

MONTHLY PROGRAM REPORT

August 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, work was to continue on the PIER Program 1st Annual Report. Project Monthly Status Reports would be drafted for all projects (#'s 1.1, 2.1, 2.2, 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 Website.

The Contract Administrator was to continue to provide support to the CE Team and Commission staff, as project deliverables were presented for internal review prior to submittal to the Commission and posting on the Commonwealth PIER Mini-Grid Program Website. In August, it was anticipated that Contract Invoice # 11 would be drafted, reviewed and submitted to the Commission for Project 1.1 – Task 1.1.7, 1.1.8 and Project 3.2 – Task 3.2.2.b(2), Task 3.2.3(2).

Project 1.1: Program Planning and Analysis

The CE Team anticipated that it would receive comments and/or approval from the Commission on the Task 1.1.10 *Prioritization Report*. Additionally, the Team planned to submit the revised final Task 1.1.8 *Generation Profiles Report* to the Commission. Upon receiving approval of these reports, the CE Team will integrate their results and finalize the Task 1.1.11b *Project 1.1 Draft Final Report* and submit to the Commission for review and approval.

Project 2.1: Enhanced Landfill Gas Production

No activities were expected in August. It was anticipated that efforts would be undertaken in September to schedule and conduct the *Technical Advisory Committee Meeting*.

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

In August, the CE Team planned to continue with the installation and start-up activities of the two ultrasound units at Riverside. Testing would also be undertaken and pre-test baseline data collection would continue. Additionally, required control system modifications that were identified in July would be implemented in August.

On the gas cleaning project, joint efforts between the CE Team and NIRAS were to continue. One option for the biological treatment system was to use an existing tank at another IEUA facility that currently is not being used, to house the biological media to be employed in the biological gas cleaning system at RP-1. In August, the CE Team planned to investigate this option further, and planned to contact the tank's supplier to determine design criteria to ensure that it is adequate for potential use at RP-1.

Project 3.1: Dairy Waste to Energy

The CE Team planned to submit the Task 3.1.1 *Interim Report* as well as the Task 3.1.1 *Draft Report* for internal review. Coordination efforts were to continue with IEUA staff working with potential suppliers of feed stocks for co-digestion projects as well as with the formulation of co-digestion mixtures and options.

Work would also progress on Task 3.1.6 on the economic and environmental assessment of the project, to ensure that the work reflects the new (pending) SCAQMD rules. The final report was to be circulated for internal CE Team review so that it can be submitted to the Commission in September.

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

Endecon planned to finish the first draft of the *Small Systems Initial Characterization Report* and submit it for internal and *Technical Advisory Committee* review prior to submittal to the

Commission. Additionally, Endecon planned to continue to monitor the output of all the small and large systems and to provide monthly enhancements to the website in order to improve the ability to understand the data which is streaming for review.

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

In August, REDI anticipated that task work would continue to be minimal due to the pending key personnel redirection issue. REDI planned to continue its coordination with the CE Project Director to resolve the key personnel and Task 3.3.4 budget reallocation issues.

WHAT WAS ACCOMPLISHED THIS PERIOD:

Project 0: Program Administration

As anticipated, *Project Monthly Status* first draft reports were created for all Projects (#s 1.1, 2.1, 2.2, 3.1, 3.2 and 3.3), for the month of March and were reviewed internally.

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 Team on various pending project deliverables. Additionally, the CE Team continued to work on the 1st Annual Program Report. Contract Invoice # 11 was drafted and submitted to the Commission for review and approval for Project 1.1 – Task 1.1.7 and Task 1.1.8, and Project 3.2 – Task 3.2.2b(2) and Task 3.2.3(2).

Project 1.1: Program Planning and Analysis

Iron received approval from the Commission on the previously submitted Task 1.1.8 *Generation Profiles Final Report*. Additional revisions were made to the *Task 1.1.10 Prioritization Report*, incorporating the results of the *Task 1.1.8 report*.

The CE Team continued to integrate approved project planning key results into the draft *Project 1.1 Final Report*, under Task 1.1.11b. Finalization of this report will occur upon Commission approval of the revised Task 1.1.10 *Prioritization Report*.

Project 2.1: Enhanced Landfill Gas Production Using Bioreactors

There were no task activities on this Project in August. The CE Team began reviewing information and coordinating schedules with Project 2.1 Technical Advisory Committee members, Commission staff and the CE team, in order to schedule and prepare for the *Technical Advisory Committee Meeting*, tentatively to be held in September or October, where lessons learned will be reviewed and discussed.

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

Efforts continued on the gas cleaning system, with design data and site condition information collected previously, analyzed. Coordination activities also continued with the technology vendors to ensure that the equipment requirements were properly integrated into the design. Additionally, NIRAS provided preliminary design information for the biological gas treatment system under consideration for this project.

As reported previously, design activities for the Ultrasound system were completed. However, the CE Team continues its close coordination with the City of Riverside to ensure that the two ultrasound units being tested will be properly integrated into the plant's existing facilities. Design information continued to be reviewed and updated in the field on an on-going basis as needed during installation.

Significant progress was made on the installation of the IWe Tech and Sonico ultrasound systems, with start-up testing occurring in August. Each system was connected to the plant's digesters in a manner that would enable both units to be run in parallel so that their performance could be reviewed. Connections were also made to the Plant to ensure that once the pretest baseline analysis was completed, it would be possible to switch over to the new ultrasound systems for testing.

Project 3.1: Dairy Waste to Energy

As anticipated, efforts were placed on completing the *Assessment, Evaluation and Selection of Technologies*. A revised Project 3.1 *Implementation Plan* was submitted for review, and reflected the results of the March 9th meeting with Commission staff, which along with Project 1.1. analysis, recognized that efforts on this project would be focused on co-digestion and gas cleaning. Input from the Task 1.1.10 report was provided and included the evaluation of the co-digestion technologies in light of their ability to increase gas and electricity production and also their ability to be applied elsewhere in California. Additionally, the Task 3.1.1 *Interim Report* was submitted to the Commission for review and comments.

Work on the *Development of Bench Scale and Other Test Plans and Protocols* continued with focus on information assembled for bench scale testing and co-digestion. Preliminary plans continued and involved tests using several mixtures of feedstocks and wastes to be tested at the bench scale. Bench scale testing will continue as it will help ensure that the full scale testing can be undertaken in the most effective manner. For example, waste from cheese making operations in the region was identified as an important source as it digests moderately easily and would increase gas digestion, while also being available in large quantities. The results of the bench scale tests will be finalized after the Task 3.1.1 efforts are completed and all relevant feedback has been considered.

Minor revisions on the *Monitoring, Reporting and Verification Protocol* continued, with comments received and being reviewed by the CE Team. Particularly relevant are findings related to the new SCQAM rules that will affect dairy operations. Extensive coordination continues with the South Coast Air Quality Management District (SCAQMD) in order to ensure that the findings of this task will be consistent with the District's pending rules related to emissions from dairy operations.

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

As envisioned, Endecon received comments from the Technical Advisory Committee on the *Multi-Array Initial Characterization Report* and began reviewing these comments prior to integration and submittal to the Commission. Additionally, Endecon continued to work on the first draft of the *Small Systems Characterization Report*.

Enhancements continued to be made to the website in order to improve the ability to understand the data which is now streaming for review, and Endecon continues to monitor the output of all the large and small systems to ensure that they continue to be operational and are gathering data.

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

Project 3.3 task development continued to be minimal, due to pending key personnel redirection issues. REDI officially submitted Vince Schwent's qualifications as well as a formal request to add Mr. Schwent as the new Project 3.3 Manager, replacing Keith Rutledge. Final revisions were made to the draft Task 3.3.4 budget reallocation documentation, which is being reviewed internally prior to submittal to the Commission.

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:** Work has ceased on this project due to the decision not to proceed with the bioreactor elements of the liner extension. Based upon San Bernardino

County's need to proceed with its liner extension at Mid-Valley, it has been determined that the Bioreactor project will not move forward.

- **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 previous delayed under Task 3.3.4a, can now resume. Currently, a key personnel redirection has limited task work, while an appropriate replacement is determined.

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 budget.

As reported previously, in July, San Bernardino County chose to proceed with the construction of the Unit 3 liner project in order to ensure that the liner extension construction would occur this summer. As the County could not delay their decision, the PIER CE bioreactor project was stopped without including the bioreactor elements.

As a key element of Project 3.1 is the definition and quantification of the environmental and economic benefits of the project, the CE Team continues to work with IEUA and is seeking cost information for centralized dairy waste to energy projects in an appropriate form. This

specific topic is being addressed earlier than anticipated within the project, which along with the program focus redirection to co-digestion and gas cleaning has caused some minor delays while the CE Team has revised or researched necessary information.

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, specifically in relation to Project revisions that are currently being discussed for Project 2.1, 2.2 and 3.1. Additionally, the Commonwealth Program Director will work with the Commission Project Manager to begin preparing for Contract Amendment decision/issues.

Work will continue to progress on the PIER Program 1st Annual Report, and Project Monthly Status Reports will be drafted for all projects (#'s 1.1, 2.1, 2.2., 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 Website.

Project Monthly Status Reports will be drafted for all projects (#'s 1.1, 2.1, 2.2, 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 Website. Contract Invoice # 12 will begin to be drafted, for submittal to the Commission in late September or early October.

Project 1.1: Program Planning and Analysis

The CE Team anticipates receiving comments from the Commission on the Task 1.1.10 *Prioritization Report*, responding to comments if provided, and finalizing and resubmitting to the Commission in September. Upon receiving approval of the Task 1.1.10 deliverable, the CE Team plans to incorporate results and finalize the Task 1.1.11b *Project 1.1 Draft Final* report to the Commission.

Project 2.1: Enhanced Landfill Gas Production

No task activities are expected in September. However, the CE Team will coordinate schedules and draft documents for the *Technical Advisory Committee Meeting*, tentatively scheduled for September or October.

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

It is anticipated that in September, the operation of the ultrasound systems and equipment at Riverside, including control system modifications that were identified during the installation

process would continue to operate and be monitored. Design efforts on the gas cleaning project will continue, focusing on the connections to the existing gas distribution system. The draft design will be completed and reviewed internally prior to submittal to the Commission. Additionally, work on the *First Quarterly Report* will also continue and will include data collection information for the ultrasound systems at Riverside as well as the gas cleaning data from RP-1.

Project 3.1: Dairy Waste to Energy

In September, the CE Team anticipates incorporating comments received from the Commission on the Task 3.1.1 *Interim Report*. Comments will also be incorporated into the Task 3.1.1 Draft Report in order to review internally and submit to the Commission.

The CE Team will continue to work with IEUA staff and potential suppliers of feedstocks for co-digestion projects and also in formulating co-digestion mixtures and options.

Efforts will continue in identifying infrastructure improvements needed at RP-1 to accommodate additional gas produced this program.

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

In September, Endecon plans to submit the final draft of the *Multi-Array Initial Characterization Report* to the Commission for review. Additionally, Endecon plans on completing the first draft of the *Small Systems Initial Characterization Report*, which will be forwarded to the Technical Advisory Committee for review prior to submittal to the Commission.

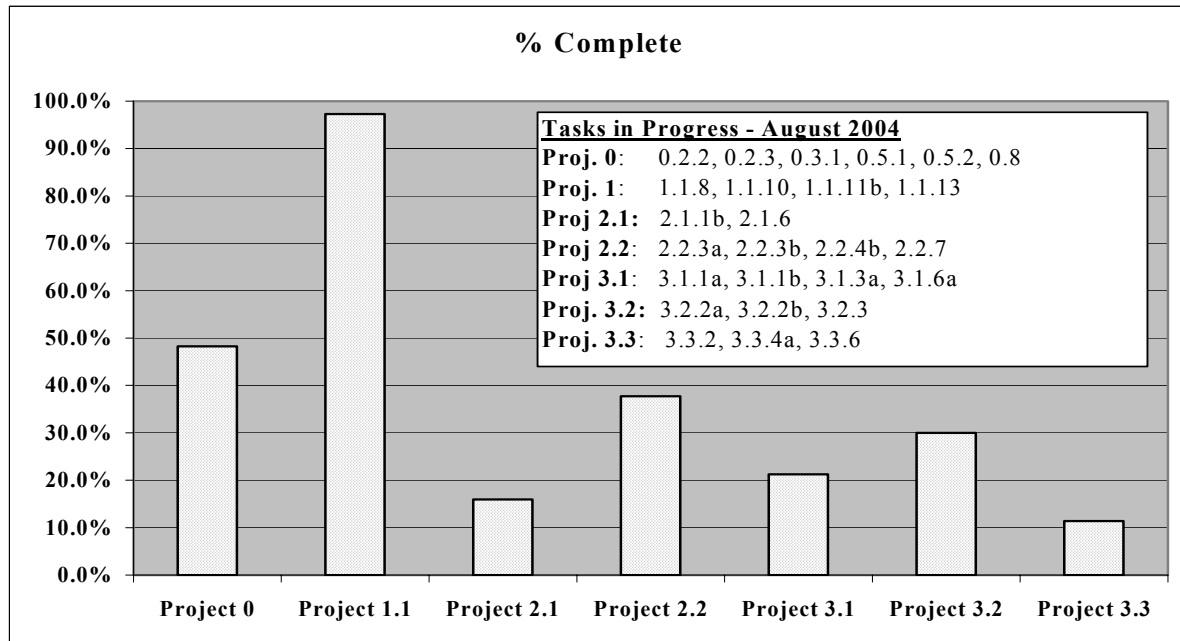
Project 3.3: Building-Integrated PV (BI-PV) on Public Facilities

In September, REDI anticipates receiving comments and/or approval from the Commission on their request to add Mr. Vince Schwent as the Project 3.3 Manager, replacing Keith Rutledge. Upon receiving approval, appropriate documentation and/or contract exhibits will be updated and provided to the Commission. Additionally, REDI anticipates submitting their Task 3.3.4 budget reallocation documentation to the Commission for review.

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.

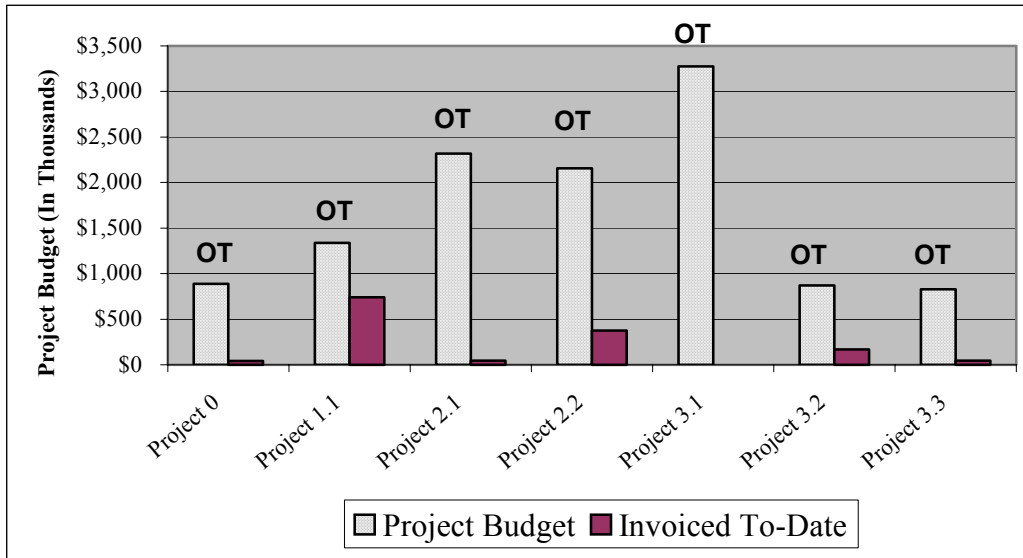
Table 1: Cumulative Program Fiscal Status by Project

Project Number	Project Budget	Invoiced To-Date (\$)	Fiscal Status *
Project 0	\$ 889,771	\$43,375 **	OT
Project 1.1	\$1,336,613	\$741,926 **	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	0	OT
Project 3.2	\$ 870,099	\$168,749**	OT
Project 3.3	\$ 827,686	\$45,000**	OT

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

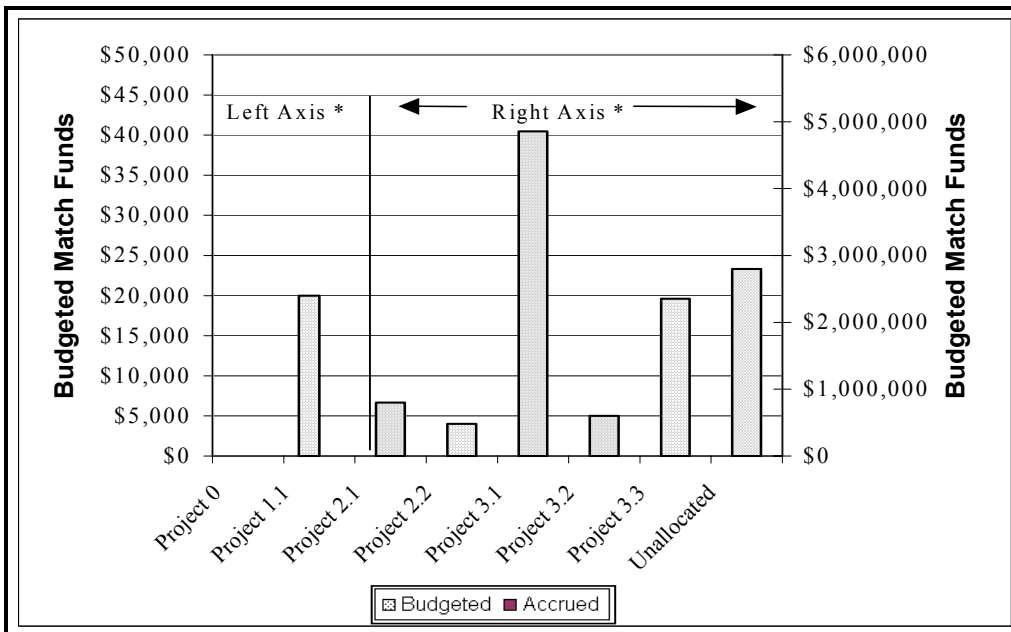
** Invoice Amount Shown after 10% retention withheld.

Figure 2: Program Fiscal Status - PIER Expenditures



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

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.