

MONTHLY PROGRESS REPORT FOR CONTRACT NO. 500-00-036

PROJECT 3.1 – DAIRY WASTE TO ENERGY PROJECT

REPORT PREPARED BY: COMMONWEALTH ENERGY TEAM

May 2003

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**What we planned to accomplish this period:**

Activities in May will focus on finalizing the draft technical memorandum comparing the existing digesters at RP-1 and RP-5 to other *plug flow* and *complete-mix* digestion projects. Analysis of digestion projects addressing both on-farm and dairy clusters in Europe and North America will be undertaken by the Team.

Two important meetings have also been scheduled for April 30<sup>th</sup> and May 1<sup>st</sup>. On April 30<sup>th</sup> a meeting will be held in San Francisco involving Federal, State and local officials to review environmental considerations related to digestion projects. This forum will provide valuable insight into environmental considerations related to digestion projects. This meeting will provide valuable insights into the identification and evaluation of these factors, which can drive such projects. The second meeting is a planned site visit to the Langerwerf Dairy in Durham, California. This facility, which has been successfully operating for over 20 years, will provide a valuable reference point for the on-farm projects in future analysis under this task.

Other activities in Project 3.1 will include further development of the testing protocols that will implement some of the suggested projects identified in Project 1.1. This will include co-digestion, improved pretreatment and several other type projects. It should be noted, that the findings related to which projects should be recommended in the prioritization assessment deliverable and in the Project 1.1 final report will influence how work on this project proceeds. Therefore in May, efforts will continue in defining an approach, which facilitates incorporation of the results of the comparative analysis of technologies (e.g., plug flow v. complete-mix) and the Mini-Grid Power Flow Analysis into the process and site selection activities. It is anticipated that the preliminary findings from Project 1.1 may be available in late May so that activities can continue for Project 3.1 according to the current schedule. If

the results of the expanded power flow study are not available until later, the schedule for completing Project 3.1 will need to be adjusted.

**What we actually accomplished this period:**

*Task 3.1.1: Assess, Evaluate and Select Animal Waste to Energy Technology*

- Efforts on this task continued in May. These efforts focused on assessing different technologies to capture the energy value of the manure and most effectively convert it to energy. Information on European technologies and practices was provided by NIRAS from Denmark.
- Efforts continued in May on the protocols for testing different processes for optimizing biogas performance at existing dairy cluster projects at RP-1 and RP-5. These protocols will enable bench and pilot scale tests to occur during design activities which will help ensure properly focused and successful projects.
- As a result of discussions held during the kickoff meeting, a comparative evaluation of *plug flow* and *complete mix* digestion systems was previously initiated. This work continued in May. The analysis, which is evaluating “on farm” and “dairy cluster” projects in European and North America, was largely completed this reporting period. The remaining task is to work with IEUA to assemble cost information for the project at RP-5 and present it in a way that will enable an “apples to apples” comparison. Particular emphasis is being placed on the economic and environmental analysis of these systems with the intent of helping to guide the Commonwealth Program to pilot projects that will be most advantageous from a technical, economic and environmental viewpoint. Related to these considerations, efforts were initiated so that follow up activities to the meeting held in San Francisco on April 30<sup>th</sup> would be undertaken in close linkage with the planned work under PIER.

**How we are doing compared to our plan:**

Work is proceeding as anticipated on this project.

**Significant problems or changes:**

On Project 3.1, Dairy Waste to Energy, it is clear that a key element on the project is to portray the environmental and economic benefits of the dairy waste to energy projects. This is particularly true for dairy cluster projects, which may offer the best potential for achieving environmental benefits for a range of dairy digestion projects. The technical memorandum being prepared to compare complete mix and plug flow projects will be important in addressing these considerations. The Commonwealth Team is working with IEUA and is seeking to present cost information for the dairy waste to energy project at RP-5 in a form that it can be appropriately compared to on farm and centralized facilities in Europe and

North America. IEUA staff are pulling together the financial data in a format that facilitates comparison with other projects.

There are no significant fiscal problems to report during this period and work is proceeding within budget. Progress and expenditures will result in project being completed on-time and within budget.

**What we expect to accomplish during the next period:**

Activities in June will focus on finalizing the draft technical memorandum comparing the existing digesters at RP-1 and RP-5 to other plug flow and complete mix digestion projects. Digestion projects related to on-farm and for dairy clusters in Europe and North America will be presented. The primary remaining activity for this task is to assemble the cost and performance information for the RP-5 project so that it can be readily compared to other projects

Other activities will include further development of the testing protocols that will implement some of the suggested projects identified in Project 1.1. This will include co-digestion, improved pretreatment and several other types of projects. It should be noted, that the findings related to which projects should be recommended in prioritization and Project 1.1 final reports will influence how work on this project proceeds. Therefore, efforts will continue in defining an approach which facilitates incorporation of the results of the comparative analysis of technologies (plug flow v. complete mix) and the Mini-Grid power flow analysis into the process and site selection activities. It is anticipated that the preliminary findings for Project 1.1 will be available in June so that activities can continue for Project 3.1 according to the current schedule. If such results of the expanded power flow study are not available as planned, the schedule for completing Project 3.1 will need to be adjusted.

**Status of Milestones and Deliverables:**

Table 1 below summarizes the status of Project 3.1 task deliverables as of the end of the current reporting period.

**Table 1: Summary of Project Status and Deliverables – Project 3.1**

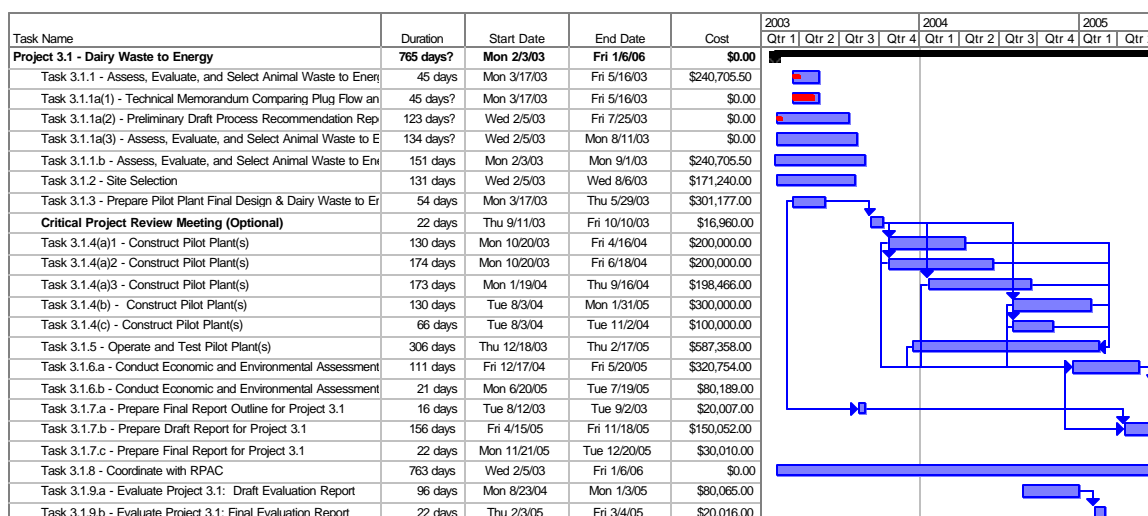
Task No.	Description	Start Date		Due Date		Status (%)
		Planned	Actual	Planned	Actual	
3.1.1	Assess, Evaluate, and Select Animal Waste to Energy Technology	03/17/03	01/24/03	05/16/03		25%
3.1.1a(1)	Technical Memorandum Comparing Plug Flow and Complete-Mix Digestion Performance & Economics	03/17/03	04/04/03	05/16/03	06/27/03	80%
3.1.1a (2)	Preliminary Draft Process Recommendation Report	02/05/03	04/04/03	07/25/03		10%
3.1.1a (3)	Assess, Evaluate, and Select Animal Waste to Energy Technology	02/05/03		08/11/03		
3.1.1.b	Assess Evaluate, and Select Animal Waste to Energy Technology	02/05/03		09/01/03		
3.1.2	Site Selection	02/05/03		09/01/03		
3.1.3a	Test Plan and Protocols	03/17/03	04/04/03	05/29/03		30%
3.1.8	Coordinate with Renewables Project Advisory Committee	2/05/03		01/07/06		

*Explanation of any Difference(s) in Schedule*

*Task 3.1.1.(a).1 Technical Memorandum Comparing Plug Flow and Complete Mix Digestion and Economics -* This report, initially planned to be submitted on May 16 has been delayed by approximately a month. The primary cause of the delay has been the length of time required to assemble the cost information for the RP-5 plug flow project so that it is in a form that it can be readily compared to the other digester projects. The balance of the report is virtually complete so once the cost information is assembled, the report can be finalized in approximately a week. It is now anticipated that this report will be completed in the second half of June.

**Task 3.1.3.a – Test Plan and Protocols** – This technical memorandum builds on the findings of the digester comparison report to be submitted as a part of Task 3.1.1.(a).1 described above. There is an approximate two week lag time between delivery of the digester comparison report and the delivery of this Test Plan and Protocols report. Due to the delay of cost data for the digester comparison report, this task has been similarly delayed. Once the deliverable for Task 3.1.1.(a).1 is submitted, this task’s deliverable should be submitted approximately two weeks later. Thus, it is now expected that the Test Plan and Protocols report will be submitted in early July. Since this test plan and protocol is the initial part of the design task, with more detailed design activities to be completed in the second half of the year, the delay in the submittal of this document should not affect the overall task or project schedule.

**Overall Schedule for Project 3.1:**



**Overview of Fiscal Status:**

Table 2 below summarizes the fiscal status of Project 3.1 by task as of the end of the current reporting period.

**Table 2: Fiscal Status by Task – Project 3.1**

Task Number	Budget	Invoiced To-Date	Fiscal Status *
3.1.1.a	\$240,706	\$0	OT
3.1.1.b	\$240,706	\$0	OT

*Commonwealth Energy PIER Renewables Affordability Mini-Grid Program Status Report*

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3.1.2	\$171,240	\$0	OT
3.1.3	\$301,177	\$0	OT
3.1.7.a	\$20,007	\$0	OT
3.1.8	\$0	\$0	OT

\*Fiscal Status – Please indicate if you are “On Track” (OT), OverBudget (OB), or UnderBudget (UB)