

MONTHLY PROGRAM REPORT

APRIL 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. It was planned that a draft of the report would be reviewed internally in late April or early May and be ready for submittal to the Commission thereafter. *Project Monthly Status* reports would 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 would 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 planned that Contract Invoice #9 would be drafted in late April, early May.

Project 1.1: Program Planning and Analysis

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

Project 2.1: Enhanced Landfill Gas Production

Activity was to focus on the finalization of the draft *Conceptual Design* and development of the *Construction and Test Plans* for the Mid-Valley bioreactor site. It was anticipated that the draft *Conceptual Design Report* would be completed and submitted to the TAC members and the Commission for review and comment. Additionally, it was anticipated that San Bernardino County would 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* was finalized and submitted for review, CH₂ would 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 were to 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 anticipated that comments would have been received from the Commission and TAC members on the *Site Selection and Test Plan Report*, and they would begin integrating the comments and/or edits into the draft report prior to finalization.

CH₂ anticipated that design efforts would continue on the Riverside and IEUA RP-1 plants respectively, and coordination would also continue with the technology vendors in order to ensure that the intended six-month testing period would begin later this year as planned. In April, fabrication would also continue on the planned test equipment so that vendor efforts could begin in May, which would allow the overall testing program to be achieved within contract timelines.

Project 3.1: Dairy Waste to Energy

In April, CH₂ anticipated focusing on the completion of the technology review, with a primary focus being co-digestion. Co-digestion plans would 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 would be largely completed in April. This will allow the detailed co-digestion work to proceed. Additionally, CH₂ anticipated 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 were to be completed in April. This review was to be undertaken in conjunction with the latest emission estimates and a baseline was to be created with and without the centralized digester.

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

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

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

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

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

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 March.

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 drafted Contract Invoice # 9, which included the following deliverables: Project 2.2 – Task 2.2.2, Project 3.2 – Task 3.2.2a(4), Project 3.2 – Task 3.2.3(1), Project 3.2 – Task 3.2.3(4)a, and Project 3.3 – Task 3.3.2.

Additionally, the CE Team continued to work on the PIER Program 1st Annual Report.

Project 1.1: Program Planning and Analysis

As anticipated, Itron incorporated the generation profiles from the anticipated CE Program RD&D generation, as well as the fully realized mini-grid, into the draft *Final Task 1.1.8 Report*, finalized the report and submitted it to the Commission for final review and approval. Work continued on the *Task 1.1.10 Prioritization Report*, with the primary focus of activity in April placed on integrating the prioritization framework, as well as incorporating objectives from the Commonwealth Business Plan and the Mini-Grid analysis along with the technical PIER Program objectives, into the final report. Following the March 9th meeting, the CE Team integrated the comments and guidance received into the report and focused on updating the decision-making model. As reported previously, this model offers a mechanism to weigh differing attributes according to their importance based upon the objectives of the Commonwealth Business Plan, the Mini-Grid benefits and the PIER program technical objectives. In April, initial weights, which had been previously assigned, were finalized and utilized within the model in order to provide prioritization efforts.

The CE Team continues 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 in April focused on completing the *Conceptual Design Report for the First Bioreactor*, along with participation in the ongoing consultations with the host and BAS. As anticipated, the *Draft Conceptual Design Report* was finalized and submitted for review in late April. CH₂ continued to work on the phase one approach, previously submitted to the Commission, implementing environmental permitting and design activities linking the PIER bioreactor project with the County's ongoing program. As outlined previously, as 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.

CH₂ moved forward on the *Construction and Test Plans* under Task 2.1.3b, utilizing information from the *Conceptual Design Report* to work on construction and test plan elements that link the bioreactor project with the ongoing design project of extending the liner, a portion of which will serve as the test area for the bioreactor. As in previous months, these efforts were conducted in a manner which would be consistent with the County's public bidding process, which will be used to select a contractor for the liner project at Mid-Valley.

Additionally, CH₂ is preparing construction plans, which can be provided to the Contractor awarded the project.

Conference calls involving BAS, the County's design engineer and CH₂ continued. Extensive coordination will be required to ensure that the bioreactor elements proposed are fully compatible with the County's ongoing 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. Detailed plans regarding the test equipment at each of the locations planned, continues to be analyzed, and subcontracts were further developed reflecting the *Site Selection and Test Plan*, the *MOU* and the objectives of the PIER Program and Commonwealth Business Plan.

In April, the *Site Selection and Test Plan* was used to prepare for the Critical Project Review meeting, which the team anticipates will be held in May. These preparations will provide clarification on the proposed testing plan (3-month baseline, six-month testing phase, and three-month post testing evaluation phase).

In April, design data and other information on site conditions continued to be collected for the initiation of the design efforts on gas-cleaning task under Task 2.2.3a. Preliminary drawings and design concepts were discussed with the host (IEUA) to ensure that the design will be consistent with IEUA's plans and activities. Additionally, preliminary data regarding piping and electrical sizing issues and instrument control elements, continued to be developed. Design activities continued 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. A preliminary set of 16 drawings were prepared, and reviewed along with other design related issues.

Project 3.1: Dairy Waste to Energy

In April one focus under Project 3.1 was to provide input to the prioritization process under Project 1.1 – Task 1.1.10. Technology evaluation continued and was reviewed as to which would be most relevant to meeting the overall objectives of the PIER Program. This review and evaluation is important, as it will be used to shape the future of Project 3.1. Specific technologies previously evaluated, were reviewed in the context of the objectives of the Commonwealth Business Plan. Evaluation results suggest that efforts should focus on co-digestion and gas cleaning.

The CE Team restarted their work on the interim Task 3.1.1 report, which summarizes the technologies considered and identifies the rationale for these selected technologies. As a result of the March 9th meeting with the Commission, it was determined that the team should focus on a limited number of technologies, which were best aligned to Commonwealth's objectives, and which would be most beneficial elsewhere in California.

Work continued but was limited on the *Test Plans and Protocols Report*, as the CE Team awaited the results of the Project 1.1 –Task 1.1.10 prioritization effort. 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*. Additionally, finalization of the *Bench Scale Test Plan* is anticipated upon completion of the interim Task 3.1.1 report.

Work continued on Task 3.1.6, with the CE team collecting additional data, using actual emissions information from existing operations – not general emissions rate data. Additionally, work continued on the *Monitoring, Reporting and Verification (MRV) Protocol* for quantifying the environmental benefits of the centralized digestion projects. A preliminary draft report was prepared utilizing the *MRV Protocol*, which addressed conditions with and without the dairy waste projects, and upon completion will be useful in achieving and documenting emission reductions.

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

As reported in March, the large system started up on March 1, 2004, and data began streaming to the web for review. Enhancements were made to the website in order to improve the ability to understand the data. Additionally, Endecon awaited comments on the second characterization report previously submitted to the Technical Advisory Committee for review.

As anticipated, Endecon received a signed agreement with NUON, for the small system installation at PVUSA. Construction began on two of the small system projects, with one installation completed in April.

Endecon will be presenting a technical paper created under this Project at a statewide PV meeting to be held in May. This presentation will provide an excellent outreach opportunity for the PIER Program and the Project 3.2 work.

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

Project development continues to be updated utilizing the *Evaluation Tools Package*, as a report is drafted, which will be used to select 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:** The CE Team continues to closely follow and facilitate/monitor this process of regulatory acceptance. 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 May or early June. 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 April, 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. It is anticipated that Contract Invoice # 9, drafted in April, will be submitted in early May to the Commission.

Project 1.1: Program Planning and Analysis

In May, primary efforts will focus on submitting the revised *Prioritization Report* as well as incorporating feedback on the prioritization framework, and applying the results of the prioritization methodology.

Additionally, the CE Team will continue to finalize the Project 1.1 Final Report, incorporating the results of the prioritization effort.

Project 2.1: Enhanced Landfill Gas Production

May's focus of activity will be on finalizing the design of the bioreactor project, including preparing detailed cost estimates for individual elements of the bioreactor based upon the *Conceptual Design Report*. Discussions will also continue with Mid-Valley in relation to finalizing the *Memorandum of Understanding (MOU)*.

Additionally, the CE Team anticipates scheduling the next Technical Advisory Committee (TAC) meeting.

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

It is anticipated that primary activity will focus on preparing for and participating in, the Critical Project Review (CPR) meeting. Additionally, extensive work is planned on the design efforts for both the ultrasound and gas cleaning projects.

Project 3.1: Dairy Waste to Energy

In May, CH₂ will focus on completing the technology review, and anticipates that a draft of the *Interim Report* will be submitted for internal team review. Additionally, a key activity to be undertaken will be the identification of potential co-digestion feedstock providers.

Vendors will be contacted in reference to participation in the gas cleaning tasks, and CH₂ will continue their discussions with representatives of South Coast Air Quality Management District in regard to proposed rules and impact on dairy operations.

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

In May, Endecon plans to schedule a teleconference with the Industry Advisory Committee to review on-line data. Additionally, the PowerLight Initial Characterization Report will be submitted to the Commission.

Endecon plans to complete the installation of three small PV systems, as well as the installation of the data acquisition systems for all three PVUSA sites.

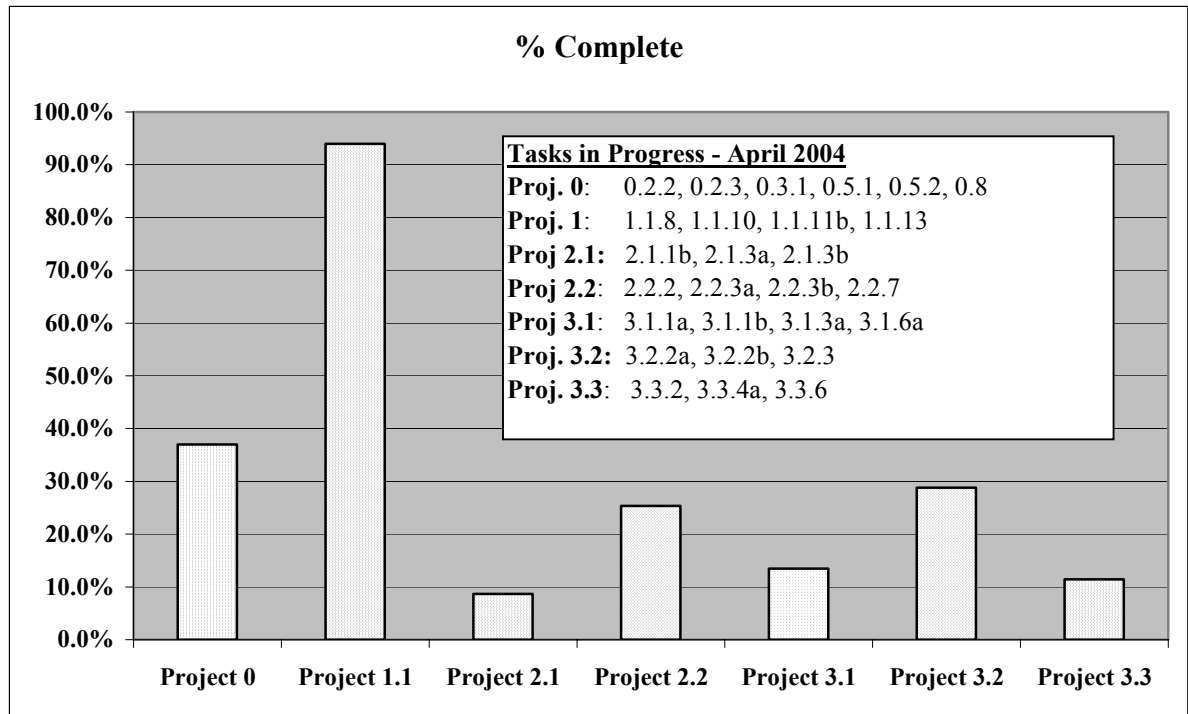
Project 3.3: Building-Integrated PV (BI-PV) on Public Facilities

In May, REDI planned to continue its coordination with the 10 Public Sector BI-PV Demonstration site representatives, in order to develop project specifications and solicitation documents. Additionally, work will continue with Commonwealth and other third party financing representatives in order to develop project funding for the match funds component of this project.

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.

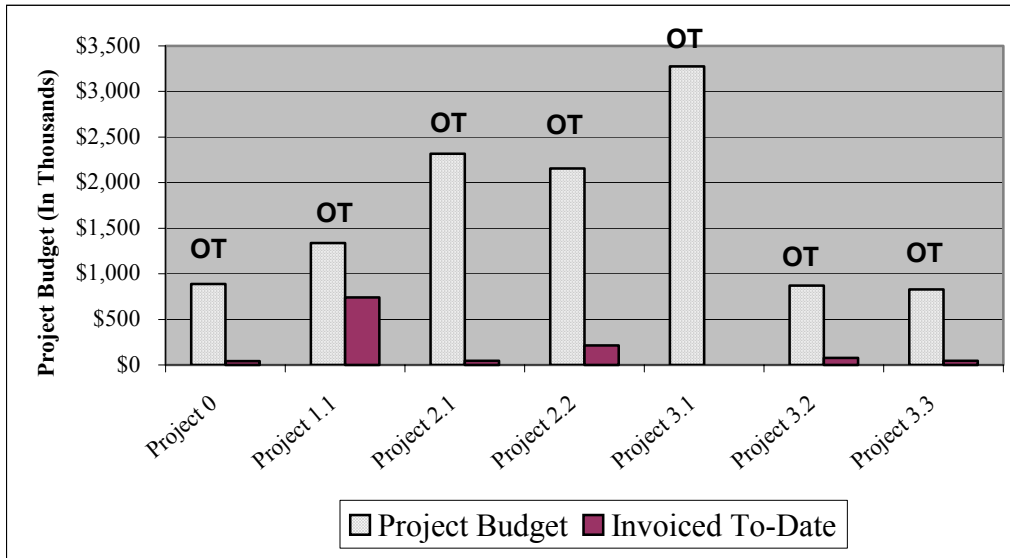
Table 1: Cumulative Program Fiscal Status by Project

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"

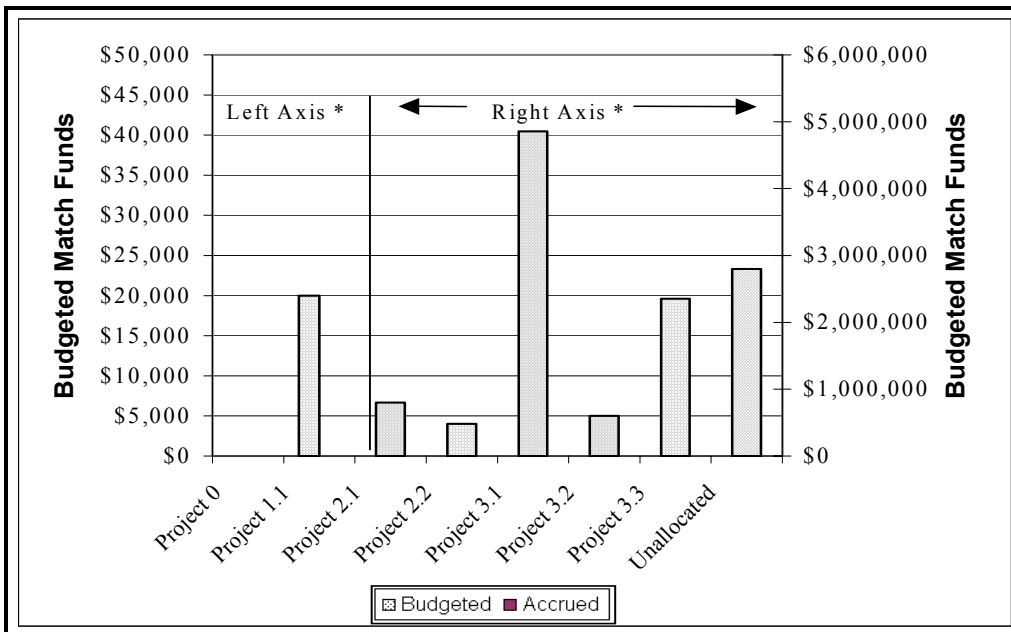
** Invoice Amount Shown after 10% retention withheld.

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.