



Memorandum

MONTEREY REGIONAL WASTE MANAGEMENT DISTRICT

Reviewed by Whm Date 12/14/07
General Manager

DATE: December 14, 2007
TO: General Manager
FROM: Assistant General Manager / Information Systems Manager
SUBJECT: Purchase of New Jenbacher JGS 420 Engine/Generator

RECOMMENDATION 1: That the Board adopt Resolution 2007-12 authorizing the purchase of a new General Electric Jenbacher JGS 420 engine without competitive bidding.

RECOMMENDATION 2: That the Board authorize the purchase of the General Electric Jenbacher JGS 420 engine with synchronous 1425 kW generator, and listed items, for the quoted price of \$736,126, in accordance with the proposal from Western Energy Systems, of Philadelphia, PA, dated December 12, 2007 (attached). The total purchase price including tax is \$789,495.

RECOMMENDATION 2: That the Board approve the Project Budget (attached) and Authorize Modifications to the Landfill Gas to Energy Project. This project replaces an existing 1-megawatt (mW) Jenbacher 320 engine/generator with a new 1.4 mW Jenbacher 420 engine/generator. This is a new capital expenditure request which was not included in the Capital Improvements portion of the FY 2006/2007 budget. Initial funding for this project will come from the FY 2006/2007 Capital Repair funds originally allocated for repair work on the engine to be replaced. The balance will be covered through a multi-year financing agreement.

BACKGROUND

The District currently operates the landfill gas to energy project, generating 4.6 megawatts of continuous power, using four internal combustion engine/generators:

Unit #	Engine Model	Generator Rated Output	Year Installed	Power Purchaser
1	Caterpillar 3516LE	1,600 kW	2006	3Phase
2	Jenbacher JGS320	1,057 kW	2002	3Phase
3	Jenbacher JGS320	987 kW	1998	PG&E
4	Jenbacher JGS320	987 kW	1997	PG&E

kW = Kilowatts

The District's landfill gas to energy project has been on-line since 1983, and has been owned and operated by the District since the mid-1980s. The District has used its own electrical power to power on-site operations since 1994. Staff has considerable experience and knowledge in the operation of this system.

The 1997 Jenbacher JGS320 engine/generator is reaching the end of its useful life. At 70,000 hours, it is past due for another major overhaul (due at 60,000 hours) at an estimated cost of over \$410,000.

DISCUSSION OF OPTIONS

Although the District is more constrained financially than it has been, staff recommends replacing this 10 year old engine rather than undertaking the expensive overhaul.

The overhauled engine would have an additional 4-6 years of useful life. However, its switch gear components would be 16 years old at the completion of that cycle. Furthermore, staff believes a substantial upgrade to the generator will be required in the next few years. Additionally, the engine/generator set to be replaced is almost identical to engine #3, which is one year newer. As component parts are more difficult to source for these older engines, staff has negotiated with Western Energy to allow the District to keep key parts from engine #4 as spares for engine #3 and still receive compensation for a returned "core" or engine block. Finally, the increase in revenue from the additional 425 kW the new generator will produce over the old unit, will pay back the additional project costs in less than three and a half years.

The District's options on the selection of a replacement engine/generator set are extremely limited.

The transformer the District uses to deliver electricity to the utility grid has a rated capacity of 5,000 kW. This is the maximum amount of power the District may export to the grid utility. With the purchase and installation of the new 1,425 kW Jenbacher 420, the District's total power production will be right at 5,000 kW. District staff projects the landfill to generate an adequate supply of LFG to power the increased capacity.

The purchase of another 1,600 kW Caterpillar 3520 (the same unit purchased in 2005) would exceed the capacity of the transformer and force the District to invest a considerable amount of time and money in upgrading our facilities immediately and would require an expensive and time consuming interconnection study by PG&E. Caterpillar does not make a 1,400 kW engine/generator set.

Only Caterpillar and Jenbacher, whose machines are currently on-site, are considered by the District for supplying engine generators compliant with California emission requirements. The main reasons to focus on just these two vendors are:

1. Parts and Service

Having worked with both vendors for many years the process to obtain parts in time of failure is well established. The District also maintains an inventory of critical parts for the Caterpillar and Jenbacher engines. Jenbacher has changed its parts and service team on the West Coast in the past 18 months to a company called Western Energy Systems. Support and inventory access has greatly improved, returning to the level of service the District experienced in the past.

2. Engines Built For LFG

The Jenbacher engine in particular has been built to operate on biogas and landfill gas. These are the leading brands for generating electricity from landfill gas.

3. Experience

The District has many years of operational experience with the engines and control technologies of these two manufacturers, staff feels it is very important to purchase either a Jenbacher or a Caterpillar to build on past training and experience.

Given the District's current power plant infrastructure, and the significant costs to modify the infrastructure, the purchase of the Jenbacher 420 is the best, and only reasonable, choice for the District. The Jenbacher 420 will not require any modification to the foundations, framing, or electrical power generator infrastructure. The selection of any other engine type would require extensive modifications to the facility. Modifications to the facility are anticipated when the District moves into its next module of the landfill and/or when a joint project with the MRWPCA is undertaken.

As the District's landfill continues to grow, expansion of our power generation facilities will need to be undertaken. Of immediate concern, after this upgrade, is the repair or replacement of Unit 3, installed in 1998. Staff is studying options for the expansion of the LFG plant to include working with the MRWPCA on a joint gas to power venture. This will most likely require a new and separate facility.

JENBACHER/WESTERN ENERGY SYSTEMS

Since Jenbacher selected Western Energy Systems as their West Coast product support team in early 2006, the District has experienced a significant improvement in the quality of support for parts and service. The GE/Jenbacher staff is aware of past issues with the District and has corrected the situation. Western Energy was able to fast track the engine replacement for unit #2 this summer. Western Energy has just recently engaged a local service support representative and will be assigning him to the District, at no cost to the District, for a period of four to eight weeks. Staff is very satisfied with Western Energy's offer to allow the District to have a local full time mechanic on this new model engine.

DELIVERY/INSTALLATION

GE/Jenbacher is committed to moving the District's order up in the production cycle and having the engine shipped from Austria as soon as possible. After shipping and installation the new engine could be selling power by September 2008.

CONNECTING WITH PG&E

To deliver the additional 425 kW to the grid, staff will file a Generator Interconnection Application with PG&E. This is PG&E's process to ensure that the grid can support the additional electricity and determine what, if any, improvements may need to be made to the system. On past projects this has led to some large expenditures for the District, including \$150,000 for a new transfer trip at the Castroville substation during the 2002 engine installation. However, based on staff's experience with PG&E on the 2006 engine installation, no major expenses are expected. Therefore, staff is allocating \$50,000 in the project budget for PG&E work.

ELECTRICAL ENGINEERING SERVICES

To assist staff with electrical engineering design services on this project, staff will engage the services of Rick Kuchenig, P.E. Mr. Kuchenig has worked for the District on past projects and is very familiar with our power plant. Authorization for his scope of work will be presented to the Board at a future meeting.

PROJECT BUDGET

The estimated project budget, prepared by staff, is attached for your information and approval. The engine/generator purchase is budgeted at \$790,000 including tax and freight. An additional \$50,000 is allocated for PG&E. Installation is approximately \$310,000 including contingency, for a total of \$1,150,000 to purchase and install the engine/generator.

MONTEREY BAY UNIFIED AIR POLLUTION CONTROL DISTRICT (MBUAPCD)

Because the District is at its emissions offset threshold limit for the landfill gas to energy project, and is receiving offset credit from the MBUAPCD, we will need to modify our Permit to Operate with the MBUAPCD. Similarly, as a Title 5 facility, this change in equipment on our Title 5 air permit will require a modification of our Title 5 permit. Staff will be working with the MBUAPCD on these changes which require public notice but not a public hearing.


POWER SALES


We are currently selling the 1,600 kW from the Caterpillar engine and the 1,057 kW from Jenbacher #2 to 3 Phase Energy. PG&E is purchasing 2,000 kW (less site usage) from engines #3 and #4. The District cannot replace the current engine #4 with the new engine #4 in the PG&E contract. The additional 425 kW is too large an increase for the new restrictions on contract modifications at PG&E. However, the District can swap engines #2 and #3 in the respective contracts. This will keep PG&E with 2,000 kW (less site usage) and increase 3 Phases power purchase to a total of 3,000 kW. Both PG&E and 3 Phases accept and support this configuration and supporting contract modifications will be developed.

Because the current Jenbacher Unit 4 is producing 1,000 kW, the new 1,425 kW unit will increase electricity sales by 425kW. The District will receive approximately 6.3¢ per kW-hr for this power, providing \$211,000/year in additional revenue. With an estimated project cost of \$1,150,000, the annual return on investment will be 18%. In the current situation requiring \$410,000 of overhaul expenditures and no increased capacity, the marginal expenditures for the increased capacity is \$740,000 or a 3.5 year payback.

FINANCING

Upon placement of the order, \$115,000 (15% of purchase price) will be paid with cash. These funds will come from the \$200,000 in the current fiscal year's capital repair budget on the engine being replaced. Staff is proposing to utilize GE Credit Capital, or similar financing, for the balance of this project.


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Don Prescott
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Attachments:
Project Budget
Western Energy Proposal