

MONTHLY PROGRAM REPORT

OCTOBER 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

Contractor Project Director: Patrick Lilly 360-906-0616
Commission Project Manager: Zhiqin Zhang 916-654-4063

Program Team Members: Commonwealth Energy Corporation (Commonwealth), Itron/Regional Economic Research (Itron/RER), CH₂MHill (CH₂), Endecon Engineering (Endecon), Renewable Energy Development Institute (REDI), Zaininger Engineering (ZECO).

PLANNED ACCOMPLISHMENTS FOR THIS PERIOD:

Project 0: Program Administration

It was anticipated that the Commonwealth Program Administrative Team would continue to provide ongoing support to the CE Project Teams and Commission PIER Program management staff. Additionally, work would continue on the PIER Program 1st Annual Report. Project and Program Monthly Status Reports would be drafted for all projects (#s 1.1, 2.1, 3.1, 3.2 and 3.3) and reviewed internally prior to submittal to the Commission and posting on the Commonwealth PIER Mini-Grid RD&D Program Website.

The Contract Administration Team was to continue to provide support to the CE Project Team as Program task deliverables are presented for internal and TAC review prior to submittal to the Commission. It was anticipated that Contract Invoice # 12, drafted in late September, would be submitted in October to the Commission.

Project 1.1: Program Planning and Analysis

In October primary efforts were to focus on submitting the revised Task 1.1.10 *Prioritization Report* as well as finalizing and submitting the Task 1.1.11b *Project 1.1 Draft Final Report*, incorporating the results of the updated prioritization process.

Project 2.1: Enhanced Landfill Gas Production

October's focus of activity was to be limited primarily to preparation for the anticipated project wrap-up meeting. All other activities have been stopped as of July 2004.

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

In October, it was anticipated that the operation of the two ultrasound systems would continue, and that system modifications would also continue to ensure that the two systems met all their design requirements. Additionally, design efforts on the gas cleaning project, were to focus on ensuring that the existing gas distribution system was adequate.

It was anticipated that equipment layout and associated control engineering activity would continue, with a draft design report completed and ready for internal CE Team review. The CE Team anticipated that the as-built drawings would be complete and ready for internal CE Team review as well.

Project 3.1: Dairy Waste to Energy

In October, CH₂ planned to focus on completing the Draft Process Recommendation Report, which is to be used to assess, evaluate and select dairy waste to energy technologies. Upon completion of the Draft Process Report, CH₂ anticipated that the Final Process Recommendations Report would be ready for internal CE Team review.

Additionally, CH₂ anticipated completing the draft reports describing the environmental benefits of manure digester projects for submittal to the project team's Peer Review Group. Also in October, it was anticipated that a scope review meeting would be held to discuss future implementation activities for Project 3.1.

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

In October, Endecon anticipated that they would receive comments from the Technical Advisory Committee (TAC) on the Small Systems Characterization Report. Also, Endecon planned to continue to monitor the output and ambient conditions from the small and large systems.

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

In October, REDI anticipated completing its coordination with the CE Project Director in order to provide a revised budget for Project 3.3 – Task 3.3.4 to the Commission. This is anticipated to be a task-level budget revision and will not affect the overall project budget, but would simply allow a reallocation of PIER funds within a project task.

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 # 12, which included the following deliverables: Project 2.1 – Task 2.1.3a, Project 2.2 – Task 2.2.3b, Project 3.1 – Task 3.1.1a(1) and Task 3.1.1a(2), and Project 3.2 – Task 3.2.2a(5) and Task 3.2.3(2), was submitted to the Commission.

Additionally, the CE Team continued to work on the Annual Program Report.

Project 1.1: Program Planning and Analysis

As anticipated, in early October, Itron completed and submitted to the Commission the *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 October were limited, with primary focus on the preparation for and attendance at the Project 2.1 wrap-up meeting, held on October 15th in Sacramento. This meeting provided a project overview, lessons learned and reasons for closing the project. Discussions were conducted on a variety of topics – including how future projects could build on the planning, development and design experiences from 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, which in October were incorporated into the design of the gas cleaning systems. Further design drawings were review and refined with the host staff to ensure that the design incorporated all equipment requirements. The gas cleaning systems drawings were then reviewed in order to finalize and forward to the Commission in November.

In October, activities on the ultrasound system were limited, with the primary focus being on the completion of the as-built drawings.

Project 3.1: Dairy Waste to Energy

In October, efforts were focused on finalizing the *Draft Process Recommendation Report*. Modifications were made to this report, initially submitted in September to include

information on co-digestion technologies and data collected on food waste sources that can be used at the RP-1 treatment facility. Additionally, work continued on the *Final Process Recommendation Report*.

Efforts continued on selecting the optimal sites for components of the co-digestion system, which the CE Team anticipates will be installed at the RP-1 plant. A meeting held on October 15th, to review the Project Implementation Plan and future Research and Development, highlighted the need to develop a plan to bring to market the technologies that are being developed under this Project. In general, information gathered to-date confirms that co-digestion of manure and food waste offers the most potential to improve dairy waste to energy project economics in California.

Additionally at the October 15th meeting, the CE Team presented to the Commission's Renewable Manager, the potential to increase biogas energy in California by advancing co-digestion of food wastes and bio-solids. The technical merit and potential benefits were recognized, however, it was clear that a plan was necessary in order to bring this potential forward to market. The CE Team agreed to prepare a *Tactical Marketing Plan*, which will outline how the results from this Project could be brought into the California market. This draft plan will be prepared within two months for Commission review.

In October, CH₂ finalized the *Bench Scale and Other Test Plans and Protocols Report*, and well as the *Final Design and Test Plan*. Work also continued on the economic and environmental assessment task, with air emissions being developed and considered in light of the regulatory activity of South Coast Air Quality Management District. The findings of the environmental benefits work were assembled into a summary report, which was prepared and distributed to the Task 3.1.6 Technical Peer Review Group.

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

As anticipated, Endecon continued to compile data for the 6-month Exposure and Operation Report, as well as to monitor the output of all large and small systems. Additionally, comments were received on the Small Systems Characterization Report.

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

In October, REDI submitted a revised notification of budget revision for Task 3.3.4 and submitted it to the CE Project Director per the Commonwealth PIER prime contract terms.

Given the PIER Renewable Program manager's verbal approval of the revised Task 3.3.4 deliverables and their associated budgets, site selection activities were once again re-started with REDI and Spectrum Energy staff making new contacts and participating in two on-site meetings within the Chino Basin with potential high priority BI-PV projects. Additionally, the Project 3.3 team evaluated information previously gathered, surveyed sites, measured

rooftops and designed preliminary layouts. Utility bills were obtained and a meeting with Southern California Edison representatives took place.

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 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. In November, it is anticipated that Contract Invoice # 13 will 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 will continue on the Task 1.1.13 M& E task, while the CE team awaits 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 are expected to be limited, with only the review of results and findings as they relate to future bioreactor projects in California, remain. 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 November testing will continue at the IWe Tech and Sonico ultrasound systems at the City of Riverside Wastewater Treatment Plant. It is also anticipated that the documents marking completion of the ultrasound installation task will be completed and submitted to the Commission. Work will 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 include the preparation of the annotated outline and initial draft components of the Project 3.1 *Tactical Marketing Plan*. Site selection activities will also continue, and the bench scale tests will begin at the Orange County Sanitation District laboratory.

Additionally, the Task 3.1.6 *Draft Tasks Reports*, which were completed in October, will 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 plans to submit the final Small Systems Initial Characterization Report to the Commission, and for placement on the PIER mini-grid website. Work will 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.

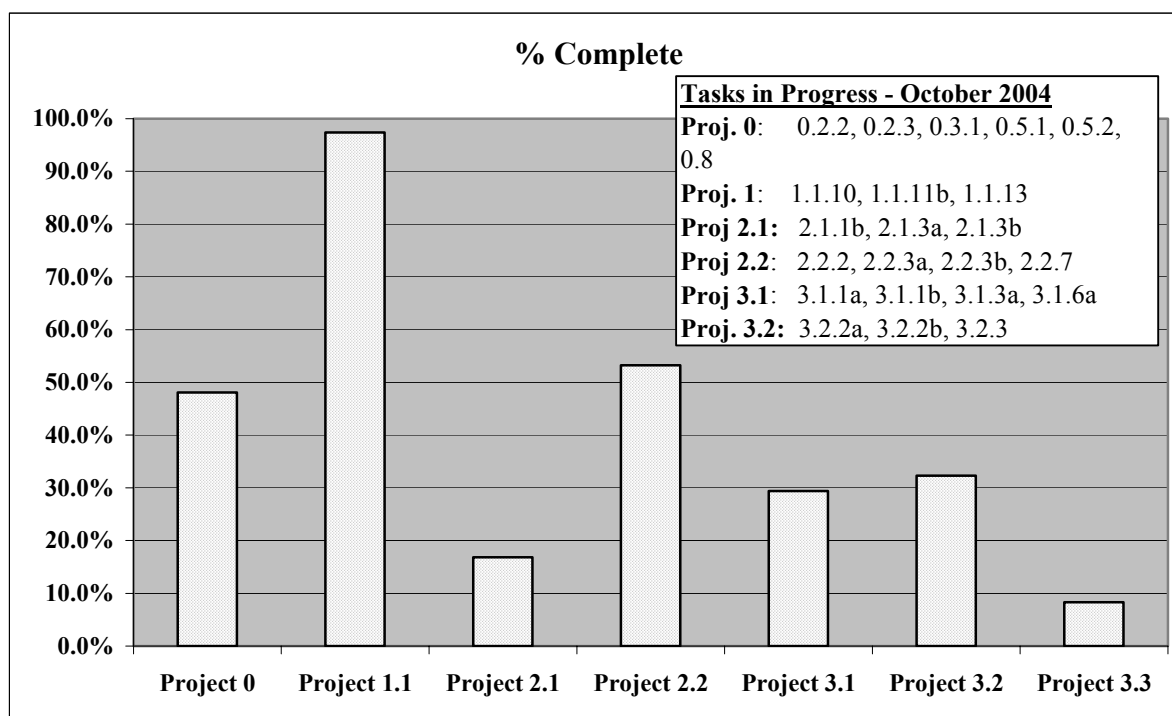
Project 3.3: Building-Integrated PV (BI-PV) on Public Facilities

REDI and Spectrum Energy plan to continue their work on identifying and establishing 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.

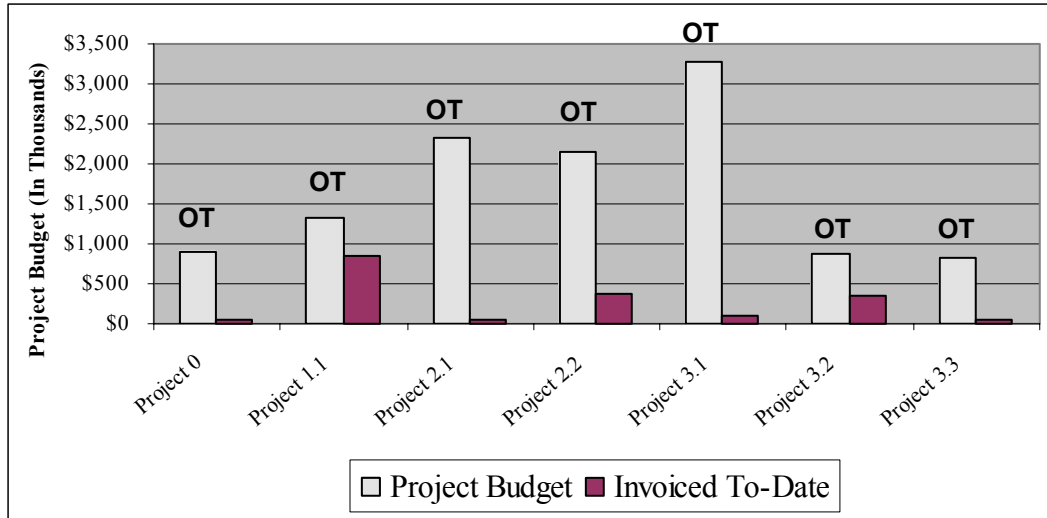
Table 1: Cumulative Program Fiscal Status by Project

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.

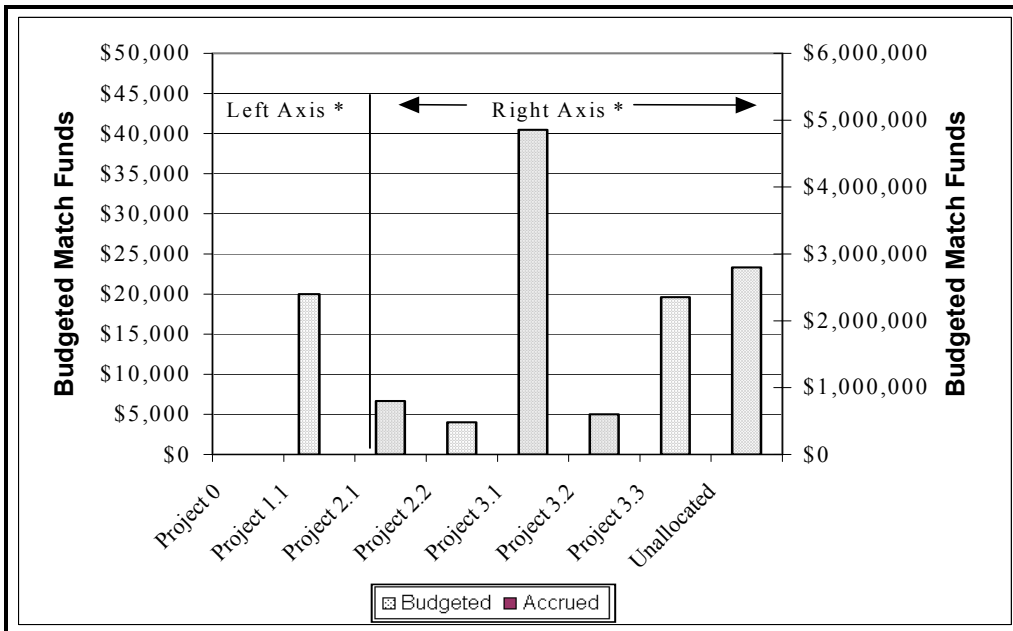
Figure 2: Program Fiscal Status - PIER Expenditures



* 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.