Board Decision
Revolution Energy Solutions Multi-Site Biogas Plant Project

April 7, 2010

Summary

Authorize up to $1,766,640 to be paid over four years to offset the above-market cost of a 0.795 megawatt (MW) project fueled by methane. The project, which would be sited at four different dairies, would be constructed, owned and operated by Revolution Energy Solutions, LLC.

Energy Trust Goals

- The proposed project would support Goal 2 of the 2010-2014 Strategic Plan: to accelerate the rate at which renewable energy resources are acquired, helping to achieve Oregon's 2025 goal of meeting at least eight percent of retail electrical load.
- This project would support the Biomass program goal of investing in commercial operation of less mature energy resources like biogas plants.
- At 0.795 MW, the project would increase the Biomass program portfolio capacity by 13%. Currently, Energy Trust has 4.9 MW of Biomass projects in operation with 1.06 MW preparing for construction.

The Proposed Project

- Revolution Energy Solutions, a third party developer, proposes to construct, own and operate individual biogas facilities at four dairies located in the Willamette Valley. The overall project is composed of four separate generators at four different dairies. The generators range from 165 to 210 kW each and total 795 kW.
- The proposed project would:
    - install and operate biogas plants using manure from a total of 4,200 cows;
    - include a digester design at each dairy developed by AgriFood Canada with commercial rights owned by Bio-Terre Systems; Revolution Energy Solutions has a license to deploy systems in the US;
    - generate a combined total of 6,000 MWh annually for all four dairies;
    - each site will be a Qualifying Facility, with output sold to PGE or Pacific Power under standard rates and terms;
- Each facility will be designed to capture the energy in the manure, improve the dairy runoff, reduce odors and pathogens, and capture and destroy the methane.

Financial Analysis

- Energy Trust determines project incentives based on a project's above-market cost, i.e., the difference between the cost to produce the power from the project over its life and the market value of the equivalent grid power at standard rates.
- The analysis includes tax credits and other benefits available to the project. Above-market costs are calculated as a net present value, which is the sum of the discounted value of the installation costs and the annual operating expenses of the project over its lifetime.

Project Financial Summary - NPV Basis

Size (MW)		0.795
Annual Output (MWh)		6000
Evaluated Resource Life (years)		15
Revenues		
Power Sales	$	3,200,280
Additional Revenue - Carbon offsets, biosolids	$	1,682,535
State BETC Pass-through	$	1,671,645
Grant in lieu of Investment Tax Credit	$	2,335,255
Total Revenue	$	8,889,715
Costs		
Capitalized Cost	$	7,784,185
Operations Expense	$	254,180
Maintenance Expense	$	1,823,520
Other Expense - Carbon Offset Verification, Biosolids Handling	$	1,302,699
Taxes	$	514,956
Total Project Cost	$	11,679,540
Gross Above Market Cost (Total Revenue - Total Project Cost)	$	(2,789,825)
Tax Benefits	$	1,128,337
Net Above Market Cost	$	(1,661,488)
Above Market Cost After Tax Adjustment	$	(2,695,296)

- Staff and an independent contractor reviewed the project design and costs and found them to be standard and reasonable for projects of similar size, type and design.
- The total capital cost of the project is $7,784,185.
- The project's above-market, net-present value is $2,695,296 over 15 years, including installation and operating costs, and assuming the project qualifies for state and federal tax benefits.

- Staff proposes to pay $1,766,640 into an escrow account to be disbursed over 4 years. The net present value of this 4-year payment is $1,400,000, or 52% of above market costs for the project.
- The $1,766,640 incentive would be divided equally, $441,660 per facility. At each facility: the first payment would be made on project commissioning; the next three would be paid annually based on project performance (each facility's planned output divided by $441,660).
- At a total payment of $1,766,640, the project's energy would cost Energy Trust about $2.6 million per average megawatt (aMW). On a net-present-value basis, the cost to Energy Trust is $2.04 million/aMW, $0.023/kWh levelized, which is at the low end of the range of costs forecast in the 2010 Biomass budget.
- The cost of this project to Energy Trust is higher than our larger biomass projects, such as the Stahlbush project, at $0.64 million/aMW; and the Douglas County project at $1.33 million/aMW. The higher cost for this project reflects the small scale of the individual generators (165 kW to 210 kW), the fact that there will be no direct use of heat from the engine, and the lower energy density of manure compared to other waste streams
- The project cost compares favorably to other renewable energy technologies; a large scale PV project cost $8.32 and $6.3 million/aMW for the OIT geothermal project.
- The project will benefit from other revenue streams associated with greenhouse gas offsets and the potential sale of biosolids remaining in the digester. The greenhouse gas offsets will be created when the methane gas is captured and destroyed by burning. Generation need not occur for offsets to be created, as long as the methane is captured and destroyed, which may be in generation, flaring or otherwise. Staff proposes to treat green tags in accordance with the green tag policy. Staff proposes to include offset revenue in calculating above-market costs, but not take ownership of offsets. The offset value would thereby reduce the Energy Trust incentive.
- Energy Trust will receive 60% of the green tags (environmental attributes of renewable energy that can be used to meet renewable portfolio standards and/or sold apart from the underlying energy) produced annually by the project.
- In addition to destroying a potent greenhouse gas (methane), the project will deliver other benefits by reducing odors, pollution and runoff from anaerobic lagoons and fields.
- Staff supports the project for a variety of reasons, including because it will likely provide an innovative business solution for dairies. The approach brings in the capital and expertise to manage generation projects while allowing dairies to retain focus on their primary business model as a commodity producer.
- The funds for this project are within the $6.3 million budgeted for the 2010 biomass program.
- The Renewable Energy Advisory Council reviewed the project on February 17, 2010 and supported funding it.
- Because three-fourths of the incentive payments would be based on project performance, we do not anticipate requiring security or payback provisions in the contracts.

Recommendation

Staff recommends approval of $1,766,640 in funding for the Revolution Energy Solutions project, by adopting resolution #549, below, authorizing the executive director to sign contracts consistent with the resolution.

RESOLUTION 549

APPROVING FUNDS FOR THE REVOLUTION ENERGY SOLUTIONS, LLC GENERATION PROJECT

WHEREAS:

1. **Revolution Energy Solutions, LLC proposes to develop a 0.795 megawatt facility (expected to generate 0.68 average megawatts over a 15-year operating life) fueled by methane produced by manure processed through digesters at four separate dairy farms.**
2. **Staff and an independent contractor reviewed the project design and costs and found them to be standard and reasonable for projects of similar type and design.**
3. **The net-present value of the project's above-market costs is $2,695,296 over 15 years.**
4. **Staff proposes a $1,766,640 incentive, to be paid in equal amounts ($441,660) to each of four facilities over the course of four years.**
5. **At the proposed payment, the project's energy would cost Energy Trust about $2.6 million per average megawatt (aMW).**
6. **Energy Trust's biomass generation portfolio is currently 4.9 MW. At 0.795 MW, the project would be a 13% increase.**
7. **The proposed project is expected to demonstrate an innovative solution that manages the high capital cost and technical complexity of anaerobic digester at dairies while addressing the environmental effects of Concentrated Animal Feeding Operations.**

It is therefore RESOLVED, that the board of directors of Energy Trust of Oregon, Inc. authorizes:

1. **Payment of up to $1,766,640 into escrow to be paid to Revolution Energy Solutions, LLC to offset the above-market costs of the multi-site biogas plant;**
2. **Energy Trust will take ownership of at least 60% of the green tags produced by the project annually; and**
3. **The executive director to enter into a contract(s) consistent with this resolution.**

Moved by: Seconded by:

Vote: In favor: Abstained:

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