

**Washington Ridge Bioenergy Power Generation Project
Evaluation, Demonstration & Fuel Procurement USFS
GRANT # 01-DG-11051750-030**

**QUARTERLY REPORT
April through June 2002**

Agency: Sierra Economic Development District

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Other Documents Attached: WRBEP – Team Member list, SEDD Washington Ridge Informational color flier, Engineered site plan for WRBEP Equipment and feedstock storage, CDF State Contract 8CA01026, WRBEP Environmental Checklist, WRBEP Heat Exchanger R&D Technology cost estimate, Washington Ridge Bio-energy Estimated Budget, and Wood vs. oil and natural gas BTU cost comparison graphs.

Location of Work or Activity

Unless otherwise noted, activities during this period were conducted at the offices of Sierra Economic Development District, Auburn.

Task Progress Report

Task progress and completion details not mentioned below have not yet been engaged. Work progress on specific USFS grant task items through the end of June 2002 are as follows:

Task 1 – Washington Ridge Bio-Energy MOU Development and Community Outreach

Task 1.1 – Our group of local public & private project participants that has been organized into the project Team continues to grow. A copy of the current Team member list is attached. A project Team meeting was held on June 17th for continued project guidance and development. A key issue of this meeting was the commitment of the group to what may be a costly R&D effort to build the air-to-air heat exchanger interface to pair the Capstone and Chiptec equipment together. This Task is 95% complete and shall be maintained through the term of the project.

Task 1.2 – On Friday, June 28, 2002 Mr. Steve Eubanks, Tahoe National Forest Supervisor was the final signature of our projects three year Memorandum of Understanding (MOU) to develop, operate, and demonstrate a renewable bio-energy production system at the CDF/CYA Washington Ridge Camp. A special thanks to Steve Gardner of the CYA for his tireless persistence and education of upper level CYA officers to the point were the CYA Director, Mr. Jerry Harper finally signed the project MOU. The CYA Director was very happy to learn of our renewable energy project and to see that the CYA was able to contribute. The significance of the finalized MOU is that our project will now qualify to be recognized as a viable community based renewable energy project within the statewide pool of energy projects that are considered for implementation funding.

The effective date of this three-year MOU will be as of the date of the last signature, June 28, 2002. Signed copies are available through SEDD and have been distributed to all participants who signed the MOU. This Task item is 100% completed.

Task 1.3 – Now that the MOU has been completely endorsed, SEDD and project management have prepared the following draft project press release that will be distributed to several newspapers and agency newsletters for publication by mid July 2002. The Press release reads as follows:

“An innovative renewable energy production plant is developing at the Washington Ridge Youth Conservation Camp located eight (8) miles east of Nevada City in Nevada County. The Sierra Economic Development District (SEDD) initiated the feasibility and evaluation of this project in August of 2001 through grant funding provided by the USFS National Fire Plan. A key element of the initial project was to assemble a Team of public and private organizations to evaluate the feasibility of implementing a Bio-energy power plant to support the energy needs of an eighty (80) person Camp and to direct the project towards a future installation, operation, and demonstration phase. The recent endorsement of this projects MOU by the Team members listed below, is the results of many months of project scoping, equipment investigations, environmental planning, and feasibility analysis that has established the will and intent of all participating to install and operate a renewal Bio-energy power plant at the Camp. The next steps to follow the MOU are: 1) The completion of all required construction, safety and environmental permits to install the equipment, store & handle an annual estimated use of 1,300 dry tons of woody biomass (fuel), and operate the 60kW/Hr Bio-energy power plant. 2) Source funding for the purchase of the equipment, for the construction of the fuel handling facility, and for the demonstration of the project to others. It is anticipated that installation could begin as early as spring of 2003. For periodic updates and to learn more please visit the SEDD web site, www.sedd.org, or call SEDD at 530-823-4703 and ask to be routed to the Project Director, Tom Amesbury of the Forester’s Co-Op.

The Team members that have endorsed the MOU to fund and establish a working relationship are: the Sierra Economic Development District (SEDD), the USFS - Tahoe National Forest and Nevada City Ranger District, the California Department of Forestry and Fire Protection, the California Youth Authority, the Capstone Turbine Corporation, Chiptec Wood Energy Systems, the Fire Safe Council of Nevada County, the Northern Sierra Air Quality Management District, the County of Nevada, Planning Department, and the Foresters Co-Op Company. The purpose and mission of the Washington Ridge Bioenergy Production project is to construct, install, operate and maintain innovative biomass conversion equipment, so as to economically & environmentally demonstrate, in a sustainable fashion, that the utilization of hazardous forest fire fuels (biomass) can provide employment & business opportunities through the appropriately scaled production of energy form renewable fuels.”

A two-page color informational project flier will also to be available to accompany this press release and is attached for your review. This task is now 50% completed.

Task 2 – Pre-Installation

Task 2.1 – All sub-contract work associated with this project has been completed. Specific sub-contractual arrangements were incurred with three separate contractors in support of key project elements. 1) Field surveying and preliminary site design – S&E Engineering completed the preliminary field surveying and site plan for the WRBEP project. Attached is a letter size reduction of the site plan for equipment installation and feedstock storage completed by S&E for your review

2) AMMA Electric was engaged to provide Camp energy audit and electrical system upgrade requirement costing as previously reported. And 3) TSS Consultants were contracted to complete the equipment “due diligence” requirement of this project. As with the AMMA Electric report a copy of the TSS report was provided in the last quarters report. All sub-contracts associated with this project have been completed. This task is considered 100% completed.

Task 2.2 – With the signing of the project MOU and the clarification the California Department of Forestry and Fire Protection is the “Special Use Permit” we have concluded that the State of California will carry title to the equipment during the demonstration period. As for the R&D heat exchanger the ownership for this proprietary equipment will have to be developed dependant upon the source of the funding build this technology. It is expected and dependant on future post installation funding that the Foresters Co-Op shall be retained to perform on-site operation and maintenance of the equipment and heat exchanger technology throughout the course of the three-year demonstration period. This task is now 100% completed.

Task 2.3 – In May a small group from the Team traveled to South Burlington, Vermont to inspect seven (7) installations of our newest Industrial Team members equipment in operation, Chiptec Wood Energy Systems. The personnel who traveled were Tom Amesbury - Project Manager, Bill Treece - Capstone VP, Ken Hughes – CDF Camp Battalion Chief, and Dick Eacobacci – of S&E Engineering. Our host, Robert Bender of Chiptec, was a terrific tour guide of his beautiful State and growing Renewable Energy Industry. Chiptec equipment is rugged and reliable as evidenced by our visit to a variety of installations where fossil fuel furnaces have been replaced by the Chiptec wood energy system. After this trip we are more confident than ever before that our project now has the Industrial Team capabilities required to overcome the significant R&D interface design/engineering technological challenges that must be overcome prior

A specific generation equipment placement has been pre-engineered with the assistance of our industrial Team members and more recently Professor Bryan Jenkins at UC Davis. We have determined the optimum design approach for the interface equipment needed to couple the Chiptec gassifier to the Capstone microturbine. The bio-energy power plant will be a 60 kW/hr base load application fueled by dry to 40% moisture content 3” minus biomass fuel. During the recent Team meeting we disclosed that the interface equipment required for the project would be the most costly element associated with the project. Bill Treece has estimated this interface to be approximately 1.8 million dollars. Attached is a four page cost break down estimate that Capstone has provided for the project. The decision to go with this design has been made by project management as a result of the knowledge and experience provided for through the completion of this project. A number of alternative bio-energy systems and R&D designs configurations have been considered. Further more, project management has decided to minimize the R&D exposure of our project and continue to pursue the proposed air-to-air Heat Exchanger R&D design which will utilize as much “off the self” equipment as possible. Bill Treece of Capstone has committed to have an R&D heat exchanger system specification requirement completed by the week of July 15th. Bryan Jenkins of UC Davis and possibly others will be assisting in funding proposal targeting and writing along with sourcing the proper manufacture. Capstone turbine has reported a total 280 hours of “Inkind” work by Bill Treece and other Capstone Engineers for the past six months (January – June). Please refer to the attached email correspondence received from Bill Treece on July 12th. This Task is now considered 100% completed for this first year USFS funding for this grant, however design modifications and improvements are expected to continue through the demonstration period.

Task 2.4 – We are happy to report that continued project implementation funding has been received through a State contract from the California Department of Forestry. For your review and

information we are attaching a copy of State contract #8CA01026 along with its associated task item list of deliverables over the course of the next year. This task item is now 100% completed.

Task 3 – Environmental

Task 3.1 – A collection agreement with the USFS - Nevada City Range District was completed this past quarter for the project to support USFS staff cost to carry out required NEPA compliance work. Multiple office and field investigations have been conducted between project management and USFS staff for the completion of this task. With the signing of the MOU and the release of the project Press Release we expect the USFS to complete the public notice requirement of the NEPA process in the near future. For a copy of this executed collection agreement between the USFS and SEDD please contact Art Umland at the Tahoe NF. This task is 90% completed.

Task 3.2 & 3.3 – Implementation of NEPA site evaluation for possible negative impacts to botanical and wildlife resources has been initiated through the USFS collection agreement and by project management whom is completing a State required CEQA permitting process. Both the NEPA and CEQA environmental review planning processes are being conducted in parallel with each other. As a part of the initial site planning and evaluation, the Foresters Co-Op and the USFS have conducted a preliminary environmental assessment (EA) of the proposed WRBEP to identify potential environmental impacts that may occur from development and implementation of the project. This status report presents the activities of the preliminary EA to date. Environmental Data Resources, Inc. (EDR) conducted a regulatory agency database review and records search to obtain information that may be used in conjunction with additional research for determining whether the proposed site or action will have a significant environmental effect. Because subsurface contamination may migrate from adjacent sites in groundwater, regulatory agency databases and files were reviewed to determine if toxic releases or fuel leaks at or near the property might pose a potential risk or environmental concern. The subject property was not identified in any of the environmental databases researched by EDR. The database search also did not identify any properties within the 1-mile search radius in any of the regulatory files or lists reviewed. Various federal and state government agency records have been searched in accordance with CEQA/NEPA requirements. Results of our CEQA/NEPA environmental planning, database search, and review of available environmental information is summarized in the attached environmental checklist for your review. An archaeological resources records check was processed by the North Central Information Center in October. An Archaeological field survey has been completed as recommended by the North Central Information Center. The findings of all surveys associated with this task will form the basis of our projects negative declaration finding for both the CEQA and NEPA. A draft CEQA finding report will accompany this projects final report. These task items are 90% completed.

Task 3.4 – The Bio-Energy power plant pre-engineering has included monitoring sound, emission, and video remote sense devices to monitor the environmental performance of the Bio-energy equipment through the demonstration period. Additionally the equipment to be sold into the project by Capstone and Chiptec each has its own electronic performance monitoring equipment standard which can be linked through a phone modem and tracked remotely anywhere in the world. The preliminary planning for monitoring potential future environmental impacts has been completed. This Task is 100% complete.

Task 4 –Energy Audit

Task 4.1 - Establish Energy Management Systems. It is the belief of project management that the California Power and Conservation Authority (CPA) will provide a future energy management system for this State facility. Now that all parties have endorsed the MOU, the CPA is able to recognize this project and assist as per their charter. When the CPA begin to assist in the project we expect that their participation will be as follows:

- The CPA to list the Washington Ridge project on the “Summary of Renewable Generation Projects” so as to elevate the recognition and understanding of the multi public trust benefits associated with this project. (Fire Prevention, Air Emission Avoidance, Economic Development, Heat & Power distributed energy generation, etc...)
- Advocate equipment funding from the appropriate state sources and act as the purchasing agent for the implementation of this three -year Bio-energy demonstration project at the CDF/CYA Washington Ridge youth Conservation Camp in Nevada County. With the successful completion of this model project, CPA shall stimulate the placement of similar wood fired CHP systems at 43 other state operated youth conservation Camps and numerous other public facilities with access to woody biomass supplies.
- The CPA to provide project oversight with respect to electric power generation economic analysis and evaluate the potential of surplus electric power sales to the local grid. In this respect the CPA may be the power broker for the project if it is determined that surplus electric power can and should be sold into the local power grid.

Continued refinement of the energy management system is expected to evolve over the course of our projects three year MOU. For the purposes of this project this task item is 100% complete.

Task 4.2 – AMMA Electric has completed the required third party energy audit and bioenergy integration into existing Camp electrical systems. Refer to attachment in task 2.1 for a copy of this report, its recommendations, and improvement cost estimates. This task item is 100% completed as was previously reported.

Task 5 – Feedstock

Task 5.1 – By signing the MOU the Calif. Youth Authority (CYA) has agreed to pay for the procurement of the woody biomass fuel required to operate the plant. After the equipment and R&D funding has been secured and three months prior to installation the CYA will circulate an RFP to known local biomass producing businesses for the development of an annual biomass supply contract. A listing of over 150 regional biomass-producing businesses will be solicited under the RFP. Project management plans continued work with the CYA to outline the specific steps necessary for the CYA to buy woody biomass fuel. This task item is 75% completed.

Task 5.2 – The preliminary site plan design illustrated in task 2.3 contains design elements for a four month feedstock receiving, storage, handling and delivery system necessary to sustain a 2 million BTU/Hr biomass combustor operating 24/7. The Chiptec wood gassifier system is supplied with its own “Hot-Charge” feedstock handling and 2-3 day storage system. During our recent trip to Vermont (Task 2.3) we inspected this equipment we were impressed with the rugged reliability of this “Hot-Charge” system designed and sold by Chiptec. This design has been selected for use once equipment purchase funding is available. This Task is now 100 % completed.

Task 5.3 – All necessary GIS related spatial data has been gathered and is being utilized for CEQA/NEPA evaluations and feedstock business and resource tracking. Informational quarries relating to all phases of this project are available using this GIS data. We are pending the release of

biological GIS data from the USFS for utilization in the CEQA process once received this task will be finished. This Task item is 75% complete.

Task 6 – Economic Analysis

A benefit cost analysis has been utilized to develop an estimated project budget that is attached for your review. Actual cost of these items may vary due to the fact that much in-kind facilities improvement contributions are expected to be provided by the CDF and CYA. Alternative design cost/benefit analysis has been run during the past quarter in an effort to select the optimum system. High-pressure steam turbine systems calculate at approximately 25 cents per kW/Hr to operate at the camp. To better understand the energy value of the woody biomass resource as compared to Natural Gas and Heating Oil Chiptec assisted project management complete two BTU cost comparison graphs that are attached for your review. As you can see from these graphs wood biomass fuel is very inexpensive when compared to fossil fuels. Cost/benefit analysis will continually be employed throughout the three year MOU period as the equipment is operated and refined. For the purposes of this initial project evaluation grant this task item is 100% completed.

Task 7 – Project Administration

Task 7.1 – SEDD staff continues to monitor this project to assure that the goals of the USDA S&P Forestry “Community Planning for Fire Protection Program” and that the project remains on task. This Task will be ongoing through the term of this project.

Task 7.2 - This Task item is 100% complete as previously reported.

Task 7.3 - A final project report complete with an audited accounting shall be supplied at the conclusion of this project.