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California Energy Commission  
Dockets Unit  
1516 Ninth Street  
Sacramento, CA 95814-5512

Subject: **CAITHNESS BLYTHE II, LLC'S RESPONSE TO STAFF'S ANALYSIS AND RECOMMENDATION REGARDING THE REQUESTED EXTENSION OF THE DEADLINE FOR COMMENCEMENT OF CONSTRUCTION BLYTHE ENERGY PROJECT PHASE II AMENDMENT DOCKET NO. (02-AFC-1C)**

Enclosed for filing with the California Energy Commission is 1 (one) original and 1 (one) copy of **CAITHNESS BLYTHE II, LLC'S RESPONSE TO STAFF'S ANALYSIS AND RECOMMENDATION REGARDING THE REQUESTED EXTENSION OF THE DEADLINE FOR COMMENCEMENT OF CONSTRUCTION**, for the Blythe Energy Project Phase II Amendment (02-AFC-1C).

Sincerely,



Marie Mills

Response to the California Energy Resources  
Conservation and Development Commission Staff's  
Analysis and Recommendation Regarding the  
Requested Extension of the Deadline for  
Commencement of Construction of the Blythe  
Energy Project Phase II

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Caithness Blythe II, LLC

December 1, 2011

## Introduction

Caithness Blythe II, LLC, is a special purpose LLC owned by Caithness Energy, LLC for the purpose of developing the Blythe Energy Project, Phase II, (Blythe II). Blythe II, a natural gas fired, combined cycle facility was initially rated at nominal 520 MW and evaluated with a maximum output of 538 MW. Because of increased turbine efficiency, the Project was modified to an increased nominal rating of 569 MW and a maximum output of 587 MW. The Blythe II facility will be located on 76 acres approximately five miles west of the center of the City of Blythe in Riverside County.

On November 14, 2011, the California Energy Resources Conservation and Development Commission Staff (Staff) submitted Staff's Analysis and Recommendation Regarding the Requested Extension of the Deadline for Commencement of Construction (Title 20, Section 1720.3), Docket No. 02-AFC-1C for the proposed Blythe Energy Project, Phase II. Staff's conclusion is that it neither supports nor opposes the petition to extend the deadline to commence construction of Blythe II. Staff's analysis centered on determining whether there was good cause for granting an extension. In its assessment, Staff focused on the following three factors:

1. Caithness Blythe II, LLC's diligence in its attempts to begin construction of Blythe II
2. Whether factors outside of Caithness Blythe II LLC's control have prevented construction of the project
3. A comparison of the amount of time and resources that would have to be spent in processing any required amendments to the project if the extension is granted versus the amount of time and resources that would be spent in processing a new Application for Certification (AFC) if the extension were denied

Staff concludes that with regard to diligence, "...the project owner remains committed to continue its efforts to develop the project, and has undertaken certain activities to this end. Staff appreciates that the project owner continues in its desire to construct and operate Blythe II, and believes the project owner should be allowed the opportunity to address the Commission in this regard."

With regard to factors outside Caithness Blythe II, LLC's control that have prevented the start of construction, Staff concluded that the interconnection agreement process delays were not entirely unforeseen or out of the control of Caithness Blythe II, LLC. But Staff also states, "However, the project owner remains committed to continue its efforts to develop the project, and has undertaken certain activities to this end..."

Caithness Blythe II, LLC counters the Staff conclusion that the interconnection

agreement process delays were not entirely unforeseen or out of the control of Caithness Blythe II, LLC. To the contrary, Caithness Blythe II, LLC points out that the delays began with performance of the System Impact Study (SIS) and its significant delays in meeting the CAISO tariff's interconnection procedures and schedule requirement (in place at that time) due in significant part to the ongoing development and planning of the Palo Verde-Devers #2 (PVD2) transmission line. Caithness Blythe II, LLC submitted its Interconnection Request with a full understanding that the tariff bound schedule would be adhered to. The SIS was not completed until literally years following the tariff prescribed date. Further, the continuous morphing of the PVD2 line (while not traversing to Palo Verde) and the significant solar Interconnection Requests in the East Riverside region underscored the state of flux of the Colorado River Substation (*aka* Midpoint). In particular, the substation's location and size due to permitting and the number of Interconnection Request was a driver of change to the LGIA. Caithness Blythe II, LLC notes that it did indeed execute an LGIA in 2009, along with the CAISO, that had been developed (Appendices to the pro forma) by SCE. SCE subsequently pulled the LGIA prior to their execution (as part of a 3-party agreement) due to developments surrounding the Colorado River Substation. To-date, Caithness Blythe II, LLC awaits the latest LGIA to be tendered for execution (expected by January 2012).

With regard to time and resources required to process amendments to the project if an extension is granted, Staff states that significant Staff resources have gone into Blythe II and that Staff has a strong interest in ensuring that those projects that are licensed by the Energy Commission are constructed and operated according to terms and conditions of certification. In its analysis, Staff expressed the concern that Blythe II's location may limit its ability to support renewable generation operation outside of areas that require local capacity, and that energy produced from Blythe II will need to be transmitted to load centers making it unlikely utilities will look to sign contracts with fossil generators outside those load centers. Staff concludes that Blythe II's ability to be built under the terms and conditions of the Energy Commission's certification will be determined by Blythe II's ability to compete in the next RFO process. As such, this report describes operational and economic aspects that utilities seek in competitive solicitations for generating resources and the ability of Blythe II to provide those products, services and attributes. These characteristics include:

1. Operating Characteristics to Provide for Variable or Intermittent Generation Integration
2. Reliability Benefits to the Grid
3. Low Cost Energy Production
4. Transmission Utilization
5. Permitting Advantages Compared to In-Basin Generation

When constructed, Blythe II will likely be the fastest start, lowest heat rate, most efficient plant interconnected to the Southern California grid. The plant has been re-permitted

for multiple starts and stops per day, to allow it to meet the ramp up and ramp down demands of the daily markets. Blythe II stands to be highly competitive in any RFO that seeks to obtain a low cost, highly efficient, operationally flexible, state-of-the-art generation facility.

## **1. Operating Characteristics to Provide for Variable Generation Integration**

Staff asserts that because of its location on the grid, Blythe II is limited in its ability to support renewable energy generation. We respectfully disagree. The primary characteristics of dispatchable generation resources that can be effectively utilized to integrate large amounts of variable generation include:

1. Quick Start
2. Ability to Start and Shut Down Frequently
3. Fast Ramping
4. Large Operating/Regulating Range

These attributes are independent of a dispatchable generator's location on the grid. Ideally, dispatchable generation and operating reserves would be dispersed throughout the grid to provide for diversification. Currently, a majority of the CAISO's operating reserves are typically deployed from Northern California. Blythe II's ability to provide operating reserves and renewable integration capabilities in Southern California improve the CAISO's resource diversity and as a result, reliability.

Because Blythe II was studied as a fully deliverable resource under the CAISO's Large Generator Interconnection Process (LGIP), the CAISO ensures that the transmission system is able to accommodate Blythe II's energy and capacity production. Blythe II has a CAISO approved point of interconnection and has been declared fully deliverable. Blythe II does not need a long term point-to-point transmission reservation as it will be interconnected directly to the CAISO grid, which allows it to schedule directly into the CAISO markets. While imported regulation and operating reserves are subject to CAISO limitations on total imports, there is no limitation on the amount of regulation and operating reserve Blythe II can offer into the CAISO Markets other than its physical operating limits.

### Quick Start

During the morning and then again in the afternoon in the summer and evening in the fall and winter, the CAISO system has to respond to steep ramps that are caused by rapid load increases, which can be exacerbated when generation output from Variable Energy Resources (VERs) declines during that period. The morning ramp is especially challenging as the load in the early morning hours is the lowest of the day and as a result, a minimal number of generating resources are on-line in order to minimize the possibility of over-generation conditions. Quick start generation is valuable because it

allows generation to be paralleled to the grid quickly in order to meet rapidly increasing energy requirements without the need to produce unnecessary, non-economic energy during the low load periods. In addition, quick start capabilities are essential to respond to system emergencies.

Blythe II has been designed to minimize the amount of time required to fire and parallel to the grid. The reduced time required during the start-up period results in lower emissions during the short start-up period. The first 150 MW for each combustion turbine (total 300 MW) can be reached in 10 minutes on a warm or hot start. The start time for the more efficient combined cycle operation is reduced to approximately 60 minutes for “hot” and “warm” start conditions.

#### Ability to Start and Stop Frequently

Because of the uncertainty of variable generation, load forecasts and unit outages, generation resources that can start up and shut down with regularity are valuable to the grid. Rapid changes to system conditions require generators that can respond not only to signals to change generation when on-line, but also go off-line for periods when not needed, but then return to the grid again when needed. Blythe II is designed for hundreds of starts per year which provides the CAISO with flexibility needed to operate in an environment under rapidly changing conditions.

#### Fast Ramping

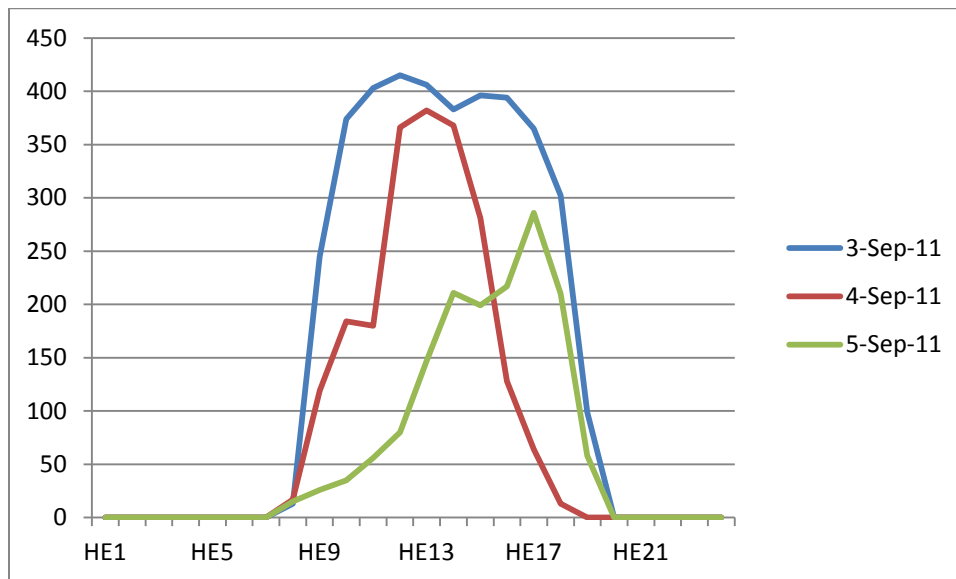
In response to an operational need for the ability to respond to rapidly changing fluctuations in load-generation balance on the grid, the CAISO engaged market participants in a Flexible Ramping Constraint stakeholder process. The result of the stakeholder process was the CAISO’s November 1, 2011 Straw Proposal for a Flexible Ramping product that specifies the requirements for the service and concepts for integrating the product in its markets. The straw proposal outlines the CAISO’s approach for generation resources to provide five minute ramping capabilities to allow for better system response to load fluctuations, variations in VER energy production, unexpected responses from generators to regulation signals and outages.

The CAISO observed that the current real-time unit commitment process (Real-Time Pre-Dispatch Process or RTPD) allows for market solutions that lack the capability to address rapid changes to the load-generation balance requirement. Inherent in the market solution is the lack of sufficient ramping capability and flexibility to meet conditions in the five-minute real-time dispatch (RTD), when conditions have changed from the assumptions made during the prior pre-dispatch. The flexible ramping products to be developed will target the discrepancies between the RTPD and RTD. Market Participants will be able to submit “flexible” ramping capabilities into the market, and the CAISO will optimize such offers to economically meet the anticipated ramping needs that will continue to increase as California makes progress toward its 33% renewable generation goal.

Blythe II is designed to ramp at 25 MW/minute nominally and 35 MW/minute under emergency conditions for each unit. Blythe II is ideally suited to provide the CAISO with fast ramping service. With over 3,500 MW of solar facilities with an LGIA or negotiating an LGIA and another 2,600 MW in the interconnection queue, vying to deliver energy to the Colorado River Station over the next 3 years, the grid will need significant fast ramping resources, such as Blythe II, to help offset significant amounts of generation that can fall off the grid as a result of cloud cover.

Figure 1 below is a graph of hourly solar generation within the CAISO over the course of a day for September 3-5, 2011 (data is from the CAISO’s Renewables Watch Reports on its website at <http://www.caiso.com/green/renewableswatch.html>).

Over the course of three summer days this past year, the CAISO’s aggregate solar generation varied widely. On September 3, except for a deviation in the afternoon, the generation profile is relatively smooth. On September 4, the amount of solar generation was reduced in the morning hours, did not reach the peak of September 3 and fell off early in the afternoon. September 5 saw even less generation all day and a significantly reduced peak compared to September 3 and 4.



**Figure 1**

Note that the CAISO’s solar output is roughly 400 MW for this period and the graph is for the entire CAISO. When additional solar facilities add capacity and are concentrated in a geographic area, variations in energy production will become more pronounced.

Rapid response generators such as Blythe II will become paramount to the CAISO's ability to respond to VER output fluctuations.

### Large Operating/Regulating Range

A generator that can operate over a wide range between its minimum output capability and its maximum output capability allows the CAISO to reduce the number of generating units it needs to call upon to provide regulation and ramping services. This reduces the cost to provide services and minimizes the amount of residual energy from generating resources. Blythe II has a number of different operating ranges depending upon operating configuration (i.e., number of combustion turbines operating). At its most efficient operating configuration, Blythe II has an operating range in excess of 450 MW. It ranges between its minimum operating point of 100 MW to its maximum nominal operating point of 569 MW.

## **2. Reliability Benefits to the Grid**

Blythe II will provide a number of reliability benefits for operation of the CAISO grid. Those benefits can be categorized as:

1. Ancillary Services and Resource adequacy Capacity
2. Response to System Disturbances and Providing Inertia to the Grid

### Ancillary Services and Resource Adequacy Capacity

Blythe II complements both grid reliability and VER resource integration. Blythe II will sign a CAISO Participating Generator Agreement (PGA) in the same manner as any other generator located within CAISO Balancing Authority (BA). All CAISO tariff provisions are applicable to all CAISO BA generators inclusive of BEP II. As such, once certified by the CAISO and tested, Blythe II will be able to provide the following ancillary services:

- Spinning Reserve
- Non-Spinning Reserve
- Regulation Up
- Regulation Down
- Voltage Control
- Fast Ramping Up (when implemented by the CAISO)
- Fast Ramping Down (when implemented by the CAISO)

Blythe II's interconnection to the grid was analyzed by the CAISO to allow for full deliverability under the CAISO LGIP. Accordingly, its energy and capacity are determined to be fully deliverable onto the CAISO's grid. As a fully deliverable resource, Blythe II will provide the CAISO with Resource Adequacy capacity on a system-wide basis.



Accordingly, CAISO system operators will have direct control to dispatch Blythe II for any reliability reason, including normal operation when Blythe II is providing reliability services such as operating reserves or regulation, or in the event of a system emergency whereby Blythe II will automatically respond to system disturbances and can be subsequently dispatched to operating levels as determined by CAISO system operators.

#### Response to System Disturbances and Providing Inertia to the Grid

In its July 6, 2011 Initial Straw Proposal titled “Renewables Integration Market Vision and Roadmap”, the CAISO states, “The ISO is concerned that as variable energy resources displace conventional generation, the system may not have sufficient inertia to maintain system frequency or enough governor response to stabilize system frequency following a grid disturbance.” As a result, the CAISO is investigating the need for market services to address the issue. Specifically, the CAISO proposed two additional products. They include:

1. Inertia - Ensures that the grid has sufficient spinning mass to damp frequency excursions
2. Frequency Response – Ensures that the grid has sufficient governor response to arrest frequency excursions prior to automatic regulation response

Blythe II provides these products. Given its location on the grid in the proximity of a large amount of solar generation that does not contribute rotating mass to the grid, Blythe II acts as a counterbalance to the photovoltaic generation in that location by providing rotating mass in the vicinity. Blythe II will automatically respond to high frequency by reducing its energy output or low frequency by increasing its energy output.

The proximity of Blythe II to PVWest, a major CAISO intertie with Arizona also provides reliability benefits when the intertie is derated in real-time. PVWest is comprised of two 500 kV lines, Palo Verde - Devers and Hassayampa - North Gila, with a cumulative Total Transfer Capability of 3,328 MWs. PVWest is a heavily utilized transmission path that allows for transfer of energy from Arizona into the CAISO. In the event of a system disturbance these tie lines may be derated in real time which limits the amount of energy that can be transferred from Arizona to California. In order mitigate this type of disturbance the CAISO needs fast reacting dispatchable resources that allow it to reduce the energy transfer from Arizona by increasing generation in its area while Arizona reduces generation in its area. Blythe II can be called upon to increase its generation and since it is in the vicinity of PVWest, its effectiveness in reducing flow on the transmission corridor is high. It is able to push back the energy flow into Arizona thereby assisting with alleviating congestion on the overloaded transmission path.

The Blythe region is one of the largest solar resource areas with multiple filings at the CEC currently under review, and over 2000 MW of solar power purchase agreements

under contract with utilities. The CAISO has proposed over \$2.5 billion in modifications to the Eastern Bulk System electrical grid to incorporate these resources. The Colorado River Substation, a key feature of the Desert Southwest Transmission Project, and now the current point of origination of the Devers II 500 kV line, is a major collection hub for the delivery of solar energy and Blythe II to the CAISO. Blythe II is a critical resource to the stability of the grid in the Eastern Bulk delivery area and a source of low cost highly efficient clean energy.

### **3. Low Cost Energy Production**

Although Blythe II will provide a number of services that facilitate renewable energy integration and provide the CAISO with tools to allow it to operate the grid in a reliable fashion, it should not be lost in the discussion that Blythe II is a state-of-the-art power plant developed to produce energy efficiently and cost effectively. Blythe II is a natural gas fired, combined cycle generation facility that is designed to generate electricity at a heat rate less than 6,000 Btu/kWh (LHV). At the current natural gas price of approximately \$4/MMBtu, that translates to a variable production cost of electricity of less than \$24/MWh. At \$5/MMBtu, the cost is less than \$30/MWh.

At that price, generation from Blythe II will displace more expensive, less efficient generation, thereby providing for cost-effective electricity generation that complements electricity generation from variable generation resources.

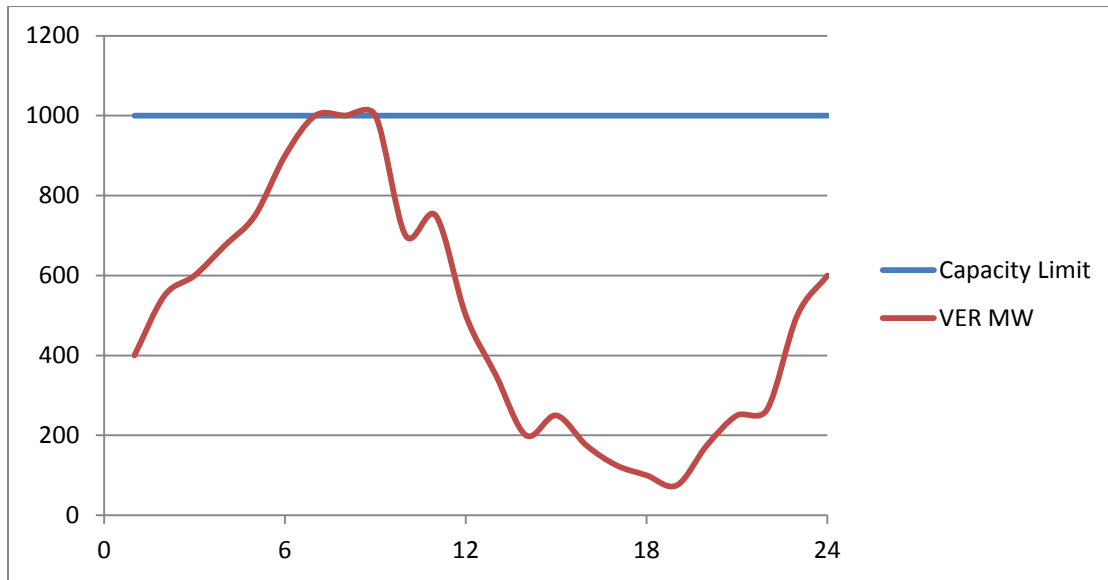
### **4. Transmission Utilization - Increased Capacity Factor**

Blythe II is to be located in SCE's Eastern Bulk system and the East Riverside CREZ, which is in the proximity of over 3,500 MW of proposed solar generation facilities (photovoltaic and solar thermal) that have either executed Large Generator Interconnection Agreements (LGIAs) or have LGIAs under negotiation. An additional 2,600 MW is in the Interconnection Study phase, totaling over 6,000 MW of renewable resources.

Energy dispatched from a highly flexible facility such as Blythe II complements energy production from VERs by producing energy when the VER production is reduced or deviates substantially from the its forward energy schedule, either over or under producing..

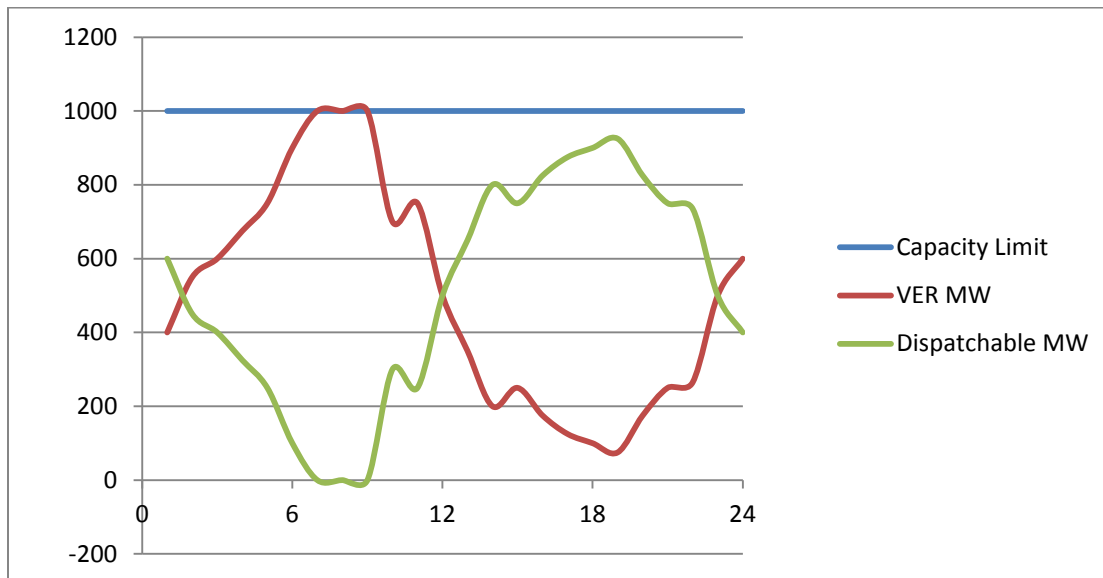
Transmission lines designed to transmit energy primarily from VERs will have a capacity consistent with the maximum expected output from the VERs. Because VERs in California operate at an annual capacity factor in the range of 25%-35%, the transmission lines will be under-utilized unless they can be supplemented with energy from other resources.

Figures 2 and 3 are graphs illustrating the concept. In Figure 2, the blue line represents the limit of the transmission line (1,000 MVA) and the red line, output of VERs over the course of a day (note that the illustrative VER generation profile more closely resembles that of wind as opposed to solar, but the concept is the same with solar). In the hours between 6 and 7 AM, VERs produce electricity at the transmission line's limit, but during other times of the day when VER energy production drops off, excess transmission capacity is available.



**Figure 2**

Figure 3 illustrates how a dispatchable generator could produce energy in conjunction with the VERs in order to maximize transmission utilization. When VER production is high, dispatchable generation is low and vice versa. The result is increased transmission utilization.



**Figure 3**

The CAISO recognized the issue of reduced transmission utilization with regard to interties and VER generation that seeks to utilize the interties via dynamic transfers from outside the CAISO. On page 14 of its May 2, 2011 Dynamic Transfers Final Proposal, the CAISO stated “Excessive (dynamic) scheduling for the purpose of obtaining flexibility for intermittent deliveries could also result in unused transmission capacity that could be used by other market participants.” As the use of dynamic transfers grows, the CAISO needs to avoid reducing the utilization of the CAISO’s import capacity. As a result, the CAISO has proposed to implement a means of modifying dynamic import schedules every 5 minutes throughout the operating hour, to allow for other resources with mid-hour dispatch capability, to be “incremented” to provide the necessary energy into the CAISO balancing authority. CAISO resources in close proximity to the interties, such as Blythe II are ideally situated to provide the needed energy when VER generation is less than forecast. This 5-minute dynamic scheduling functionality is intended to allow for more efficient use of limited transmission capacity.

Blythe II is well positioned to submit intra-hour energy bids into the real-time market to respond to CAISO market signals indicating system needs for balancing energy while enhancing transmission utilization to make up for VER production variability. Blythe II is especially valuable given its point of interconnection close to the interties and the increased use of dynamic transfers for import of VER energy, from adjacent balancing authorities into California.

## 5. Permitting Advantages Compared to In-Basin Generation

Environmental issues with in-basin resources make it difficult to replace those facilities in-kind. Local capacity benefits provided by in-basin resources are certainly desirable from an electrical reliability perspective. But that is often at conflict with the practicality of repowering, replacing or building generation facilities within load centers. .

Increasingly, California relies upon transmission to provide the requisite energy and ancillary services to support coastal load centers. As an example, the recent retirement of San Francisco's Potrero Power Plants, and the failure of project sponsors to secure permitting for re-powering the plant on this established generation site in the face of stiff community opposition, resulted in approval and construction of the Trans Bay DC Cable to allow for the load center to be served from generation outside the local area. The result was that transmission replaced the need for local generation. As coastal once-through cooling generation facilities are retired, it will be difficult to replace those facilities on a MW-for-MW basis. Other solutions will be required. While the Blythe II plant may not be able to provide local capacity benefits, this does not diminish the plant's ability to provide system reliability services, voltage support, respond to inertie emergency derates and follow VER load variations system-wide, in response to dispatch instructions from CAISO operators.

Specific to the CAISO's SP15 region, Blythe II will support deliveries of capacity, energy and ancillary services into the South Coast Basin without further degradation of the LA Basin air shed or need for South Coast Air Quality Management District (SCAQMD) Priority Reserve banked Emission Reduction Credits (ERCs). The SCAQMD has experienced a shortage of ERCs and due to ongoing lawsuits has been unable to allocate the use of ERCs contained within its Priority Reserve bank to power generation facilities located within its air basin. Blythe II, as modified, will be one of the few permitted power plants that can deliver the type of power Southern California needs to the South Coast Region without being affected by the current shortage of ERCs.

## Conclusion

Staff's position that it neither supports nor opposes Caithness Blythe II, LLC's petition to extend the deadline to commence construction of Blythe II is based on Staff's concern that Blythe II's location on the grid limits its ability to compete in the next RFO process. As a state-of-the-art facility, except for local capacity attributes in load pockets, Blythe II provides all the services and products that a load serving entity and CAISO would seek to obtain. As generation facilities in load centers are retired, other solutions such as transmission will be increasingly utilized as siting new or repowered power plants in densely populated load centers will continue to be a challenge.



The key components of a solicitation for generating facilities are economic production of energy and capacity and operational flexibility and responsiveness. Blythe II possesses those attributes and would be highly competitive in an RFO.