

Tyler County Forest Landowner Association Gemma Power Plant Tour – August 13, 2015

Facility Manager, Doug Tomison, welcomed twenty members of the Tyler County Forest Landowner Association (TCFLOA) to the East Texas Electric Cooperative (ETEC) Hilton Lively Renewable Power Project biomass facility in Woodville. Gemma Power Systems, LLC has a contract to run the facility through 2017.

ETEC is comprised of ten electric cooperatives, including the Sam Houston Electric Cooperative (SHECO). As a non-profit

organization, ETEC can neither accept any federal subsidies, nor does it pay income taxes. The facility is subject to local property taxes, per the terms of the agreement with Tyler County.

The plant, designed to produce up to 50 megawatts an hour, started operation on July 1, 2014. It was run at low levels for almost a year to work out the procedures and is now running efficiently. When running at full capacity, the plant burns about 1400 tons of wood per day, which equates to approximately 51 loads of woodchips, however if the plant is scheduled to run on the weekends, they have to receive additional loads on a daily basis to support weekend operations. Since the plant started, 104,000 megawatts of power has been produced. The plant uses some of the electricity produced; the rest goes to the electric grid.



20 TCFLOA members attended the tour.



On a daily basis, employees check with Midcontinent Independent System Operator (MISO)

<https://www.misoenergy.org> to determine the price of electricity on the energy market; i.e., the price for which they can sell the electricity they produce. If the price is high enough to cover the immediate cost of production, the facility is brought online. A lot of the electricity is

purchased by distributors in Beaumont but could go as far as Canada once it hits the

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grid. Power prices sometimes change within 6 seconds. They don't bid into this market. They operate on the day ahead market, which is based on hourly prices. Prices have not yet reached a level to recover all the overhead costs associated with production, but market projections are for prices to rise over the next few years.

The facility was not producing electricity the day of the tour. When the plant is not producing electricity, the 28 employees work their scheduled hours performing cleaning and maintenance tasks. Jeff Strong, the Operations Manager, said they are frequently busiest when the plant is not running.

Because of energy prices, the plant is currently silent on most weekends. There was a period early this year when the plant did not operate because the wood was too wet because of heavy rainfall. The moisture needs to be around 38% to burn efficiently during processing. A large tractor is maintained on the premises to spread the waiting woodchip piles. The primary purpose of the Wagner chip dozer is to receive and stack fuel.



Delivery of the wood: The specialized woodchip trucks are weighed then backed onto one of the two truck tippers. A sample of the woodchips is taken to ensure quality. Then the whole truck is tipped so that the chips fall out of the back of the truck. Very interesting! If the wood is wet, the chips will be spread out on the back part of the lot for drying by the sun.

About wood: North American Procurement Company (NAPCO) is the plant's sole supplier of woodchips. The size of the chips matters because if they are too long, they will not make the turn in the tracks/belts to be traveled. While oak chips have the highest BTU value, pine chips are also good. However, eucalyptus is undesirable because they contain too many minerals. Ash in the chips is undesirable because it fouls the boiler and increases ash disposal costs. The plant is not permitted to burn trash, and they go to extremes to ensure that the wood chips are clean. While the plant cannot process a load of only leaves or pine straw, it is acceptable for some leaves and pine straw to be mixed with the woodchips.



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About the process: Huge fans blow over the fire in the boilers. There are cameras in the boilers to transmit live video of the fire to the control room. Employees in the control room watch for dark spots in the displayed flames. Dark Spots are not good. They indicated that there is either too much or too little wood at that spot. The employees in the control room monitor all parts of the operation. The air from the process is filtered and cleaned by a catalytic reactor. The plant's nitrous oxide and carbon monoxide emissions are less than .07 lb/BTUs -- which is 1/3 to 1/4 the normal that other plants produce. The biomass plant in Woodville is considered one of the cleanest in the nation.

About Water: Water plays an important role. Water from the high capacity water well is stored in a 750,000 gallon water tank. Appropriate small amount of this water is purified for use in the boiler to make up for any small leaks and continuous boiler blowdown for chemistry control. Additionally, six hundred gallons a minute of effluent gray water from the City of Woodville are used for cooling tower makeup. In case of a fire in the fuel yard, there are two large fire pumps, one of which is diesel, and a system of fire hydrants and water cannons that can be used to withdraw water from the large water tank filled by the plant's high-capacity water well. The facility uses the public water supply for its drinking water.



The "**bottom ash**" (residue left after the burn) should look like gravel and charcoal. If not, then too much carbon is left unburned. Now that the facility is running efficiently, the appearance of the ash has changed to reflect that the plant is achieving a much better burn than it did initially. The ash comes out a bit wet. We saw a sample of earlier produced ash; it had little pieces of wood still in the ash mix. The recent production sample, shown in the picture, does not contain pieces of wood.

Thanks to the Gemma employees for a wonderful, informative tour!

For more information, click on <http://www.gemapower.com/portfolio/hilton-lively-renewable-power-project/>.