

**Feasibility Study of Biomass-Powered  
Renewable Energy Generation  
on Tribal Lands in Snohomish County, Washington**

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**Final Technical Report**

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**The Tulalip Tribes of Washington State**

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## Executive Summary

In April of 2003, the U.S. Department of Energy awarded a \$256,476 grant to the Tulalip Tribes of Washington State to “assess the feasibility of developing biogas generation facilities to convert manure and other biomass resources into electricity to help meet the Tribe's energy needs from a renewable energy source.”

During the past year and a half, the Tulalip Tribes, working cooperatively with area dairy producers, have completed a comprehensive assessment of the feasibility of developing a biogas generation facility in Snohomish County. This work included an assessment of significant dairy and non-dairy biomass resources in Snohomish County, an analysis of preliminary design elements for a biogas facility, and a baseline analysis of engineering and cost values of constructing one such facility at the Monroe Honor Farm, a dairy farm formerly operated by the Washington State Department of Corrections.

This comprehensive feasibility study, including work by some of the world’s foremost experts in the fields of biomass production, has concluded that development of a biogas facility in Snohomish County is both technologically and economically feasible. The final report outlined here summarizes the work performed under the DOE grant, and provides full documentation of the study results.

The final report consists of two parts:

**Part I:** Project Summary, is a full color 12-page booklet entitled: *The Snohomish Basin Biogas Project Feasibility Study Executive Summary* (December 1, 2004). This booklet is provided herein as Attachments 1 – 6. Each attachment is in Adobe Acrobat (.pdf) file format. The files range from 18.2 MB to 34.8 MB each. The cumulative file size is 137.6 MB.

*Table 1: List of Attachments That Constitute Part I, Project Summary*

Attachment 1	Front Cover & Back Cover (SB-FC-BCC) Adobe .pdf 34.8 MB
Attachment 2	Interior Front Cover & I. Back Cover (SB-IFC-IBC) Adobe .pdf 32.6 MB
Attachment 3	Page 1 & Page 8 (SB-P1-8) Adobe .pdf 13.9 MB
Attachment 4	Page 2 & Page 7 (SB-P2-7) Adobe .pdf 18.2 MB
Attachment 5	Page 2 & Page 6 (SB-P3-6) Adobe .pdf 24.1 MB
Attachment 6	Page 4 & Page 5 (SB-P4-5) Adobe .pdf 14.0 MB

The Project Summary booklet contains the following required elements of the DOE final report:

- Project Overview
- Objectives
- Description of Activities Performed
- Conclusions and Recommendations
- Lessons Learned

**Part II: Comprehensive Business Plan**, is a compilation of task deliverables (provided as attachments) that comprise the work supported by DOE during the course of this study. The cooperative agreement between the Tulalip Tribes of Washington State and the U.S. Department of Energy stipulated that the biogas feasibility study should include the following tasks:

- Site-specific renewable resource assessment;
- Review of tribal load assessment and export markets;
- Consideration of transmission and interconnection needs;
- Technology analysis;
- Economic analysis;
- Consideration of environmental benefits and impacts;
- Consideration of cultural, social, and community benefits and impacts;
- Preliminary system design;
- Consideration of training and other professional development needs;
- Consideration of long-term operation and maintenance needs; and
- Business planning needed to move from feasibility into project implementation.

A full report of each task activity and its results can be found in the following:

*Table 2: List of Attachments That Constitute Part II, Comprehensive Business Plan*

Attachment 7	Tulalip Tribes-Snohomish County Organic Waste Assessment—Final Report. RCM Digesters, Inc. Nov. 22, 2003 (WORD doc 20.5 MB) <ul style="list-style-type: none"> <li>• Site-specific renewable resource assessment;</li> <li>• Consideration of cultural, social, and community benefits and impacts</li> </ul>
Attachment 8	WA Tulalip Task 2 Digester Technologies. RCM Digesters, Inc. Sept. 2, 2003 (WORD doc) <ul style="list-style-type: none"> <li>• Technology analysis;</li> </ul>
Attachment 9	Preliminary Design Elements. RCM Digesters, Inc. Jan. 2004 (WORD doc 394 KB) <ul style="list-style-type: none"> <li>• Consideration of transmission and interconnection needs;</li> <li>• Consideration of training and other professional development needs;</li> </ul>

	<ul style="list-style-type: none"> <li>• Consideration of long-term operation and maintenance needs</li> </ul>
Attachment 10	Baseline Analysis of Engineering and Cost Values. RCM Digesters, Inc. March 2004 (WORD doc 862 KB) <ul style="list-style-type: none"> <li>• Economic analysis;</li> <li>• Consideration of environmental benefits and impacts;</li> <li>• Preliminary system design;</li> </ul>
Attachment 11	Working Copy Business Structures Memo. Dairy Strategies LLC March 3, 2004 (WORD doc) <ul style="list-style-type: none"> <li>• Business planning needed to move from feasibility into project implementation.</li> </ul>
Attachment 12	Business Structures and State Tax Issues Memo. Tribal Strategies Inc. April 28, 2004 (WORD doc) <ul style="list-style-type: none"> <li>• Business planning needed to move from feasibility into project implementation.</li> </ul>

In addition to the required task activities, outlined above, the feasibility study effort included the following:

- A RFQ/Expression-of-Interest request effort to identify and rank anaerobic digestion system technology providers; and
- An early NEPA scoping effort to identify outstanding issues related to future development of a regional digester at the Monroe Honor Farm.

These activities complemented the DOE-required tasks, and allowed the team a more realistic assessment of feasibility and of the long-term sustainability of the project. The results of these two additional task elements are found in the following:

*Table 3: List of Additional Attachments in Part II, Comprehensive Business Plan*

Attachment 13	Expression-of-Interest Review Memo. The Stella Group. Jan. 21, 2004 (WORD doc) <ul style="list-style-type: none"> <li>• Technology analysis;</li> <li>• Consideration of training and other professional development needs</li> </ul>
Attachment 14	Finding of No Significant Impact (FONSI). USDA Rural Development. Jan. 28, 2004 (WORD doc) <ul style="list-style-type: none"> <li>• Consideration of cultural, social, and community benefits and impacts;</li> <li>• Consideration of environmental benefits and impacts</li> </ul>

These 14 attachments constitute The Tulalip Tribes formal submittal to the Department of Energy of a Final Technical Report for work completed under DOE Grant **DE-FG36-03GO13017**.

All of these reports, as well as all of the power point presentations made during the course of the study to the Tribal Council, DOE and other federal agencies, and the public can also be found at the following: <http://www.quilcedapower.com/Document.htm>

The Tribes is pleased to report that the project is moving forward, and that expectations are that construction will begin on the first Tribal-private regional anaerobic digester in the country in summer 2005.

We thank the Department of Energy, Office of Tribal Programs, for their encouragement, support, and commitment.