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COMPREHENSIVE ENERGY PROJECT - PHASE 2 SUMMARY

BACKGROUND

On September 12, 2006, the Board of Supervisors approved a Climate Protection Action Plan (CPAP) that laid out a plan to reduce County generated greenhouse gas (GHG) emissions to 20% below 2000 levels by 2010. The estimated GHG emissions for 2000 were 36,474 tons, making the 2010 goal 29,179 tons (20% less) – a difference of 7,295 tons. The CPAP proposed a plan that would reduce GHG by 8,454 tons to account for continued growth in GHG gas emissions due to building expansion and other variables. The reduction target was divided between three elements:

- Buildings - 6,348 tons
- Fleet - 436 tons
- Employee Commute - 1,670 tons

On September 19, 2006, the Board approved a Comprehensive Energy Project (CEP) to achieve the building-related GHG reductions identified in the CPAP.

PROJECT OBJECTIVES

Three objectives were established for the Comprehensive Energy Project:

1. **GHG Reduction:** The primary objective of the CEP is to design, construct and operate a combination of energy efficiency and generation measures to meet the GHG reduction target established in the CPAP.
2. **Positive Financial Impact:** The CEP is being done under the authority of Government Code §4217.10 *et. seq.*, which allows the County to finance the project if the governing body finds that the funds for repayment are available from funding that would have otherwise been used to pay its regular energy costs if the project had not been done. In other words, the energy cost savings over the life of the improvements need to pay for the cost of the project. Furthermore, in developing the financial plan for the project, it was determined that the energy and water cost savings should pay the debt service from the beginning, and that annual cash flow should be either neutral or positive throughout the term of the financing as compared to the anticipated energy and water costs without the improvements.
3. **Infrastructure Renewal:** To the extent possible, within the first two objectives, replace worn-out infrastructure that has reached the end of its service life.

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PHASE 1 - AUDIT

Through the RFP process, an Energy Services Company (ESCO), Aircon Energy, was selected to identify, design, and construct building-related energy efficiency measures (EEMs) to meet the GHG reduction target for buildings. On March 18, 2008, the Board authorized a contract with Aircon for Phase 1 to perform an Investment Grade Audit of County facilities to identify and evaluate the possible EEMs. One hundred and one measures were identified. The measures were evaluated for impact on energy and water consumption, GHG reduction, project cost, payback and financial impact. The list of possible EEMs was reduced to the most cost-effective measures that would meet the three objectives of the CEP. This reduced list is being proposed as the scope of work for Phase 2 of the CEP. Some identified measures were deferred because of their low impact on consumption or GHG, or because of their high costs relative to energy savings. These deferred measures will continue to be evaluated for possible inclusion in the Phase 3 scope of work, depending on funding opportunities. Financing plans have been developed and evaluated for Phase 2, and a plan has been selected that will meet the objectives of the project.

PHASE 2 - PROPOSED PROJECT

The proposed scope of work for the CEP Phase 2 includes 38 EEMs at 24 buildings, most of which are at the County Administration Center. (See Attachment A for a complete list of proposed EEMs.) The project will reduce GHG emissions by an estimated 6,135 tons annually. Adding these GHG savings to those associated with energy improvements implemented under other projects since the year 2000, the total GHG reduction below the baseline year 2000 is an estimated 6,514 tons - 166 tons more than the CPAP target for buildings. The Phase 2 work includes lighting retrofits (primarily replacement of existing fluorescent lamps and ballasts with new generation high efficiency lamps and ballasts) at 20 buildings, replacement or reconstruction of heating, ventilating and air-conditioning equipment in four buildings, replacement of chillers and other equipment at the Central Mechanical Plant (CMP), and various other measures. The project also includes a substantial water retrofit package, including installation of flush controls in the Main Adult Detention Facility (MADF) and the Juvenile Justice Center (JJC). The water retrofit package will reduce GHG emissions due to reduced energy demands for water pumping. The resulting water flow reduction will also lessen water usage and help address other issues, such as sewer discharge problems at the MADF.

Fuel Cell Power Plant: The centerpiece of Phase 2 is a 1.4 mega-watt (MW) fuel cell combined heat and power plant, an ultra-clean and quiet system which will provide cost effective on-site electrical generation, with waste heat from the fuel cell being captured to heat water used by the Central Mechanical Plant. Fuel cells generate power by unlocking the energy in a hydrocarbon fuel source and turning it into usable heat, water and electricity. The process is electrochemical, involving no combustion, and therefore no incomplete combustion. The process is inherently cleaner and uses the hydrocarbons in a more efficient manner than fossil fuel power plants, so a fuel cell plant creates electricity with up to twice the efficiency of traditional plants. The fuel cell proposed for the County Administration Center will run on natural gas and provide enough electricity for the entire campus. See Attachment C for further information about the proposed Fuel Cell.

The proposed fuel cell power plant will:

- Generate up to 10,693,216 kWh of electricity per year, reducing the need for grid power,

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- Operate 24 hours a day, 7 days a week,
- Produce 45 billion BTU of thermal energy per year in the form of usable hot water, which will reduce the use of the gas fired boilers at the Central Mechanical Plant.
- Produce virtually no NOx, CO, SOx, volatile organic compounds or particulates – all considered the most harmful emissions.
- Reduce greenhouse gas emissions by 69 percent compared with the same amount of energy being generated by California’s electrical grid portfolio. Due to its efficiency, this fuel cell will reduce the County of Sonoma’s emissions by approximately 3,810 tons of CO2 per year.
- The Direct Fuel Cell power plant proposed for Phase 2 has been designated as “Ultra-Clean” by the California Air Resources Board (CARB), and exceeds all 2007 CARB standards.

Fuel cell power plants provide safe and reliable power throughout California. The fuel cell is being provided by FuelCell Energy, a subcontractor to Aircon. FuelCell Energy installed their first fuel cell (2 MW) as a demonstration project in Santa Clara, California in 1996. Other fuel cells installed by FuelCell Energy in California include:

- City of Santa Barbara, 500KW
- Sierra Nevada Brewing Company, Chico, CA 1MW
- Sheraton Hotel, San Diego 1MW
- Westin Hotel, San Francisco Airport, 600KW
- California State University at Northridge, 1MW
- City of Riverside 1MW
- County of Alameda, 1MW
- Turlock Irrigation District, 1.2 MW
- City of Tulare, 900KW
- Dublin San Ramon Service District, 600KW
- Cache Creek Casino, 750 KW

Phase 2 Impact: The total scope of work included in Phase 2, including the Fuel Cell, will have a significant impact on energy and water consumption. Based on assumptions, projections, and conservative estimates provided by Aircon and confirmed by a third-party consultant, the proposed scope of work is expected to reduce consumption and GHG emissions as shown in the following table:

	Estimated Annual Savings
Total annual greenhouse gas reduction	6,135 tons
Annual electricity reduction	13,365,226 kWh
Annual water savings	19,138,620 gallons
First year energy and water cost savings	\$1,689,316

With the reduction in energy consumption and the implementation of the fuel cell power generation, the County Administration Center will no longer use electricity from the power grid. However, the Center will still be connected to the grid which will provide backup power in case the

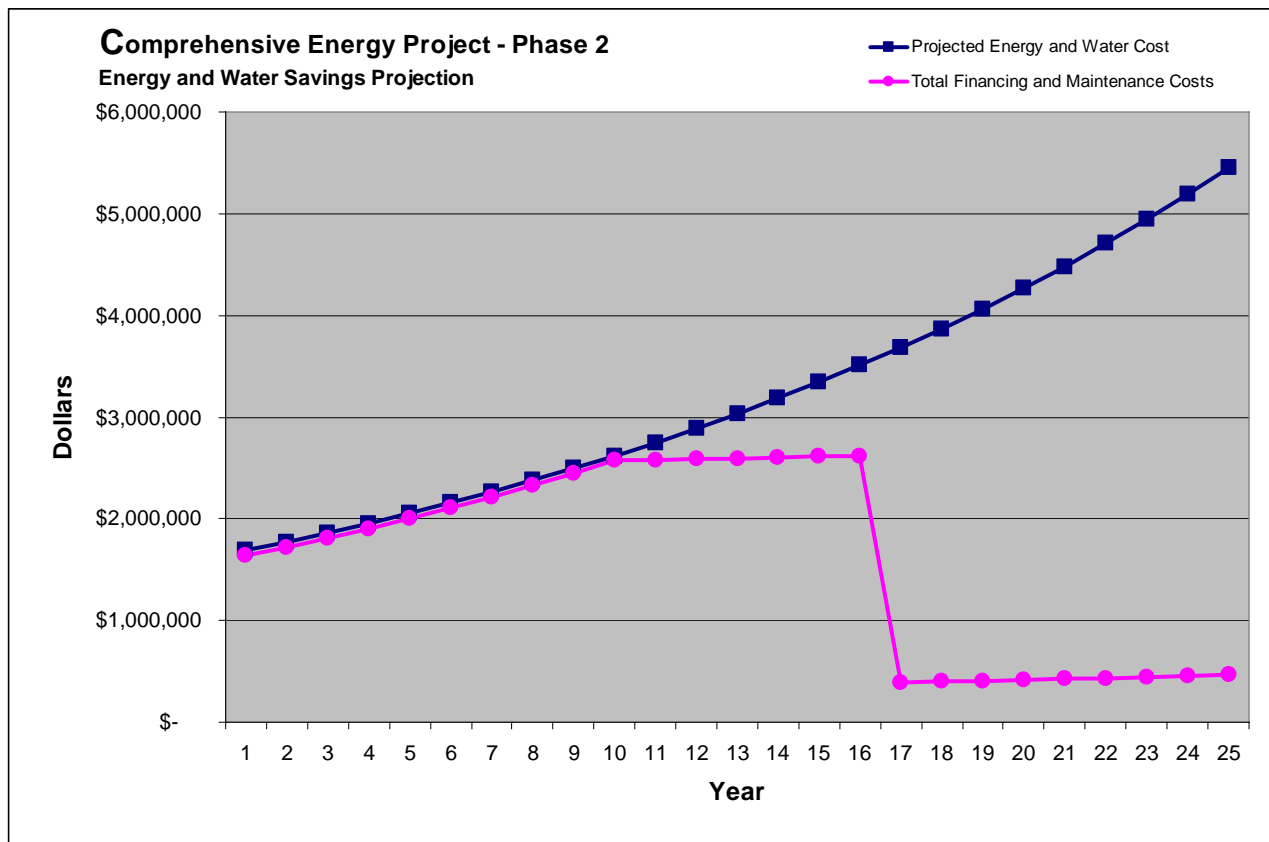
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fuel cell is out of service or additional power if consumption exceeds the fuel cell capacity in the future.

PROJECTED ENERGY AND COST SAVINGS

The project is anticipated to save a considerable amount of money for the County over the life of the improvements (25 years). As energy costs continue to escalate (assumed rate of 5% per year, although actual escalation may vary), the payment schedule eventually levels out and the financing will be paid off long before the improvements need to be replaced. In addition to the financing costs and energy savings, the economic analysis accounts for the net difference in maintenance costs for the equipment being installed or replaced. While a reduction of maintenance cost is anticipated for several pieces of equipment, there is an added maintenance cost associated with the fuel cell. Fuel cell maintenance, including major equipment replacement at certain intervals, will be provided under a separate annual agreement with the fuel cell vendor over the life of the equipment at a cost of \$400,000 per year for the next 10 years, and escalated annually after that. The cost of this service agreement has been included in the economic forecast, and even with this added ongoing maintenance cost, the savings outpace the costs. Based on the assumed 5% annual increase in energy cost, the CEP is projected to save over \$80.6 million in energy costs over its 25 year life vs. the total lease payments (\$31.8 million) and the added maintenance cost (\$10.6 million), as shown on the following chart:



The economic assumptions, including the energy cost escalation rate, were reviewed and confirmed by the third party peer review consultant. The Auditor-Controller-Treasurer-Tax Collector

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reviewed the economic analysis and the Banc of America financing proposal, as well as other financing alternatives and sources, and found that the Banc of America proposal was in the best interests of the County. The final proposal has also been reviewed and approved by the County's Debt Advisory Committee.

CONFIRMATION OF ENERGY SAVINGS

The energy savings are critical to the financing objectives of the project and will be confirmed through the following measures:

1. The energy services company hired for this project, Aircon Energy (Aircon), is responsible for estimating and meeting the energy savings objectives. They have already completed the "Investment Grade Audit", in which they accumulated utility bills, inspected existing buildings and facilities, and established a baseline for current energy consumption.
2. Aircon has used modeling tools that are recognized by various energy authorities, including US Department of Energy, California Energy Commission, California Public utilities Commission, PG&E and others, in order to estimate energy and cost savings.
3. Third-party review and validation of the assumptions and savings has been done within Aircon and by a separate energy consultant hired by the County.
4. The financing plan relies on over \$3 million in PG&E rebates. PG&E requires validation of all savings prior to approval of the rebate application. Aircon advises that PG&E will use a performance based review using an outside engineering firm to verify all the calculations and engineering.
5. Aircon's estimates of energy savings are intentionally conservative, such that savings might actually exceed estimates.
6. As part of their contract, Aircon will provide one year of measurement and verification of the energy savings using a third-party engineer. This measurement and verification will be submitted to both the County and PG&E. If the savings do not meet or exceed the estimates, Aircon is contractually obligated to implement the changes necessary to meet the established energy savings targets.

PROJECT DELIVERY

The majority of this project, including the fuel cell, will be implemented as a design/build project through an Energy Services Contract in which Aircon will provide the engineering, construction and installation. A portion of installation work will be done by the County's own Facilities Operations construction crew. This installation work includes the lighting retrofits, which are routine, reoccurring and usual maintenance, and installation of the water saving devices and controls in secured areas of the MADF and JJC, where construction work requires uniquely vetted, specialized, and flexible crews (see discussion below). Work associated with the Data Processing Building is included in the financing but will be done under a separate project.

SCHEDULE

Based upon projected scheduling for design, permitting and construction of this project, the estimated completion date will be 66 weeks from the date of Notice to Proceed. Notice to Proceed is expected to be issued in January, 2009 and the project is expected to be completed in June, 2010, which will meet the schedule objectives of the CPAP.