

## **Open Solicitation**

### **Douglas County Forest Products 3.04-MW biomass cogeneration**

November 17, 2004

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#### **Purpose**

Douglas County Forest Products (DCFP) of Winchester, Oregon, proposes to install power generation equipment as part of a boiler upgrade already underway. This equipment would be fueled by hogged bark, shavings and sawdust, which represent biomass resources eligible for Energy Trust funding. DCFP is located in Pacific Power territory

Through Energy Trust's Open Solicitation Program (OSP), DCFP requests financing for the above-market project costs associated with power generation. This briefing paper documents the staff's review of the proposal. As part of our review, we seek input from the Renewable Energy Advisory Council (RAC).

#### **Recommendation**

Staff supports acceptance of this project into the OSP. We estimate \$727,000 as an upper bound on Energy Trust funding. It is also possible that the project might have no above-market component. The exact above-market costs will depend, among other factors, on interconnection costs and the price at which Pacific Power would purchase the electric output.

Our recommendation to the Board to fund the project will be contingent on the project meeting ETO's technical requirements; on DCFP obtaining a satisfactory power purchase agreement and interconnection agreement from Pacific Power; and on satisfactory clarification of several other areas of uncertainty regarding project costs.

#### **Background**

DCFP intends to install a biomass-fueled boiler to heat ten dry-kilns currently fueled by natural gas. Contingent on Energy Trust funding, they propose to upgrade this boiler to supply supercritical steam for a back-pressure turbine-generator. DCFP operations would provide all necessary biomass fuel.

Our expedited review of this project reflects DCFP's intention to proceed rapidly in securing the new boiler, and the short-term opportunity to help them add power generation to their plans. The boiler has been ordered from Wellons. We understand that DCFP has a 60-day window in which to specify whether to incorporate supercritical steam capacity into the boiler.

Given Energy Trust's high interest in the biopower sector, we offered to share with DCFP the cost of additional research to develop their proposal. This work was undertaken by RHT Energy Solutions.

#### **Relation to Strategic Plan**

This project meets Strategic Goal 2, by providing approximately 22.6 million kilowatt-hours (2.6 average megawatts) of electricity annually from a renewable resource; and Goal 4, by demonstrating biomass-fueled cogeneration in a sector that might potentially represent a key target for Energy Trust's Biopower Program, projected for launch in 2005.

## Technical Analysis

The project will use a Wellons wood-fired boiler operating at 100,000 pounds per hour of steam and 150 psig. The upgrade for power generation would produce an additional 28,000 pounds of saturated steam at 800 psig and 825 degrees, routed to a used and reengineered General Electric 6.25-MW steam turbine.

The project would include construction of silos to dry and mix the biomass fuel. In the analysis below, we allocate 20% of the cost of the silos to the power generation components of the project, and the rest to DCFP's base-case boiler upgrade.

DCFP expects to sell the entire output of the project to the grid, thus avoiding standby charges.

## Benefits

This project will demonstrate biomass cogeneration in the forest products sector, which may offer Energy Trust additional project opportunities in coming years. Our experience to date with this proposal has provided insight into how Energy Trust might structure its Biopower Program, and how best to analyze applications of this sort.

Assuming zero net greenhouse gas emissions from this project, the electricity produced by the turbine will help avoid 316,484 standard tons of CO<sub>2</sub> emissions over its first 20 years of operation. To sequester this much carbon would require planting approximately 6,279 acres of forest.

At a levelized cost of 0.26 cents per kilowatt-hour, this opportunity represents an extremely low-cost renewable resource.

## Cost Analysis

The table below summarizes our high-end estimate of project costs. We base our analysis on a system life of 20 years. We have modified DCFP's proposed costs through assessing what is "usual and reasonable" for some individual cost components.

Total installed costs	\$3,332,370
NPV of operating costs	5,364,426
NPV energy output	(5,800,392)
NPV BETC net of Federal tax impacts	(560,838)
NPV of tax value of depreciation	(766,613)
Proposed ETO Production Efficiency incentives	(34,800)
5-year Production Tax Credit	(806,994)
<b>NPV above-market costs</b>	<b>\$727,159</b>

### Notes:

1. "Total installed costs" includes incremental cost to upgrade the boiler, installed cost of turbine generator, and a portion of silo construction cost.
2. This analysis calculates assumes a discount rate of 10%.
3. The energy value assumes a power purchase price of 2.3 cents/kWh, inflated over time at 3.9%.
4. The NPV for the state's Business Energy Tax Credit (BETC) recognizes that federal tax liability may increase due to lower state tax payments, since state taxes are deductible.
5. This analysis assumes the Energy Trust would take title to all green tags.

In order to bracket Energy Trust's greatest possible contribution to the project, we tend to use estimates leading to high – although still reasonable – above-market costs. Changes in key components might change project costs appreciably. For instance, changing the power purchase price to 4.3 cents/kWh, the upper end of the range quoted to DCFP by Pacific Power, would place the project over \$4 million in the black.

An award of \$727,159 from Energy Trust to DCFP represents 9.1% of the net present value of project costs. On a capacity basis, our award is equivalent to \$239.51 per kilowatt. On a levelized basis, our payment represents 0.26 cents per kilowatt-hour.

Our proposed award will be paid contingent on continued energy production.

### **Committee and Public Review**

With the help of an outside consultant, staff began analyzing the project in October of 2004 on an expedited basis, in response to DCFP's hope for a funding decision in time to make their boiler purchase. Staff seeks input and review by the RAC on November 17, 2004. By Board policy, a project of this size must seek approval on the Board's regular agenda. The Board next meets December 15, 2004.