

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 No. 06-08-010
Exhibit No.: _____

CHAPTER 2
PREPARED REBUTTAL TESTIMONY
OF SAN DIEGO GAS & ELECTRIC COMPANY
IN RESPONSE TO PHASE 2 TESTIMONY
OF THE DIVISION OF RATEPAYER ADVOCATES

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

March 28, 2008

TABLE OF CONTENTS

	Page
I. SUNRISE PROVIDES LONG-TERM NET GHG REDUCTIONS (Robert Anderson) ¹	2.1
A. Sunrise’s Long-Term GHG Reduction Outweighs Construction GHG Effects.....	2.1
B. SDG&E Will Have Sufficient Renewables under Contract to Support GHG Reduction (Michael McClenahan).....	2.5
II. THE GREATER IMPERIAL VALLEY-SAN DIEGO AREA LOCAL CAPACITY REQUIREMENT DOES NOT LIMIT, IN ANY WAY, THE VALUE OF SUNRISE IN REDUCING THE SAN DIEGO AREA LCR (Jan Strack).....	2.6
A. DRA Wrongly Excludes Mexicali Generation From Contributing Towards LCR.....	2.7
B. Mexicali Generation Will Be Available For Local Reliability	2.9
III. THE BENEFITS SUNRISE WILL PROVIDE IN TERMS OF REDUCED LCR FOR THE SAN DIEGO AREA CAN, AND SHOULD BE, RELIED UPON BY THE COMMISSION IN DECIDING WHETHER TO APPROVE SUNRISE.	2.11
IV. DRA OFFERS NO OBJECTIVE ALTERNATIVE TO THE USE OF GRIDVIEW RESULTS FOR PURPOSES OF ESTIMATING THE EFFICIENCY GAINS PROVIDED BY THE SUNRISE POWERLINK PROJECT.	2.12

ATTACHMENTS TO CHAPTER 2	
Attachment	Document
2-1	Curriculum Vitae of Robert Anderson

¹ A witness designated is responsible for that section, for all subparts to that section, and for all subsequent sections, unless and until another witness is designated for a following section.

CHAPTER 2

I. SUNRISE PROVIDES LONG-TERM NET GHG REDUCTIONS (Robert Anderson²)

Daniel Suurkask, witness for the Division of Ratepayer Advocates (“DRA”), testifies regarding Sunrise and greenhouse gas (“GHG”) emissions. Mr. Suurkask states: “SDG&E claims that the Proposed Project can reduce California’s GHG footprint and provide additional benefits. The Draft EIR/EIS analysis, in part relying on CAISO modeling data, indicates the contrary: that after accounting for construction and other GHG emission impacts, the Proposed Project, as well as the other IV-SD TL alternatives, result in a net increase in GHG emissions.” Suurkask Phase 2 Direct Testimony (“Suurkask”) at 3.

A. Sunrise’s Long-Term GHG Reduction Outweighs Construction GHG Effects

Mr. Suurkask’s implication that Sunrise has a “net negative” effect on GHG emissions is mistaken. The long-term GHG reduction benefits from Sunrise’s facilitation of the operation of renewable power sources clearly out weight the short-term GHG realized from construction activities. SDG&E, and other load serving entities in the state, will be looking to the Imperial Valley region for renewable energy to meet obligations under the state’s Renewable Portfolio Standard (“RPS”). As stated by Mr. McClenahan below, SDG&E has already signed a number of contracts for renewable power in that area and is actively seeking more, as was explained in SDG&E’s Phase 2 Direct Testimony (“SDG&E”) at 12.11 and Phase 1 Direct Testimony (Vol. 2, Part 1 at III-11 to -12). The GHG emission reduction benefits from Sunrise will vary depending on the

² Mr. Anderson’s CV is attached as Attachment 2-1

quantity of emissions that, in the absence of this project, would otherwise have been produced from conventional resources. The table below shows this range.

The table below was prepared as follows. First, each of the columns represents an incremental amount of renewable energy that may be produced and delivered to SDG&E as a result of the additional transmission capacity provided by Sunrise. As an example, the 5% column represents an incremental amount of delivered renewable energy that is equal to 5% of SDG&E's forecast retail sales in year 2010. An extremely low assumption of only 1% incremental renewable energy is shown in the table to demonstrate that even a very small increase in renewable energy production would nevertheless easily out-weigh the amount of short-term GHG emissions generated during construction phase of Sunrise. To put this 1% in perspective, a 22 MW geothermal power plant operating at a 90% capacity factor would provide about 1%, or one twentieth, of SDG&E's forecast 2010 RPS requirement (the goal for year 2010 is 20%). As Mr. McClenahan states below, SDG&E currently has ~60 MW of geothermal capacity already under contract in the Imperial Valley.

If Sunrise is not built, SDG&E will have to rely on additional fossil based resources to satisfy its local area requirements. In fact, several of the alternatives discussed in the DEIR contemplate the use of new fossil based resources to be located in San Diego County. The rows of the table below show non-renewable generating technologies that are contemplated as some of the alternatives to Sunrise for SDG&E's needs if Sunrise was not built. The table includes three possible sources. The first is a natural gas-fired combined cycle power plant. SDG&E consistently sees combined cycle power plants as being the primary source of baseload and intermediate load energy.

Accordingly, if Sunrise is not constructed and geothermal or solar energy sources were subsequently not developed, it is highly likely that SDG&E’s energy needs will have to be met by an increase in natural gas-fired generation, including combined cycle facilities. During a few hours of the year, peaking plants may be the marginal source of energy so, if Sunrise was not constructed there will also be an increase in peaking generation. The second line of the table shows the emission reductions that the addition of Sunrise would provide if the source of the energy that would otherwise be produced is conventional gas turbines. SDG&E also included a line on the table based on the CPUC’s Emission Performance Standard. This is the highest rate that the CPUC will allow for new purchase power contracts that are long-term (greater than 5 years) and base-loaded (60% capacity factor and above).

Table 2-1
Annual Avoided GHG Emissions (tons)

Displaced Power Source	Percentage of SDG&E Expected Retail Sales (MWh) in 2010 to Be Met with Renewable Power Obtained As a Result of Sunrise			
	1%	5%	10%	15%
Combined Cycle (819 lb/MWh)	73,000	365,000	730,000	1,095,000
Gas Turbine (1,170 lb/MWHR)	104,000	521,000	1,043,000	1,564,000
EPS Rate Power (1,100 lb/MWh)	98,000	490,000	980,000	1,470,000

This table illustrates that the GHG emission reduction benefits of adding renewable power to SDG&E’s portfolio are large over a wide range of renewable energy scenarios involving Sunrise. The table shows a low value of 73,000 tons/year in the cell that represents replacing only 1% of SDG&E’s 2010 retail sales with Imperial Valley renewable power and avoiding combined cycle power, to a high value of about 1,500,000

tons/year in the cell the represents replacing 15% of SDG&E's expected 2010 retail sales with Imperial Valley renewables and displacing peaking resources or resources meeting the CPUC's EPS standard.

This table demonstrates that the GHG emission reduction benefits in a single year will greatly exceed the temporary GHG emissions associated with construction of Sunrise that the DEIR identified (109,000 tons for the two year construction period). Even if Sunrise results in an incremental amount of renewable energy that is only 1% of SDG&E's RPS obligation, the associated reduction in air emissions in just two years would exceed the quantity of air emissions produced during construction of the line. As stated in Chapter 12 of SDG&E's Phase 2 Direct Testimony at 12.11, SDG&E's resource portfolio depends on a substantially greater amount than 1% of its annual RPS to be produced in the Imperial Valley. This amount would not be for just one year; it would be for the life of the line.

It is also worth noting that it is not only SDG&E's purchases of renewable energy from Imperial Valley that will confer a GHG emission reduction benefit. Any renewable energy produced in the Imperial Valley that displaces fossil fuel-generated energy will confer a GHG emission reduction benefit whether purchased by SDG&E or anyone else. What is important to note however, is that without Sunrise, the development of renewable resources in the Imperial Valley will be significantly impaired.

Because Sunrise will be part of the integrated transmission network and because electricity flows on the path of least resistance, neither SDG&E, nor the CAISO who will operate the line, can state that only renewable power will flow over the line. However, of the over 7,000 MW for new generation in the CAISO queue that wish to connect to the

SDG&E system that are located in the Imperial Valley region, 100% are for renewable resources and none are for fossil resources. SDG&E's existing contracts for Imperial Valley renewable power, future SDG&E contracts with other renewable energy resources that are under consideration, and any other renewable energy developed in the Imperial Valley will provide substantial GHG emission reduction benefits because the energy produced by the new renewable resources in the Imperial Valley will displace energy that would otherwise be produced by conventional generating sources.

B. SDG&E Will Have Sufficient Renewables under Contract to Support GHG Reduction (Michael McClenahan)

SDG&E is confident that Sunrise will result in an incremental quantity of renewable energy production that is much closer to the higher percentages in the table. SDG&E is aggressively moving forward with contracts for new renewables on every front. Once Sunrise is in place, SDG&E expects to have sufficient renewables under contract and in service to meet its RPS obligation at that time through physical deliveries of renewable energy. Recognizing that the delay in Sunrise will jeopardize its ability to have sufficient renewable resources to deliver 20% of its retail sales in 2010, SDG&E's ongoing search for additional renewable energy sources should be sufficient to meet our RPS obligation for 2010 through compliance mechanisms using both past credits and future borrowings. These efforts also will also put SDGE on the road towards increasing the percentage in future years.

Even with Sunrise's in-service date now pushed into 2011 for SDG&E's preferred routes, SDG&E expects to obtain significant renewable power from Imperial Valley. SDG&E already has contracted with a number of developers in Imperial Valley that

could provide almost 10% of SDG&E's expected retail sales in 2011. For example, the following contracts have significant potential after their first year of full operation:

- Stirling Phase 1 (300 MW or 3.6% of SDG&E's retail sales)
- Esmeralda San Felipe (20 MW or 0.9% of SDG&E's retail sales)
- Esmeralda Truckhaven (40 MW or 1.8% of SDG&E's retail sales)
- Bethel 1 (50 MW or 1.7% of SDG&E's retail sales)
- Bethel 2 (50 MW or 0.9% of SDG&E's retail sales)

SDG&E also has an option for Stirling Phase 2 (300 MW) and a right of first refusal for Stirling Phase 3 (300 MW). As stated in SDG&E's Phase 2 Direct Testimony at 12.11, SDG&E is negotiating with additional renewable energy developers in Imperial Valley. Thus, there is no doubt that, even accepting some risk that some renewable projects may not be built, SDG&E fully expects to receive significant amounts of renewable energy over Sunrise.

II. THE GREATER IMPERIAL VALLEY-SAN DIEGO AREA LOCAL CAPACITY REQUIREMENT DOES NOT LIMIT, IN ANY WAY, THE VALUE OF SUNRISE IN REDUCING THE SAN DIEGO AREA LCR (Jan Strack)

DRA states that the Commission should find that “none of the three IV-SD TL [Imperial Valley-San Diego transmission line] alternatives will necessarily offer significant local reliability benefits to SDG&E customers...” Woodruff at ES-2:9-10. DRA bases this recommendation on its interpretation of how the Local Capacity Requirements (“LCR”) for a Greater Imperial Valley-San Diego (“GIV-SD”) area could be met.

A. DRA Wrongly Excludes Mexicali Generation From Contributing Towards LCR.

The LCR for the GIV-SD area were defined by the CAISO in connection with its *2009-2011 Local Capacity Technical Analysis, Report and Study Results*, dated October 31, 2006 (see CAISO Ex. D-45) and its *2010-2012 Local Capacity Technical Analysis, Report and Study Results*, dated December 28, 2007. See Woodruff at Attachment E. The CAISO determined in both of these reports, that with the addition of the Sunrise Powerlink, the outage of the North Gila-Imperial Valley 500 kV line becomes limiting in as much as there will be two 500 kV paths linking the Intergen and Termoelectrica de Mexicali (“TDM”) combined cycle plants with the San Diego area; *i.e.*, the outage of either the Imperial Valley-Miguel or the Imperial Valley-Central 500 kV lines would still allow the output of these plants to reach the San Diego area.³

Because the GIV-SD area LCR is a result of adding the Sunrise Powerlink, DRA mistakenly concludes that “SDG&E customers would thus not be relieved from purchasing even one less MW of LCR capacity” (Woodruff at 9:16-17). While DRA acknowledges that the CAISO’s reports “did state additional units that interconnect directly with the Imperial Valley (IV) substation can be used to meet GIV-SD area needs” (Woodruff at 9:20-21), and even identifies the existing units by name (“Intergen/Coral La Rosita” and “Sempra Termoelectrica de Mexicali (TDM)”) (Woodruff at 9:23-24), DRA completely discounts the availability of capacity from these existing units to meet the GIV-SD LCR.

³ Without the Sunrise Powerlink, the outage of the Imperial Valley-Miguel 500 kV line would require that the Intergen and TDM plants be shut down in order to avoid overloads on the parallel 230 kV facilities within the IID and CFE control areas. Accordingly, without the Sunrise Powerlink, the most limiting contingency for purposes of establishing LCR, is the outage of the Imperial Valley-Miguel 500 kV line.

For example, the GIV-SD area portions of Table 3-1 at 14 and the companion tables in Woodruff Attachment J of DRA Woodruff's testimony, fail to include any capacity from the Intergen and TDM plants.

Exactly why DRA decided not to include any capacity from the Intergen and TDM plants is not clear from their testimony. Woodruff at 9:25-28 and 10:1-2 does assert that:

1. the CAISO data regarding these units' capacities vary between each of the two long-term LCR studies and the 'Master CAISO Control Area Generating Capability List' , and
2. DRA is also not aware if these specific plants are readily available to provide local reliability services to the GIV-SD area or the terms and conditions the plants' owners would require to provide such services.

Generating capacity figures can and do vary between the multitude of databases and reports used and generated by the CAISO and other parties on an ongoing basis.

However what matters is that ultimately it is the amount of Qualifying Capacity that is designated as deliverable, *i.e.* Net Qualifying Capacity ("NQC"), and which is adopted by the Commission for Resource Adequacy ("RA") counting purposes.⁴ It is SDG&E's understanding that the Intergen and TDM plants have been determined by the CAISO to be fully deliverable and that the NQC shown in the CAISO's December 28, 2007 LCR report for these units (collectively 1077 MW)⁵ is representative of their physical capabilities. Accordingly, DRA's apparent worry over conflicting capacity figures is not appropriate.

⁴ D.06-07-031.

⁵ See the listing of units under the heading "Additional units available in 2010-12 for the Greater Imperial Valley-San Diego area," Woodruff at Attachment D.

B. Mexicali Generation Will Be Available For Local Reliability.

DRA's other apparent concern that the Intergen and TDM plants may not be "readily available to provide local reliability services" (Woodruff at 9:28), should also be disregarded. The Intergen and TDM plants are highly efficient combined cycle units that will be operating any time market prices justify operating, *e.g.*, during summer heat storms when the overlapping outage of the most critical transmission line and most critical in-area generating unit establishes the area's LCR. This will be true, regardless of whether these plants are selling their output under contract to a third party, or whether they are selling into the CAISO's daily and real-time spot energy markets. Unlike the older San Diego area merchant units, such as the Encina boiler units and the older gas turbines, there should be no requirement for supplemental capacity payments (comparable to existing above-market Reliability Must Run payments) to maintain the economic viability of the Intergen and TDM plants. Market revenues should suffice for this purpose; historically they have and there is no evidence that the future will be different.

DRA's point that it is "not aware" of the "terms and conditions the plants' owners would require to provide [local reliability] services" (Woodruff at 9:27-28 and 10:1-2) is misplaced. As is evident from examining the multitude of contracts under which existing generation within the San Diego area operates and upon which the Commission relies in determining load serving entities' ("LSEs") RA compliance, what is important is that the individual generating units have the economic incentive and financial wherewithal to be available to operate when peak loads are at their highest and system conditions are stressed. The exact "terms and conditions" of contracts that the plant owners may enter into, while important, will not change the basic incentives they have.

In summary, DRA has no credible basis for completely ignoring the ability of the Intergen and TDM plants to count towards the LCR for the GIV-SD area. As the CAISO's LCR reports clearly reflect, with the addition of the Sunrise Powerlink the LCR for the GIV-SD area will exceed that of the San Diego area by 1000 MW.⁶ The dependable and deliverable capacity from the Intergen and TDM units totals 1077 MW, more than the 1000 MW increase in the GIV-SD area LCR. Because the GIV-SD LCR can be met with existing generating resources, this constraint does not, in any way, undermine the value of the Sunrise Powerlink in reducing the San Diego area LCR.

SDG&E does note one detail with respect to the ability of the Intergen plant to contribute to the GIV-SD area LCR. Because the GIV-SD area LCR is determined through application of the CAISO's G-1/N-1 reliability criteria, it is necessary to consider whether the Intergen plant would replace the Palomar plant as the most critical G-1. In terms of dependable summer capacity, the Intergen plant exceeds the Palomar facility by 25 MW, (590 MW versus 565 MW⁷). Thus, in terms of size, the Intergen plant would become the largest G-1 within the GIV-SD area. However, even if the CAISO determines the Intergen plant to be the most critical G-1, there would still be 1052 MW (487 MW from TDM plus 565 MW from Palomar) of existing generating capacity available to meet the 1000 MW increase in GIV-SD LCR.

⁶ The December 28, 2007 LCR report identifies a San Diego area LCR of 2193 MW in 2010 and 2329 MW in 2012. (page 75) Assuming the Sunrise Powerlink is in service by the summer of 2010, the same report identifies a GIV-SD area LCR of 3193 MW in 2010 and 3329 MW in 2012.

⁷ Includes the addition of the 24 MW Palomar chillers.

III. THE BENEFITS SUNRISE WILL PROVIDE IN TERMS OF REDUCED LCR FOR THE SAN DIEGO AREA CAN, AND SHOULD BE, RELIED UPON BY THE COMMISSION IN DECIDING WHETHER TO APPROVE SUNRISE.

DRA suggests that the CAISO's and SDG&E's estimates of the benefits of lower LCR for the San Diego area cannot be relied upon because "the Commission will not be able to get assurances as to what an IV-SD TL's LCR benefits will be in this docket; instead, the answer to this question cannot even begin to be *known* until the year before a new IV-SD TL [is] put into service." Woodruff at 8:13-15. DRA goes so far as to assert that it would be "irresponsible for SDG&E or the CAISO to assert, or for the Commission to find in this docket, that a new IV-SD TL *will* reduce SDG&E customers' net LCRs by 1,000 MW." Woodruff at 16:16-18.

The Commission must disregard DRA's admonishments. It is illogical for the Commission to render an informed decision on Sunrise that has a 58 year life without considering the potential impacts of the project on the San Diego area LCR. Apparently DRA would recommend the Commission should not make a decision when there exists uncertainty in an estimate of future value or cost. By this logic, the Commission would be paralyzed by indecision since there is always uncertainty in any long term analysis it must undertake. Of course, this is not an available option. The Commission needs to decide whether to approve the Sunrise Powerlink and the Commission will make this decision based on the best information that is available to it, considering all of the uncertainties and unknowns that are bracketed by parties' testimonies in the record of this proceeding.

While it is technically true that final LCR determinations are not made by the CAISO until approximately six months before the initial local RA showings are due, that

does not excuse the parties and the Commission from making their best estimates as to what those LCR determinations would be without and with the Sunrise Powerlink and what the value of the LCR reductions provided by the Sunrise Powerlink will be over the life of the facilities.

Curiously, DRA exempts itself from its own admonishments. Despite the fact that the CAISO has not rendered a final LCR determination for the San Diego area for the next 40 years, witness Woodruff nevertheless undertakes an effort to project the possible benefits that the Sunrise Powerlink provides in terms of reducing LCRs for the period 2011 through 2050. *See* Woodruff at Attachment J.

IV. DRA OFFERS NO OBJECTIVE ALTERNATIVE TO THE USE OF GRIDVIEW RESULTS FOR PURPOSES OF ESTIMATING THE EFFICIENCY GAINS PROVIDED BY THE SUNRISE POWERLINK PROJECT.

DRA recommends that “the Commission should give no weight to SDG&E’s Gridview results and only limited credibility to the CAISO’s Gridview results.” Woodruff at 27:11-12. DRA bases this recommendation on the parties’ “Rebuttal Testimony on modeling issues” and on SDG&E’s and the CAISO’s “oral testimony during Phase 1 hearings.” Woodruff at 27:8-9. SDG&E has a considerably different understanding of the Phase 1 Rebuttal Testimony and oral testimonies; namely, that different assumptions lead to different results. For example, while there was much criticism of the WECC load and resource assumptions SDG&E used in its GridView modeling, a detailed assessment of those assumptions demonstrated that, in fact, the effective planning reserve levels throughout most of the WECC were actually quite

modest and generally lower than the reserve levels assumed by the other parties providing WECC simulation results.⁸

What is striking about DRA's recommendation is that DRA's own estimate of the grid efficiency benefits provided by the Sunrise Powerlink relies on the thinnest thread of objective analysis. For its Phase 2 testimony, DRA simply "increased its Phase 1 estimates of an IV-SD TL's energy benefits by approximately 60 percent." Woodruff at 27:17-19. DRA's Phase 1 estimates, in turn, were based on "the CAISO's levelized estimate of \$35 million per year" which was then reduced "to \$25 million per year to reflect infirmities that plague CAISO energy modeling". *See* Woodruff, Ex. D-66 at 37:7-9. DRA has provided no analytic basis for the \$10 million reduction in the CAISO's Phase 1 numbers nor 60 percent increase to arrive at DRA's Phase 2 numbers.

If the Commission is to discount the reasonableness any of the parties' estimated grid efficiency benefits, it is DRA's wholly unsupported assumptions that should be discounted.

Notwithstanding the fact that DRA has not performed its own simulation analysis to obtain an independent and objective estimate of the grid efficiency benefits that will be provided by the Sunrise Powerlink, DRA has recognized that "the recent steep rise in natural gas prices" will tend to increase the grid efficiency benefits of adding the Sunrise Powerlink. Woodruff at 27:17-18. So, while SDG&E has serious reservations about DRA's methodology for estimating grid efficiency benefits, SDG&E agrees with DRA

⁸ *See* Ex. SD-31 at 6, the line labeled "WECC Reserve Margin calculated by comparing WECC coincident peak load to WECC generation capacity. Note: using WECC wide coincident peak results in higher Planning Reserve Margin for WECC than for the individual control areas" on the joint South Bay Replacement Project ("SBRP")/SDG&E/CAISO/The Nevada Hydro Company ("TNHC") comparison exhibit.

that the Commission should consider the current level of natural gas prices in evaluating the magnitude of energy benefits that may be obtained if the Sunrise Powerlink is built.

Attachment 2-1

QUALIFICATIONS

My name is Robert B. Anderson. My business address is 8330 Century Park Court, San Diego, California, 92123.

I am employed by San Diego Gas & Electric Company as Director - Resource Planning. My responsibilities mainly include electric resource planning. I have been employed by SDG&E since 1980, and have held a variety of positions in resource planning, corporate planning, power plant management, and gas planning and operations.

I have a BS in Mechanical Engineering and a MBA - Finance. I am a registered professional engineer in Mechanical Engineering in California.

I have previously testified before this Commission.