COUNCIL AGENDA: 12-14-10
ITEM: 2.10

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

Memorandum

TO: HONORABLE MAYOR AND CITY COUNCIL

FROM: John Stufflebean

SUBJECT: SEE BELOW

DATE: 11-22-10

Approved

Date 12/1/10

SUBJECT: BUSINESS TERMS FOR BIOMASS TO ENERGY TECHNOLOGY PROJECT WITH HARVEST POWER, INC.

RECOMMENDATION

Provide the Administration direction to negotiate an agreement with Harvest Power, Inc. for evaluation and demonstration of a biomass-to-energy technology project at the San Jose Santa Clara Water Pollution Control Plant to begin February 1, 2011 consistent with the business terms specified herein.

OUTCOME

Approval of this recommendation would enable the Administration to proceed with negotiating a grant agreement with the California Energy Commission. This project offers the City an opportunity to leverage private sector resources and grant funding to study and showcase an emerging technology that can meet regional and the City's Green Vision goals for waste diversion, waste to energy, alternative fuels, and job creation. The demonstration project could also further the San Jose/Santa Clara Water Pollution Control Plant (the Plant) goals of energy self-reliance, new uses for Plant land currently dedicated to drying biosolids, and alternative disposal options for biosolids.

BACKGROUND

In February 2010, the City released a Request for Information for the City's Green Vision Demonstration Partnership. The Harvest Power proposal was one of four received for energy conversion technologies. The 2010 Green Vision Work Plan includes the development of waste-to-energy technology infrastructure at the Plant, which is consistent with the land use alternatives being developed as part of the Plant Master Plan effort for the buffer lands. If successful, the new technology could be a better alternative to the current process of handling biosolids including odor mitigation, generation of energy, and freeing up land for alternative uses.

The proposed project demonstrates that biomethane suitable for generating electricity or fuel can be produced through gasification of wood and biosolids feedstocks. The City and regional stakeholders also have an interest in evaluating and demonstrating the feasibility of gasification to meet regional waste diversion and renewable energy goals.

The California Energy Commission (CEC) solicited proposals for a grant in Spring 2010 seeking projects similar to the project proposed by Harvest Power. The Administration also learned from past grant applications that applying with a private partner would make the City more competitive for an award. The Treatment Plant Advisory Committee (TPAC) on May 13, and Council on May 18, 2010 was informed of the opportunity, and the City submitted a $1.9 million grant application to the CEC in May 2010. The State Energy Commission approved award to the City in November 2010.

Before the Administration can begin negotiating the grant agreement, the CEC requires that the City approve the business terms of the project with Harvest Power. Since the parameters of the grant agreement with the CEC will affect the agreement with Harvest Powers, and the terms of the Harvest Power project will be reflected in the CEC agreement, the Administration proposes to negotiate both agreements in parallel, and return to Council for approval in January 2011.

ANALYSIS

Project Timeline

The phased approach of the feasibility and demonstration gasification project as outlined in Table 1 below, is designed to include stakeholder input, evaluate environmental impacts and confirm economic feasibility of the technology before further steps in technology development.

The feasibility phase of the three-year project will be critical to confirm optimal siting of a small demonstration-scale gasification facility on Plant lands, and provide an analysis of all permitting, engineering, feedstock, and outreach considerations required for the demonstration unit, as well as indicators of feasibility for commercial technology implementation. Design of the feasibility study will be informed by stakeholder input, which is important for the validity of the study. Based on the results of the feasibility study, all of the project partners (City, Plant partners, Harvest Power, and CEC) must agree to proceed with the demonstration phase of the project. As a condition precedent to operation of the demonstration unit, Harvest Power would be required to secure and maintain all permits, and other entitlements required by the City, Santa Clara County, and appropriate State, and federal agencies.

Once operational, the demonstration gasifier would produce syngas, which would then be upgraded through a proprietary methanation process to produce biomethane. This gas could be used for generating electric power or vehicle fuel. It is projected that the unit will produce enough power to support its own needs as well as providing excess methane which would be used to augment Plant energy sources during the demonstration period. Throughout this demonstration project, data will be collected and analyzed by Harvest and the City to analyze

technical performance, and assess feasibility for commercial-scale implementation of the technology.

Table 1 – Project Timeline

	Time Required
Feasibility Study	Approx 12 months
Technical, Economic, & Stakeholder Analysis	Start February 2011
Critical Review Process	
Construction and Operation	Approx 24 months
Public Outreach - Ongoing	Start February 2012
Building design	
Equipment Procurement	
Construction	
Commissioning of Facility	
Feedstock testing – wood waste	Start August 2012
Feedstock testing - biosolids	
Long-term feasibility studies	
Operating/Capital Cost Analysis	
Fueling Station Viability	
Project Reporting	Approx 7 months
Data Collection & Reporting	
Publish Report of Findings	

CEC Fund Disbursement
Energy Commission funds are disbursed through a reimbursement process and will be released only after the required match percentages are expended. Project partners would need to first expend the funds necessary to meet the CEC match requirement before grant funds are disbursed to the City. The City will then release the matching funds from the CEC for additional project activities.

Land Requirements
The proposed project requires approximately 2 acres of Plant land. The footprint of the proposed two-story demonstration unit is approximately 1,000 square feet. The City would lease the land to Harvest Power for purpose of the demonstration project. To the extent, there is a need to preprocess the feedstock, the preprocessing would also occur on-site.

Energy Requirements and Gas Production
The demonstration unit requires power to operate, and may require energy inputs while the unit is being tested and coming up to production standard. When the unit is up and running and producing gas that meets Plant standards, the unit would provide methane for use at the Plant to offset current Plant purchase of natural gas. The Agreement would provide that Harvest Power compensate the City for the power usedby the demonstration unit, and ensure power required by the demonstration unit does not affect Plant operations.

Feedstock Requirements
During the initial portion of the demonstration period, the feedstock would consist entirely of wood waste from the Residential Solid Waste program. Subsequently, the feedstock would incorporate up to 1,000 tons per year of biosolids from the Plant. The City would provide Harvest Power with a total of 2,000 to 3,000 tons of feedstock per year. This amount of feedstock equates to 2 truck trips per week, and in the case of biosolids, transfer from the Plant site itself. Currently, the biosolids are collected and delivered to the landfill once per year, and ground wood waste is delivered to co-generation facilities up to 120 miles away for energy production. For the demonstration, ground wood would be delivered to the Plant at no charge per the existing residential agreement between the City and Newby Island. For the biosolids, the Administration estimates that the City could save $22.75 per ton for the biosolids diverted from Newby Island Landfill to the demonstration unit, or an estimated total of $68,000 per year depending on the total amount of materials tested in the unit.

Harvest Power would be responsible for any additional preprocessing of the wood waste and biosolids required to prepare the material for gasification, as well as mitigating any potential odor issues resulting from biosolids pre-processing or feedstock handling.

Solid Waste Disposal
The estimated solid waste residue from the demonstration unit will be approximately 4% of the tonnage input. If the residue can be accepted by Newby Island Sanitary Landfill, the City would pay for the cost of disposing the residue under the current disposal agreement from the appropriate ratepayer funds depending on the source of the waste. The cost of disposing approximately 240 tons of residue is estimated to be $10,000 per year and is already budgeted in the Environmental Services Departments (ESD) existing base budget for the City's Disposal Agreement with Newby Island Landfill. Harvest Power would be responsible for the ongoing analysis of waste residuals in order to confirm that the materials meet the standards for disposal at the landfill. If they do not, Harvest Power will dispose of these materials as hazardous waste at its sole expense. Irrespective of the form of disposal, Harvest Power will be deemed the generator of the residue.

Water Use and Waste Water
The demonstration unit will require approximately 1,000 gallons of water per day for normal operations, and is estimated to result in up to 750 gallons of residual water per day. The unit can utilize recycled water, which can be supplied by the Plant. The Administration still needs to determine if this project will require an industrial waste discharge permit, or in the alternative transport the waste water off-site. In order for the residual wastewater from the unit to be treated by the Plant, the wastewater must be within limits for industrial discharge, and treatment must not impact the Plant's current treatment processes.

Staff Resources
The CEC grant requires a match from the City and Harvest Power. The City intends to include as part of its match, commitment of Environmental Specialists from the Integrated Waste

Management Division (IWM) and Plant operational and engineering staff. These existing staff positions would monitor the project implementation and integrate the demonstration unit with the Plant infrastructure and operations. It is forecasted that City employees would each contribute an average of between two hours to four hours per week for the duration of the project. This commitment is valued at approximately $200,000 for the three-year term of the project.

The City will also commit up to $200,000 in consultant support. The funding for the consultant was encumbered by IWM in 2009 to perform engineering, environmental review, public outreach, and conversion technology analysis for these types of projects.

Harvest Power Staffing Support
Harvest Power will provide substantial staffing resources throughout the feasibility analysis, and support the project development and operations phases. Staffing resources from Harvest will total approximately $560,000 and include up to eight personnel with the following expertise: Construction Manager, Chief Technology Officer, Lead Engineer, Plant Operations Manager, Economic Feasibility Analyst, and Technology Feasibility Analyst.

Construction of Demonstration Unit and Equipment Maintenance
Harvest Power will provide all upgrades to the site needed to operate the demonstration-sized unit including upgrades for power and water connections, feedstock delivery, storage, and processing. They will also issue a competitive bid for the construction phase of the project resulting in payment of prevailing wages for construction of demonstration unit. The City will provide inspection services to assure that demonstration unit connections to plant infrastructure are appropriate, and project management support as needed to resolve policy, administrative, or other issues that may be encountered during implementation and operations. Harvest Power will operate and maintain the facility including infrastructure and extension of utilities to operate the unit. Harvest will be liable for any damage their unit causes to the Plant and will make immediate repairs, replacement or correction at not cost to the City. Throughout the project, Harvest Power will measure and report on equipment performance and make adjustments as needed to meet all permits and requirements.

Ongoing Evaluation
Every six months through the conclusion of the pilot, Harvest Power will provide an evaluation of the pilot project to date, including but not limited to feedstock throughput, problems encountered or reported and how they were resolved, real versus projected costs to operate the system, and cumulative data on system performance to the City for provision to the CEC.

Ownership of Demonstration Unit
Harvest will own the demonstration Unit and remove the unit at the termination of the demonstration project. Because the demonstration unit will be purchased with the match contribution from Harvest Power, removal of the unit should not trigger any City obligation to the CEC to reimburse for the cost of the equipment.

Indemnification, and Subcontractors
Harvest Power will indemnify and hold the City harmless for any claim, loss or liability arising from the project. Harvest Power subcontractors will be approved by the City, and Harvest Power will be responsible for compensating and directing work of its subcontractors as well as ensuring its subcontractors comply with terms of the agreement.

EVALUATION AND FOLLOW-UP

The Administration will return in January 2011 for approval of the proposed agreements with Harvest Power, and the California Energy Commission.

PUBLIC OUTREACH/INTEREST

This recommendation meets Criteria 1.

- ☐ **Criteria 1**: Requires Council action on the use of public funds equal to $1 million or greater.
  (Required: Website Posting)
- ☐ **Criteria 2:** Adoption of a new or revised policy that may have implications for public health, safety, quality of life, or financial/economic vitality of the City. **(Required: E-mail and Website Posting)**
- ☐ **Criteria 3:** Consideration of proposed changes to service delivery, programs, staffing that may have impacts to community services and have been identified by staff, Council or a Community group that requires special outreach. **(Required: E-mail, Website Posting, Community Meetings, Notice in appropriate newspapers)**

In preparation for the development of the City's Organics to Energy Plan in 2009, City staff conducted a nationwide phone survey with municipalities who are working to implement conversion technology projects, and identified outreach to key stakeholders as one of the most critical factors for success. In a questionnaire completed by 117 people at the Plant Master Plan community workshops and 213 people online, one of the questions asked was about development of waste-to-energy facilities on the bufferlands. 57 percent of respondents indicated that developing waste-to-energy facilities on the Plant site was a "good idea." Outreach conducted regarding the proposed gasification project will be based a communication plan which is tailored to key stakeholders and will take advantage of prescheduled meetings, existing stakeholder groups, and established communications channels developed through the Plant Master Plan process.

COORDINATION

This memorandum was coordinated with the City Manager's Budget Office, the Office of Economic Development, and the City Attorney. This project and memorandum are scheduled to be considered by the Treatment Plant Advisory Committee on December 9, 2010.

COST IMPLICATIONS

The grant requires a match by City and Harvest of $1.9 million. Harvest Power, its investors, and project partners are committed to contributing more than the CEC required match in the form equipment, materials, labor, administrative support such as installation and operation, maintenance for the demonstration unit, assistance with preparation of reports, special waste disposal, and maybe methane to the Plant.

The value of the City's contribution to this demonstration agreement will not exceed $675,000. Of this, $200,000 is currently encumbered in multi-year consulting contracts that support feasibility analysis and demonstration evaluation funded by ESD Non-Personal/Equipment appropriation in the Integrated Waste Management Fund. Another $212,000 of the City's contribution is the estimated value of two acres for locating the demonstration project. Matching resources also include City Staff support for the project, estimated at approximately $200,000. This would be absorbed by existing staff with no need for additional staffing allocations, including two staff approved by Council specifically to implement new organic energy conversion projects. The City will contribute the value of recycled water, waste water treatment, and solid waste disposal. The estimate for these services is $60,000 during the demonstration period. The balance of City contributed resources will be from Plant operations staff, provided by the Plant Capital Division. The value of any energy provided for unit start up will be offset by methane provided to the plant by the demonstration unit.

CEQA

Categorical Exemption, File No. PP10-130, CEQA Guidelines Section 15303(d), New Construction and Conversion of Small Structures

/s/
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For questions please contact Michele Young, Organics Manager, at (408) 975-2519.