



**REQUEST FOR QUALIFICATION  
FOR A  
COMBINED HEAT AND POWER GENERATION SYSTEM  
POWER PURCHASE AGREEMENT**

**RFP Issued: December 6, 2013**

**Pre-Proposal Meeting Date: December 18, 2013**

**On-Site Building Inspections/Reviews Following Pre- Proposal Meeting**

**Vendor Questions Due: December 27, 2013**

**Proposals Due: January 10, 2014, 4:00pm PST**

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## **1.0 PROJECT INFORMATION**

### **1.1 INTRODUCTION**

The Aquarium of the Pacific (“Aquarium”), a 501 (c)(3) nonprofit dedicated to providing entertaining, educational, award-winning exhibits and programs on the Pacific Ocean and the lives of its people, is soliciting a request for qualification (“RFQ”) for a power purchase agreement to provide on-site power generation through a combined heat and power (CHP) infrastructure that is more fully described in the following sections of this document.

The RFQ seeks qualified developers or Proposers to submit proposals to enter into a power purchase agreement (“PPA”) for the sale of electricity to the Aquarium of the Pacific. The Aquarium intends to award this Contract based on a negotiated price per kilowatt-hour(kwh). The first stage will consist of the submittal of qualifications package as prescribed by Section 3.0 SUBMISSION REQUIREMENTS. The submittals will be evaluated in accordance with the criteria described in Section 2.4 EVALUATION CRITERIA. Based on this evaluation, the highest ranking Proposers may be asked to participate in an interview. After the interview, the most qualified Proposer will be asked to submit a final proposal for a negotiated price for the power purchase agreement.

Proposals will be evaluated based on a number of criteria, including technical, management and cost.

Proposals must be received by the Aquarium no later than January 10, 2014 at 4:00 p.m. PDT.

### **1.2 PROJECT DESCRIPTION**

In order to reduce the Aquarium of the Pacific’s annual electricity costs and to reduce environmentally unsafe carbon emissions, the Board of the Aquarium of the Pacific has determined to implement an on-site combined heat and power (CHP) system.

The PPA will require the successful Proposer to construct, own, operate, and maintain an on-site Combined Heat and Power (CHP) system, to be installed on the above-referenced building, at the site identified on the drawings found in Appendix E, for the purpose of generating electricity to be sold to the Aquarium at a fixed annual per kilowatt hour (kWh) rate for a term of ten (10) years (hereafter referred to as the “Project”).

The Aquarium has conducted a preliminary engineering analysis and estimated that the minimum power usage is 800kw. The preferred size of the on-site combined heat and power (CHP) system should be a minimum of 600kw and maximum of 900kw.

### **1.3    SCOPE OF WORK**

The proposed Combined Heat and Power (CHP) installation would consist of a minimum of 600kw of onsite power generation. Additionally, the project scope would include supplying and maintaining a minimum of a 70 ton absorption chiller fired by the High Grade waste heat provided from the power generation. The low grade heat from the power generation would be used to preheat the boiler return water to the existing condensing boilers up to 140F.

The installation of the new CHP system would be located at the current site of the existing cogeneration equipment consisting of two (2) 650kW Deutz natural gas reciprocating engines, two (2) 80 ton Thermax absorption chillers, cooling towers, and associated equipment. The new system would be interconnected to the facility 480v grid at the same location the engines interconnected and will reutilize the existing net generation meters and grid protection equipment. It is unknown whether tele-metering equipment for the existing equipment is present, but will probably be required for the new system installation if the total distributed generation connected to the meter is greater than 1MW per SCE.

The new absorption chiller can be located in the existing boiler room where a 400 ton absorption chiller was originally located or next to the installation of the new system. New heat lines will be run from the proposed system to the boiler room for both high grade and low grade heat. Existing chilled water lines for the absorption chiller as well as condenser water lines will be reused for the new 70+ ton chiller. The new chiller will utilize existing cooling tower capacity for the current electric chillers. The low grade heat will be connected to the new boiler return water lines.

The proposed system installation shall be able to provide a minimum of roughly 70 tons of chilling in year round.

Proposers should note that final project design and engineering is not provided herein, and will be the responsibility of the successful Proposer. Various system types will be considered by the Aquarium. The scope of this RFQ requires Proposers to include all work necessary to design, install, and maintain complete systems including but not limited to: total project financing, design services, permits, materials, labor, equipment, utility interconnection and commissioning for the proposed system.

The successful Proposer will provide all development, engineering, design, permitting, labor, materials, construction, installation, operation, maintenance, and insurance to achieve a fully operational and functional CHP system ("System") and guaranteed energy performance savings at no capital cost to the Aquarium. The Proposer will sell, and the Aquarium will buy, all of the electricity produced by the system at a price to be negotiated during the selection process.

The selected Proposer will retain ownership of the system throughout the duration of the Power Purchase Agreement (PPA), and the agreement will include a buyout option at the end of the term.

Should the Aquarium choose to not purchase the system at the end of the term, the Proposer shall remove the system and return the site to its pre-existing condition (with the exception of replacing the Cogen system), or if improved during the Term, to the condition when such improvement was made, normal wear and tear accepted, at the Proposers sole expense.

The Aquarium of the Pacific assumes that the Proposers will take advantage of all applicable incentives such as performance based incentives, rebates, tax incentives, governmental and non-governmental cost offsetting programs, SRECs, and any other environmental attributes available to reduce the installation and operational costs of the System, and the cost of the electricity to be purchased by the Aquarium of the Pacific.

All Proposers must provide estimates of avoided CO2 Emissions associated with their systems to assist the Aquarium in evaluation of additional environmental benefits beyond cost savings.

All Proposers must provide supporting documentation that the specified system will be compliant with the emissions requirements set by the AQMD over the life of the contract

#### **1.4 Proposed System Design**

Proposers should include a listing of vendors, materials, components and manufacturers for evaluation by the Aquarium. The Aquarium will consider the Proposer's technical approach, proposed design, team qualifications, experience, and price in the decision making process. This includes responsiveness and understanding of the scope of work / services and site conditions, including but not limited to existing conditions and capability of the Aquarium of the Pacific's power systems and any upgrades that may be necessary, utility interconnection, metering and power quality reliability and other existing conditions.

The Aquarium requires that Arrow Electric be the subcontractor for all electrical related work. Please contact Mike Herndon or Dirk Hibler at (714) 632-9890.

The Aquarium will be purchasing natural gas for the CHP system from the Long Beach Gas & Oil at a pre-determined price.

#### **1.6 Project Schedule and Minimum Disruption**

Consideration for having systems installed quickly, without disruption to the facility will be evaluated positively. Also, the Aquarium of the Pacific will consider completed installation dates in the evaluation. The proposed system must be fully operational no later than May 1, 2015.

#### **1.7 Contract Term**

The desired term of the Power Purchase Agreement awarded pursuant to this RFQ is ten (10) years. Proposers may also submit a PPA for a 15 year term in addition to submitting for a 10 year option. The term shall commence on the date of the commercial operation of the CHP system that is installed pursuant to this RFP (the "Power Purchase Commencement Date"). The Agreement will terminate ten or

15 years from the Power Purchase Commencement Date. Commercial operation of a system can only commence after all inspections, including inspections by the local utility and the building department officials have been completed and the system is deemed to have met all inspection requirements and operational requirements.

### **1.8 Cost of Power Purchase Agreement**

Each Proposer shall submit an aggregate, annual cost per kWh price for the sale of electricity to the Aquarium of the Pacific on a per kilowatt hour (“kWh”) basis for the facility (per system size identified above).

Proposers are required to submit PPA quotations including all costs required and note all assumptions. These costs must include any insurance and other fees necessary for the project. Please see Appendix B for COST PROPOSAL FORM for the minimum cost information required. Proposers are encouraged to show greater costing details.

### **1.9 Proof of Ability to Secure Financing for this Project**

Proposer should list previously completed projects similar or larger in scale than this project that were financed by the proposer. Letters from lending institutions that have committed to financing this project will be evaluated positively. Additional references should be provided to show ability to deliver requested services.

### **1.10 Qualifications & Experience**

The Aquarium of the Pacific will consider the Proposer’s history, financial strength, expertise, experience and reputation, with particular emphasis on the quality and depth of the management team, to determine whether the Proposer is capable of providing the scope of services required for the completion of the project. The Aquarium of the Pacific considers the financial strength of the Proposer as an important evaluation factor. If a Proposer desires to strengthen its proposal in this area, it may wish to consider obtaining a financial Guarantor.

The team will consider the Proposer’s knowledge and experience of California law and regulations for permitting, financial incentives, and construction/installation of energy generation projects. The Project Team will consider the Proposer’s experience in design/installation and successful collaboration with subcontractors in completing similar/larger CHP projects. The successful Proposer shall have a documented track record of successfully designing, constructing, financing, operating and maintaining commercial CHP installations.

### **1.11 Financial Benefit to Aquarium of the Pacific**

The Aquarium of the Pacific will evaluate the cost savings produced from the PPA. It is the intention of the Aquarium to award the contract to the respondent upon whose response is the most advantageous to the Aquarium, price and other factors considered as the Aquarium will be used to determine total

benefit, in its sole discretion; and who will provide the highest quality service at fair and competitive prices. The Aquarium of the Pacific may execute a power purchase agreement for a term of ten (10) or fifteen (15) years only if the entire price of the contract results in a savings to Aquarium in energy costs over the term of the contract.

## 2.0 SELECTION PROCESS

The following section of the RFQ outlines and describes the major events of the Selection Process and specifies general requirements.

### 2.1 SCHEDULE OF KEY EVENTS

The Aquarium reserves the right to change the dates shown below upon email notification.

No.	Event	Date
1.	Issue RFQ	December 10, 2013
2.	Pre-proposal conference	December 18, 2013
3.	Deadline for submission of questions	December 27, 2013
4.	Deadline for submission of RFQ	January 10, 2013
5.	Identify short-listed finalist(s)	January 15, 2014
6.	Interview of short-listed finalist(s)	January 20-21, 2014
7.	AOP Board conceptual approval	January 23, 2014
8.	Negotiate Final Submission Value	January 27-February 21, 2014
9.	Notice of award to selected PPA contractor	February 28, 2014
10.	Sign contract; Submit bonds and insurance	March 7, 2014
11.	Begin project	March 10, 2014

### 2.2 EVALUATION PROCESS

1. **Issue RFQ** – This RFQ is issued by the Aquarium of the Pacific to Power Purchase Agreement providers and CHP Vendors.
2. **Questions/Clarifications** – Between issuing the RFQ and submission of Proposals, Proposers are encouraged to contact the Aquarium with questions about the scope of the project. Please use the Request for Information (RFI) form in Appendix A to submit questions. Please consult with the Aquarium for clarification before providing an estimate. The Aquarium will not be held responsible for errors after submission of the Proposal. For questions concerning the project please email:

Amy Kishaba: [AKishaba@lbaop.org](mailto:AKishaba@lbaop.org)

All RFI's received will be compiled, answered via email, and posted on our web. Answers to questions will be submitted to all those expressing interest. Request for information or clarification will not be answered if received after December 27, 2013.

3. **RFQ Addendum** – Any interpretation, correction, or change to the RFQ will be made by an Addendum. The Addendum will be sent to all Proposers on the Aquarium's list and posted on our web. Proposers will be responsible for meeting the requirements of all addenda and will be required to acknowledge receipt of all addenda. To receive all addenda and other information pertaining to this RFQ, a firm must contact the person above and must designate an email address for communication.
4. **Pre-Proposal Conference** – A pre-proposal conference and tour of the project site will be held on December 18, 2013 at 8:00 a.m. Proposers wishing to submit are encouraged to have a representative attend this conference. Items discussed at the conference may become part of the contract. Attendance at this conference does not require submission of a proposal. Location of the pre-proposal conference is at the project site and attendees should meet at the entrance of the Aquarium of the Pacific, 100 Aquarium Way, Long Beach, California 90802.
5. **Submission of Proposal** – Proposals must be sent via email as **only one file** to Amy Kishaba at [AKishaba@lbaop.org](mailto:AKishaba@lbaop.org) by January 10, 2014 at 4:00 p.m. PST. Proposals received after the deadline will be deemed non-responsive, and will be returned. Only electronic materials will be accepted. If the files are too large to send by email please use online file sharing websites such as Dropbox.
6. **Identify Short-Listed Finalists** – Aquarium staff will review each proposal submitted in response to this RFQ for completeness, signatures, and all data required. A Selection Committee will evaluate proposals against the evaluation criteria for the degree to which each proposal meets the criteria. Points will be allocated according to a specified guideline outlined in Section 2.4 EVALUATION CRITERIA, by each committee member. Member's point totals will be translated to a numeric ranking and will be used to determine a short-list of finalists.
7. **Interview of Short-Listed Finalists** – The short-listed finalists will be interviewed and should be prepared to deliver a presentation, discuss, and substantiate any of the areas of the RFQ it has submitted, its own qualifications for the services required, and any other area of interest relative to the Proposal. Proposers will be required to break down the items of the cost proposal for all costs to show the scope of work that can be delivered for the proposed price/kwh and a project schedule to identify key milestones and completion dates for construction. Proposers who are interviewed must have their key representative in attendance specifically for this Project. After the interview the Selection Committee will evaluate the finalists and choose the selected Proposer. Finalists should be prepared to bring hard-copy of qualifications, budget, and schedule details to the interview, but other hard copy materials are strongly discouraged.

8. **Notice of Award** – The Selection Committee will notify the selected Proposer of the final decision.
9. **Contract** – The Aquarium and the selected Proposer will sign the Contract after notice of award. If negotiations are unsuccessful the Selection Committee will make the decision to select a different Proposer or reissue the RFQ.

### 2.3 MINIMUM QUALIFICATIONS

All Proposers must meet or exceed the following qualification requirements:

- Certified to work in the State of California
- Appropriate technical and professional degrees and registrations
- Appropriate business and contracting licenses in good standing
- Insurance requirements as prescribed in Section 4.3 INSURANCE REQUIREMENTS
- Experience in the construction of at least one combined heat and power (CHP) project.

### 2.4 EVALUATION CRITERIA

The Selection Committee will evaluate Proposers submittals based on a set of evaluation criteria. Responses to the criteria will be rated according to a 1000 point system and short-listed finalists will be contacted for interviews. The evaluation criteria to be used by the Selection Committee for the proposal shortlist and the corresponding point values for each criterion are as follows:

(1) Cost Proposal .....	415 points
(2) Experience and Qualifications .....	275 points
(3) Schedule .....	100 points
(4) Work Plan and Approach .....	75 points
(5) Quality of Proposal .....	50 points
(6) Safety Record.....	50 points
(7) Company Commitment to Sustainability .....	25 points
(8) Local Company.....	10 points

TOTAL 1000 points

The evaluation criteria are briefly explained below. As points are assigned for responses to each category, Proposers are expected to address each issue completely. Responses are specific to the project team only.

#### 1. Cost Proposal

- Cost of electricity per kwh to be purchased by the Aquarium
- Underlying assumptions of total development, operational, and maintenance clearly identified
- Length of Contract Term proposed

**2. Experience and Qualifications**

- Similar projects completed and proven track record
- Financial history and backing for company and selected technology.
- Resumes of all team members
- References for similar projects
- Success of completing projects on time and within budget.

**3. Work Plan and Approach**

- Provide plan for implementing proposed system by proposed operational date, including all approvals, permitting, construction schedule, commissioning, and other items needed for completion.
- Staffing and management plan
- Current workload and capacity/commitment to the scope of services

**4. Quality of Proposal**

- Recognition of overall concepts and objectives, completeness

**5. Safety Record**

- Include Safety Plan

**6. Commitment to Sustainability**

- Discuss your company's internal sustainability policies and programs

**7. Local Company Location**

- Note which single category applies:
  - Location of office in LA/OC region (for a max. of 2 points)
  - Location of headquarter is in LA/OC region (for a max. of 5points)
  - Location of office is in Long Beach (for a max. of 7 points)
  - Location of headquarter is in Long Beach (for a max. of 10 points)

### 3.0 SUBMISSION REQUIREMENTS

Before submission, Proposers shall review and become familiar with this RFQ, and site of the proposed work. Submission of a Proposal shall indicate that the team has complied with these requirements.

#### 3.1 NUMBER OF RESPONSES/COPIES

Proposals must be sent via email as **one file** to the Aquarium no later than January 10, 2014 at 4:00 PST. Proposals received after this date and time will not be accepted. If the files are too large to send by email please use an online file sharing website such as Dropbox.

#### 3.2 REQUIRED RESPONSE ITEMS

Below is a summary of requested information. Proposals submitted without this information will be evaluated accordingly.

1. **Company Information:** Include company description, ownership, physical address, mailing address, other company locations, telephone and facsimile number, and e-mail address of company's primary contact.
2. **Letter of Interest:** Limit to two pages or less. The letter of interest may contain any information not shown or asked for elsewhere in the submittal. Receipt of all Addenda to this RFQ should be acknowledged by emailing a signed copy of each Addendum to the response or in the letter of interest.
3. **Project Team:** Describe the proposed project team, including a list of subcontractors, and outside consultants if any.
  - a. Provide brief descriptions of the history and experience of each firm in the project team.
  - b. The Aquarium reserves the right to reject any subcontractor prior to the start of their work.
4. **Key Personnel:** Detail experience and qualifications of **only** the key personnel who will be committed to work on the Project. Such personnel should include, but are not limited to the Project Manager, Financier, Technical Lead, etc.
  - a. Describe relevant experience of each personnel on previous projects and the roles played by each person
  - b. Provides references for each personnel
  - c. Specify percentage of time to be committed to this project
  - d. Note where key personnel are located (e.g. office in what geographic location)
  - e. Show organizational chart for this project and where each key personnel are positioned.

5. **Experience in completing similar projects with financing:** For each project, provide the scope of work, duration of PPA term, the construction schedule, cost per kwh of electricity, and the names of the individuals who participated as members of the project team.
6. **Cost proposal and schedule:** Submit a cost proposal for all elements included in the scope of work using the COST PROPOSAL FORM found in Appendix B. The cost proposal shall be accompanied with sufficient detail to clearly identify the following:
  - a. Breakdown and definitions of all costs included in the total price per kwh to be purchased by the Aquarium.

Note: All permit costs will be paid by the Proposer

7. **Project schedule:** Show what estimating and scheduling systems and management techniques your firm employed to achieve success in completing projects on time and within budget.
  - a. For the most recent projects, demonstrate experience in meeting completion date schedules by providing the original construction duration and final construction duration. Provide appropriate explanation for any variance.

Note: The selected Proposer must complete their work by the specified time.

8. **Safety Record:** Proposer shall provide the companies workers' compensation records for the past five years. This shall be submitted by your insurance carrier. Provide a description of the firm's safety program. The safety program may become part of the contract document if your firm is selected. Comprehensive safety program must be included.
9. **Financial Capability:** Proposers may be asked to provide evidence of financial bankability in the form of balance sheet information or letters for financial institutions to attest to the ability to finance the proposed project.

The Aquarium will review each proposal submitted in response to this RFQ for completeness, signatures, and all data required. The Aquarium will then evaluate proposals against the evaluation criteria for the degree to which each proposal meets the criteria. Application materials will not be returned. The Selection Committee may reject all proposals and stop the selection process at any time.

## 4.0 CONTRACT FORMS AND REQUIREMENTS

### 4.1 CONTRACT BETWEEN AQUARIUM AND PROPOSER

The Power Purchase Agreement is to be provided as identified in this RFQ. Each Proposer shall submit a sample of copy of the contract for purchasing power that they intend to use for this project.

If the Aquarium and selected Proposer have not completed and executed the contract within a reasonable period of time, the Aquarium reserves the right to terminate contract negotiations and select another Proposer.

### 4.2 SUBCONTRACTING

All Proposers' subcontractors are subject to the same contractual conditions as that of the primary Proposers. If the prime proposer uses a subcontractor for any or all of the work required, the following conditions shall apply under the listed circumstances:

1. The proposer planning to subcontract all or a portion of the work shall identify the proposed subcontractors.
2. Subcontracting shall be at the Proposer's expense.
3. Aquarium retains the right to check subcontractor's background and will make determination to approve or reject the use of submitted subcontractors.
4. All labor must be paid at prevailing wage rates.

### 4.3 INSURANCE REQUIREMENTS

The selected Proposer (and their subcontractors) shall procure and maintain for the duration of the contract insurance against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the work hereunder and the results of that work by the Proposer, his agents, representatives, employees or subcontractors. Insurance requirements must be maintained for two years after the contract is completed to ensure that problems are corrected during the warranty period. Coverage shall apply both on and away from the Project Site.

#### **Automobile Liability**

Commercial Business Auto Policy covering all owned, hired, and non-owned automobiles, trucks and trailers with coverage limits not less than \$1,000,000 Combined Single Limit each accident for Bodily Injury and Property Damage.

#### **Workers' Compensation and Employer's Liability**

	<u>Limits</u>
Workers' Compensation	Statutory Limit
Bodily Injury by Accident, each Accident	\$1,000,000

Bodily Injury by Disease, each employee	\$1,000,000
Bodily Injury by Disease, policy limit	\$1,000,000

**Commercial General Liability/Umbrella Liability**

	<u>Limits</u>
General Aggregate	\$4,000,000
Products/Completed Operations Aggregate	\$4,000,000
Personal/Advertising Injury Aggregate	\$2,000,000
Each Occurrence Limit	\$2,000,000

**Waivers and Additional Insured Endorsements Required**

Workers’ Compensation, General Liability, Automobile Liability, Umbrella or Excess Liability and Property insurers shall provide Waivers of Subrogation and Additional Insured Endorsement in favor of the Aquarium. The additional insured endorsement will state that coverage is primary and non-contributory.

**4.4 ISO 14001:2004 REQUIREMENTS**

The selected Proposer shall be required to comply with the Aquarium’s ISO 14001:2004 Environmental Sustainability Management System requirements. The proposer will receive a briefing packet outlining the Aquarium’s environmental sustainability policy and its procedures. In addition, the Proposer shall provide a Method Statement—a written statement prepared by the Proposer which outlines the work to be undertaken and the method(s) for minimizing and managing environmental impacts.

# APPENDIX A

**REQUEST FOR INFORMATION NO. 001**

**To:** Amy Kishaba  
Aquarium of the Pacific  
320 Golden Shore, Suite 150  
  
Long Beach, CA 90802

**Job No:** Aquarium of the Pacific  
Combined Heat and Power System  
Power Purchase Agreement  
.100 Aquarium Way, Long Beach

**From:**

**Email:**  
**Phone:**  
**Fax :**

**Subject:**

**Reference:**

**Reply Requested By:**

---

**INFORMATION REQUESTED:**

**Date:**

\_\_\_\_\_

\_\_\_\_\_

Attachments:  YES  NO

**Cost:**

**Schedule Impact:**

**By:**

---

**RESPONSE:**

**Date:**

## **APPENDIX B**

Aquarium of the Pacific  
Combined Heat & Power: Power Purchase Agreement

***COST PROPOSAL FORM***

Proposer's Name: \_\_\_\_\_

ITEM		COST
I	Base Electricity Rate (per kwh)	\$
II	Core Fuel Price (per mmBtu)	\$
III	Fuel Transport & delivery (per mmBtu)	\$
IV	Insurance	\$
V	O&M Costs	\$
VI	Rebates & Incentives	\$
VII	Warranty	\$
VIII	Escalator	%
	Contingency (min. 5%)	\$
	Overhead and Fees (%)	\$
	<b>TOTAL COST PER KWH</b>	<b>\$</b>

Note: The above table is the minimum cost information required. Proposers are encouraged to provide additional costing detail within each section.

# APPENDIX C

Aquarium of the Pacific  
Combined Heat & Power: Power Purchase Agreement

## Checklist: Facility Energy Data Collection Sheet

### ELECTRICAL REQUIREMENTS

- Average demand during operating hours\* 1250 kW (kilowatt)
- Minimum demand during operating hours 800-900 kW
- Peak demand during operating hours 2000 kW
- Annual electricity consumption 11,309,310 kWh (kilowatt-hour)

### THERMAL REQUIREMENTS

- Form of thermal energy use\* Y hot water Y cooling \_\_\_\_\_ other (specify)
- What is the primary application for thermal energy at the plant?\* Cooling
- Maximum / Peak demand during operating hours\* 800 tons
- Minimum / Peak demand during operating hours\* 80 tons

### OPERATING CONDITIONS

- Nominal operating hours per year\* 24/7 365 hours per year

### ENERGY RATES

- Average 2013 electric rate\* 0.1173 cents/kWh
- Tariff rate (electric)\* TOU-8-S cents/kWh

# APPENDIX D

Aquarium of the Pacific  
Combined Heat & Power: Power Purchase Agreement

***Site Plan (Existing CoGen Area)***



# APPENDIX E

Aquarium of the Pacific  
Combined Heat & Power: Power Purchase Agreement

***Existing Conditions Summary***

- **Site Characteristics**
  - Built in 1998
  - 5 Acre Site
  - Building Size: 160,000 SF (current) + 26,000 SF (future expansion)
  
- **Current Energy Consumption<sup>1</sup>**
  - Electricity (SCE): 10,582,612 kwh/year
  - Cogen: 613,748 kwh/yr (only run 11am to 6:30pm, Jun through Sept)
  - Gas (LBGO): 61,873 therms/yr (main)
  - Gas (LBGO): 87,649 therms/yr (cogen)
  - Electric Rate (SCE) = \$0.11/kwh
  - Gas Rate (LBGO) = \$0.69/therm (main)
  - Gas Rate (LBGO) = \$0.44/therm (cogen)
  
- **Previous Cogeneration System**
  - Previous system configuration includes two 1600 horsepower natural gas fired reciprocating engines that ran from 11am until 6:30pm during the months of June through September to offset peak electricity charges.
  - During peak operations, Cogen offset approximately 14% of the grid supplied electricity consumption.
  
- **Current Renewable Energy Source**
  - There are currently two solar photovoltaic arrays installed on-site:
  - Watershed Classroom = 5kw
  - Molina Animal Care Center = 40kw

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<sup>1</sup> Based on 2011 and 2012 data provided by AOP staff.

# APPENDIX F

## Aquarium of the Pacific Combined Heat & Power: Power Purchase Agreement

Professor Jack Brouwer  
National Fuel Cell Research Center  
University of California, Irvine  
Irvine, California 92697-3550  
(949) 824-1999 x11-221  
[jb@nfcrc.uci.edu](mailto:jb@nfcrc.uci.edu)



24 September 2012

Barbara Long  
Aquarium of the Pacific  
VP, Government Relations and Special Projects  
320 Golden Shore, Ste. 150  
Long Beach, CA 90802  
(562) 951-1636

Dear Barbara:

The Aquarium of the Pacific asked the National Fuel Cell Research Center (NFCRC) at UC Irvine to review a proposed distributed energy plan that was being considered by the Aquarium. The purpose of this letter is for the NFCRC to report the findings of its review of the distributed energy plan that is being proposed to the Aquarium of the Pacific by GoGreenside Consulting.

Since it was founded in 1998 by the US Department of Energy, the NFCRC has developed a broad portfolio of research expertise and analysis capabilities that involve fuel cell technologies, the integration of those technologies into distributed energy systems that include solar power and smart grid technologies, and the deployment of those systems into the built environment. Throughout this process the NFCRC has worked directly with product providers in the fuel cell, solar, and circuit areas, and has been engaged in deployment projects that utilize new financing mechanisms including power purchase agreements.

Over the past two months, the NFCRC has interacted with GoGreenside Consulting and their team to obtain the proposed project information and technical background needed to appropriately assess the viability of the proposed distributed energy project at the Aquarium of the Pacific. In addition to several phone conversations in which GoGreenside and their partners answered questions from the NFCRC, Dr. Jack Brouwer of the NFCRC was able to meet personally with Mr. Derek Hildreth of UTC Power at a technical conference in San Diego. After review of the proposal, phone call discussions and personal interviews the NFCRC is pleased to report the following findings:

The technical details of the combined cooling, heating and power aspects of the Aquarium of the Pacific project were reviewed from steady state and dynamic analysis perspectives. The integration and use of both electrical and thermal product were evaluated on the basis of the phone conversations, personal interviews and upon the basis of the project documents provided to NFCRC. In all of the discussions and

interviews NFCRC personnel found the GoGreenside team to be completely forthcoming and willing to discuss all technical details of the project.

NFCRC personnel evaluated the technical capabilities of the project to provide the electrical power on-site as well as dynamically recover the heating and cooling proposed as a function of time-of-day and season. The magnitude of power provision and the expected heating and cooling recovery that the project is expected to provide is deemed reasonable and feasible.

One concern that was raised was the lack of information provided regarding the selection process for the fuel cell and solar companies and technologies selected. Only brief (and unsubstantiated) justification statements were provided in the letter entitled "Process of Selection of Clean Energy Systems for The Aquarium of the Pacific" and in the presentation entitled "Clean Energy Systems Procurement," but, no technical analysis details were provided for the potential use of other products in the proposed solution. This concern was thoroughly discussed and analyzed as a result of feedback from the GoGreenside team to the NFCRC. Details regarding the fuel cell company selection process that included combined heating and power capabilities and financial viability were revealed that addressed all the concerns of the NFCRC regarding the fuel cell selection process. In addition, the details of the selection process for a Tier 1 solar panel provider were provided to the satisfaction of the NFCRC.

The NFCRC recommends that the GoGreenside team should immediately: (1) formally submit a Self Generation Incentive Program (SGIP) application, (2) check with the local utility and Aquarium technical personnel regarding the interconnection options for the PV system that will be installed on the parking structure (i.e., virtual utility option or trenching and wire installation requirement), (3) determine whether or not the fuel cell stack replacement cost is included in PPA, and (4) determine whether Southern California Edison (SCE) costs are accounted for properly in the PPA calculations.

If the above points can be satisfactorily accomplished it is the opinion of the NFCRC is that the technical, environmental, and economic factors support the case for proceeding with the project. We are pleased to endorse the project as proposed by GoGreenside and its partners.

If desired, we would be pleased to set up an appointment to discuss further our findings.

Sincerely,



Dr. Jack Brouwer  
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National Fuel Cell Research Center  
University of California, Irvine



Dr. Shane Stephens-Romero  
Manager, Research Development & External Relations  
National Fuel Cell Research Center  
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