

MONTHLY PROGRAM REPORT

July 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, 3.1, 3.2 and 3.3) and a Program Status report would be drafted for April and May 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 were presented for internal review prior to submittal to the Commission.

Project 1.1: Program Planning and Analysis

In July, Itron and the CE Team planned to focus on the final incorporation of the *Generation Profiles* under Task 1.1.8. Additionally, the CE Team planned to work primarily on the completion of the *Project 1.1 Draft Final Report* under Task 1.1.11b. Efforts were to continue on incorporating Commission and other comments on the *Task 1.1.10 Prioritization*

Report, with final results being incorporated into the Task 1.1.11b report, prior to submittal to the Commission in July or August.

Project 2.1: Enhanced Landfill Gas Production

This was to be a critical month for the project, as San Bernardino County needed to proceed with its liner extension in early July in order to meet its schedule to accept waste in early 2005. A *Technical Advisory Committee* (TAC) meeting was planned to review the bioreactor project and to provide the TAC and Commission staff the opportunity to present direct comments and guidance on the proposed implementation of the project. Discussions were to continue in order to resolve outstanding issues related to the *Memorandum of Understanding* (MOU). CH₂ anticipated that resolution would occur and the MOU would be finalized in July.

Additionally, CH₂ anticipated that the bioreactor design would be finalized in July including the incorporation of comments received from the *Conceptual Design Report*. Preparation would continue on the *Construction and Test Plans*, to ensure that the design contractor has the appropriate details and requirements and unit cost bid prices.

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

In July, it was anticipated that the installation of the ultrasound systems at Riverside would continue. Equipment received in June was to be installed and start-up activities were to be planned. Additionally, further control system modifications begun in June were to continue, specifically focusing on the connections to the existing gas distribution system. Finally, it was anticipated that the gas sampling plan would be reviewed by the project team.

Design activity on the gas cleaning task was also to continue, as was the ongoing coordination with the host facility staff.

Project 3.1: Dairy Waste to Energy

The primary focus of activity was to surround the completion of the Task 3.1.1 *Interim Report*. The Draft Task 3.1.1 report was to follow and would include assessment and evaluation of the technologies relevant to dairy waste to energy. Also in July, additional plans were to be developed regarding how best to utilize available co-digestion technologies practices and experiences, both in the U.S and in Europe. The CE Team planned to continue its work on the environmental benefits of dairy waste digestion projects, with a draft of the report anticipated to be completed and submitted in July.

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

In July, Endecon planned to complete the first draft of the *Multi-Array Characterization Report* and forward it to the Technical Advisory Committee as well as internally for review prior to submittal to the Commission. Additionally, Endecon was to continue to monitor the output of the small and large systems

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

Task work was to be minimal as REDI continued to work with the CE Project Director finalizing a revised budget for Task 3.3.4, which would reallocate the existing budget within specific Task 3.3.4 deliverables. Additionally, REDI planned to make a formal decision regarding the future status of Keith Rutledge and begin to review potential replacement candidates.

WHAT WAS ACCOMPLISHED THIS PERIOD:

Project 0: Program Administration

As anticipated, the first drafts of *Project Monthly Status* reports were created for all Projects (#s 1.1, 2.1, 2.2, 3.1, 3.2 and 3.3), 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 and 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 leads on various pending project deliverables. Additionally, the CE Program Administration Team continued to work on the First Annual Program Report.

Project 1.1: Program Planning and Analysis

Iron completed the integration of the Generation Profiles into the Task 1.1.8 report, which was submitted for final Commission review. Additionally, the CE Team completed its internal review of the *Task 1.1.10 Prioritization Report*. In July, the CE Team focused primarily on completing the updated decision-making model. The areas updated were within Projects 2.1 and 3.1, where updated project site information was integrated into the model. The initial numeric weights were finalized and used to provide results of the prioritization effort and then sent to the Commission for review.

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

In early July, San Bernardino County determined that it would move forward with the liner extension project at Mid-Valley without the bioreactor elements in order to proceed on their timeline to accept waste by early 2005. This decision confirmed that the PIER Commonwealth Bioreactor project could not be implemented at Mid-Valley as planned. Based upon this outcome, it was determined that the project work would be stopped. A Technical Advisory Committee meeting was tentatively scheduled for September to review lessons learned on the project.

The CE Team determined that the *Construction and Test Plans*, pending finalization, would be completed and submitted to the Commission and be made available at the September TAC meeting. Work on the *Conceptual Design for the First Bioreactor* was limited, as the Draft Report had been submitted previously for review. Based upon the Mid-Valley decision, all activities on this project have ceased.

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

Work on the *Process Selection* and *Site Selection and Test Plan* tasks are complete and the results have been incorporated into the design process and are being implemented into the project in the field. Efforts continued on the gas cleaning system in July, with design data and site condition information collected for the design efforts. Additionally, NIRAS began developing design information for the biological gas treatment system that is under consideration for this project.

The design activities for the Ultrasound system were completed in July, with the CE Team continuing its close coordination with the City of Riverside to ensure that the two ultrasound units being tested would be properly integrated into the plant's existing facilities. Design documents for this project were submitted to the Commission in June, and continued to be updated on an ongoing basis as installation proceeded. Significant progress was made on the installation of the IWe and Sonico ultrasound systems. Both systems were placed in their proper location and connection activities were undertaken. Site improvements were needed however each system was connected to the plant's digesters in a manner that would enable both units to be run in parallel, which will allow the CE Team to ensure that each unit is run in accordance with the Project's test plan.

Project 3.1: Dairy Waste to Energy

In July, 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. The submitted plan also reflected subsequent evaluations conducted since the March 9th meeting was held.

Further efforts were focused on co-digestion, with suppliers screened and a preliminary assessment of key parameters developed and reviewed. An evaluation of the host facility's (RP-1) ability to handle the increased gas production was undertaken.

Work on the *Development of Bench Scale and Other Test Plans and Protocols* continued, however were limited in July as information on co-digestion was being analyzed. *The Revised Test Plans and Protocols Report* will focus on co-digestion and gas cleaning and will be consistent with feedback received from the Commission on the *Commonwealth Business Plan*, the *Prioritization Report* and the revised *Project 3.1 Implementation Plan*. Activities continued on the *Economic and Environmental Assessment*, with additional updates on the baseline analysis utilizing actual emissions information from existing operations. Minor revisions were completed on the *Monitoring, Reporting and Verification* protocol for quantifying the environmental benefits of the centralized digestion projects. A preliminary draft was circulated within the CE Team for internal review, and comments received along with information generated were utilized in a presentation at the digester summit at IEUA's headquarters in Chino California.

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 anticipated, Endecon finalized the first draft of the *Multi-Array Initial Characterization Report* and submitted it internally and to the Technical Advisory Committee for review.

Enhancements continued to be made to the website in order to improve the ability to understand the performance data that is now available in a streaming review format.

Additionally in July, Endecon continued 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

As anticipated, Project 3.3 task development was minimal, due to pending key personnel redirection issues. Itron and REDI continued their discussions surrounding the pending personnel changes at REDI, regarding the appropriate potential replacement for REDI's Project 3.3 Manager. Additionally, the proposed Task 3.3.4 scope and budget reallocation continued to be reviewed by the CE Team.

HOW WE ARE DOING COMPARED TO PLAN:

Of the active projects, Projects 1.1, 2.1, 3.1, 3.2 and 3.3 have some task elements that are running behind the original CE 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 under this Program.
- **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 their 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 Power Light array had caused a slight delay, but this issue 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.

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 redirection of its focus 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. Additionally, work will continue on the PIER Program 1st Annual Report. 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.

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 and posting on the Commonwealth PIER Mini-Grid Program Website. In August, it is anticipated that Contract Invoice # 11 will be drafted, reviewed and submitted to the Commission for Project 1.1 – Tasks 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 anticipates that it will receive comments and/or approval from the Commission on the Task 1.1.10 *Prioritization Report*. Additionally, the Team anticipates submitting 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 Project 1.1, Task 1.1.11.b Draft Final Report and submit it to the Commission for review.

Project 2.1: Enhanced Landfill Gas Production

No activities are expected in August. It is anticipated that efforts will be undertaken in September to schedule and conduct the next Technical Advisory Committee Meeting.

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

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

On the gas cleaning project, joint efforts between the CE Team and NIRAS will continue. One option for the biological treatment system is 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 plans to investigate this option further, and will 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

In August the CE Team plans to submit the Task 3.1.1 *Interim Report* as well as the Task 3.1.1 *Draft Report* for internal review. Coordination efforts will 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 will continue under 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 will 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

In August, Endecon plans 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 plans to continue to

monitor the output of all the small and large systems and will continue to provide monthly enhancements to the website in order to improve the ability to understand the individual system's performance data, which is now streaming for review.

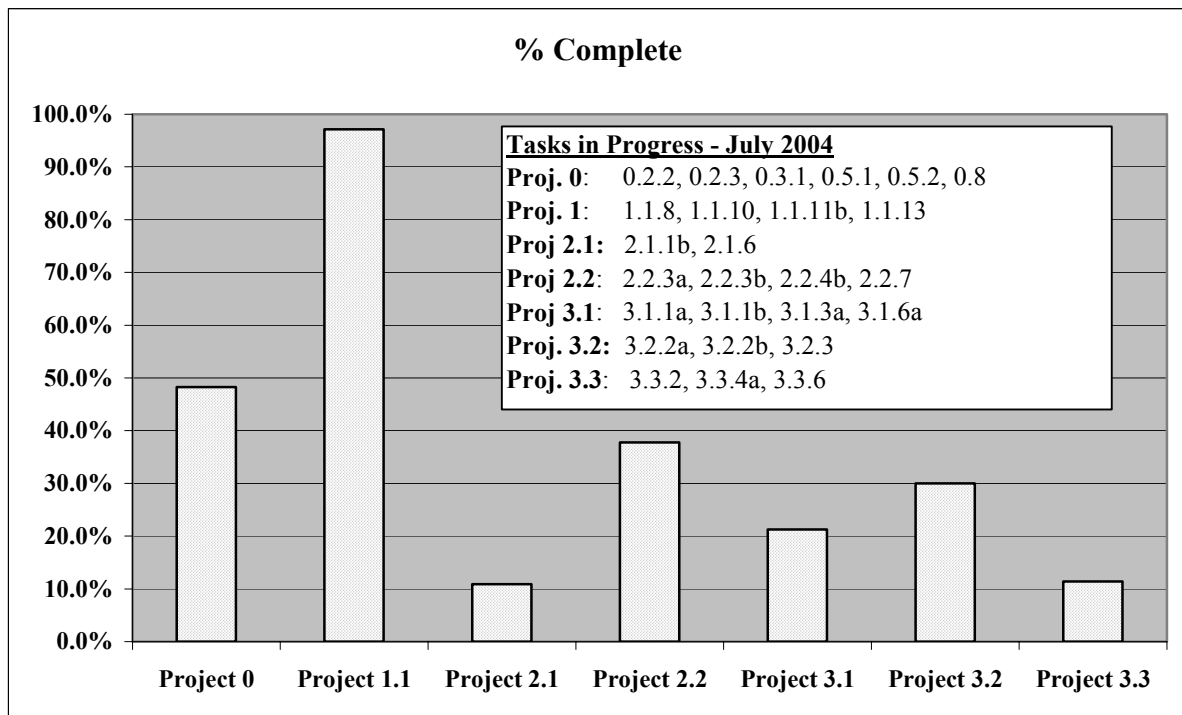
Project 3.3: Building-Integrated PV (BI-PV) on Public Facilities

In July, REDI anticipates that task work will continue to be minimal due to the pending key personnel redirection issue. REDI will continue to work with the CE Project Director to resolve the key personnel and subtask 3.3.4 budget and scope reallocation issues.

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 for each Project as of the end of the current reporting period.

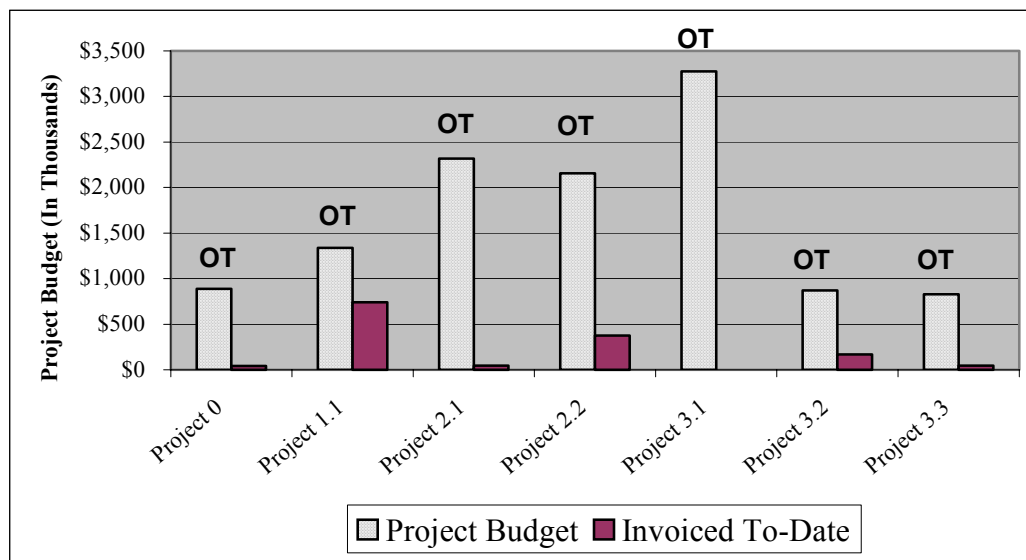
Table 1: Cumulative Program Fiscal Status by Project

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"

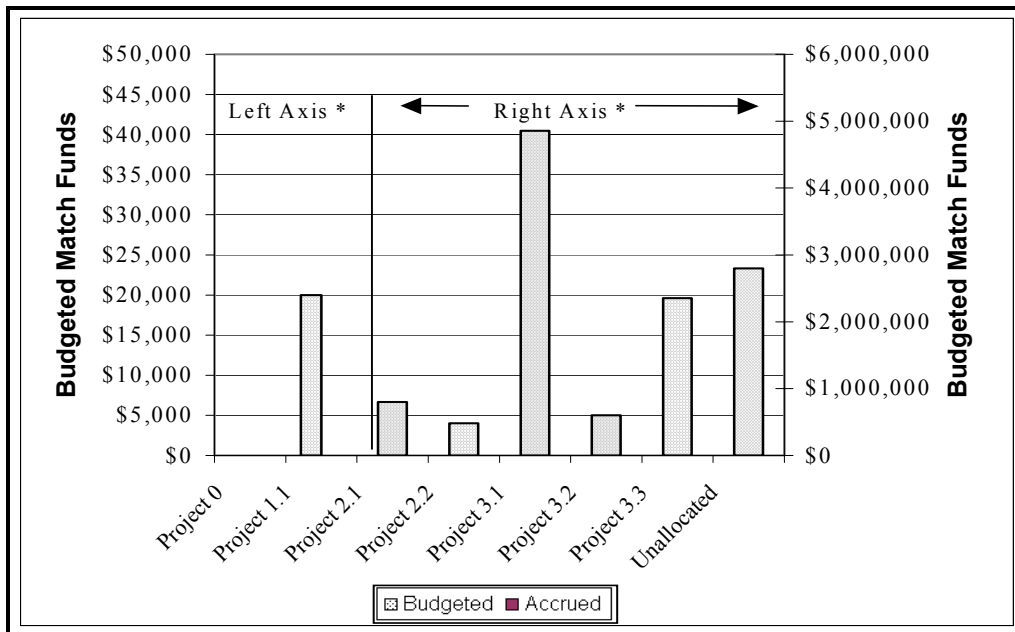
** Invoice Amount Shown after 10% retention withheld.

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.