BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

In the Matter of the Application of San Diego Gas & Electric Company (U 902 E) for a Certificate of Public Convenience and Necessity for the Sunrise Powerlink Transmission Project.	))))))	Application 06-08-010 (Filed August 4, 2006)

PHASE 2 OPENING BRIEF OF THE CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION

Nancy Saracino, General Counsel
Judith B. Sanders, Senior Counsel
CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION
151 Blue Ravine Road
Folsom California 95630
Tel. (916) 351-4400
Fax. (916) 608-7296
Email: jsanders@caiso.com

Jeffrey P. Gray
DAVIS WRIGHT TREMAINE LLP
Suite 800
505 Montgomery Street
San Francisco, CA 94111-6533
Tel. (415) 276-6500
Fax. (415) 276-6599
Email: jeffgray@dwt.com

Attorneys for the CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION

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ACRONYMS FOR SUNRISE ALTERNATIVES

ASGA: In-Area All-Source Generation Alternative

ENRA: Enhanced Northern Route Alternative

ESNRA: Environmentally Superior Northern Route Alternative

ESSRA: Environmentally Superior Southern Alternative

LEAPS: Lake Elsinore Advanced Pumped Storage project

MSRA: Modified Southern Route Alternative

NPA: Aspen's No Project Alternative (DEIR/EIS)

RGA: In-Area Renewable Generation Alternative

TE/VS: Talega-Escondido/Valley-Serrano transmission project

SUMMARY OF RECOMMENDATIONS

The California Public Utilities Commission ("Commission") should grant San Diego Gas & Electric Company ("SDG&E") a Certificate of Public Convenience and Necessity for either the Sunrise Powerlink Transmission Project ("Sunrise") or SDG&E's Enhanced Northern Route Alternative ("ENRA") based on the following considerations:

- SDG&E is facing an impending resource deficiency and long-term reliability needs.
- Individually, Sunrise and the ENRA will increase SDG&E's import capability into its service area from 2850 MW to at least 4000 MW, thus enabling SDG&E to meet its resource deficiency and reliability needs.
- A conservative estimate of the net economic benefits of Sunrise and the ENRA are $145 million and $143 million per year (levelized) respectively and the net economic benefits for each could exceed $300 million per year.
- The California Independent System Operator Corporation ("CAISO") evaluated over 60 proposed alternatives to Sunrise and ran more than 80 models analyzing the reliability and economic impacts of these alternatives. Based on the CAISO's analysis, Sunrise and the ENRA provide superior long-term benefits relative to other alternatives evaluated in this proceeding.
- Sunrise and the ENRA facilitate SDG&E compliance with California's renewables portfolio standard requirements by providing access to renewable resources expected to be developed in the Salton Sea and other areas in the Imperial Valley.
- Sunrise and the ENRA provide options for future expansion of import capability and strategic interconnections between SDG&E and Southern California Edison.
- Sunrise and the ENRA provide much needed long-term improvement to California's aging transmission infrastructure.
- Sunrise and the ENRA will facilitate the replacement of old and inefficient power plants currently needed to ensure reliability in SDG&E's service area, many of which rely on once-through-cooling.
- Sunrise and the ENRA provide insurance against unexpected load growth and/or extreme weather conditions, such as the July 2006 heat storm experienced in Southern California.

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PHASE 2 OPENING BRIEF OF THE CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION

Pursuant to the December 11, 2007 ruling of Administrative Law Judge Weissman setting the schedule for Phase 2, the California Independent System Operator Corporation ("CAISO") submits its Phase 2 opening brief in support of California Public Utilities Commission ("Commission") approval of a Certificate of Public Convenience and Necessity ("CPCN") for the Sunrise Powerlink Transmission Project ("Sunrise" or "Proposed Project").

The Phase 2 record confirms that San Diego Gas & Electric Company ("SDG&E") is facing an impending resource deficiency and long-term reliability needs in its service area. Based on its extensive and comprehensive analysis, the CAISO has determined that either Sunrise or SDG&E's Enhanced Northern Route Alternative ("ENRA")[1] offers the best option for meeting SDG&E's long-term resource and reliability needs. Using conservative assumptions, each of these options produce significant net economic benefits, play a critical role in SDG&E meeting renewables portfolio standard ("RPS") requirements, and provide SDG&E with an "expandability" option to further increase its import capability through a strategic interconnection with Southern California Edison ("SCE"), should such an interconnection be

[1] The ENRA is similar to Sunrise with the route of certain segments modified to avoid the need for a new transmission corridor through the Anza Borrego Desert State Park. *See* SD-33 at 2.23-2.24.

needed in the future. For these and other reasons discussed herein and in the CAISO's Phase 1 briefs, the CAISO urges the Commission to grant a CPCN for either Sunrise or the ENRA.

I. INTRODUCTION

The demarcation point for the two phases in this proceeding was the issuance of the draft environmental impact report/environmental impact statement ("DEIR/EIS"). In Phase 1, prior to the issuance of the DEIR/EIS, the CAISO undertook a broad and systematic approach to its analysis of the need for Sunrise and the evaluation of potential alternatives to the project. As part of this process, the CAISO worked directly with intervenors, the Commission's Energy Division, and the Commission's environmental consultants (Aspen Environmental Group or "Aspen") evaluating more than 60 alternative scenarios to Sunrise and running more than 80 models analyzing the reliability and economic impacts associated with these alternatives.[2]

The DEIR/EIS presents an analysis of environmental impacts associated with Sunrise, 27 proposed alternatives to the project, and a No Project Alternative ("NPA"), ranking what it refers to as seven "environmentally superior alternatives."[3] In Phase 2, the CAISO evaluated these seven alternatives, the NPA, and several additional alternatives proposed by parties (but not specifically addressed as alternatives in the DEIR/EIS) for the purpose of determining which of these alternatives would best meet the three primary project objectives identified in the DEIR/EIS ("Primary Project Objectives"). The Primary Project Objectives identified in the DEIR/EIS are substantially the same as the objectives used by the CAISO to evaluate Sunrise and potential alternatives to Sunrise in Phase 1 (*i.e.*, the "three legged stool")[4] and consist of:

1. Maintaining reliability in the delivery of power to the San Diego region;
2. Reducing the cost of energy in the region (*i.e.*, net economic benefits); and

[2] *See* CAISO Phase 1 Opening Brief at 4.
[3] DEIR/EIS at ES-2 - ES-4. Sunrise is included in the list of environmentally superior alternatives.
[4] CAISOEx. I-1 at 6-7.

3. Accommodating the delivery of renewable energy to meet state renewable energy goals from geothermal and solar resources located in the Imperial Valley and wind and other resources located in San Diego County.[5]

In addition to the Primary Project Objectives identified in the DEIR/EIS, SDG&E has identified two potential expansion projects that could be connected to Sunrise facilities in the future. One of these projects – a 500 kV line connecting the SDG&E and SCE systems – would provide SDG&E with access to additional resources, help meet future reliability needs, and create a more robust transmission network in Southern California. From a transmission planning perspective, this "expandability" option provides significant long-term value and should be considered by the Commission in making a decision in this proceeding.

As part of Primary Project Objective 1 (maintaining reliability), the DEIR/EIS provides that a proposed alternative must result in an increase in transfer capability or the construction of new in-area generation resources sufficient to reduce the Local Capacity Requirement ("LCR") in the San Diego area by 1000 MW or, in combination with other resources, contribute to meeting the LCR by 1000 MW.[6] Accordingly, the CAISO's reliability analysis is based on the ability of a proposed alternative to reduce the San Diego area LCR by 1000 MW.

To evaluate specific reliability impacts and benefits of both Sunrise and alternatives to Sunrise, the CAISO performed power flow studies, transient stability studies, and post-transient studies.[7] For purposes of calculating net economic benefits, the CAISO used the Transmission Economic Assessment Methodology ("TEAM") approach to identify a resource plan that would minimize the expected electricity expenditures over the forecast period (*i.e.*, calculate net economic benefits) consistent with (i) CAISO and Western Electricity Coordinating Council

[5] CAISO Ex. I-8 at 2.
[6] DEIR/EIS at Ap.1-20; CAISO Ex. I-8 at 3; CAISO/Sparks, Tr. at 5415.
[7] CAISO Ex. I-1 at 12.

("WECC") reliability standards; and (ii) compliance with California's RPS targets of 20% by 2010 and 33% by 2020.[8]

To the best of the CAISO's knowledge, the scope and detail of the analysis it undertook in this proceeding to evaluate Sunrise and the numerous proposed alternatives to the project has been unprecedented. The results of the CAISO's studies and analysis have been documented in nearly 500 pages of testimony and been the subject of numerous stakeholder meetings and workshops. Based on its extensive analysis, the CAISO has identified a need for either Sunrise or the ENRA, and concluded that each of these alternatives provide greater net benefits than any other proposed alterative evaluated in this proceeding. In addition, Sunrise and the ENRA will increase access to much needed renewable resources, and provide an option for increasing the import capability into the San Diego area in the future through a 500 kV interconnection with the SCE system. Given that this combination of benefits cannot be matched by any of the other alternatives, the Commission should grant SDG&E a CPCN for either Sunrise or the ENRA.

A. Summary of Phase 1 Evidence

In Phase 1, the CAISO identified a long-term reliability need in the San Diego area beginning as early as 2010.[9] This need was determined by creating an analytical baseline which accounted for the California Energy Commission's ("CEC") May 2007 forecast of peak demand for 2008 (adjusted going forward based on historical load growth), demand reduction programs, new resource additions, and line losses.[10] The reliability need identified by the CAISO represents the amount of capacity that is needed for SDG&E to meet the CAISO's grid planning criteria.[11]

[8] CAISO Ex. I-1 at 14.
[9] CAISO Ex. I-6 at 39, Table 5.
[10] CAISO Ex. I-6 at 39.
[11] *See* CAISO Opening Brief at 21.

To determine the best and the most economic option to meet SDG&E's reliability need, the CAISO performed reliability and economic evaluations of various alternatives to Sunrise proposed by the parties, the Commission's Energy Division, and Aspen. The CAISO study process included the development of both a "base case" and a Sunrise case to which alternative scenarios were compared. In comparing the relative economic benefits of the base case, Sunrise, and proposed alternatives to Sunrise, the CAISO applied the TEAM methodology to calculate production cost (*i.e.*, energy) savings, reliability cost savings, and RPS benefits. The result of CAISO's economic analysis demonstrated that Sunrise provided the highest range of net economic benefits relative to the base case and project alternatives considered in Phase 1. Specifically, using conservative assumptions, the CAISO's Phase 1 economic analysis showed Sunrise producing levelized net benefits of at least $52 million per year and potentially reaching as high $226 million per year,[12] depending on the actual cost of certain renewable resources and the status of certain long transmission lines.[13]

Based on the Phase 1 record, the CAISO determined that, on a head-to-head basis, Sunrise provides greater net benefits than any of the proposed alternatives evaluated in Phase 1, is needed to address SDG&E's long-term reliability needs, will increase access to much needed renewable energy resources, and provides SDG&E with an expansion option that could be used to connect SDG&E to the SCE system and thereby provide access to additional resources that may be necessary to meet SDG&E's reliability needs in the future.

B. Summary of Phase 2 Evidence

1. Changes from Phase 1

Several modifications from Phase 1 were made by the CAISO in Phase 2 to update and capture changes to certain underlying assumptions and facts that were used by the CAISO in

[12] CAISO Ex. I-5 at 83 (Table 49).

evaluating its base case, Sunrise, and alternatives to Sunrise in Phase 2. Changes were also made in light of information provided in the DEIR/EIS. The key changes made by the CAISO in Phase 2 include (a) accounting for a 1150 MW dispatch limit for generation connected to the Imperial Valley ("IV") substation or the IV-Miguel portion of the Southwest Powerlink ("SWPL"); (b) the use of phase shifters on the proposed Talega-Escondido/Valley-Serrano ("TE/VS") transmission line;[14] (c) an increase in the representative cost of a simple cycle combustion turbine ("CT"); (d) revised in-service dates; and (e) updated cost information.

a. 1150 MW dispatch limit

In late 2007, a 1150 MW dispatch limit was established for all generation connected to the IV substation or the IV-Miguel portion of SWPL.[15] The need for the dispatch limit was discovered during an interconnection study conducted as part of the CAISO's large generator interconnection procedures.[16] Specifically, the interconnection study revealed a dramatic increase in risk to the electrical system operated by Comision Federal de Electridad ("CFE") as generation is added to the IV substation above 1150 MW.[17] CFE is currently unwilling to accept this increased risk to its system[18] and, as a result, a joint decision was made by the CAISO, SDG&E, and CFE to establish the dispatch limit.[19]

Implementation of the dispatch limit means that any generation connected to the IV substation or the IV-Miguel portion of SWPL above 1150 MW is not "deliverable" to San Diego

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[13] CAISO Ex. I-6 at 43-45.
[14] TE/VS consists of a new transmission line that would intersect an existing line segment between SCE's Valley and Serrano substations and intersect an existing line segment between SDG&E's Talega and Escondido substations at the northern boundary of the SDG&E transmission system. *See* TNHC Ex. N-1 at 2.
[15] CAISO/Sparks, Tr. at 5308; CAISO Ex. I-8 at 22-23; CAISO Ex. I-9 at 7.
[16] CAISO/Sparks, Tr. at 5308
[17] CAISO/Sparks, Tr. at 5322. As an "affected system," CFE participated in the interconnection study process. *See* CAISO/Sparks Tr. at 5311, 5320.
[18] CAISO/Sparks Tr. at 5322, 5325-26.
[19] CAISO/Sparks Tr. at 5308-09.

for Resource Adequacy ("RA") and RPS compliance purposes.[20] Currently, there is approximately 1070 MW of generation connected to the IV substation. Thus, no more that 80 MW of new generation connected at the IV substation or the IV-Miguel portion of SWPL can be counted by SDG&E for RA and RPS purposes absent the addition of a redundant electrical path, such as Sunrise or the ENRA, from the IV substation directly to the San Diego load pocket.[21] As discussed below, the 1150 MW dispatch limit prevents several potential alternatives to Sunrise from meeting the Primary Project Objectives identified in the DEIR/EIS related to reliability and the delivery of renewable energy.

b. Use of phase shifters on TE/VS

In its Phase 1 reliability analysis, the CAISO calculated the reliability benefits of TE/VS (alone and in combination with the Lake Elsinore Advanced Pumped Storage ("LEAPS") project) on the basis that TE/VS would reduce LCR by 500 MW in the San Diego area. After the conclusion of Phase 1, the Commission's Energy Division asked the CAISO re-evaluate the ability of TE/VS to reduce the San Diego area LCR taking into account the operation of phase shifters.[22] Based on power flow studies with phase shifters set to force the TE/VS line flow to 1000 MW, the CAISO determined that TE/VS could reduce the San Diego area LCR by up to 625 MW.[23] As a result, the CAISO's Phase 2 economic analysis for all alternatives involving TE/VS was updated to include the 625 MW LCR reduction capability. As discussed below, this increase in the reduction is San Diego area LCR still does not bring TE/VS to the level of Sunrise in terms of reliability benefits nor does it result in the TE/VS or the TE/VS + LEAPS alternative having greater net economic benefits than either Sunrise or the ENRA.[24]

[20] CAISO Ex. I-9 at 4.
[21] CAISO Ex. I-9 at 8.
[22] CAISO Ex. I-8 at 14-15.
[23] CAISO Ex. I-8 at 15.
[24] *See* CAISO Ex. I-13 at 22 (Phase 2 Rebuttal Table 1).

c. Increase in representative CT costs

In its Phase 1 economic analysis, the CAISO used a representative CT cost of $78/kW per year ($2006) for purposes of calculating costs associated with its base case and determining the relative benefits of Sunrise and alternatives to Sunrise.[25] The $78/kW per year cost was based on a 2003 CEC report entitled "Comparative Cost of California Central Station Electricity Generating Technologies." In December 2007, after the conclusion of Phase 1, the CEC issued an updated report with new cost information for CTs.[26] For purposes of its Phase 2 economic analysis, the CAISO used the average total fixed cost for CTs of $162.10/kW per year based on information provided in the CEC's December 2007 report.

CEC December 2007 Report - CT Costs ($2007)[27]

Ownership	Capital & Finance Costs ($/kW-yr)	Other Fixed Costs ($/kW-yr)	Total Fixed Cost ($/kW-yr)
Independent power producer	$ 145.30	$ 78.71	$ 224.01
Investor-owned utility	$ 112.91	$ 51.64	$ 164.55
Publicly-owned utility	$ 64.98	$ 32.76	$ 97.74
Average	**$ 107.73**	**$ 54.37**	**$ 162.10**

As shown below, applying the updated CT costs results in an increase in the range of total levelized benefits from the CAISO's in Phase 1 analysis.

Increase from Phase 1 in Total Levelized Benefits from Updated CT Costs ($M/yr)[28]

	RPS Base Case	RPS Alt Case
Sunrise	$119	$120
South Bay	$69	$69
TE/VS + LEAPS	$58	$58
TE/VS	$12	$12
TE/VS + LEAPS + Green Path North	$124	$124
TE/VS + Green Path North	$84	$85

[25] *See* CAISO Ex. I-2 at 24.
[26] CAISO/Orans Tr. at 5538-39.
[27] CAISO Ex. I-12 at 7 (Phase 2 Table 3).
[28] CAISO Ex. I-12 at 8-9.

It is important to note that the CAISO confirmed the reasonableness of the updated CT costs through an independent assessment of market information.[29] Moreover, even though the CT costs used in the CAISO's Phase 2 analysis have increased, these costs are still lower than the contract prices recently paid for capacity by SCE and approved by the Commission.[30] Accordingly, the increased CT costs used in the CAISO's Phase 2 economic analysis provide a more accurate but still conservative reflection of current market conditions and, as a result, it is appropriate to use the updated cost information to evaluate the benefits of Sunrise and the alternative to Sunrise in this proceeding.

d. Revised in-service dates

For purposes of its Phase 2 reliability and economic analysis, the CAISO revised the in-service dates for Sunrise (to 2011), Green Path North (2011), and TE/VS (to 2012), and used a 2012 in-service date for the Environmentally Superior Northern Route Alternative ("ESNRA")[31] and the Environmentally Superior Southern Route Alternative ("ESSRA")[32] based on information provided to the CAISO by SDG&E.[33] The revised in-service dates resulted in a reduction in the total levelized benefits for each alternative analyzed by the CAISO in Phase 2.[34]

e. Updated project cost information

Project cost information for Sunrise and certain of the alternatives to Sunrise was updated based on new cost information provided to the CAISO by SDG&E. In addition, to better ensure an apples-to-apples comparison of alternatives, inputs used to calculate annual levelized costs

[29] CAISO/Orans Tr. at 5541.
[30] CAISO Ex. I-12 at 6-7
[31] The DEIR/EIS describes the ESNRA as including portions of the Sunrise route with ceratin segments replaced and the additional undergrounding of facilities. DEIR/EIS at E-3. One notable aspect of the ESNRA is that it does not include the proposed new Central East substation, but rather would locate the 500/230kV transformers that would have otherwise been located at the Central East substation to the San Felipe substation.
[32] The DEIR/EIS describes the ESSRA as the Interstate 8 ("I-8") Alternative with Modified Route D Alternative. DEIR/EIS at E-3 One notable aspect of the ESSRA is that this alternative shares a common corridor with SWPL for approximately 36 miles. CAISO Ex. I-8 at 19.
[33] CAISO Ex. I-12 at 9.
[34] CAISO Ex. I-12 at 10-11.

were revised for Sunrise and the alternatives to account for changes made by SDG&E to the levelization term, Weighted Average Cost of Capital ("WACC"), Revenue Requirement Multiplier , and Levelization Factor .[35]

2. Demand Forecast

In October 2007, the CEC published an updated long-term demand forecast which indicated lower demand for SDG&E than assumed in the CAISO's Phase 1 LCR analysis. In Phase 2, the CAISO did not specifically update its Phase 1 LCR analysis to include the updated CEC demand forecast but did evaluate the effect the updated forecast would have on the CAISO LCR and economic analyses. With respect to the San Diego area LCR, the CAISO determined that, notwithstanding a lower long-term forecast from the CEC, a resource deficiency still exits in the San Diego area.[36] In addition, the lower forecast had "relatively minor" impacts on the CAISO's economic analysis.[37]

3. Reliability

As noted above, the CAISO's reliability analysis is based on the ability of a proposed alternative to reduce the San Diego area LCR by 1000 MW. Based on its reliability analysis, as updated in Phase 2, the CAISO has determined that Sunrise, the ENRA, and the ESNRA will reduce the SDG&E area LCR by 1000 MW. In contrast, because the ESSRA, Modified Southern Route Alternative ("MSRA"),[38] and UCAN Southern Route Alternative[39] would each share a common corridor with SWPL for approximately 36 miles, these alternatives result in a

[35] CAISO Ex. I-13 at 23; *see also infra* Table 2 showing "Changes to Phase 1 Economic Analysis."
[36] CAISO/Sparks, Tr. at 5418.
[37] CAISO/Orans Tr. at 5541.
[38] SDG&E proposed the MSRA in its Phase 2 direct testimony as a means for mitigating direct environmental impacts to the Cleveland National Forest lands currently designated as Back Country Non-Motorized Zone and avoiding Native American reservations located along the ESSRA. Similar to the ESSRA, the MSRA would share a common corridor with SWPL for approximately 36 miles.
[39] The UCAN Southern Route Alternative was proposed in the Utility Consumer Action Network's Phase 2 direct testimony. The route for this alternative begins at the IV substation and follows the I-8 Alternative route for 40 miles. . Similar to the ESSRA and MSRA, the UCAN Southern Route Alternative would share a common corridor with SWPL for approximately 36 miles.

WECC Category C contingency (or common mode failure risk) that would require a remedial action scheme designed to drop up to 1000 MW of load in the San Diego area and trip up to 2000 MW of generation in the Imperial Valley.[40] Thus, the ESSRA, MSRA, and UCAN Southern Route Alternative create a significant risk of load shedding that is not present under Sunrise or the ENRA. In light of the required remedial action scheme, the CAISO concludes that these alternatives do not provide the same level of reliability provided by Sunrise, the ENRA, or the ESNRA.

Furthermore, as discussed below, based on information provided in the DEIR/EIS regarding the development status of the various generation projects which make-up the In-Area All-Source Generation Alternative ("ASGA")[41] and In-Area Renewable Generation Alternative ('RGA"),[42] it is highly unlikely that these resources would come on-line when needed, much less by the dates assumed in the DEIR/EIS. Accordingly, the CAISO concludes that it is neither reasonable nor prudent to expect that either the ASGA or RGA projects will be available to meet SDG&E's resource deficiency and reliability needs. As a result, the Commission should not consider these alternatives as providing the same reliability benefits as Sunrise, the ENRA, or the ESNRA.

4. Delivery of Renewable Energy

For the reasons discussed below, including the 1150 MW dispatch limit, TE/VS, and the two generation alternatives (*i.e,* the ASGA and RGA), and the NPA would likely provide significantly lower levels of renewable energy from the Imperial Valley and Salton Sea areas to

[40] CAISO Ex. I-8 at 19.
[41] The DEIR/EIS describes the ASGA as including approximately 1000 MW of in-area generation comprised of one base load combined cycle natural-gas fired power plant, four natural-gas fired peaking plants, and a combination of wind, solar photovoltaic, and biomass/biogas renewable generation facilities.
[42] The RGA consists of essentially the same renewable resources that the DEIR/EIS identifies for the renewable portion of the ASGA.

SDG&E customers relative to Sunrise, the ENRA, and other transmission alternatives directly connecting the IV substation to the San Diego load pocket.

5. Expansion Option

As discussed in Phase 1, and in the DEIR/EIS, Sunrise provides SDG&E with an expansion option that would provide a 500 kV connection between SDG&E and SCE. Connecting the SDG&E and SCE systems will improve the robustness of the transmission system in Southern California and provide SDG&E with access to additional resources to meet SDG&E's reliability needs in the future. This expansion option is associated with a new Central East substation that would only be constructed under Sunrise or the ENRA. Moreover, because a new Central East Substation is already a component of the Sunrise and ENRA plans of service, the expansion option is effectively *free*. While not quantifiable at this time, the expansion option provides significant long-term value to SDG&E - *at little cost* - and should be an important consideration for the Commission in evaluating Sunrise and the alternatives to Sunrise in this proceeding. Once Sunrise or the ENRA is built, the TE/VS and TE/VS + LEAPS alternatives could also facilitate a 500kV connection of the SDG&E and SCE systems.[43]

6. Economic Analysis

Based on conservative estimates, the CAISO's economic analysis shows that Sunrise, the ENRA, and the ESSRA produce, by far, the greatest amount of net economic benefits relative to the other alternatives analyzed by the CAISO in Phase 2.

[43] CAISO Ex. I-8 at 20.

Table 1: Levelized Net Benefits[44]

Alternative	Net Benefits	
	RPS Base Case	**RPS Alt Case**
Sunrise	$145	$318
ENRA	$143	$316
ESNRA	$13	$178
ESSRA	$155	$320
South Bay Replacement Project	$104	$104
TE/VS	$ (91)	$ (91)
TE/VS + LEAPS	$ (26)	$ (26)

However, notwithstanding that it produces marginally greater benefits than Sunrise and the ENRA, the ESSRA introduces significant reliability concerns as a result of sharing a common corridor with SWPL, creating an unacceptable risk of load shedding that is not present with the other two alternatives. Moreover, the ESSRA does not include a new Central East substation meaning that it does not provide the same low cost expansion option provided by Sunrise and the ENRA. For these reasons, the CAISO does not support approval of the ESSRA over either Sunrise or the ENRA, notwithstanding the additional net benefits provided by the ESSRA.

7. Comparison of Sunrise and Phase 2 Alternatives

The following table provides a comparison of Sunrise and the Phase 2 alternatives evaluated by the CAISO with respect to the Primary Project Objectives identified in the DEIR/EIS and the expandability option.

[44] CAISO Ex. I-13 at 22 (Phase 2 Rebuttal Table 1).

Table 2: Phase 2 Alternative Comparison

Alternative	Meets Reliability Needs	Net Economic Benefits	Facilitates Delivery of Renewable Energy	Provides Expandability Option
Sunrise	Yes	Yes	Yes	Yes
ENRA	Yes	Yes	Yes	Yes
ESNRA	Yes	Yes	Yes	No
ESSRA	No	Yes	Yes	No
MSRA	No	Unknown	Yes	No
UCAN Southern Route Alternative	No	Unknown	Yes	No
ASGA	No	Unknown	No	No
RGA	No	Unknown	No	No
TE/VS	No	No	No	Yes[45]
No Project Alternative	No	Unknown	No	No
UCAN No Action Alternative	No	Unknown	No	No

As Table 2 demonstrates, only Sunrise and the ENRA can reasonably be expected to meet all three of the Primary Project Objectives identified in the DEIR/EIS, as well as provide SDG&E with an expandability option to further increase its import capability should the need arise in the future.

II. PROCEDURAL HISTORY AND ISSUES

In its Phase 1 Opening Brief, the CAISO detailed its role in identifying SDG&E's reliability needs and evaluating ways to meet these needs.[46] The CAISO's involvement in this process predated SDG&E's filing of a CPCN for Sunrise by several years[47] and included several stakeholder processes that looked both at reliability needs in southern California in general (the STEP group) and specific projects, such as Sunrise, for meeting SDG&E's reliability needs in

[45] Specifically, the TE/VS alternative could facilitate the connection of the SDG&E and SCE systems.
[46] CAISO Opening Brief at 6-9.
[47] The CAISO began to analyze needed infrastructure additions to southern California, including a Sunrise "prototype" and the Lake Elsinore Advanced Pumped Storage project ("LEAPS") as part of its participation in the Southwest Transmission Expansion Plan ("STEP") group, which was formed in 2002. *See* CAISO Ex. I-6 at 7.

particular (the CSRTP group).[48] The CSRTP group concluded that Sunrise would meet SDG&E's reliability needs, provide net economic benefits, and facilitate compliance by SDG&E with RPS requirements.[49] In August 2006, the CAISO Board of Governors approved Sunrise affirming the conclusions reached by the CSRTP group and finding that Sunrise is a necessary and cost-effective upgrade to the transmission network that will also facilitate compliance with RPS requirements.[50]

Since 2006 the CAISO has continued to perform additional analysis of Sunrise and proposed alternatives to Sunrise, including conducting a comprehensive and independent assessment of the CSRTP process. As a result of its participation in this proceeding, the CAISO has made several modifications to the inputs and assumptions used in its models based information and input provided by the intervenors, the Commission's Energy Division, and the DEIR/EIS. The net result has been the creation of an independent and comprehensive record demonstrating the need for either Sunrise or the ENRA, and the significant net benefits to be realized from these projects.

III. THE PROPOSED PROJECT, ALTERNATIVES IN THE DEIR AND ROUTE ALTERNATIVES PROPOSED BY PARTIES

A. The Proposed Project

1. Scope and Plan of Service

SDG&E provides a detailed description of Sunrise in its Phase 2 initial testimony,[51] and similar details are included in the DEIR/EIS.[52] In general, Sunrise consists of new 500 kV and 230 kV transmission lines between the IV and Penasquitos substations, a proposed new Central

[48] In early 2006, the CAISO South Regional Transmission Plan Group ("CSRTP") was formed under the umbrella of the STEP group to specifically study Sunrise, along with transmission projects associated with Tehachapi wind development and the LEAPS project. CAISO Ex. I-1 at 6.
[49] CAISO Ex. I-1 at 6-7.
[50] SDG&E Ex. SD-5 at II-11.
[51] *See*, *e.g.,* SDG&E Ex. SD-33, Chapters 2 and 7.

East substation, and related facilities required to reliably operate the lines. Specifically, the Proposed Project includes:

- A new overhead single-circuit 500 kV transmission line, approximately 91.3 miles in length, beginning at the Imperial Valley substation and terminating at the new 500/230 kV Central East substation.
- A new double circuit 230 kV transmission line, approximately 45.3 miles in length, beginning at the new Central East substation and terminating at the existing Sycamore Canyon substation.
- A new single circuit 230 kV transmission line, approximately 13.4 miles in length, beginning at the existing Sycamore Canyon substation and terminating at the existing Penasquitos substation.
- Relocation of certain 69 kV and 92 kV transmission lines.
- Construction of the new Central East substation and modification of the Imperial Valley, Sycamore Canyon and Penasquitos substations.
- Other system upgrades, such as reconductoring the existing 69 kV overhead transmission line from the existing Sycamore Canyon substation to the existing Elliott substation and modification of the San Luis Rey and South Bay substations.[53]

SDG&E has divided the proposed route for Sunrise into four "links" according to geographic area: the Desert Link, Central Link, Inland Valley Link and Coastal Link.[54] In addition, SDG&E has identified two potential expansion projects that could be connected to Sunrise facilities in the future. These projects, which would require separate Commission approval, consist of (1) the addition of four 230 kV circuits (two circuits of which could be added within 10 years of Sunrise going into service); and (2) a 500 kV circuit connecting SDG&E's proposed Central East substation to SCE's existing Serrano-Valley 500kV line in Riverside County.[55] As discussed above, the 500 kV circuit connecting SDG&E to SCE, would

[52] *See*, *e.g.*, DEIR/EIS Section B. The route and location of the Proposed Project is contained in DEIR/EIS Figure B-1.
[53] SDG&E Ex. SD-33 at 2.2-2.4.
[54] SDG&E Ex. SD-33, 2.4-2.5. The DEIR/EIS further divided the Desert Link into the Imperial Valley Link and the Anza-Borrego Link, shown on DEIR/EIS Figure B-2.
[55] DEIR/EIS at B-5, B-31.

provide SDG&E with access to additional resources, help meet future reliability needs, and create a more robust transmission network in Southern California.

2. Feasibility of Obtaining Necessary Approvals and Construction

The CAISO is not specifically addressing this issue in its Phase 2 Opening Brief but reserves the right to reply to arguments raised by other parties.

3. Estimated Cost

For its Phase 2 economic analysis, the CAISO used an updated direct cost for Sunrise of $1,518 million ($2011).[56] In addition, the CAISO made the following changes to the methodology it used in its Phase 1 economic analysis to reflect updated information provided by SDG&E in Phase 2:

Table 3: Changes to Phase 1 Economic Analysis[57]

Category	Phase 1	Phase 2	Increase (Decrease)
Levelization Term	41 years	58 years	17 years
WACC	8.23%	7.81%	(0.42%)
Revenue Requirement Multiplier	1.68	1.41	(0.27)
Levelization Factor	8.6%	7.9%	(0.7%)

Using the above inputs, the CAISO calculated the levelized cost for Sunrise at $182.5 million ($2010), including mitigation, O&M, working capital and franchise fees and uncollectibles ("FFU"). This represents a $25.5 million increase from the CAISO's Phase 1 economic analysis.[58]

[56] CAISO Ex. I-13 at 23.
[57] CAISO Ex. I-13 at 23-24.
[58] The levelized Revenue Requirement for Sunrise in Phase 1 was $157 million ($2010).

4. Effect on System Reliability

Sunrise will reduce the LCR in the San Diego area by 1000 MW.[59] Accordingly, Sunrise meets the Primary Project Objective related to maintaining reliability in the delivery of power to the San Diego region.

5. Effect on "ability to deliver renewable energy to SDG&E customers."

Sunrise will facilitate the delivery of renewable energy to SDG&E customers from geothermal and solar resources located in the Imperial Valley and wind and other resources located in San Diego County.

6. Environmental Impacts

The CAISO is not specifically addressing this issue in its Phase 2 opening brief but reserves the right to reply to arguments raised by other parties.

7. Meets Project Objectives?

Sunrise meets all the Primary Project Objectives identified in the DEIR/EIS in that it will reduce the San Diego area LCR by 1000 MW, provide significant net economic benefits of between $145 million and $318 million, and accommodate the delivery of renewable energy to SDG&E customers to help meet RPS requirements. In addition, Sunrise provides SDG&E with an expansion option that would connect SDG&E to the SCE system, providing access to additional resources that could be used to meet reliability needs in the future. While not quantifiable at this time, the expansion option provides significant value to SDG&E.

B. SDG&E's Enhanced Northern Route

1. Scope and Plan of Service

SDG&E identified the ENRA in its Phase 2 direct testimony.[60] In general, the ENRA consists of the Sunrise route with certain segments modified to avoid the need for a new

[59] CAISO Ex. I-2 at 73.
[60] *See*, Ex. SD-33, Chapter 2 at 2.23-2.28.

transmission corridor through the Anza Borrego Desert State Park.[61] By staying within existing transmission corridor in the park, SDG&E asserts that the ENRA avoids lands that have been designated as wilderness.[62] In addition, similar to Sunrise, the ENRA includes a new Central East Substation that could be utilized as a connection point for a new 500kV transmission line between the SDG&E and SCE systems.

2. Feasibility of Obtaining Necessary Approvals and Construction

The CAISO is not specifically addressing this issue in its Phase 2 opening brief but reserves the right to reply to arguments raised by other parties.

3. Estimated Cost

For its Phase 2 economic analysis, the CAISO used a direct cost for the ENRA of $1,532 million ($2011) and mitigation Costs of $191 million ($2011). Using the same inputs noted above in Table 3, the CAISO calculated the levelized Revenue Requirement for the ENRA, including mitigation, O&M, working capital and FFU, at $183.7 million ($2010), or $192.9 million ($2011).[63]

4. Effect on System Reliability

The ENRA will reduce the LCR in the San Deigo area by 1000 MW providing the same level of reliability benefits as Sunrise.[64] Accordingly, the ENRA meets the Primary Project Objective related to maintaining reliability in the delivery of power to the San Diego region.

5. Effect on "ability to deliver renewable energy to SDG&E customers."

The ENRA has the same ability to deliver renewable energy to SDG&E customers as Sunrise.[65] Accordingly, the ENRA will facilitate the delivery of geothermal and solar resources located in the Imperial Valley and wind and other resources located in San Diego County.

[61] Ex. SD-33 at 2.23-2.24.
[62] Ex. SD-33 at 2.24.
[63] CAISO Ex. I-13 at 25.
[64] CAISO I-9 at 21.

6. Environmental Impacts

The CAISO is not specifically addressing this issue in its Phase 2 opening brief but reserves the right to reply to arguments raised by other parties.

7. Meets Project Objectives?

Similar to Sunrise, the ENRA meets all Primary Project Objectives identified in the DEIR/EIS. Specifically, the ENRA will reduce the San Diego area LCR by 1000 MW, provide significant net economic benefits of between $143 million and $316 million, and facilitate the delivery of renewable energy to SDG&E customers. In addition, given that the ENRA terminates at a new Central East substation, the ENRA would also provide SDG&E with an expansion option, providing additional long-term value.

C. Aspen's Environmentally Superior Northern Route Alternative

1. Scope and Plan of Service

The DEIR/EIS describes the ESNRA as the "Proposed Project (75 miles) plus 8 alternatives (64 miles) replacing proposed segments, with 85 miles overhead and 54 miles of underground 230 kV transmission line."[66] The CAISO understands the ESNRA to be the same as the Aspen 1 alternative analyzed by the CAISO in Phase 1.[67] One notable aspect of the ESNRA is that it does not include the proposed new Central East substation, moving the 500/230kV transformers that would have otherwise been located at the Central East substation to the San Felipe substation.[68]

2. Feasibility of Obtaining Necessary Approvals and Construction

The CAISO is not specifically addressing this issue in its Phase 2 opening brief but reserves the right to reply to arguments raised by other parties.

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[65] CAISO Ex. I-9 at 21.
[66] DEIR/EIS at ES-3
[67] CAISO Ex. I-8 at 18.
[68] CAISO Ex. I-5 at 78.

3. Estimated Cost

For its Phase 2 economic analysis, the CAISO used a direct cost for the ESNRA of $2,968 million ($2012). Using the same inputs noted above in Table 3, the CAISO calculated the levelized Revenue Requirement for the ESNRA, including mitigation, O&M, working capital and FFU, at $305.9 million ($2010).[69]

4. Effect on System Reliability

The ESNRA is comparable to the Aspen 1 alternative discussed in the CAISO Phase 1 testimony[70] and performs electrically similar to Sunrise for reliability purposes.[71] Accordingly, the ESNRA will reduce the LCR in the San Diego area by 1000 MW.

5. Effect on "ability to deliver renewable energy to SDG&E customers."

Similar to Sunrise and the ENRA, the ESNRA will facilitate the delivery of geothermal and solar resources located in the Imperial Valley, and wind and other resources located in San Diego County.

6. Environmental Impacts

The CAISO is not specifically addressing this issue in its Phase 2 opening brief but reserves the right to reply to arguments raised by other parties.

7. Meets Project Objectives?

The ESNRA technically meets the three Primary Project Objectives identified in the DEIR/EIS in that it will reduce the San Diego area LCR by 1000 MW, facilitate the delivery of renewable energy to SDG&E customers, and provide net economic benefits. However, due to the costs of undergrounding major segments of the 230 kV portion of the ESNRA, the net economic benefits are substantially lower than the net benefits to be realized from either Sunrise

[69] CAISO Ex. I-13 at 25.
[70] CAISO Ex. I-8 at 18; *see also* CAISO Ex. I-3 at 61-64; CAISO Ex. I-5 at 77-81
[71] CAISO Ex. I-8 at 18; *see also* CAISO Ex. I-3 at 61-64; CAISO Ex. I-5 at 77-81.

or the ENRA.[72] Furthermore, because the ESNRA does not include the new Central East substation, it does not provide the expansion option provided by Sunrise and the ENRA. In light of the significantly increased costs associated with undergrounding major segments of the ESNRA and the lack of the expansion option the CAISO has concluded that the ESNRA does not provide the same level of overall benefits as either Sunrise or the ENRA.

D. Aspen's Environmentally Superior Southern (SWPL) Alternative

1. Scope and Plan of Service

The DEIR/EIS describes the ESSRA as the Interstate 8 ("I-8") Alternative with Modified Route D Alternative (and three route options), consisting of 110 miles total (104 miles overhead; 5.9 miles underground).[73] The CAISO understands the ESSRA to be the same as the Aspen 10 alternative analyzed by the CAISO in Phase 1. One notable aspect of the ESSRA is that this alternative shares a common corridor with the Southwest Powerlink ("SWPL") for approximately 36 miles.[74]

2. Feasibility of Obtaining Necessary Approvals and Construction

The CAISO is not specifically addressing this issue in its Phase 2 opening brief but reserves the right to reply to arguments raised by other parties.

3. Estimated Cost

For its Phase 2 economic analysis, the CAISO used a direct cost for the ESSRA of $1,502 million ($2012) and a mitigation cost of $155 million ($2012). Using the same inputs noted above in Table 3, the CAISO calculated the levelized Revenue Requirement for the ESSRA, including mitigation, O&M, working capital and FFU, at $164.2 million ($2010).[75]

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[72] CAISO Ex. I-13 at 22, Phase 2 Rebuttal Table 1, line 15.
[73] DEIR/EIS at ES-3. SDG&E provides a detailed description of the ESSRA at SDG&E Ex. SD-33, Chapter 2, pages 2.39 to 2.41.
[74] CAISO Ex. I-8 at 19.
[75] CAISO Ex. I-13 at 24.

4. Effect on System Reliability

The ESSRA is comparable to the Aspen 10 alternative, described in the CAISO's Phase 1 testimony[76] and performs *electrically* similar to Sunrise. However, because the ESSRA shares a common corridor with SWPL for 36 miles, WECC has determined that this alternative creates reliability concerns.[77] Specifically, WECC has determined that the risk of a common corridor outage creates a Category C contingency that would require a remedial action scheme designed to trip up to 1000 MW of load in the San Diego area and up to 2000 MW of generation in the Imperial Valley.[78] As a result, the ESSRA presents a significant, and the CAISO believes unnecessary, risk of load shedding that would not be present with Sunrise, the ENRA, or the ESNRA. Accordingly, the CAISO has concluded that the ESSRA does not provide the same level of reliability as Sunrise or the ENRA.

5. Effect on "ability to deliver renewable energy to SDG&E customers."

Similar to the other transmission alternatives connected to the IV substation (*e.g.*, Sunrise, the ENRA and the ESNRA), the ESSRA will facilitate the delivery of geothermal and solar resources located in the Imperial Valley, and other resources located in San Diego County.

6. Environmental Impacts

The CAISO is not specifically addressing this issue in its Phase 2 opening brief but reserves the right to reply to arguments raised by other parties.

7. Meets Project Objectives?

The ESSRA only meets two of the three Primary Project Objectives identified in the DEIR/EIS. Specifically, it facilitates the delivery of renewable energy to SDG&E customers and would provide significant net economic benefits of between $155 million and $320 million.[79]

[76] CAISO Ex. I-8 at 18; *see* also CAISO Ex. I-3 at 61-64; CAISO Ex. I-5 at 77-81.
[77] CAISO Ex. I-8 at 19.
[78] CAISO Ex. I-8 at 19.
[79] CAISO Ex. I-13 at 22, Phase 2 Rebuttal Table 1, line 14.

However, because the ESSRA introduces a new Category C contingency as a result of sharing a common corridor with SWPL, it does not provide the same level of reliability as Sunrise or the ENRA. In addition, the ESSRA does not include a new Central East substation meaning that it does not provide an expansion option. For these reasons the ESSRA does not provide the same level of overall benefits as either Sunrise or the ENRA.

E. SDG&E's Modified Southern Route

1. Scope and Plan of Service

SDG&E proposed the MSRA in its Phase 2 direct testimony as a means for mitigating direct environmental impacts to the Cleveland National Forest lands currently designated as Back Country Non-Motorized Zone and avoiding Native American reservations located along the ESSRA.[80] Similar to the ESSRA, the MSRA would share a common corridor with SWPL for approximately 36 miles.[81] The CAISO did not study the MSRA in Phase 1, nor was the alternative reviewed for the purposes of drafting the CAISO Phase 2 testimony.

2. Feasibility of Obtaining Necessary Approvals and Construction

The CAISO is not specifically addressing this issue in its Phase 2 opening brief but reserves the right to reply to arguments raised by other parties.

3. Estimated Cost

The CAISO did not independently estimate the cost of the MSRA nor perform a cost analysis utilizing cost estimates developed by other parties. Accordingly, the CAISO has not determined the net economic benefits (if any) associated with this alternative.

4. Effect on System Reliability

SDG&E's testimony indicates that the MSRA would perform electrically similar to Sunrise, the ENRA and the ESNRA. Although the CAISO did not specifically study the effect

[80] SDG&E Ex. SD-33 at 2.42.
[81] SDG&E Ex. SD-33 at 6.18, footnote 16 and 6.19.

the MSRA would have on reliability, the MSRA presents the same reliability concerns as the ESSRA as a result of sharing a common corridor with SWPL.[82] Accordingly, the MSRA would be subject to 1000 MW of load shedding under the WECC-required remedial actions scheme. As a result, the MSRA does not provide the same level of reliability as Sunrise or the ENRA.

5. Effect on "ability to deliver renewable energy to SDG&E customers."

According to SDG&E, the MSRA will facilitate the delivery of renewable energy to SDG&E customers.[83] The CAISO has no basis to disagree with this conclusion.

6. Environmental Impacts

The CAISO is not specifically addressing this issue in its Phase 2 opening brief but reserves the right to reply to arguments raised by other parties.

7. Meets Project Objectives?

Based on its understanding of the MSRA, the CAISO has concluded that this alternative does not meet the Primary Project Objectives identified in the DEIR/EIS. Specifically, the MSRA introduces a Category C contingency as a result of sharing a common corridor with SWPL. Thus, the MSRA would be subject to the 1000 MW of load shedding under the WECC-required remedial action scheme. In addition, the MSRA does not include a new Central East substation. Accordingly it does not provide the expansion option provided by Sunrise and the ENRA. For these reasons, the MSRA does not provide the same level of overall benefits as either Sunrise or the ENRA.

F. UCAN's Southern Route

1. Scope and Plan of Service

UCAN proposed several southern routes for a transmission alternative to Sunrise in its Phase 2 direct testimony. These alternatives included a southern route which begins at the

[82] SDG&E Ex. SD-33 at 6.19 and 8.8.
[83] SDG&E Ex. SD-133 at 8.11.

Jacumba substation rather than the IV substation ("Jacumba Alternative") and a route that begins at the IV substation and follows the I-8 Alternative route for 40 miles ("UCAN Southern Route Alternative").[84] With respect to the Jacumba Alternative, UCAN asserts that the alternative could "save at least another 30 miles of 500 kV construction costs, and eliminate environmental impacts in Imperial County."[85] According to UCAN, this proposal would allow wind generation located in eastern San Diego and Mexico to be deliverable to San Diego and provide the same reliability benefits as Sunrise."[86] With regard to the UCAN Southern Route Alternative, the CAISO notes that this alternative suffers from the same flaw as the ESSRA and MSRA in that it would share a common corridor with SWPL for 36 miles.

2. Feasibility of Obtaining Necessary Approvals and Construction

The CAISO is not specifically addressing this issue in its Phase 2 opening brief but reserves the right to reply to arguments raised by other parties.

3. Estimated Cost

The CAISO understands that UCAN developed a cost estimate for the UCAN Southern Route Alternative[87] and that SDG&E has disputed the cost estimate.[88] The CAISO did not independently estimate the cost of the UCAN Southern Route Alternative nor perform a cost analysis utilizing cost estimates developed by other parties. Accordingly, the CAISO has not determined the net economic benefits (if any) associated with this alternative.

4. Effect on system reliability

With respect to the Jacumba Alternative, the CAISO has determined that this alternative would not provide the same reliability benefits as Sunrise or the ENRA. Specifically, the

[84] UCAN Ex. U-100 at 11-13.
[85] UCAN Ex. U- 100 at 11-13.
[86] UCAN Ex. U-100 at 11-13.
[87] UCAN Ex. 100 at 36.
[88] SDG&E Ex. SD-38 at 7.21.

Jacumba Alternative would not alleviate the 1150 MW dispatch limit current applicable to generation connected to the IV substation or the IV-Miguesl portion of SWPL.[89]

As noted above, the UCAN Southern Route Alternative presents the same reliability concern as the ESSPA and the MSRA as a result of sharing a common corridor with SWPL. Accordingly, the UCAN Southern Route Alternative would be subject to 1000 MW of load shedding under the WECC-required remedial action scheme. As a result, the UCAN Southern Route Alternative does not provide the same level of reliability as Sunrise or the ENRA.

5. Effect on "ability to deliver renewable energy to SDG&E customers."

Based on its understanding of the UCAN Southern Route Alternative, the CAISO believes this alternative would facilitate the delivery of renewable energy to SDG&E customers.

6. Environmental Impacts

The CAISO is not specifically addressing this issue in its Phase 2 opening brief but reserves the right to reply to arguments raised by other parties.

7. Meets Project Objectives?

Based on its understanding of the Jacumba Alternative and the UCAN Southern Route Alternative, the CAISO has concluded that neither alternative meets the Primary Project Objectives identified in the DEIR/EIS. Specifically the Jacumba Alternative does not alleviate the 1150 dispatch limit, and the UCAN Southern Route Alternative is subject to significant load shedding as a consequence of sharing a common corridor with SWPL. In addition, neither alternative includes a new Central East substation. Accordingly the new Jacumba Alternative and the UCAN Southern Route Alternative do not provide the expansion option provided by Sunrise and the ENRA. For these reasons, the Jacumba Alternative and the UCAN Southern

[89] CAISO Ex. I-9 at 9.

Route Alternative do not provide the same level of overall benefits as either Sunrise or the ENRA.

G. Aspen's In-Area, All-Source Generation Alternative

1. Scope and Description

The DEIR/EIS describes the ASGA as including approximately 1000 MW of in-area generation comprised of one base load combined cycle natural-gas fired power plant ("CCGT"), four natural-gas fired peaking plants, and a combination of wind, solar photovoltaic ("PV") and biomass/biogas renewable generation facilities.[90]

a. Base load generation

The DEIR/EIS identifies three CCGT projects within the San Diego area and assumes that one of these three projects can "feasibly be built by 2010."[91] The projects consist of:

- The South Bay Replacement Project (nominal capacity 620 MW);
- The San Diego Community Power Project being developed by ENPEX (nominal capacity 750 MW); and
- The Encina Power Plant Repowering (nominal capacity 540 MW).

Based on the assumption that one of these three projects will be built, the DEIR/EIS provides that "at least" 620 MW of "incremental firm on-peak [base load] capacity" can be expected by 2010 for purposes of meeting the resource deficiency and reliability need in SDG&E's service area.[92]

b. Peaking Generation

The DEIR/EIS identifies four peaking power plant projects within the San Diego area resulting from SDG&E's 2008 Peaker request for offers ("RFO") and assumes that all four of

[90] CAISO, Ex. I-8 at 3.
[91] DEIR/EIS at Ap.1-325.
[92] DEIR/EIS at Ap.1-326 (Table Ap.1-15).

these projects will be online in 2008.[93] The DEIR/EIS identifies these projects based on their respective locations:

- Miramar substation (49 MW);
- Pala substation (99 MW);
- Margarita substation (99 MW); and
- Borrego Springs substation (15 MW).[94]

Based on the assumption that these peaking power plants will be built, the DEIR/EIS provides that 250 MW of "incremental firm on-peak [new or expanded peaker] capacity" can be expected by 2010.[95] The DEIR/EIS, however, also identifies four other peaking projects that could be online by 2010 if the four specific peaker projects resulting from SDG&E's 2008 Peaker RFO are not fully developed or otherwise do not achieve 250 MW.[96]

c. Renewable Generation

The DEIR/EIS identifies a mix of renewable generation resources and assumes these resources will begin to come on-line by 2010 and be fully developed by 2016. These renewable resources consist of:

- Approximately 200 MW (nameplate) of wind power located in the Crestwood Summit/Boulevard area by 2010 with an additional 200 MW (nameplate) by 2016. For reliability accounting purposes, this equates to 48 MW by 2010 and an additional 48 MW by 2016.[97]
- Approximately 50 MW (both nameplate and for reliability accounting purposes) of biomass or landfill gas generation by 2010 with an additional 50 MW by 2016.[98]
- Approximately 210 MW (nameplate) of PV to be installed on unidentified residential and commercial buildings by 2010. For reliability accounting purposes, this equates to 105 MW by 2010, reduced to 84.5 MW by 2016.[99]

[93] *See* DEIR/EIS at C-78; Ap.1-335.
[94] DEIR/EIS at Ap.1-335 – 1-336.
[95] DEIR/EIS at Ap.1-326 (Table Ap.1-15).
[96] *See* DEIR/EIS at Ap.1-336 – 1-337.
[97] DEIR/EIS at Ap.1-312 (Table Ap.1-13); Ap.1-317 – 1-318.
[98] DEIR/EIS at Ap.1-312 (Table Ap.1-13); Ap.1-318 – 1-321.

- Approximately 300 MW (nameplate) of solar thermal to be developed near Borrego Springs by 2016. For reliability accounting purposes, this equates to 240 MW by 2016.[100]

Assuming *arguendo* that all of these resources are constructed within the time frames noted in the DEIR/EIS, nameplate capacity in the San Diego area would increase 460 MW by 2010 and 969 MW by 2016. For reliability accounting purposes, this equates to a 203 MW increase in 2010 and 520.5 MW increase in 2016.[101] However, as discussed in more detail below, key assumptions underlying this alternative are flawed.

2. Feasibility of Obtaining Necessary Approvals and Construction

a. Base Load Generation

There are significant questions regarding whether either the South Bay Replacement Project or the ENPEX project will be constructed as assumed in the DEIR/EIS. In addition, given that it is merely a repowering project, the Encina project will not provide the amount of net *incremental* capacity that the DEIR/EIS seems to assume the project will provide. Accordingly, it is not prudent to assume or otherwise rely upon these base load generation projects as being available to meet SDG&E's resource deficiency and reliability needs as assumed in the DEIR/EIS

(1) South Bay Replacement Project

By letter dated October 19, 2007 from the developer of the South Bay Replacement Project, the CAISO was notified that the developer was unable to secure site control for the project, had elected not to proceed with executing a Large Generator Interconnection Agreement, and was no longer pursuing development of the project.[102] As a result, the South Bay Replacement Project's interconnection request was removed from the CAISO's interconnection

[99] DEIR/EIS at Ap.1-312 (Table Ap.1-13); Ap.1-313 – 1-317.
[100] DEIR/EIS at Ap.1-312 (Table Ap.1-13); Ap. 1-317
[101] DEIR/EIS at Ap.1-312 (Table Ap.1-13).
[102] CAISO, Ex. I-8 at 4-5. A copy of the October 19 letter was attached to Exhibit I-8.

queue.[103] In addition, the DEIR/EIS notes that, in October 2007, an application for certification ("AFC") with the California Energy Commission ("CEC") was withdrawn for the project.[104] Thus, it appears unlikely at the present time that the South Bay Replacement Project will be built.

Moreover, given the time necessary to acquire site control (which, to date, the South Bay Replacement Project has not been able to acquire), obtain necessary regulatory approvals (which can take more than a year), and complete construction (which can take several years), it is not reasonable to assume that the South Bay Replacement Project can feasibly be built within the next several years, even if the project's developer immediately resumed development activities. Indeed, in recent long-term procurement decision, the Commission found that "*[s]even years* is a reasonable time to develop[, permit and construct] new generation and to avoid 'just-in-time' procurement."[105]

(2) ENPEX

The CAISO has several concerns with respect to the ENPEX project. As an initial matter, the DEIR/EIS notes that the development status of the project is unclear. Specifically, ENPEX has not submitted an AFC to the CEC[106] and thus, there is no indication that ENPEX is even moving forward with the development of the project at this time. Furthermore, for the CAISO's grid planning purposes, the CAISO only considers generation projects that are under construction when assessing the need for transmission system additions in 5 year planning cases and, for 10-year planning cases, only generation projects that are under construction or have received regulatory approval.[107] Because the ENPEX project has not received regulatory

[103] CAISO, Ex. I-8 at 5.
[104] DEIR/EIS at Ap.1-325, note 29.
[105] Decision 07-12-052, mimeo at 277 (Finding of Fact 40) (emphasis added).
[106] DEIR/EIS at Ap.1-332.
[107] CAISO, Ex. I-8 at 5-6. *See also* CAISO/Sparks, Tr. at 5389 (explaining that this standard is used to model generation "inside load pockets" for purposes of evaluating the need for new transmission. Accordingly, the

approval, for planning purposes the CAISO does not assume that the ENPEX project will be online within the next 5-10 years (2013 - 2018).

Furthermore, even if the CAISO's grid planning standards are ignored, there are significant questions regarding when the ENPEX project could be timely completed even if ENPEX were to submit an AFC for the project in the immediate future. Given the permitting and construction times for a CCGT project (*see* discussion above), it is unreasonable to expect that the ENPEX project could be constructed within the time period assumed in the DEIR/EIS. In addition, and perhaps more problematic, the City of Santee strongly opposes the ENPEX project,[108] which could further delay or perhaps prevent construction altogether.

(3) Encina

In contrast to the South Bay Replacement Project and the Enpex project, a decision from the CEC on an AFC for the Encina project is expected at any time.[109] The Encina project, however, is a repowering project, meaning that it will simply replace a portion of the existing capacity at the power plant (specifically, existing steam boiler Units 1, 2 and 3)[110] with new capacity. The net result will be an increase in capacity of only approximately 220 MW – not the entire 540 MW nameplate capacity for the project. In its Phase 1 needs analysis, the CAISO assumed that the existing Encina power plant (Net Qualified Capacity 960 MW) is *not* retired and, thus, is still operating and providing capacity needed to help meet the San Diego LCR.[111] As a result, the project would not result in a net 540 MW increase in available local generation capacity to meet SDG&E's LCR as assumed in the DEIR/EIS; it would only result in a net increase of approximately 220 MW.

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standard is not applied to generation outside a load packet that would be accessed by new transmission infrastructure.)

[108] City of Santee, Ex. Santee 1 at 1-2.

[109] *See* CAISO Ex. 1-8 at 6.

[110] DEIR/EIS at Ap.1-334.

[111] CAISO Ex. I-8 at 7.

b. Peaking Generation

As is the case with the base load generation assumptions made in the DEIR/EIS, the CAISO has significant concerns with respect to whether the peaking generation resources identified in the DEIR will provide sufficient incremental resources to meet the resource deficiency and reliability need in SDG&E's service territory.

For example, for purposes of its Phase 1 LCR analysis the CAISO assumed that 138 MW of the 198 MW of capacity the DEIR/EIS assumes for the peaker projects located at the Pala (99 MW) and Margarita (99 MW) substations were on-line in 2008.[112] Thus, at most, the Pala and Margarita projects would seem to contribute only an additional 50 MW of on-peak capacity above what the CAISO has already assumed for these projects in its Phase 1 analysis.

With respect to other peaker projects identified in the DEIR/EIS that could potentially make-up this shortfall, it is unclear whether any of these projects will actually be constructed. As the DEIR/EIS notes, no public information is available for the Kearney Mesa or the Escondido peaker expansion projects, and the CEC provides no information on the status of these projects.[113] The Chula Vista Peaker expansion project has filed an AFC with CEC but, without a power purchase agreement, it is unclear whether the project will be constructed. Accordingly, there is scant evidence to suggest that these peaker projects will be developed, much less whether they are going forward.

c. Renewable Generation

Given the challenges in developing large scale renewable energy projects *within San Diego* and the fact that some of the renewable projects identified in the DEIR/EIS do not have sites and/or are currently not being developed, it would be extremely risky to assume the

[112] *See* CAISO Ex. I-6 at 39 (Table 5).
[113] DEIR/EIS at Ap.1-336 – 1-337.

renewable generation projects identified in the DEIR/EIS will be constructed in the time frame identified in the DEIR/EIS.

For instance, with respect to solar thermal generation, the DEIR/EIS notes that to build 300 MW of solar thermal nameplate capacity approximately 1,500 acres of land would be needed in San Diego[114] and that no developers have identified sites in the Borrego Springs area that could accommodate such a large solar thermal project.[115] Even if such a large site could be found in the San Diego area, however, interconnecting such generation would require substantial additions or upgrades to the transmission infrastructure, including at least 40 miles of additions or upgrades from Borrego Springs to the closest existing 230 kV or 138 kV substation, as well as downstream upgrades beyond the existing 230 kV or 138 kV substation.[116]

The ability of potential in-area wind resources to provide incremental firm on-peak capacity as assumed in the DEIR/EIS is also problematic. The DEIR/EIS notes that 400 MW of wind generation would require *2,000 acres* of land in the San Diego area. This would seem to present significant, if not insurmountable, land acquisition and permitting challenges. Significant transmission infrastructure would also be needed to interconnect such new wind resources to the grid.

Furthermore, there are serious deliverability issues associated with any new wind generation in the Crestwood area. Specifically, the DEIR/EIS provides that the in-area wind generation component of the ASGA would require a new switchyard, a new 500 kV substation and a transmission line interconnecting the generation to SWPL.[117] Importantly, this proposed generation would be subject to the 1150 MW dispatch limit discussed above. Accordingly, even if the wind generation in the San Diego area interconnected at the new substation as envisioned

[114] DEIR/EIS at Ap.1-313.
[115] DEIR/EIS at Ap.1-312.
[116] CAISO Ex. 1-8 at 11.

in the DEIR/EIS, no more than 80 MW of the generation could be counted for RA purposes because any amount over 80 MW would cause the dispatch limit to be exceeded.

More than 26,649 residential and 85 commercial installations would need to occur each year in order to achieve the 210 MW of in-area solar PV nameplate capacity identified in the DEIR/EIS.[118] This represents *25,000* more residential and 36 more commercial installations each year than currently occur. Moreover, developing 210 MW of solar PV capacity would require approximately 500 workers per year installing individual PV systems throughout San Diego County over a three year period.[119] Given this massive undertaking, it is questionable whether the amount of solar PV assumed to be online by the DEIR/EIS in San Diego is achievable.

3. Estimated Cost

The CAISO did not specifically estimate the cost of the ASGA nor perform a cost analysis utilizing cost estimates developed by other parties. The CAISO, however, did perform an economic analysis assuming the South Bay Replacement Project is constructed. Using the same inputs noted above in Table 3, the CAISO calculated the levelized Revenue Requirement for the South Bay Replacement Project at $8.4 million ($2010).[120] Although the CAISO's "South Bay" case is not identical to the ASGA, the CAISO believes it serves as a useful proxy for evaluating the economic benefits associated with the ASGA.

4. Effect on System Reliability

The ASGA is designed to increase capacity in San Diego by 1000 MW. Thus, if the projects which make-up the ASGA were timely constructed, this alternative would provide SDG&E with reliability similar to that provided by Sunrise and the ENRA. However, as

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[117] DEIR/EIS at C-73.
[118] *See* DEIR/EIS at Ap.1-313.
[119] DEIR/EIS at Ap.1-313 – 1-317 (footnote omitted).

discussed above, based on the development status of the various ASGA projects, it is extremely unlikely that these projects would come on-line when needed, much less by the dates assumed in the DEIR/EIS. Accordingly, it is neither reasonable nor prudent to expect that the ASGA projects will be available to meet SDG&E's resource deficiency and reliability needs. As a result, the Commission should not view the ASGA as providing the same reliability benefits as Sunrise or the ENRA.

5. Effect on "ability to deliver renewable energy to SDG&E customers."

As discussed above, the renewable resource component of the ASGA would provide for the addition of 460 MW (nameplate) of in-area renewable generation by 2010 and 969 MW (nameplate) by 2016. For reliability accounting purposes, this equates to 203 MW in 2010 and 520.5 MW in 2016 – *assuming these resources are constructed, which is highly unlikely based on information contained in the DEIR/EIS.* Moreover, the ASGA would not address the current 1150 MW dispatch limit for renewable generation connected to the IV substation or the IV-Miguel portion of SWPL meaning that, under current conditions, no more than 80 MW of the wind generation identified in the DEIR/EIS will be deliverable. In contrast, both Sunrise and the ENRA would resolve the 1150 MW dispatch limit and provide for the delivery of renewable energy from the Imperial Valley to SDG&E customers.

6. Environmental Impacts

The CAISO is not specifically addressing this issue in its Phase 2 opening brief but reserves the right to reply to arguments raised by other parties.

7. Meets Project Objectives?

The ASGA does not meet the Primary Project Objectives identified in the DEIR/EIS. As discussed above, it is unlikely that the ASGA will contribute to the San Diego area LCR by 1000

[120] CAISO Ex. I-13 at 23.

MW, or deliver similar amounts of renewable energy to SDG&E customers as either Sunrise or the ENRA. In addition, the ASGA will not provide the expansion option provided by Sunrise and the ENRA. For these reasons the ASGA does not provide the same level of overall benefits as either Sunrise or the ENRA.

H. Aspen's In-Area Renewable Generation Alternative

1. Scope and Description

The RGA consists of essentially the same renewable resources that the DEIR/EIS identifies for the renewable portion of the ASGA.[121]

2. Feasibility of Obtaining Necessary Approvals and Construction

For the reasons discussed above with respect to the renewable portion of the ASGA, there is little evidence at this time to suggest that the renewable generation projects identified in the DEIR/EIS will be developed and constructed within the time frames identified in the DEIR/EIS.

3. Estimated Cost

The CAISO did not independently estimate the costs of the RGA nor perform a cost analysis utilizing cost estimates developed by other parties. Accordingly, the CAISO has not determined the net economic benefits (if any) associated with this alternative.

4. Effect on System Reliability

As discussed above, the in-area capacity associated with the RGA for reliability accounting purposes is significantly less than the 1000 MW reduction in the San Diego area LCR provided by either Sunrise or the ENRA. Thus, in order for the RGA to provide SDG&E with reliability similar to that provided by Sunrise and the ENRA, a significant amount of additional *new* renewable resources would have to be constructed in the San Diego area. However, given that it is highly unlikely that even the various RGA projects identified in the DEIR/EIS could

[121] CAISO Ex. I-8 at 12.

come on-line within the time frames assumed in the DEIR/EIS, it is unreasonable to assume that additional new renewable projects can be timely built. Accordingly, it is neither reasonable nor prudent to expect that the RGA projects will be available to meet SDG&E's resource deficiency and reliability needs. As a result, the Commission should not view the RGA as providing the same reliability benefits as Sunrise or the ENRA.

5. Effect on "ability to deliver renewable energy to SDG&E customers."

As the CAISO understands the RGA, for reliability accounting purposes this alternative would provide for the addition of 203 MW of in-area renewable generation by 2010 and 520.5 MW by 2016. Thus, assuming *arguendo* these resources can be constructed, which is highly unlikely based on information contained in the DEIR/EIS, the RGA would provide for significantly less renewable power than either Sunrise or the ENRA. Furthermore, the RGA would not address the current 1150 dispatch limit for renewable generation connected to the IV substation or the IV-Miguel portion of SWPL. Accordingly, the RGA would not have the same ability to deliver renewable energy from the to SDG&E customers as Sunrise or the ENRA.

6. Environmental Impacts

The CAISO is not specifically addressing this issue in its Phase 2 opening brief but reserves the right to reply to arguments raised by other parties.

7. Meets Project Objectives?

Similar to the ASGA, the RGA does not meet the Primary Project Objectives identified in the DEIR/EIS. As discussed above, it is unlikely that the RGA will contribute to meeting the San Diego area LCR by 1000 MW, or deliver similar amounts of renewable energy to SDG&E customers as either Sunrise or the ENRA. In addition, the RGA will not provide the expansion option provided by Sunrise and the ENRA. For these reasons, the RGA does not provide the same level of overall benefits as either Sunrise or the ENRA.

I. Aspen's LEAPS Transmission-Only Alternative

1. Scope and Description

The TE/VS and TE/VS + LEAPS alternatives were addressed in detail in testimony sponsored by The Nevada Hydro Company in both Phases 1 and 2.[122] As described in the DEIR/EIS, TE/VS consists of 32 miles of 500 kV transmission lines primarily on National Forest land in Riverside and Orange Counties, and 48 miles of upgraded 230 kV line in an existing corridor to accommodate the interconnection of a new 500 kV line and northern substation. The TE/VS alternative does not contemplate the LEAPS project. TE/VS + LEAPS includes the TE/VS project plus a new substation and switching station, powerhouse, pumping generation/turbines and reservoir associated with the LEAPS project.[123] The TE/VS and TE/VS + LEAPS alternatives were studied by the CAISO in Phase 1 and Phase 2.[124]

2. Feasibility of Obtaining Necessary Approvals and Construction

The CAISO is not specifically addressing this issue in its Phase 2 opening brief but reserves the right to reply to arguments raised by other parties.

3. Estimated Cost

For its Phase 2 economic analysis, the CAISO used a direct cost for TE/VS of $968 million ($2012) and a mitigation cost of $124 million ($2012). Using the same inputs noted above in Table 3, the CAISO calculated the levelized Revenue Requirement for TE/VS, including mitigation, O&M, working capital and FFU, at $110.5 million ($2010).[125]

4. Effect on System Reliability

As explained above, assuming the use of phase shifters set to force the TE/VS line flow to 1000 MW, power flow studies performed by the CAISO show that TE/VS could reduce the

[122] *See* TNHC Ex. N-1 at 2-3.
[123] DEIR/EIS ES-3; *see* also CAISO Ex. I-8 at 13.
[124] CAISO Ex. I-8 at 14.
[125] CAISO Ex. I-13 at 24.

San Diego area LCR by up to 625 MW,[126] an amount significantly less than the 1000 MW reduction that would be provided by either Sunrise or the ENRA. As a result, neither TE/VS not TE/VS + LEAPS provide the same level of reliability benefits as Sunrise or the ENRA.

5. Effect on "ability to deliver renewable energy to SDG&E customers."

The DEIR/EIS correctly acknowledges that neither TE/VS nor TE/VS + LEAPS fully meets the Primary Project Objective related to the delivery of renewable energy.[127] Specifically, the DEIR/EIS provides that these alternatives will only "partially" meet this objective because the ability of TE/VS to access renewable energy in the Imperial Valley and Salton Sea areas is dependent upon the completion of the Green Path North project, in conjunction with SCE's second Devers-Palo Verde 500 kV line ("DPV2").[128]

The conclusion that TE/VS will not provide access to renewable resources located in the Imperial Valley and Salton Sea areas is consistent with the CAISO's analysis in this proceeding. When TE/VS was studied by the CAISO on a stand-alone basis (or in combination with LEAPS), the renewable benefits were similar to the South Bay repowering scenario - an in-area generation alternative that provided no access to renewable resources located in the Imperial Valley and Salton Sea areas, and produced negative net benefits when compared to Sunrise.[129]

The DEIR/EIS incorrectly concludes that TE/VS could provide *indirect* access to renewable generation in the Imperial Valley and Salton Sea areas in combination with the DPV2 by allowing for "importation of low cost conventional generation from the Blythe area or the Palo Verde hub in Arizona, thereby freeing capacity on the existing Southwest Powerlink to

[126] The DEIR/EIS describes TE/VS as having a design capacity of 1,300 MW to 1,600 MW. Because no further explanation was provided, the CAISO assumes that the DEIR/EIS equates the design capacity of TE/VS with the ability of TE/VS to reduce LCR by 1000 MW. *See* DEIR/EIS at C-69; A.1-20. As the CAISO explained in its Phase 2 testimony, this is an incorrect assumption. *See* CAISO Ex. I-8 at 14.
[127] CAISO Ex. I-8 at 16.
[128] DEIR/EIS at Ap.1-258.
[129] CAISO Ex. I-8 at 16.

import renewable power from the Imperial Valley."[130] While this suggestion has surface appeal, the CAISO's power flow analysis shows that this would not be the case.[131] Accordingly, the CAISO has concluded that neither TE/VS nor TE/VS + LEAPS has the same ability to deliver renewable energy to SDG&E customers as either Sunrise or the ENRA.

6. Environmental Impacts

The CAISO is not specifically addressing this issue in its Phase 2 opening brief but reserves the right to reply to arguments raised by other parties.

7. Meets Project Objectives?

TE/VS and TE/VS + LEAPS does not meet the Primary Project Objectives identifies in the DEIR.EIS. As discussed above, TE/VS will not provide a 1000 MW reduction in the San Diego area nor access to renewable generation in the Imperial Valley and Salton Sea areas without the completion of Green Path North and DPV2. Furthermore, when compared to Sunrise and the ENRA, these alternatives have negative net benefits. For these reasons, TE/VS and TE/VS + LEAPS do not provide the same level of overall benefits as either Sunrise or the ENRA.[132]

J. Aspen's No Project Alternative

1. Scope and Description

The NPA purportedly represents a scenario that could occur if Sunrise is not approved. The precise elements of this alternative are not specifically identified in the DEIR/EIS but generally include a combination of demand-side actions (primarily increased solar PV, distributed generation, and energy efficiency) and supply-side generation and transmission

[130] DEIR/EIS at Ap. 1-258.
[131] CAISO Ex. I-8 at 17.
[132] This does not mean that TE/VS and TE/VS + LEAPS cannot provide certain operational benefits once Sunrise is in-service. Specifically TE/VS has the potential to provide a 500 kV connection between the SDG&E and SCE systems, meaning that the line could be utilized to realize the value of the expansion option discussed above. .CAISO Ex. I-8 at 20.

resources.[133] Essentially, the generation supply-side resources consist of the same resources that the DEIR/EIS identifies for the ASGA and RGA, although the DEIR/EIS does not specify the particular resources that make-up the NPA.[134] The transmission supply-side resources include TE/VS, Path 44 Upgrades and Mexico Light.[135]

The DEIR/EIS notes that "[t]he identification of a definite No Project Alternative is not possible, because specific certain consequences cannot be identified without undue speculation."[136] Nevertheless, the DEIR/EIS acknowledges, as it must, that "not all" of the projects which could conceivably be part of the NPA "would be required to replace the Proposed Project."[137] The lack of any specificity, with respect to the components of the NPA is problematic from an analytical point of view and makes it impossible to accurately describe the scope of the NPA.

2. Feasibility of Obtaining Necessary Approvals and Construction

The CAISO is not specifically addressing this issue in its Phase 2 Opening Brief but reserves the right to reply to arguments raised by other parties.

3. Estimated Cost

Given that the DEIR/EIS does not identify a definitive NPA, it is not possible to develop a cost estimate for this alternative that in any way could be deemed reasonable or otherwise relied upon for purposes of calculating the economics benefits (if any) of the NPA relative to Sunrise or the ENRA.

4. Effect on System Reliability

To the extent the NPA results in a 1000 MW contribution to meeting the San Diego area LCR, this alternative would technically provide the same reliability as Sunrise. However,

[133] DEIR/EIS at C-147 – C-152.
[134] DEIR/EIS at C-149 – C-150.
[135] DEIR/EIS at C-150 – C-152.
[136] DEIR/EIS at C-146.

because the DEIR/EIS does not identify a definite NPA, it is impossible to accurately evaluate the effect the NPA will have on the system reliability, much less determine whether the NPA provides a level of reliability similar to that provided by Sunrise or the ENRA. Indeed, the underlying reliability assumption in the DEIR/EIS with respect to the NPA is that, in the absence of Sunrise, SDG&E will have to do something to ensure reliability. This is, in effect, a game of reliability "chicken" based on a skewed notion that "no plan is a plan." It is neither prudent nor reasonable to assume that the correct pieces of the hypothetical NPA will simply fall into place to ensure system reliability is maintained.

Moreover, as discussed above, based on information in the DEIR/EIS regarding the development status of the resources the DEIR/EIS identifies for the ASGA and RGA, it is highly unlikely that the generation supply-side resources included in the NPA would come on-line when needed, much less by the dates assumed in the DEIR/EIS. In addition, with respect to the Path 44 Upgrades and Mexico Light transmission projects, the CAISO has already determined that both options cause reliability and economic concerns on the CAISO and CFE systems.[138] Thus, even assuming some mix of supply-side generation and transmission projects, it is unlikely that the NPA can meet system reliability needs. Accordingly, the Commission should not view the NPA as providing the same level of reliability benefits as Sunrise or ENRA.

5. Effect on "ability to deliver renewable energy to SDG&E customers."

Given that the precise resources that would make-up the NPA are not identified in the DEIR/EIS, it is difficult to determine to what extent the NPA will deliver renewable energy to SDG&E customers. Furthermore, the NPA would not address the current 1150 dispatch limit for renewable generation connected to the IV substation or the IV-Miguel portion of SWPL.

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[137] DEIR/EIS at C-146.
[138] *See e.g.*, CAISO Ex. I-6 at 54-57.

Accordingly, the CAISO has concluded that the NPA does not have the same ability to deliver renewable energy to SDG&E customers as either Sunrise or the ENRA.

6. Environmental Impacts

The CAISO is not specifically addressing this issue in its Phase 2 Opening Brief but reserves the right to reply to arguments raised by other parties.

7. Meets Project Objectives?

The NPA does not meet the Primary Project Objectives identified in the DEIR/EIS. As discussed above, it is unlikely that the NPA can provide the same reliability benefits as either Sunrise or the ENRA, or deliver similar amounts of renewable energy to SDG&E customers. In addition, the NPA would not provide the expandability option provided by Sunrise and the ENRA. For the reasons, the NPA does not provide the same level of overall benefits as either Sunrise or the ENRA.

K. RPCC's Coastal Link Alternative

The CAISO is not addressing this issue in its Phase 2 opening brief but reserves the right to reply to arguments raised by other parties.

L. UCAN's No Action Alternative

In reviewing the Phase 2 testimony submitted by the Utility Consumers Action Network ("UCAN"), it appears to the CAISO that the UCAN No Action Alternative is essentially the NPA. Specifically, as far as the CAISO can tell, the substance of UCAN's testimony on the "UCAN No Action Alternative" focuses on what UCAN asserts is an understatement of the potential benefits to be realized by the NPA as described in the DEIR/EIS- not on a different or unique alternative.[139] Accordingly, the CAISO's position on the UCAN No Action Alternative

[139] UCAN Ex. U-100 at 25-31.

is the same as the CAISO's position on the NPA.[140] That is, the UCAN No Action Alternative does not meet the Primary Project Objectives identified in the DEIR/EIS because it is unlikely it will provide the same reliability benefits as either Sunrise or the ENRA, or deliver similar amounts of renewable energy to SDG&E customers. In addition, the UCAN No Action Alternative would not provide the expandability option provided by Sunrise and the ENRA.

1. Scope and Description

See discussion of NPA above at Section III.J.1.

2. Feasibility of Obtaining Necessary Approvals and Construction

See discussion of NPA above at Section III.J.2.

3. Estimated Cost

See discussion of NPA above at Section III.J.3.

4. Effect on System Reliability

See discussion of NPA above at Section III.J.4.

5. Effect on "ability to deliver renewable energy to SDG&E customers."

See discussion of NPA above at Section III.J.5.

6. Environmental Impacts

See discussion of NPA above at Section III.J.6.

7. Meets Project Objectives?

See discussion of NPA above at Section III.J.7.

M. Other Party Alternatives

The CAISO is not addressing this issue in its Phase 2 opening brief but reserves the right to reply to arguments raised by other parties.

[140] To the extent that UCAN or other parties provide a discussion in their respective briefs that indicates that the UCAN No Action Alternative is a unique alternative, substantively different from the NPA, the CAISO reserves the right to address the UCAN No Action Alternative in its reply brief.

IV. MATERIAL FACTUAL INACCURACIES OR DEFICIENCIES IN THE DRAFT EIR/EIS

The CAISO's Phase 2 testimony specifically identifies factual inaccuracies and deficiencies in the DEIR/EIS associated with the alternatives to Sunrise evaluated in the DEIR/EIS. Many of these inaccuracies and deficiencies have been discussed in detail above. At a very high level, the CAISO has identified basic assumptions in the DEIR/EIS that are deficient - or simply wrong - with respect to the ability of the various alternatives to Sunrise to meet the three Primary Project Objectives.

V. THE ECONOMIC BENEFIT OF THE PROPOSED PROJECT, THE DEIR ALTERNATIVES, AND PARTY-PROPOSED ROUTE OPTIONS

A. Definition/description of baseline against which benefits for each alternative are compared

For purposes of comparing the relative net benefits of Sunrise and the alternatives to Sunrise, the CAISO developed a "base case" consisting of a combination of all existing generation capacity in the San Diego area (with the South Bay Power Plant assumed retired in 2010) and new CT capacity sufficient to meet San Diego's local capacity needs. The base case also includes an estimated cost of energy produced from a least cost dispatch of resources in the Western Interconnect and an amount of renewable resources consistent the Commission's most recent Energy Action Plan.

B. Cost of Baseline

For its Phase 2 economic analysis, the CAISO calculated the total levelized cost of its base case as $16,154 million ($2010), which includes total energy, reliability, and RPS procurement costs.[141] For comparison, Sunrise (including the cost of the line) would lower this cost to $16,009 million ($2010), resulting in a levelized net benefit for Sunrise of $145 million ($2010).

C. Net economic benefit of proposed project and alternatives relative to baseline (total NPV), consistent with "costs" in sections II.A-M.3

As described above, in Phase 2 several changes were made to the inputs used by the CAISO to calculate the levelized costs and benefits for Sunrise and alternatives to Sunrise evaluated in the DEIR/EIS. After accounting for these changes, the CAISO's fundamental conclusion from Phase 1 remains unchanged – Sunrise provides significant net benefits relative to the CAISO's base case. As shown in the table below, the CAISO estimates that the annual net benefits produced by Sunrise range from $145 million (under the RPS base case) to $318 million (under the RPS alternative case). In addition, the CAISO has determined that both the ENRA and ESSRA will produce net benefits comparable to Sunrise.

Annual Levelized Costs and Benefits[142]

Alternative	Transmission Cost ($M/yr)	Total Benefits		Net Benefits	
		RPS Base Case	RPS Alt Case	RPS Base Case	RPS Alt Case
Sunrise	$183	$327	$500	$145	$318
ENRA	$184	$327	$500	$143	$316
ESNRA	$306	$319	$484	$13	$178
ESSRA	$164	$319	$484	$155	$320
South Bay	$8	$112	$112	$104	$104
TE/VS	$111	$20	$20	$ (91)	$ (91)
TE/VS + LEAPS	$111	$85	$85	$ (26)	$ (26)

The respective net benefits produced by Sunrise, the ENRA, and the ESSRA are substantially more than the net benefits produced by the other alternatives to Sunrise. Accordingly, the Commission should look first to Sunrise, the ENRA, and the ESSRA as it considers the various options for meeting SDG&E's long-term resource and reliability needs. However, as discussed above, in light of reliability concerns related to the ESSRA, the ESSRA

[141] CAISO Phase 2 Rebuttal Workpapers, "CAISO3 SD&LA v5.xls", sheet "Summary", cell X84.
[142] CAISO Ex. I-13 at 22 (Phase 2 Rebuttal Table 1).

does not meet all of the Primary Project Objectives identified in the DEIR/EIS. For this reason, the Commission should approve either Sunrise or the ENRA.

VI. WILDFIRE CONSIDERATIONS

The CAISO is not addressing this issue in its Phase 2 opening brief but reserves the right to reply to arguments raised by other parties.

VII. COMPARISON OF THE PROPOSED PROJECT, THE DEIR ALTERNATIVES, AND PARTY-PROPOSED ROUTE OPTIONS

A. Ability to Provide System Reliability

The CAISO's reliability analysis demonstrates that only Sunrise, the ENRA, and the ESNRA are likely to satisfy Primary Project Objective 1 in the DEIR/EIS (maintaining reliability in the delivery of power to the San Diego region) by reducing the San Diego area LCR by 1000 MW.

B. Ability to Facilitate Renewable Energy

The CAISO's analysis shows that all of the transmission alternatives that connect the IV substation to the San Diego load pocket[143] will satisfy Primary Project Objective 3 in the DEIR/EIS by facilitating the delivery of geothermal and solar resources located in the Imperial Valley, and wind and other resources located in San Diego County to SDG&E customers.

C. Estimated Cost

The following table shows the estimated costs used by the CAISO to calculate net economic benefits in Phase 2:

Project Cost Estimates[144]

	Sunrise	South Bay	TE/VS	ESSRA	ESNRA	ENRA
Levelized Cost (2010 $M/yr)	**$182.5**	**$8.4**	**$110.5**	**$164.2**	**$305.9**	**$183.7**

[143] This includes Sunrise, the ENRA, ESNRA, ESSRA, MSRA, and the UCAN Southern Route Alternative.
[144] CAISO Ex. I-13 at 26 (Phase 2 Rebuttal Table 2).

The methodology for calculating the project costs for each of the alternatives in the table above is described above in Section II. The CAISO did not have cost information for the MSRA, UCAN Southern Route Alternative, ASGA,[145] or RGA. In addition, because the precise resources that would make-up the NPA and UCAN No Action Alternative are unknown, it was not possible for the CAISO to develop cost estimates for these two alternatives.

D. Ability to Provide an Economic Benefit

While all of the alternatives analyzed by the CAISO in Phase 2 - except TE/VS and TE/VS + LEAPS - would produce net economic benefits, the respective net benefits produced by Sunrise, the ENRA, and the ESSRA are substantially more than the net benefits produced by these other alternatives.

E. Feasibility of Obtaining Necessary Approvals and Construction

Other than the generation projects discussed above with respect to the ASGA and RGA, the CAISO has not specifically addressed this issue in its Phase 2 Opening Brief. The CAISO, however, reserves the right to reply to arguments raised by other parties.

F. Environmental Impact

The CAISO has not specifically addressed this issue in its Phase 2 opening brief but reserves the right to reply to arguments raised by other parties.

G. Expandability

As discussed above, only Sunrise and the ENRA provide SDG&E with an expansion option to further increase import capability in the future through a 500 kV connection between SDG&E and SCE. Connecting the SDG&E and SCE systems would provide SDG&E with access to additional resources, help meet future reliability needs, and create a more robust transmission system in Southern California. While a precise value of this expansion option is

[145] As noted above, the CAISO believes that "South Bay" can serve as a useful proxy for the ASGA.

not quantifiable at this time, the expansion option provides significant long-term value to SDG&E at literally no cost and should be an important factor in evaluating Sunrise and the alternatives to Sunrise in this proceeding.

VIII. EMF

The CAISO is not addressing this issue in its Phase 2 opening brief but reserves the right to reply to arguments raised by other parties.

IX. COST CAP

The CAISO addressed the cost cap issue in its Phase 1 Opening Brief.[146] Accordingly, it is not addressing the issue in its Phase 2 Opening Brief but reserves the right to reply to arguments raised by other parties.

X. OTHER

The CAISO is not addressing this issue in its Phase 2 opening brief but reserves the right to reply to arguments raised by other parties.

XI. CONCLUSION

The level of scrutiny applied to Sunrise in this proceeding has been unprecedented. The CAISO itself has participated in numerous stakeholder meetings and workshops, evaluated more than 60 alternative scenarios proposed by intervenors, the Commission's Energy Division, and Aspen, ran more than 80 models analyzing the reliability and economic impacts associated with these alternatives, and submitted nearly 500 pages of testimony detailing its findings and conclusions. Based on its extensive and comprehensive analysis, the CAISO has determined that either Sunrise or the ENRA offers the best option for meeting SDG&E's long-term resource and reliability needs. In addition, both of these options will produce significant net economic benefits, facilitate the delivery of renewable energy to SDG&E customers, and provide SDG&E

[146] *See* CAISO Phase 1 Opening Brief at 24-25.

with an expansion option that will provide access to additional resources, help meet future reliability needs, and create a more robust transmission system in Southern California. For the reasons discussed herein and in the CAISO's Phase 1 briefs, the CAISO urges the Commission to grant a CPCN for either Sunrise or the ENRA.

Respectfully submitted,

/s/ Jeffrey P. Gray

Nancy Saracino, General Counsel
Judith B. Sanders, Senior Counsel
CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION
151 Blue Ravine Road
Folsom California 95630
Tel. (916) 351-4400
Fax. (916) 608-7296
Email: jsanders@caiso.com

Jeffrey P. Gray
DAVIS WRIGHT TREMAINE LLP
Suite 800
505 Montgomery Street
San Francisco, CA 94111-6533
Tel. (415) 276-6500
Fax. (415) 276-6599
Email:jeffgray@dwt.com

Attorneys for the CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION

Dated: May 30, 2008

CERTIFICATE OF SERVICE

I, Judy Pau, certify:

I am employed in the City and County of San Francisco, California, am over eighteen years of age and am not a party to the within entitled cause. My business address is 505 Montgomery Street, Suite 800, San Francisco, California 94111.

On May 30, 2008, I caused the following to be served:

PHASE 2 OPENING BRIEF OF THE CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION

enclosed in a sealed envelope, by first class mail on the parties listed as "Appearance" and "State Service" on the attached service list who have not provided an electronic mail address, and via electronic mail to all parties on the service list who have provided the Commission with an electronic mail address.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct, and that this declaration was executed on the date above at San Francisco, California.

/s/ Judy Pau
Judy Pau

cc: Commissioner Dian M. Grueneich (via US Mail and email)
Commissioner Michael R. Peevey (via US Mail and email)
Commissioner John A. Bohn (via US Mail and email)
Commissioner Timothy Alan Simon (via US Mail and email)
Commissioner Rachelle Chong (via US Mail and email)
ALJ Steven A. Weissman (via US Mail and email)
Service List A. 06-08-010 (via US Mail or email)