Special thanks to:

Dr. Joe Clark
Dr. Don Hodges
Dr. Mark Fly
Dr. Miriam Davis
Dr. Siqun Wang
Any connections?

Hydrogen power
electric
solar
Biodiesel
wind
Ethanol

Carbon fiber utilized in each industry

Hydrogen power
electric
solar
Biodiesel
wind
Ethanol

http://www.utsi.edu/research/carbonfiber/cf.htm
Carbon Fiber is a very strong, lightweight, synthetic fiber often bound together in a matrix with epoxy or plastic resin by heat, vacuum, and pressure.

http://www.carbonfiberguru.com/what-exactly-is-carbon-fiber

Carbon fiber mat
(bidirectional weave)
Organosolv Solvent Fractionation

Similar to the paper industry

Black liquor is recovered and processed to separate lignin component from the hemi-cellulose component

Black Liquor

The black liquor is split by a phase separation caused by adding NaCl

Each phase is drained from a separatory funnel and dried
Lignin as the Precursor

1. The precursor is drawn into long strands and then heated in an anaerobic environment.
2. Most non-carbon atoms are expelled during the process leaving a carbon fiber.
3. After spinning, the fibers are stabilized and carbonized.
4. Surface treatment and sizing

Polyacrylonitrile is currently the major source of precursor used in carbon fiber production. It is a synthetic resin created by the polymerization of acrylonitrile.

http://pslc.ws/macrog/pan.htm

Entomological impacts

Goal: To study the possible affects of insects on biomass
DNA Fingerprinting

Goal: To utilize PCR and other technologies to create a DNA profile of the biomass samples

PCR

Polymerase Chain Reaction-
Technique used to quickly amplify regions of DNA

Special thanks to:

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<thead>
<tr>
<th>Name</th>
<th>Department</th>
<th>Tenure</th>
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<tbody>
<tr>
<td>Dr. Max Cheng</td>
<td>Tree physiology</td>
<td>Summer 2007</td>
</tr>
<tr>
<td>Dr. Tom Mueller</td>
<td>Wood science</td>
<td>Summer 2008</td>
</tr>
<tr>
<td>Dr. Neal Stewart</td>
<td>Plant genomics</td>
<td>Fall 2008</td>
</tr>
<tr>
<td>Dr. Joe Bonell</td>
<td>Organic chemistry</td>
<td>2008-present</td>
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<tr>
<td>Dr. Darren Baker</td>
<td>Material science</td>
<td>present</td>
</tr>
<tr>
<td>Dr. David Harper</td>
<td>Wood science</td>
<td>present</td>
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</tbody>
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Questions?

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