

MONTHLY PROGRAM REPORT

November 2004

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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PLANNED ACCOMPLISHMENTS FOR THIS PERIOD:

Project 0: Program Administration

It was anticipated that the Commonwealth Program Director would continue to provide ongoing support to the CE Team and Commission staff. Additionally, the CE Team was to proceed with work on the PIER Program 1st Annual Report, with an anticipated draft to be submitted internally in late December. Project Monthly Status Reports were to be drafted for all projects (#'s 1.1, 2.1, 3.1, 3.2 and 3.3) and a Program Status report would 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 was to 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. In November, it was anticipated that Contract Invoice # 13 would be drafted, reviewed and submitted to the Commission, for Project 3.2 – Task 3.2.2b (3) and Task 3.2.3 (2).

Project 1.1: Program Planning and Analysis

In November, efforts were to continue on the Task 1.1.13 M&E Task, while the CE team awaited comments and/or approval on the Task 1.1.10 and Task 1.1.11b final reports submitted in early October.

Project 2.1: Enhanced Landfill Gas Production

Activities were 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 measurement and evaluation activity for this Project.

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

In November testing was to continue at the IWe Tech and Sonico ultrasound systems at the City of Riverside Wastewater Treatment Plant. It was also anticipated that the documents marking completion of the ultrasound installation task would be completed and submitted to the Commission for review. Work would continue on the *First Quarterly Report*, with the first draft ready for internal review in December prior to submittal to the Commission.

Project 3.1: Dairy Waste to Energy

Planned activities for November included the preparation of the annotated outline and initial draft components of the Project 3.1 *Tactical Marketing Plan*. Site selection activities were also to continue, and the *Bench Scale Tests* would begin at the Orange County Sanitation District laboratory.

Additionally, the Task 3.1.6 *Draft Tasks Reports*, which were completed in October, were to be forwarded to the peer technical team reviewers upon receiving approval from the Commission contract manager to do so.

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

In November, Endecon planned to submit the final *Small Systems Initial Characterization Report* to the Commission, and for placement on the PIER Mini-Grid Website. Work would also continue on the *6-Month Exposure and Operation Report* for large systems, while Endecon continues to monitor the output and ambient conditions from each of the small and large systems.

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

REDI and Spectrum Energy planned 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, and Contract Invoice # 13, which included the following deliverables: Project 3.2 – Task 3.2.2.b(3) and Task 3.2.3(2), was submitted to the Commission for review, approval and payment. The Commission rejected the invoice, requesting that match fund documentation accompany the invoice. The Contract Administrator requested this documentation from the CE Team.

Also as anticipated, the CE Team continued to work on the PIER 1st Annual Program Report.

Project 1.1: Program Planning and Analysis

Itron and the CE Team awaited comments from the Commission on the previously submitted *Task 1.1.10 Prioritization Report*, and the *Project 1.1 Draft Final Report*, under Task 1.1.11b.

Project 2.1: Enhanced Landfill Gas Production Using Bioreactors

As anticipated, activities in November were very limited, with focus placed on the measurement and evaluation activity for this project.

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

CH₂ continued to move forward with its design data and site conditions information collected previously. Further design drawings were reviewed and refined with the host staff to ensure that the design incorporated all equipment requirements. The gas cleaning systems drawings were reviewed internally, finalized and were to be submitted to the Commission for review.

In November, activities on the ultrasound system were limited, with the finalization of the as-built drawings completed, which along with the letter certifying that the ultrasound units had been installed, marked the completion of this task.

Work also continued on the First and Second Quarterly Data Collection and Analysis tasks, under Task 2.2.5a and Task 2.2.5b. In November, the draft *First Quarterly Report*, which contains baseline data for the City of Riverside systems used in the ultrasound testing, was

circulated internally for review. Although baseline data on the gas cleaning project was collected in November, it was not complete and therefore was not included in this draft report.

Project 3.1: Dairy Waste to Energy

In November, efforts were focused on finalizing the *Draft Process Recommendation Report*. This report, which expanded on the *Interim Report* was finalized, with previous comments incorporated and information regarding co-digestion technologies and food waste sources that can be used at the RP-1 facility, integrated. Additional work was undertaken related to the *Final Process Recommendation Report*, with work focusing on co-digestion and gas cleaning as identified through the biogas project prioritization activity in Project 1.1, as well as in accordance with work completed under this project. Additionally, efforts focused on finalizing the selection of the optimal sites for the various components of the co-digestion system to be installed at the IEUA RP-1 treatment plant.

As reported previously, a key activity outlined at the October 15th meeting, was the need to bring to market the technologies developed under this Project. The CE Team agreed to prepare a *Tactical Marketing Plan*, outlining how the results from this Project could be brought into the California market. This draft *Tactical Marketing Plan* is being prepared and will be submitted within the next two months for Commission review.

Also in November, CH₂ finalized the *Bench Scale and Other Test Plans and Protocols report* and the *Final Design and Test Plan*. As a component of the bench scale testing, various laboratories were contacted regarding the use of their facilities for co-digestion tests involving a range of food waste feedstocks. After reviewing several options, it was determined that the CE Team would use laboratory space provided by the Orange County Sanitation District for the initial bench scale testing.

Work continues, but is limited, on the Economic and Environmental Assessment task. A workshop was held at the IEUA headquarters on renewable energy credits. Participants presented various viewpoints based upon the potential importance of renewable energy and emission reduction credits. Although a variety of topics were addressed and no single set of positions on the value of these credits emerged, the consensus of the attendees was that the environmental benefits accrued as a result of the manure collection were distinct and separate from the renewable energy credits associated with energy generation and therefore represented another potential benefit that could be accounted for.

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

As anticipated, Endecon submitted the final version of the *Small Systems Initial Characterization Report*. Additionally, data was compiled for analysis on the *6-Month Exposure and Operation Report*.

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

In November, REDI and Spectrum Energy staff participated in an onsite meeting with a high potential BI-PV project client. Additionally, sites continued to be surveyed, rooftops measured and preliminary layouts designed. Work was stopped in mid-month as the Commission staff was reviewing the overall project status and costs incurred to-date. In response to Commission questions, REDI and Spectrum Energy staff prepared and submitted a report in response to these questions.

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:** Although the CE Team has experienced challenges in gathering certain data, completing responses to comments, which has in some instances, delayed the completion of reports that were in turn crucial to the completion of another task, the majority of these issues have been resolved.
- **Project 2.1:** The CE Team continues to closely follow and facilitate/monitor this process of regulatory acceptance. Additionally, a delay in receiving primary data, affected the completion of the Task 2.1.1.a report. As of July, Project 2.1 has been closed.
- **Project 2.2:** Although this project is on track, due to project redirection and specifically a change of focus to the RP-1 site, additional coordination activities have been required with the technology vendors. This redirection will improve the implementation of the pilot programs, but has delayed the completion of the Site Selection and design tasks.
- **Project 3.1:** As the *Test Plan and Protocols Report* builds on the results from the aforementioned *Digester Comparison Report*, there has been a lag time between report submittals. These reports will be revised based upon the approved Project 3.1 Implementation Plan, prior to final submittal.
- **Project 3.2:** Task 3.2.2(1) activity has previously been delayed due to negotiations and related contract approvals in relation to the Commonwealth-IEUA Power Purchase agreement, as well as approval of the purchase orders and the SGIP Incentives reservation request to SCE 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, but was resolved in January.

- **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 implemented to the BI-PV ETP. The final draft deliverable has now been approved and the work, which was previously delayed under Task 3.3.4a, can now resume. The key personnel redirection has been resolved, and REDI's new team is actively moving forward while reviewing work previously completed.

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 0: Program Administration

It is anticipated that the Commonwealth Program Direction will continue to provide ongoing support to the CE Team and Commission staff. Additionally, work will continue on the PIER Program 1st Annual Report. Project Monthly Status Reports will be drafted for all projects 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 the CE Team and Commission staff, as project deliverables are presented for internal review prior to submittal to the Commission.

Project 1.1: Program Planning and Analysis

In December, Itron and the CE Team anticipate receiving approval from the Commission, on the *Task 1.1.10 Prioritization Report*, and the *Project 1.1 Draft Final Report*, under Task 1.1.11b . These task deliverables will then be finalized and invoiced. Work will continue to progress on the Project 1.1. M&E work under Task 1.1.13.

Project 2.1: Enhanced Landfill Gas Production

Limited activities are expected for December, with only the review of the findings and results of the project in relation to future bioreactor projects remaining. This effort will be conducted as a component of the measurement and evaluation activity of this project.

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

In December, testing of the IWe and Sonico ultrasound systems will continue and baseline data for the gas cleaning tasks at IEUA's Regional Plant Number 1 (RP-1) will be collected. Data will continue to be reviewed and integrated into the *First Quarterly Report* which will be finalized and submitted to the Commission in late December or early January.

Project 3.1: Dairy Waste to Energy

In December, the CE Team anticipates the completion of the *Draft Tactical Marketing Plan*. Additionally, the *Draft Process Recommendation Report* will also be submitted to the Commission for review. Site selection activities and the bench scale testing will continue, and further coordination with IEUA staff regarding the bench scale tests and the use of the results in the design of the co-digestion systems will be ongoing.

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

In December, Endecon plans to continue to work on the *6-Month Exposure and Operation Report* for the large systems and will also continue to monitor the output and ambient conditions from each of the small and large systems.

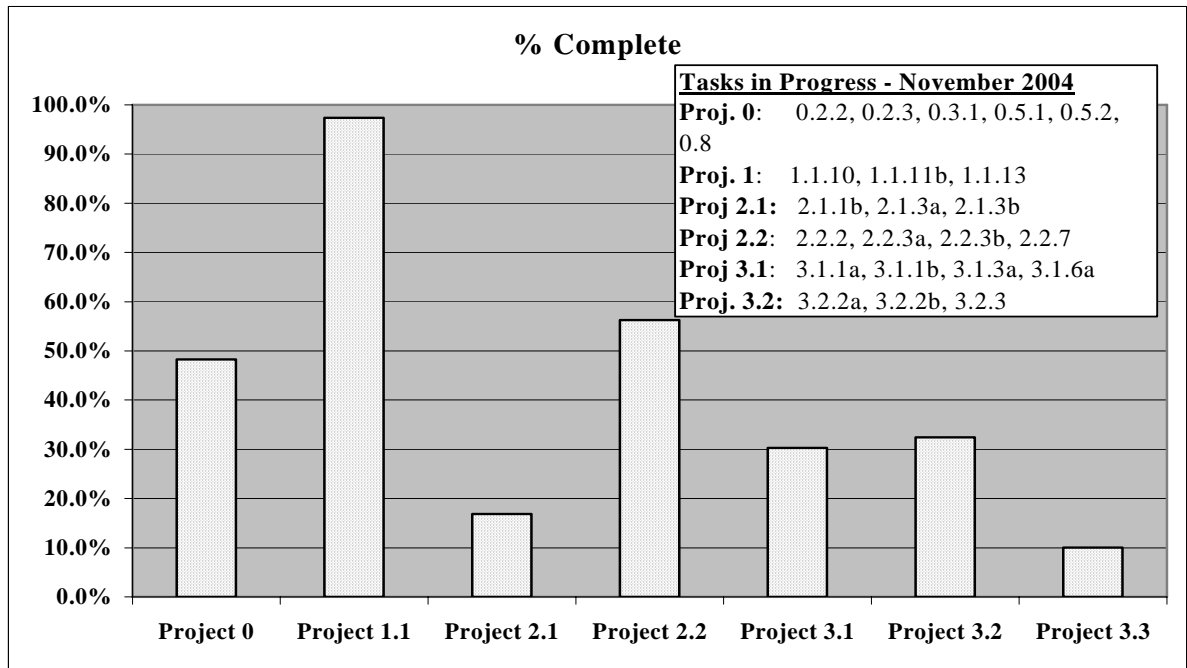
Project 3.3: Building-Integrated PV (BI-PV) on Public Facilities

REDI and Spectrum Energy staff will continue their financial analysis on potential BI-PV sites and will prepare a *Draft Final Report* of at least six candidate sites for BI-PV installations.

OVERVIEW OF PROGRAM STATUS:

Figure 1 on the following page 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:

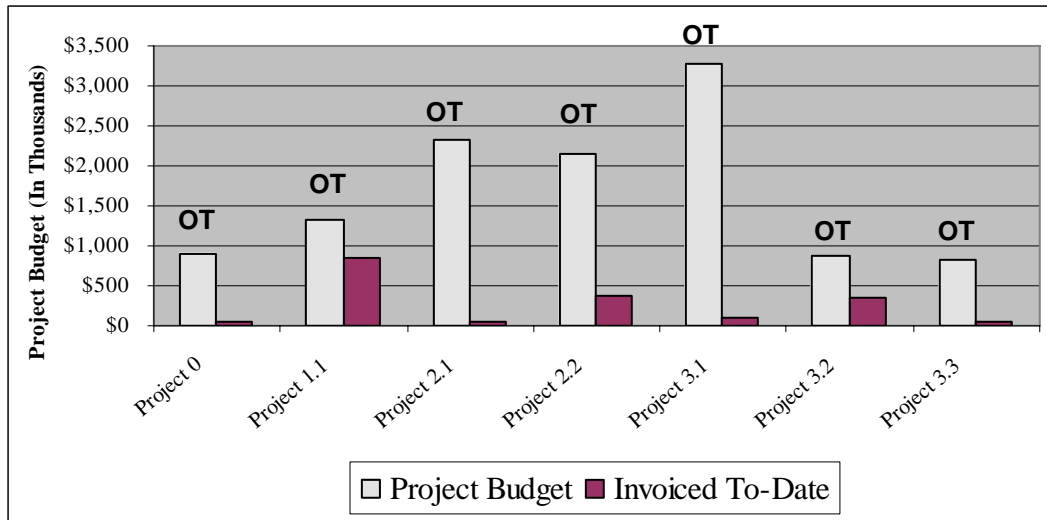
Table 1 and Figure 2 summarize the fiscal status of the Commonwealth Program by Project as of the end of the current reporting period. Figure 3 provides a status summary of the match funds for the Program to date. Note that a considerable amount of match funds have been incurred for Project 1.1 and Project 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	\$377,195 **	OT
Project 3.1	\$3,274,664	\$108,000**	OT
Project 3.2	\$ 870,099	\$340,199**	OT
Project 3.3	\$ 827,686	\$45,000**	OT

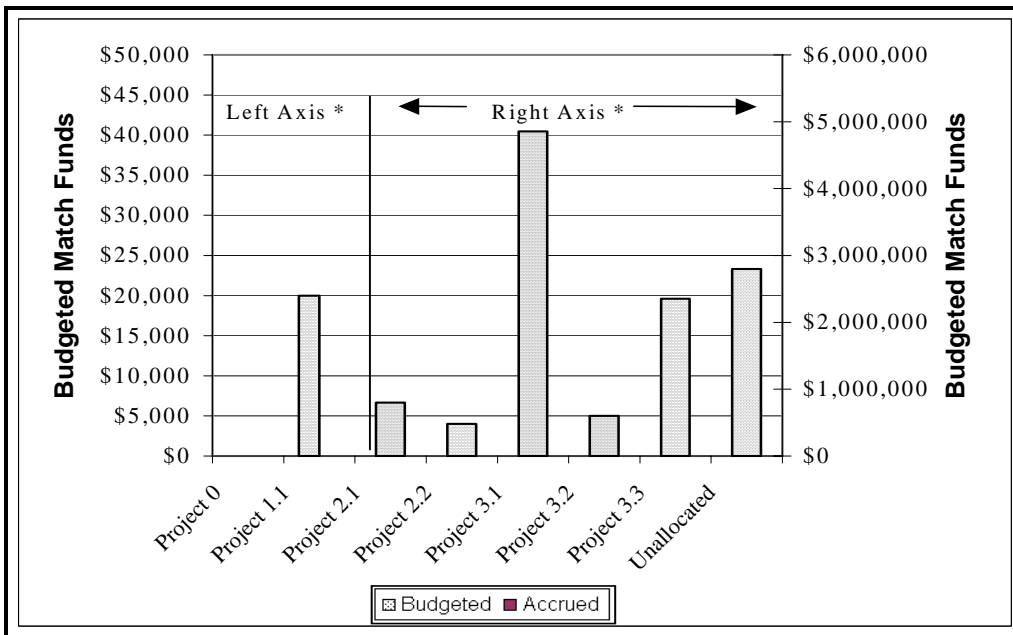
*Fiscal Status = (OT) "On Track", (OB) "OverBudget", (UB) "UnderBudget"
 ** Invoice Amount Shown after 10% retention withheld.

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.