coal-fired power plants.

**JOBS AROUND THE REGION**

A wood-fueled biorefinery would lead to jobs in many different sectors. The estimates below are for the Pacific to Cascade Crest region of western Washington and Oregon, assuming construction of a bio-refinery in Longview, Washington.
- **10,000 jobs** over 3 years related to construction of biorefinery.
- **2,170 jobs** related to annual operation of biorefinery and meeting needs of plant employees, their families, and plant suppliers:
  - **170 jobs** at the biorefinery
  - **820 jobs** to meet household needs of plant owners, employees, and suppliers (restaurants, hospitals, local retail, etc.)
  - **1,170 jobs** associated with meeting supply needs of the biorefinery

**INDUSTRIES WITHIN THE REGION THAT WOULD MOST BENEFIT FROM A WOOD-FUELED BIOREFINERY:**

<table>
<thead>
<tr>
<th>Industry</th>
<th>Projected revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biorefinery</td>
<td>$327,000,000.00</td>
</tr>
<tr>
<td>Logging</td>
<td>$48,500,000.00</td>
</tr>
<tr>
<td>Nonresidential remodeling and repair</td>
<td>$40,800,000.00</td>
</tr>
<tr>
<td>Electric power distribution</td>
<td>$40,700,000.00</td>
</tr>
<tr>
<td>Sawmills</td>
<td>$22,700,000.00</td>
</tr>
<tr>
<td>Truck transportation</td>
<td>$17,400,000.00</td>
</tr>
<tr>
<td>Wholesale trade</td>
<td>$17,400,000.00</td>
</tr>
<tr>
<td>Owner-occupied dwellings</td>
<td>$14,400,000.00</td>
</tr>
<tr>
<td>Industrial gas manufacturing</td>
<td>$11,400,000.00</td>
</tr>
</tbody>
</table>

**LOGGING AND TRUCKING: ECONOMIC BENEFITS TO THESE INDUSTRIES BY COUNTY**

Branches, bark, and other forest residuals from timber harvests would fuel the biorefinery. Because of transportation costs, the forestry sectors in counties closest to the proposed plant benefit the most:

**Volume of woody material by county**

- Cowlitz WA 18%
- Lewis WA 16%
- Wahkiakum WA 6%
- Columbia OR 7%
- Pacific WA 13%
- Clark WA 6%
- Tillamook OR 4%
- Washington OR 5%
- Clark WA 6%
- Tillamook OR 11%
- Clatsop OR 14%