Forest Based Feedstocks and Biofuel

Panel on Research, Development, and Commercialization of Advanced Biofuels in the Northwest
Biomass Research and Development Technical Advisory Committee | May 22, 2012

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Vice President, Finance
Catchlight Energy LLC
# Weyerhaeuser: Forest Products Leadership

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<th><strong>FOUNDED:</strong></th>
<th>1900</th>
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<tbody>
<tr>
<td><strong>2011 REVENUES:</strong></td>
<td>$6.2 Billion</td>
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<td><strong>FORTUNE 500 RANK:</strong></td>
<td>147</td>
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<tr>
<td><strong>NUMBER OF EMPLOYEES:</strong></td>
<td>12,800 in 11 countries (U.S.: 10,200)</td>
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<td><strong>TECHNOLOGY STAFF:</strong></td>
<td>300 scientists / engineers</td>
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<td><strong>FORESTLAND OWNED OR MANAGED:</strong></td>
<td>20.5 million acres (U.S.: 6 million acres)</td>
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<td><strong>HOME OFFICES:</strong></td>
<td>Federal Way, WA</td>
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<tr>
<td><strong>OPERATIONAL EXPERIENCE:</strong></td>
<td>Australia, Brazil, Canada, China, France, Indonesia, Ireland, Japan, Malaysia, Mexico, New Zealand, Philippines, Uruguay, USA</td>
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<td><strong>SALES AND SUPPORT:</strong></td>
<td>Worldwide (&gt; 60 Countries)</td>
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OUR VISION
SUPERIOR SUSTAINABLE SOLUTIONS FOR THE WORLD

HOW WE DELIVER THE VISION

Performance: We delight our customers and generate top-quartile returns. We hold ourselves accountable.

People: We attract diverse, high-performing talent. Our employees are engaged and proud advocates for our company. We invest in our people and communities.

Planet: We conserve natural resources. We address society’s needs with sustainable, innovative solutions.

WHAT SUCCESS LOOKS LIKE

Safely Make Money: We deliver superior sustainable solutions that provide shelter, create green energy, and make lives more comfortable.

Focused Growth: We grow with our customers, forge partnerships, explore new business models, and take advantage of market opportunities.

Satisfied Stakeholders: Our investors, customers, employees, and communities know we are a company that delivers sustainable results.

OUR VALUES
Safety • Accountability • Integrity • Citizenship • Innovation
• Joint venture between Chevron and Weyerhaeuser
• Our Mission is to commercialize the large scale production of liquid transportation fuels from sustainable forest based resources
• Our Vision is to be the leader in delivering advanced biofuels “from forest to fuel”
• We will research, develop & commercialize the technologies & business models to produce 2nd generation biofuels
• We leverage synergies between Catchlight Energy, Chevron, Weyerhaeuser, and third parties
End-to-End Value Chain Solution Leverages the Strengths of Two Natural Resource Leaders

Feedstocks at Scale

Conversion Technology

Fuel to Customers

Weyerhaeuser
Goals and Challenges

• Commercialize integrated “forest to fuel” solution
  – Sustainable biomass and supply chain to end customer
  – Feedstock available and economic at scale
  – RFS2 implementation
  – Economic conversion technology (internal and 3rd party)
  – Product integration into Downstream infrastructure

• Competitive financial return

• Build, own and operate facilities – feedstock supply/product offtake in short term

• Finding the right partners – technology, business model
Feedstock Strategy

• **Forest-based**
  – Utilize forest potential to produce additional biomass
  – Build on Weyerhaeuser's existing infrastructure
  – Supplement with third party supply
  – Leverage superior supply assurance of woody biomass
  – Avoid using food-producing acreage

• **Grow energy crops in conjunction with timber**
  – Maintain supply for traditional forest products
  – Deliver a new and sustainable resource for biofuels

• **Achieve scale**
Examples of biomass research being conducted in sustainability science

- Capitalizes on Weyerhaeuser’s expertise in sustainability research
- Weyerhaeuser collaboration with the US Forest Service, Oregon Department of Forestry and other partners on the Trask River Watershed Study in western Oregon
- Large-scale studies in Southeast U.S.
- Identifying ecosystem effects: Soil, water, wildlife/biodiversity, carbon life cycle analysis
Partnering for Aviation Biofuels

- Multi-stakeholder collaboration is important in developing biofuel solutions
- In the Northwest Advanced Renewables Alliance (NARA) scientists are taking a holistic approach to building a supply chain for aviation biofuel

- Led by Washington State University and supported by a $40 million grant over five years from the USDA (Agriculture and Food Research Initiative Competitive Grant no. 2011-68005-30416 from the USDA National Institute of Food and Agriculture)
- Target feedstock includes northwest softwood residues
- Weyerhaeuser focus
  - Sustainable feedstock production
  - Feedstock logistics
  - Conversion of lignin to high value products
- Catchlight Energy advisory role in pretreatment of softwood
Summary

• Weyerhaeuser has been managing forests for over 100 years, and the forests are certified under the Sustainable Forestry Initiative (SFI)

• Catchlight Energy, a joint venture between Chevron and Weyerhaeuser, was formed to commercialize the large scale production of liquid transportation fuels from sustainable forest based resources

• Multi-stakeholder teams in the Northwest are working on solutions to produce advanced biofuels from woody biomass

• Cellulosic biofuel can fill an important role in diversifying energy sources by providing a source of low carbon transportation fuel