

## **Aggregated Distributed Generation Pilot Project (ADGPP) REQUIREMENTS**

### **Introduction**

The California Independent System Operator (ISO) has developed an Aggregated Distributed Generation Pilot Project (ADGPP). The ADGPP is intended to demonstrate the feasibility of allowing physically separated Generating Units with a rated capacity of less than 1 MW to be aggregated to Schedule Energy with the ISO and to participate in the ISO's Supplemental Energy market.

The ADGPP will allow Generating Units with a rated capacity of less than 1 MW to be aggregated above the 1 MW level, but less than 10 MW, to form an Aggregated Distributed Unit (ADU). No more than a total of 50 MW will be accepted for the ADGPP. To qualify for participation in the ADGPP, Generating Units must meet all the technical requirements discussed in this document. Generating Units participating in the ADGPP will be allowed to Schedule Energy with the ISO and to participate in the ISO Supplemental Energy market. However, such units will not be allowed to participate in the ISO's Ancillary Services markets. The ADGPP is intended only to accommodate Generating Units with a rated capacity less than 1 MW and is not intended to facilitate "portfolio bidding" from Generating Units with a rated capacity 1 MW or larger.

The ADGPP is also intended to improve the ISO's visibility of generating resources within the ISO Control Area by demonstrating the functionality of various basic-level operational data reporting processes, which may be proposed by the prospective participants. These operational data reporting processes should demonstrate the capability of delivering operational data for the ADU to the ISO in a near real time environment and be economical for small Generating Units. The uniqueness of the operational data reporting processes proposed will be one factor in selection of participants in the pilot project.

### **Key Dates**

March 8th	ADGPP Workshop
April	Meet with participants to discuss requirements
June – December	ADGPP period
November – December	Evaluate pilot project

## Key Definitions

The following definition is established for the ADGPP and is utilized in this document. Unless otherwise provided in this document, other terms used with initial capitalization herein have the meanings set forth in the Master Definitions Supplement, ISO Tariff Appendix A, or are recognized power system industry terms.

### Aggregated Distributed Unit (ADU)

Two or more Generating Units, each with a rated capacity of less than 1 MW, each of which may be at different physical locations, individually capable of producing Energy and operating in parallel with the electric grid in the ISO Control Area, which are aggregated for scheduling and settlement purposes and operated as if they were a single Generating Unit.

## Operational Requirements

- 1) The ADGPP period will run from June 1, 2002 through December 31, 2002 unless extended by the ISO. The ISO can terminate the ADGPP at any time after September 30, 2002 upon fifteen (15) days notice.
- 2) Except as set forth herein or in the *pro forma* ADGPP Participating Generator Agreement, Generating Units participating in the ADGPP are subject to the same provisions as apply to any individual Generating Unit participating in the ISO's markets or scheduling Energy in the ISO Control Area.
- 3) Each ADU must be approved by the ISO before participating in the ADGPP and must meet the following criteria:
  - a) the total rated capacity of the Generating Units in the ADU minus the monthly average Demand of any Load that the Generating Units are serving under a net metering arrangement must be more than 1 MW, but less than 10 MW,
  - b) each Generating Unit comprising the ADU must have a rated capacity of less than 1 MW,
  - c) each Generating Unit comprising the ADU may serve Load under a net metering arrangement, but 1) must have a rated capacity greater than the monthly average Demand of the Load it is serving and must be capable of producing net Generation into the electric grid on a typical and routine basis, absent any forced outages or maintenance activities which make the unit unavailable and 2) must, at a minimum, have bi-directional, interval revenue metering to differentiate a net Generation from net Load condition,
  - d) meter data from the individual Generating Units that reflects net Generation conditions must be in a form that can be combined to serve as the meter data for the ADU,
  - e) the individual Generating Units comprising the ADU must be located within the same Demand zone and must not exist on opposite sides of an operationally constrained transmission element (e.g., line or transformer) within the ISO Controlled Grid as determined by the ISO, and
  - f) the Settlement Quality Meter Data (SQMD) for the ADU must have the appropriate distribution loss factors applied to reflect Energy delivered to the point of delivery with the ISO Controlled Grid.

- 4) Each ADU will be assigned a unique Resource ID. The unique Resource ID will be used for all scheduling and meter data reporting associated with the ADU. The unique Resource ID will also be used in the ISO's internal system for monitoring and tracking near real time operational data associated with the ADU.
- 5) Each ADU must be represented by an ADGPP Participating Generator, an entity that serves as an aggregator of the Generating Units in the ADU, that will be contractually and financially responsible for all aspects of operation of the ADU during the term of the ADGPP.
- 6) The ADGPP Participating Generator must prepare and provide to the ISO an ADGPP Units List which shall identify the ADU by the assigned Resource ID and all Generating Units comprising the ADU. For each Generating Unit comprising the ADU, the ADGPP Participating Generator must include with the ADGPP Units List an electrical one-line diagram for each of the Generating Units, the Generating Unit's location and fuel, and a description of how the Generating Unit connects to the grid in the ISO Control Area.
- 7) Each ADU must be represented by an ISO certified Scheduling Coordinator (SC), which will be responsible for providing Energy Schedules and Supplemental Energy bids for the ADU through the ISO's scheduling system. The SC will also be responsible for submitting SQMD for the ADU to the ISO's revenue meter data acquisition and processing system (MDAS).
- 8) ISO Tariff metering requirements for SC Metered Entities apply to the ADU and the individual Generating Units comprising the ADU as described in further detail below.
- 9) An ADGPP Participating Generator must provide near real-time operational data, as described below, for each ADU using processes, protocols and formats acceptable to the ISO. The ADGPP Participating Generator must have the ability to provide near real-time operational data updates no less frequently than every 10 minutes, and will be requested to demonstrate the feasibility of providing operational data updates as often as every one minute.
- 10) Each Generating Unit comprising an ADU must have all necessary environmental permits and other permissions that allows it to operate interconnected with the grid freely on an as-scheduled and as-dispatched basis. The ADGPP Participating Generator will be required to certify to the ISO that all Generating Units in its ADU have such permits and permissions, and must provide the applicable permits and permissions to the ISO upon request. (The ISO notes that executed ADGPP PGAs and associated documentation are public documents. To reduce concerns that the ADGPP could promote operation of Generating Units in violation of their environmental permits and permissions, the ISO may forward these documents including environmental permits and permissions to the California Air Resources Board. In addition, the ISO may be required to provide these documents to the other entities in response to data requests and subpoenas.)
- 11) All available Energy from the Generating Units in the ADGPP Units List in excess of Energy consumed by any Load that the Generating Units are serving under a

net metering arrangement must be scheduled with the ISO through bilateral Energy transactions or bid into the ISO's Supplemental Energy market. For purposes of testing the capabilities and responsiveness of an ADU during the ADGPP, the Scheduling Coordinator will be required by the ISO, for limited periods of time, to have zero Energy Schedules on an ADU and bid the entire capability of the ADU into the ISO Supplemental Energy market at a \$0/MWh price. The ISO will monitor the response of the ADU during such events.

- 12) During the period of the ADGPP, the ISO shall have full audit rights of all near real-time operational data and revenue meter data. The ADGPP Participating Generator shall record and maintain operational data for each Generating Unit comprising an ADU on a periodicity no less frequent than that used for providing operational data updates for the ADU to the ISO. The ADGPP Participating Generator shall make such recorded individual Generating Unit operational data available to the ISO upon the ISO's request. The SC must maintain revenue meter data for each individual Generating Unit comprising an ADU, and shall make such revenue meter data available to the ISO upon the ISO's request.

### **Operational Data Requirements**

Each ADGPP Participating Generator will be responsible for installing equipment and communication services to provide near real-time operational data to the ISO for each ADU it represents. ADGPP Participating Generators are encouraged to offer alternative solutions to providing operational data to the ISO. The following are the minimum operational data reporting requirements for the ADGPP.

#### Communication Methods

Currently, the ISO can retrieve operational data from field devices using a Data Processing Gateway (DPG). DPG devices typically communicate to the ISO systems utilizing the Internet and the DNP3 protocol standard. DPGs conform to the security and communications requirements established by the ISO's Technical Standard for *Monitoring and Communications Requirements for Generating Units Providing Only Energy and Supplemental Energy*. The DPG is an acceptable and proven method of transmitting operational data to the ISO. The ADGPP Participating Generator may utilize DPG technology to transmit aggregated operational data. Information on this standard and the DPG can be found on the ISO Home Page at ([www.caiso.com/thegrid/operations/gcp/index.html](http://www.caiso.com/thegrid/operations/gcp/index.html)).

The ISO is willing to investigate alternative methods of reporting operational data that do not conflict with existing ISO standards and that meet the ISO's security and communications requirements. ADGPP Participating Generators are encouraged to offer alternative communication methods and solutions that meet the intent of this document and the ADGPP. All operational data must eventually be made available to the ISO Energy Management System (EMS).

The ADGPP Participating Generator must provide operational data updates at least once every 10 minutes. Under the ADGPP, the ADGPP Participating Generators will be requested to demonstrate their ability to provide data updates more frequently, up to a one-minute update frequency.

## Security Requirements

The ISO has established security requirements for communication of data between the ISO and external organizations. In general, each ADGPP Participating Generator must transmit data to the ISO in a manner that provides data integrity, confidentiality and authentication. Use of the DPG described above fulfills these requirements if installed properly. The ISO is willing to discuss alternative proposals for satisfying these general security requirements.

## Data To Be Reported

Each ADGPP Participating Generator must deliver the following near real-time operational data to the ISO for each ADU that it represents under the ADGPP:

- ?? Total aggregate Generating Unit MW output as measured at the terminals of the Generating Units;
- ?? Total aggregate Generating Unit MW output capability deliverable at the terminals of the Generating Units; and
- ?? Aggregate connectivity status (“connected” if at least one Generating Unit is paralleled with the grid and has a positive net delivery of Energy into the electric grid).

All operational data reported must be demonstrated, to the ISO’s satisfaction, to accurately represent the local generator source data as determined from in-plant measurements. The ISO may accept verified transducer specification information, current loop measurements and/or current local data values reported to support this requirement. The ISO or its designee reserves the right to inspect the ADU and/or Generating Unit facilities to verify the accuracy and validity of all operational data supplied to the ISO. The ISO reserves the right to periodically audit and re-verify the accuracy and validity of all data provided to the ISO.

## Availability and Maintenance

The ISO will maintain a database for all data reported by the ADGPP Participating Generator for the ADU(s) and Generating Units it represents. The ADU database may contain additional information for other interested parties and may at times require changes. The ISO requires prior notification (minimum ten days) for all database changes that affect the ADU, the Generating Units it represents, or operational data reported to the ISO for the ADU.

The ADGPP Participating Generator is responsible for all installation, testing and on-going maintenance costs of systems outside the ISO. The reliability and availability of the operational data is the responsibility of the ADGPP Participating Generator. Loss of operational data communications for an ADU within the responsibility of the ADGPP Participating Generator (including an Internet Service Provider failure, if applicable) will result in the inability of the ADU to participate in the ISO Supplemental Energy market.

## **Scheduling, Metering, and Settlement Requirements**

### Scheduling

ADUs participating in the ADGPP will have the ability to Schedule Energy with the ISO and to bid Energy from the ADU into the ISO Supplemental Energy market. A certified SC using the assigned Resource ID must Schedule an ADU. The SC scheduling Energy from the ADU and bidding the ADU in the ISO Supplemental Energy Market must comply with all applicable requirements for scheduling set forth in the ISO Tariff. The ISO will not dictate the mechanism by which the SC communicates instructions to the ADGPP Participating Generator, the ADU and the individual Generating Units. However, ADUs that fail to comply with ISO Dispatch instructions will be subject to the same financial consequences that apply to any other resource that fails to comply.

The Energy delivered from the ADU will be settled based on the established settlement procedures of the ISO Tariff.

Generating Units participating in the ADGPP must coordinate their preferences for scheduling Energy transactions and bidding Energy into the ISO Supplemental Energy market with their ADGPP Participating Generator and Scheduling Coordinator. The Scheduling Coordinator will then submit the sum of the elected Energy Schedules and Supplemental Energy bids for the ADU[s] into the ISO's scheduling system through the Day Ahead and Hour Ahead scheduling mechanisms.

### Metering

The ADU's Scheduling Coordinator will be responsible for submitting the ADU's Settlement Quality Meter Data to the ISO. The SC must submit the aggregated SQMD for the ADU to the ISO per the requirements in the ISO Payment Calendar (the aggregated SQMD is due to the ISO at T+45 days). The SC must provide the SQMD for the ADU Resource ID assigned on an hourly interval basis that meets the requirements for SC Metered Entities in the ISO Tariff.

All Generating Units comprising an ADU will be subject to the ISO's metering standards applicable to an SC Metered Entity, except that, in accordance with ISO Tariff Section 10.6.9 and Metering Protocol Section 13.2(d), the ISO hereby grants Generating Units participating in the ADGPP an exemption from the requirements of Metering Protocol Section 2.3.5 during their participation in the project. Each SC, in conjunction with the relevant Local Regulatory Authority, shall ensure that a revenue meter complying with any standards of the relevant Local Regulatory Authority meters each Generating Unit. In the event that an existing bi-directional, interval revenue meter that can differentiate a net Generation condition from a net Load condition is used, only the data from the revenue meter channel which registers a net Generation condition from each Generating Unit site will be utilized and combined with meter data for other Generating Unit sites to form the aggregate revenue meter data for the ADU.

The meter data submission by the SC for the ADU will reflect the sum of all net Generation for all the aggregated Generating Unit sites which are combined and scheduled to deliver Energy and which are dispatched according to their Supplemental Energy bid in any given hour.

Figure 1 provides an illustrative example of how the scheduling, bidding, and meter issues relate. For simplicity, the example uses whole MW values, which implies that each Generating Unit site would consist of two or more physical Generating Units having a rated capacity of less than 1 MW and that the total Generation at each site exceeds the on-site Load by at least 1 MW. Moreover, even though the figure refers to “Schedules” and “bids” for the Generating Unit sites, these merely refer to each Generating Unit site’s election as to how it desires its SC to represent its portion of Generation contributing to the ADU total in the Schedule the SC submits for the ADU.

The SC upon request must provide the ISO with the meter reads for the individual Generating Unit sites comprising the ADU. The SC shall ensure that the ISO will have access to the entire metering facility of the individual Generating Units, as well as the ADU facilities that it represents, in order to inspect, test, or otherwise audit those metering facilities. The SC shall apply the security and validation procedures prescribed by the California Public Utilities Commission or relevant Local Regulatory Authority to the meter data of the Generating Units represented. The SQMD provided must include the appropriate distribution loss factors to reflect Energy delivered to the point of delivery with the ISO Controlled Grid.

### Settlement

Financial settlement for services purchased and sold by the ISO will be in accordance with the ISO Tariff, more specifically, Section 11 of the ISO Tariff and the ISO Settlement and Billing Protocol. The Energy delivered from the ADU will be settled with the appropriate Scheduling Coordinator based on the established settlement procedures of the ISO Tariff. The ISO will settle with the Scheduling Coordinator, which in turn will settle with the ADGPP Participating Generator, and the ADGPP Participating Generator will be responsible for settling with the Generating Units that comprise the ADU.

### **Contractual Requirements**

The ADGPP Participating Generator must enter into a pro forma ADGPP Participating Generator Agreement, as approved by the Federal Energy Regulatory Commission (FERC), with the ISO. If it is a jurisdictional entity, the ADGPP Participating Generator must comply with any applicable FERC requirements. General information for the PGA and contract process that applies for Generating Units is found on the ISO Home Page at <http://www.caiso.com/clientserv/certification>.

**Figure 1**

**Example for One ADU Comprised of Nine Generating Unit Sites**

