

Renewable Advisory Council Meeting

June 22, 2011

Project Name:	TMF Biofuels, LLC
Program Manager:	Thad Roth
Utility:	PacifiCorp
Power delivery:	Qualifying Facility
Capacity:	4.8 MW
Generation:	37,800 MWh annually
Total capital cost:	\$22,395,211
Date of Commercial Operation:	April 30, 2012

Brief Project Description

TMF Biofuels, LLC has applied for funding of a 4.8 MW biogas plant to be sited at Three Mile Canyon Farms in Boardman Oregon. The proposed project will process dairy manure from 23,000 cows and other agriculture residues located at Three Mile Canyon Farms in anaerobic digesters and burn the resulting methane in three 1.6 MW Caterpillar engine generators.

The biogas plant will generate electricity that will be sold to Pacific Power, provide high quality bedding to the dairy, and produce verifiable carbon offsets for the compliance and voluntary carbon markets. This project is a base load generation resource that will operate at a 90% capacity factor. It will utilize manure from 20% of the dairy cows in Oregon.

TMF Biofuels, LLC and Three Mile Canyon Farms, LLC are affiliates of R.D. Offutt Company, a national diversified agricultural business.

Project Evaluation

Project evaluation addresses the following issues: project qualification, off take rate, adequate fuel supply (biogas), conversion technology, project costs, grants, financing, operational expertise, electrical interconnection and additional revenues. Energy Trust was aided in its review by a third party consultant with strong credentials related to anaerobic digestion.

Project Qualification

This project utilizes an eligible fuel (biogas produced from the anaerobic digestion of animal manure and other agricultural processing waste); it generates electricity that will be sold to Pacific Power as a Qualifying Facility; and at 4.8 MW it's capacity is below our maximum limit of 20 MW, qualifying it for incentives from Energy Trust's Renewable Energy program.

Off Take Rate

This project proposes to sell 100% of the power produced to Pacific Power under Rate Schedule 37, Avoided Cost Purchase from Qualifying Facilities of 10,000 kw or less. Under Rate Schedule 37 Pacific Power provides a set rate for facilities that qualify. This project is unique in that the Farm is served by Pacific Power but must utilize Bonneville Power Administration (BPA) firm transmission resources during part of year to deliver power to Pacific Power's network load. To secure transmission access from BPA, Pacific Power has amended the standard rate schedule to include the additional cost of transmission reducing the contract rate over the life of the contract.

Feedstock Assessment

Three Mile Canyon Farms, LLC operates a dairy with 23,000 milking cows, a 21,000 heifer facility, and a 4,000 head nursery. In addition, the farm operates 30,000 acres of irrigated crops and a potato storage facility.

Three Mile Canyon Farms has agreed to deliver 100% of the manure produced by 23,000 dairy cows and any additional on farm organic residues necessary to meet the production needs of the biogas plant owned by TMF Biofuels. TMF Biofuels will integrate the proposed biogas plant into the existing manure management system and make additional improvements to the manure handling system necessary to meet the operational needs of the biogas plant.

The feedstock assessment of this project included an analysis of the volumes of feedstock available to the project and the associated energy content to determine if there is adequate feedstock to support the proposed energy generation.

An independent third party reviewed the volume of manure available from 23,000 cows and the available on farm organic residues (excess feed, potato waste and apple mash) and found the energy production to be reasonable to support the proposed generation capacity.

The independent review did indicate that the existing flush system to move manure from the loafing barns and milking parlors could reduce volatile solids available to the biogas plant. In recognition of this challenge the project has worked closely with the digester designer to make improvements to the existing manure collection system to prevent short circuiting of flush water and to install solids recovery tanks (clarifiers) and thickening screens to maximize collection of volatile solids and the associated energy.

With a corporate directive committing necessary feedstock from Threemile Canyon Farms, LLC (100% of the available manure and any necessary supplemental organic residues) to meet energy production goals of TMF Biofuels, LLC and improvements to maximize volatile solids delivered to the digester, the independent review concluded that the project controlled adequate feedstock and the proposed energy production was reasonable.

Energy Conversion Technology

For a biogas plant there are two critical components to the energy conversion technology, the digester design and the prime mover. Key to the evaluation of digester design is the applicability of the design to the feedstock being used. With respect to the engine generator it is important to document applicability to fuel type, service availability and efficiency.

The digester design utilized in this project is GHD, Inc. with headquarters located in Wisconsin. The GHD design is a modified plug flow that operates at mesophilic temperature (100 degrees F). GHD presently has approximately 60 digesters operating at dairies in the United States and has more installed digester capacity at dairies in the US than any other design. There are currently seven operating GHD digesters at dairies in Washington and Idaho and two additional dairy projects proposed in Oregon that expect to use this design. This design has a proven track record for this type of application.

A review of the technical specifications of the proposed digester design are reasonable. Specifically the proposed design is properly sized for the volumes of materials to be received and the retention times necessary to process the residues and generate adequate methane to support electricity generation.

The prime mover for this project is a Caterpillar 3520C engine-genset, rated at 1.6 MW. The project will install three of these engine-gensets for a total capacity of 4.8 MW. This unit is rated at 42% electrical conversion efficiency and is designed to operate on medium content btu gas (600 btus/cubic foot). Each unit will include recovery of engine jacket heat and exhaust heat which will be used to meet thermal needs of the digesters. This engine-genset is presently utilized at a number of landfill gas-to- energy projects in Oregon and has a well established operating record and significant local operational experience.

Project Costs

The capital and O&M costs of this project appear reasonable and consistent with costs we have seen for similar projects we have reviewed.

Project Name	Capital Cost per KW
TCF Biofuels	\$4,700
Third Party Proposal	\$4,800
RES	\$9,500
City of Medford	\$3,700
Stahlbush	\$5,500

The O&M costs also were found to be reasonable compared to other projects. Below is a table of cost comparisons:

Project Name	Cost per Mwh
TCF Biofuels	\$36/mwh
Third Party Proposal	\$39/mwh
RES	\$68/mwh
City of Medford	\$27/mwh
Stahlbush	\$49/mwh

Grants/Incentives

To help offset the \$22,395,211 capital cost, this project will receive the following incentives:

- Grant In Lieu of ITC - \$5,600,000
- BETC - \$1,515,391(pass through value)
- Bonus Depreciation - 50% of eligible capital cost in year one for projects operational in 2012

The project received precertification in the last round for a Tier 3 eligible BETC. The final BETC precertification offered by ODOE and accepted by the project was below the amount the project requested and was eligible for.

Project Finance

Projects are typically modeled based on a project finance approach. Project financing is made up of sponsor equity, grants due upon commercial operation, and debt. The level of debt is determined by the project's ability to generate adequate cash flow to meet acceptable debt service coverage ratios. (Lenders indicate that an acceptable DSCR is 1.5) The BETC pass through is considered revenue because it is taxable.

Project Management

Construction of this facility will be completed by Andgar Corp. located in Ferndale Washington. Andgar is a full service construction and project management firm that has constructed seven GHD digesters operating in the northwest. They also provide operations services for two projects.

Day to day operation and maintenance of the power production facility will be provided through a contract with G. Friesen and Associates (GFA) The contract includes all power production costs including monitoring digester operation, regular engine maintenance and annual accruals for overhauls. GFA's primary business focus is designing landfills and operating landfill gas to energy projects. GFA presently operates the Finley Buttes Bioenergy facility located in Boardman OR. Operation of the manure handling equipment and effluent from the digester will be provided by Three Mile Canyon Farms.

The project will be owned and operated by a special purpose entity, TCF Biofuels, LLC, an affiliate of R. D. Offutt Company. R.D. Offutt is the largest potato grower in the United States with over 50,000 acres of potatoes grown annually for the frozen processing and fresh markets. R.D. Offutt Company is also involved in 11 potato processing facilities in four states that produce frozen potato products, fresh pack potatoes, and potato flakes. These products are sold into both the retail and foodservice markets. R.D. Offutt Company is a Fargo-based company and was established in 1964.

Interconnection

Pacific Power has completed a System Impact Study and Facilities Study for the project and provided an estimate for the cost of interconnection which is included in the overall project cost. Pacific Power has indicated that they expect to meet the project's commercial operation date of April 30, 2012. The cost of interconnection is approximately \$1.1 million.

Co-product Revenues

The proposed biogas plant produces energy (electricity and heat), animal bedding and carbon offsets. The electricity revenues are based on published rates from Pacific Power under Rate Schedule 37, Avoided Cost Purchase from Qualifying Facilities of 10,000 kw or less and adjusted as described above. Engine jacket heat and heat off the engine exhaust will be utilized to heat the digesters. No other uses for additional heat have been identified.

The fiber resulting from the digestion process will be utilized as bedding at the dairy. No additional value was attributed to this bedding in the financial model because under existing conditions the fiber is already utilized for bedding after it is composted. However the dairy does expect an improvement in the quality and consistency in the bedding material as a result of the installation of the biogas plant.

An important emerging revenue stream for biogas plants at dairies is the sale of carbon offsets. Converting manure management systems from open lagoon systems to anaerobic digestion allows the capture and destruction of methane otherwise emitted into the atmosphere. This benefit, separate from the carbon reduction from replacing fossil fueled electric generation with renewable electric generation, can be sold into voluntary and compliance markets.

Presently these carbon markets are very volatile and unpredictable. The state of California is launching a compliance carbon market expected to begin in 2012. While this market is still very

uncertain in terms of price and demand, protocols verifying offsets have been established that are recognized nationally and internationally.

To include a value for the carbon offsets for modeling purposes carbon traders provided an estimate of the annual offsets potentially available for this project and a price for the present market for offsets. The price of \$7/ton of CO₂e reflects recent purchases by institutional investors in preparation for the opening of the California market. This price was escalated on an annual basis. Also included in the financial analysis was the annual cost of verification of the offsets (\$15,000 per year). The sales of these offsets are available for ten years and represent about 5% of revenues for the project.

Above Market Cost Evaluation

To determine the AMC for custom projects in a consistent and transparent manner, each project must undergo a due diligence evaluation of key development requirements (noted under Project Evaluation above), establish the term for the project, and select an Internal Rate of Return for the project.

The project term used to conduct the financial analysis is based on the unique requirements of the project and typically ranges from 15-25 years. The IRR applied to each project is determined by a matrix that reflects the risk of the project, the returns reflected in recent market activity, project ownership (public versus private) and how the project will be financed.

Once the Above Market Cost is established, the final project incentive attempts to provide a financial floor to the expected return of the project, reflect the budget constraints of Energy Trust, and to align the interests of all parties around a successful project.

Proposed Incentive

Based on the selected IRR, a project term of 15 years, and including all relevant incentives, this project has an NPV above market cost of \$4,373,303.

I propose a total incentive of \$2,500,000 paid in four installments: \$625,000 paid upon commissioning and three additional payments of \$625,000 paid annually based on achieving agreed upon production targets. The NPV of the incentive is \$1,898,343. The proposed incentive (NPV) is 43% of the above market cost.

The incentive cost of the project is \$439,430/aMW. This compares to Stahlbush Island Farms at \$575,000, Rough & Ready at \$1.6 million/aMW and RES at \$2.4 million and City of Medford at \$817,000/aMW.

Renewable Energy Certificate (REC) Allocation

Based on an incentive of \$1,898,343 (NPV) and an above market cost of \$4,373,303, the levelized cost of 43% of the 37,800 RECs associated with this project is \$11.30/REC. We estimate the market value for RECs currently to be \$8.91/REC levelized. Because our incentive for this project produces a higher value for the prorated portion of RECs than market, we base our allocation on a percentage of the incentive to total above market cost (43%). We proposed and the project owner agreed to a 45% allocation for the term of the project.

The project has proposed to front load the delivery of 45% of the RECs in a way to maximize the project's share of RECs in years after 2015. To assure that Energy Trust receives a REC allocation not reduced by early poor performance, the Funding Agreement will require any

shortfall in the early years to be recovered from the project owner's portion of the RECs.