

## Powers Engineering

April 3, 2008

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Ms. Billie Blanchard  
California Public Utilities Commission  
505 Van Ness Ave.  
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**Subject: Powers Engineering Comments on A.06-08-010 Sunrise Powerlink DEIR**

Dear Ms. Lee and Ms. Blanchard:

Please find attached Powers Engineering comments on the Sunrise Powerlink DEIR. These comments are in the form of Powers Engineering's March 12, 2008 Phase II testimony in the Sunrise Powerlink proceeding.

The Powers Engineering comments address two general topic areas: 1) inaccuracies or deficiencies as they relate to the two in-area generation alternatives evaluated in the DEIR, the New In-Area Renewable Generation Alternative and the New In-Area All-Source Generation Alternative, and 2) the failure of the DEIR to perform an environmental impact analysis of the route of the reasonably foreseeable 500 kV interconnection along Highway 76 between the Central substation on SDG&E's preferred Sunrise Powerlink route and the Pendleton substation on the proposed 500 kV LEAPS transmission line. SDG&E asserts in its application that it intends to link the Sunrise Powerlink and LEAPS to form the Full Loop 500 kV transmission project. SDG&E also asserts in its March 12, 2008 Phase II testimony that the preferred Sunrise Powerlink route must be followed to afford the "expandability" necessary to construct the Full Loop transmission project.

Please feel free to call me at (619) 295-2072 or e-mail at [bpowers@powersengineering.com](mailto:bpowers@powersengineering.com) if you have any questions about the comments in this letter.

Regards,



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these sites already operate CHP plants, such as the University of California San Diego, San Diego State University, Children's Hospital, and Qualcomm.<sup>34</sup> Commercial CHP systems are now available in increments down to 240 kW. The availability of such small CHP packages greatly expands the potential number of candidate CHP facilities in San Diego County.<sup>35</sup> The development of 620 MW of CHP, by reducing CO<sub>2</sub> emissions relieving congesting on the urban transmission and distribution system, would be a superior substitute for the 620 MW combined cycle plant in the In-Area All-Source alternative. The DEIR errs by prioritizing combined cycle over CHP for the provision of baseload natural gas fired power.

#### **D. Firm PV capacity can substitute for 250 MW of peaker turbines**

Renewable energy is higher in the loading order than conventional utility-scale power plants. As explained in Attachment B, urban/suburban PV with limited battery storage provides firm on-peak capacity at or near the nameplate capacity of the PV system(s). The CO<sub>2</sub> emission rate of peaking turbines is 1,170 lb CO<sub>2</sub> per MWh.<sup>36</sup> This compares to 0 lb CO<sub>2</sub> per MWh for PV. The distributed nature and relatively small size of individual PV systems compared to peaking turbines assures that a forced outage of a single PV system has no impact on grid reliability at peak demand. In contrast, the forced outage of one or two 50 MW peaking turbines at peak demand might have a material effect on grid stability due to the significance of the lost output. The DEIR errs by presuming that peaking turbines must provide the bulk of the peaking power envisioned in the In-Area All-Source alternative when PV with limited battery storage is available, provides firm on-peak capacity at or near nameplate rating, and is much higher in the loading order.

#### **4. Failure Of DEIR To Include Detailed Environmental Impact Analysis Of Reasonably Foreseeable 500 Kv Interconnection Along Highway 76 Between Sunrise Powerlink And LEAPS Transmission Lines**

##### **A. Recirculation of DEIR necessary to include detailed environmental analysis of 500 kV corridor along Highway 76 between Sunrise Powerlink and LEAPS**

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<sup>34</sup> Ibid, p. 61.

<sup>35</sup> Ibid, p. 62.

<sup>36</sup> Ibid, p. 60.

SDG&E's ultimate objective is a 500 kV Full Loop to SCE territory.<sup>37</sup> SDG&E has cited in its presentations to policymakers the desire of the company to support the California Independent System Operator (CAISO) long-term concept to add a 500 kV Full Loop through Southern California, stating:<sup>38</sup>

*“Needs for a New 500 kV Transmission Line - To improve reliability for San Diego and CAISO by enhancing California’s 500 kV electric grid, consistent with the CAISO’s long-term concept of adding a 500 kV loop through Southern California.”*

The SDG&E Aug. 4, 2006 application to the California Public Utilities Commission (PUC) describes the route that will be used to complete the 500 kV Full Loop, stating (p. VI-13):

*“Of the Full Loop alternatives originating at Imperial Valley, the best-performing Full Loop alternative went from Imperial Valley to a new “Central” Substation to a new substation in SCE’s territory between the Serrano and Valley Substations. This alternative also had the advantage of combining the Sunrise Powerlink (Imperial Valley – Central 500 kV) with the LEAPS transmission.”*

A combination of 500 kV Sunrise Powerlink and the 500 kV LEAPS transmission line is presented by SDG&E as the Full Loop option in the application, not one of several options.

However, the Full Loop described by SDG&E is missing one piece, an interconnection between the Sunrise Powerlink’s Central substation near Lake Henshaw and the LEAPS 500 kV substation on Camp Pendleton’s northern boundary. The Talega-Escondido 230 kV line is a component of the LEAPS transmission project. This existing 230 kV corridor is only about 30 miles from the proposed Central substation of the Sunrise Powerlink. The interconnecting 500 kV line between the Central substation and the LEAPS 500 kV substation will follow the route of the existing Warners-Rincon 69 kV transmission line along Highway 76, then the existing Rincon-Lilac 69 kV transmission line to the Lilac substation north of Escondido. The 500 kV line would then parallel the existing Talega-Escondido 230 kV line about 30 miles to the proposed Pendleton substation on the 500 kV LEAPS transmission line. The portion of the 500 kV interconnection route passing through or by Indian lands along Highway 76 is shown below in Figure 2 (map extracted from Figure B-12b, DEIR, p. B-30, tags added by B. Powers).<sup>39</sup>

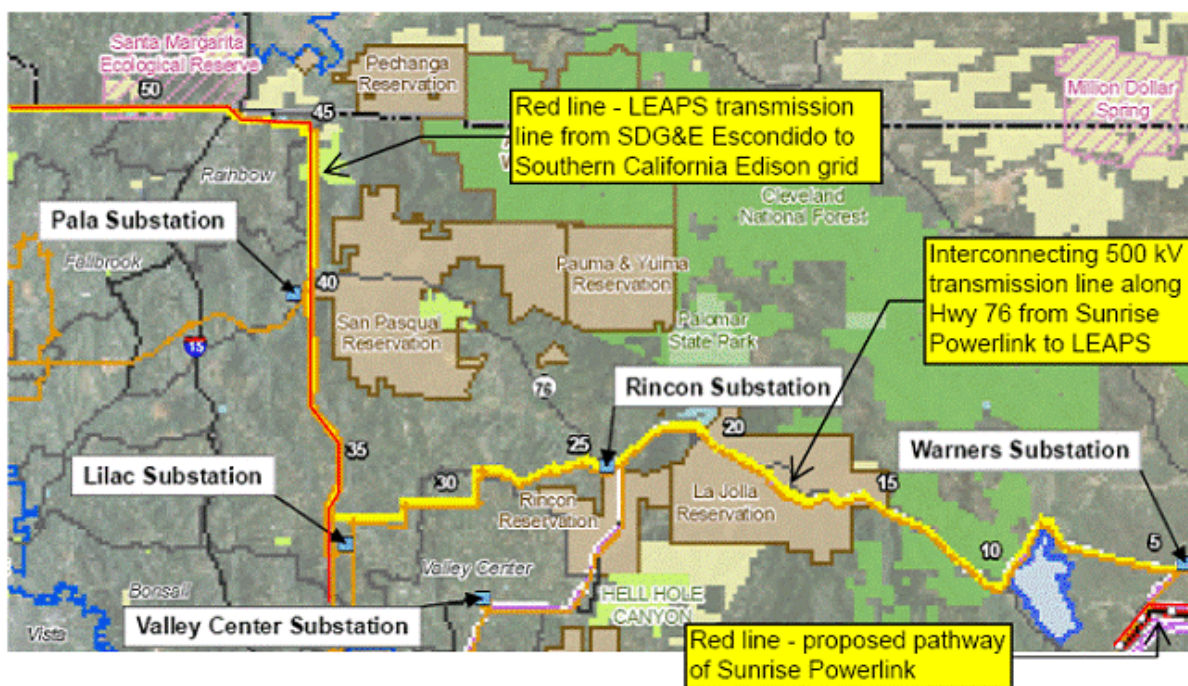
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<sup>37</sup> SDG&E Aug. 4, 2006 application, p. VI-4: “The Full Loop would complete the 500 kV loop through Southern California, connecting SCE’s 500 kV Palo Verde-Devers-Valley-Serrano system to SWPL.”

<sup>38</sup> David Geier - SDG&E, *Transmission Constraints to Geothermal Resource Development*, presented at CEC IEPR Committee Workshop, April 11, 2005. Online at: [http://www.energy.ca.gov/2005\\_energypolicy/documents/2005-04-11\\_workshop/Geier\\_David\\_SDGE.PDF](http://www.energy.ca.gov/2005_energypolicy/documents/2005-04-11_workshop/Geier_David_SDGE.PDF)

<sup>39</sup> The complete Full Loop route map is shown in Figure B-12b of the DEIR/EIS at: [http://www.cpuc.ca.gov/Environment/info/aspen/sunrise/deir/figs/Figure%20B-12b\\_Future%20Expansion\\_500kV\\_CE\\_Riverside.pdf](http://www.cpuc.ca.gov/Environment/info/aspen/sunrise/deir/figs/Figure%20B-12b_Future%20Expansion_500kV_CE_Riverside.pdf)

**Figure 2. 500 kV Interconnection between Sunrise Powerlink and LEAPS lines**



The failure of the DEIR to include an environmental analysis of this 500 kV interconnection between the Sunrise Powerlink Central substation and the proposed Pendleton substation on the 500 kV LEAPS transmission line is a critical omission.

**B. It is reasonable to assume construction of SDG&E’s Full Loop route is foreseeable and imminent**

The SDG&E Aug. 4, 2006 application was explicit in representing that SDG&E considers the highest ranking transmission alternative to be the “Full Loop” interconnection with the SCE grid, stating (application, VI-3, VI-4):

*“This assessment determined the two highest ranking alternatives to be the Imperial Valley – Central – Serrano/Valley 500 kV alternative (or the “Full Loop”<sup>2</sup>) and the Imperial Valley – Central 500 kV alternative (the “Sunrise Powerlink”). These two alternatives were found to be the best performing thermally and economically, and provide the best access to renewable energy resources.*

SDG&E goes on to state (application, VI-15):

*“Although performing adequately—technically and economically—the Full Loop was not selected as the preferred alternative. The main reasons were its higher cost, the low probability of operation by 2010 and the need for a Full Loop could not be justified today,*

*under the ISO's grid reliability criteria or for economic reasons. The July 28th CAISO report concurred with SDG&E's findings, but noted it is in the process of further evaluating the Full Loop proposal. If upon further evaluation a Full Loop option is justified in the future, SDG&E would seek appropriate approvals for transmission facilities for the Full Loop and conduct any requisite environmental review of such facilities at that time."*

This Full Loop route was rejected for analysis in the DEIR for the stated reason that it had more negative impacts than the proposed project while achieving the same objectives (DEIR, p. C-125, p. C-132). However, a 500 kV interconnection with the SCE grid is not one of SDG&E's stated objectives for the Sunrise Powerlink. Yet SDG&E is clear in its application that the Sunrise Powerlink is a critical component of the Full Loop project that SDG&E considers to be the highest ranking transmission alternative, and that a favorable opinion from CAISO on the energy and economic merits of the Full Loop via the CAISO's in-process evaluation would initiate a formal application process by SDG&E to complete the Full Loop.

The CAISO can not reasonably be considered a neutral party in the Sunrise Powerlink proceeding. The CAISO technical analysis that supports the need for the Sunrise Powerlink was finished days before SDG&E filed its Aug. 4, 2006 application. SDG&E inserted the entire July 28, 2006 CAISO report as an attachment to the executive summary of its application as supporting technical justification for the Sunrise Powerlink. Regarding the Full Loop alternative, CAISO states (July 28, 2006 report, p. 47): "*The CAISO is in the process of evaluating the energy benefits of this project to determine if the Full-Loop proposal would provide economic value for further consideration.*" As noted, SDG&E has cited in its presentations to policymakers the desire of the company to support CAISO's long-term concept to add a 500 kV Full Loop through Southern California.<sup>40</sup> SDG&E also lists CAISO as a supporter of the Sunrise Powerlink on its Sunrise Powerlink "supporters" webpage.<sup>41</sup> Given SDG&E points to CAISO as a primary reason for pursuing the construction of the Full Loop, the DEIR errs by presuming there is uncertainty that CAISO will be anything less than an enthusiastic partner in providing SDG&E with the necessary technical and policy support to complete the Full Loop once approval for Sunrise Powerlink is granted.

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<sup>40</sup> David Geier - SDG&E, *Transmission Constraints to Geothermal Resource Development*, presented at CEC IEPR Committee Workshop, April 11, 2005. Online at: [http://www.energy.ca.gov/2005\\_energypolicy/documents/2005-04-11\\_workshop/Geier\\_David\\_SDGE.PDF](http://www.energy.ca.gov/2005_energypolicy/documents/2005-04-11_workshop/Geier_David_SDGE.PDF)

<sup>41</sup> <http://www.sdge.com/sunrisepowerlink/supporters.html>

Sempra Energy, parent company of SDG&E, requested assistance in passing the Sunrise Powerlink through Indian “tribal lands” along Highway 76 in northern San Diego County in a November 28, 2005 letter to the U.S. Department of Energy (DOE) regarding the programmatic Environmental Impact Study for the National Interest Electric Transmission Corridor designation program. (See UCAN June 15, 2007 rebuttal testimony, *Attachment 9*; Sempra Comment letter). The 2005 Energy Policy Act grants the DOE greatly increased authority to approve transmission lines on certain federal lands designated as “critical” by the DOE.

Sempra Energy has sought DOE assistance to impose a 500 kV transmission pathway through tribal lands along Highway 76 north of the Central substation of SDG&E’s preferred route for the Sunrise Powerlink. This effort is a probable response to the resistance that SDG&E encountered with the Pechanga band while seeking approval for the 500 kV Valley-Rainbow transmission project. The Valley-Rainbow transmission project was ultimately rejected by the CPUC in 2003. LEAPS is in essence a modified version of the Valley-Rainbow transmission line.

Sempra Energy has a strong motive for seeing its affiliate SDG&E expedite the construction of the Full Loop. Sempra loses a major power contract with the state in 2011. As noted in UCAN’s June 15, 2007 rebuttal testimony (p. 4):

*“Sempra was awarded a 10-year, \$7 billion California Department of Water Resources contract in 2001. (See Attachment 4, Sempra DWR contract). In order to avoid conflicts of interest, the Sempra contract was assigned to Southern California Edison (SCE) as the administrator of the power contract. The Sempra contract is a “seller’s choice” contract that allows Sempra to determine which units within its fleet of plants will provide power under the contract. The contract will end in 2011, about the time the proposed Sunrise Powerlink is scheduled to become operational in 2010.”*

In large part as a result of the DWR contract, Sempra Energy combined-cycle plants are operating at higher capacity factors than merchant combined-cycle plants without DWR contracts. Sempra Energy owns natural gas-fired power plants in Mexicali, Mexico (600 MW), western Arizona (1,250MW), Boulder, Nevada (480 MW), and Kern County, California (550 MW) [UCAN June 15, 2007 rebuttal testimony, p. 3]. The combined capacity of these four plants is 2,880 MW. All four of these plants supply power under the DWR contract.



Sempra's 550 MW Kern County combined-cycle plant, Elk Hills Power, operated at an average capacity factor of 76 percent in 2004-2005.<sup>42</sup> During this time combined-cycle plants in California as a whole had an average capacity factor of 57 percent.<sup>43</sup> It is not unreasonable to assume that Sempra's other three plants maintained capacity factors similar to Elk Hills Power given these four plants supply power as a group under the DWR contract.

The DWR contract required Sempra to provide 1,200 MW continuously and 1,900 MW on-peak (for 9 months of the year) or 800 MW continuously and 1,200 MW on-peak (for 3 months of the year) in the 2004-07 timeframe.<sup>44</sup> The composite capacity factor of the four Sempra plants solely attributable to the DWR contract, without considering any other spot market or shorter-term power sales contracts, was 51 percent in the 2004-07 timeframe.<sup>45</sup> The DWR contract requires Sempra to provide 1,200 MW continuously and 1,600 MW during on-peak in the 2008-11 timeframe, with the contract ending on Sept. 30, 2011. The composite capacity factor of all four Sempra units attributable solely to the DWR contract will be 50 percent in the 2008-11 timeframe.<sup>46</sup> This guaranteed power market will end with the termination of the DWR contract in 2011.

1,250 MW Mesquite plant is located just south of the Palo Verde Nuclear Generating Station, the starting point of SDG&E's Southwest Powerlink.<sup>47</sup> The 600 MW Mexicali plant is interconnected to the Imperial Valley substation on the Southwest Powerlink. The starting point of the proposed Sunrise Powerlink is the Imperial Valley substation. The construction of the Full Loop project will provide both of these plants a new pathway to reach the largest power market in the West, the Los Angeles basin. The value of these two plants will increase the moment the Full Loop project becomes operational. Without access to a larger market (than San Diego) via the Full Loop and without the DWR contract, it is likely that the average capacity factor of Sempra's Mexicali plant, and potentially Sempra's Mesquite plant, will drop significantly. The

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<sup>42</sup> California Energy Commission, draft staff report, *Comparative Costs of California Central Station Electricity Generation Technologies*, June 2007, p. 56.

<sup>43</sup> Ibid, p. 56.

<sup>44</sup> Department of Water Resources, *Energy Purchase Agreement - Sempra Contract*, May 4, 2001, Appendix C. Online at: [http://www.cers.water.ca.gov/pdf\\_files/power\\_contracts/sempra/050401\\_sempra\\_ppa.pdf](http://www.cers.water.ca.gov/pdf_files/power_contracts/sempra/050401_sempra_ppa.pdf)

<sup>45</sup> 2004-2007 Sempra Energy DWR contract terms as composite capacity factor (CF) for Sempra's four plants (2,880 MW total): 9 months per year at  $[(168/168) \times 1,200 \text{ MW}] + [(96/168) \times 700 \text{ MW}]/2,880 = 0.56$ ; 3 months per year at  $[(168/168) \times 800 \text{ MW}] + [(96/168) \times 400 \text{ MW}]/2,880 = 0.36$ . Composite annual CF =  $(9/12)(0.56) + (3/12)(0.36) = 0.51$ .

<sup>46</sup> 2008-2011 Sempra Energy DWR contract terms: Composite annual CF =  $[(168/168) \times 1,200 \text{ MW}] + [(96/168) \times 400 \text{ MW}]/2,880 = 0.50$ .

<sup>47</sup> Mesquite Power webpage: <http://www.semprageneration.com/mesquite.htm>.

PUC has already authorized SDG&E to purchase the 480 MW El Dorado plant from Sempra Energy in 2011.<sup>48</sup> One interpretation of Sempra's willingness to sell El Dorado Energy at a reduced price in 2011 is the company's anticipation that revenue generating prospects for this plant would be reduced in its new incarnation as a purely merchant competitor in the post-DWR contract world beyond 2011.

### **C. SDG&E's Full Loop route will follow Highway 76 and will pass through the La Jolla Reservation**

Under "Future Transmission System Expansion," the DEIR describes the exact route of the expected 500 kV interconnection between the proposed Sunrise Powerlink Central substation and LEAPS, stating (DEIR, p. B-31):

*"The potential future 500 kV circuit would exit the proposed Central East Substation, running northwest to parallel the existing 69 kV line past the Warners Substation. It would then follow the existing Warners-Rincon 69 kV transmission line past Lake Henshaw, hugging the lake's northern banks until it would meet SR76. The route would continue to follow the existing 69 kV line and generally following SR76 for approximately 12 miles to Rincon Substation. From Rincon, the route would continue west along the existing Rincon-Lilac 69 kV transmission line for approximately 9.5 miles across Valley Center and meet the existing Talega-Escondido 230 kV transmission line west of Lilac Substation. The route would parallel the existing 230 kV line north for approximately 13 miles, turning west with the existing corridor near the community of Rainbow. After another 16 miles, the potential future route would be between the northern boundary of Camp Pendleton Marine Corps Base and Cleveland National Forest, still following the Talega-Escondido corridor."*

However, despite the DEIR describing the exact route of the Full Loop through Indian lands along Highway 76, SDG&E's explicit intent to complete the Full Loop, and SDG&E's statement in its application that the CAISO is reviewing the merits of the Full Loop (and implicitly could find it has merit at any time), the DEIR offers no opinion on when the completion of the Full Loop might occur. This is an error, as it is reasonably foreseeable that SDG&E will move to gain approval to complete the Full Loop as soon as PUC approval is secured for the Sunrise Powerlink. At that point in time there will be little option but to run the line along the existing Warners-Rincon 69 kV transmission line along Highway 76 and the existing Rincon-Lilac 69 kV transmission line to the Lilac substation.

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<sup>48</sup> California Energy Circuit, *Utility profits up despite recession*, February 29, 2008.



Approval of the Sunrise Powerlink application by the PUC will be de facto approval of the 500 kV interconnection route along Highway 76 prior to any environmental assessment of the advisability of that 500 kV interconnection route. In the case of the La Jolla band, the environmental assessment will ultimately be limited to little more than a mitigation exercise as a 500 kV line is built through the heart of the reservation. The burden of this omission in the DEIR will be borne by Native Americans.

**D. 500 kV transmission construction along Highway 76 is imminent if Sunrise Powerlink is approved**

As discussed, Sempra and SDG&E have strong motives to interconnect the Sunrise Powerlink with LEAPS as soon as possible if Sunrise is approved by the PUC. The effect of the interconnecting 500 kV transmission line along Highway 76 would have approximately the same effect on the people of the La Jolla reservation, by traversing through the heart of the reservation, that the Sunrise Powerlink route preferred by SDG&E will have a protected natural resource area by traversing through the heart of Anza Borrego State Park. The protection of Anza Borrego State Park has been a central issue in the Sunrise Powerlink proceeding. The environmental impact of the 500 kV line passing through the La Jolla reservation and passing adjacent to other reservations along Highway 76 is not evaluated in the DEIR, even though construction of the line is reasonably foreseeable if the Sunrise Powerlink is approved by the PUC. The DEIR errs in failing to include a detailed environmental analysis of the linkage corridor between the proposed 500 kV Sunrise Powerlink Central substation and the proposed Pendleton substation on the LEAPS 500 kV line and must be recirculated to address this omission.