



# **Flowchart And Required Contracts for Interconnection And Operation of Project 184**

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## **INTRODUCTION: TWO CATEGORIES OF CONTRACTS/AGREEMENTS**

There basically two categories of agreements that are necessary in order to sell Project 184 electricity. The first category is the contracts and agreements necessary to get Project 184 physically connected to the grid. The second is the collection of contracts and agreements that are necessary to sell Project 184 electricity. These two categories can be processed simultaneously, but you will have to have everything completed on the interconnection side before the selling/marketing side can start functioning.

This all looks rather daunting, but basically you contact the parties involved and they put you in their interconnection queue and establish a client relations person who shepherds you through the process.

## **THE PARTIES**

Here's who you have to deal with. I've included the web page and contact information for each party.

I've also included, under separate cover by party, the necessary forms and instructions for each party.

### **California ISO**

<http://www.caiso.com/docs/2002/06/11/2002061110300427214.html>.

Client Relations at (916) 608-7059 will assign you a person to guide you through their interconnection process.

### **PG&E**

<http://www.pge.com/gen/>

gen@pge.com is the email address, phone number for generator

Interconnection hotline is 415.972-5676.

### **FERC**

[http://www.ferc.gov/Electric/gen\\_inter.htm](http://www.ferc.gov/Electric/gen_inter.htm) for generator interconnection activities

<http://www.ferc.gov/Electric/pwrmt/pwrmt.htm> for power marketer information

[iris.curtis@ferc.gov](mailto:iris.curtis@ferc.gov) is the contact at FERC.

### **APX**

[www.apx.com](http://www.apx.com)

Cris Gallegos at (408) 517-2154 is the person that handles new

generators: [cgallegos@apx.com](mailto:cgallegos@apx.com)

## 1) GETTING CONNECTED

Counterparties – California Independent System Operator (ISO) and Pacific Gas and Electric Company

Generators who interconnect with PG&E's electric system at transmission-level voltage (60 kv or more) must apply for interconnection under the PG&E's Transmission Owner Tariff (TO). As mandated by a recent FERC ruling, transmission-level applications are no longer sent directly to Pacific Gas and Electric Company. All new applications must be submitted to the California ISO. The CAISO, in conjunction with PG&E, will then determine whether the application is complete. See attached New Facility Interconnection Process (Attachment 1).

### 1.1) ISO Interconnect Agreements filed with ISO (ISO):

|           |    |      |
|-----------|----|------|
| Reviewed: | by | date |
| Signed: : | by | date |

|                    |              |      |
|--------------------|--------------|------|
| Good Faith Deposit | Check Number |      |
| Reviewed:          | by           | date |
| Signed: :          | by           | date |

ISO stamps application (attached) and sends to PG&E, and posts proposed new facility information on ISO OASIS site. Note, I've check to the OASIS site and can't find any information for El Dorado Irrigation District or for Project 184.

The Transmission Owner Tariff establishes the terms, conditions and rates of wholesale entities interconnecting to the transmission system and procuring transmission service from the Independent System Operator. The [TO Tariff terms and conditions](#) and [TO Tariff rates](#) are Attachments 2 and 3.

[The CAISO Tariff](#) describes the latest application procedures for transmission generators. [Amendment 39 \(New Facilities Interconnection Procedures\)](#) is Attachment 4.

Generators (called NFOs) that wish to interconnect New Facilities to the ISO Controlled Grid shall submit, in accordance with the ISO Tariff, two copies of a Completed IA to the ISO. To facilitate processing, however, the generator is requested to submit three copies of the Completed IA to the ISO.

A Completed IA shall include the following:

- ISO Generator Interconnection Application Form
- Additional documentation requested in the ISO Generator Interconnection Application Form
- The NFO's Good Faith Deposit in the amount of \$10,000,



Most generators also need to execute a Standby Agreement, which ensures that Pacific Gas and Electric Company will reserve enough electric capacity to serve the customer during power outages. These are standard utility tariffs so there isn't much to argue about.

When all this is done, you should have all agreements for interconnection completed.

## 2) MARKETING/SELLING THE ELECTRICITY

Counterparties – California Independent System Operator (ISO), Federal Energy Regulatory Commission (FERC), Automated Power Exchange (APX), Meter Data Management Agent (MDMA) (maybe), Bank or other Letter of Credit, Scheduler (maybe), California Energy Commission (maybe), Purchaser of electricity (maybe).

### 2.1 Register as a Power Marketer (FERC):

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All new generators who intend to sell energy into the marketplace must have a Power Marketer's License issued by FERC. Applications may be obtained from the Federal Energy Regulatory Commission's (FERC) Web site:  
<http://www.ferc.fed.us>.

### 2.2. Sign APX Agreements (APX):

<[https://www.apx.com/Ex\\_html/gscali.html](https://www.apx.com/Ex_html/gscali.html)>. These agreements serve as the foundation of the APX business relationship. All participants that use the APX Scheduling Coordination Services or the APX Markets are bound by the same agreements. The only exception is for those participants that are bound by Federal law.

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| Reviewed: | by | date |
| Signed: : | by | date |

#### 2.2.1 ATTEND THE APX MARKET WINDOW TRAINING WORKSHOP

The training workshop focuses on strategies and tactics to buy and sell electricity via the APX Market Window. It is designed for those people responsible for integrating the APX markets into the organization's operations and for those actually buying and selling in the APX markets. At least one individual from each company is required to attend, particularly the person

responsible for selling the power.

### 2.3 Execute the California ISO Participating Generator Agreements (ISO):

Reviewed: \_\_\_\_\_ by \_\_\_\_\_ date \_\_\_\_\_  
 Signed: : \_\_\_\_\_ by \_\_\_\_\_ date \_\_\_\_\_

Generators must execute some agreements with the Independent System Operator. All generators must execute the "Participating Generator Agreement," which can be found on the ISO web site:

<<http://www.caiso.com/clientserv/agreements>>

If you are directly connected to the ISO grid and the meter will be polled by the ISO, then you execute the "ISO Metered Entity, Metered Service Agreement." If you are not directly connected to the ISO grid and your meter is read by a Meter Data Management Agent, have your Scheduling Coordinator modify their "SC Meter Service Agreement" with the ISO to include you as one of their generators.

To become certified to provide power into the grid, the prospective Participating Generator must complete two contractual agreements, the PGA and the Meter Service Agreement for the ISO Metered Entities (MSA/ISO), install the requisite ISO certified revenue quality metering, establish or verify SCADA visibility with the ISO Energy Management System (EMS) system, and arrange to have the specific generation unit(s) scheduled with the ISO by a certified Scheduling Coordinator.

| Requirement   | Estimated Time to Complete  |
|---|---|
| <p>Execution of Contractual Agreements with the ISO</p> <ul style="list-style-type: none"> <li>• <a href="#">Participating Generator Request For Information Sheet</a></li> <li>• <a href="#">Meter Service Agreement Request For Information Sheet</a></li> <li>• <a href="#">PGA Schedule 1: Technical Characteristics of Participating Generator Units</a></li> <li>• <a href="#">Participating Generator Agreement</a></li> <li>• <a href="#">Meter Service Agreement for ISO Metered Entities</a></li> </ul> | <p>7-21 business days</p> <p><i>Please contact your Client Representative to initiate preparation of these two contracts.</i></p> |
| <p>ISO Metering Installation</p>  | <p>40 business days</p>   |

|  |   |
|--|---|
| <ul style="list-style-type: none"> <li>• <a href="#">Metering Guidelines</a></li> <li>• Installation of ISO Specification Metering by a certified installer</li> <li>• Certification of meters by an independent certification company</li> </ul>                | <p><i>An ISO Metering representative will be assigned to facilitate the timely installation and certification of ISO revenue metering. Connection to the ISO Energy Communication Network (ECN) is required to establish connectivity with the ISO Metering and Data Acquisition System (MDAS). ISO MDAS will poll each unit's meters each day.</i></p> |
| <p>ISO MDAS Connectivity</p>   | <p>20 business days</p> <p><i>ISO IT/Telecom and the respective PG IT personnel coordinate the interconnection of the Unit's ISO metering with the ECN (ISO intra-net) and ISO MDAS.</i></p>  |
| <p>Ancillary Services (A/S) Certification</p> <ul style="list-style-type: none"> <li>• <a href="#">A/S Certification Requisite Application Form</a></li> <li>• <a href="#">A/S Testing and Request form</a></li> <li>• <a href="#">Outage Request</a></li> </ul> | <p>Up to 30 business days</p> <p><i>Generators and Importers of A/S must first be certified by test to determine unit performance characteristics including P<sub>MAX</sub> and Ramp Rate.</i></p>  |

|  |   |
|--|---|
| <p>EMS Visibility – SCADA/Telemetry</p> <ul style="list-style-type: none"> <li>• Remote Intelligence Gateway (RIG) installation</li> <li>• <a href="#">Data Processing Gateway (DPG) installation</a></li> </ul> | <p>Up to 90 business days</p> <p><i>RIG installation is only applicable if a PG plans to participate in the AGC Regulation Market (Regulation Up and/or Regulation Down). ISO EMS directly controls AGC Units.</i></p> <p><i>DPG (telemetry) installation is required for any unit 10 MW of capacity or greater. SCADA visibility is also required for all units 1 MW or larger participating in the A/S markets (Spin, Non-Spin, or Replacement Reserves).</i></p> |
| <p><a href="#">Automated Dispatch System (ADS) Connectivity</a></p> <ul style="list-style-type: none"> <li>• Electronic Dispatch</li> </ul>  | <p>15 business days</p> <p><i>All ISO dispatch instructions are delivered electronically either via the SC or directly to the PG. ADS Connectivity is required for all dispatchable resources that are participating in the ISO's A/S or Real Time Energy Market.</i></p>   |

**2.4 Post Required Credit for APX (Bank or other):**

Reviewed: \_\_\_\_\_ by \_\_\_\_\_ date \_\_\_\_\_  
Signed: : \_\_\_\_\_ by \_\_\_\_\_ date \_\_\_\_\_

APX operates a cash market. All participants are required to post credit in the form of a monetary reserve facility or a letter of credit to cover their net exposure at all times. Net exposure is defined as APX's estimate of a participant's maximum net monetary exposure at any given time.

The amount of the monetary reserve facility or letter of credit is based in part on the nature of the participant's business. For a generator, this will be approximately the net exposure in the market between the start of sales into the APX markets and the first meter reading.

This can be done by either maintaining a cash balance in a monetary reserve account held by APX for the participant's benefit at Comerica Bank or by providing an irrevocable letter of credit in a form satisfactory to APX and through a bank meeting APX's requirements. The monetary reserve account can be established at Comerica Bank by APX. Balances in these accounts will earn interest for the Participant at a rate negotiated with Comerica Bank based on the balances maintained in the account.

The letter of credit must be either issued or confirmed by a bank with an A-minus or better (Standard & Poors or Moody's) long-term debt rating. The letter of credit must be payable at a location and in a manner that meets APX's requirements for short term liquidity.

Promptly after the close of each day, APX will produce a settlement statement for each participant. The settlement statement will reflect actual and estimated amounts owed to the generator for sales in the APX markets. Promptly after the end of each month, APX will send each participant a monthly invoice reflecting that participant's financial position for the prior month. Payments are made to generators on the 17th of each month.

**2.5 Arrange For Metering Services (ISO or MDMA):**

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| Signed: : | by | date |

The ISO requires that generators utilize a specific type of meter, which is found at the ISO Web site under "Meters":  
<<http://www.caiso.com/clienterv/metering/>>. This should be installed under the PG&E Special Facilities Agreement.

You will need to have your meter read by a Meter Data Management Agent (MDMA). The MDMA will regularly read your meter and transmit the data to the ISO for ISO Metered Entities. All generation meter data must be submitted to the CAISO on a daily basis. APX applies a monthly meter aggregation fee to those participants for whom generation meter data is submitted less than daily. There are three MDMA's currently approved;  
<[https://www.apx.com/Ex\\_html/meterList.html](https://www.apx.com/Ex_html/meterList.html)>.

Your new meter will require communications interface through the WENET (Western Energy Network) which has been built by MCI. Contact MCI at 510-497-2547 to arrange for this connection.

Once your new ISO-approved meter is installed, it must be certified by an approved ISO meter inspection company. Approved companies are listed on the <<http://www.caiso.com/clienterv/metering/>> ISO Web site under "Meters".

If you are directly connected to the ISO grid and the meter will be polled by the

ISO, then you execute the "ISO Metered Entity, Metered Service Agreement." After you begin delivering through your new meter, the ISO will regularly poll the meters of ISO Metered Entities or your MDMA will regularly poll the meters of non-ISO Metered Entities.

## **2.6 Sign Up As A Registered Renewable Supplier With The California Energy Commission If You Want To Be A "Green" Generator (CEC):**

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|-----------|----|------|
| Reviewed: | by | date |
| Signed: : | by | date |

If you are a green generator, you can sell into the APX Green Power Market. This can have some advantages – the price you're paid is about ½ cent higher. Check the <<http://www.energy.ca.gov/renewables/index.html>> California Energy Commission's renewables Web site for information and the forms you need to fill out. All green generators can become "Registered Renewable Suppliers" with the CEC. Some generators may also be eligible for incentive payments from the CEC's Renewable Resource Trust Fund.

## **2.7 Set Up Necessary Hardware, Software, And Communications For Managing Scheduling (EID/APX)**

All ordering is done via the APX Market Window, a software program that resides on the participant's personal computer. To run the APX Market Window, participants must use a compatible desktop computer system. See WECC Download Instructions for details.

<[http://www.apx.com/sRes\\_html/dnHelp1.html](http://www.apx.com/sRes_html/dnHelp1.html)>

Participants may add optional features to provide additional functionality. These options are outlined in the APX Terms and Conditions.

In addition, all participants must have an external communications interface. Connection may be accomplished by any of the following methods:

- A dial-up modem over an analog telephone circuit
- An Integrated Services Digital Network (ISDN) circuit
- A direct T-1 digital circuit
- A corporate network to Internet connection.

Note: you may want to have someone else other than EID do the scheduling for 184.

### **2.7.1 INSTALL THE APX MARKET WINDOW AND DEMONSTRATE ELECTRONIC CONNECTIVITY WITH APX**

After a participant has signed the Service Agreement and set up the required hardware, software, and communications, they can download the demo version of APX Market Window. Go to My APX, APX WECC Services, Client Page, to do so <[https://www.apx.com/sMy\\_html/cali.asp](https://www.apx.com/sMy_html/cali.asp)>.

## **2.7.2 COMPLETE THE APX REGISTRATION PROCESS**

Before a Generator can use the APX Market Window, they must register contacts, login accounts, and facilities with APX.

## **2.8 Sign Contracts With Purchaser of Electricity (EID/Purchaser)**

There are a lot of options for selling your electricity. You can:

- sell to the utilities – will need to participate in the utility RPS (Renewable Portfolio Standard) solicitations, which occur periodically. Price generally capped at 5.37 cents/kWh.
- sell to someone else under a contract (yearly or otherwise). APX has contacts that are looking for power.
- sell on the spot market – through the APX.
- Eventually you should be able to sell to yourself or your customers– but this will involve becoming a Energy service provider (ESP) – which is yet another series of contracts and arrangements.

## **3) ONGOING REQUIREMENTS**

In addition to the regular operation and maintenance and water scheduling there are several ongoing activities required when selling generation from 184.

### **3.1) Daily Generation Scheduling**

Someone will need to be giving the APX an hourly schedule of generation from 184 on a daily basis. There are several alternative ways or entities that can do this that we should talk about but it will have to be done.

### **3.2) FERC Filings**

As a power generator/marketer you will have to file several reports with FERC.

- Quarterly power transaction reports – listing all your sales
- Annual filing of Electric Power Marketers – annual summaries that list purchaser and volumes sold to each entity.

## **4) ATTACHMENTS**

I've attached, by counter party, the forms and contracts that will need to be signed with the ISO, APX, and PG&E.

