

# Statement

Southeastern Communities Review

## **Statements regarding the Recirculated Draft Environmental Impact Report / Supplemental Draft Environmental Impact Statement, of July 2008**

**San Diego Gas & Electric Company's Sunrise Powerlink Project  
(Applications A.05-12-014 and A.06-08-010)**

**To: The State of California Public Utilities Commission  
and The Bureau of Land Management**

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From: CBH, P.O. Box 1032, Hemet, California 92546, August 25, 2008

California Public Utilities Commission, Public Advisor's Office at: CPUC Public Advisor, 505 Van Ness Avenue, Room 2103, San Francisco, CA 94102; or call 1-866-849-8390 or 1-415-703-2074; or email [public.advisor@cpuc.ca.gov](mailto:public.advisor@cpuc.ca.gov).

Provided within the comment period ending August 25, 2008, which Susan Lee of Aspen Environmental said, at the August 4<sup>th</sup> 2008 meeting in Jacumba, would be extended at least 3 days, since considerable congestion would be expected at their email servers which could block their ability to receive emailed comments. Since Acrobat's compact version of this document is 10.94 megabytes an alternate email address was provided by Mark Tangard: [mtangard@speakeasy.net](mailto:mtangard@speakeasy.net) in case Aspen's email server failed.

**This document continues with part 2, titled: The Southern Route**



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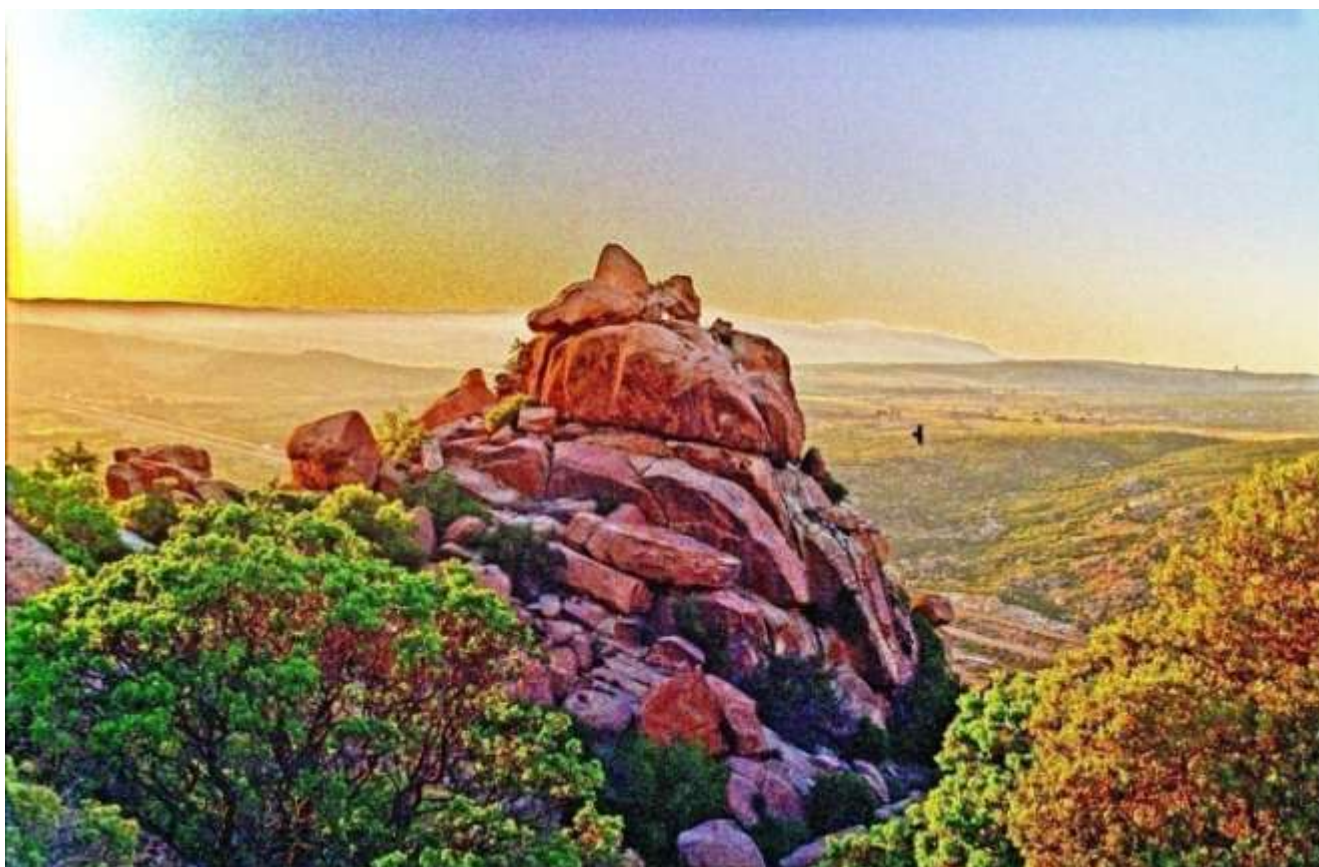
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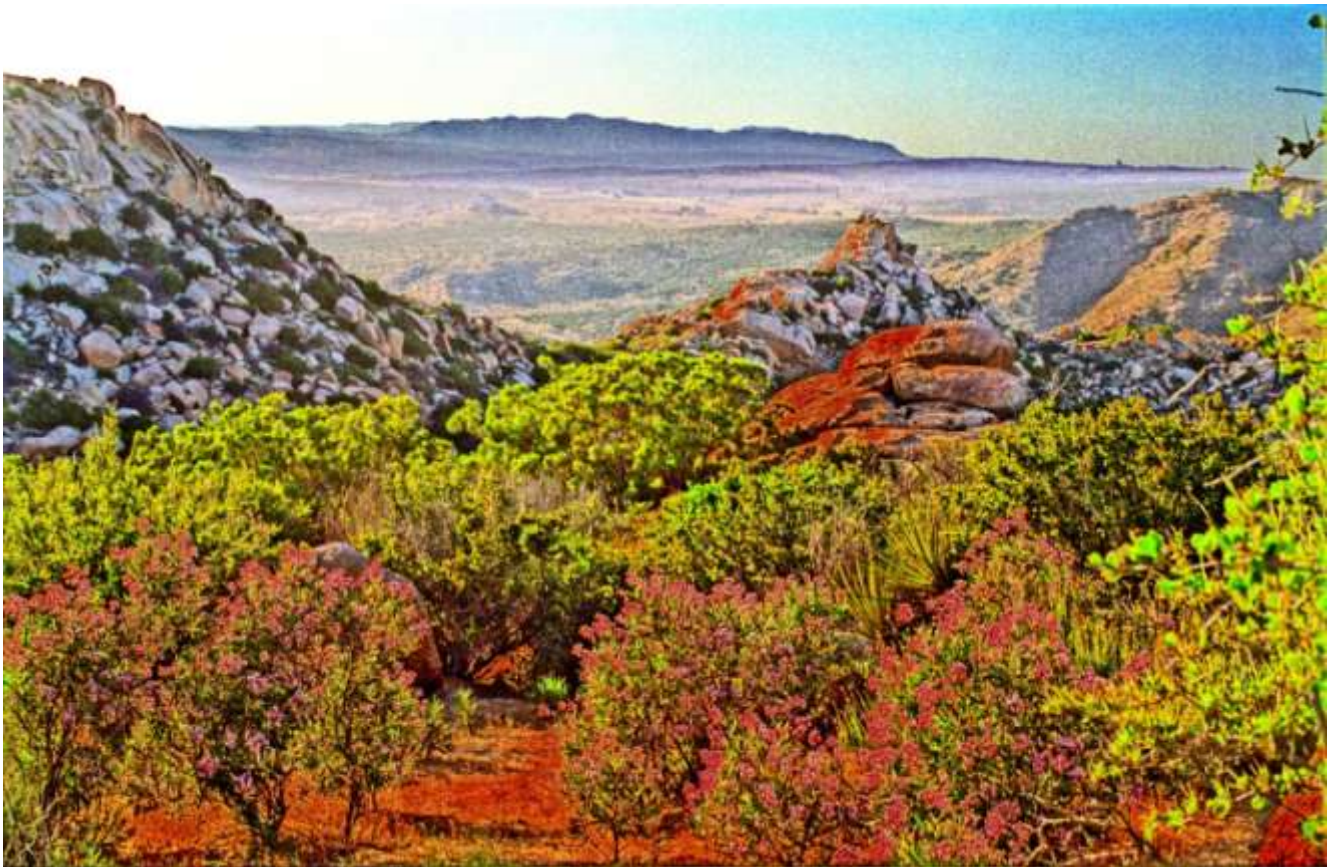
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**Anthropological Nature Reserve, Research Center and Recreation Area at Bankhead Springs California, elevation 3615 feet, overlooking Interstate 8 west and the McCain Valley (BLM) in the background. Mountain tops devastated by huge pylons and array of hot sagging power lines extending 170 to 450 feet overhead crossing our valleys, continuing across the McCain Valley to damage land held in public trust.**



***Looking northeast at sunset toward the adjacent ABDSP***



*Evening beyond the northwest valley, above the McCain Valley in the background*



## Introductory Comment

As an Anthropological Nature Reserve with viewshed and boundaries which are visible by over 6 million people each year, over 3.25 miles along Interstate 8 and 4.25 miles along Old Highway 80, which is adjacent to the southern boundary of the Anza Borrego Desert State Park, we are concerned with the impacts proposed by San Diego Gas and Electric (SDGE) which would place 170 tall pylons on top of our mountains over 450 feet above our valleys, suspending array of hot sagging 500,000 volt power lines across our valleys, as well as bulldoze numerous access roads and clearings through an extraordinary and vulnerable landscape, severely and permanently devastating our wilderness, research, construction and recreational areas, all in violation of the California Environmental Quality Act (CEQA)<sup>1</sup>, particularly when there are several easier to implement, lower cost alternatives that cause no damages, which have not been reviewed or considered by the CPUC or SDGE.

We are also concerned that if new environmental data and alternatives are not considered and that existing choices, particularly along the southern route, which have not been well researched or considered, are then implemented, that the results will be devastating to the region.

We have expended considerable efforts, to describe proven technological alternatives that are safer, nondamaging to the environment or property, and provide greater capacity,

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<sup>1</sup> CEQA Compliance (Rule 2.4 of Article 2 of CPUC Rules of Practice and Procedure), and the California Environmental Quality Act, Public Resources Code Sections 21000 et seq. and the guidelines for implementation of CEQA, California Administrative Code Sections 15000 et seq.

<sup>2</sup> **(After governor touts Sunrise, his cause gets Sempra cash, By Bruce V. Bigelow , UNION-TRIBUNE STAFF WRITER, May 10, 2008)**

Sempra Energy gave \$50,000 to one of Gov. Arnold Schwarzenegger's pet causes last month, just days after the governor complained publicly about activists impeding the Sunrise Powerlink proposed by San Diego Gas & Electric Co.

A SDG&E spokeswoman said yesterday there is "no connection" between Schwarzenegger's

all at a lower cost. The fact that a utility company is willing to devastate the environment, damage private property and people's lives and that the CPUC can't or doesn't inhibit those actions or compel the utility company to pay for all its damages is catastrophic to California and its people. Apparently, the review process has not addressed any of these issues, and has not so far, encouraged an economic or engineering analysis that can be implemented by SDGE or Sempra Energy so that a nondamaging power line alternative could even be defined and considered. Naturally the review process has not yet been completed, and so we are asking that the CPUC review process continue until these issues have been studied and addressed without needless damages to people, business or the environment. Placing the Commissioners conclusion ahead of completing the review process presents a predicament, and so far may not allow the consultants assembling the final environmental document to provide functional alternatives, based on a full and complete analysis, which should include a review of the environmental impacts, the technological and economic issues that can help determine if business, people and the environment will be offered any beneficial or nondamaging conclusion. Unfortunately without thoroughly understanding these issues and without any personal incentive to be considerate of the extraordinary wilderness in this region, then apparently a review based on understanding, developing nondamaging alternatives, hearing the clearly articulated needs of the people of this region, or even following the law, will become an automatic and expected impossibility.

These are not trivial technological or environmental issues that can be effectively addressed in the 1½ minutes that were allowed through CPUC participation, after traveling hundreds of miles, and spending thousands of hours researching and documenting the issues. So, we hope that the nondamaging alternatives, which incidentally, in total, cost less than the damages proposed, will be provided as nondamaging opportunities, hopefully to be considerate of this region and the thousands who have asked the CPUC to uphold its obligations to our extraordinary environment and the people, who have clearly asked for

these environmental protection as defined in the California Environmental Quality Act, which incidentally has not yet occurred.

Why would governor Schwarzenegger, Donald Felsing of Sempra Energy or the Commissioners care if the people of California want their environment protected and the laws of California upheld, after all the people are always the ones who pay for every Sempra Energy and SDG&E expense, along with the salaries of each government employee. So why would the governor choose to oppose the expressed interests and the needs of the people, in favor of causing damages that will actually cost far more? A thorough economic review is necessary to be understand the magnitude of the damages being proposed and the effectiveness of any alternatives, and while clearly is an essential requirement of the review process, it has been intentionally avoided. Nevertheless, I have only been amazed how the staff and consultants claimed they could not assemble the available economic data, not just for all the massive damages that are being proposed against the people and the wilderness of this region, but for each alternative that could both save money and completely avoid causing this extraordinarily adverse impact and permanent injury to one of the most beautiful parts of California.

To be of assistance I have included our own economic summary of environmental, property, business and home losses, medical hazards and losses of life, costs of overhead AC transmission versus underground DC transmission, maintenance expense, upgrade costs, future transmission load estimates, geology and habitat restoration costs, erosion and restoration on 9,000 acres of SDG&E roads and clearings, equivalent property replacement costs, power line fire ignitions and losses that exceeded \$4 billion in 2007, aircraft hazards, affects on recreation and tourism, replacement values, attorneys, legal research and collection costs.



We also wish to offer our respect to the people who try to open the CPUC review process toward greater understanding, along with their consideration to eliminating damages and to help reimbursing all expenditures and losses, and we suggest no form of criticism related to their efforts anywhere in our documentation. However, like anywhere else most people know that there are many more employees and consultants, who may not be as concerned about any damages being caused, nor have the time or the personal interest needed to understanding the myriad of details, nor have much regard for any nondamaging alternatives, nor any real interest in protecting the people or the environment, nor any willingness to support our beneficial laws, nor limit damages, or reconsider major injustices, perhaps in order to protect their personal time and not be inconvenienced at work, or experience social pressures. Unfortunately, their lack of consideration has clearly imprinted their tolerance of massive damages against the people and the environment of California, that some might say was complicit behavior, in order to create a massive boilerplate document that so far can be interpreted as supporting the extraordinary damages being promoted by SDG&E, which ultimately encourages an obsolete, very costly and damaging technology (overhead 500 kV, 230 kV & 69 kV high power lines), which reduce transmission efficiency, which is particularly relevant over long distances, while lowering capacity, increasing maintenance and decreasing reliability, all of which is economically damaging to the interests of SDG&E and Sempra Energy. This for example, means that 7 massive 500 kV power lines are required to do the job of 1 DC power line as is being implemented in China (6,400 megawatts at 800 kV DC), which could be installed under any of 7 different county highways.

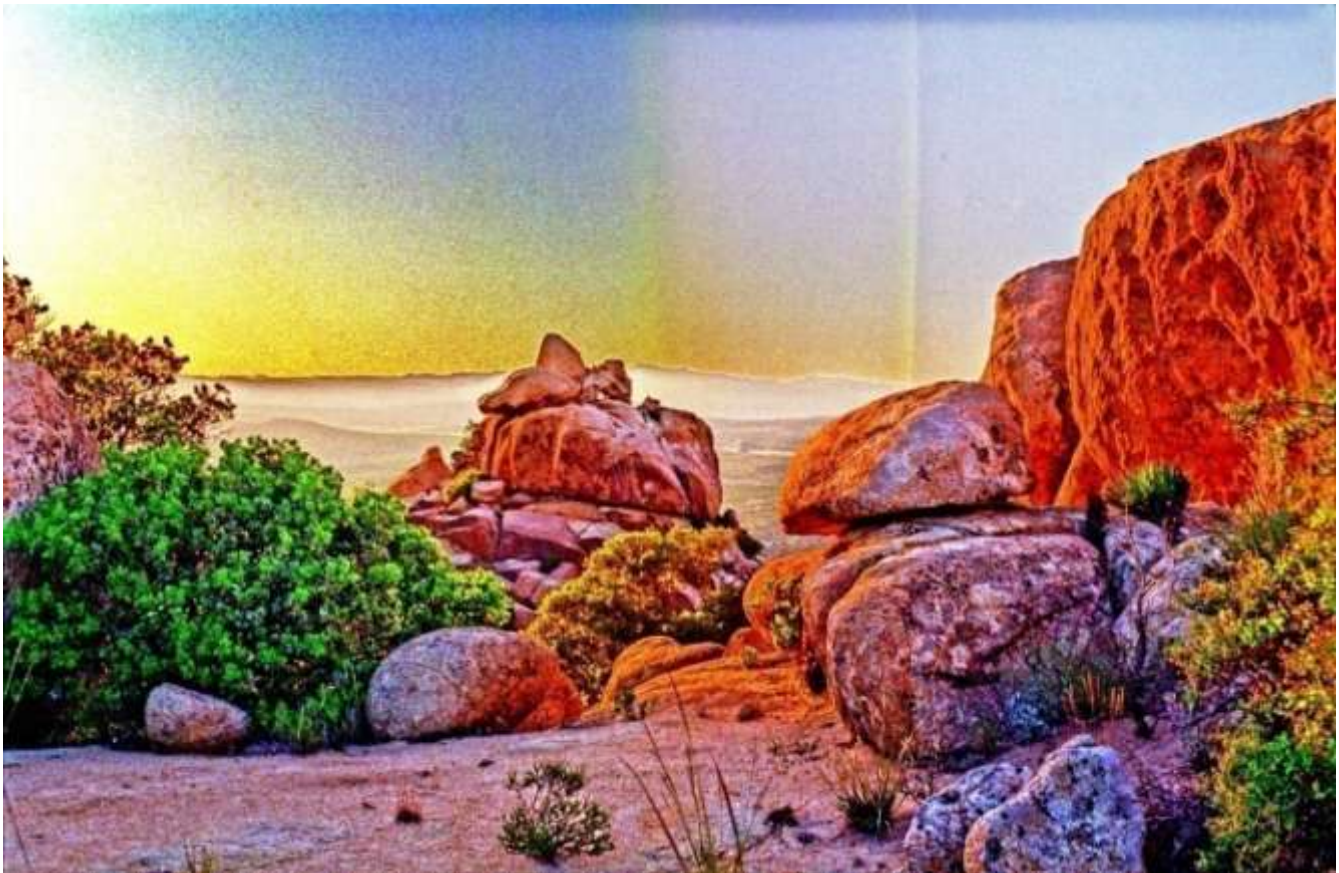
No doubt most American executives would be far too busy to consider evaluating any of the technical or economic details of their \$1.4 billion dollar project, or consider how many more billions of dollars in damages that they would be needlessly inflicting against the people and the environment could be easily averted. Like yourself, I can't change human nature,

Sunrise A.06-08-010

however, I can work toward uncovering the details of a damaging situation, study a number of solutions and present those observations in a way that anyone could easily verify. Naturally, if any question might arise, I could help address any unclear or unresolved issue at your convenience. Unfortunately, damages on the scale proposed will regrettably inflict irreversible scars against our irreplaceable natural resources while seriously damaging the future of many communities in the region. So I will start by providing a few images of our paleoanthropological reserve to offer unfortunately only a very limited view of our wilderness area, its natural stone walkways, mountain gardens, sculpted caves, pure blue sky and wonderful views of distant valleys and mountains to the most distant horizons, where you can occasionally see rare and amazingly beautiful creatures that we have never seen before, and find the ancient artifacts of a humanity that understood this world intimately and knew how to live without causing the slightest damage. This is an ancient living treasure that predates our own history, with more extraordinary sculptures than in almost any museum, crafted by nature over millions of years.



*Manzanita and flat granite*



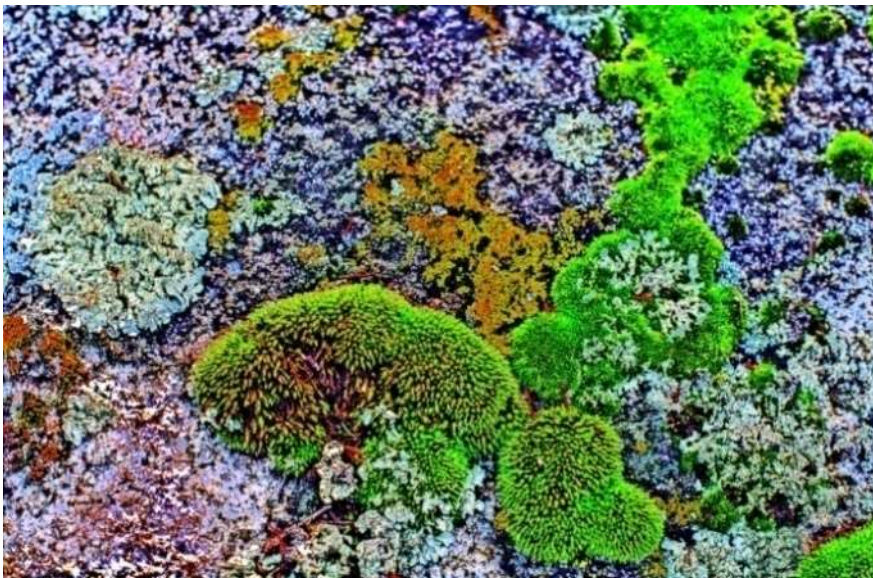
*Western point illuminated at sunset, above McCain Valley in the background*



*Mountain top cavity, northeast view, with ABDSP to the left, photo May 1993*



*Mountain top garden after sunset, looking west toward Boulevard California, Old Highway 80 in the upper left, 3585 foot elevation, 180 degrees diagonal view*



*Soft rock coverings: Lichen symbiosis, an algae/fungal partner & photobiont*

# Statements

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There are several significant matters that have been omitted from consideration by the CPUC documentation titled: Environmental Impact Report / Supplemental Draft Environmental Impact Statement.

Measurements of environmental and property impact, including equivalent replacement costs, full restoration costs, health risks or number of lives that will be lost as a result of electromagnetic fields (EMF) and exposure to ionized pollutants which are responsible for a high incidence of lung cancers downwind from high power lines, and most significantly no review has been provided for a nondamaging underground power line which is still required under the California Environmental Quality Act (CEQA).

The proposed 100 foot tall structures, which would be the height of a 10 storey building designed to carry the 69kv power cables, which were the proven source of major fires last year costing thousands of homes and over \$3 billion in losses, is now depicted on the newest CPUC maps which follow. These new 69kv high power lines are designated for a variety of routes to deliver power from the Jacumba substation through Bankhead Springs to the Boulevard substation, in addition to the 230kv power lines from the Jacumba substation to the wind farm in Mexico, all of which would impact over 45 square miles (> 28,800 acres) of ranches, homes, property, business, viewshed and wilderness habitat, with a restoration and equivalent replacement value that would exceed \$3 billion for *just compensation* as required by law, and significantly more if medical costs and losses of life were to be included.

Further the routes shown on the following two maps, illustrate the 69kv, 230kv and 500kv power line routes, as well as the property that would be crossed which is dedicated to or held by the Anza Borrego Desert State Park and the Native American People or reservations.

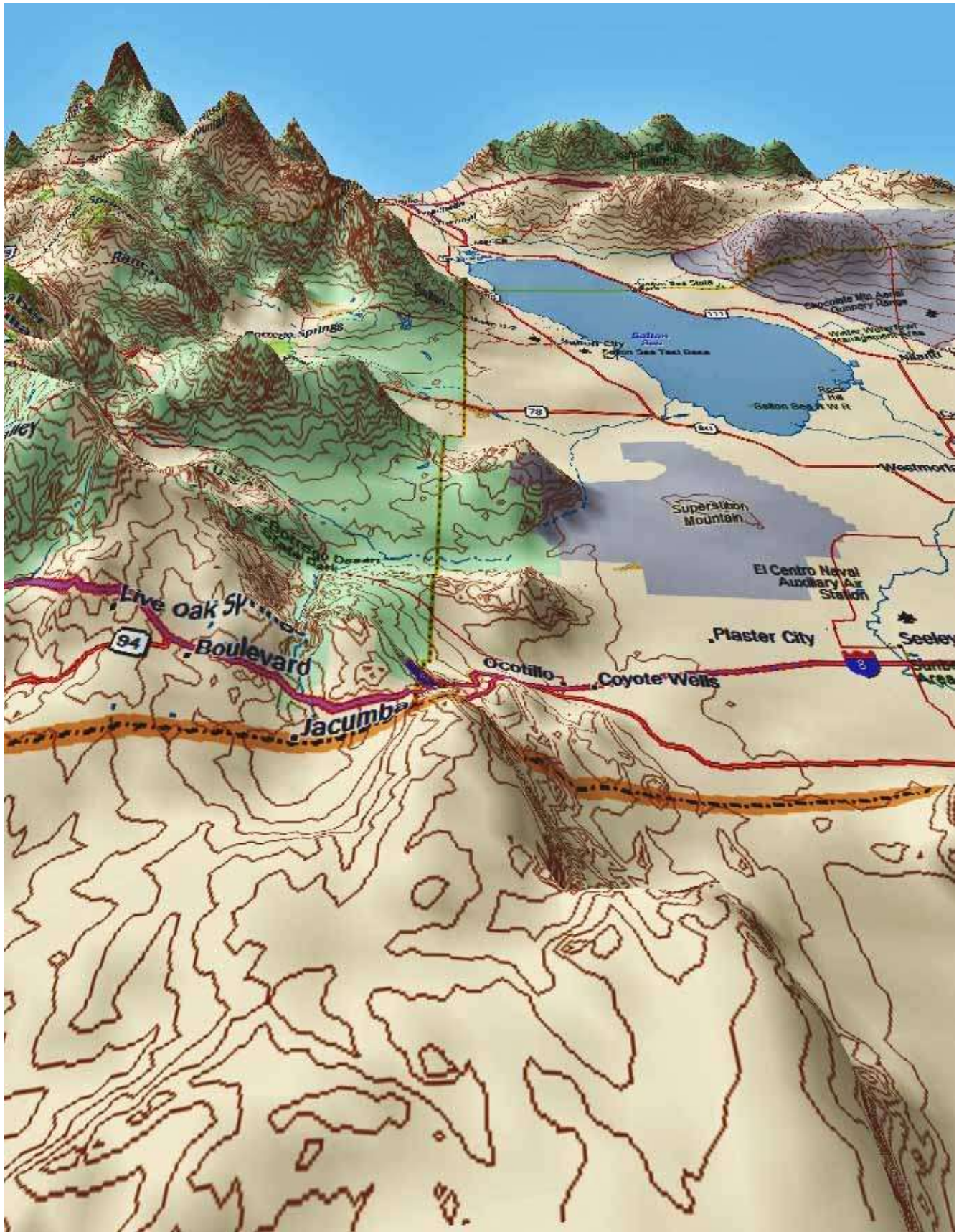


45 square mile substation and new power line impact area for Jacumba, Bankhead Springs, Boulevard and the southern Anza Borrego Desert State park, based on new 69 kv, 230 kv and 500 kv power lines.

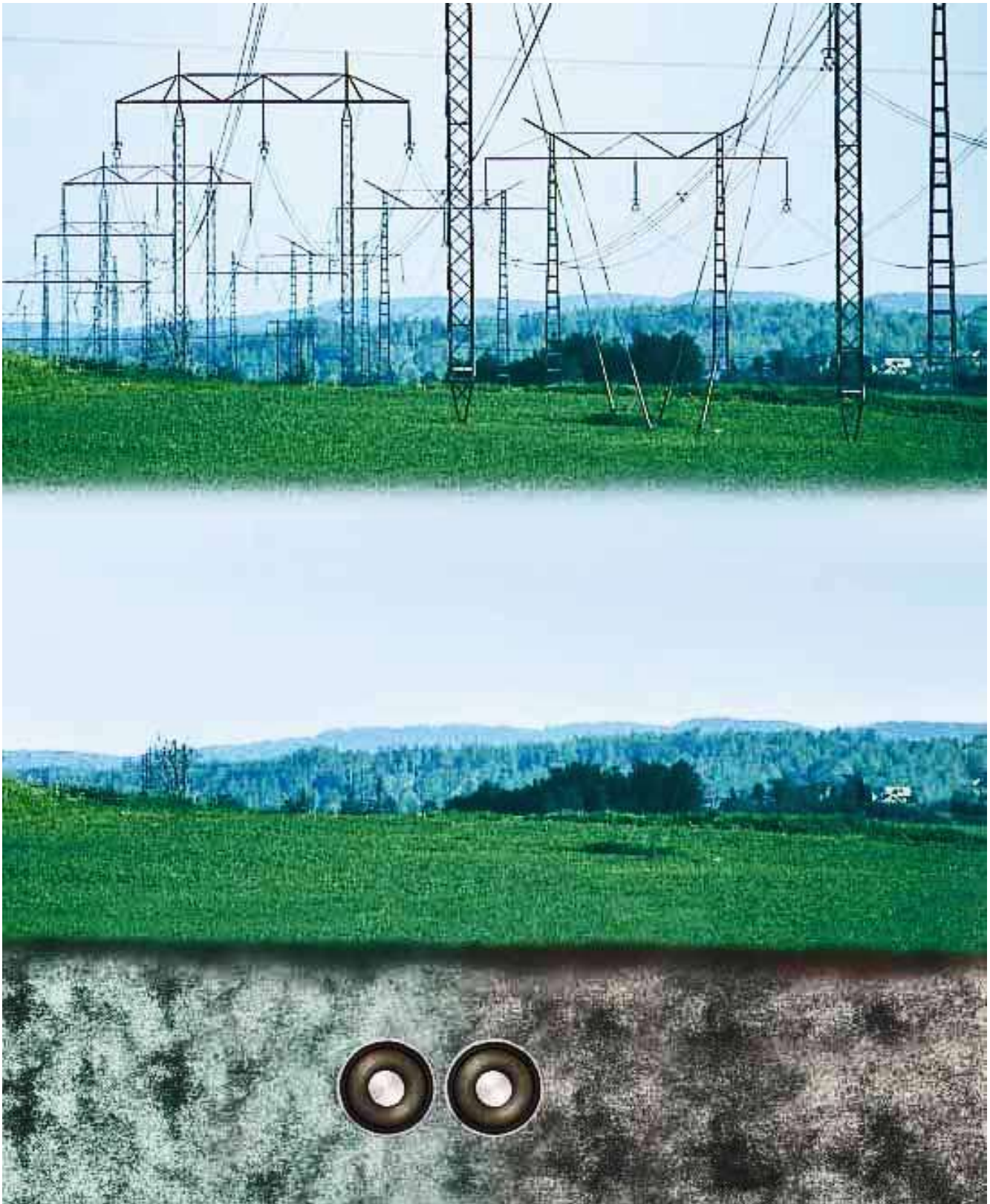
**The following 3-D relief map with exaggerated elevations shows Interstate 8 from Imperial County at the east (right), past Jacumba, Bankhead Springs, Boulevard and Live Oak Springs, to the west (left). The elevations illustrate the extremely clear visibility of high power lines through the valley and along ridge lines.**

**The 3-D map also shows the clear views of the area designated for the huge wind farm with 500 turbines up to 500 feet in height, incidentally as tall as some of the tallest buildings in San Diego, or San Francisco for that matter, that will all be visible throughout the region from Imperial County, throughout Jacumba, Bankhead Springs, Boulevard, and beyond Live Oak Springs to the west. The ridge for the wind turbines is in the lower right corner of the picture, again elevated on top of a ridge, which would also insure immediate visibility at great distances throughout the region. Placing the wind farm 10 miles further south, which is a remote and unpopulated region, as a condition to bringing power into the U.S. would benefit San Diego County, and cause no disadvantage to Mexico. On the next map we can see that this ridge extends southeast into Mexico well over 45 miles, so there's no shortage of space for wind farms in this area.**



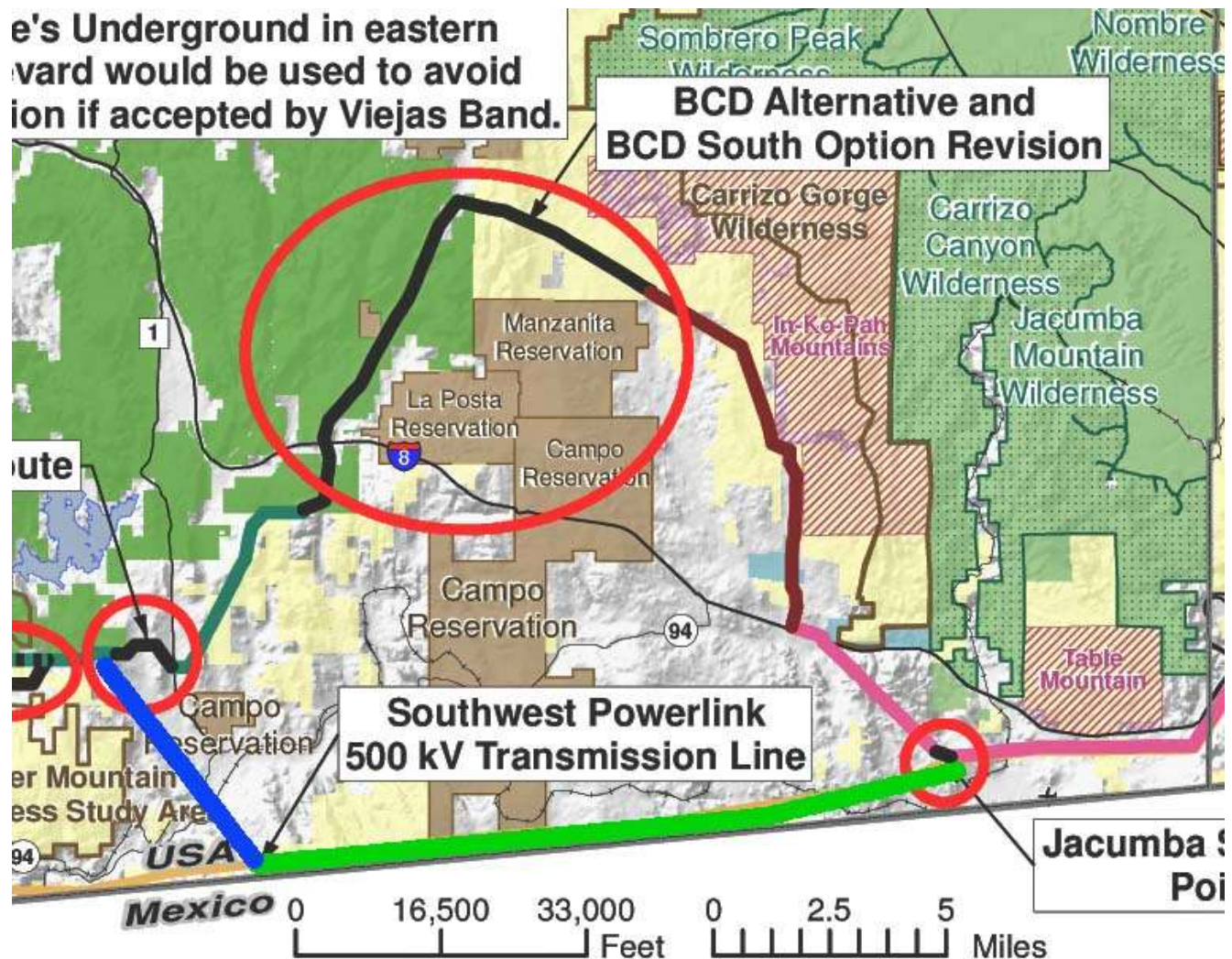






**Two underground power lines can carry 1,000 to 10,000 megawatts at 300 kV to 800 kV DC, which is up to 10 times the capacity of the Sunrise Powerlink, all in one small trench, typically 5 feet deep & 1 foot wide, that can be rapidly installed, at lower cost.**

e's Underground in eastern  
ward would be used to avoid  
ion if accepted by Viejas Band.



- 1) 20 mile AC underground bypass route **GREEN** line plus **BLUE** line. Provides a way to completely avoid: 4 Indian Reservations, 6 Communities, 3 Dedicated Wilderness Reserves, 2 Scenic Highways, and 3 Power Line Reroutes, all listed below.
- 2) Or: 5 mile AC underground **BLUE** line, plus a 15 mile, 500 kV overhead **GREEN** line. Not preferable, but an extremely low budget alternative to massive environmental damages. Still knocking-off 15 miles from the 35 mile loop, without significant fire risks, since the border region to Campo is extremely damaged, due to the Southwest Powerlink.

## Improvement A, Southeast County Bypass

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- 1) Provides for a 20 mile, 500 kV AC underground bypass route GREEN line plus BLUE line, to bypass 4 Reservations, 6 Communities, 3 Dedicated Wilderness Parks, 2 Scenic Highways, and 3 Power Line Reroutes.**
  
  - 2) Or a 5 mile AC underground BLUE line, plus an overhead 500 kV segment, GREEN line, between the Jacumba and past Campo and the Cameron Reroute.**
1. Bypass: Jacumba SWPL Breakaway Point Reroute
  2. Bypass: BCD Alternative and BCD South Option Revision
  3. Bypass: Cameron Reroute
  4. Bypass: Scenic Old Highway 80
  5. Bypass: Bankhead Springs Wilderness Area
  6. Bypass: BLM, McCain Valley
  7. Bypass: Cleveland National Forest
  8. Bypass: Running along and 2 crossings of Interstate 8
  9. Bypass: Homes and ranches west of Jacumba
  10. Bypass: Homes, ranches and businesses in Bankhead Springs
  11. Bypass: Homes, ranches and businesses east of Boulevard
  12. Bypass: Buckman Springs Road and valley
  13. Bypass: Lake Morena Village area
  14. Bypass: Campo north area

15. Bypass: Surrounding Campo Reservation (going around east, north & west)
16. Bypass: Surrounding Manzanita Reservation
17. Bypass: Surrounding La Posta Reservation
18. Bypass: Surrounding Ewiiapaayp Reservation (not on CPUC map, North of Manzanita Reservation)
19. Eliminate: 35 miles of 170 foot tall pylons on mountains & air traffic hazards
20. Install: 20 miles of underground AC power lines, from before the Jacumba SWPL Breakaway Point Reroute, to after the Cameron Reroute, (see GREEN line + BLUE line below). Saves 15 miles, is fire safe and will cost far less than the environmental damages proposed by going through 6 communities, 3 parks and by surrounding 4 Indian Reservations.
21. Alternative: Install 5 miles of underground 500 kV lines plus a 15 mile overhead segment, extremely low cost, short route, along the border already is a cleared low fire potential area, and still saves 15 miles distance from the 35 mile northern loop, along with the massive environmental damages of going through 3 parks and 6 communities.



**Putting power lines through here would trash one of the most extraordinary wilderness landscapes in all of California. I am amazed that the BLM would ever consider forsaking this amazing valley at any price, and yet it can be saved at no additional cost. The understanding is simply refused, even though all the information needed is available. Truly amazing!!! Opposition to nondestructive underground power lines has been consistent, with no functional regard for environmental protection, the economic damages caused, the law, medical or fire safety, only a malicious interest in perpetuating damages.**



**Images of this wilderness region have been provided, with exceptional views, a rich paleoanthropological history, geologic monuments with numerous rare & endangered species which has been assembled over many decades as a gift to be cared for by humanity; but instead it's amazing mountain gardens with expansive views are targeted for bulldozing 15 new roads to mount huge 170 foot tall pylons on top of its mountains for hot sagging aluminum cables, that make the park a serious medical risk, uninhabitable for camping, research or any other purpose. There's no way any of this could be replaced, not even for \$3 million per acre, nor would the most skilled botanists be able to restore damages at less than \$75 per square foot, nor in less than half a century. The bizarre fact is that nondamaging underground AC or DC alternatives cost less than the old 500 kV overhead structures, but are adamantly opposed by SDG&E. Unbelievable!!!!!! The destructive ambitions appear intentional.**



- 1) Jacumba to Boulevard detail, 69 kV AC underground route (**BLUE line**), 13 miles following the existing unpaved roads shown in **PURPLE**.
- 2) Alternatively, end the above ground segment at the east side of ABDSP (3.6 miles), placing only 9.5 miles underground to the Boulevard Substation (**BLUE line**).

# Improvement B, SE County 69kV underground

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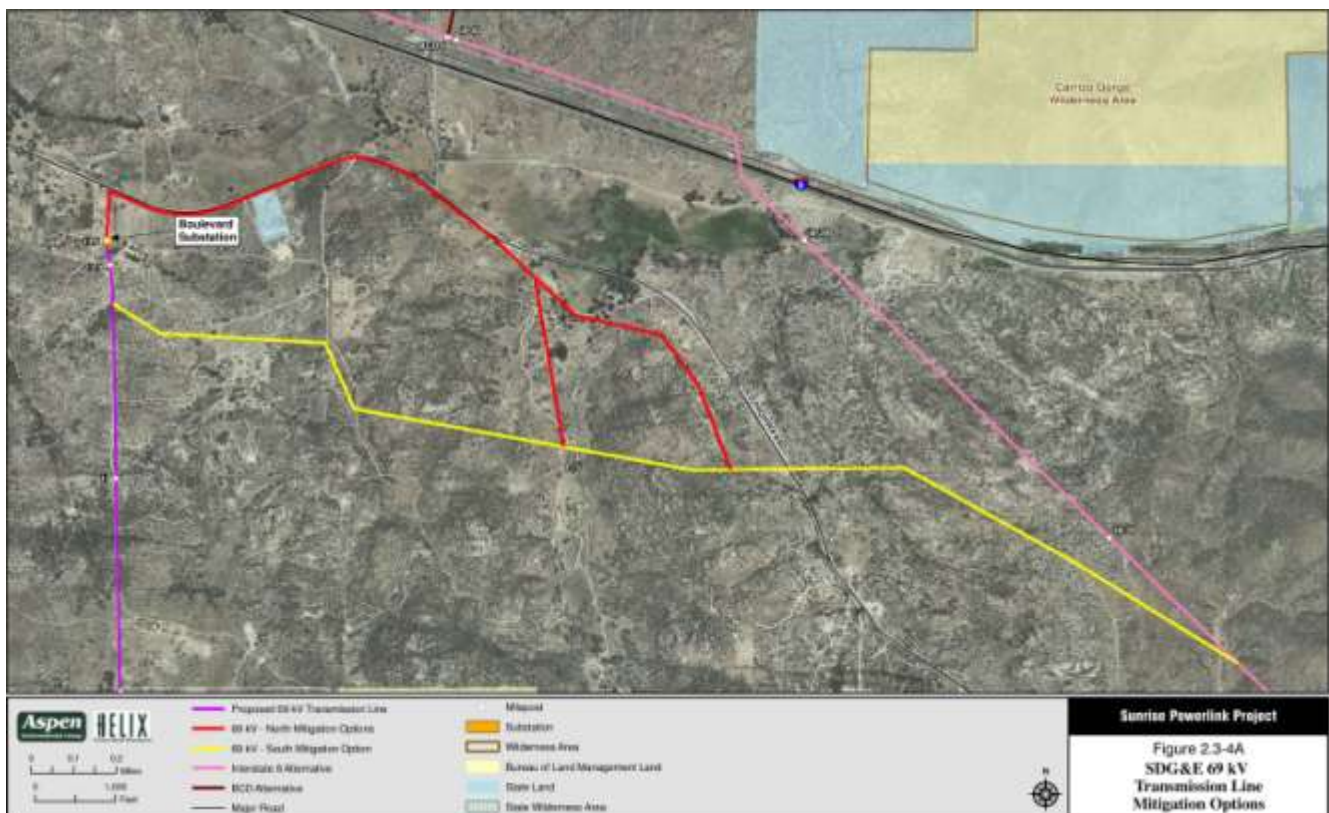
**Provides for a 9.5 mile or a 13 mile 69 kV underground segment between the Jacumba and Boulevard substations. BYPASS means to go underground, along existing unpaved roads or SDG&E right-of-ways.**

1. Bypass: Anza Borrego Desert State Park north of Jacumba
2. Bypass: West of Jacumba, Homes, ranches and businesses
3. Bypass: Bankhead Springs Wilderness Area, homes, ranches & businesses
4. Bypass: Jewel Valley, homes and ranches
5. Bypass: Jewel Valley Airport's landing pattern
6. Bypass: Boulevard CA, homes, ranches and businesses
7. Eliminate: 13 miles and 110 steel towers every 650 feet, 100 foot tall, on mountains with high power cables which are local air traffic hazards
8. Install: 13 miles of 69 kV underground AC power lines, from Jacumba to Boulevard power station following existing unpaved roads and SDG&E Right-of-Way. This should be a little shorter than the overhead route shown in purple near the Jewel Valley Airport and notably safer.
9. Alternatively, install 9.5 miles of 69 kV underground AC power lines, from the eastern boundary of the Anza Borrego Desert State Park designated property, following the same path to the Boulevard Substation. The 1<sup>st</sup> 3.6 mile segment from the Jacumba substation to the ABDSP property being above ground, utilizing 29 steel poles (spaced every 650 feet).

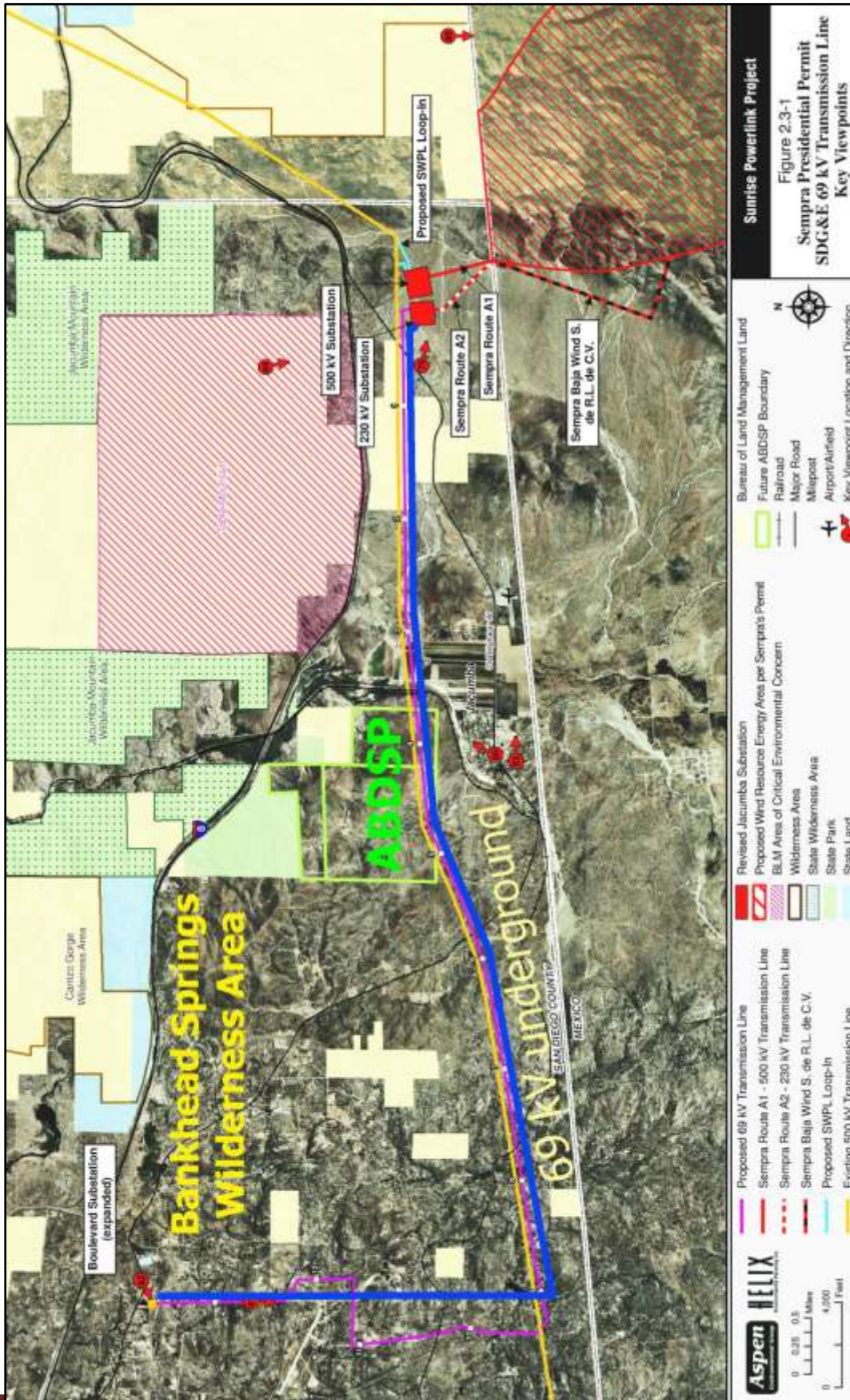


## Note: Note: Note: 69 kV Damages

Moving the 69 kV further north along any of the 3 lines, PURPLE, RED or YELLOW (as shown in figure 2.4-4A, SDG&E 69 kV Transmission Line Mitigation Options, provided herein) would have severe damaging impacts on the region, including numerous homes, ranches, businesses, the scenic "Old Highway 80", which is traveled daily by visitors particularly on weekends, and the Bankhead Springs Wilderness Area, which includes rare and endangered species, paleoanthropological resources, research and recreational facilities.



**Avoid these extremely damaging 69 kV northern access route alternatives above.**



## Improvement C, Wind Farm Viewshed, geologic and botanical damage reductions

Given the extreme visibility of the huge 500 turbine wind farm, which can be seen from Jacumba and Bankhead Springs due to its higher elevation, in an area which is one of San Diego County's best scenic areas with a great scenic highway "Old Highway 80" which was a destination for travelers since the 1920's, we have 2 requests regarding the wind farm: 1) put the 3 miles of 500 kV power lines underground, and 2) don't get a bunch of dumb bulldozer jockeys to trash the landscape first, it serves no purpose other than environmental abuse. Minimize all excavation impacts with a careful plan, observe how much space is absolutely required for each truck movement, and then replant all the construction areas with native plants utilizing a drip irrigation system and botanists familiar with full habitat restoration efforts based on proven experience, not his sales pitch. Otherwise you will be creating an environmental nightmare, and the cost to minimize impacts is slight. If self regulation is impossible, get a botanist referral from an environmental group like the California Native Plant Society.

## Wind Project Construction and Grading (CPUC document excerpt):

Each turbine pad would occupy approximately a 40-foot by 40-foot site (or approximately 1,600 square feet), including a concrete pad and drain rock surround, for a total of approximately 20 acres for the 500 wind turbines. During the construction period, relatively flat temporary pads would be constructed at each turbine site to provide a base for construction equipment, including the large crane needed to erect the tower and assemble the turbine. Installation of tower foundations would involve excavations to depths up to 40 feet below grade, with the diameters of excavations being roughly the same as the diameter of the tower base, approximately 15 to 20 feet depending on turbine model selected. Approximately 160 cubic yards of concrete, requiring an average of 6,000 gallons of water, would be required for each tower foundation (BLM, 2005). After backfilling of foundation voids, remaining excavated materials would need to be disposed of off-site or redistributed on-site. Contour grading would be conducted at each turbine pad as needed to match construction grade with the existing grade. The temporary area of disturbance for new turbines is estimated to be approximately one to three acres per turbine, or approximately 1,000 to 1,250 acres (assuming 2 to 3 MW turbines) of which approximately 18.5 acres would be permanent disturbance. (Recirculated draft for Sempra, page 2-16, July 2008) [http://www.cpuc.ca.gov/Environment/info/aspensunrise/rdeir/rdeir/2\\_sempra\\_mex\\_wind.pdf](http://www.cpuc.ca.gov/Environment/info/aspensunrise/rdeir/rdeir/2_sempra_mex_wind.pdf)

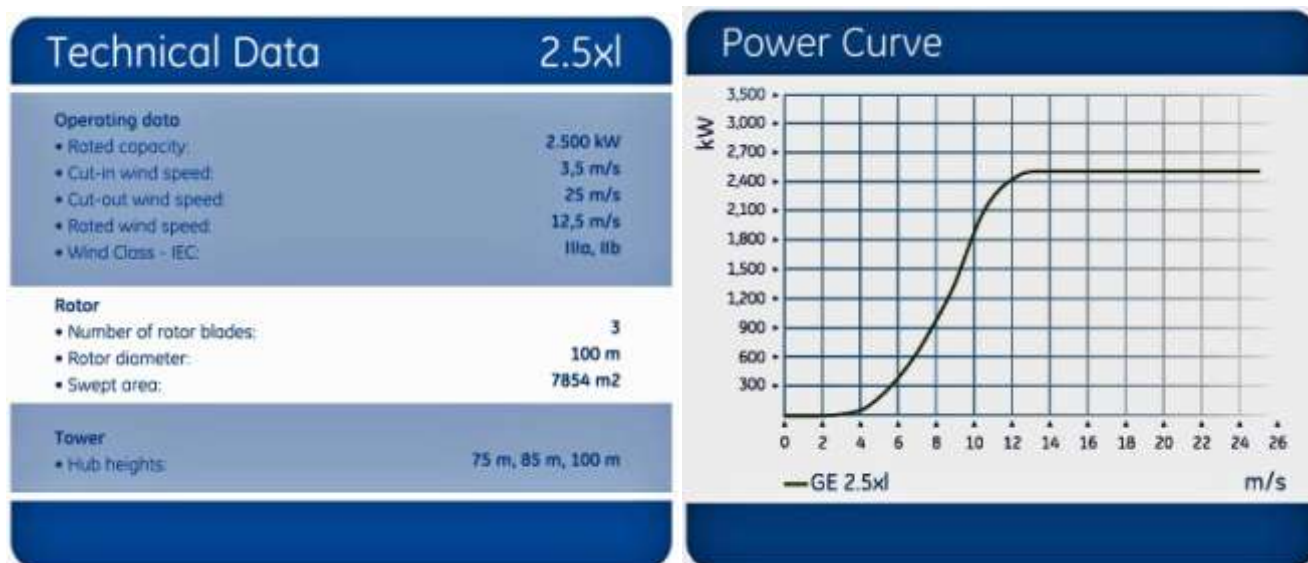
## General Electric Wind Turbine Data:

### 3.6 MW Series Wind Turbine



#### Proven Technology with Offshore Expertise

A larger version of our proven 1.5 MW design, the 3.6 MW machine was specifically designed for high-speed wind sites. With a rotor diameter of 104 meters and a swept area of 8,495 square meters, the new wind turbine is ideal for offshore markets worldwide.



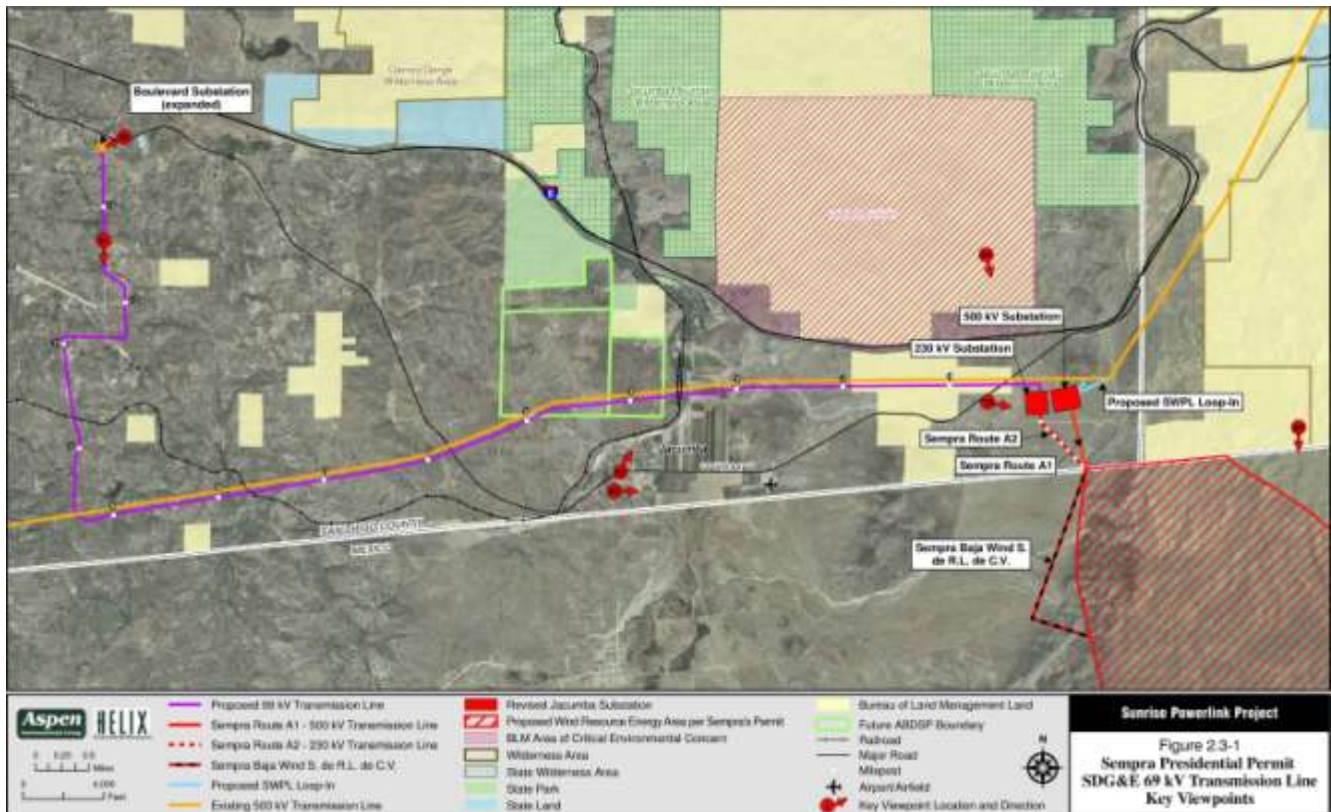
[http://www.ge-energy.com/prod\\_serv/products/wind\\_turbines/en/2xmw/index.htm](http://www.ge-energy.com/prod_serv/products/wind_turbines/en/2xmw/index.htm)

### **Warning, impossible turbine installation problem:**

The above data is from General Electric's specifications for their 2.5 megawatt wind turbine, which shows the rotor blade diameter as 100 meters or 328 feet, with a maximum height of 492 feet. Now the CPUC's site construction data (shown above) says that a wind turbine the height of a 49 storey building with a 328 blade rotational diameter is going to be installed on a 40 foot by 40 foot site. Naturally, we would like to know how to accomplish that. Perhaps, we could put off the directional change, wind turbulence and energy loss issues with much less closely spaced turbines.

At 20 acres per turbine, 500 turbines would take 10,000 acres or 15.6 square miles, or an ridge line about 1 mile by 16 miles, depending on slope, and wind direction along with considerable on site testing at over 200 feet above ground.

**NOTE: Placing the wind farm 10 miles further south, which is a remote and unpopulated region, as a condition to bringing power into the U.S. would benefit San Diego County, and cause no disadvantage to Mexico, particularly since this ridge extends well over 45 miles south of Jacumba. Also, Sempra would need to get the Mexican government to concur; otherwise there is no reason to allow power into California.**



Since the proposed wind farm would be highly visible from the north, from into Imperial County to Boulevard CA due to the higher elevation, consequently it should be considered as relevant to the review process, with provisions to insure the following:

- a) **Underground all 3 or more miles of power lines from the wind farm to Jacumba.**
- b) **Carefully minimize all bulldozing and impacts at the turbine assembly site, with a site plan that is translated to solidly mounted steel posts on the ground (such as 7 foot steel T posts at \$3 each).**
- c) **Require that all construction site damages, excepting essential roads of minimum width (10 foot), be provided a full and complete native plant restoration effort that is fully sustainable without additional maintenance or irrigation.**



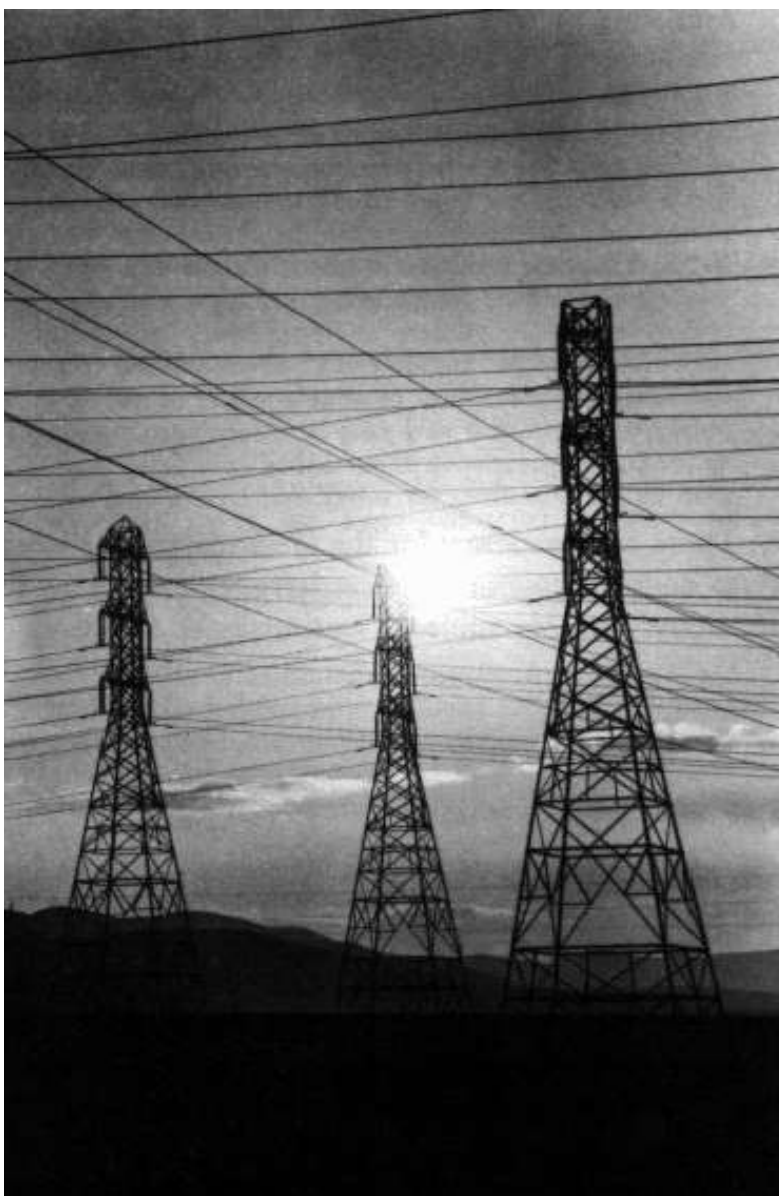
## Underground DC power line advantages

The issues of environmental, home and property damages are the central dilemmas that have been repeatedly brought up 1,000s of times by the people at CPUC hearings and in writing, along with medical risks and business losses; a portion of which would be caused by bulldozing many new roads to the proposed overhead 69 kV lines would add 110 new 100 foot tall steel structures to the nearly 700 huge steel pylons, 170 feet in height, carrying an array of hot sagging reinforced aluminum cables over our heads, homes, ranches and along our roads.

It has been made extraordinarily clear by the people of this region that nobody wants any of these damaging impacts here and have said so 1,000s of times, while requesting the

Sunrise A.06-08-010

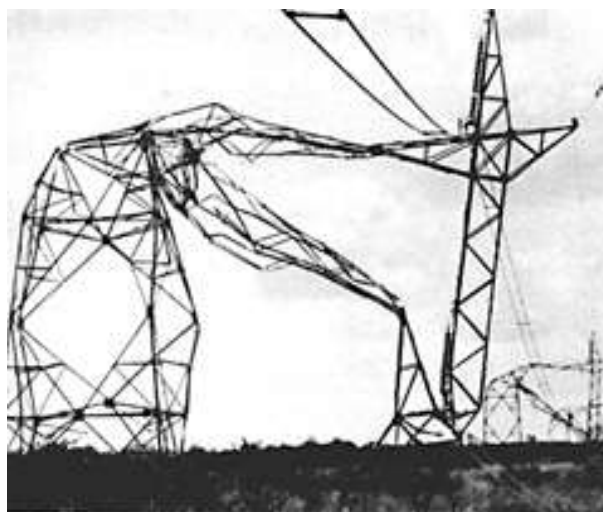
same reasonable underground alternatives that had been more considerably offered along the Northern Route. Yet SDG&E, the CPUC, the BLM and Aspen have repeatedly ignored all their pleas and avoided any review of the benign requests that the people have repeatedly asked for, which incidentally is required by California law. The nondamaging requests have been dismissed as impractical or too costly. However a review of the current technical and economic information shows that those requests do not cost more, are immediately technically feasible and would protect all of the environment, the homes, property, businesses and the health of the people along the proposed power line routes. Consequently we are asking why this work was not provided.





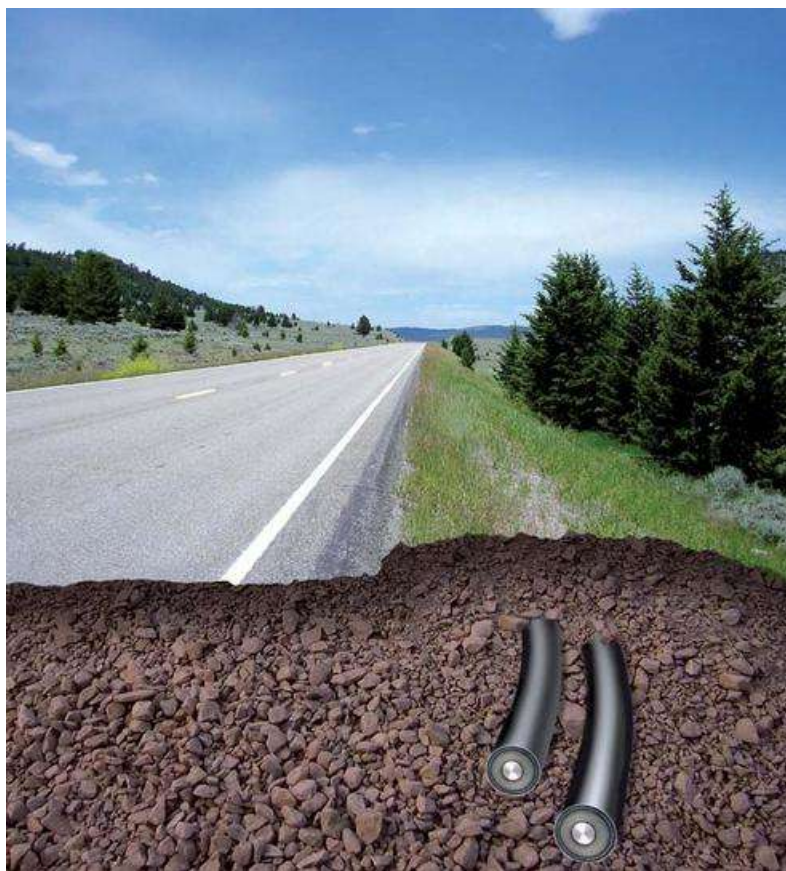
Naturally, we find it curious that since the people are ultimately paying for the power lines, and they want to avoid extremely damaging overhead power lines and utilize some other alternative, then why does a public utility like SDG&E or the CPUC need to impose the more destructive technology on the people, particularly when it's evident that it's not in their interest and it's not their wish.

Please, before CPUC consultants again start providing old boilerplate excuses to oppose underground DC power lines which are not even true, which we have heard many times, and addressed those false criticisms in writing and at hearings many times, all without any consideration, consequently we have again listed these erroneous arguments and provided more contemporary information which is publicly available from the power industry, and from similar scale underground projects around the world and in the United States.



Fortunately, all the issues that the people have been repeatedly describing to the CPUC can be easily resolved, since underground power lines have been proven in over 50 large scale projects, and at a cost that is in total far less costly than the overhead AC power line that was proposed by SDG&E and perpetuated by the CPUC. We understand that major utility decisions cannot be based on misinformation or the avoidance of data, simply because

it's more convenient for those assembling SDG&E or CPUC documentation to just reuse or update old data from prior projects, or from common data sources, which unfortunately to a large extent is what we are seeing. Nevertheless, the newer, nondamaging and the more appropriate technology is certainly available, and an introduction to that data along with technical references is also available here. The older overhead, pylon based overhead technology can be easily be proven to be extremely damaging to a large region, as well as higher in total cost, consequently completely obsolete for the SDG&E application proposed, and inadequate to address the California Environmental Quality Act Requirements (CEQA), while avoiding serious health and economic consequences to the people of San Diego County, who cannot afford well over \$20 billion in near-term damages, nor the long-term loss of thousands of lives. Further, the existing plans and review documentation provided by the CPUC and Aspen also avoid billions of dollars in savings that would be available to SDG&E, which could be a serious incentive to encourage Sempra Energy to consider less damaging technologies.



**Underground DC power line illustration, (not depicting full depth or protective concrete barrier).**

The following table lists some of the advantages of underground DC technology that would apply to the SDG&E power lines, for any phase of the Sunrise Powerlink projects.

## Underground DC power line advantages being ignored

- 1 **Cost:** The total cost of underground DC is in total far less costly than the proposed 69 kv, 230 kv or 500 KV overhead AC technology. Continuously digging a 5 foot deep, 1 foot wide trench is far lower cost than building pylons. Installing underground cables along existing highways is also far lower in cost than overhead AC high power lines.
- 2 **Safety:** The serious matters of fire and aircraft safety, which has cost the people of San Diego County well over \$3 billion during 2007 alone, can be fully resolved through underground DC technology.
- 3 **Environmental damages:** The extremely significant matter of environmental damages, including over 9,000 acres of excavations, bulldozing and destruction to wilderness regions, plus 1,000's of acres of off-road extensions, can be completely eliminated through underground DC power lines.
- 4 **Reliability:** The matter of underground power line reliability is a great improvement compared to overhead AC power lines according to large-scale and long-term power industry studies; further underground cables are not subject to: storms, aircraft collisions, fire, vibrations, stress, corrosion, wind damages (which exceeded 110 miles per hour in many parts of Southern California during 2007).
- 5 **Capacity increase by 300 – 500%:** The issue of sufficient capacity is massively improved through underground DC technology. Currently over 8,000 megawatts are being scheduled for delivery from Imperial County and Mexico through San Diego County according to SDG&E. The Sunrise Powerlink proposes to deliver 1,000 megawatts, while far higher capacity underground DC cables can carry 3,000 to over 5,000 megawatts in just 2 cables buried only 5 feet deep in a small (approx. 1 foot wide trench) on just one side of a county highway, for a total of 10,000 megawatts on just 1 of 7 different county highways, with a long-term total of over 130,000 megawatts of capacity on existing San Diego routes, without causing or increasing any environmental or property damages.
- 6 **Property losses:** The issues of property damages, business and economic losses along the route can easily exceed \$20 billion on a short term basis, could be eliminated through underground power lines. Naturally, it is expected that the people will be forced to absorb all losses through eminent domain and aggressive litigation by SDG&E and through protective judicial reviews in behalf of SDG&E, which may or may not be true.

- 7 Medical & cancer losses:** The matter of medical damages and losses of life as a result of electromagnetic fields and the ionization of pollutants, as an expected source of over 3,000 related cancer fatalities can be effectively eliminated through underground DC power lines. As molecular biology continues addressing the role of cellular microcurrents juries will be provided understandable arguments that can cost the power industry many billions for their continuing efforts to promote risks via overhead AC power transmission, while offering *plausible deniability* statements as a defense.
- 8 Viewshed losses:** Over 500,000 acres of viewshed losses, which degrade San Diego County's scenic highways, tourism resources and recreation resources, which state wide provide \$90 billion in income, can be completely avoided through underground DC technology.
- 9 Maintenance for pylons & overhead power lines:** Maintenance costs are far less for underground power lines, since overhead power line cables fatigue (lasting 30 or more years, depending on wind vibration fatigue requiring a more frequent replacement cycle), further steel pylons corrode (lasting 50 or more years, depending on humidity), all of which have to be replaced repeatedly, perhaps costing over \$4 billion on a 100 year basis.
- 10 Security costs:** Security costs for underground DC power lines, under county highways, would be low, as well as reliable and continuously monitored, while trying to protect 700 pylons in remote areas would be very difficult, costly, unreliable and easily catastrophic. Incidentally, this is why the Department of Homeland Security paid 60% of the cost to insure that high power lines to Manhattan were underground. Unfortunately, SDG&E didn't make such inquiries for assistance from Homeland Security, and wasn't familiar with the Homeland Security program nor underground DC projects in Europe or Australia. Naturally we would recommend including a TCP/IP fiber optic cable to make 1080p surveillance and automatic alarms available to local residents through the web, while providing rural communities with high speed internet access.
- 11 Electrical grid reliability:** DC interconnections between AC grids eliminates both phase synchronization requirements between distant cities, along with cascading blackouts that are inherent in large AC systems, where any single AC link can overload and trip, increasing the strain on neighboring links which in turn disconnect causing blackouts over vast areas, along with huge economic losses.
- 12 DC efficiency advantages:** The efficiency of DC transmission can reduce transmission losses by 50% compared to AC, as well as double the capacity at the same voltage, while utilizing only 2 cables (instead of 6) and providing for 500% greater capacity underground, all with significant long-term financial savings.

## A cooperative offer

There are billions of dollars in savings currently available that could be implemented by SDG&E, which we would be glad to assist with including the engineering and integration process, all with no salary, if SDG&E would donate 20% of the savings it makes to help protect habitat and threatened species, which constitutes a tax deductible contribution. This would naturally represent an 80% profit, on all improvements with no investment to address all the issues, and nothing to pay if it's not a guaranteed profit for SDG&E, plus a tax deduction of up to 20% to compensate for the 20% contribution. We of course have absolutely no idea why all of this effort isn't obvious, as well as completely beneficial for the people of San Diego County, including all the generation companies, as well as SDG&E's economics and naturally the environment, all with absolutely no damages or injustices needing to be perpetrated against anyone. Apparently, the public relations benefits could also be significant. Of course, we are not rash enough to believe that there would ever be any interest in mutual benefits, no matter what the rewards could be for Sempra Energy, which has long been the central dilemma of the business perspective and the state's economics; resulting in short term gain and long term tragedy. It's also what's extraordinarily disappointing to most Americans, that I would hope could be turned around for everyone's survival and benefit.

There is no inherent conflict between protecting the environment and installing high power lines. In 1881, Thomas Edison addressed the matter by placing the first power lines from the first power station completely underground. By 1883 high quality (kerite) insulated underground and underwater power cables were in production in at least three facilities. While high voltage AC transmission was introduced during 1893 in Redlands California, however it wasn't until 1950 that Shockley of Bell Labs designed the thyristor as a solid state device which could assist with rectification, converting AC to DC, and inversion converting DC to AC in high voltage applications. Beginning in 1965 the Los Angeles Department of Water and Power saw the benefits of this DC technology and ultimately implemented extremely reliable arrays of solid state thyristor power converters to connect power generation from the Columbia River on the Washington-Oregon border to Los Angeles, 846 miles (1362 km). The discoveries, innovations and risks have been successfully accomplished over the past 60 years. This underground DC technology is now mature, extraordinarily reliable and proven in over 50 major installations worldwide. We are not taking any risk by evaluating and implementing this technology. Further, SDG&E has already very successfully installed the same underground high power cables through San Diego, while the Los Angeles Department of Water and Power has over 40 years of experience, now with 3,100 megawatt DC transmission.

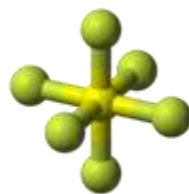
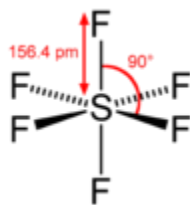
## Underground Cable Options

	Underground cable technology	Voltage DC, Amps	Capacity megawatts
1	Kerite, Permashield, 3.8" OD	138 kV, 1000 amps AC	138 MW
2	XLPE, cross-linked polyethylene, 6"	300 kV, 3066 amps DC	1840 MW (3000 sq mm)
3	PPL, Paper Polypropylene Laminate	600 kV, 3066 amps DC	3680 MW
4	SCFF, Self Contained Fluid Filled	800 kV, 3066 amps DC	4906 MW, oil insulated
5	GIL, Gas Insulated Transmission Lines Sulfur hexafluoride SF <sub>6</sub> insulation	800 kV, 6400 amps AC or DC	10240 MW DC 5120 MW AC

### Notes:

1. Kerite, claims to have shown zero electrical deterioration of its Permashield insulation formula after 50 years of continuous use and provides an unlimited warranty, and have been manufacturing underground power lines since the early 1880's.  
[http://www.kerite.com/catalog/catalogfiles/high\\_voltage\\_138kv.htm](http://www.kerite.com/catalog/catalogfiles/high_voltage_138kv.htm)
2. Where mountains are involved fluid filled systems would present serious pressure problems without an internal cellular structure.
3. Recommendations for XLPE, cross-linked polyethylene are to not exceed 345 kV, and preferably stay below 245 kV, to maintain a stable system without significant electrical deterioration. A review of all XLPE, cross-linked polyethylene, PPL, Paper Polypropylene Laminate, Kerite Permashield and related insulator formulations should be carefully studied and electrically tested based on old existing system examples, before selecting an insulation system.
4. Gas Insulated Transmission Lines (GIL) based on Sulfur hexafluoride SF<sub>6</sub> insulation and a high capacity cylindrical conductor can provide a very high degree of insulation, extremely high capacities and not sustain deterioration and could in one trench provide over 10,000 megawatts of capacity and should be carefully considered as a solution.

**Sulfur hexafluoride SF<sub>6</sub> with no free electrons creates a very efficient, fully contained and stable insulation system, that is 5 times denser than air, is used to assist with surgery and enhance medical imaging.**



**Gas Insulated Power Lines  
Direct burial and enclosed**

**10,000 megawatts DC**

**5,000 megawatts AC**

## **10,000 Megawatt High capacity routes**

- 1. Two existing ultra high capacity overhead routes**
- 2. Seven new high capacity underground routes**

**200,000 megawatts of transmission capacity exist east and west across San Diego County without causing any environmental or property damages**

### **I. Two existing high capacity 31,000 megawatt overhead routes to San Diego and Orange County**

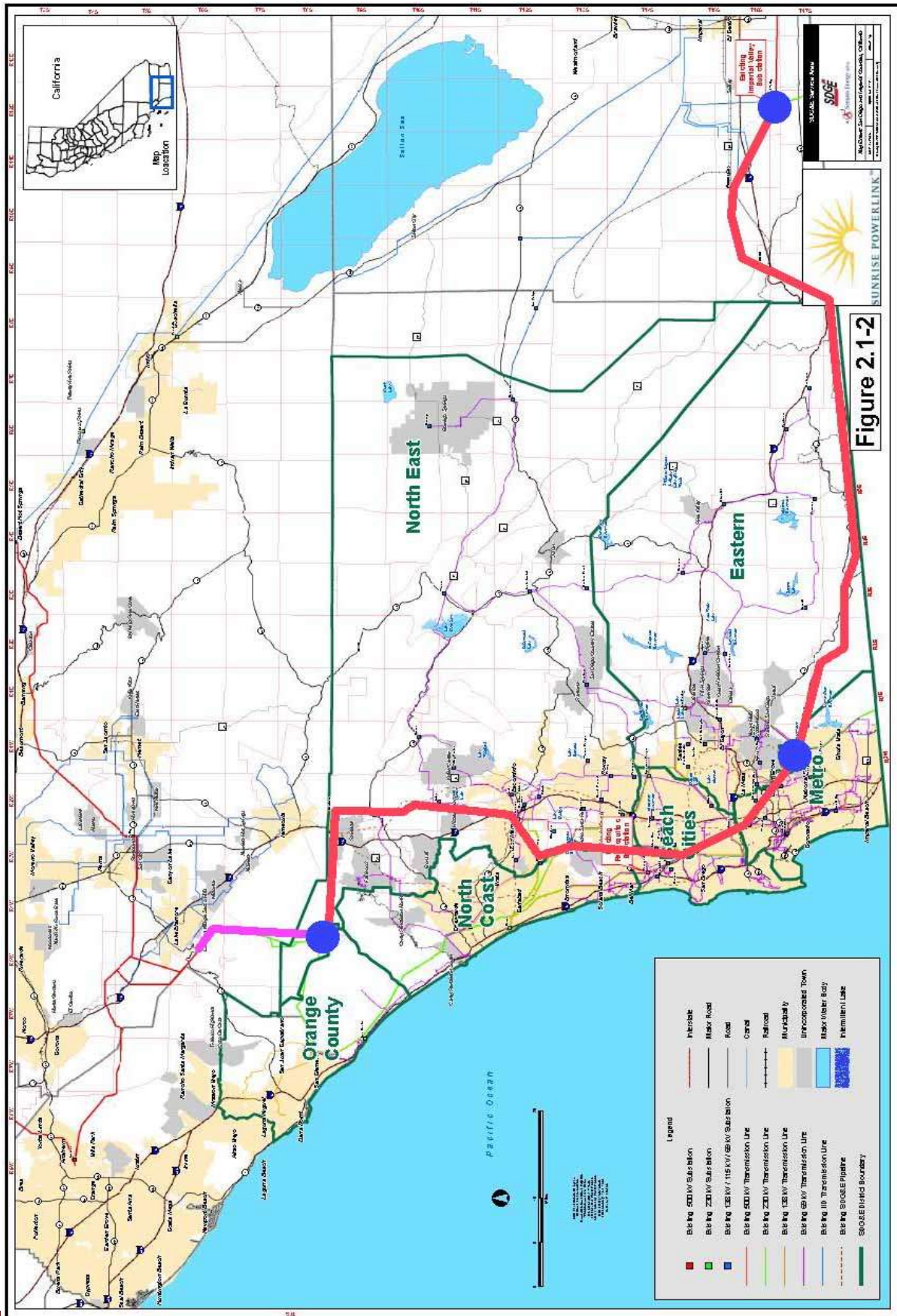
(Expandable to 30,000 MW of UHVDC east-west and 30,000 MW north-south + an integral 1,000 megawatt AC distribution corridor and no new environmental impacts.)



Implementation of a 30,000 megawatt corridor from El Centro to San Diego can be incrementally developed using the existing 500 kV Southwest east-west right-of-way to San Diego, then continues north along the existing 230 kV right-of-ways to Orange County then to Lake Elsinore where it connects to Southern California Edison's (SCE) 500 kV corridor, all of which can be upgraded to 30,000 megawatts on pylons capable of carrying 3 sets of Ultra High Voltage Direct Current (UHVDC) cables, all based on a +/-800 kV upgrade using an updated version of the same proven DC technology used by the Los Angeles Department of Water and Power (LADWP) for 40 years.

This approach can provide for 2 separate access routes each up to 30,000 megawatts into San Diego, one east-west through Imperial County and one north to the SCE 500 kV AC grid, which is also capable of receiving or sending up to 30,000 megawatts, in order to provide 2 complete paths that can fully supply San Diego County. Phase one pylons could provide three 230 kV to 500 kV AC cables for local power distribution with 2 additional cable pairs above for UHVDC, with adequate pylon strength and space to add 2 additional cable sets at a later date with 10,000 megawatts each, for an ultimate capacity of 30,000 megawatts. Which can mean bringing up to 60,000 megawatts into San Diego or sending up to 30,000 megawatts north into the SCE grid, all without increasing SDGE's environmental footprint, all of which can also provide for 2 separate high capacity paths from Imperial County's renewable resources to San Diego.

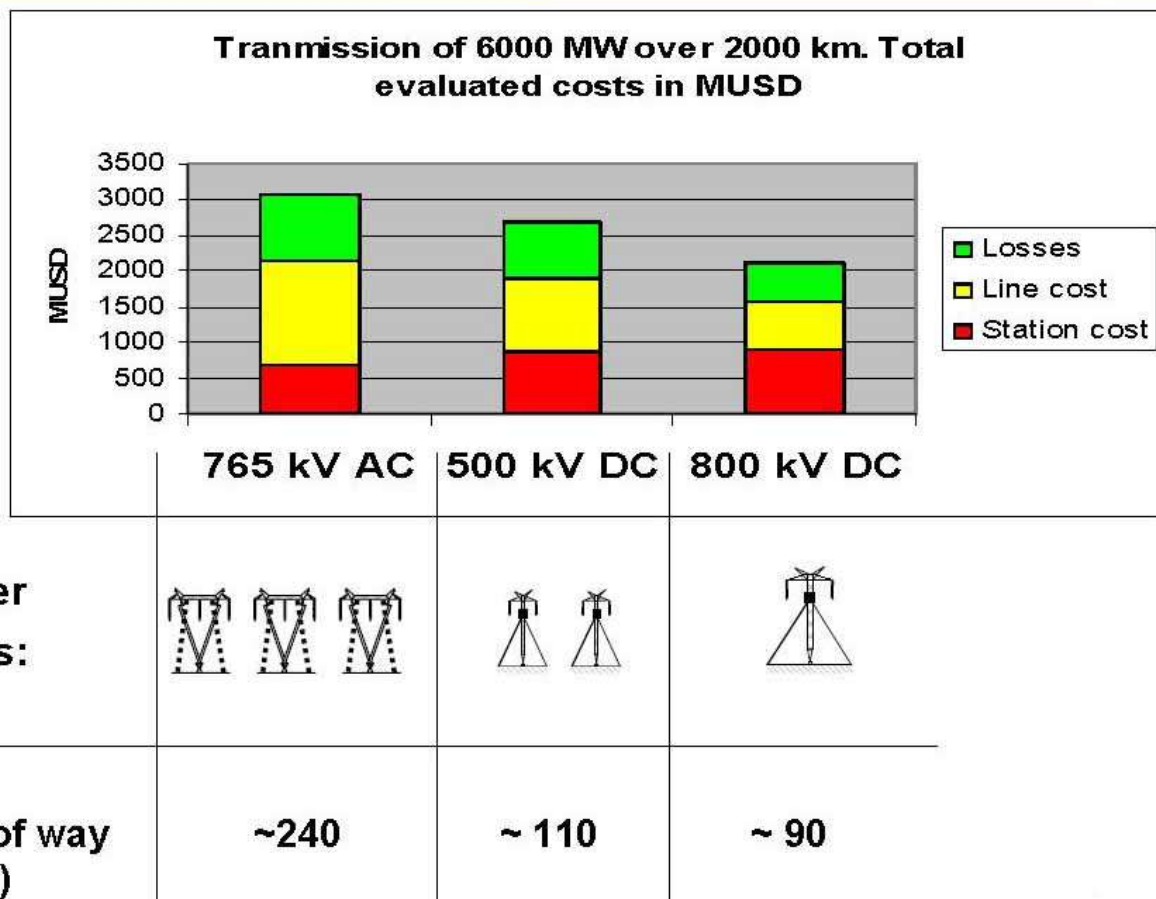
Ultra high capacity route, from El Centro to San Diego to Orange County





**Pacific Intertie 3,100 megawatts, +/-500 kV DC, 1965 LADWP**

# Transmission Economics



The proposed 1,000 megawatt Sunrise Powerlink does not provide significant future expandability to even begin addressing San Diego’s transportation needs, nor is it able to deliver more than a small fraction of the 7,000 megawatts that SDGE indicates it already needs to deliver from renewable generators in Imperial County to San Diego. Consequently, many more Sunrise Powerlinks would be needed, resulting in extraordinary economic and environmental damages and far higher costs to SDGE, unless a more comprehensive solution is considered.

## Advantages of +/- 800 kV Ultra High Voltage DC transmission including an AC distribution line

1. The first advantage is that no new transmission corridor has to be created.
2. Existing right-of-ways are used to implement a system with over 30 times the existing capacity.
3. Capacity is expandable in 1,000 to 10,000 megawatt increments on same pylon system, by either upgrading the converter stations or alternatively adding another set of cables.
4. No new environmental or property damages are imposed on the region.
5. The expansion of renewable power at remote locations across both San Diego and Imperial Counties is provided for with an integral 1,000 megawatt AC power line, in addition to addressed San Diego's future needs for many decades with 30 times the capacity of the Sunrise Powerlink.
6. Coverage areas include Southern Imperial County, San Diego, Southern and Western San Diego County, Orange and Southwest Riverside County, with a 500 kV link to Southern California Edison's 500 kV AC line near Lake Elsinore.
7. This power corridor functions both as a super high capacity point to point DC network and as a 500 or 230 kV AC distribution network to provide coverage for county wide distribution and recovery of widely distributed wind and solar generation facilities in San Diego County.
8. Such a high capacity hybrid delivery system could be capable of feeding 30,000 megawatts into Orange, Riverside and Los Angeles Counties based on electrical demands from southern Imperial County, or points eastward in Arizona or south in Mexico (which could change with LNG).

9. As global petroleum resources are consumed, at least 20,000 additional megawatts of power will be needed for San Diego County's vehicles in the short term, which can easily double, perhaps ultimately requiring 60 megawatts of capacity. Designing a system that can be upgraded to 30,000 megawatts of new capacity is a conservative increment that should be increased, based on the route's actual overhead capabilities, which could alternatively include at least 60 megawatts of underground cables in 6 separate 2 foot wide trenches, 5 feet deep, each 10 feet apart, as described later, which incidentally could render even this high capacity overhead route obsolete, in deference to a completely underground 60 megawatt system under the existing Southwest 500 kV AC power lines already in place, which could allow the existing 500 kV lines to revert to local distribution uses for San Diego and Imperial County, with increments of up to 60 megawatts to reach San Diego, Orange and Los Angeles Counties, all underground within existing right-of-ways in use.
10. No new overhead AC power lines need to be implemented except for small scale local household distribution, which could be underground. Future EMF cancer risks can be reduced through DC and by undergrounding all local AC power lines.
11. While power generation represents only 20% of anyone's electric bill, most people undoubtedly will not want to pay 1/2 cent per kilowatt hour by installing photovoltaic panels on their roof, nor have they been educated to understand the issues, so they will probably remain dependant on SDGE, SCE and the LADWP for a very long time, unless of course installation companies can economically and reliably address installation.
12. The primary issue remaining is how to stop economic and environmental damages, or how to stop either faction from violating California and federal laws, or alternatively how to get SDGE to addressing paying an estimated 6 to 20 billion dollars in short term damages, plus vastly more in medium term damages, if it builds the grossly inadequate 1,000 megawatt Sunrise Powerlink.
13. SDGE now indicates that there are at least 7,000 megawatts of renewable power resources being scheduled for delivery on the 1,000 megawatt Powerlink, so SDGE

already knows that they will need well over 10 times the capacity of the Sunrise Powerlink to deliver just the first phase of that supply. So what plan could SDGE possibly have to resolve this future load problem, 20 to 40 additional Sunrise Powerlinks (numbered 1 through 40)?

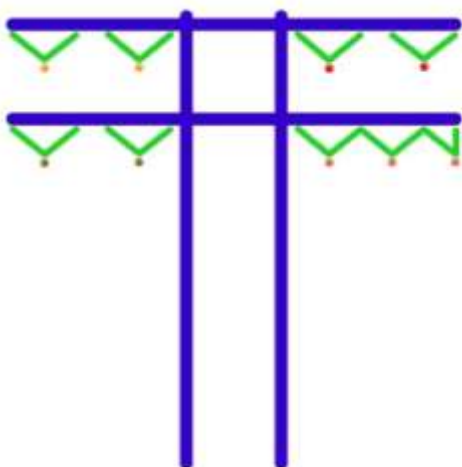
14. If SDGE needs well over 10,000 megawatts of additional capacity from Imperial County into San Diego and Orange and Riverside Counties then where do these new 10 to 40 additional Powerlinks go, all over San Diego County, until the EMF is so intense that everybody gets Leukemia and lung cancer as their birthright?
15. China is already building or planning over 20 such high capacity UHVDC power lines that will minimize environmental impacts and lower the cost of building high power lines. But Southern California with the highest energy demands is incapable of considering a safer, higher capacity system that doesn't increase any environmental impacts?
16. The cost per 1,000 megawatts of capacity with UHVDC is considerably less as well as more efficient than conventional 500 kV AC power lines.
17. The environmental and economic savings to the region achieved by using UHVDC would be over 20 billion dollars in short term damages and far more in medium term damages per 500 kV AC power line, and apparently many times that amount as additional power lines are needed. The Sunrise Powerlink's AC strategy is a flawed vision.
18. The low capacity, high impact Sunrise Powerlink is the most costly approach and perhaps the most damaging strategy that could have been devised. Both underground DC and an upgradeable approach to UHVDC using existing right-of-ways can save many billions of dollars both for SDGE and for the people of the region.
19. With 2 high capacity power line routes serving San Diego, with 10,000 to 60,000 megawatts each, expandable say in 1,000 megawatt increments, either one could be shut down for maintenance or to improve capacity.

20. A 2 level, wide profile, pylon could accommodate one +/-800 kV pair of DC lines on the first level to transmit 10,000 megawatts plus three 500 kV 1,000 megawatt AC cables, and as future expansion was required a second level could be added to carry two additional 10,000 megawatt DC circuits. Insulators can be arranged in a typical "V" pattern, with reduced pylon to pylon spacing and minimize cable motion in high winds, as well as maintaining a safe compact design to minimize visual intrusion, with less cable sagging, less stress, lower cable fatigue and lower maintenance costs.
21. A fiber optic link can provide for high definition video security cameras on each pylon to provide for security monitoring, also directly available to law enforcement and the public, along with free wide area high-speed internet to all residents along the power line route, with an ability to rotate and zoom a camera on each pylon, when not being used by SDGE or law enforcement.
22. SDGE could provide a web site which contains isoline maps showing EMF levels from the 1 milligauss level, up to the power lines, with signs on each side of the pylons showing the 2 milligauss (mG) level locations, particularly between pylons, so that residents can consider their health safety, as well as protect their home and property values.
23. A mixed AC and DC power line could provide one or more high capacity, high efficiency DC transmission systems, along with a 1,000 megawatt AC path to pick-up and distribute scattered wind and solar generation resources along the route.
24. This mixed ultra high capacity AC and DC transmission system may well address San Diego, Orange and western Riverside County's needs and support the needs of the state grid well into the next century, all without creating any new routes, nor increasing any damages to the environment, or increasing harm to property interests.
25. With a more efficient grid that could save SDGE over \$20 billion in construction costs over several decades, as well as saving 100's of thousands of acres from environmental devastation, and saving many billions in property losses and liabilities, there's no doubt that SDGE could afford to reimburse everyone for the full

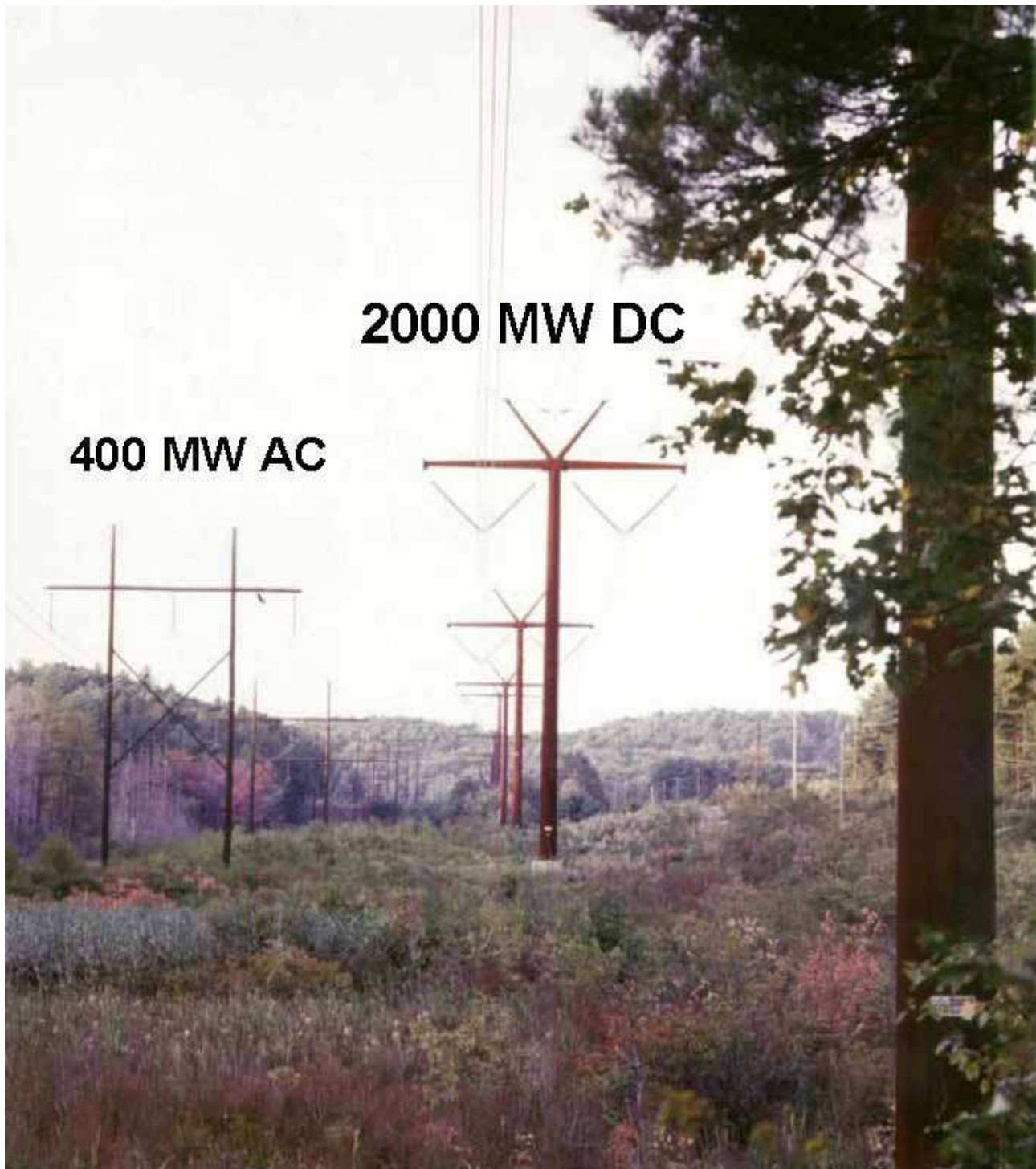


replacement value of the property they lost or which was damaged along existing high power lines. Instead of the power industry spending 100's of millions of dollars trying to deny EMF and pollutant ionization associations with cancer, funding could be provided for a molecular biology institute to assist in reversing electrical field promoted cancers, including leukemia and lung cancer.

26. Restoration of environmental damages caused along existing power line routes can continue by researching drought tolerant on-site propagation techniques based on rainfall, nutrients, moisture retention, genetic strains and improvements to benefit drought tolerance.
27. The public relations benefits for protecting the environment on a massive scale, while addressing the molecular biology of ion and field promoted cancers, eliminating any significant need for eminent domain, supporting sustainable electrical generation and resolving the huge electrical demand for plug-in hybrid vehicles, could incidentally result in large scale, as well as profitable benefits for Sempra Energy, along with supporting the governor's administration.



**High capacity 31,000 megawatt pylon diagram for: three 10,000 megawatt DC lines and one 1,000 megawatt AC circuit, (with all + and – cables on opposite sides).**

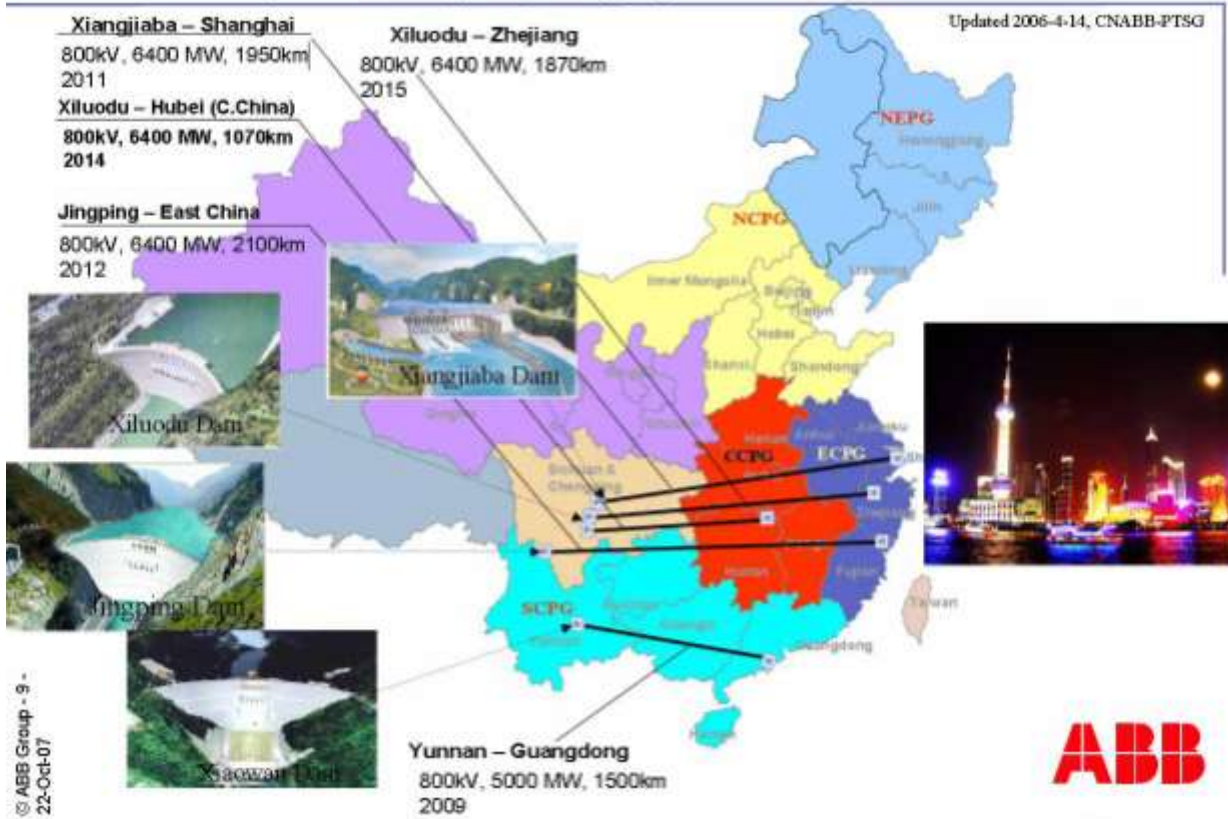


**The lower impact steel pylon to the right carries 2,000 megawatts, twice the capacity of the Sunrise Powerlink**

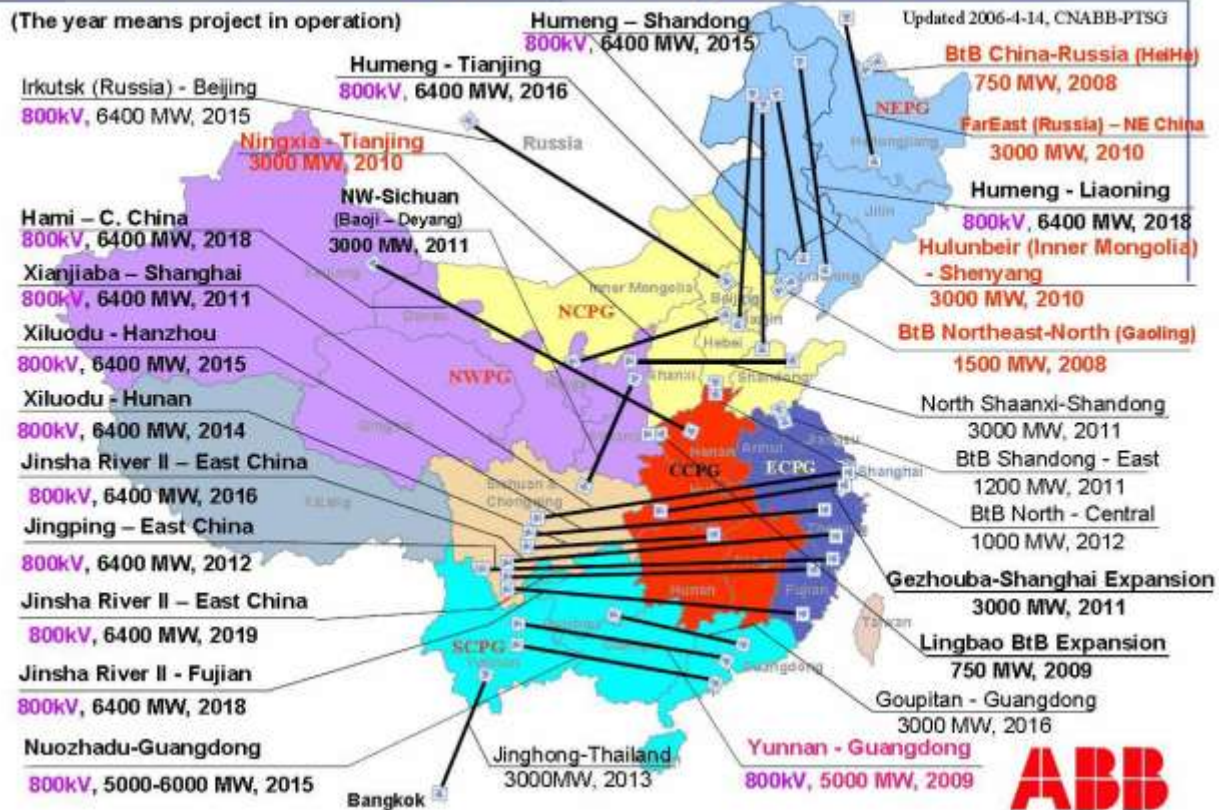


**Pacific Intertie 3,100 megawatts, +/-500 kV DC, 1965 LADWP**

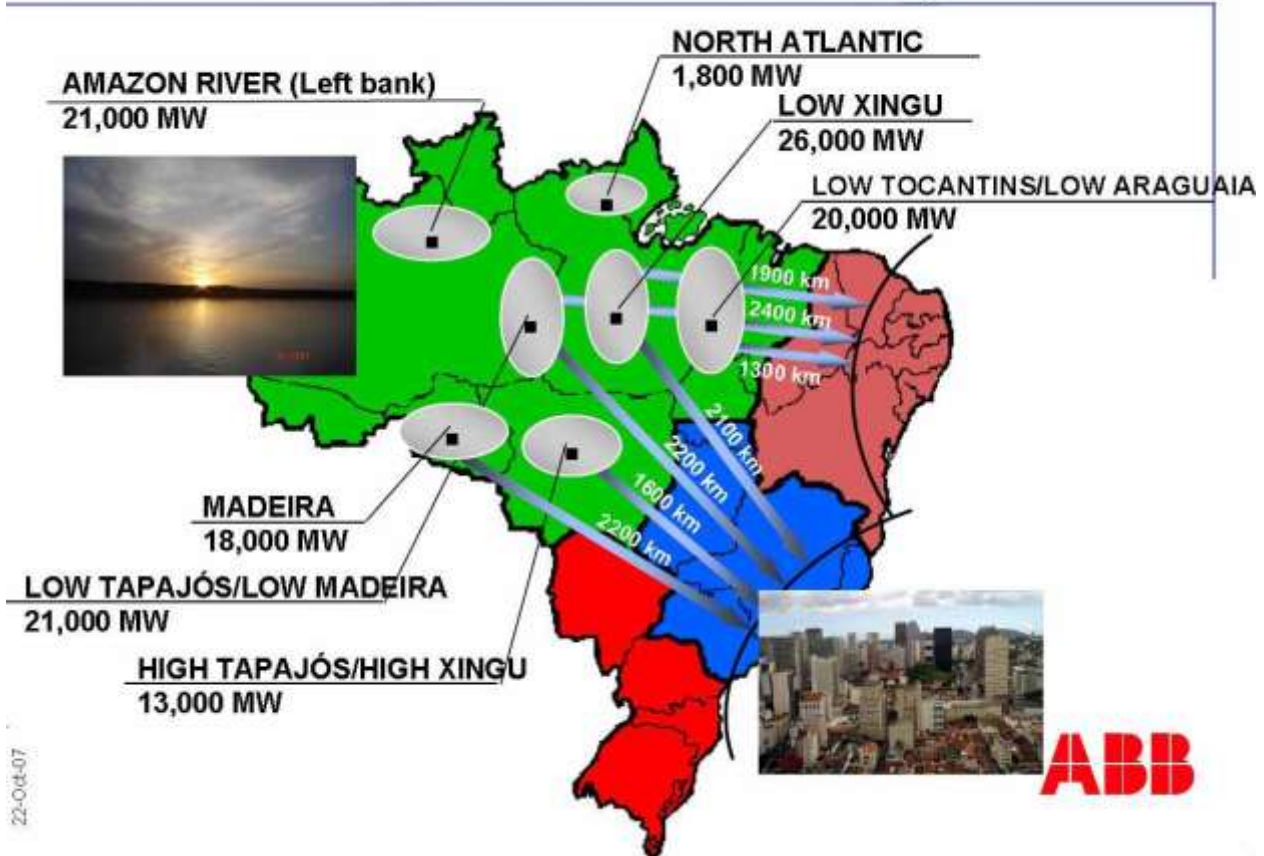
**Jinsha River I (Xiluodu, Xiangjiaba), Jingping & Xiaowan Dams, for 800kV UHVDC**



**Planned Future HVDC Projects by 2020 in China**

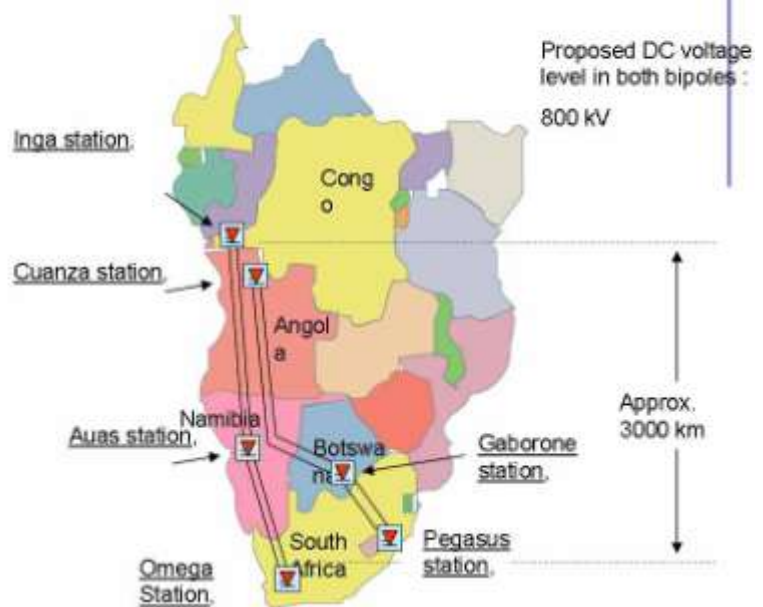


# Brazil: Potential Amazonas River Projects



22-04-07

# South Africa: West Cor Line



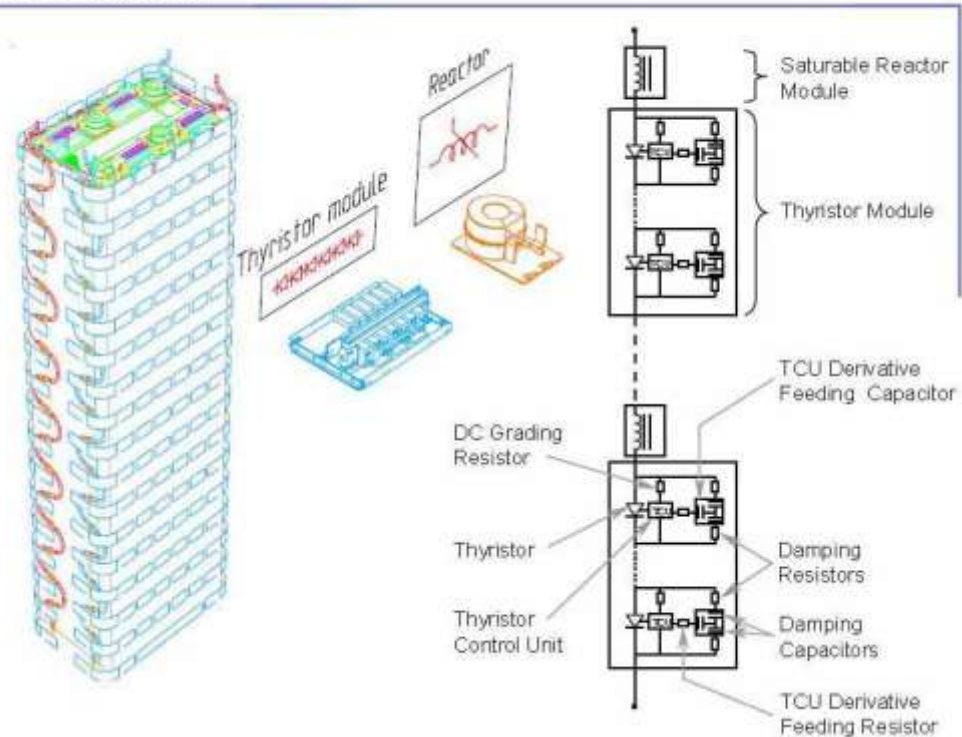


+/- 800 kV 6400 MW DC converter station



Wall Bushing 800kV ABB

## Thyristor Valve Layout



## Thyristors

- The valve voltage is not decisive for the thyristor. Will be handled by sufficient number of thyristor positions in series. **Due to the well defined voltage grading each individual thyristor position has the same electrical stress in an 800 kV valve as in a 500 kV valve!**
- The critical parameter for the thyristors is the short circuit current. This is given by the ratio between rated DC current and transformer reactance



## Experience of 14000 5" thyristors

Project	Power Transmitted, MW	Number of thyristors	Commissioned year	Nominal Current, A	Overload Current, A
Garabi 1 Brazil	1100	1728	2000	4020	-
Garabi 2 Brazil	1100	1728	2002	4020	-
Three Gorges- Changzhou, China	3000	4176	2003	3000	3555 @20°C
Rapid City USA	2x100	336	2003	3920	-
Three Gorges- Guandong, China	3000	4176	2004	3000	3555 @20°C
Sylmar Replacement Project USA	3100	2016	2004	3100	3650 @20°C

**One thyristor failed during commercial operation reported (Garabi 2002)**



**Composite support insulator +-800 kV DC, ABB**





**Pylon foundation, Pacific Intertie 3,100 megawatts, 1965 LADWP**

## Ultra high voltage DC videos:

["800 kV UHVDC" \(7 min\)](#)

Large 22 MB

["800 kV UHVDC" \(7 min\)](#)

Small 7 MB


<http://www.abb.com/cawp/gad02181/0ca04adc1b0b9c76c12570f3002eb4c7.aspx> (Index of HVDC videos, which are available in high or low resolution for faster buffering)

<http://www.prysmian.com/our-products/energy/power-transmission/high-voltage-systems.html>  
(400 kV underground Madrid to Barajas Airport Prysmian cable and tunnel installation)


**HVDC Videos**



**Ditta Pirelli now Prysmian Cables, founded 1872, began undersea cable production in 1886, acquired Siemens cable division 1999, has 52 manufacturing facilities in 21 countries**



**II. 7 high voltage (+/- 600 to 800 kV) high capacity (10,000 to 20,000 megawatt) underground DC routes, based on pairs of 3,000 to 5,000 megawatt cables, (in 1 to 4 trenches under each roadway, each 2 feet in width, up to 5 feet in depth, and separated by 10-12 feet.)**



Underground power lines running east and west across San Diego County and along existing roads are expandable to at least 140,000 megawatts of underground UHVDC capacity, with approximately no environmental impacts and no property damages.

## East to west highway routes from Imperial County to Western San Diego County

1. Highway S22 to 79 west to 74 into Orange County
2. Highway 78 west
3. Highway S2 to 76 west
4. Old Highway 80 west
5. Highway 94 + Southwest power line right-of-way to the east
6. Boarder road or Southwest power line right-of-way westerly
7. Unpaved roads east to west between border and Highway 2 in Mexico

## High capacity underground DC cable considerations

1. Use the existing AC power network not for long distance transmission, DC can do that more efficiently with greater capacity, lower maintenance and negligible damages. AC's advantage is for internal regional distribution, which is already substantially in place.
2. Where the roads may be narrow entering a desert region with high summer heat, such a Borrego Springs CA, a small water main may incidentally accompany a pair of underground cables, may also help increase capacity under high loads when the daytime temperature may exceed 110 F, even though DC cables operate cooler than AC power lines, and are designed to provide optimum performance at 70-90 degrees centigrade (158-194 F). Also a water line can help address desert water table depletion caused by aggressive agricultural practices. Naturally, thermodynamic modeling would have to verify efficiency, compared to increasing the copper cross-section vs. night dissipation.

3. While underground cable capacities have increased from 150 kV to 300 kV to 600 kV and +/-800 kV, and underground spacing does not have an electrical effect, but does have a thermal influence that could also be taken into account during cable design. Four to five meter separations are in general sufficient to maintain the thermal influence at low values, i.e. a few degrees. Two 2 cable pairs could provide 6,000 to 10,000 megawatts operating at +/-500 to 800 kV. System examples including the Pacific Intertie which has increased voltages and capacity many years after construction, when needed, long after system reliability had been proven.
  4. **Cables technologies:** Underground DC power lines with a minimum of 3,000 square millimeter copper cross-section and 6.2 inch outer diameter operating at: +/- 300 kV (using XLPE, cross-linked polyethylene extruded cables), or +/- 600 kV ( using PPL, Paper Polypropylene Laminate), or +/- 800 kV (using SCFF, Self Contained Fluid Filled).
- 
5. Arguments that high voltage DC whether overhead or underground are exclusively cost effective for very long distance lines, may have been true decades earlier. However, runs as short as 20 miles have been effectively used, connecting New Jersey to Manhattan, and the cost of a 1.3 megawatt, 161 mile DC lines in the UK (BritNed) has been \$530,000,000 less costly than the proposed overhead AC Sunrise Powerlink.
  6. Designing an underground power line which maximizes capacity and allows for upgrades, to double, triple or quadruple the initial capacity, means that a 50 foot wide roadway could 1<sup>st</sup> use one trench 2 feet in width to separate the first cable pair by 18 inches, which could provide between 3,000 and 5,000 megawatts at +/-600 to +/-800 kV, leaving room on the opposite side of the road for the second cable pair, plus room in the center for a third pair, and if there is adequate width for 2 trenches in the

middle, for a total of 4 trenches, 2 feet wide each, with a 10-12 foot separation between each trench, for a total capacity of 12,000 to 20,000 megawatts under a single county roadway, naturally depending on future requirements which can be incrementally increased.

7. While cable spool size may be determined by a delivery route which avoids any low bridges, with 6 inch cables, the expected lengths would be 500 to 600 meters, or 1640.4 to 1968.5, or .3728 miles per segment, or 268 segments and splices per 100 miles of cable, or 536.5 spools for + and - cables.
8. Using both sides of each road could provide adequate heat dissipation, or each cable could be placed in a separate trench separated by 10-12 feet, although an 8 inch separation between positive and negative DC cables is considered appropriate in a 1 foot wide trench that's 5 feet in depth, however a .4 to .5 meter (18 inch separation) could assist heat dissipation in the desert or when operating at higher capacities. Deeper burial would not benefit night time heat dissipation during the summer months and could potentially reduce capacity, since the earth would act as an effective thermal insulator at greater depth.
9. Based on immediate need 2 cables can be installed on only one side of the highway providing from 3,000 to 5,000 megawatts of capacity, of which only 1,000 or 2,000 megawatts may to be implemented at first, which can later be expanded by simply upgrading the converter stations and later expanded by installing the second cable under the other side of the road, bringing the capacity up to 6,000 or 10,000 megawatts; leaving room for 1 or 2 additional expansions, with a total capacity of 12,000 to 20,000 megawatts under each road.
10. Naturally, underground barriers are installed such as poured concrete to inhibit accidental back-hoe damages, along with signs and phone numbers.
11. Water permeable concrete and pavers can be used to retain moisture from rain, which would assist with heat conduction, heat dissipation and solar heat reflection compared

to black asphalt coatings. Further, such roadways when appropriately engineered for sub-pavement drainage will absorb rain water, not create puddles and not require storm drains. The paving systems have been designed for automated, rapid, low cost installation and eliminate the need for storm drains, providing a considerably more attractive road, with better traction, which is designed to carry fully loaded high-capacity tank trucks, at a lower cost than asphalt systems, and further can be disassembled and reassembled as needed for construction purposes, all with patented and licensed, high volume, low cost manufacturing facilities in Corona California. Further, such water permeable systems are becoming a requirement in San Diego County, which is an economic, environmental, safety and engineering advantage, particularly for underground power lines.

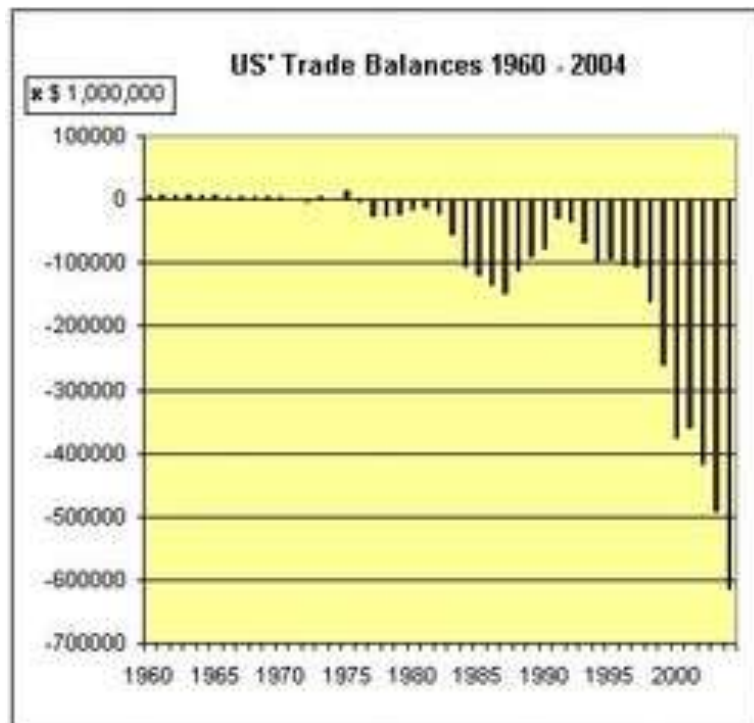
12. When someone is willing to sacrifice a functioning wilderness and ecosystem by placing an array of hot sagging cables overhead in spite of studies showing a 70% increases in leukemia (based on only very limited EMF exposure levels), and is willing to disregard cancer deaths and oppose a vastly less damaging trench that's only 5 feet deep, then the basis of the position appears to be a matter of dogma designed to perpetuate a fraud and the taking of lives. Which is not to say that the needless destruction of nature and property for personal profit is ultimately advantageous to anyone, nor even useful from the perspective of private gain; nevertheless we see these sorts of damaging actions repeatedly, as if they were the law. Naturally, a review process needs to accumulate, measure and summarize all damages caused by a Powerlink, based on the full restoration and the full cost of equivalent property replacement, including damages done to lives, not just commercially measured values, but fully equivalent values including equivalent habitat, unobstructed views, rare species, access, personal, local and urban facilities, energy generation capabilities, access, security, operating expenses and maintenance requirements, time to locate and acquire the equivalent sites, legal and collection expenses.
13. If a small portion of an underground power line needs to go from an existing highway, where it can be regularly watched and protected. Then that portion of off-road access

needs to be carefully photographed and mapped, with the exact location and orientation of each boulder identified, with accurate coordinates, so that the geology and plant specimens impacted can be fully restored. The value of wilderness is not what someone who wants to destroy it says it's worth. It's the full restoration and replacement cost, the same as when anyone destroys a new Mercedes or a corporate jet. Which incidentally are mass produced and far more easily replaced than wilderness, that can take over 40 years of labor, materials and accumulated knowledge to complete the restoration process at a cost of \$25 to \$75 per square foot. Naturally a 1 square foot hole in a jet plane does not diminish its value by \$75 or even \$500. The entire jet plane has a negative value until the hole is completely restored with skilled workmanship, which may mean that the loss may be in excess of \$50 million, until the hole or the demand for the obstruction is completely eliminated. Of course serious and permanently enforced damages to a wilderness preserve are not just damaged just where a collection of 500,000 volt cables pass overhead, the entire paleontological, research, facilities and recreational value of our properties is overwhelmingly defeated, and require the full and complete restitution, based on everything that has been lost, including the full and equivalent replacement value, along with losses of time, expenses, legal and collection costs, plus interest (excluding inflation), adjusted for the time of the full replacement, which incidentally can and typically does take several decades of intensive effort to accommodate, and undoubtedly will not be any bargain as population pressures increases and habitat is lost, and could easily be well over 100 times more costly to either restore or replace, given the lack of equivalent wilderness regions. Based on the often poorly measured issue of inflation, homes that sold for \$10,000 during the 1950's were recently resold for over \$1 million, surprisingly not completely remodeled as anyone might expect, but in their original 1/2 century old and poorly cared for condition, while better quality homes in Bellaire have increased by over 300 times during that same period, which naturally refers to the intentional economic mismanagement of this economy.

14. Why would the electric industry be expanding its dependency on imports, including massive quantities of Liquefied Natural Gas (LNG) which does not offer a stable price



or supply, when the total national debt exceeds \$90 trillion and when we have enormous quantities of renewable resources. Going deeper into debt to buy energy when we already have an abundance of energy resources doesn't save money nor develop long-term profits.



15. Implementing lower cost, higher capacity, nondamaging solutions is an opportunity to reverse a long history of causing needless environmental and property damages. Fortunately, it also includes economic advantages for SDGE. Apparently, Europe, Australia, China, India and Brazil have all been able to evaluate the engineering advantages and implement higher capacity UHVDC and underground systems with very significant economic advantages. But we have to circumvent or violate our environmental laws and health laws because corporate executives can't review the issues or consider change?
16. Thousands of people have pleaded with SDG&E to protect the San Diego County's extraordinary wilderness regions, their homes, ranches and farms, with no reconsideration by SDGE of any lower cost underground alternatives that could reduce all these massive and needless damages.

17. The integration of a fiber optic link above the underground power line can provide for immediate security alarms directly to the local sheriff, in addition to high definition video security cameras on each cable segment to provide for security monitoring, which is also available to the public, along with free wide area high-speed internet to all residents along the power line route, with the ability to rotate and zoom one camera on each visible segment, when not being used by SDGE or law enforcement.
18. With a more efficient grid that could save SDGE over \$20 billion in expansion costs over several decades, as well as saving 100's of thousands of acres from environmental devastation, and saving many billions in property losses, there's no doubt that SDGE could afford to reimburse everyone for the full replacement value of the property that was lost or was damaged along existing high power lines. Instead of the power industry spending 100's of millions of dollars trying to deny EMF and pollutant ionization, or proven associations with cancer, resources could be far better spent by providing funding for a local molecular biology institute to assist in studying cellular electron field interference, along with methods to defend against and reverse related cancers.
19. Restoration of environmental damages caused along existing power line routes can continue by researching advanced on-site propagation techniques based on rainfall for indigenous drought tolerant trees, along with nutrients, moisture retention, genetic strains and improvements to drought tolerance.
20. The public relation benefits for protecting the environment on a large scale, along with addressing the molecular biology of ion and field promoted cancers, while eliminating any significant need for eminent domain, and supporting sustainable electrical generation while resolving the huge electrical demand for plug-in hybrid vehicles, could incidentally result in a notable public relation benefits for Sempra Energy, as well as significantly increase SDGE's delivery of electricity while providing support for the governor's administration.

21. However, with identifiable nondamaging alternatives and cost estimates provided, SDG&E cannot later say they were unaware of the damages to the environment, damages to public and private property, the massive economic losses that would be inflicted, nor the cancer risks along the 150 mile route, based on large scale medical studies, because we provided SDG&E and the CPUC with hundreds of pages of documentation which they acknowledged receiving and reading, and we further personally offered to answer any questions that might exist, or respond to the accuracy or basis of any data, or the estimates which we have provided, also which has not occurred, and which we again offer on a cooperative, working basis, in order to help find a mutually beneficial solution, or initiate research to more thoroughly respond to any issue.



**Many people at the May 12, 2008 CPUC hearing described their own successful home solar projects that have been operational for years, which also deliver unreimbursed excess power into the SDG&E grid.**

## References:

1. <http://search.abb.com/library/Download.aspx?DocumentID=9AKK101130D3429&LanguageCode=en&DocumentPartID=&Action=Launch&IncludeExternalPublicLimited=True>
2. <http://search.abb.com/library/Download.aspx?DocumentID=9AKK101130D3428&LanguageCode=en&DocumentPartID=&Action=Launch&IncludeExternalPublicLimited=True>
3. <http://www.abb.com/cawp/gad02181/f665be70ddd7edb3c1256fe2002cdf0d.aspx>
4. <http://www.prysmian.com/our-products/energy/power-transmission/high-voltage-systems.html>
5. <http://www.undergroundpower.us>
6. <http://www.cpuc.ca.gov/puc/>
7. Next page, specifications for **+/-300 kV XLPE underground DC cable**, with a 3,000 square millimeter copper conductor, 155 mm (6.2 inch) diameter and 1,840 megawatts of capacity, with PPL and SCFF technology underground cable options to operate at +/-600 kV and +/-800 kV, with proportionally greater capacity (estimated at 3,680 megawatts, and 4900 megawatts).

Reel diameter, or local bridge height during transport are the more significant limiting factors to cable length and power line capacity or splice reduction, with a typical reel capacity of 600 meters (1,968.5 feet).

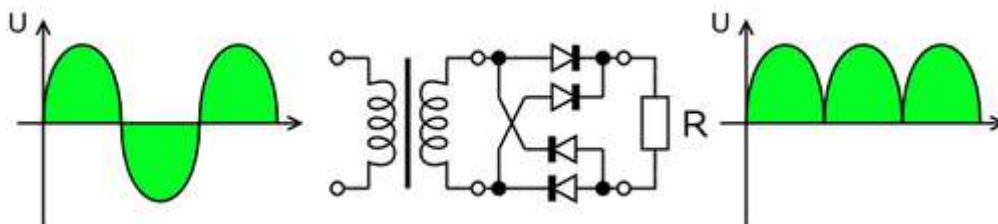
**Moderate climate, submarine cables with copper conductor**

Area	Ampacity		80 kV cable bipole			150 kV cable bipole			300 kV cable bipole					
	Close laying	Spaced laying	Close laying	Spaced laying	Weight per cable	Diam. over cable	Close laying	Spaced laying	Weight per cable	Diam. over cable	Close laying	Spaced laying	Weight per cable	Diam. over cable
mm <sup>2</sup>	Amps	Amps	MW	MW	kg/m	mm	MW	MW	kg/m	mm	MW	MW	kg/m	mm
95	343	404	55	65	4,7	42	103	121	8,5	60	206	242	15	90
120	392	463	63	74	5,5	44	118	139	9,4	61	235	278	16	91
150	441	523	71	84	6,7	47	132	157	10	63	265	314	17	93
185	500	596	80	95	7,4	49	150	179	11	64	300	358	18	95
240	583	697	93	112	8,4	52	175	209	12	67	350	418	20	99
300	662	797	106	128	9,4	56	199	239	13	69	397	478	22	102
400	765	922	122	148	11	61	230	277	16	75	459	553	24	105
500	883	1072	141	172	13	66	265	322	18	78	530	643	26	108
630	1023	1246	164	199	15	71	307	374	21	83	614	748	30	114
800	1175	1438	188	230	17	76	353	431	24	88	705	863	33	118
1000	1335	1644	214	263	21	81	401	493	26	96	801	986	37	122
1200	1458	1791	233	287	24	85	437	537	29	100	875	1 075	40	126
1400	1594	1962	255	314	27	89	478	589	32	103	956	1 177	43	130
1600	1720	2123	275	340	30	92	516	637	35	107	1 032	1 274	47	133
1800	1830	2265	293	362	32	96	549	680	38	110	1 098	1 359	50	137
2000	1953	2407	312	385	35	99	586	722	41	113	1 172	1 444	53	140
2200	2062	2540	330	406	40	103	619	762	45	118	1 237	1 524	58	145
2400	2170	2678	347	428	42	106	651	803	48	121	1 302	1 607	61	148
2600	2275	2814	364	450	45	109	683	844	51	123	1 365	1 688	63	150
2800	2373	2937	380	470	48	111	712	881	54	126	1 424	1 762	67	152
3000	2473	3066	396	491	50	114	742	920	57	128	1 484	1 840	70	155

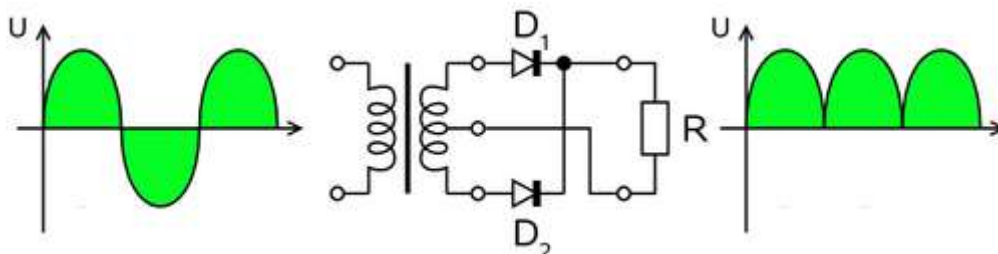
Sea soil: Temperature 15 deg.C, Burial 1.0 metre, Thermal resistivity 1.0 K x W /m  
 Cable: Copper conductor, HVDC polymer insulation, Steel wire armour

## Full-wave rectification, AC to DC

A full-wave rectifier converts the whole of the input waveform to one of constant polarity (positive or negative) at its output. Full-wave rectification converts both polarities of the input waveform to DC (direct current), and is more efficient. However, in a circuit with a non-[center tapped](#) transformer, four diodes are required instead of the one needed for half-wave rectification. (See [semiconductors](#), [diode](#)). Four rectifiers arranged this way are called a [diode bridge](#) or bridge rectifier:



For single-phase AC, if the transformer is center-tapped, then two diodes back-to-back (i.e. anodes-to-anode or cathode-to-cathode) form a full-wave rectifier (in this case, the voltage is half of that for the non-tapped bridge circuit above, and the diagram voltages are not to scale).



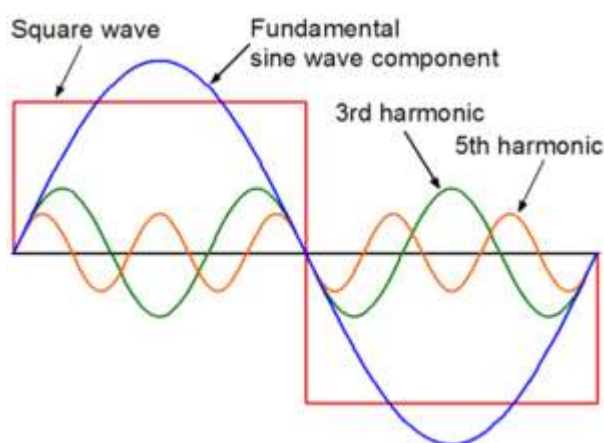
<http://en.wikipedia.org/wiki/Rectifier>

## Inverter (electrical), DC to AC

An **inverter** is an electrical or electro-mechanical device that converts [direct current](#) (DC) to [alternating current](#) (AC). The electrical inverter is in effect a high-power [electronic oscillator](#). It is so named because early mechanical AC to DC converters were made to work in reverse, and thus were "inverted", to convert DC to AC. The inverter performs the opposite function of a [rectifier](#). With [HVDC](#) power transmission, AC power is rectified and high voltage DC power is transmitted to another location. At the receiving location, an inverter in a [static inverter plant](#) converts the power back to AC.

The electromechanical version of the switching device includes two stationary contacts and a spring supported moving contact. The spring holds the movable contact against one of the stationary contacts and an electromagnet pulls the movable contact to the opposite stationary contact. The current in the electromagnet is interrupted by the action of the switch so that the switch continually switches rapidly back and forth. This type of electromechanical inverter switch, called a [vibrator](#) or buzzer, was once used in [vacuum tube](#) automobile radios. A similar mechanism has been used in door bells, buzzers and [tattoo guns](#).

As they have become available, [transistors](#) and various other types of [semiconductor](#) switches have been incorporated into inverter circuit designs.



**Square waveform with fundamental sine wave component, 3rd harmonic and 5th harmonic**

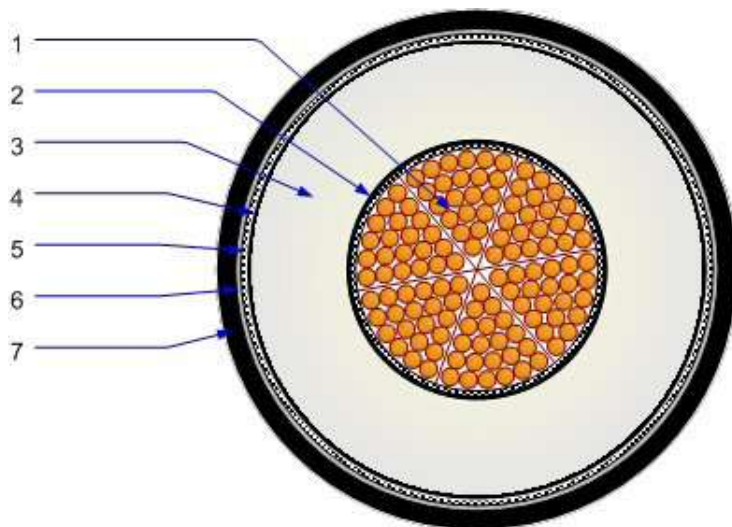
## Output waveforms

The switch in the simple inverter described above produces a square voltage [waveform](#) as opposed to the [sinusoidal](#) waveform that is the usual waveform of an AC power supply. Using [Fourier analysis](#), [periodic](#) waveforms are represented as the sum of an infinite series of sine waves. The sine wave that has the same [frequency](#) as the original waveform is called the fundamental component. The other sine waves, called *harmonics*, that are included in the series have frequencies that are integral multiples of the fundamental frequency.

[http://en.wikipedia.org/wiki/Inverter\\_\(electrical\)](http://en.wikipedia.org/wiki/Inverter_(electrical))



Laying operation, Tubigo near Milan 2005, Prysmian extruded cross-linked polyethylene XLPE cable



380 kV cable, 1 x 2000 mm<sup>2</sup>

*1) CooperMilliken conductor, waterblocked; 2) semiconducting screen; 3) XLPE insulation; 4) semiconducting screen; 5) semiconducting waterswellable tapes; 6) Welded Aluminum Sheath; 7) PE outer sheath.*

Cable has been design to comply with the required performances. Moreover, starting from 80% loading, it is capable to be overloaded at 180 % for 5 hours.

<http://www.empersdorf.com/380kv/gutachten/CIGRE%20Tubigo%20Rho%20Nov.2006.pdf>

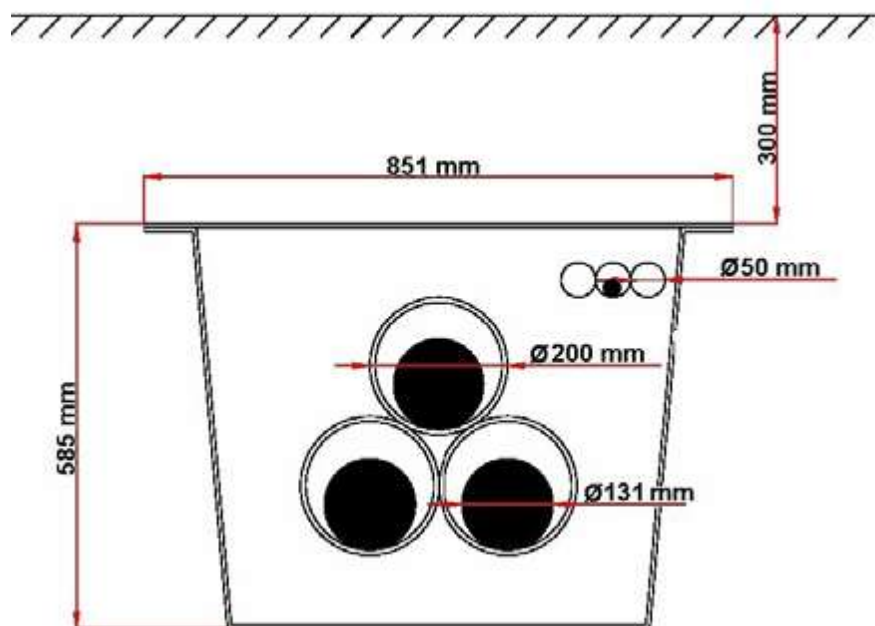


# EMF and AC underground power line shielding

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The following information is provided from a power industry equipment manufacturer that made efforts to reduce electromagnetic field (EMF) not from open above ground AC cables but from buried and specially shielded alternating current (AC) power lines, and the following result demonstrates the great difficulty involved in reducing electromagnetic fields, and the high levels that resulted even after burying the cables and adding special EMF shielding.

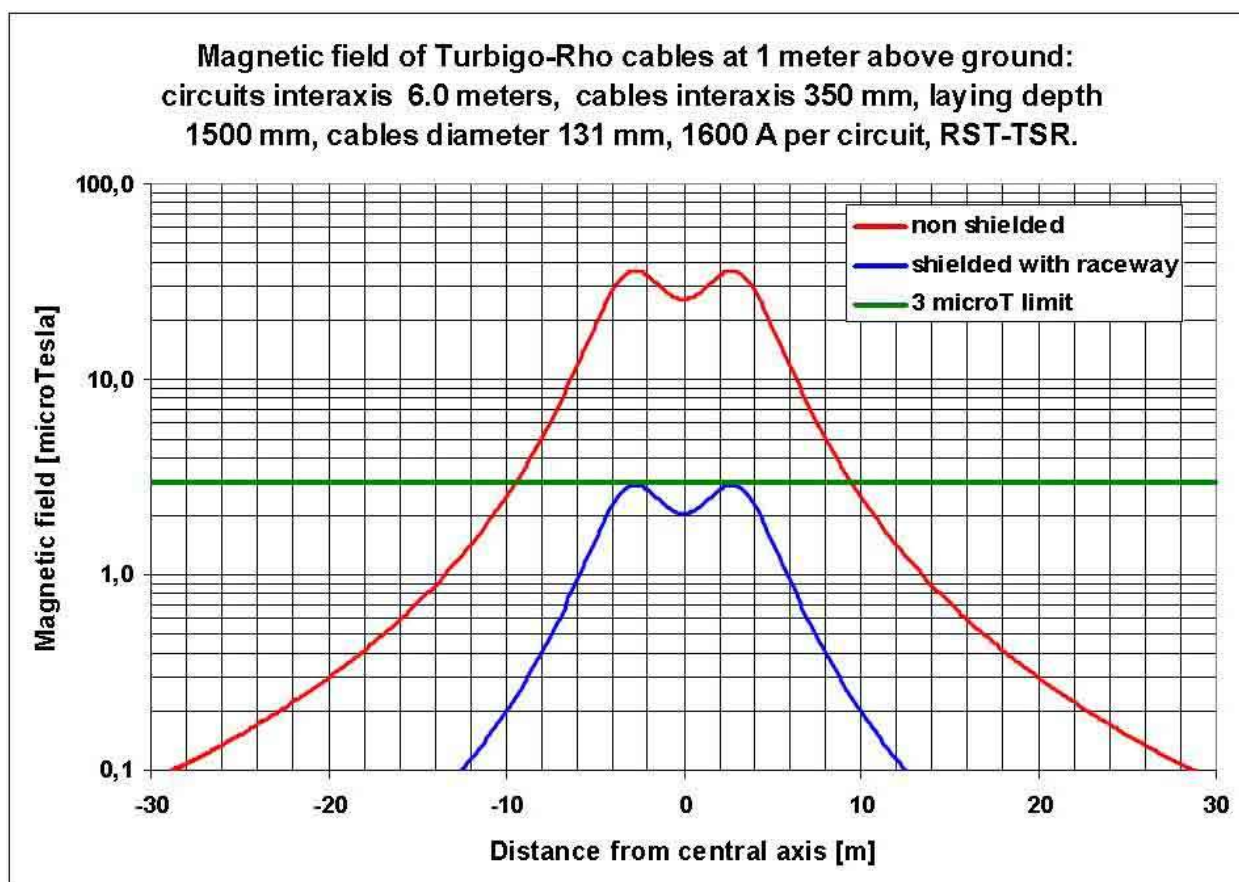
At 1 meter above ground, the electromagnetic fields were about 15 times higher than what is considered safe, even when the underground AC line was specially contained and shielded in a ferromagnetic raceway or conduit, and the EMF was about 60 times higher than what is considered safe for EMF exposure when the AC cables were buried under earth at 1.5 meters in depth.



### AC high power line raceway design and its installation

The ferromagnetic raceway is composed of different elements: the hull, the cover and the closing clips. The raceway is made of special steel, suitably protected against corrosion. The design of the described open raceway system (specially developed and designed by Prysmian) combines the closed perimeter shielding efficiency with an open shape and the absence of welding. The particular shape allows also the raceways to follow the curves of the trench and lateral and vertical variations of direction. It is important to underline that the

raceway design is an integral part of the system design and its dimensions are tailored for this project. Indeed they have to reach the optimum compromise between the EMF shielding effect and the minimization of the derating for the power cables. With the Specified layout (flat formation, 350 mm cable axial distance, 6 m distance between circuits) and the cables fully loaded, the EMF curves with and without raceway are as shown in Fig. 5.3.



### EMF from underground AC power lines

Magnetic fields (1 micro-tesla = 10 milligauss) 3 microT = 30 mG at 1 meter above ground, which would be about 15 times higher than what is considered safe in the AC shielded ferromagnetic conduit (blue line), and about 12 microT = 120 mG at 1 meter above ground, or 60 times higher than what is considered safe for EMF exposure when the AC cables are buried under earth at 1.5 meters in depth (red line).

One of the most important constraints is the electromagnetic field produced by electrical lines. For the underground cable portion only the magnetic field is present. Italian laws specify a maximum of 100 microT, with a threshold of 3 microT for those called "sensible receivers" (i.e. where human presence may last 4 hours per day). Where EMF have to be limited within 3 microT, cables are installed in trefoil formation, enclosed in a raceway (see Fig. 5.2) made of special high magnetic permeability material.

<http://www.empersdorf.com/380kv/gutachten/CIGRE%20Turbigo%20Rho%20Nov.2006.pdf>

## Avoidance of nondamaging underground power line options

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The people of this region have no idea why the CPUC and its consultants would not review and carefully consider the huge advantages that underground power lines offer, particularly when it addresses and solves 12 major problems (noted in the prior table: Underground DC power line advantages being ignored) that 1,000s of people have asked to have addressed at public hearings and in written form, including many public officials. The use of old or erroneous data to discredit a functional and proven technology that is being used worldwide with great success, along with providing major environmental and economic savings, is already obvious to the general public, who have repeatedly asked for the underground option to be the solution of choice, second only to the no new power lines option based on local wind and roof top solar.

Either going with underground DC power lines, or no new power lines at all, would each fulfill the CEQA requirements, because these are effective alternatives to massively damaging the environment with hundreds of huge pylons, over 700 new roads, along with

fire, aircraft and cancer risks that overhead AC high power lines present. The overhead AC power line approach proposed by SDG&E creates an unbelievable burden on the people of the entire San Diego County region, that will cost far in excess of \$20 billion in damages to homes, properties, wilderness regions, business, health and lives, none of which SDG&E plans to ever reimburse. And the people who actually care for the environment and their communities are then told that their burdens and the destruction they are supposed to endure is all for their benefit and to help bring them renewable energy (which the governor then repeats), all of which incidentally travels just fine on underground cables.

While we agree with the benefits of local renewable electric generation; however neither the environment nor the people would be damaged if SDG&E or the CPUC noticed the advantages of underground DC power lines. We will attempt to provide an introductory overview of the critical issues and the differences between underground DC and overhead AC technologies. If there are any unresolved details, we would be available to provide any additional research as needed.

The only problem that exists in this CPUC/BLM/Aspen review process is that the alternatives to causing damages are being ignored or not researched and not presented in any of the CPUC/Aspen review documentation, including the high capacity DC underground power line options, nor even a thorough economic analysis of an option based on local solar and wind projects distributed throughout San Diego County which can provide many 1,000's of megawatts. We would place consideration of underground DC power as the highest priority because the pylon based AC power line alternative is so extraordinarily damaging to people and the environment that the consequences would be irreversible.

I understand that there has previously been criticism of underground DC power, indicating that it would cost about double the price of overhead AC power lines as proposed by SDG&E and as reviewed by the CPUC's consultants (Aspen). However, more recent underground projects in the UK and the Netherlands show that those conclusions are obsolete and that a recent project of over 161 miles in length, delivering 1,320 megawatts,

which is higher in capacity and longer than the Sunrise Powerlink, costs a total of \$870 million, which is \$530 million less than the Sunrise Powerlink.

Around the world over 50 major DC underground power lines have been installed, frequently to avoid environmental damages, ultimately at a lower cost, with greater reliability and considerably greater capacity, since the weight of the heavier copper cables is supported by the ground, naturally without EMF or ionization and related cancer risks. Since SDG&E regularly installs underground AC power lines throughout San Diego County, they could easily provide an underground link between Jacumba and Boulevard and continue with underground extensions throughout this scenic area. This region is not less valuable because 1,000 year old oak trees line our roads and because thousands of visitors travel our scenic highways. While these scenic qualities are easily destroyed, they cannot be replaced in this area for \$3 billion or even \$12 billion. While regard for our region may be irrelevant to SDG&E, an SDG&E planner recently said why do you care about underground power lines, you're not living in La Jolla, where underground power lines would be installed without hesitation. The SDG&E planner was concerned that the transformer they would place in an underground container would cost a couple of hundred dollars extra, and was willing to degrade the area and offer a cancer risk so his huge company could save perhaps \$200.

## Impact report omissions

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The CEQA requires that we consider alternatives which protect the environment, not destroy the environment simply because this isn't La Jolla and doesn't deserve any consideration, or because SDG&E can save a few dollars on a transformer. Nevertheless, these are the extraordinarily inconsiderate arguments we hear at CPUC hearings from SDG&E, which are tragically acknowledged as inevitable or repeated as gospel by the BLM and the CPUC's consultants. Unfortunately, SDG&E, the BLM nor the CPUC, nor it's consultants have ever provided an environmental review of the areas to be impacted including this latest: Environmental Impact Report / Supplemental Draft Environmental Impact Statement, nor in the prior: Draft Environmental Impact Report / Environmental Impact Statement and Draft Land Use Plan Amendment.

## Environmental impact report omissions:

	Category	Damages
1	Geologic	Photo identify each geologic structure & exact location
2	Botanical	Photo identify each plant damaged: species & location
3	Animal species	Identify numbers & species lost per acre damaged
4	Roads	Measurement of bulldozed road width/length per pylon
5	Clearings	Measurement of work areas and fire security damages
6	Barriers	Fencing & gates to prevent off-road intrusions
7	Erosion	Deliver & install equivalent soils & rock at \$50 per sq ft
8	Restoration geological	Deliver-install equivalent soils & rock monuments \$75/ft
9	Restoration botanical	Over 40 years at \$50-\$75 per square foot
10	Home losses	Architectural, economic, environmental & family values
11	Business losses	Facilities, development, growth potential and losses
12	Ranch losses	Facilities, development, growth potential and losses
13	Conservancy losses	Geologic monuments & rare botany is not commercial
14	Paleoanthropology	Identification and protection not provided for region
15	Research facilities	Relocation of dedicated facilities & site not provided
16	Viewshed losses	170' tall pylons on mountain tops visible over 2 miles
17	Property losses	Equivalent access and environmental replacement value
18	Facilities losses	Loss of paleoanthropological and recreational facilities
19	Growth losses	Economic losses due to oppression & hazards
20	Future growth	Most economic value is in overwhelming in the future, measuring prior potential is the denial of compensation
21	Access losses	Urban, medical, cultural & transportation resource losses
22	Energy resource loss	Loss of local wind, geothermal or solar energy resources
23	Medical losses	Diagnostics at oncology centers and medical clinics
24	Cancer therapy	Chemotherapy, radiation, proton, stem cell therapies

25	Losses of life	EMF and ionization of pollutants, > 3,000 fatalities
26	Recreational losses	Local losses to the region, current, planned & potential
27	Tourism losses	Local losses as a portion of \$90 billion/year for Calif.
28	Replacement costs	Equivalent location, environment, access, facilities
29	Construction costs	Facilities replacement, planning & fees
30	Security & insurance	Transportation, fencing, gates, video, insurance
31	Financial costs	For losses, restoration and replacement costs
32	Legal	Preparation, attorney and expert witnesses
33	Research expenses	Labor and professional expertise, for CPUC & legal
34	Collection costs	Legal, professional and title policies
35	Interest on debt	Compounded at > 1% per month above inflation

The botanical data in the report provided is not site specific or specific to the Jacumba, Bankhead Springs or Boulevard regions and did not review the properties, nor the rare, threatened or endangered flora and fauna that would be impacted by any of the power lines shown. The data was simply lifted from the California Native Plant Society web site. Incidentally, I have been on data collection projects with the California Native Plant Society and understand many of the identification issues, the regional distribution by species, climatic and drainage patterns that affect our area. Further many animal species that occupy a specific site may be witnessed only once in 50 years of continuously living on a site. I have many onetime only observations of threatened or endangered species in the regions mapped and supposedly studied by the CPUC consultants. I know of no naturalists who live in this area who have ever been asked for their observations or data, nor do I know of any studies conducted by CPUC consultants, including CPUC consultants I have spoken with. While the environmental review documents are huge, this appears to be largely boilerplate activity and does not constitute an environmental review. I have also included a review of rare, threatened and endangered species, based on CNPS data and other sources, relevant to the Jacumba to Bankhead Springs region.



Unfortunately, I have never observed any review, of any kind, of any power line alternatives for this region which were ever provided by the CPUC or its consultants, which is required by the CEQA to help find an alternative for the massive environmental damages which are being proposed in the CPUC documents. Apparently, there has never been any economic review of the environmental or property damages being proposed, no estimate of the full geological and habitat restoration costs, no estimate of medical costs or cancer fatalities, nor oncology expenses or number of lives lost, nor estimates of property devaluation, no equivalent property replacement valuations or costs, no economic data to address equivalent access, viewshed, habitat, air and environmental qualities, protection for threatened and endangered species, and so on. Naturally, having a commercial firm develop even thousands of additional pages of vaguely related information is not what we are suggesting, that would amount to perpetuating a deception. We would however encourage a public economic review based on measuring all damages, full restoration efforts and equivalent replacement costs, which would be available on the web for public input and for an open and public analysis process; not just for public reading or for sending in comments that are catalogued and then ignored.

How could the state sanction well over \$20 billion in property losses and environmental damages and not provide any economic review or any requirements for SDG&E to pay for those damages? Meanwhile, SDG&E is preparing to pay for easements at approximately .0001% of the value of the damages to ranches, homes, nature reserves, businesses and for all the property losses inflicted, while it continues to provide *plausible deniability* statements to avoid having to pay for the promotion (not cause) of cancers related to EMF and ionization by high power lines.

The environmental impact report that was provided doesn't describe how wilderness areas could be protected, instead it's a construction manual for SDG&E describing how construction should proceed and how wilderness could be devastated without getting caught for breaking laws. Such as:

**Avoid blasting where damage to groundwater wells or springs could occur.**

Blasting shall be managed with a Blasting Plan for each site. The Plan shall include the blasting methods, distance calculations to estimate the area of effect of the blasting, and surveys for wells and springs within the blast influence area. (Recirculated Draft EIR/Supplemental Draft EIS, page 2-198, July 2008)

**Operational Impacts: Impact H-5: Creation of new impervious areas could cause increased runoff resulting in flooding or increased erosion downstream (Class II, Class III) Sempra RWEP (Mexico) (Class III).**

Construction of turbine foundations and access roads would result in additional runoff through creation of impervious areas and compaction of soils. Impervious areas and compacted soils generally have higher runoff coefficients than natural areas. (Recirculated Draft EIR/Supplemental Draft EIS, page 2-198, July 2008)

**Sempra Baja Wind Transmission Line (Mexico to U.S.) and SDG&E 69 kV Transmission Line (Class II).** Encroachment of project towers or associated facilities into a flow path or floodplain could result in flooding of or erosion damage to the encroaching structure, diversion of flows and increased flood risk for adjacent property, or increased erosion on adjacent property. This impact is likely to occur because the transmission route is located in an intermittent desert wash. (Recirculated Draft EIR/Supplemental Draft EIS 2-200 July 2008)

**SDG&E 69 kV Transmission Line (Class I or II).** To date, no TCPs have been identified within the 69 kV project alignment. However, the Sacred Lands File search conducted for the transmission line noted that lands sacred to Native Americans are present in the vicinity of Jacumba, in undisclosed locations. The BLM, as the Federal Lead Agency under NEPA and Section 106 of the NHPA has initiated government-to-government consultation with appropriate Native American groups and notification to other public groups regarding project effects on traditional cultural values. That consultation will determine whether there are TCPs that could be affected within this segment. Though impacts to TCPs are often significant (Class I), mitigation, as defined by NEPA (in King, 2003), can include "minimizing impacts by limiting the degree or magnitude of the action...", "rectifying or reducing the impact, and/or "compensating for the impact by replacing or providing substitute resources or environments," which when properly coordinated Native Americans or other Traditional Groups can reduce the impact to less than significant (Class II). Implementation of Mitigation Measure C-4a (Complete consultation with Native Americans and other Traditional Groups) could potentially reduce impacts to TCPs to a level that is less than significant (Class II); however, in some cases impacts may remain significant (Class I). (Recirculated Draft EIR/Supplemental Draft EIS 2-140 July 2008)

**Impact G-7: Project would expose people or structures to potential substantial adverse effects as a result of landslides, earthflows, debris flows, and/or rockfall Sempra RWEP (Mexico). (Class II)** Slope instability including landslides, earth flows, debris flows, and rock fall has the potential to

undermine foundations, cause distortion and distress to overlying structures, and displace or destroy associated project components. Given the moderate to steep slopes that comprise the RWEF area, slope instability presents a significant impact. The potential for project structures to be damaged by landslides, earthflows, debris flows, and/or rock fall is mitigable to less than significant levels (Class II). Mitigation includes ensuring that project structures are located outside of areas with unstable slopes and that boulders are removed from slopes or stabilized. Mitigation Measure G-3b and G-6a are recommended. (Recirculated Draft EIR/Supplemental Draft EIS 2-212 July 2008)

[http://www.cpuc.ca.gov/Environment/info/aspensunrise/rdeir/rdeir/2\\_sempra\\_mex\\_wind.pdf](http://www.cpuc.ca.gov/Environment/info/aspensunrise/rdeir/rdeir/2_sempra_mex_wind.pdf)

Apparently, what we are reading is how to implement damages in a more legally acceptable manner, which is still breaking California's environmental laws, since CEQA has never actually been addressed or resolved, which amounts to the production of a detailed construction manual, not ways that habitat and property damages, medical and personal damages, new roads and overhead power lines could be avoided altogether or even implemented with a 98% reduction in all impacts. The CPUC documents only reinforce the comparatively high impact construction methods without considering alternative technologies or notable reductions to environmental impacts. Nor do these documents provide for an analysis of underground transmission methods which are common in Australia and particularly in Europe where most of these turbines and the underground cables are built.

What is supposed to be an environmental review of alternatives to damages, is now apparently the reinforcement or the sanctioning of highly destructive construction strategies by the CPUC for the benefit of SDG&E. While Aspen tell us that the CPUC is not involved in reviewing construction in Mexico, consequently it's not for us to comment on, however the CPUC environmental documentation is a very detailed manual which describes construction procedures in Mexico, to do what? to help Sempra Energy with its construction efforts in Mexico? Does the CPUC work for Sempra Energy of Mexico? What other conclusions are there? Everything that could have helped the people of California protect themselves from unnecessary and brutal damages has been avoided in this report, nor does it protect

wilderness or threatened species from completely needless damages or massive destruction. Naturally, I have no idea why the CPUC would claim to be protecting the environment and following California law, when they are preparing a manual to massively devastate this region, for absolutely no justifiable reason, which incidentally has been done before; however this is on a considerably larger scale and directly through the heart of San Diego's and California's most treasured wilderness regions. The CPUC documentation, so far, does not constitute an environmental review, nor offer a way to protect our most valuable wilderness from severe damages; it's a construction manual explaining how to legally cause damages, for Sempra's extraordinarily poorly considered projects, all paid for by the people of California.

After reading the environmental reports and statements in the latest CPUC documentation, we can't identify what plant or animal species would be impacted, or encountered in what areas, there are no photographs to help anyone in the area with identification efforts, nor even help any construction workers avert the destruction of threatened or endangered species. In our review and statement we provide such identification information which is relevant to the area approximately from Imperial County westerly including Bankhead Springs, over 7 miles, and from the Mexican border north, approximately 9 miles, to assist with identification on a regional basis. Naturally, site or parcel specific information would be essential, unfortunately it was not provided.

Incidentally, we are not against power lines or wind farms, we are against needless, severe and unreimbursed damages, particularly when there are underground alternatives that the CPUC and its consultants have been refusing to review or even consider, in spite of vast amounts of information which is available and which we compiled, which do in fact describe extraordinary benefits and at lower total costs. If the CPUC would fairly and thoroughly address these extremely important issues and nondamaging alternatives, as is required by law, and we would be extremely impressed that the CPUC process was considering the California environment, the requests and needs of the people and the California Environmental Quality Act. Further, if these extremely significant issues were

being closely examined by Sempra and the CPUC, then billions of dollars in savings could be made in behalf of both Sempra Energy and the people of California, because these interests are not mutually exclusive, on anyone's closer inspection. Unfortunately, SDG&E, the BLM and the CPUC or its consultants have so far not addressed the issues of higher efficiency, or lower impact technologies, and have repeatedly made their position and lack of interest clearly known, in spite of hundreds of attempts by the people to address the issues of damages and low impact alternatives, such as underground power lines at every CPUC hearing held for the Sunrise Powerlink.

## Community opposition to overhead AC

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At all CPUC public hearings, the public opposition of the local residents, farmers, environmentalist and business owners has been overwhelmingly in opposition to the Sunrise Powerlink, including local overhead extensions for the wind farm in Mexico to the Jacumba Substation and the Boulevard Substation. Since local residents and business owners who would be impacted by the power lines did not receive any notification fewer people showed up at the August 4<sup>th</sup> 2008 review in Jacumba. In any case no public comments were being documented by the CPUC during the Jacumba review. Further the public response was one of extreme concern, and for those whose region was impacted, the response was extraordinarily negative, with the full expectation that the people's interests and concerns were going to be completely ignored by the CPUC, Aspen Environmental and the BLM, in favor of SDG&E's entrenched political connections and political contributions. Nevertheless many questions were asked regarding impacts to this area, including why SDG&E's request for local damages to the people, their environment, even our local portion of the Anza Borrego Desert State Park in Jacumba, was not reviewed and why alternative power line strategies including underground power lines were not considered. Susan Lee of Aspen mentioned exaggerated costs which were not verified by any equipment manufacturers, even though we tried to provide more contemporary information during many prior CPUC hearings

and in writing on many occasions, which are a part of the record, unfortunately with no effect whatsoever.

We also offered to answer any related engineering, economic, health or environmental damage questions that the BLM, CPUC or Aspen Environmental might have, unfortunately their interest or knowledge of these issues appeared to be very limited or nonexistent. While we were very optimistic that the damage and environmental issues would be examined during early 2007, however after providing the requested information in great detail for over 1½ years, all with no interest or comprehension on the part of the CPUC or Aspen, we are inclined to believe that the public is correct, that there is no interest in providing an open or fair review process, since none of the information, nor the requests of the overwhelming majority of the people, have never received the slightest consideration along the southern route. These same concerns were also expressed by numerous public officials, who also received little to no consideration. We cannot help but believe that the CPUC review process has been sabotaged and is in violation of California Law. This view is not isolated. Both the Los Angeles Times and the San Diego Union Tribune have reviewed the process of political influence between Sempra Energy and the governor in relation to the Sunrise Powerlink. Further, comments by the State Attorney General's Office have confirmed these observations. Nevertheless, we are going to do our best to encourage a fair review process by the CPUC and its participants, even though information critical to any review of damages, the environment, health, property losses, economic damages and legal requirements has been so far been excluded from this review process. However, we cannot believe that the consultants working for the CPUC, nor most people working for the CPUC or the BLM have the slightest interest in addressing any of these issues; perhaps they wouldn't have the independence or ability, due to their political structures, to discuss any of the issues of environmental damages, economic losses, medical damages or engineering alternatives. Further, given many conversations with their consultants, while polite and politically adept, we cannot believe that these agencies would ever be in a position to hire anyone with consideration or interest in the community or the environment. These observations are also expressed in the many hundreds of comments provided by the people regarding a serious

need for the CPUC to pursue alternatives to environmental, property and personal damages, which have not been addressed in any functional way, nor appeared in any CPUC documents, nor can we realistically expect that there will be beneficial efforts considered by the CPUC, which we do find extraordinarily disappointing.

“Most Californians are surprised to learn that (power industry) generators and traders claim that even if they commit fraud or engage in price-fixing, they are immune from suit under state law.”

“The Attorney General’s involvement reflects a (California Public Utility Commission, CPUC) regulatory system unable or unwilling to police the very industry it governs.”

California Attorney General’s Energy White Paper  
<http://ag.ca.gov/antitrust/publications/energywhitepaper.pdf>

"Law has become the practice of greed. I don't think lawyers are practicing law, they're practicing money, filing motions by the metric ton, taking depositions to send their children through law school."

U.S. Senator Alan Simpson of Wyoming, from a Public Broadcasting television transmission (via KCET) of the Senate's Supreme Court review of nominee Judge Anthony Kennedy on December 14, 1987.

Anthony Kennedy then replied, "Every lawyer has a duty first to the

law. We've lost that to money. If a wage earner is hit by a law suit and they don't have an insurance company to back them up, they're in real trouble."

**"The state can only function if we are a part of one team."  
Governor Schwarzenegger, August 20, 2008, NBC 5 pm news, KNBC Television.**

**"I write to offer my support for the Sunrise Powerlink project before you for your consideration. The project's significance lies not in its supplying additional power for a thriving and growing region, but in doing so in a way that truly moves California into the future."**

**Governor Schwarzenegger's opening lines in his December 3, 2007 letter to Ms. Dian Grueneich, California Public Utilities Commissioner. Governor Schwarzenegger then proceeds to use the requirement for 20% renewable electrical resources to justify massive environmental and property damages.**

Incidentally, the people of California also want California to "move into the future", and not devastate their environment, property or lives, which the people repeatedly indicated could be accomplished by utilizing advanced solar and wind technology which is local, without requiring huge overhead power lines to send the solar generated power 150 miles to the west where solar panels also work well, nor build 700 new, 170 foot tall pylons, and alternatively utilize completely underground power lines to fully avoid environmental, property and medical damages.

During a long break in Borrego Springs (May 12, 2008) after Dian Grueneich had spoken to a staff member and was not occupied, I thought I would ask if Ms. Grueneich, who happens to be the CPUC commissioner assigned to the oversee the Sunrise Powerlink, if she



had the opportunity to review any of the alternatives that hundreds of people were asking for, which repeatedly included underground power lines. However, as I began to ask the question, Ms. Grueneich immediately cut me off, saying that it was inappropriate for me to discuss the Sunrise Powerlink for legal reasons. Not having read anything in the law which precluded anyone's speaking at a public hearing, I figured she must know the legal requirements better than I could ever know. However, a few days later by accident, I happened to notice the specific regulations which do not inhibit Ms. Grueneich or any commissioner from speaking or listening to anyone. So, Ms. Grueneich just stood there until another staff member reported something to Ms. Grueneich. I then asked one of Ms. Grueneich's staff members if anyone on their staff had ever reviewed local sustainable solar and wind energy or underground power lines. Ms. Grueneich's staff member was a bright and alert person, who said that they didn't review any of those options and was completely unfamiliar with any information related to underground power lines in the U.S., Europe or Australia. She however realized that a number of people had publicly requested consideration of this alternative by the CPUC at this public hearing, because it would be protective of the environment. I then mentioned that underground power was unfortunately being ignored by the CPUC review process and was discredited as being too costly, when the total cost of underground power lines that we could review of equivalent length and greater capacity were actually less costly than the proposed Sunrise Powerlink. She then mentioned that they would look into this option, which I felt was a wonderful response, but perhaps too optimistic to be a real possibility.

Now this entire conversation took about 1 minute to address all the most relevant issues, which Ms. Grueneich could have accommodated in her free time at this public hearing, which is certainly not against any law; it is in fact her job description and duty under the law to be informed and discuss these details with the people, particularly at a public hearing, which unfortunately she refused to do. Naturally, Schwarzenegger's letter to Ms. Grueneich may well be a clearly implied requirement to obey SDG&E, which SDG&E proudly displays on its web site, since gifts to Schwarzenegger's campaign and charities have been received from Sempra Energy, the parent company of SDG&E, with influences or reins which

have been described in detail by the Los Angeles Times and the San Diego Union Tribune, which comes as no surprise to the people at any CPUC hearing. Nevertheless, government officials appear to be extremely careful about following hundreds of minor regulations, perhaps intentionally using pieces of those regulations to confuse others, so they can do whatever they feel obligated to do, while huge issues that would devastate the state or cause many billions of dollars in damages to the people are completely ignored.

**EX PARTE COMMUNICATIONS**

Public utilities, property owners and others will be required to honor the Commission's ban on written or oral communication about the substance of the (their own) case with "decisionmakers," such as the Administrative Law Judge, Commissioners, or Commissioner's personal advisors, **except during a hearing, or a public meeting or workshop.**

[http://docs.cpuc.ca.gov/Word\\_Pdf/sb\\_177/manual\\_sb177.pdf](http://docs.cpuc.ca.gov/Word_Pdf/sb_177/manual_sb177.pdf)

**STATEMENT OF SUPERVISOR JACOB****County of San Diego****RAMONA, CALIFORNIA, FEBRUARY 26, 2008 - 7:10 P.M.**

SUPERVISOR JACOB: Well, thank you both again so very, very much for being here in

Ramona and being downtown and being in Pine Valley, and I know you'll be in Julian, and accommodating the people that are most affected by this line.

I hate to make a request to break your rules right away, but if I could request five minutes, and I'll try to get done in less time, I would greatly appreciate it.

ALJ WEISSMAN: One grand, limited exception, yes. Granted.

SUPERVISOR JACOB: If that's all right with everyone else.

I do represent the people of San Diego County's Second District, which encompasses the eastern portion of the county. And my district includes many of the communities that would

be affected by this proposed Sunrise Powerlink proposal by SDG&E, which includes Ramona and Julian, Santa Ysabel, Pine Valley, all of the communities that would be around the — along the Alternative D and the southeastern portion of the region also. So it's my district. These are my people, and these are properties in my district.

The County of San Diego is finalizing its formal comments on the Draft Environmental Report and will be submitting those technical comments before the April 11th deadline. I have reviewed the Draft EIR. I have not read all 7,000 pages, but in particular I have focused on the executive summary.

I do remain steadfastly opposed to the project in the entirety and even more so after reading the environmental document, and that would include Preferred Route and Alternative Route D.

As the Draft EIR points out, there are cheaper and less destructive ways to meet future energy needs. If the speakers here tonight seem especially upset, it's because this area is still reeling from the massive fire storms of last October, fires likely started by SDG&E power lines.

In addition, the region has endured SDG&E's controversial Sunrise campaign for more than two years. This divisive effort has pitted rural communities against urban communities and tried to turn northern communities against southern communities.

Fortunately, many of us have seen through SDG&E's propaganda, and SDG&E has presented the CPUC's decision as a choice. That choice is approve Sunrise or suffer rolling blackouts. That's SDG&E's choice.

Yet, as the Draft EIR thankfully indicates, and as expert after expert has testified, Sunrise is a false choice. The EIR's top two alternatives clearly show that this region, its economy and its landscape are better served by local, not imported, generation. In commercials and glossy brochures, SDG&E's impressive public relations machine has boiled down the pitch for Sunrise into a snappy sound bite. SDG&E says this: Sunrise will bring us the three Rs: Renewables, reliability, and reduced costs.

Unfortunately, SDG&E overlooked a fourth and important R, reality.

Here's the reality about renewables. There's enough capacity on the existing Southwest Powerlink to bring wind, solar and geothermal energy from the Imperial Valley into this

region without building Sunrise. SDG&E's own testimony reveals that the utility can meet California's renewable mandate without building Sunrise.

The unproven Stirling Solar Dish Project, the cornerstone of SDG&E's renewable claims, has been delayed again. The company has not filed an application for construction with the California Energy Commission. Worse yet, Stirling officials have testified they won't move forward with a type of technology that has long suffered from hydrogen and engine seal leaks.

Finally, if SDG&E is as committed to renewable energy as it claims, then why last summer did the company lobby against increasing the state's renewable mandate?

Here's the reality about reliability: A massive extension cord through our fire-prone back country does not equal greater reliability. It equals perilous danger.

In my discussions with SDG&E, the utility used the 2003 Cedar Fire as an argument for Sunrise. SDG&E said that Sunrise was needed because if the existing Southwest Powerlink were to go down in a fire, Sunrise could assure reliability.

Huh. Well, guess what? SDG&E officials downplayed the likelihood of the regions' having two massive fires at the same time. That argument was debatable until October of 2007. It turned out SDG&E was right. We didn't have two massive fires at the same time, we had seven. The Southwest Powerlink went down in the Harris Fire. And had Sunrise had been built, it would have been out of service too because of the path of the Witch Fire.

Here's the reality about reduced costs: Repeatedly, we have seen the alleged financial benefits of Sunrise drop dramatically because of SDG&E's own miscalculations, math errors and faulty assumptions about power plants. First it was \$447 million. Then \$204 million. Then \$129 million, less than one-quarter of the line's original cost savings estimates.

The Utility Consumers Action Network, UCAN, and other energy stakeholder groups have done some remarkable research into the cost-effectiveness of upgrading existing infrastructure and investing in solar, proposals that have largely been ignored unfortunately by SDG&E.

I think it's time for SDG&E to retire the claims about the three Rs. The facts don't support them. The region needs to turn its focus to the three Es: Existing infrastructure, emerging technologies and efficiency measures.

The state of California is standing at the threshold of a whole new era in energy development. And in my mind, Sunrise is really a battle between the dying past and the promising future.

California, with its million solar roofs campaign and its investments in energy research, is blazing trails when it comes to renewables. The state and its Governor have put its money where its mouth is. That investment is paying off.

This month a story in The New York Times describes California as the world's, and I quote, next big solar market and its entrepreneurial center, unquote. An economist said of California, and I quote: We're at the dawn of a revolution that could be as powerful as the Internet revolution, unquote. A venture capitalist said companies are just starting to blossom from venture funding, and through innovation and volume, prices are coming down.

Change is scary, and SDG&E is likely protecting an old way of doing business. Yet the financial sector and the energy sector are all saying the same thing: hulking lines and massive steel are antiquated concepts. Distributed generation, self-reliance and new green technologies are here to stay whether SDG&E likes it or not.

Imported power, in Sunrise's case much of it from fossil-fuel plants, is a thing of the past. So by approving Sunrise, California would be building a billion-dollar monument to the past. We don't want that. We don't need it, and it will be outdated before it's even finished.

By turning down this line, the Commission sends an important message to the San Diego region: San Diegans need to create in-basin generation and become self-sufficient and safer from fire. And with your help, we can force our utility to do the right thing.

Again, thank you so much for the opportunity of allowing me to speak and being here tonight.

(Applause)

ALJ WEISSMAN: Thank you. In Supervisor Jacob's defense, in Commission hearings there are no curtain calls, so they'll have to —

SUPERVISOR JACOB: I have no control over that.