

MONTHLY PROGRAM REPORT

MARCH 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 would continue on the PIER Program 1st Annual Report. It was anticipated that a draft of the report would be reviewed internally in early April and be ready for submittal to the Commission thereafter. *Project Monthly Status* reports were to be drafted for all Projects (#s 1.1, 2.1, 3.1, 3.2 and 3.3) as well as a *Program Status* report for the month of February, and reviewed internally prior to submittal to the Commission and posting on the Commonwealth PIER Mini-Grid RD&D Program Website.

The Contract Administrator planned to continue to provide support to the CE Team as project deliverables are presented for internal and TAC review prior to submittal to the Commission. Additionally, it was anticipated that Contract Invoice #8 would be drafted in late March.

Project 1.1: Program Planning and Analysis

Efforts were to continue on the prioritization process as projects were identified within the inventory process. It was anticipated that preliminary conclusions would be presented to the Commission prior to the finalization of the prioritization effort.

Iron additionally anticipated incorporating final revisions into the Task 1.1.8 report, and submitting it for final review and approval to the Commission, in late March.

Upon receiving feedback from the Task 1.1.10 prioritization effort, as well as key results from the approved Task 1.1.7 final report, the CE Team would integrate these results and findings into the Project 1.1. Final Report, under Task 1.1.11b.

Project 2.1: Enhanced Landfill Gas Production

In March, the CE Team planned to finalize the conceptual design and construction and test plans for the bioreactor site at Mid-Valley. Ongoing collaboration between BAS and the CE Team was to continue as the conceptual design was integrated with the ongoing design at the site. The team anticipated that a draft *Conceptual Design Report* would be ready for internal circulation and review. Additionally, discussions were to continue on the draft *Memorandum of Understanding (MOU)*, with anticipation that it would be finalized by the end of March.

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

Team efforts were to continue to be focused on the integration of two ultrasound systems into the Riverside Plant and integrating H₂S and siloxane removal systems into the RP-1 site. It was further anticipated that the final results of these efforts were to be presented in the *Site Selection and Test Plan* report, in mid-March.

Project 3.1: Dairy Waste to Energy

Activity was to continue to focus on efforts to re-evaluate the project in light of Commonwealth's Business Plan. Additionally, the proposed project prioritization decision-making framework was to continue to be developed. It was anticipated that a meeting would be held in March with the CE Team and Commission staff to review the future direction of Project 3.1 in light of Commonwealth's business objectives. Additionally, the results of the February 5th workshop with the *Environmental Benefits Peer Review Team* were to be reviewed and analyzed. Based upon input from the meeting, specialists in air and water quality as well as renewable energy, would begin to develop sections of the Task 3.1.6 deliverable.

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

Endecon anticipated that the startup of the large system would have occurred, and data would be streaming to the web for review. Additionally, two *Initial Characterization Reports* would be drafted and submitted to the Technical Advisory Committee for review and comment. Agreements were to be finalized in order to have all three (3) systems ready for installation at PVUSA.

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

REDI anticipated receiving final approval on the *Evaluation Tools Package (ETP)* deliverable. Upon approval, REDI would review all of the Public Sector BI-PV Demonstration sites and generate a report for internal CE Team review. REDI also planned to continue to work with the 10 Public Sector BI-PV site representatives while developing specifications and solicitation documents as needed.

Additionally, REDI anticipated continuing its coordination with Commonwealth and other ESP third party financing representatives in order to further develop matching funds for this project.

WHAT WAS ACCOMPLISHED THIS PERIOD:

Project 0: Program Administration

As anticipated, *Project Monthly Status* reports were drafted for all Projects (#s 1.1, 2.1, 2.2, 3.1, 3.2 and 3.3), as well as a *Program Status* report for the month of February, and 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 Project 2.1, 2.2 and 3.1.

As anticipated, the Commonwealth Contract Administrator continued to provide support to the CE Team on various pending project deliverables, and prepared and submitted Contract Invoice # 8, which included the following deliverable: Project 3.3 – Task 3.3.2

Project 1.1: Program Planning and Analysis

Itron continued to make revisions to the Task 1.1.8 report, incorporating the generation profiles from the anticipated CE Program RD&D generation, as well as the fully realized mini-grid. It is anticipated that this report will be submitted to the Commission in early April. Work also continued on the Task 1.1.10 report, with the primary focus of activity in March placed on refining the initial draft of the prioritization framework, incorporating objectives from the Commonwealth Business Plan and the Mini-Grid analysis along with the

technical PIER Program objectives. The draft framework was submitted to the Commission for review, and discussed at a meeting held on March 9th, where both the mode and the decision-making framework were reviewed and preliminary rankings of biogas projects were achieved.

The CE Team continued to integrate approved project key results into the draft Project 1.1 Final Report, under Task 1.1.11b. As with the *Project Prioritization Report*, this deliverable awaits the completion of the revised project prioritization effort under Task 1.1.10, the final generation profiles report under Task 1.1.8, the finalized Commonwealth Business Plan and a revised Project 3.1 *Implementation Plan*, prior to being finalized for submission.

Project 2.1: Enhanced Landfill Gas Production Using Bioreactors

Activities continued on Task 2.1.3, the *Conceptual Design for the First Bioreactor*, along with ongoing consultations with the host and BAS. In March, a draft report was completed and submitted internally for CE Team review. BAS also continued to work on the elements of the conceptual design as well as the construction and test plans, which will link the bioreactor project with the ongoing design project at the site. These efforts are focused on both permitting and engineering elements, and the integration of the PIER bioreactor project elements into the ongoing Unit 3 expansion. As reported earlier, the design effort has been expanded to develop further information consistent with the need for a design suitable for the public bidding process. When later phases of this plan are implemented, they will include the linkage of approximately \$4 million in matching funds for construction and approximately \$4 million in matching funds for operations with the PIER Program.

Conference calls continued between BAS and CH₂ continued. These calls provide an invaluable exchange of information, which is needed in order to complete the ongoing design activities and further, link work at the Mid-Valley site to the PIER Program's bioreactor project.

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

CH₂ continued to follow-up on the Draft *Process Selection Report* submitted previously, with ongoing emphasis placed on the review and analysis of the presented technologies. Discussions continue with the technology vendors and County staff in order to ensure that appropriate and efficient plans are under way, allowing a smooth transition from process selection through installation. Further coordination between Riverside County and the CE Team was undertaken regarding the *Memorandum of Understanding (MOU)*, as it relates to the implementation at their facility. As anticipated, the *MOU* was completed and executed in March. Detailed plans regarding the test equipment at each of the locations planned, continues to be analyzed, and subcontracts were developed reflecting the *Site Selection and*

Test Plan, the *MOU* and the objectives of the PIER Program and Commonwealth Business Plan.

The CE Team and technology vendors, continued to apply information from the *Process Selection* phase, into the *Site Selection and Test Plan* development activities. Information was included to ensure that the proposed project would clearly present a detailed six-month testing plan, fostering gas production and improved operations at the host site. The draft final of this report was completed in March, and submitted to the Project 2.2. TAC members, and Commission staff for review and comments. Additionally, planning was initiated on the Project 2.2 Critical Project Review meeting.

Commission and Commonwealth Energy staff, along with CE Team representatives, participated in a site visit at the City of Riverside's treatment plant, and gas-cleaning project at the IEUA Regional Plant 1 (RP-1).

In March, design data and other information on site conditions were collected for the initiation of the design efforts on gas-cleaning task - Task 2.2.3a. Preliminary drawings were prepared and data related to pipe sizing, electrical and instrumental control and other project elements were developed. Additionally, design activities began on Task 2.2.3b, in close coordination with the City of Riverside in relation to the integration of the two ultrasound test units in the plant's existing facilities. This effort is being closely coordinated to ensure that the units will be properly sized and will function effectively.

Project 3.1: Dairy Waste to Energy

Efforts continued in March, on the Project 3.1 *Implementation Plan*. Revisions continue to be integrated into the plan, as the CE Team compiles results, which could be applied to future centralized projects. Work also continued on the integration of these potential projects into Commonwealth's Business Plan.

As anticipated, a meeting was held on March 9th to review the priorities and future direction of work under Project 3.1. The results of the prioritization effort were presented, and areas of focus were identified. The primary conclusion of the meeting was that the CE Team was to focus on a limited number of technologies and projects in order to concentrate fully on those that are most aligned with Commonwealth's business objectives and, which will be most beneficial elsewhere in California. Further, three tiers were defined, with Tier 1 projects at the highest priority and Tier 3 projects being lowest.

Revisions continued on the *Test Plans and Protocols Report*, with the CE Team integrating Commission comments on proposed projects. The revised *Test Plans and Protocols Report* will focus on co-digestion and will be consistent with the feedback provided by the Commission as it relates to the Commonwealth Business Plan.

Work continued on Task 3.1.6, with the CE team building upon information obtained from prior visits and subsequent analysis. Additionally, work continued on the expanded annotated outline of the *Monitoring, Reporting and Verification* protocol for quantifying the environmental benefits of the centralized digestion projects. The results and discussions of the February 5th workshop were utilized as the *Economic and Environmental Assessment* draft report was compiled, and will also be utilized as the CE Team further develops their investigations into the air and water quality, renewable energy and greenhouse analysis components of the Task 3.1.6 work. Additionally the report includes a description of baseline conditions with and without the digester, and with a draft water quality baseline developed in March. The air emission estimates are being reviewed and compared to permit additions and test results.

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

As anticipated in February, the large system started up on March 1, 2004, and data began streaming to the web for review.

Additionally, Endecon finalized one characterization report and submitted a second to the Technical Advisory Committee for review.

In March, Endecon received signed agreements, from RWE Schott and Kyocera for the loan of the systems; as such, all three systems are now ready for installation at the PVUSA site. Significant progress was made with NUON, and Endecon anticipated that installation would begin in April. Additionally, the Sharp inverter was tested for characterization.

Database and website issues were resolved, under Task 3.2.1(1) and data is now available for viewing on the PIER Commonwealth BI-PV System Evaluation Plan Website: <http://209.132.206.84/htdocs/>. Additionally, a presentation was developed and presented twice in October of 2003 under Task 3.2.3 (3) a, and submitted as deliverables in March to the Commission.

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

As anticipated, the *Evaluation Tools Package (ETP)* submitted in February, was approved in March. Project work under Task 3.3.4a, *Select Demonstration Project Sites*, is being updated utilizing the approved *ETP*, and a report will be created selecting the final four demonstration sites.

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:** As reported previously, an important challenge has been gaining regulatory acceptance of the bioreactor landfill project. The CE Team continues to closely follow and facilitate/monitor this process. Additionally, a delay in receiving primary data, affected the completion of the Task 2.1.1.a report.
- **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.

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.

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. It is anticipated that a draft of the report will be reviewed internally in late April or early May and be ready for submittal to the Commission thereafter. *Project Monthly Status* reports will be drafted for all Projects (#s 1.1, 2.1, 3.1, 3.2 and 3.3) as well as a *Program Status* report for the month of March, and reviewed internally prior to submittal to the Commission and posting on the Commonwealth PIER Mini-Grid RD&D Program Website.

The Contract Administrator will continue to provide support to the CE Team as project deliverables are presented for internal and TAC review prior to submittal to the Commission. Additionally, it is anticipated that Contract Invoice #9 will be drafted in late April, early May.

Project 1.1: Program Planning and Analysis

In April, efforts will continue on the prioritization process, under Task 1.1.10, as the CE Team continues to integrate the Commonwealth Business Plan into this process. It is anticipated that the internal draft of the revised report will be finalized and submitted to the Project 1.1. TAC and the Commission for review in late April early May. Additionally, Itron plans to submit the Task 1.1.8 final report to the Commission for final review and approval. Work will continue on the Project 1.1 Final Report under Task 1.1.11b.

Project 2.1: Enhanced Landfill Gas Production

Activity will focus on the finalization of the draft conceptual design and development of the construction and test plans for the Mid-Valley bioreactor site. It is anticipated that the draft *Conceptual Design Report* will be completed, and submitted to the TAC members and the Commission for review and comment. Additionally, it is anticipated that San Bernardino County will begin obtaining the necessary permits, which relate to the match fund activity on this project, along with the documentation required by the California Environmental Quality Act (CEQA).

Once the draft Conceptual Design Report has been finalized and sent out for review, CH₂ will schedule the next Project 2.1 Technical Advisory Committee (TAC) meeting, estimated for mid-May.

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

Efforts will continue on the integration of the two ultrasound systems into the Riverside Plant as well as integrating gas drying, H₂S and siloxane removal systems into the RP-1 site. CH₂ also anticipates that comments will have been received from the Commission and TAC members on the *Site Selection and Test Plan Report*, and they will begin integrating the comments and/or edits into the draft report prior to finalization.

Design efforts will continue on the Riverside and IEUA RP-1 plants respectively, and coordination will continue with the technology vendors in order to ensure that the intended six-month testing period will begin later this year as planned. In April, fabrication will also continue on the planned test equipment so that vendor efforts can begin in May, which will allow the overall testing program to be achieved within contract timelines.

Project 3.1: Dairy Waste to Energy

In April, CH₂ anticipates focusing on the completion of the technology review, with a primary focus being co-digestion. Additionally, co-digestion plans will be developed for RP-1 enabling the testing of various feedstock's in order to highlight digestion and increased gas potential. Efforts to re-evaluate the project in light of Commonwealth's Business Plan will be largely complete in April. This will allow the detailed co-digestion work to proceed.

Additionally, CH₂ anticipates finalizing and submitting the *Test Plan and Protocol and Digester Comparison Reports*.

The integration of the results of the February 5th workshop as well as subsequent analysis and review of pending South Coast Air Quality Management District (SCAQMD) rules will be completed in April. This review will be undertaken in conjunction with the latest emission estimates and a baseline will be created with and without the centralized digester.

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

In April, Endecon will schedule its first teleconference with the Industry Advisory Committee in order to review the on-line data. Additionally, it is anticipated that the NUON agreement will be finalized, allowing the systems to be installed at PVUSA, as well as the data acquisition system. Endecon will begin to prepare to receive the data stream from the website, as it is anticipated that data will begin streaming in May.

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

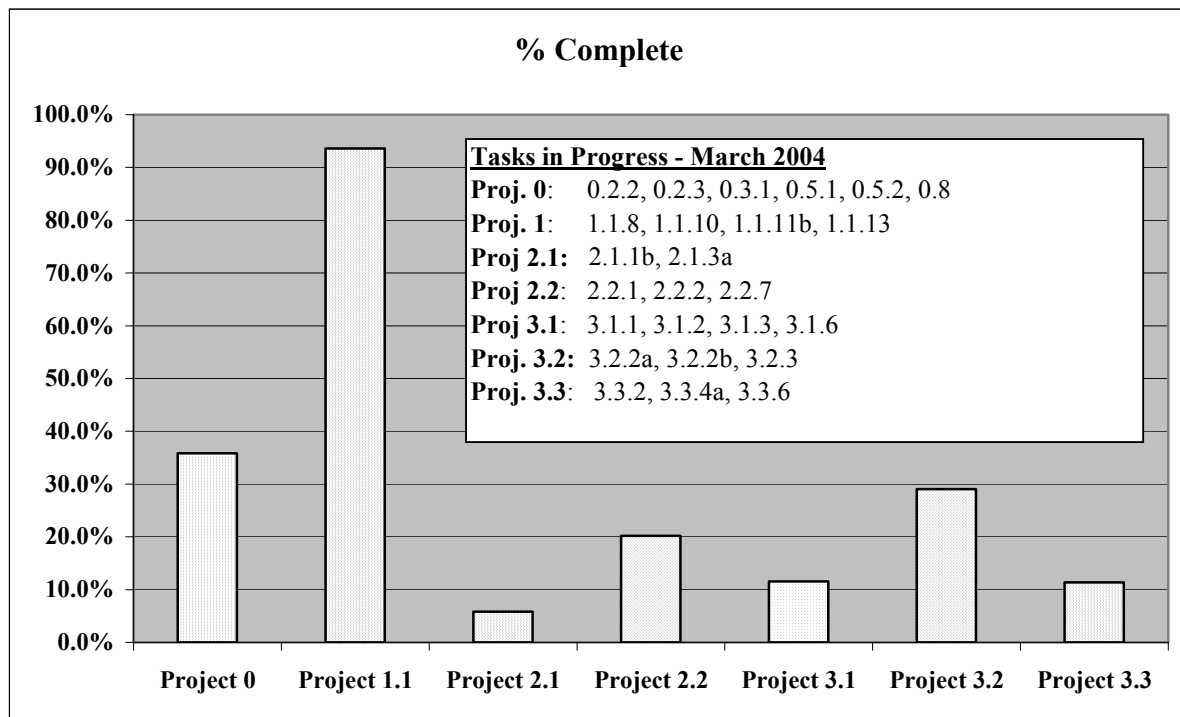
In April REDI will review all of the Public Sector BI-PV demonstration sites and will generate a report utilizing the recently approved *Evaluation Tools Package (ETP)*.

Additionally, work will continue with the 10 Public Sector BI-PV representatives to develop projects specifications and/or solicitation documents. REDI will also continue to work with Commonwealth and other ESP third party financing representatives.

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

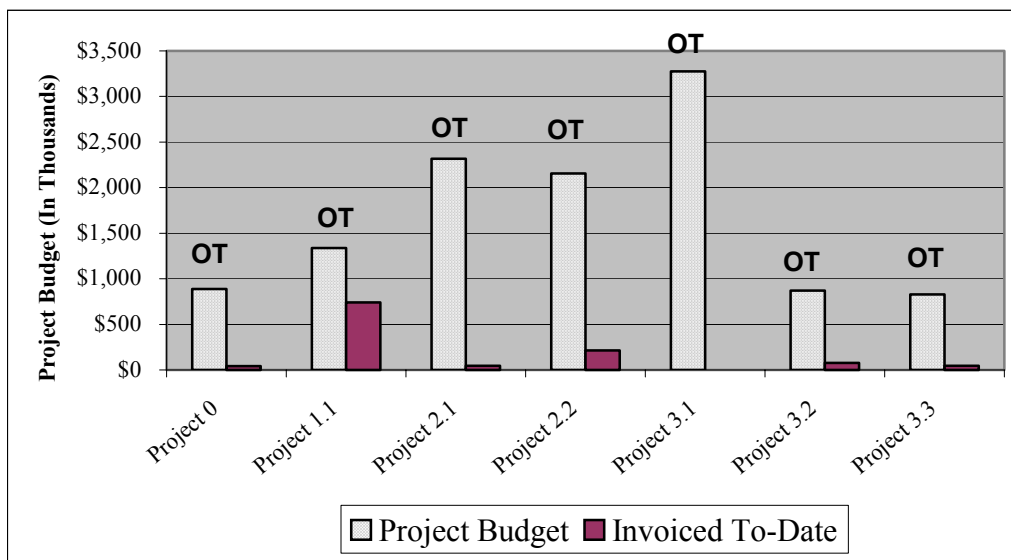
Table 1: Cumulative Program Fiscal Status by Project

Project Number	Project Budget	Invoiced To-Date (\$)	Fiscal Status *
Project 0	\$ 889,771	\$43,375 **	OT
Project 1.1	\$1,336,613	\$741,926 *	OT
Project 2.1	\$2,315,999	\$46,905 **	OT
Project 2.2	\$2,153,740	\$212,907 **	OT
Project 3.1	\$3,274,664	0	OT
Project 3.2	\$ 870,099	\$76,014**	OT
Project 3.3	\$ 827,686	\$45,000**	OT

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

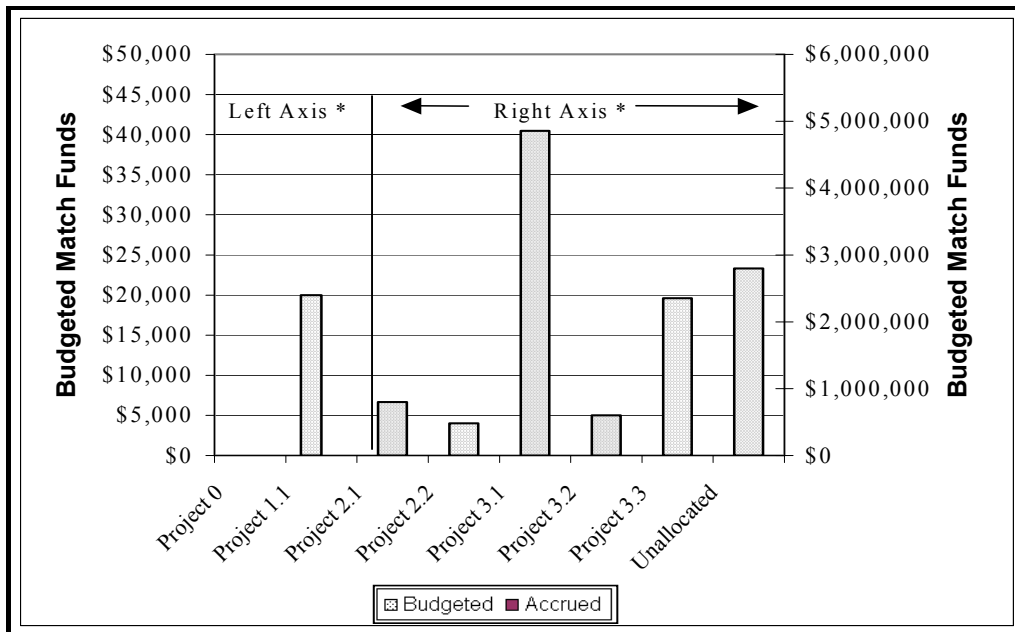
** Invoice Amount Shown after 10% retention withheld.

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.