

Federal, HSU project seeks to improve biomass energy capabilities



Larry Cumming, the president of Eugene, Oregon-based Peterson Pacific Corp., explains to a tour group at Green Diamond Resource Company's Big Lagoon Tree Farm on Wednesday how wood chips are sorted by size when making renewable biomass fuels. The tour showed the progress of the \$5.9 million Waste to Wisdom project led by Humboldt State University and the U.S. Department of Energy, which seeks to make biomass energy production more cost-effective and collaborative. Will Houston — The Times-Standard

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<http://www.times-standard.com/general-news/20150627/federal-hsu-project-seeks-to-improve-biomass-energy-capabilities>

Posted: 06/27/15, 9:40 PM PDT|Updated: 1 day ago



John Crouch of the Pellet Fuels Institute (right) shows off briquettes of assorted wood chips that had been passed through a briquetter machine during a tour of Humboldt State University's \$5.9 million Waste to Wisdom project. The project, backed by the U.S. Department of Energy, seeks to discover a cheaper way of producing, processing and transporting biomass fuels such as wood chips. Will Houston — The Times-Standard

In the isolated timberlands east of Big Lagoon, a multimillion-dollar project led by Humboldt State University and the U.S. Department of Energy is working to harness the bountiful biofuel within the forests for use as renewable energy here and abroad.

Entering its second year, the Waste to Wisdom project is seeking the best methods to process and transport leftover wood material from timber cuts to be used in renewable energy plants and land restoration. One of the project's principal investigators, professor Han-Sup Han of HSU's Department of Forestry and Wildland Resources, said the goal of the project is to make biomass fuel production more cost-effective and collaborative.

"Right now, timber operations and biomass are completely separated," Han said. "We're trying to push them together."

Members of the public joined officials from energy and natural resources organizations on Wednesday for a tour of the nearly \$5.9 million project at Green Diamond Resource Company's Big Lagoon Tree Farm. There, the project's partners showed off a variety of technologies ranging from a tree-shredding microchipper to portable biomass power generators.

Redwood Coast Energy Authority Executive Director Matthew Marshall said that the project has the potential to restore two recently idled biomass energy plants in the county.

“The challenge is it’s not the cheapest electricity,” he said. “We have to balance whether we want local renewables or the cheapest possible power. I think we can still make it work, but the devil is in the details.”

Biomass energy

Biomass is another name for material derived from plants or animals that can be broken down to release stored energy. Biomass fuels, such as wood, can be utilized in several ways. A common method used at biomass energy plants is to burn the material in boilers, which produces steam that will spin a turbine, generating electricity.

About 68 million dry tons of woody biomass in the form of forest residues — like treetops, limbs and branches — are produced in the country each year from logging and tree thinning operations, with about 28 million acres of western U.S. National Forest land are described as having “unnatural or excessive amounts of woody vegetation” causing them to be more prone to wildfires and insect infestation, according to Waste to Wisdom.

Despite this abundance of material, the isolation of logging sites and the costs needed to transport and process the materials for use at biomass plants often outweighs market prices for biomass fuels. As a result, these materials go unused.

During the tour at Green Diamond’s tree farm, the touring buses stopped in front of a partially barren hillside where mounds of broken logs, treetops, twigs and branches rose by the edge of the logging road. Green Diamond’s Mike Alcorn told the tour group that these timber piles would likely never make it to a biomass plant.

“All of this will be burned this winter,” he said.

These leftovers, known as timber slash, are often subjected to controlled burns due to them being wildfire hazard and due to the high cost — Han estimated about \$500 per acre — to sort out all of the usable wood.

With two local biomass power plants recently closed this year — the Eel River Power Plant in Scotia and Blue Lake Power LLC — Green Diamond spokesman Gary Rynearson said that their company has stopped removing biofuel from its lands, which it would normally sell to the plants.

“While we are working closely with the collaborators on the ‘Waste to Wisdom’ biomass study, all commercial-level biomass removal has stopped,” Rynearson wrote in an email to the Times-Standard. “It is still necessary to remove slash in some areas to reduce fire hazard and to ensure the harvested area can be planted with seedlings.”

Tech solutions

Having begun in September 2013, the three-year Waste to Wisdom project is seeking reestablish utilization of timber slash by partnering with energy companies and West Coast universities to analyze three areas relating to biomass production: economic and environmental sustainability, biofuel development and biofuel conversion technology.

The tour on Wednesday highlighted proven and prototype technologies that would make biomass fuel production both cost-effective at the commercial level and portable to be used in isolated logging sites, according to project officials.

Visitors were able to witness how biomass fuels are created from start to finish. The timber slash is first ground into precise chip sizes after being pushed through a large microchipper. The chips are filtered by size and then sent to a dryer to remove some moisture.

Technical and Project Manager Daron “Chuck” Norris of Indiana-based Norris Thermal showed visitors the next step in the process: torrefaction.

During torrefaction, the dried chips are heated even further in large machine to remove as much moisture and contaminants as possible to purify the fuel.

“It’s almost like roasting your coffee,” he said.

Norris said his company is currently developing a commercial dryer that would be placed in a 40 foot container, allowing it to be dropped at remote locations.

“You can pick it up with a helicopter and put it anywhere,” Norris said.

While the prototype torrefier could process a 55-gallon barrel of wood chips in 10 hours, Norris said the commercial-sized machine could handle 660 pounds of wood chips per hour.

Rather than loading loose wood chips on to a truck bed, the torrefied chips can be compacted into bricks allowing for six times as much material to be transported.

During its third year, the project will begin testing the feasibility of using commercial-sized machines at the remote logging site.

Local energy plants

After Pacific Gas and Electric Co. decided not to renew its amended contract with the Eel River Energy Plant in Scotia in October 2014, 23 workers were laid off and the plant became idle. Currently owned by Greenleaf Power, the plant has no future prospect of reopening for the next several years, according to Greenleaf Power Vice President of California Operations Russell Huffman.

Huffman said the reason for the closure of the Eel River plant was due to natural gas power being a cheaper source of energy to produce than biomass power.

“The price [PG&E] paid for us to deliver power dropped below our price of energy production,” Huffman said.

Blue Lake Power LLC also became idle after its contract with San Diego Gas & Electric was bought out earlier this year, according to Marshall. DG Fairhaven Power LLC in Samoa is currently the only operating biomass plant in the county, Marshall said.

However, a decision the Board of Supervisors made at its Tuesday meeting sparked new hope for the two dormant biomass facilities. The board had directed staff to create an ordinance that would create a community choice aggregate program. This program allows cities and counties to be the purchaser of electric energy for residents within a community and choose where what type of energy it purchases. One of the expressed interests of the board was the ability to restore jobs and operations at the two closed biomass power plants.

“One of the key drivers for doing a community choice aggregation program is the potential to have local renewable generation and we’ve got the three existing biomass power plants,” Marshall said. “I think this is a great opportunity for us to say this is important to our community to support the broader forest products industry and all the connections that are there.”

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The Times Standard*