# Table of Contents

Appendix Q Eligible Intermittent Resources Protocol (EIRP) ................................................................. 2

1 SCOPE .................................................................................................................................................. 2

1.1 Scope of Application to Parties ....................................................................................................... 2

1.2 Liability of the CAISO .................................................................................................................... 2

2 REQUIREMENTS FOR ELIGIBLE INTERMITTENT RESOURCES, PARTICIPATING
INTERMITTENT RESOURCES, AND HYBRID RESOURCES WITH VARIABLE COMPONENT ....... 2

2.1 No Mandatory Participation ............................................................................................................ 2

2.2 Minimum Certification Requirements ............................................................................................. 2

2.2.1 Agreements ................................................................................................................................ 2

2.2.2 Composition of a Participating Intermittent Resource ................................................................. 3

2.2.3 Equipment Installation ................................................................................................................. 3

2.2.4 Forecast Model Validation .......................................................................................................... 3

2.2.5 [Not Used] .................................................................................................................................. 3

2.3 Notice of Certification of a Participating Intermittent Resource ...................................................... 3

2.4 Additional Requirements ................................................................................................................. 3

2.4.1 Forecast Fee ............................................................................................................................... 3

2.4.2 Modification of Participating Intermittent Resource Composition .......................................... 4

2.4.3 Continuing Obligation .................................................................................................................. 4

2.4.4 Failure to Perform ....................................................................................................................... 4

3 COMMUNICATIONS ............................................................................................................................ 4

3.1 Forecast Data .................................................................................................................................. 4

3.1.1 Wind Generation Meteorological Station Requirements ............................................................. 5

3.1.2 Wind Generation Meteorological Data Requirements ................................................................. 5

3.1.3 Designated Turbines .................................................................................................................... 6

3.1.4 Topographical Map ..................................................................................................................... 6

3.1.5 Site Information .......................................................................................................................... 6

3.1.6 Shape-File Submission ................................................................................................................. 7

3.2.1 Solar Generation Meteorological Station Requirements ............................................................. 7

3.2.2 Solar Meteorological Data Requirements .................................................................................. 8

3.2.3 Site Information .......................................................................................................................... 10

3.2.4 Shape-File .................................................................................................................................. 11

3.3 Power Reliability Requirements ..................................................................................................... 11

3.4 Standards ...................................................................................................................................... 11

3.5 Cost Responsibility .......................................................................................................................... 11

4 FORECASTING .................................................................................................................................... 12

4.1 [Not Used] ....................................................................................................................................... 12

4.2 [Not Used] ....................................................................................................................................... 12

4.3 Confidentiality ................................................................................................................................. 12

5 SCHEDULING AND SETTLEMENT ................................................................................................. 12

5.1 Schedules ..................................................................................................................................... 12

5.2 Settlement ..................................................................................................................................... 12

5.3 [Not Used] ..................................................................................................................................... 12

6 DATA COLLECTION FACILITIES ............................................................................................. 12

6.1 Other Eligible Intermittent Resources ............................................................................................ 12

7 PROGRAM MONITORING ............................................................................................................. 12

8 AMENDMENTS ............................................................................................................................... 13
Appendix Q

Eligible Intermittent Resources Protocol (EIRP)

1 SCOPE

1.1 Scope of Application to Parties

This EIRP applies to the CAISO and to:

(a) Scheduling Coordinators (SCs);

(b) Eligible Intermittent Resources that are not certified as Participating Intermittent Resources;

(c) Participating Intermittent Resources; and

(d) Hybrid Resources with a wind generation or solar generation component.

1.2 Liability of the CAISO

Any liability of the CAISO arising out of or in relation to this EIRP shall be subject to Section 14 of the CAISO Tariff as if references to the CAISO Tariff were references to this EIRP.

2 REQUIREMENTS FOR ELIGIBLE INTERMITTENT RESOURCES, PARTICIPATING INTERMITTENT RESOURCES, AND HYBRID RESOURCES WITH VARIABLE COMPONENT

2.1 No Mandatory Participation

Eligible Intermittent Resources may elect to be scheduled and settled as the CAISO Tariff provides for Generating Units, and are not required to seek certification as Participating Intermittent Resources.

2.2 Minimum Certification Requirements

Eligible Intermittent Resources, Participating Intermittent Resources, and Hybrid Resources with a variable component must meet the following requirements, as applicable.

2.2.1 Agreements

The following agreements must be executed by the owner or operator of any Eligible Intermittent Resource, unless that resource is not subject to any of these agreements pursuant to the CAISO Tariff, such as an Eligible Intermittent Resource of an MSS Operator:

(a) A Participating Generator Agreement, Net Scheduled PGA, Dynamic Scheduling Agreement for Scheduling Coordinators, or Pseudo-Tie Participating Generator Agreement that, among other things, binds the Eligible Intermittent Resource to comply with the CAISO Tariff; and

(b) A Meter Service Agreement for CAISO Metered Entities, for all Eligible Intermittent Resources other than Dynamic System Resources.

If an Eligible Intermittent Resource intends to become a Participating Intermittent Resource, it must also execute a letter of intent, which when executed and delivered to the CAISO shall initiate the process of certifying the Participating Intermittent Resource. The form of the letter of intent shall be specified by the CAISO in a Business Practice Manual.
Hybrid Resources with a variable component must execute all agreements that are otherwise required in this CAISO tariff.

2.2.2 Composition of a Participating Intermittent Resource

The CAISO shall develop criteria to determine whether one or more Eligible Intermittent Resources may be included within a Participating Intermittent Resource. Such criteria shall include:

(a) A Participating Intermittent Resource must be at least one (1) MW rated capacity.

(b) A Participating Intermittent Resource may include one (1) or more Eligible Intermittent Resources that have similar response to weather conditions or other variables relevant to forecasting Energy, as determined by the CAISO.

(c) Each Participating Intermittent Resource shall be electrically connected at a single point on the CAISO Controlled Grid, except as otherwise permitted by the CAISO on a case-by-case basis as may be allowed under the CAISO Tariff. Interconnection to a portion of the CAISO Controlled Grid outside or not contiguous to the CAISO Balancing Authority Area does not make an Eligible Intermittent Resource that is a Dynamic System Resource or Pseudo-Tie Generating Unit eligible to be included within a Participating Intermittent Resource.

(d) The same Scheduling Coordinator must schedule all Eligible Intermittent Resources aggregated into a single Participating Intermittent Resource.

2.2.3 Equipment Installation

Eligible Intermittent Resources and Hybrid Resources with a variable component must install and maintain the communication equipment required pursuant to Section 3 of this EIRP, and the equipment supporting forecast data required pursuant to Section 4 of this EIRP.

2.2.4 Forecast Model Validation

The CAISO must determine that sufficient historic and real-time telemetered data are available to support an accurate and unbiased forecast of Energy generation by a Participating Intermittent Resource, according to the forecasting process validation criteria described in Section 4 of this EIRP.

2.2.5 [Not Used]

2.3 Notice of Certification of a Participating Intermittent Resource

When all requirements described in Section 2.2 of this EIRP applicable to Participating Intermittent Resources have been fulfilled, the CAISO shall notify the Scheduling Coordinator and the representatives of the Eligible Intermittent Resources comprising the Participating Intermittent Resource that the Participating Intermittent Resource has been certified, and is eligible for the settlement terms provided under Section 11.12 of the CAISO Tariff, as conditioned by the terms of this EIRP.

2.4 Additional Requirements

2.4.1 Forecast Fee

An Eligible Intermittent Resource must pay the Forecast Fee for all metered Energy generated by
the Eligible Intermittent Resource, as specified in CAISO Tariff Appendix F, Schedule 4. A Hybrid Resource with a variable component must pay the Forecast Fee for all metered Energy generated by variable component, as specified in CAISO Tariff Appendix F, Schedule 4, if it elects, per section 3.1 of this EIRP, to have the CAISO produce a forecast of the output of the Hybrid Resource’s variable component.

2.4.2 Modification of Participating Intermittent Resource Composition

A Participating Intermittent Resource may seek to modify the composition of the Participating Intermittent Resource (e.g., by adding or eliminating an Eligible Intermittent Resource from the Participating Intermittent Resource). Such changes shall not be implemented without prior compliance with the written approval by the CAISO. The CAISO will apply consistent criteria and expeditiously review any proposed changes in the composition of a Participating Intermittent Resource.

2.4.3 Changes in Scheduling Coordinator

This EIRP does not impose any additional requirement for CAISO approval to change the Scheduling Coordinator for an approved Participating Intermittent Resource than would otherwise apply under the CAISO Tariff to changes in the Scheduling Coordinator representing a Generating Unit.

2.4.4 Continuing Obligation

Eligible Intermittent Resources (including Participating Intermittent Resources) and Hybrid Resources with a variable component have a continuing obligation to meet all applicable obligations established under the CAISO Tariff and this EIRP, and must fully cooperate in providing all data, other information, and authorizations the CAISO reasonably requests to fulfill its obligation to validate forecast models and explain deviations.

2.4.5 Failure to Perform

If the CAISO determines that a material deficiency has arisen in the Participating Intermittent Resource’s fulfillment of its obligations under the CAISO Tariff and this EIRP, and such Participating Intermittent Resource fails to promptly correct such deficiencies when notified by the CAISO, then the eligibility of the Participating Intermittent Resource for the settlement accommodations provided in Section 11.12 of the CAISO Tariff shall be suspended until such time that the unavailable data is provided or other material deficiency is corrected to the CAISO’s reasonable satisfaction. Such suspension shall not relieve the Scheduling Coordinator for the deficient Participating Intermittent Resource from paying the Forecast Fee over the duration of the period covered by the letter of intent described in Section 2.2.1(c) of this EIRP.

3 COMMUNICATIONS

3.1 Forecast Data

The CAISO may require various data relevant to forecasting Energy from an Eligible Intermittent Resource or Hybrid Resource with a variable component to be telemetered to the CAISO, including appropriate operational data, meteorological data or other data reasonably necessary to forecast Energy.

In order for the CAISO to forecast Energy, an Eligible Intermittent Resource or Hybrid Resource with a variable component must provide the CAISO with MW production data and meteorological data as outlined in this Eligible Intermittent Resources Protocol. This data must be collected for a minimum of thirty (30) consecutive days and be of sufficient quality as determined by a CAISO to produce a state of the art forecast.
A Hybrid Resource with a wind generation or solar generation component may elect to provide its own forecasted production in lieu of a CAISO forecast but such election does not relieve the resource of the obligation to provide production data and meteorological data as otherwise required in this Eligible Intermittent Resources Protocol.

3.1.1 Wind Generation Meteorological Station Requirements

Each wind Eligible Intermittent Resource or Hybrid Resource with a wind generation component must install and maintain equipment required by the CAISO to support accurate power generation forecasting and the communication of such forecast, meteorological, and other required data to the CAISO consistent with the timeframes specified in this Eligible Intermittent Resource Protocol.

3.1.1.1 Each wind Eligible Intermittent Resource or Hybrid Resource with a wind generation component shall install a minimum of one meteorological station to measure barometric pressure, temperature, wind speed and direction. If such a resource has a rated capacity of five (5) MW or greater, then the resource shall install a minimum of two meteorological stations to measure barometric pressure, temperature, wind speed and direction. If an Eligible Intermittent Resource or Hybrid Resource with a wind generation component, as part of compliance with any other contractual or regulatory requirement outside of this Eligible Intermittent Resource Protocol, provides data from more than the two required meteorological stations to an entity other than the CAISO, then the resource must also submit data from any additional meteorological station to the CAISO.

3.1.1.2 Each wind Eligible Intermittent Resource or Hybrid Resource with a wind generation component shall locate its meteorological station(s) on the windward side of the wind farm. Each such resource must install one meteorological station at the average hub height of the wind turbines. Hub height is the distance from the ground to the center of the turbine axis. If a second meteorological station is required, then it may be so co-located with the primary station. The approximate distance separating the primary station and the secondary station shall be an average of one (1) rotator blade length. Where placement of the meteorological station(s) in accordance with this Eligible Intermittent Resource Protocol would reduce production or violate a local, state, or federal statute, regulation or ordinance, the CAISO, in coordination with any applicable forecast service provider, will coordinate with the resource to identify an acceptable placement of the meteorological station.

3.1.1.3 The use of SODAR\(^1\) and/or LIDAR\(^2\) equipment may be an acceptable substitute for wind direction and velocity only after obtaining prior agreement from the CAISO.

3.1.1.4 Wind Eligible Intermittent Resources and Hybrid Resources with a wind generation component may not satisfy the meteorological station location requirements through a sharing agreement with another resource.

3.1.2 Wind Generation Meteorological Data Requirements

Table Q-1 details the units and accuracy of measurements for telemetry data points wind Eligible Intermittent Resources and Hybrid Resources with a wind generation component must send to the CAISO in real time (i.e., every 4 seconds).

Table Q-1 Wind Telemetry Data Points

---

1 SODAR means Sonic Detection and Ranging- a meteorological instrument also known as a wind profiler which measures the scattering of sound waves by atmospheric turbulence.

2 LIDAR means Light Detection and Ranging - a meteorological instrument which measures the properties of scattered light waves caused by atmospheric turbulence.
Element | Device(s) Needed | Units | Accuracy |
---|---|---|---|
Wind Speed (Meter / Second) | Anemometer, wind vane and wind mast | m/s | ± 2m/s |
Air Temperature (Degrees Celsius) | Temperature probe & shield for ambient temp | °C | ± 1° |
Barometric Pressure (hecto Pascals) | Barometer | hPA | ± 60 hPa |
Real Time Data | | MWs* | |
High Sustainable Limit (for Hybrid Resources with a wind generation component and wind EIRs that are a Colocated Resource) | | MWs** | |

* Hybrid Resources with a wind generation component must provide MW values through telemetry for both the wind generation component and the overall Hybrid Resource

** High Sustainable Limit may be updated every 12 seconds.

3.1.3 Designated Turbines

For any wind eligible Intermittent Resource or Hybrid Resource with a wind generation component, designated turbines are required to improve forecast accuracy within a wind park. The CAISO shall identify a designated turbine, from which the resource shall provide nacelle wind speed and wind direction every four seconds. Wind EIRs with a PGA or NS PGA that are operating or have final regulatory approvals to construct as of November 1, 2018, that have wind turbines without nacelle anemometers need not comply with the requirements of this section for Designation Turbines. However, when the wind EIR repowers or replaces a portion of its existing wind turbines, then the Wind EIR must become compliance with the requirements of this section for Designated Turbines.

3.1.4 Topographical Map

A wind Eligible Intermittent Resource or Hybrid Resource with a wind generation component must submit a topographical map that illustrates the location and height for each wind turbine within a wind park. The map must identify all meteorological stations and turbine location by latitude and longitude and should be in degrees/decimals using WGS84 geodetic datum only.

3.1.5 Site Information
A wind Eligible Intermittent Resource or Hybrid Resource with a wind generation component must provide the site information specified below in the manner and format as specified through the CAISO new resource implementation process. Latitude and Longitude should be in degrees/decimals using WGS84 geodetic datum only.

1. Park Potential (MW; numeric-float field [example: 100.5])
2. Resource Project Corner Coordinates in WGS84 format
3. Meteorological Station ID Numbers
4. Meteorological Station Coordinates in WGS84 format
5. Address
6. Resource ID
7. MW Generation Capacity
8. Plant Location (Latitude and Longitude in WGS84)
9. Lidar or Sodar (required)
10. Make (required; alphanumeric)
11. Model (required; alphanumeric)
12. Wind Speed (Anemometer) (required; alphanumeric)
13. Wind Direction (Anemometer) (required; alphanumeric)
14. Air Temperature (required; alphanumeric)
15. Barometric Pressure (required; alphanumeric)
16. Wind Turbine Group Numbers
17. Turbine Specifications:
   18. Number of Turbines (numeric field)
   19. Turbine Manufacturer (alphanumeric field)
   20. Turbine Model (alphanumeric field)
   21. Turbine Maximum Generation Capacity (numeric field)
   22. Turbine Height Above Ground Level (numeric field)
   23. Cut in Speed (numeric field; in m/s)
   24. Cut Out Speed (numeric field; in m/s)
   25. Cold Weather Package (Yes or No Dropdown)
   26. Hot Weather Package (Yes or No Dropdown)
   27. Low Temperature Cut Out (numeric field)
   28. High Temperature Cut Out (numeric field)
   29. Wind Turbine ID Numbers (alphanumeric field)
   30. Elevation (numeric field; in meters)
   31. Hub Height (numeric field; in meters)
   32. Turbine(s) Latitude(s) and Longitude(s) Coordinates (WGS84 Coordinate Field)
   33. Turbine ID
   34. Turbine Latitude and Longitude
   35. Turbine Elevation
   36. Turbine Hub Height
   37. Turbine Group Number

3.1.6 Shape-File Submission

Each wind Eligible Intermittent Resource and Hybrid Resource with a wind generation component must submit a shape-file that illustrates, at a minimum, the location of the meteorological station(s), resource project corner, and all individual wind turbines comprising the resource. The shape-file must be submitted in .shp, .dbf, or other file format upon which the CAISO and resource mutually agree.

3.2.1 Solar Generation Meteorological Station Requirements

Each solar Eligible Intermittent Resource and Hybrid Resource with a solar generation component must install and maintain equipment required by the CAISO to support accurate
power generation forecasting and the communication of such forecast, meteorological, and other required data to the CAISO consistent with the timeframes specified in this Eligible Intermittent Resource Protocol.

3.2.1.1 Each solar Eligible Intermittent Resource and Hybrid Resource with a solar generation component shall install a minimum of one meteorological station. If such a resource has a rated capacity of five (5) MW or greater, the resource shall install a minimum of two meteorological stations. If an Eligible Intermittent Resource or Hybrid Resource with a solar generation component, as part of compliance with any other contractual or regulatory requirement outside of this Eligible Intermittent Resource Protocol, provides data from more than the two required meteorological stations to an entity other than the CAISO, then the resource must also submit data from any additional meteorological station to the CAISO.

3.2.1.2 Solar Eligible Intermittent Resources and Hybrid Resources with a solar generation component that require direct normal irradiance (DNI) and global horizontal irradiance (GHI) measurements may provide alternate radiometry meteorological station data. For example, one meteorological station may report DNI and another meteorological station may report GHI. All other meteorological data reporting requirements shall remain the same.

3.2.1.3 Meteorological stations for solar Eligible Intermittent Resources shall cover at least 90 percent of the facility’s footprint for each Resource ID. Meteorological stations for Hybrid Resources with a solar generation component must cover at least 90 percent of the solar generation component’s footprint.

3.2.1.4 Subject to the CAISO’s prior approval, Solar Eligible Intermittent Resources and Hybrid Resources with a solar generation component may satisfy the meteorological station location requirements by entering a mutually agreeable sharing agreement(s) with another solar Eligible Intermittent Resource or Hybrid Resource with a solar generation component. The following conditions must apply for the CAISO to grant approval:

(a) One resource (the host plant) meets the meteorological station requirements; and

(b) The site of the other resource (the sharing plant) lies contiguous to or overlaps the site of the host plant, or

(c) Meteorological conditions on the sharing plant site are substantially similar to those on the Host Plant site.

Proof of the agreement between the host plant and sharing plant must be provided to the CAISO. Should the agreement terminate, the sharing plant must independently demonstrate it meets the meteorological tower requirements specified in this Eligible Intermittent Resource Protocol.

3.2.2 Solar Meteorological Data Requirements

Table Q-2 details the units and accuracy of measurements for telemetry data points solar Eligible Intermittent Resources and Hybrid Resources with a solar generation component must send to the CAISO in real time (i.e., every 4 seconds).
Table Q-2 Solar Eligible Intermittent Resources Telemetry Data Points

<table>
<thead>
<tr>
<th>Element</th>
<th>Device(s) Needed</th>
<th>Units</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wind Speed (Meter / Second)</td>
<td>Anemometer, wind vane and wind mast</td>
<td>m/s</td>
<td>± 2 m/s</td>
</tr>
<tr>
<td>Wind Direction (Degrees - Zero North 90CW)</td>
<td>Anemometer, wind vane and wind mast</td>
<td>Degrees</td>
<td>± 5°</td>
</tr>
<tr>
<td>Air Temperature (Degrees Celsius)</td>
<td>Temperature probe &amp; shield for ambient temp</td>
<td>°C</td>
<td>± 1°</td>
</tr>
<tr>
<td>Barometric Pressure (hecto Pascals)</td>
<td>Barometer</td>
<td>hPa</td>
<td>± 60 hPa</td>
</tr>
<tr>
<td>Back Panel Temperature (Degree C)</td>
<td>Temperature probe for back panel temperature</td>
<td>°C</td>
<td>± 1°</td>
</tr>
<tr>
<td>Plane of Array Irradiance Watts/Meter Sq.</td>
<td>Pyranometer or Equivalent</td>
<td>W/m²</td>
<td>± 25 W/m²</td>
</tr>
<tr>
<td>Global Horizontal Irradiance Watts/Meter Sq.</td>
<td>Pyranometer or Equivalent</td>
<td>W/m²</td>
<td>± 25 W/m²</td>
</tr>
<tr>
<td>Direct Irradiance Watts/Meter Sq.</td>
<td>Pyranometer or Equivalent</td>
<td>W/m²</td>
<td>± 25 W/m²</td>
</tr>
<tr>
<td>Real Time Data</td>
<td></td>
<td>MWs*</td>
<td></td>
</tr>
<tr>
<td>High Sustainable Limit (for Hybrid Resources with a solar generation component and solar EIRs that are a Co-located Resource)</td>
<td></td>
<td>MWs**</td>
<td></td>
</tr>
</tbody>
</table>

* Hybrid Resources with a solar generation component must provide MW values through telemetry for both the solar generation component and the overall Hybrid Resource

** High Sustainable Limit may be updated every 12 seconds.

Table Q-3 details the minimum required (R) measurement of solar irradiance by each solar generating technology that solar Eligible Intermittent Resources and Hybrid Resources with a solar generation component must send to the CAISO consistent with the requirements of this Eligible Intermittent Resource Protocol.

Table Q-3 Irradiance and Back Plane Required Measurements

<table>
<thead>
<tr>
<th></th>
<th>Direct Irradiance (DIRD)</th>
<th>Global Horizontal Irradiance (GHIRD)</th>
<th>Global Irradiance/ Plane of Array (PAIRD)</th>
<th>Back Panel Temperature (BPTEMP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flat-Plate PV (fixed / horizontal / flat roof)</td>
<td>R</td>
<td></td>
<td>R</td>
<td></td>
</tr>
<tr>
<td>Flat-Plate PV (fixed angle / azimuth tracking)</td>
<td>R</td>
<td></td>
<td>R</td>
<td></td>
</tr>
</tbody>
</table>

December 15, 2021
Appendix Q
### Site Information

A solar Eligible Intermittent Resource or Hybrid Resource with a solar generation component must provide the site information specified below in the manner and format as further specified in the CAISO new resource implementation process. Latitude and Longitude should be in degrees/decimals using WGS84 geodetic datum only.

#### General Resource Information
1. Park Potential (MW; numeric-float field [example: 100.5])
2. Resource Project Corner Coordinates in WGS84 format
3. Meteorological Station ID Numbers
4. Meteorological Station Coordinates in WGS84 format
5. Address
6. Resource ID
7. MW Generation Capacity
8. Plant Location (Latitude and Longitude in WGS84)
9. Lidar or Sodar (required)
10. Make (required; alphanumeric)
11. Model (required; alphanumeric)
12. Wind Speed (Anemometer) (required; alphanumeric)

---

<table>
<thead>
<tr>
<th>Resource Description</th>
<th>Direct Irradiance (DIRD)</th>
<th>Global Horizontal Irradiance (GHIRD)</th>
<th>Global Irradiance/ Plane of Array (PAIRD)</th>
<th>Back Panel Temperature (BPTEMP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flat-Plate PV (DNI zenith &amp; azimuth tracking)</td>
<td>R</td>
<td></td>
<td>R</td>
<td>R</td>
</tr>
<tr>
<td>Flat-Panel Solar (thermal fixed angle mounted)</td>
<td></td>
<td></td>
<td>R</td>
<td>R</td>
</tr>
<tr>
<td>Flat-Panel Thermal Collector (azimuth tracking)</td>
<td></td>
<td></td>
<td>R</td>
<td>R</td>
</tr>
<tr>
<td>Low Concentrating PV (LCPV)</td>
<td>R</td>
<td>R</td>
<td>R</td>
<td></td>
</tr>
<tr>
<td>High Concentrating PV (HCPV)</td>
<td>R</td>
<td>R</td>
<td>R</td>
<td></td>
</tr>
<tr>
<td>Concentrated Solar Thermal (solar through zenith tracking)</td>
<td>R</td>
<td></td>
<td>R</td>
<td></td>
</tr>
<tr>
<td>Heliostat Power (tracking focusing mirrors)</td>
<td>R</td>
<td></td>
<td>R</td>
<td></td>
</tr>
<tr>
<td>Greenhouse Power Tower (hot air convection turbine)</td>
<td></td>
<td></td>
<td>R</td>
<td></td>
</tr>
<tr>
<td>Stirling Engine (concentrated solar power generation)</td>
<td>R</td>
<td>R</td>
<td>R</td>
<td></td>
</tr>
</tbody>
</table>

---

December 15, 2021
Appendix Q
13. Wind Direction (Anemometer) (required; alphanumeric)
14. Air Temperature (required; alphanumeric)
15. Barometric Pressure (required; alphanumeric)
16. Irradiance (required; alphanumeric)
17. Back Panel Irradiance (required; alphanumeric)
18. MW Generation DC
19. Meteorological Station Sharing (Y or N: If ‘Yes’, require the project ID of the resource that is being shared) (Validate that project key/code of host site exists)
20. Solar Panel Group Number

Solar Panel Specifications:
1. Panel Manufacturer (alphanumeric field)
2. Panel Model (alphanumeric field)
3. Number of Panels (numeric field)
4. Panel Power Rating (numeric field)
5. Number of Inverters (numeric field)
6. Inverter Ratings (alphanumeric field)
7. Tracking (Yes or No Dropdown)
8. Single or Dual Axis Tracking (Single, Dual, or None Dropdown)
9. Tracker Manufacturer (alphanumeric field)
10. Tracker Model (alphanumeric field)
11. Wind Protection (Speed in m/s)
12. Altitude Angle of Panels (alphanumeric field)
13. Azimuth Angle of Fixed Panels (alphanumeric field)
14. Height of Panels Above Ground Level (alphanumeric field)
15. Concentrating PV (Yes or No Dropdown)
16. Solar Panel Coordinates (WGS84)

3.2.4 Shape-File

Each solar Eligible Intermittent Resource and Hybrid Resource with a solar generation component must submit a shape-file that illustrates, at a minimum, the location of the meteorological station(s) and resource project corner. The shape-file must be submitted in .shp, .dbf, or other file format upon which the CAISO and resource mutually agree.

3.3 Power Reliability Requirements

Each Eligible Intermittent Resource and Hybrid Resource with a wind generation or solar generation component shall provide a backup power source for the Remote Intelligent Gateway, meteorological station equipment, revenue meter, and essential communication equipment (including, but not limited to, the router, network switch, fiber optic transceiver, 120V plug-in power supplies). The backup power source shall be sized accordingly to carry that equipment load. A backup power supply may include, but is not limited to, an uninterruptable power source (UPS) or a battery bank with solar panel charger. Whichever backup power source the Eligible Intermittent Resource installs, it shall be sized and provide power until the primary power source is restored.

3.4 Standards

The standards for communications shall be the monitoring and communications requirements for Generating Units providing only Energy; as such standards may be amended from time to time, and published on the CAISO Website.

3.5 Cost Responsibility

December 15, 2021
Appendix Q
An Eligible Intermittent Resource is responsible for expenses associated with engineering, installation, operation and maintenance of required communication equipment.

4 FORECASTING

The CAISO is responsible for overseeing the development of tools or services to forecast Energy for Participating Intermittent Resources. The CAISO will use its best efforts to develop accurate and unbiased forecasts, as limited by the availability of relevant explanatory data. Objective criteria and thresholds for unbiased, accurate forecasts shall be used to certify Participating Intermittent Resources in accordance with Section 2.2.4 of this EIRP.

4.1 [Not Used]

4.2 [Not Used]

4.3 Confidentiality

The CAISO shall maintain the confidentiality of proprietary data for each Participating Intermittent Resource in accordance with Section 20 of the CAISO Tariff.

5 SCHEDULING AND SETTLEMENT

5.1 Schedules

For all Generating Units that comprise the Participating Intermittent Resources shall comply with the Bidding and scheduling rules specified in Sections 4.8, 30, 31, and 34.

5.2 Settlement

After a Participating Intermittent Resource is certified, Settlement shall be determined for each Settlement Period based on consistency of Bids submitted on behalf of such Participating Intermittent Resource with the rules specified in the CAISO Tariff and this EIRP.

5.3 [Not Used]

6 DATA COLLECTION FACILITIES

An Eligible Intermittent Resource not otherwise exempt and Hybrid Resource with a variable component that elects to have a CAISO forecast must install and maintain equipment to collect, record and transmit data that the CAISO reasonably determines is necessary to develop and support a forecast model that meets the requirements of Section 4 of this EIRP.

6.1 Other Eligible Intermittent Resources

Eligible Intermittent Resources other than wind or solar projects will be required to provide data of comparable relevance to estimating Energy generation. Standards will be developed as such projects are identified and will be specified in this Eligible Intermittent Resources Protocol.

7 PROGRAM MONITORING

The CAISO shall monitor the operation of these rules, and will in particular seek to eliminate any gaming opportunities provided by the flexibility provided Participating Intermittent Resources to self-select participation on an hourly basis.
Participating Intermittent Resources are expected to bid, schedule, and otherwise perform in good faith, and not seek to act strategically in a manner that causes financial gain through systematic behavior, where such gain results solely from the settlement accommodations provided under CAISO Tariff Section 11.12.

If requirements specified in this EIRP are not met, then Participating Intermittent Resource certification may be revoked pursuant to Section 2.4.5 of this EIRP. Any patterns of strategic behavior by Participating Intermittent Resources will be tracked, and the statistical significance of such deviations will be used by the CAISO to evaluate whether changes in the rules defined in this EIRP are appropriate.

The CAISO will monitor the impact of rules for Participating Intermittent Resources on FMM or RTD imbalance energy and Regulation costs to the CAISO.

8 AMENDMENTS

If the CAISO determines a need for an amendment to this EIRP, the CAISO will follow the requirements as set forth in Section 15 of the CAISO Tariff.