

## **Douglas County Forest Products 3.04-MW Biomass Cogeneration project**

December 15, 2004

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### **Purpose**

Adoption of this resolution authorizes Energy Trust staff to negotiate, and the executive director to execute, a contract of up to \$727,159 with Douglas County Forest Products (DCFP) to develop a biomass cogeneration project, provided contract terms are substantially the same as those presented in the resolution. Board action is requested now to accommodate DCFP, which must make go/no-go decisions before the next board meeting in February 2005.

### **Background**

Douglas County Forest Products operates a stud mill in Winchester, Oregon, in Pacific Power territory. To fuel the boilers that produce steam for the 10 kilns in which they dry lumber, the firm is switching from natural gas to wood waste. As part of that upgrade, they propose to install additional equipment allowing the generation of electric power.

Specifically, DCFP will upgrade the boiler to supply supercritical steam for a used GE back-pressure turbine-generator. The boiler will be fueled entirely by hogged bark, wood shavings and sawdust resulting from DCFP operations. These materials, which DCFP currently sells offsite, represent biomass resources eligible for Energy Trust funding.

DCFP requests financing for the above-market project costs associated with the power generation components of the upgrade. In the absence of a Biopower program (scheduled for launch in 2005), Energy Trust received this application through the Open Solicitation program. Staff employed the process and rigor of the established Open Solicitation to evaluate the DCFP proposal.

DCFP has ordered its boiler from Wellons. We understand that they have a six- to eight-week window in which to tell Wellons whether or not to incorporate supercritical steam capacity into the boiler, and to finalize their purchase of the turbine-generator. If DCFP elects to proceed with this project, it will be necessary for Energy Trust to act before the next board meeting, scheduled for February 5, 2005.

Our expedited review of this project, and our request for permission to negotiate and execute the contract, reflects DCFP's need to fit this power generation project into a larger, fast-moving capital improvement schedule, as well as the extraordinary opportunity for Energy Trust to procure a large quantity of low-cost renewable energy on behalf of Pacific Power ratepayers.

### **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 base-case project will use a Wellons wood-fired boiler operating at 80,000 pounds of steam per hour and 150 psig. The upgrade for power generation would produce an additional 20,000 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 mix and keep dry the biomass fuel. In the analysis below, we allocate 25% 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 the emission of 316,484 standard tons of CO<sub>2</sub> over its first 20 years of operation. To sequester this much carbon would require planting 6,279 acres of forest.

In fact, there will be a net greenhouse gas benefit from this project. DCFP currently sells the biomass waste offsite. Using it onsite as fuel would avoid the diesel emissions associated with transporting it (at high moisture content and therefore high weight) to buyers' premises.

At a levelized cost of \$0.0024 per kilowatt-hour (i.e., about a quarter of cent), this opportunity represents an extremely low-cost renewable resource.

## Cost Analysis

The table below summarizes our approximation of project costs. We modified DCFP's proposed costs through assessing what is "usual and reasonable" for some individual components.

Total installed costs	\$3,096,976
NPV of operating expenses	8,304,271
NPV of energy output	(9,256,212)
NPV of BETC net of Federal tax impacts	(521,221)
NPV of accelerated depreciation	(724,345)
Proposed ETO Production Efficiency incentives	(34,800)
NPV of 5-year Production Tax Credit	(894,669)
<b>NPV of above-market costs</b>	<b>\$727,159</b>

This figure represents an up-to limit on the Energy Trust renewable energy incentive. Actual project costs will vary. Key unknowns include the cost of interconnection to the Pacific Power grid and the power purchase price that DCFP will ultimately negotiate with Pacific Power.

Depending on the resolution of these issues, the costs may be lower than \$727,159. It is even possible that the project may have no above-market component. Should the costs exceed \$727,159, DCFP understands that Energy Trust may be unable to fund the entire above-market cost due to budgetary constraints.

An award of \$727,159 from Energy Trust to DCFP represents 6.4% of the net present value of project costs. On a capacity basis, our award is equivalent to \$239 per kilowatt. On a levelized basis, our payment represents 0.24 cents per kilowatt hour.

While originally proposed under the Open Solicitation program, funds for the project would be paid from the proposed budget allocations for Biopower for PacifiCorp in 2005.

### **Proposed Contract Terms**

We expect to propose the following contract terms:

- 15- to 20-year contract term
- Ownership by Energy Trust of all green tags
- Energy Trust grant to be escrowed
- Payment on actual energy production over the first 7 years of commercial operation, with a true-up period of up to 3 years if production is less than expected
- Other standard Energy Trust contracting terms

### **Committee and Public Review**

Given Energy Trust's high interest in the biopower sector, we offered to support additional research to develop the DCFP proposal. This work was undertaken by RHT Energy Solutions in October 2004. We also contracted with BioContractors, Inc., to provide additional technical support and a second review of the project costs. Staff sought input and review by the Renewable Energy Advisory Council on November 17, 2004. The RAC endorsed the project.

### **Recommendation**

Staff supports acceptance of this project. Our recommendation to fund the project is contingent on the project meeting Energy Trust's technical requirements, and on DCFP obtaining a satisfactory power purchase agreement and interconnection agreement from Pacific Power. If final costs exceed the requested amount and the project remains a good choice, staff would return to the board for additional funding authority.

Adoption of this resolution delegates authority to approve and execute the contract to the executive director, providing that terms do not change significantly from those described here.

## **RESOLUTION TO FUND DOUGLAS COUNTY FOREST PRODUCTS BIOMASS COGENERATION PROJECT**

### **WHEREAS:**

- I. **Energy Trust staff has received and reviewed a proposal from Douglas County Forest Products to install a biomass cogeneration system 3.04 megawatts in capacity as part of an ongoing boiler replacement project.**

2. The applicant must make critical near-term decisions in its boiler replacement in order to include power generating capacity.
3. A funding level of \$727,159, which corresponds to staff's current moderate high-end estimate of project costs, would represent an Energy Trust subsidy of 0.24 cents per kilowatt-hour, substantially below any renewable energy project funded by Energy Trust so far.
4. The project will deliver approximately 24,000,000 annual kilowatt-hours of renewable energy to the Pacific Power grid, demonstrate the use of biomass as a generation fuel in a key sector, and provide insight into how best to structure the Energy Trust's Biopower program in 2005.
5. The proposed project is consistent with Energy Trust's strategic plan, action plan and 2005 budget.
6. The proposal was reviewed and endorsed by the Renewable Energy Advisory Council.

It is therefore **RESOLVED**:

- I. The Energy Trust of Oregon, Inc., Board of Directors authorizes staff to negotiate and the executive director to execute a contract with Douglas County Forest Products for up to \$727,159 to support the firm's biomass cogeneration project, providing that the contract terms do not deviate significantly from those described below:
  - a. Contract term of 15 – 20 years
  - b. Energy Trust retains ownership of all green tags in trust for customers of Pacific Power
  - c. Energy Trust grant to be escrowed
  - d. Payment on actual energy production over the first 7 years of commercial operation, with a true-up period of up to 3 years if production is less than expected
  - e. Other Standard Energy Trust contracting terms

Moved by: \_\_\_\_\_ Seconded by: \_\_\_\_\_

Vote: In favor: \_\_\_\_\_ Abstained: \_\_\_\_\_

Opposed: [list name(s) and, if requested, reason for no vote]