PASADENA WATER AND POWER

MEMORANDUM

November 2, 2009

To: CITY COUNCIL

From: CITY MANAGER

Subject: ADDENDUM TO THE AGENDA ITEM: AUTHORIZATION TO EXECUTE A MEMORANDUM OF UNDERSTANDING FOR THE IMPERIAL VALLEY GEOTHERMAL FEASIBILITY AND EXPLORATION PROJECT BY AND AMONG THE LOS ANGELES DEPARTMENT OF WATER AND POWER, IMPERIAL IRRIGATION DISTRICT, GLENDALE, BURBANK, COLTON, PASADENA, AND SOUTHERN CALIFORNIA PUBLIC POWER AUTHORITY

At the October 27, 2009 meeting, the Municipal Services Committee requested additional information on the proposed geothermal generation plan feasibility study and potential project, including the estimated capital costs to construct the plant, how it would fit into the renewable resource portfolio goals, and the relative merits and risks associated with resource ownership versus procurement through a power purchase agreement. Additionally, the City Attorney's office has recommended that the City Council should also make a finding that the proposed contract is exempt from the California Environmental Quality Act (CEQA).

RECOMMENDATION

In addition to recommendations set forth in the Agenda Report, it is further recommended that the City Council find that CEQA is not applicable to the action proposed herein as the City is not committing itself to a definite course of action to undertake any physical construction project at this time.

BACKGROUND

As part of its Integrated Resource Plan, the City adopted aggressive Renewable Portfolio Standard (RPS) goals, 15% by 2010, 33% by 2015, and 40% by 2020, Pasadena Water and Power's (PWP) current portfolio includes 8% renewable resources, the majority of which have been procured through power purchase agreements over the last six years. If the proposed MOU results in construction of a geothermal project and PWP ultimately participates in 2% of the project, the associated

energy would represent about 2.5% of PWP's energy portfolio.

PWP is pursuing the following strategies and vehicles to procure sufficient renewable resources:

- Long term power purchase agreements, with or without options to buy, involving a diversified mix of technologies such as wind, bio mass, solar and geothermal;
- Renewable gas fuel for the local power plant and Pasadena's share of the Magnolia Power Plant;
- Biomass co-firing with coal at Intermountain Power Plant;
- Development of solely owned or jointly owned renewable energy generation facilities; and
- Purchase of qualifying renewable energy in the spot and short-term forward markets, unbundled renewable energy credits, or a combination of both.

Each of the above approaches poses unique challenges or risks. While any long-term commitment introduces the risk that the project or contract energy cost will be higher than other options at a future date, they also introduce a degree of cost certainty over time. Power purchase agreements usually insulate the buyer from higher capital costs and production risks, thus the average price for energy is fixed for the term of the agreement. Developers price their energy to recover all capital costs and return on investment over the term of the agreement and include risk premiums to reflect uncertainties. On the other hand, ownership of a plant introduces capital and operational risk that can affect the average cost of energy over time; however, the project owner enjoys the benefit of plant output for its entire useful life.

The current demand for renewable energy in the California market far exceeds available supply. This has steadily driven up the prices offered by developers regardless of trends in the project development costs. Also, this has allowed developers to insist on contract terms that either allow them to increase the price or unilaterally terminate the contract prior to project completion if development costs increase. In addition, most electric utilities have fallen behind in their renewable procurement goals as a result of limited supplies and transmission constraints. The demand for renewable energy is expected to continue increasing due to the following regulatory developments:

- The Governor's executive order S-21-09 issued on September 15, 2009 directs the California Air Resources Board to adopt by July 31, 2010 a renewable portfolio standard of 33% by 2020. This standard, which will be part of AB32 regulations will apply to all California load serving entities including public and investor owned utilities;
- Adoption of renewable energy standards by other western states;
- The pending Federal Climate initiative and RPS legislation widely expected to be in place in a year or two.

PWP is not aware of any renewable energy resources that are currently in operation and available for purchase by PWP or other utilities on a long-term basis. All the projects under negotiation are at various stages of development to be commissioned in six months to three years after signing the contract.

The Proposed Geothermal Project

The proposed geothermal project would be developed in the Imperial Valley through a joint ownership arrangement such as the Southern California Public Power Association (SCPPA) in several phases:

1. Land acquisition (Los Angeles Department of Water and Power ("LADWP") and Imperial Irrigation District ("IID") have already procured land).

2. Due diligence including field exploration, permitting, financial and operational feasibility studies:
   - Execution of the proposed MOU is needed prior to participating in this phase
   - Withdrawal: A participant can withdraw any time but will be responsible to pay its percentage share (2% for PWP) of project costs incurred to that point if no other participant or a third party steps in to acquire the withdrawing participant's share. If another party acquires a withdrawing party's share, the acquiring party may negotiate to reimburse the withdrawing party's share of incurred expenses.
   - Transmission: The project will be connected to IID's transmission system that connects to the CAISO for Pasadena to bring energy home. Pasadena and IID will negotiate a transmission service contract.
   - Initial cost estimates for feasibility and exploration
     - Phase I for 50 MW = $10,800,000 (Pasadena's 2% share = $216,000)
     - Phase II for 150 MW = $25,200,000 (Pasadena's 2% share = $504,000)
     - Total Phase I and II = $36,000,000 (Pasadena's 2% share = $720,000)
   - Decision to build and operate the plant or not

3. Plant construction, commissioning, operation, transmission and upgrades to IID substation:
   - The initial capital cost estimates for the project range from $212 to $260 million. If Pasadena committed to a 2% share, this would represent a $4.2 to $5.2 million investment
   - In all probability, SCPPA would finance 100% of the capital costs through municipal bonds on behalf of its participants including Pasadena.
   - The initial estimate for Operation and Maintenance, Taxes, Royalties, and Insurance range from $12.4 to $17.9million per year.

- The cost of energy delivered at Pasadena (includes transmission) is estimated to be between:
  a. First year: $75.30 to $99.91 per MWh
  b. 30-year levelized: $83.00 to $112.07 per MWh

Benefits of Participating in the Proposed MOU

- Acquisition of the necessary property resources, a challenging part of any renewable project, has already been completed by IID and LADWP;
- Pasadena benefits from sharing the costs of financing and project management resources provided by SCPPA, IID and LADWP;
- SCPPA is expected to raise 100% financing through municipal bonds on behalf of its participants including Pasadena;
- The potential project offers an opportunity to own part of a geothermal plant at a discount to prices currently being offered for other renewable resources;
- The MOU provides rather liberal withdrawal provisions; and
- Available transmission arrangement through IID to CAISO to Pasadena.

Risks of Participating in MOU

- If the project is determined to be not feasible, Pasadena stands to lose from $216,000 to $720,000. However, the Salton Sea region is proven to have high geothermal potential and similar plants are in operation and/or under construction;
- Due to budget overruns or new technologies in the future or other market conditions, the cost of energy may be higher than market or future alternatives. The cost risk exists with any alternative of procuring renewable energy including power purchase agreements. However, due to favorable municipal financing through tax exempt bonds and a development team with proven power plant construction and project management experience, the net cost of ownership is expected to be lower than energy purchased from private parties;
- Transmission risk is low as IID, a major project participant, agreed in principal to provide its transmission system to other participants to deliver energy at agreed upon points (connecting to the CAISO in the case of Pasadena);
- Under performance by the plant would result in an increase in the average cost of energy produced. This risk is relatively low given that the Salton Sea and adjacent areas in Imperial Valley are geothermally active and data from exploration wells should provide quite dependable information about the expected performance of the plant.

While bringing some degree of risk due to the large up front capital investment, the ownership alternative as part of a diverse portfolio of renewable resources has substantial value that we believe warrants the risk. The expected levelized cost is lower

and PWP (via SCPPA) will retain ownership of the equipment for its useful life. Once the bonds have been paid off, the average energy cost will be very low. Furthermore, under the ownership option, the project participants will have control over on-going operations and capital improvements that may be warranted over time as turbine technologies and market conditions warrant. Finally, the ownership option has less counterparty credit risk than a long-term contract with a private, limited liability company counterparty.

Respectfully submitted,

MICHAEL J. BECK
City Manager

Agenda Report

November 2, 2009

To: CITY COUNCIL
Through: MUNICIPAL SERVICES COMMITTEE (October 27, 2009)

From: CITY MANAGER

Subject: AUTHORIZATION TO EXECUTE A MEMORANDUM OF UNDERSTANDING FOR THE IMPERIAL VALLEY GEOTHERMAL FEASIBILITY AND EXPLORATION PROJECT BY AND AMONG THE LOS ANGELES DEPARTMENT OF WATER AND POWER, IMPERIAL IRRIGATION DISTRICT, GLENDALE, BURBANK, COLTON, PASADENA, AND SOUTHERN CALIFORNIA PUBLIC POWER AUTHORITY

RECOMMENDATION:
It is recommended that the City Council Authorize the City Manager to enter into a Memorandum of Understanding ("MOU") with the Southern California Public Power Authority ("SCPPA"), the Los Angeles Department of Water and Power, Imperial Irrigation District, City of Glendale, City of Colton, and City of Burbank under which the parties will undertake exploratory drilling to ascertain whether there is sufficient geothermal potential for the parties to develop a power plant located on the southeastern shore of the Salton Sea in Imperial County in Southern California for an amount not to exceed $720,000.

This MOU is exempt from competitive bidding pursuant to City Charter Section 1002(h) contracts with other governmental agencies or their contractors.

BACKGROUND:
On March 16, 2009, the City Council adopted the 2009 Pasadena Power Integrated Resource Plan and a revised Renewable Portfolio Standard ("RPS") which directed PWP to achieve a 40% RPS by 2020. Subsequently, legislative and regulatory efforts have been underway at the State level to make it mandatory for all utilities, including publicly-owned utilities, to achieve a 33% RPS by 2020 rather than leaving it to the discretion of each city to set the standard for its utility. Governor Schwarzenegger issued an Executive Order mandating 33% by 2020. Similarly, it is expected that the California Legislators will pass bills with similar requirements. Staff expects that by the end of the

calendar year the current self-determination and policing that municipal utilities now enjoy will be replaced by mandatory requirements.

To meet these requirements and PWP's own higher RPS targets, PWP has been working with other SCPPA members over the past few years primarily negotiating joint power purchase agreements for renewable energy. Participating in the exploratory project allowed under the MOU may present an opportunity to lower power costs by eliminating developer profits and passing the savings on to SCPPA participants. Further, it provides PWP an opportunity to participate in developing a project by taking advantage of economy of scale which would be too large to do on its own.

Based on preliminary work, the results suggest that under an optimistic scenario, the project costs would range from $68.45/MWh when the facility goes into service in 2012 and gradually increase to $85.52/MWh over thirty years for an average cost of $75.45/MWh. Under a worst cost case scenario, it is expected that the first year cost would be $90.83/MWh, gradually grow to $117.20/MW by year thirty, with an overall average cost of $101.88/MWh. This compares favorably to offers for power sales agreements for geothermal energy from developers.

Phase 1 50MW Project	First Year cost	30-year average cost
Expected cost	$68.45/MWh	$75.45/MWh
Worst case scenario	$90.83/MWh	$101.88/MWh

This MOU limits the participants to undertaking actions to determine an optimal organizational structure for the venture and an exploratory drilling program to assess whether there is sufficient resource to develop a 50MW to 200MW facility. If such development appears technically and economically feasible, SCPPA will finance the project through bond financing. Staff will bring the matter back to City Council to obtain approval to participate in the actual development of the facility.

Project Summary

Both the Imperial Irrigation District and the Los Angeles Department of Water and Power own land in the geothermal rich area located in the southeastern region adjacent to the Salton Sea. They have jointly agreed to allocate 5,230 acres for the purpose of developing this geothermal resource. The long term goal is to ultimately develop 200 MW on this land in two phases. As a first step, the parties would proceed with an initial investigation and development of 50 MW. Under the MOU, the plan is to initially drill four exploratory 6.75 inch wells to a depth of 3000 feet at an expected cost of $2.5 million each in order to ascertain the best sites to develop. Phase 1 of the project is expected to begin

soon after execution of the MOU and if the exploratory drilling is successful this phase of the project will be completed by 2012.

In order to ensure a successful exploratory drilling program, Geothermex, the leading geothermal consulting firm in the nation is under contract to help the participants with the planning and execution of the proposed exploratory program. Further, the parties have deliberately chosen to contribute land that is located in a known geothermal rich area. It is in the same general vicinity of existing plants that have been operated for many years by California Energy and Ormat, both leading geothermal developers.

Memorandum of Understanding Summary

In order to make certain that the parties have a clear path on how to proceed with aligned expectations, the attached MOU has been developed by the participants. It addresses the following issues:

1. Land commitments - identifies and sets forth the specific properties that will be considered.

2. Royalties and surface lease rate - establishes the property owners will receive a royalty rate of 4% of the cost of the energy produced and an annual surface lease rate of $100 per acre per year.

3. Cooling water - provides for cooling water to be made available from the Imperial Irrigation District at prevailing tariff rates.

4. Budget - sets forth a maximum development budget for the exploratory drilling of $36 million.

5. Milestones - provides a milestone schedule.

6. Participants - specifies the project participants as follows:

Participant	Percent Share (%)	Total Cost Share ($)
Los Angeles	50.00	18,000,000
Imperial Irrigation District	32.50	11,700,000
Burbank	9.50	3,420,000
Glendale	4.00	1,440,000
Colton	2.00	720,000
Pasadena	2.00	720,000
Total	100.00	36,000,000

7. Organization structure - provides for a participant team consisting of representatives from the Los Angeles Department of Water and Power, the Imperial Irrigation District, the City of Burbank, and the Southern California Public Power Authority to conduct an evaluation of the tax, financing and other economic advantages of public, private, or public/private project development so as to ensure that the project legal and organization structure minimizes the risks and costs to the participants.

8. Exploratory drilling - prior to drilling provides that the participants conduct an evaluation of options to mitigate exploratory drilling and development risk, including looking at public/private sharing strategies.

9. Due Diligence Report – a due diligence report will be prepared that incorporates the results of the organization structure review and results of the exploratory drilling program.

10. Recommendation – the due diligence process will end with a recommendation based on consideration of reliability, cost, risk, and schedule to accomplish the 50 MW project. This report would then be used by the participants as the basis for making the case to their respective governing boards on whether to proceed with actual development of the facility.

Transmission and Related Services

PWP is also working with SCPPA on a long term solution to get the power from the facility to a point where the City of Pasadena ("Pasadena") has transmission rights. Options being evaluated include delivering energy to Pasadena through the Imperial Irrigation District and/or LADWP transmission networks..

Additional Actions and Authority

Execution of the MOU only preserves Pasadena's option to participate in the geothermal feasibility and exploratory stages of the project and does not obligate PWP's participation beyond the initial development phase. The development team will also look into alternative structures of risk sharing with other parties which may result in another party bearing some of this drilling risk. Should such efforts prove successful, this could result in a situation where the actual exploratory drilling costs are significantly less.

Should PWP decide to cease participation in the project, PWP is only obligated pay its 2% share of the Project development costs incurred up to the time of its formal notice to SCPPA of its withdrawal. If, however, Pasadena decides to participate in the geothermal generation project, Pasadena would then reimburse itself in an amount equal to that spent on development through the SCPPA bond financing. PWP will approach City Council at that time to seek authorization to participate in the geothermal project.

FISCAL IMPACT:

Because the Due Diligence process as required in the MOU and the proposed investigation into risk sharing alternatives must be completed prior to any exploratory drilling taking place, actual costs incurred in FY 2010 are expected to be minimal. The majority of the costs under the MOU will be recommended as part of the FY 2011 Operating Budget. PWP's participation under the Phase 1 for cost of the feasibility study, exploration and other related expenses is about $216,000 under the Imperial Valley Geothermal Project. The initial cost will be charged to Power Fund account 1702- 401-841600 Work in Progress – Imperial Valley Geothermal Project. Should PWP decide to cease participation in the project, PWP's 2% share of the Project development costs incurred at the time of its formal notice to SCPPA of its withdrawal will be charged to PWP's Renewable Energy budget 8291-401-841910-0555. Under Phase 2 of the plan PWP's obligation will be up to about $504,000. The maximum exposure that Pasadena expects to be subject to by participating under this MOU is $720,000 if both phases of the exploratory drilling are undertaken by the participants.

Respectfully submitted,

for MICHAEL J. BECK
City Manager

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