

MONTHLY PROGRAM REPORT

FEBRUARY 2003

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

The Commonwealth Team anticipated that the Program RPAC and Project TAC member selection and confirmation process would be completed, and that the 1st Commonwealth Program RPAC meeting would be held on February 27th at the Commission.

The 3rd Contract invoice was to be submitted in early February covering Project 0: (Task 0.1 and 0.2.2) as well as Project 3.2: (Task 3.2.1).

Project specific administration support under Task 0.8 will continue. Updates will also continue to be reviewed and refined by the Contract Project Director. Monthly Status Reports will be drafted and submitted to the Commission for Project 1.1, Project 2.1, Project 2.2, Project 3.1, Project 3.2 and Project 3.3.

Project 1.1: Program Planning and Analysis

It is anticipated that the Agricultural waste database and Final Inventory Report would be submitted to the Commission for review. Work would also continue on the Project Prioritization List and the task deliverable final report text and outline.

A visit was planned for February by NIRAS, a Danish firm with biogas energy expertise. Presentations were to be held in Sacramento in the 12th and 13th of February. Two NIRAS representatives will be participating in these presentations and a dairy facility tour will take place on the 11th.

It is anticipated that the Task 1.1.5 inventory and technical potential report will be finalized and submitted to the Commission for review and approval. Additionally, the draft report on the generation profiles is expected to be finalized, and reviewed internally by the Team.

ZECO will complete the draft Task 1.1.6 and 1.1.9a T&D Inventory and Power Flow reports and deliver the PSLF model & database to the Commission for review and approval.

Finally, the Project 1.1. Critical Project Review meeting will be held in Sacramento on the 27th of February, immediately following the Program RPAC meeting. This will be the 1st CPR meeting, and the first gathering of the Project 1.1 Technical Advisory Committee (TAC).

Project 2.1: Enhanced Landfill Gas Production Using Bioreactors

Work will continue to progress, as CH₂ moves forward on this project. A formal Project 2.1 kick-off meeting is expected to occur in late February.

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

Work will continue to progress, as CH₂ moves forward on this project. A formal Project 2.1 kick-off meeting is expected to occur in late February.

Project 3.1: Dairy Waste to Energy

Work will continue to progress, as CH₂ moves forward on this project. A formal Project 2.1 kick-off meeting is expected to occur in late February.

Project 3.2: Building Integrated PV Testing and Evaluation Project

It is anticipated that the IEUA Management Team and Board of Directors will approve the contract between Commonwealth Energy and IEUA. This will allow Commonwealth to provide and install the system on the new IEUA headquarters building, which will become the large system test site. Arrangements will be developed and coordinated with IEUA on all

aspects of preparation and installation of the Large (60kW) PV system. Additionally, equipment and material procurement will begin.

Finally, the DAS Letter of Notification and DAS Manual will be submitted for approval and approval.

Project 3.3: Building-Integrated PV on Public Facilities

REDI anticipates completing the verification and test of the software evaluation tools, and submitting the Evaluation Tools package and Public Facilities Test Plan draft to Itron for review and comments.

Work will continue as BI-PV projects are developed with public agencies within the mini-grid. REDI will continue to contact public agencies, which to-date have been non-responsive or have yet to be contacted. A workshop will be developed in conjunction with the local Assembly Member to discuss reducing energy costs through BI-PV projects. And, a PV analysis paper will be sent to key facilities to expedite the development process.

WHAT WAS ACCOMPLISHED THIS PERIOD:

Project 0: Program Administration

The RPAC and TAC members were confirmed and invited to participate in person (or as necessary, via phone) in the first Commonwealth Program RPAC meetings, which were held at the Commission and CH₂ Government Affairs offices in Sacramento on February 27th. Meeting agendas and presentation slides were prepared and forwarded to the RPAC and Project 1.1 TAC members, along with overall program descriptive information and the link to the PIER Program website. This information allowed the RPAC and TAC Committee Members to view the deliverables submitted to-date, as well as providing an overall review of each Project's tasks, objectives and goals. Itron and the CE Team coordinated with the Commission Project Manager in preparation of the RPAC meeting and began preparing the meeting minutes.

The CE Team received approval from the Commission on Task 0.2.2 deliverables, and they were placed on the PIER Mini-Grid website along with the approved monthly program and project status reports.

The 3rd Contract Invoice was submitted as expected, in early February. This invoice covered Project 0: (Task 0.1 and 0.2.2), as well as Project 3.2: (Task 3.2.1).

Project specific administration support under Task 0.8 continued. Revisions and/or potential budget reallocations continue to be reviewed and refined by the Commission Project Manager and Commonwealth Program.

Project 1.1: Program Planning and Analysis

The CE Team prepared the necessary materials and presented the first Critical Program Review Meeting for Project 1.1, which was held on February 27th in Sacramento with the Project 1.1 Technical Advisory Committee (TAC) members present either in person or via teleconference. The meeting formed a strong foundation through the participation of the TAC members. Discussions took place in regard to the presentations from CE Team members on their respective tasks within Project 1.1. Of most significant interest was the scope of the T&D mini-grid power flow analysis and related evaluation of grid-tied DG.

As expected, CH₂ completed its internal review of the Agricultural Facilities Database and Inventory Report and submitted this draft report to the Commission. Comments were received late in the month, and CH₂ is reviewing the additional data the Commission would like incorporated into the report, and will begin the process of gathering data and updating the Inventory Report in March.

Final revisions were made to the BI-PV Technical Potential Report and it was resubmitted to the Commission in February. Final Commission approval was received in late February for this deliverable.

ZECO completed the T&D Report and submitted it along with the basecase PSLF model to the Commission on February 12th. Additionally, on this same date, ZECO completed and submitted the Task 1.1.9a Power Flow Analysis draft report to the Commission.

RER continued to develop technology cost data for the biogas and BI-PV Minigrid Market Potential report. Work may continue on this task into April.

Work continued on the Prioritized List of Projects. The Program Final Report outline was submitted on February 12th and CH₂M reviewed and incorporated comments from the CE Team into each of these tasks/reports.

Project 2.1: Enhanced Landfill Gas Production Using Bioreactors

Planning activities for the first task of this project continued. A meeting was scheduled with San Bernadino County staff to discuss participation in the Program. An overview of the landfill bioreactor project was prepared. Dialogue continues with landfill owners in regard to potential projects in Riverside County. Preparation for the Project 2.1 kick-off meeting began, and the original meeting date was postponed as it conflicted with the 1st RPAC meeting. The meeting will be rescheduled for a later date in March.

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

Information has been collected on processes as a component of the Process Selection Task. Data that has been assembled through previous work on Task 1.1.4 will be used as a starting point, with new and additional data being collected which will better define the technologies under consideration for this task.

Various firms with biogas cleaning expertise, as well as vendors involved in thermal hydrolysis and ultrasound processes have been contacted by the Team. The information collected will be utilized within the Process Selection Report.

The Project kick-off meeting was conducted as anticipated on February 28th in Sacramento.

Project 3.1: Dairy Waste to Energy

Work continues on this project with a focus on different technologies used to capture the energy value of the manure which most effectively converts it into energy. Information that was previously gathered for Project 1.1 inventory reports will be utilized, as well as input from various technology vendors and other organizations involved in waste generation.

As anticipated, NIRAS a Danish firm with extensive biogas energy expertise gave two presentations, one in the Chino Basin and one at the CEC in Sacramento. Many interesting points and recommendations came from these presentations, including the need to seriously review co-digestion for the purpose of increasing gas production. One other important recommendation focused on the need for the team to consider biological, as opposed to chemical processes for gas and waste water streams whenever possible. This trend has only recently occurred in Europe.

The Project kick-off meeting was conducted as anticipated on February 28th in Sacramento. The work scope and an overview of Project 1.1 findings, which will be applicable to this project, were presented and discussed. A considerable discussion on the merits of both plug flow and complete-mixed digestion systems took place, and approaches to these and other options discussed at the meeting will be reviewed and developed by the CE Team over the next several months.

Project 3.2: Building- Integrated PV Testing and Evaluation Project

The process of completing the Commonwealth Energy-IEUA BI-PV energy purchase Contract continued. Currently, the project is on hold pending IEUA Board approval of this contract. There were many questions addressed by the IEUA Board, which have been answered. Currently the approval is expected in March, and although the installation

schedule has slipped as a result of the Board Approval delays, we believe that this project will be moving forward in the near future.

Procurement and planning has been completed for the large systems and progress has been made on assembly of the DAS.

Project 3.3: Building-Integrated PV on Public Facilities

Revision to the Software Evaluation Tools package continues as REDI has revised the building type aspects of the model and has added new graphic features to the software tool. Integration of the demand savings model and the analysis aspect of the evaluation tool have taken place. Draft products have been created for the test plan and technical assistance booklets.

A BI-PV economic analysis has been created for numerous project sites, and contacts continue to be made with various public sector clients as well as public agencies. A public workshop was scheduled for March 28th, sponsored by Assemblywoman McLeod.

How we are doing compared to plan:

Of the currently active projects, Project 0, Project 1.1 and Project 3.2 have task components, which are running behind schedule. However, the majority of the Projects/Tasks are proceeding along schedule. Following are summaries of the delays that have been encountered. It is important to note, that the minor delays experiences, should not impact the overall Project 0, Project 1.1 or Project 3.2 targeted completion dates.

- **Project 0:** Itron has experienced delays in presenting the Project Monthly Status and Program Monthly Progress Reports. It is anticipated that by May, the submitted reports will be up-to-date and current.
- **Project 1.1:** Itron has encountered a greater difficulty than anticipated in the gathering of data, as well as the development of biogas project prototypes. This has delayed the completion of the mini-grid market potential assessment report. CH2 has learned that the regulatory R&D exemption could potentially affect bioreactor pilot research projects. Additionally, a new regulation, which would affect projects that are being conducted under Project 1.1 are to be issued in March or April. This new regulation may have a serious impact on the success of permitting the Landfill bioreactor project.
- **Project 3.2:** This project continues to be held up due to negotiation and approval delays of the Commonwealth-IEUA BI-PV power sales agreement. As this delay continues, there will be residual effects on other Project 3.2 tasks. The CE team currently anticipates that the Agreement will be completed in March.

SIGNIFICANT PROBLEMS OR CHANGES:

As indicated above, Project 0, Project 1.1 and Project 3.2 all have tasks, which are currently behind schedule. However, these task delays are not expected to impact the overall Project completion dates, and as such, we report that current Program progress and expenditures will result in the Program being completed on time and within budget.

EXPECTED ACCOMPLISHMENTS DURING THE NEXT PERIOD:

Project 0: Program Administration

The CE Team will review and revise the RPAC meeting minutes from the first RPAC meeting held on February 27th. Once finalized, these minutes will be forwarded to the Commission for review and approval, and then sent on to the RPAC members prior to the next RPAC meeting.

It is anticipated that the 4th Contract Invoice will be submitted in mid-to-late March and will cover Project 1.1: Task 1.1.5.

Project-specific administration tasks under Task 0.8 will continue. Revisions and/or potential budget reallocations will continue to be reviewed and refined by the Contract Project Director. Monthly Status Reports will be drafted and submitted to the Commission for Project 1.1, Project 2.1, Project 2.2, Project 3.1, Project 3.2 and Project 3.3, and a monthly Program Report will be drafted and submitted as well. It is anticipated that by May, these reports will be current and up-to-date.

Project 1.1: Program Planning and Analysis

CH2's activity will focus on continuing the effort to define and prioritize the projects to be recommended for funding in Project 1.1. Additionally, they anticipate that the Agricultural database and draft report should be ready for its final submission to the Commission for review and approval.

Iron will finalize prototypes for the market assessment and run market potential analyses, and ZECO will complete the expansion of the mini-grid from the base case.

Project 2.1: Enhanced Landfill Gas Production Using Bioreactors

The primary focus will be to work with the leading candidate for the primary hosts of the bioreactor project, the Mid Valley Landfill in Fontana. A meeting will be scheduled with San Bernardino County staff to review County interest in the bioreactor project and to consider how the project would proceed. Regulatory strategizing will continue with the assistance of regulatory agency personnel.

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

Information collection and analysis will continue for the process selection task. Communications will continue with developers for the technologies that are under consideration.

Project 3.1: Dairy Waste to Energy

The primary focus will be to respond to the discussions held at the Project kick-off meeting, specifically in relation to accelerating the analysis of economic and environmental analysis of various plug flow and complete-mixed digestion technologies. Additionally, a new approach will be developed to modify the Project activities that can be finalized earlier in the project timeline and these results could therefore be used later in the project.

Project 3.2: Building- Integrated PV Testing and Evaluation Project

It is anticipated that the IEUA-Commonwealth contract will be delayed until April. Preparations continue, but will focus on small system comparison as it can be run independently of the large system comparison. An update will be forwarded to the TAC members on the developments within the large system as well as the plans for the small system. A proposal will be forwarded to Commonwealth for the procurement of the small systems installation at the PVUSA site in Davis.

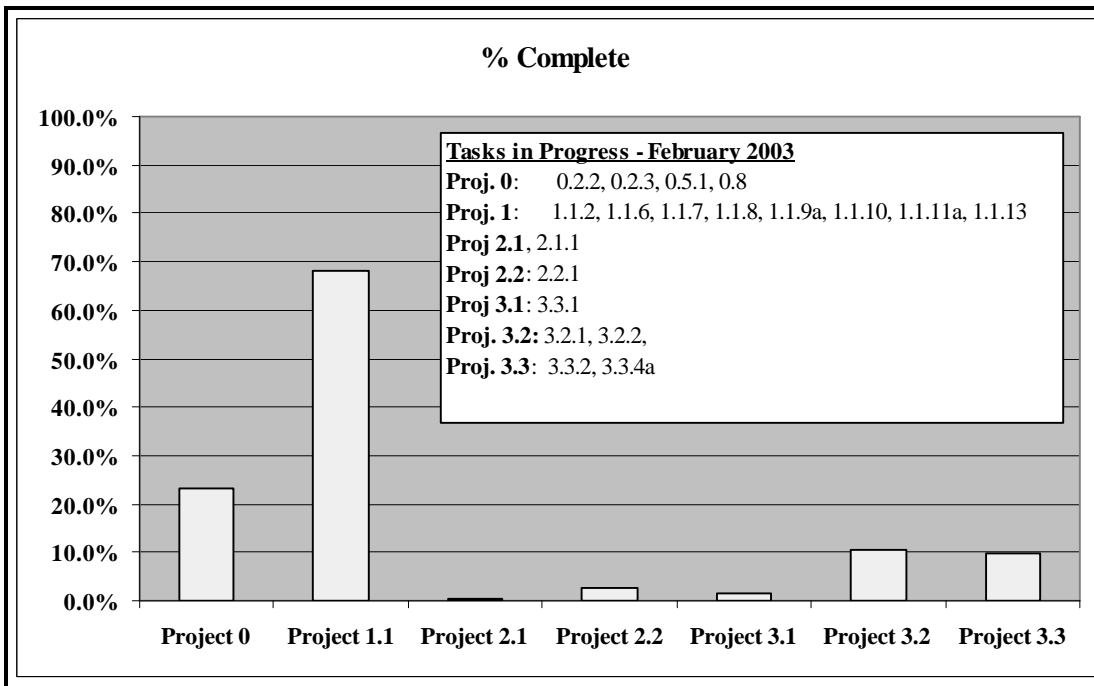
Project 3.3: Building Integrated PV on Public Facilities

Drafts of the Software Evaluation Tools package will be submitted to the Commission for review. A meeting will be held with Joseph McCabe of the Commission to review a “walk-through” of the software capabilities.

OVERVIEW OF PROGRAM STATUS:

Figure 1 below summarizes the overall Commonwealth Program status by project number and task as of the end of the current reporting period.

Figure 1: Summary of Program Status – Project Percentage Complete



Overview of Program Fiscal Status:

Table 1 and

Figure 2 below summarize the fiscal status of the Commonwealth Program by Project as of the end of the current reporting period.

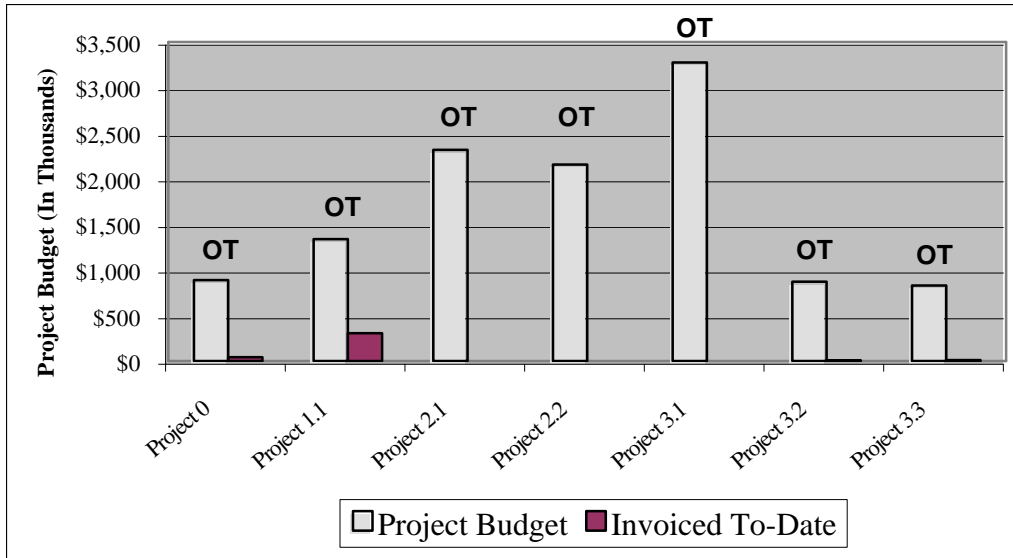
Table 1: Cumulative Program Fiscal Status By Project

Project Number	Project Budget	Invoiced To-Date (\$)	Fiscal Status *
Project 0	\$ 889,771	\$43,375 **	OT
Project 1.1	\$1,336,613	\$305,014**	OT
Project 2.1	\$2,315,999	0	OT
Project 2.2	\$2,153,740	0	OT
Project 3.1	\$3,274,664	0	OT
Project 3.2	\$ 870,099	\$8,514**	OT
Project 3.3	\$ 827,686	\$9,000**	OT

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

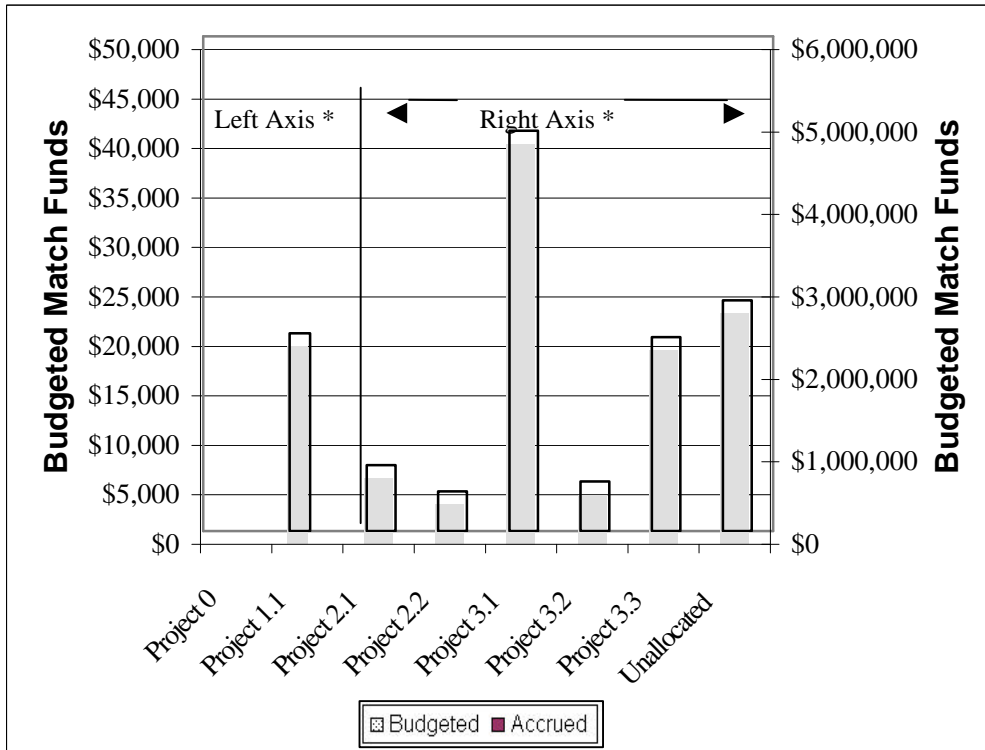
** Invoice Amount Shown after 10% retention withheld.

Figure 2: Program Fiscal Status



*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.