

MONTHLY PROGRAM REPORT

SEPTEMBER 2002

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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Regional Economic Research/Itron (Itron), CH2MHill (CH₂), Endecon Engineering
(Endecon), Renewable Energy Development Institute (REDI), Zaininger Engineering
(ZECO).

PLANNED ACCOMPLISHMENTS FOR THIS PERIOD:

Project 0: Program Administration

Although work under Task 0.2.2 is running slightly behind schedule, the Commonwealth Team expects to have the Program's website operational within the first half of September.

Program and Project specific administrative tasks will continue, including coordination of the Commonwealth Team Members, Monthly Progress Reports, Monthly Program Highlights and Monthly Program Reports. It is anticipated that the invoicing process may begin during the next reporting period.

Project 1.1: Program Planning and Analysis

The Commonwealth Team plans to finalize the comments from the Commission on the Renewable Resource Assessment Review Report under Task 1.1.1. and present a final of the report as well as the mini-grid definition and map. The databases under Tasks 1.1.3 and 1.1.4 are planned to be completed, along with the associated inventory reports. The

Commonwealth Team also hopes to complete most of the data collection and database development work on the agricultural facilities database under Task 1.1.2, however, it is anticipated that this task will not be ready for submittal until November. Additionally, it is expected that work on the Agricultural Waste Inventory Report will begin in September.

Under Task 1.1.5, the Commonwealth Team plans to continue developing the BI-PV database emphasizing the available information on public buildings within the mini-grid area, this information will also be used to support the prioritization for potential sites under Project 3.3.

The Commonwealth Team plans to complete much of the local T&D data collection under Task 1.1.6, and will begin the development of the local T&D model under Task 1.1.9a.

Work is also expected to begin on Task 1.1.7 and Task 1.1.8. This work will include collecting cost information on various technologies to be examined within the mini-grid area, as well as the development of the PV generation profiles and the waste water treatment, landfill and dairy waste biogas project generation profiles.

Project 2.1: Enhanced Landfill Gas Production Using Bioreactors

Per the Program schedule, work will not begin on this project.

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

Initial work on this project is expected to be delayed pending resolution of several project implementation issues.

Project 3.1: Dairy Waste to Energy

Per the Program schedule, work will not begin on this project.

Project 3.2: Building Integrated PV Testing and Evaluation Project

The Commonwealth Team expects to begin incorporating the comments received from the Technical Advisory Committee (TAC) into the plan. It is anticipated that the Final Plan will be submitted as the first deliverable for this Project in September. Additionally, the sites, which fall under Project 3.2, will be reviewed in order to present them to the TAC.

Project 3.3: Building Integrated PV on Public Facilities

REDI will continue to develop the evaluation tools for Task 3.3.2, and will additionally under Task 3.3.4a, continue making contacts from the database in order to locate applicable potential host facilities for BI-PV Projects.

WHAT WAS ACCOMPLISHED THIS PERIOD:

Project 0: Program Administration

RER continued to work on the PIER Program website, under Task 0.2.2. A conference call was held on September 25th bringing Commonwealth Team members and Commission Staff together to discuss the overall aesthetics and ease-of-use of the website. Several suggestions were made, including the incorporation of the team member corporate logos on the Home Page. Although all present felt that the website was very close to what was needed, the primary suggestions focused on ease-of-use. The team requested that the logos once “clicked” would direct the viewer to the appropriate corporate home page. Additionally, the Team and Commission staff felt that this same approach should also be used for each of the Commonwealth PIER projects. RER will incorporate the suggestions made and will submit two alternate Program home pages to the Team and Commission staff for review. Once a consensus is reached by the group, RER will finalize the website.

Overall Program and Project contract administration tasks under Task 0.8 continued, as the Commonwealth Team reviewed and confirmed the PIER Contract terms and conditions regarding invoice and status report structures. Monthly Status Reports were drafted for Project 1.1, Project 3.2 and Project 3.3.

Project 1.1: Program Planning and Analysis

RER continued to address outstanding issues and make appropriate revisions to the Draft Renewable Resource Assessment Review Report as well as the mini-grid definition map.

CH₂ continued its data collection and database development activity for agricultural facilities. The Team has experienced some difficulty with collecting information from 8 of the dairies. The issue appears to be that this information is viewed as proprietary, and they are reluctant to provide the information to the Team. CH₂ determined that working with the Milk Producers Council to develop a mechanism with which to collect this information from the dairies would be the most effective manner to resolve this situation.

Additionally, CH₂ continued data collection and database development for landfill and sewage treatment facilities. A number of those facilities contacted had failed to provide information, as they did not wish to be included in the database. With information from 70% of the landfill facilities, the Team has estimated a 90% completion of data collection activities. CH₂ has sought comments on sewage treatment data, and determined that a slight modification to the database should be made. REDI continued updating information on methods used to determine technical potential and began preparing a database, which will

include PV specification and technical potential that will be added to the database of biogas resources that CH₂ is compiling.

REDI continues to identify and refine sources of data and projections for the technical potential for photovoltaic power systems. Additionally they have started a file referencing information from public planning documents, and have added a NAICS code to the Public Sector Database. The Team refined a methodology, to aid in determining the technical potential for BI-PV applications. Data sources for the years 2007 and 2012 containing forecasted electrical market potential were collected from the Commission, and show relevance to the method for the current BI-PV efforts. Regulatory data was gathered from permitting agencies within the mini-grid area and mapping software was purchased which will allow the exploration of GIS mapping applications.

Zaininger Engineering (ZECO) met again with Southern California Edison (SCE). Additionally, proprietary data was collected from the 66/12 kV sub transformer and the associated 12 kV feeder layouts for seven substations in the mini-grid area. ZECO continued to collect the proprietary local 66 kV sub transmission and load shape data from various SCE customer classes.

RER began the process of collecting cost information on the biogas technology systems, which included capital, operating and maintenance costs.

ZECO initiated development of the representative local T&D model. Additionally, ZECO began reviewing data that was collected from SCE as well as the appropriate electrical parameters for local 66 kV sub-transmission systems, 66/12 kV transformers and 12 kV feeders for the load flow study model.

Project 2.1: Enhanced Landfill Gas Production Using Bioreactors

Work has yet to begin on this project, per the Program schedule.

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

Work has yet to begin on this project, due to the need to re-assess the anaerobic digestion optimization technology implementation options available inside and out of the mini-grid and related stakeholder match funding issues.

Project 3.1: Dairy Waste to Energy

Work has yet to begin on this project, per the Commonwealth Program schedule.

Project 3.2: Building Integrated PV Testing and Evaluation Project

Comments continued to be received from the TAC members throughout the month of September on the first draft of the BI-PV Evaluation Test Plan under Task 3.2.1. Various conference calls and emails were exchanged with the TAC and Endecon in order to clarify and better address the comments that had been received.

Under Task 3.2.2.a progress continued to be made on the development of specifications of equipment and drawings for the data acquisition system for the large system comparison. Endecon developed a timeline for the tasks that were to be accomplished during the month of September.

Additionally, REDI traveled to Southern California to review the Inland Empire Utilities Agency (IEUA) facilities that might accommodate all 60 kW of the PV systems that are to be tested under the Large System comparison of this project. During this same timeframe/site visit, a meeting was held with Max Carpenter, Power Resources Director and the Chief Operating Officer of Commonwealth Energy to discuss how the photovoltaic systems would be handled financially with their customers, as well as the overall performance ownerships issues and required evaluation of the project.

Project 3.3: Building-Integrated PV on Public Facilities

REDI continued its work on refining the zip codes for the Public Sector Database under Task 3.3.1a, designating city names along with percentage within the mini-grid boundaries. Additionally, REDI received city manager and public works mailing lists and filtered their contacts down to 55, which then was appended into the Public Sector Database. REDI began searching the Commission website for construction awards for public schools in San Bernardino County. Additionally, 127 schools and school districts were added to the database.

Comments were received from RER and the deliverable was submitted for final approval.

Under Task 3.3.1b, comments that had been received from RER were incorporated, and resubmitted to Commonwealth for final approval.

Software has been identified from national, state and local sources, and is being screened and evaluated for use under Task 3.3.2 for evaluation of the BI-PV evaluation tools. REDI made contacts with numerous agencies, as well as local governments within the Chino Basin for the process selecting Demonstration Project Sites under Task 3.3.4. REDI sent letters and outreach materials to all known contacts, developed a “call script” and reviewed and updated maps and information provided by the Commonwealth Team.

How we are doing compared to plan:

Of the projects that are currently active, several of Project 1.1's and one of Project 3.3's tasks have fallen behind schedule. However, the remaining active 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 experienced, should not impact the overall Project 1.1. or Project 3.3 targeted completion dates:

- Project 1.1: Task 1.1.2a, Task 1.1.3 and Task 1.1.4 continue to be slightly behind schedule due to the previously reported difficulty in receiving the information requested in a timely manner.
- Project 2.2: As reported previously, Project 2.2 has yet to begin pending clarification of certain project scoping/implementation issues.
- Project 3.3: Task 3.3.1a has been submitted slightly behind schedule, as comments received from RER needed to be addressed and incorporated. Additionally, the zip code range was further defined, mapped and added to the existing database. Under Task 3.3.1b, additional cross-checking was accomplished to ensure that the global BI-PV market was addressed. Comments were received from RER and incorporated into the database, pushing this task slightly behind schedule. Work under Task 3.3.2 and 3.3.4a are on track with plan.

SIGNIFICANT PROBLEMS OR CHANGES:

Project 1.1

Task 1.1.1 has fallen slightly behind as RER addresses questions and comments that were received from the Commission Project Manager. CH₂MHill continued to face the challenge of collecting load information from dairies under Task 1.1.2a. As noted previously, they have begun working with the Milk Producers Council, and believe that overall this coordination will result in a favorable return of information. Additionally, as reported in August, the late receipt of sewage treatment plant and landfill data continued to delay submittal of information into the databases under Tasks 1.1.3 and 1.1.4. It is expected that based upon the delay in receiving information, the Inventory Reports will also fall behind schedule. The Commonwealth Team believes that these issues will be resolved in October.

Overall, there are no significant problems or changes encountered during this reporting period. 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

Work will continue under Task 0.2.2, as RER addresses the comments and input received from the Commonwealth Team and the Commission regarding the PIER Program Website. RER will forward two alternate views of the website homepage for comments, and once a consensus has been reached, the changes will be instituted and the website will be ready for access/viewing. RER will submit new passwords to each Team member, and will begin the process of placing Program documents including draft and final deliverable, and Status Reports on the website for Team and public access.

Program and Project specific administrative tasks will continue. Although draft invoices have been submitted to RER for review, the final deliverables have yet to be approved by the Commission, therefore final invoices have yet to be submitted.

Project 1.1: Program Planning and Analysis

RER will complete and submit the final version of both the Draft Renewable Resource Assessment Review Report and the initial mini-grid definition map, to the Commission for final approval.

CH₂MHill plans to complete and submit the Sewage Treatment Plant and Landfill Facilities Databases and associated Inventory Reports under Tasks 1.13 and 1.1.4. The delay in receiving load information from the dairies under Task 1.1.2 will be resolved. Data collected thus far will continue to be analyzed, with the focus on the potential sites for demonstration projects. Meetings between RER and CH₂ will occur in order to prioritize projects and commence work in the appropriate emphasis areas.

RER and REDI plan to complete the database under Task 1.1.5. Work will commence on the BI-PV technical potential target area, with results to be used in Task 1.1.7 and Task 1.1.9. Work will continue and involve collecting cost information and developing business models to be used in the mini-grid market potential for Task 1.1.7. A report will be developed highlighting the process used for PV generation profiles and wastewater treatment, landfill and dairy waste to energy generation profiles. ZECO plans to complete much of the local T&D model development under Task 1.1.9.

Project 2.1: Enhanced Landfill Gas Production Using Bioreactors

Per the Program schedule, work will not begin on this task.

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

Initial work on this project will continue to be delayed pending resolution of several project implementation issues.

Project 3.1: Dairy Waste to Energy

Per the Program schedule, work will not begin on this task.

Project 3.2: Building Integrated PV Testing and Evaluation Project

Endecon Engineering and The Commonwealth Team will submit a second draft of the BI-PV Evaluation Test Plan to the Project 3.2 Technical Advisory Committee (TAC) members. It is anticipated that a joint conference call will be held to discuss incorporating comments into the Test Plan. Available BI-PV products research will be reviewed in order to provide a selection for the TAC to review in order to select for the large systems comparison element under this task.

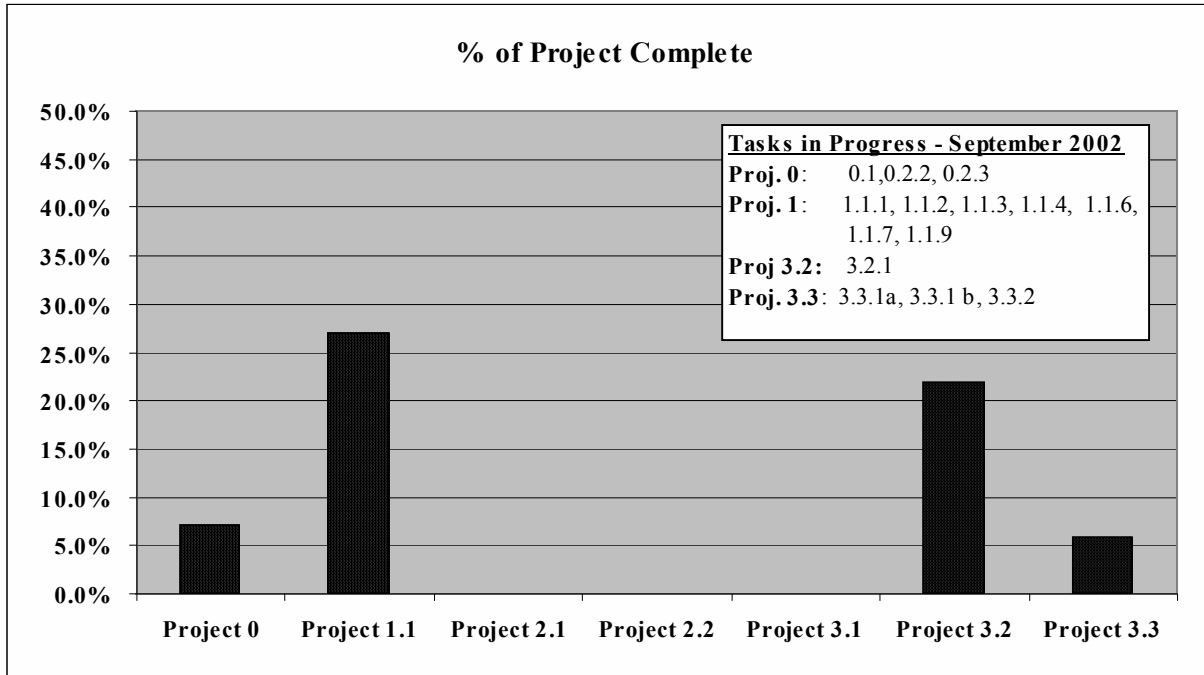
Project 3.3: Building Integrated PV on Public Facilities

Under Task 3.3.2, REDI plans to complete an experimentation of the data loggers, in order to determine if they are able to send the necessary information remotely, and get this information back to REDI. The inventory of existing evaluation tools will be identified and a draft report will be outlined and submitted for review. REDI will follow-up with contacts made under Task 3.3.4. Additionally, REDI will work with Commonwealth and IEUA to develop an ownership model for the purpose of deploying the first public sector BI-PV system, at an IEUA facility.

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:

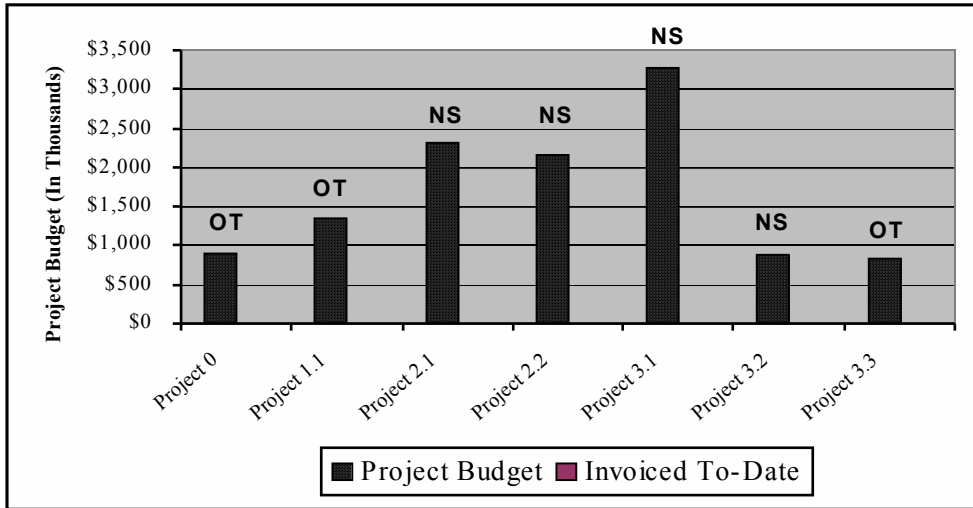
Table 1 and Figure 2 below summarize the fiscal status of the Commonwealth Program by Project as of the end of the current reporting period.

Table 1: Program Fiscal Status By Project

Project Number	Project Budget	Invoiced To-Date (\$)	Fiscal Status *
Project 0	\$ 889,771	0	OT
Project 1.1	\$1,336,613	0	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	0	OT
Project 3.3	\$ 827,686	0	OT

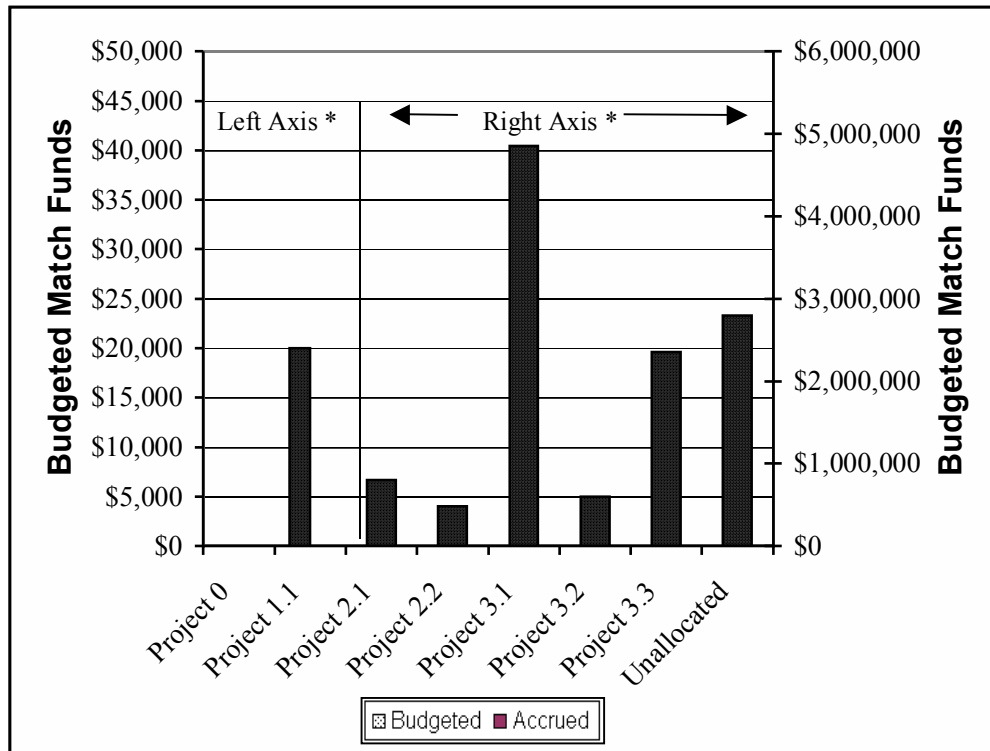
*Fiscal Status = (OT) "On Track", (OB) "OverBudget", (UB) "UnderBudget"

Figure 2: Program Fiscal Status



*Fiscal Status = (OT) "On Track", (OB) "OverBudget", (UB) "UnderBudget" (NS) "Not Started"

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.