

MONTHLY PROGRAM REPORT

JANUARY 2005

COMMONWEALTH BIOGAS/PV MINI-GRID RENEWABLE RESOURCES
RD & D PROGRAM

*Making Renewables Part of an Affordable and Diverse
Electric System in California*

CONTRACT NO. 500-00-036

REPORT PREPARED BY: COMMONWEALTH ENERGY TEAM

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Engineering (Endecon), Renewable Energy Development Institute (REDI), Zaininger
Engineering (ZECO).

PLANNED ACCOMPLISHMENTS FOR THIS PERIOD:

Project 0: Program Administration

It is anticipated that the Commonwealth Program Director will continue to provide ongoing support to the CE Team and Commission staff. Additionally, work will continue on the PIER Program 1st Annual Report, with an anticipated draft to be submitted internally in late December. Project Monthly Status Reports will be drafted for all projects (#'s 1.1, 2.1, 3.1, 3.2 and 3.3) and a Program Status report will be drafted for internal review prior to submittal to the Commission and posting on the Commonwealth PIER Mini-Grid Program Web-Site.

The Contract Administrator will continue to provide ongoing support to the CE Team and Commission staff, as project deliverables are presented for internal review prior to submittal to the Commission. Upon receiving match funds documentation, and submitting this documentation to the Commission, the Contract Administrator will re-invoice Contract Invoice # 13.

Project 1.1: Program Planning and Analysis

In January, the CE Team anticipates receiving comments and/or approval from the Commission on the *Prioritization Report* under Task 1.1.10 and the *Project 1.1. Draft Final*

Report under 1.1.11b. Upon receiving approval, the task deliverables will be finalized and the CE Team will commence work on the *Project 1.1 Final Report* under Task 1.1.11c.

Project 2.1: Enhanced Landfill Gas Production

Activities are expected to be limited, with only the review of results and findings as they relate to future bioreactor projects in California, remaining. This *Key Learnings* effort identified in the project wrap-up meeting will be conducted as a component of the Measure and Evaluation activity for this Project.

Project 2.2: Enhanced Energy Recovery through Optimization of Anaerobic Digestion and Microturbines

In January, testing will continue at the two ultrasound sites. Baseline data from the ultrasound systems at RP-1 will be collected. Ultrasound data from the first operating period will be reviewed in the *First Quarterly Report*, which was drafted in December and will be submitted to the Commission for review and comments.

Project 3.1: Dairy Waste to Energy

Activities planned for January include the submittal of the *Draft Tactical Marketing Plan*, and coordination meetings will continue between the CE Team and IEUA facility staff. Additionally, The Draft *Process Recommendation Report* will be submitted to the Commission for review. Comments are anticipated on the Draft Task 3.1.1b report, and once received these comments will be reviewed and integrated into the report prior to submittal to the Commission. Site selection activities will also continue as will the Bench Scale Testing at the Orange County Sanitation District laboratory

Project 3.2: Building-Integrated PV (BI-PV) Testing and Evaluation Project

In January, Endecon plans to complete the first draft of the *Six-month Exposure and Operation Report* and forward it to the Technical Advisory Committee for review. Additionally, the monitoring of the output and ambient conditions from each of the small and large systems will continue.

Project 3.3: Building-Integrated PV (BI-PV) on Public Facilities

REDI and Spectrum Energy plan to continue their work on identifying and establishing at least six candidate sites for BI-PV installations.

WHAT WAS ACCOMPLISHED THIS PERIOD:

Project 0: Program Administration

The Commonwealth Program Director continued to hold teleconference meetings and met with Commission staff and CE Team members, to review and discuss potential redirection/revisions to Project work plans/scope/focus for Projects 2.1, 2.2 and 3.1.

As anticipated, the Commonwealth Contract Administrator continued to provide support to the CE Project Teams on various pending project deliverables. Match fund documentation requested by the Commission Project Manager in conjunction with Contract Invoice # 13, continued to be received, with one team member's partial input awaited.

Project 1.1: Program Planning and Analysis

Work continued to be limited on this Project, as the CE Team continued to await Commission approval of the Task 1.1.10 *Prioritization Report* and the Task 1.1.11b *Project 1.1. Draft Final Report*.

Project 2.1: Enhanced Landfill Gas Production Using Bioreactors

As anticipated, in January there was very limited task activity. The CE Team continued to move forward with comments received at the October *Technical Advisory Committee Project Wrap-up Meeting*. These comments will be reviewed along with the findings of the project as they relate to future bioreactor projects within the State of California. This review work will be conducted as part of the measurement and evaluation activity for this project.

Project 2.2: Enhanced Energy Recovery through Optimization of Anaerobic Digestion and Microturbines

Efforts were focused on the gas cleaning system design and installation activities that began in December continued in January. Design documents provided to equipment suppliers were reviewed, and delivery and installation arrangements were made. Efforts on the biological scrubber continued in conjunction with the technology work under Project 3.1, as the biological gas cleaning activity will be undertaken on gas produced by the manure digester and is a direct result of the European technology review conducted under Project 3.1.

The biogas baseline data collection activities continued in January, as well as data collection during the ultrasound operational phase. In review of the two technology vendors, IWe Tech and Sonico, the serviced provided on the Sonico units improved their performance substantially. The IWE Tech units continued to have performance issues, and were down a substantial portion of the time. It was determined that the IWe unit could not operate reliably and it would be removed early in order to focus the remaining testing efforts on the Sonico

unit. Also, comments were received on the Draft *First Quarterly Report*, the comments were integrated into the report, and the report was then submitted to the Commission.

Project 3.1: Dairy Waste to Energy

Efforts were focused on the completion of the Draft *Process Recommendation Report*. This report expands on the previously submitted *Interim Report*, and includes information on co-digestion technologies and the data collected on food waste sources that may be used at the RP-1 facility. The report was finalized in December and after internal review will be submitted to the Technical Advisory Committee and Commission staff for final review.

On the site selection task, efforts focused on finalizing the selection of the optimal sites for the various components of the co-digestion system planned for the IEUA RP-1 treatment plant. Additionally, the CE Team began developing the *Tactical Marketing Plan*. The draft is being reviewed internally prior to submittal to the Commission.

In December CH₂ finalized the *Bench Scale and Other Test Plans and Protocols Report*, as well as the *Final Design and Test Plan*. A testing sequence was developed which provided a stepwise strategy to optimize the full scale test phase of the co-digestion effort. Co-digestion suppliers were screened further and a preliminary assessment of the key parameters were reviewed and refined.

Project 3.2: Building- Integrated PV (BI-PV) Testing and Evaluation Project

As anticipated, Endecon continued to work on the *Six-Month Exposure and Operation Report*, as well as to monitor the output of all large and small systems. Additionally, Endecon submitted the *Final Small Systems Characterization Report* to the Commission for review.

Project 3.3: Building-Integrated PV (BI-PV) on Public Facilities

In December REDI and Spectrum Energy staff sought additional utility bills and continued work on economic analysis to determine the financial feasibility of the potential BI-PV sites.

HOW WE ARE DOING COMPARED TO PLAN:

Of the active projects, Project 1.1, Project 2.1, Project 3.1, Project 3.2 and Project 3.3 have some task elements that are running behind our original Program schedule. However, the majority of the Project Tasks being implemented are proceeding along the (09/17/03) revised Exhibit B schedule. The following discussion summarizes the delays that have been encountered to date. Note that these individual task delays may impact the individual Project's targeted completion dates.

- **Project 1.1:** The CE Team has experienced challenges in gathering certain data and completing responses to comments. This has delayed the completion of

- reports that were in turn crucial to the completion of another task; however, the majority of these issues have been resolved.
- **Project 2.1:** Work has ceased on this project because of the decision to not proceed with the bioreactor elements of the liner extension project at Mid-Valley in July 2004. Work had been proceeding with a schedule for the bioreactor being able to accept waste in January or 2005, but when work ceased it was decided that the project would be completed after a lessons learned/project wrap up meeting was held. That meeting, involving the *Technical Advisory Committee*, was held on October 15, 2004.
 - **Project 2.2:** As reported previously, the redirection of the approach (two ultrasound technologies, instead of one ultrasound and one thermal hydrolysis technology) will make the project findings more relevant to the State of California, but required additional consultation and planning with the technology vendors. This delayed completion of the *Site Selection and Test Plan Report*. However, the findings produced will clearly document how the use of ultrasound technology can help increase gas production as well as improve the treatment process.
 - **Project 3.1:** The overall efforts on Project 3.1 were delayed pending incorporation of the results of the Commonwealth Business Plan and subsequent guidance from Commission staff. The meeting held with the Commission in March 2004 enabled development of a revised schedule and also permitted CE Team members to focus their efforts on developing a co-digestion and gas cleaning demonstration program that meets the Commonwealth Business Plan and overall PIER Renewables Mini-Grid Program objectives. The project was enhanced by development of the *Tactical Marketing Plan*, which outlines the market entry and implementation roles of Project Team participants in bringing the results of this project into the California marketplace.
 - **Project 3.2:** Task 3.2.2(1) activity has previously been delayed due to negotiations and contract approvals for the Commonwealth-IEUA Power Purchase agreement and due to waiting for approval of the purchase orders and the SGIP Incentives reservation request for the 60 kW large systems. This delay has had a trickle down effect on subsequent tasks within this Project. Additionally, a problem with the PowerLight Array had caused a slight delay in December 2004, but was resolved in January 2005.
 - **Project 3.3:** Task 3.3.2 has continued to take much longer than anticipated to complete due to multiple outside technical reviews and related revisions on the BI-PV *ETP*. The final draft deliverable has now been approved and the work can now resume. The key personnel redirection has been resolved, and REDI's new team is actively moving forward while reviewing work previously completed. REDI and Spectrum Energy are waiting for a response to their report on status of overall project work and costs incurred to date, which was requested by Commission staff in November, as well as direction on whether to conclude or to go forward with the project.

SIGNIFICANT PROBLEMS OR CHANGES:

As indicated above, many of the Projects have work elements, which are currently behind schedule. Some of these task delays may impact overall Project completion dates, and as reported, a revised program schedule (i.e., contract Exhibit B) was submitted to the Commission for review and approval, which addressed schedule and task-level budget changes for these projects and their tasks. However, note that current Program progress and expenditures should result in the Program being completed on time under this revised schedule and within the Program's overall budget.

EXPECTED ACCOMPLISHMENTS DURING THE NEXT PERIOD:

Project 1.1: Program Planning and Analysis

In February, the CE Team anticipates receiving comments and/or approval from the Commission on the Prioritization Report under Task 1.1.10 and the Project 1.1 Draft Final Report under Task 1.1.11b. Upon receiving approval, the task deliverable will be finalized and the CE Team will move forward on the Project 1.1 Final Report under Task 1.1.11c, and the measurement and evaluation task under Task 1.1.13.

Project 2.1: Enhanced Landfill Gas Production

As reported previously, there are limited activities on this project. The only remaining work will be the review of the findings and results of the Project as they relate to future bioreactor projects. This effort will be conducted as part of the Measurement and Evaluation activity of this project.

Project 2.2: Enhanced Energy Recovery through Optimization of Anaerobic Digestion and Microturbines

It is anticipated that testing of the Sonico ultrasound system will continue in February. Baseline data from the gas cleaning tasks at IEUA's RP-1 will continue to be summarized and data from the first operation period will be reviewed and incorporated into the *First Quarterly Report*. Additionally, work will continue on the *Second Quarterly Report*, with the data collection on the gas cleaning lagging the data collection on the ultrasound systems by approximately 3 months.

Project 3.1: Dairy Waste to Energy

Activities planned for February include the submittal of the *Draft Tactical Marketing Plan*, and coordination meetings will continue between the CE Team and IEUA facility staff. Additionally, The Draft *Process Recommendation Report* will be submitted to the Commission for review. Comments are anticipated on the Draft Task 3.1.1b report and, once

received, these comments will be reviewed and integrated into the report prior to submittal to the Commission. Site selection activities will also continue as will the bench scale testing at the Orange County Sanitation District laboratory

Project 3.2: Building-Integrated PV (BI-PV) Testing and Evaluation Project

In February, Endecon plans to complete the first draft of the *Six-Month Exposure and Operation Report* and forward to the Technical Advisory Committee for review. Additionally, the monitoring of the output and ambient conditions from each of the small and large systems will also continue.

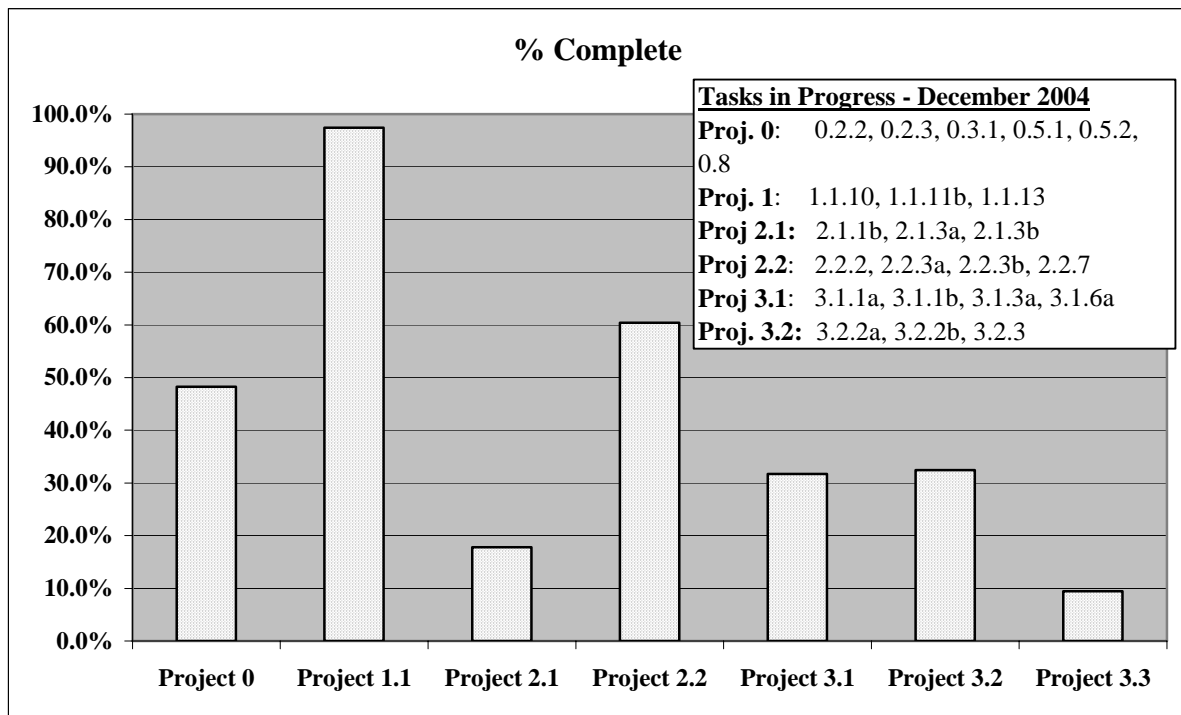
Project 3.3: Building-Integrated PV (BI-PV) on Public Facilities

REDI and Spectrum Energy plan to continue their work on identifying and establishing at least six candidate sites for BI-PV installations.

OVERVIEW OF PROGRAM STATUS:

Figure 1 below summarizes the overall Commonwealth Program status for each project and identifies the active tasks as of the end of the current reporting period.

Figure 1: Summary of Program and Project/Task Status



OVERVIEW OF PROGRAM FISCAL STATUS:

Table 1 and Figure 2 summarize the fiscal status of the Commonwealth Program by Project as of the end of the current reporting period. Figure 3 provides a status summary of the match funds for the Program to date. Note that a considerable amount of match funds have been incurred for Project 1.1 and Project 3.2 to date; however, these private sector Program matching resources have not yet been submitted for Commission approval.

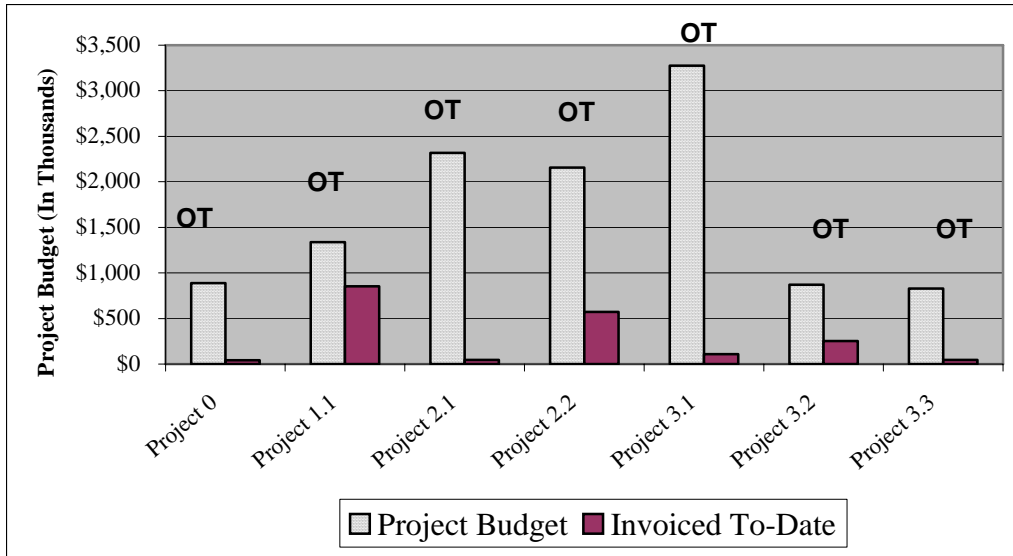
Table 1: Cumulative Program Fiscal Status by Project

Project Number	Project Budget	Invoiced To-Date (\$)	Fiscal Status *
Project 0	\$ 889,771	\$43,375 **	OT
Project 1.1	\$1,336,613	\$852,859 **	OT
Project 2.1	\$2,315,999	\$46,905 **	OT
Project 2.2	\$2,153,740	\$571,453 **	OT
Project 3.1	\$3,274,664	\$108,000**	OT
Project 3.2	\$ 870,099	\$252,449**	OT
Project 3.3	\$ 827,686	\$45,000**	OT

*Fiscal Status = (OT) "On Track", (OB) "OverBudget", (UB) "UnderBudget"

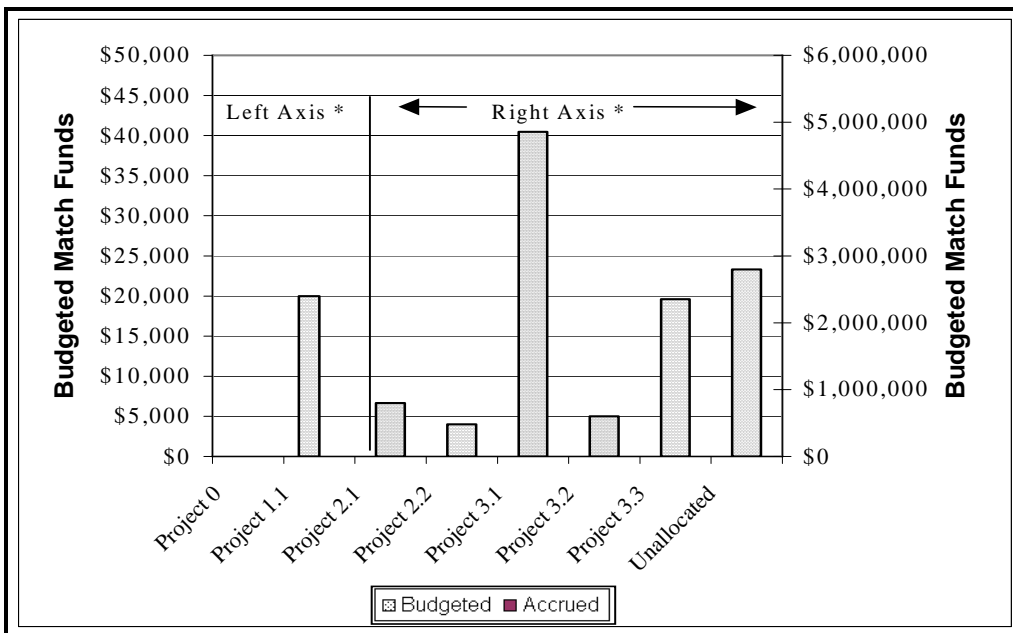
** Invoice Amount Shown after 10% retention withheld.

Figure 2: Program Fiscal Status - PIER Expenditures



* Fiscal Status = (OT) “On Track”, (OB) “Over Budget”, (UB) “Under Budget”
 ** Invoice amount shown after 10% retention withheld

Figure 3: Program Fiscal Status - Match Funds



* The Budgeted Match Funds for Project 1.1 are significantly lower than Projects 2.1 through Project 3.3; therefore, we have utilized a left and right axis with differing value levels, which allows us to better highlight the Project Match Funds.