
Energy and Environment in the California – Baja California Border Region: Race to the Bottom?

Good Neighbor Environmental Board Meeting
Bill Powers, P.E., Powers Engineering
June 16, 2011

U.S. and Mexico nominate members for cross-border electricity task force – no environmental presence

source: Business News Americas, *Governments nominate members for cross-border task force – Mexico*, November 3, 2010.

- Presidents Barack Obama and Felipe Calderon agreed to establish cross-border electricity task force in May 2010.
 - Charged with advancing power transmission, grid connections, and trade in renewable energy technologies.
 - October 18, 2010 task force scoping meeting (San Diego) co-sponsored by Mexico energy ministry SENER & DOE.
 - Following day government officials met by themselves to nominate the task force members.
 - No U.S. or Mexico environmental agency representatives were at scoping meeting or are on the task force.
 - No public information on who the task force members are.
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Senators Feinstein and Boxer are not onboard with Baja California as energy hub for California

source: Joint Sen. Feinstein/Sen. Boxer letter to Sempra CEO Don Felsing, March 9, 2011.

- March 2011 letter to Sempra: Adding power from Mexico to Sunrise Powerlink (transmission line) would limit line's ability to deliver renewable power from Imperial County.
- Imperial County has highest unemployment rate in California at 28 percent.
- Very concerned that cross-border transmission line could undermine employment opportunities in (Imperial) County.
- April 2011 CA State Asso. of Electrical Workers resolution: opposes construction of cross-border transmission lines from Mexico into California and strongly condemns recent actions in Mexico to crush the Mexican electrician's union.

California Energy and American Jobs **VS** Offshoring Energy and Exporting Jobs

Transmission space in California is limited...

by connecting energy projects in Mexico to California's grid, Sempra's proposed Energia Sierra Juarez cross-border transmission line would displace California energy and export American jobs.

President Obama's Department of Energy must protect American jobs by denying Sempra Energy's Presidential Permit Request for a Cross-Border Transmission Line!



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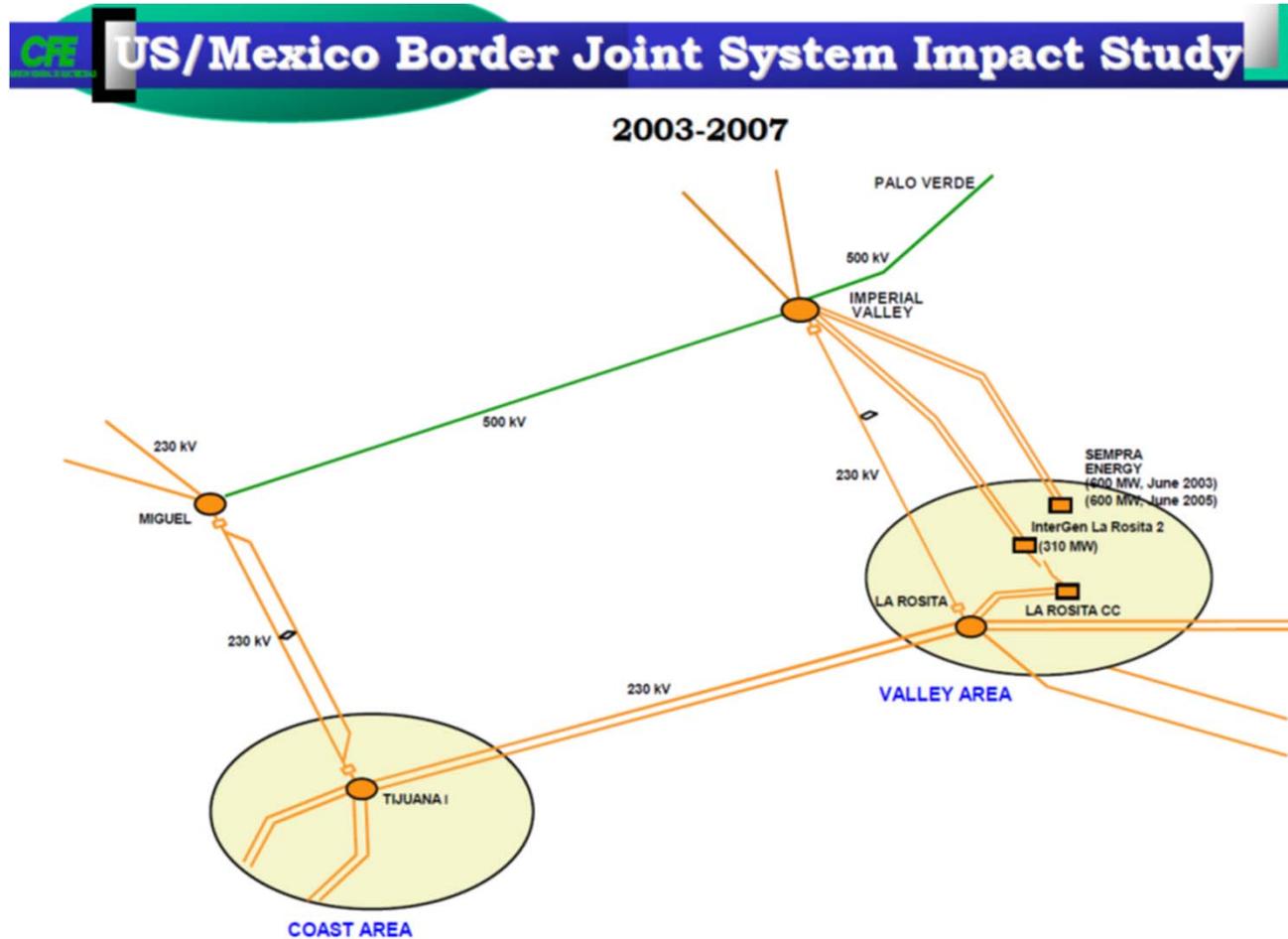
Liquefied Natural Gas Imported from Russia and Indonesia on Tankers to Sempra's Existing Costa Azul Import Terminal



- Proposed California Solar, Wind and Geothermal Projects
 - Existing Export Natural Gas Power Plant
 - Future Export Power Plant
 - Proposed Cross-border Transmission Line
 - Existing Natural Gas Pipeline
 - Approved Route for Sunrise Powerlink Transmission Line
 - Existing Southwest Powerlink Transmission Line
- Map Not to Scale

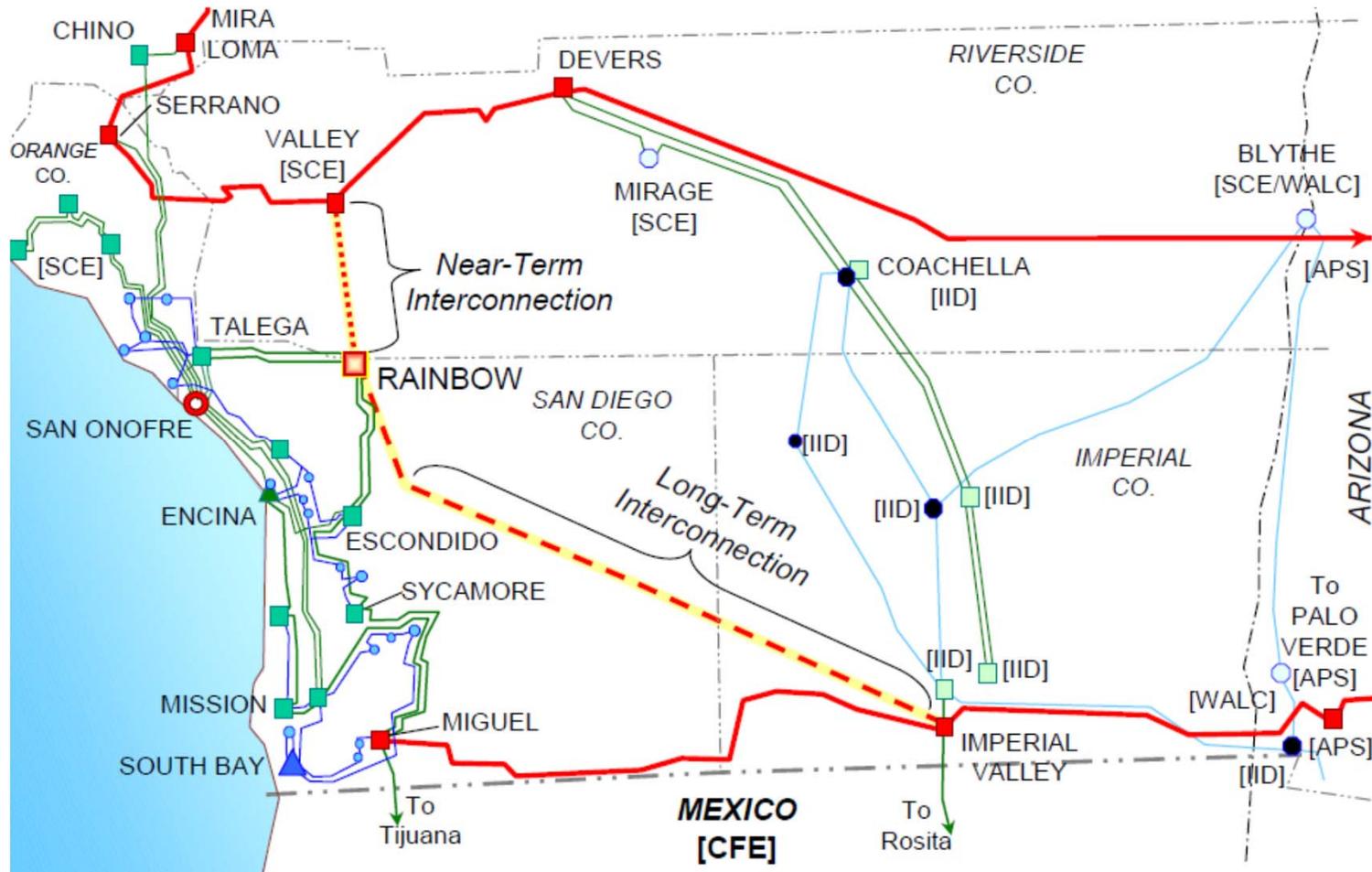
CFE (Mexico) border power plant assumption 2003 – another 600 MW Sempra plant in Mexicali

source: Florencio Aboytes PhD – CFE, *CFE Generation and Transmission Expansion Plan Baja California System 2003-2007*, March 2003., p. 14.



Original SDG&E transmission plan – border to LA Basin interconnection

source: D. Korinek SDG&E direct testimony, R.01-10-024 Valley-Rainbow Transmission Line Proceeding, April 15, 2003.



Sempra on advantages of Baja California

source: Gas Turbine World, , *Sempra Energy – Mexicali Plant Spurs Surge of Capacity*, March-April 2004.

“Advantages for Mexican programs include:”

- “Availability of low cost labor.”
- “Avoiding some of the stringent environmental rules for new U.S. facilities.”
- “Another overriding factor is that under Mexican regulations permitting for a new plant takes only 6-8 months, compared with much longer periods – usually twice that – to gain approvals for U.S. projects.”
- Sempra vision – energy maquiladoras.

InterGen gives in, unplugs turbine

source: San Diego Union Tribune, *InterGen gives in, unplugs turbine*, January 17, 2004.

- “InterGen has shut down one generating unit at its Mexicali power plant.”
- “InterGen misled the government into believing that both of the plant's export turbines were fitted with pollution control devices.”
- “Environmentalists recently discovered that InterGen had not fitted one of the turbine units with the Selective Catalytic Reduction technology, SCRs, for NO_x control.”
- “Officials in Imperial County, concerned about emissions from both the InterGen and Sempra plants, also believed the InterGen unit was equipped with scrubbers.”

Gaming the system, border style

sources: 1) press release, *Sempra Energy Reaches Agreement To Settle Energy Crisis Class-Action Litigation*, January 4, 2006 (<http://investor.shareholder.com/sre/releasedetail.cfm?releaseid=183120>); 2) CA Dept. of Water Resources press release, *DWR Awarded more than \$70 Million in Dispute with Sempra Energy - Arbitration Panel Rules Sempra Energy Acted in Bad Faith and in Breach of Multiple Aspects of its Long-Term Energy Contract with DWR*, April 21, 2006 (<http://www.water.ca.gov/news/newsreleases/2006/042106sempra.pdf>); 3) San Diego Union Tribune, *SDG&E set to pay after misstating Sunrise info*, March 7, 2009.

- January 2006: Sempra \$350 million Continental Forge settlement – ricochet natural gas trades to CFE Rosarito, Baja California power plant drive up SoCal natural gas prices during 2001 energy crisis.
- April 2006: Sempra \$70 million fine for violating terms of 10-year electricity contract with state, includes Sempra Mexicali plant.
- March 2009: \$1.1 million settlement, SDG&E misleading California utility commissioners on viability of southern route for Sunrise Powerlink transmission line. \$200,000 allocated for ethics training for senior executives.

Sempra's border doubts – end of 10-year state electricity contract, low natural gas prices hurt LNG

sources: 1) Sempra contract with DWR: http://www.cers.water.ca.gov/pdf_files/power_contracts/sempra/050401_sempra_ppa.pdf, pdf. p. 31; 2) Jakarta Post, *Appropriate sale price for Tangguh LNG is imperative*, June 18, 2007.

- Sempra's 10-year, \$7 billion electricity supply contract with state of California ends in September 2011.
- Mexicali power plant will have no captive buyer when state contract ends. What to do with the Mexicali plant?
- Sempra buys LNG from BP Tangguh (Indonesia) for ~\$6 per million Btu under 20-year contract.
- Shale gas has dropped U.S. domestic natural gas price to ~\$4 per million Btu – low domestic prices expected for foreseeable future.
- What to do with the Costa Azul LNG terminal?

Half court shot – Sempra’s Costa Azul LNG becomes regional natural gas-fired power plant energy hub

source: California Energy Commission, *Comparative Analysis of Future Gas and Electric Infrastructure Options in the California/Mexico Border Region*, October 2008, Figure 6.



Environmental impacts of export energy development in Baja California

source: B. Powers, *San Diego Smart Energy 2020*, October 2007, Attachment C. See: http://www.etechinternational.org/new_pdfs/smartenergy/52008_SmE2020_2nd.pdf.

Costa Azul LNG terminal:

- ❑ Greenhouse gas burden of LNG imports is ~25 percent higher than domestic natural gas.
- ❑ BP Tangguh raw field gas is rich in CO₂ which is vented to atmosphere at the liquefaction plant.
- ❑ Liquefaction and shipping of LNG are energy intensive.
- ❑ Seawater LNG re-heat system at Costa Azul uses large amounts of seawater in once-through heating system.

Mexicali export power plants:

- ❑ No air emission offsets required on Mexico side of border, despite poor air quality in Imperial County and Mexicali.
 - ❑ No requirement to report results of continuous emissions monitoring.
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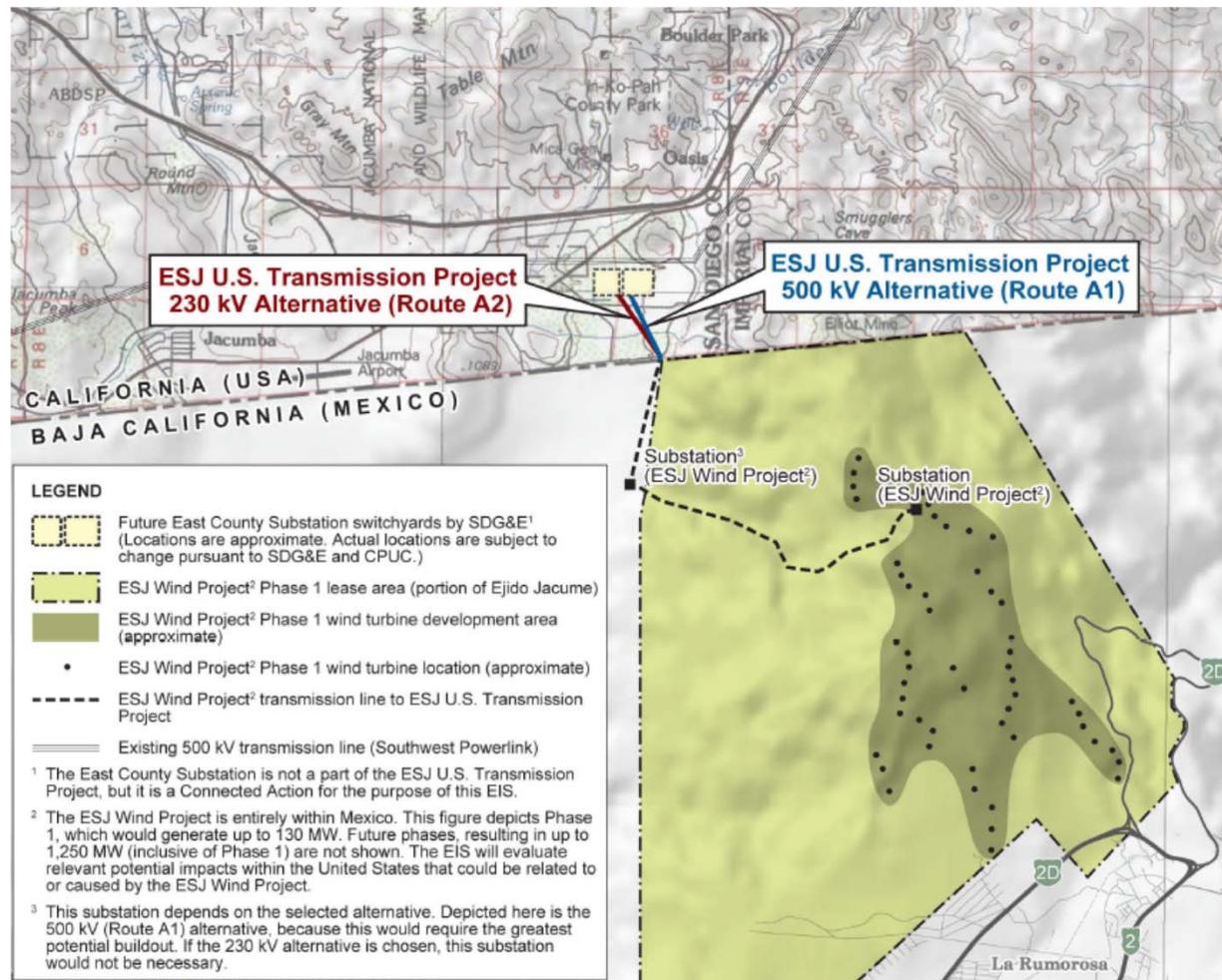
Sempra's Energía Sierra Juárez (ESJ) wind proposal – live or memorex?

Source: California Energy Markets, *Mexico Could Be Wind Hotspot If Wires, Border Issues Are Solved*, June 17, 2008.

- Mexican renewables are ineligible for U.S. tax credits, which for wind equate to about 3 cents/kWh in value.
 - La Rumorosa (Energía Sierra Juárez) developers have quoted wind capacity factors of 30 percent compared to the 35 to 40 percent touted by U.S. wind companies.
 - The (\$2 billion SDG&E) Sunrise Powerlink or some other transmission solution would be required to move La Rumorosa wind to load centers.
 - SDG&E has applied to contract for 450 MW of peaking gas turbines, a ~\$500 million investment, to address (in part) the intermittency of wind power.
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Sempra as gatekeeper for export of renewable energy from Baja California to California –ESJ “generator tie”

source: U.S. DOE, *Energía Sierra Juárez Transmission Line Project – Scoping Report*, September 2009, Figure 2.



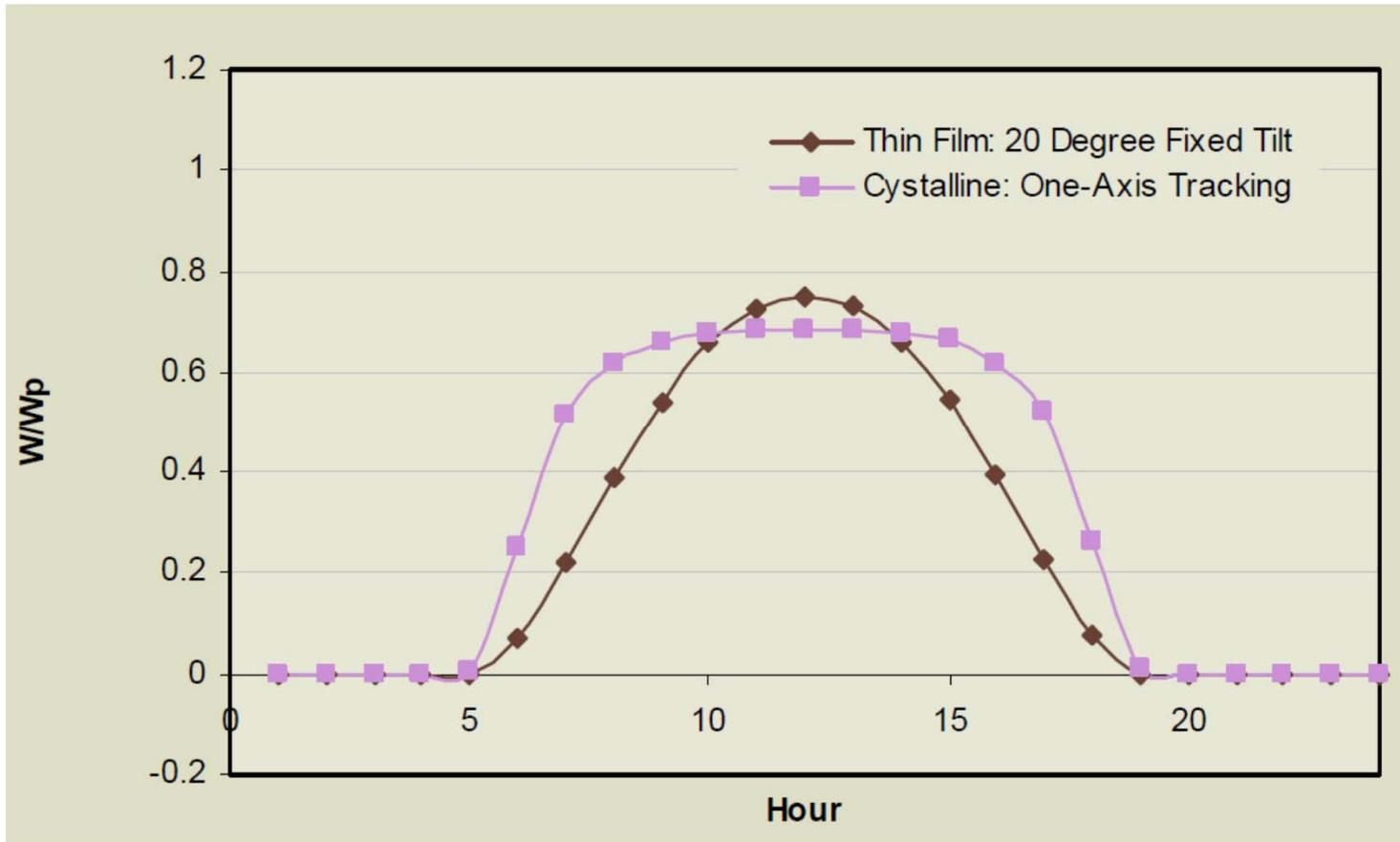
Distributed solar PV and ESJ wind cost about same – no reason to pay for transmission and gas turbines

sources: 1) San Diego Union Tribune, *SDG&E buying power from Mexican wind farm*, April 19, 2011; 2) Renewable Energy Transmission Initiative, *RETI Phase 2B Final Report*, May 2010, p. 4-8 (PV at \$135/MWh, see: <http://www.energy.ca.gov/2010publications/RETI-1000-2010-002/RETI-1000-2010-002-F.PDF>); 3) B. Powers - confidential 10 MW PV project, May 2011, \$120/MWh bid price.

- Estimated long-term contract price between Sempra and SDG&E for up to 156 MW of ESJ wind power: \$120 per megawatt-hour.
- Estimate cost of electricity production from 10 to 20 MW solar PV array at substation near San Diego: \$120 to \$140 per megawatt-hour.
- Solar PV is reliably available on hot summer afternoons when electricity demand, and cost of power, is highest.
- Wind production in San Diego area is lowest in summer, and lowest on 24-hour basis during mid-day.

Output of solar PV systems on hot summer days

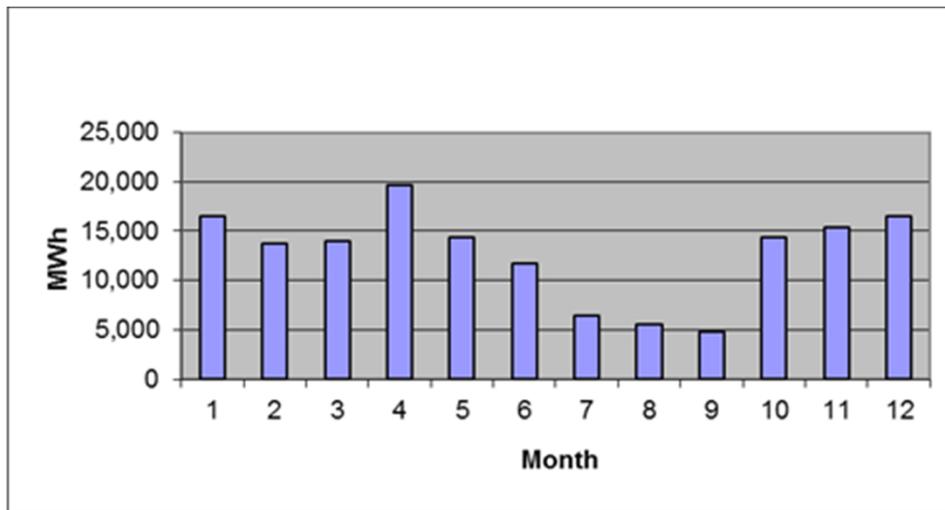
source: Renewable Energy Transmission Initiative, *RETI Phase 1B Final Report*, January 2009, p. 6-23.



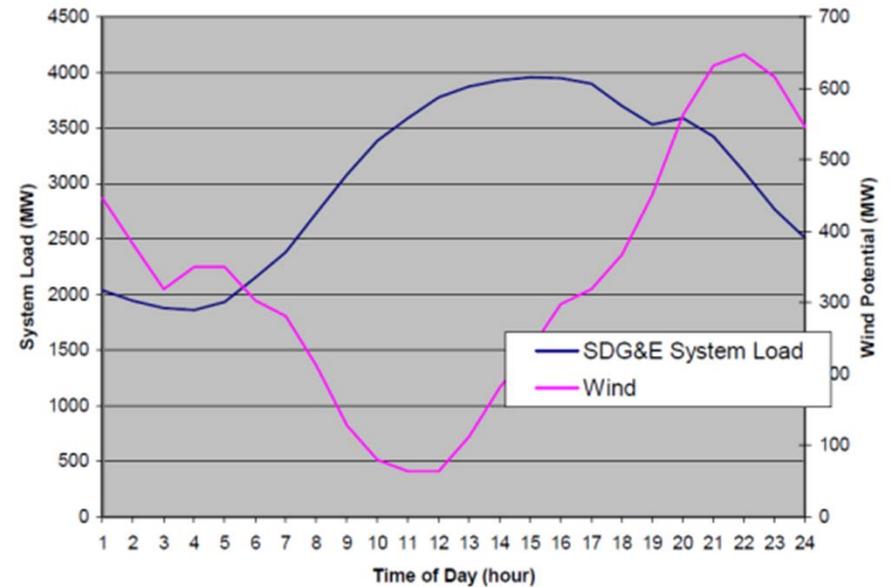
Output of San Diego area wind on hot summer days

source: 1) U.S. DOE, Energy Information Administration, 2008 Form 923 Monthly Time Series, 50 MW Kumeyaay Wind Project, 2) San Diego Regional Renewable Energy Study Group, *Potential for Renewable Energy in the San Diego Region – Chapter 4: Wind*, August 2005.

Month-to-month 2008 wind energy production, 50 MW Kumeyaay wind project (Campo, CA)



SDG&E Summer Load Profile (blue) and Summer Wind Profile (purple)



California moving away from mega-scale remote renewable energy projects to local projects

sources: Clean Energy Jobs Plan - http://www.jerrybrown.org/sites/default/files/6-15%20Clean_Energy%20Plan.pdf,
SDG&E May 9, 2011 presentation: http://www.energy.ca.gov/2011_energy_policy/documents/index.html#05092011.

- California Gov. Jerry Brown “Clean Energy Jobs Plan” – local renewable energy focus.
- 12,000 MW of local renewable power by 2020, out of 20,000 MW target.
- Proposed allocation of 2,000 MW of local renewable power for San Diego.
- SDG&E asserts that 2,000 MW of local solar production could result in San Diego having too much solar power on some days, requiring some export of solar power.

Too many projects are going on undeveloped lands in both countries, not retired ag lands or brownfields

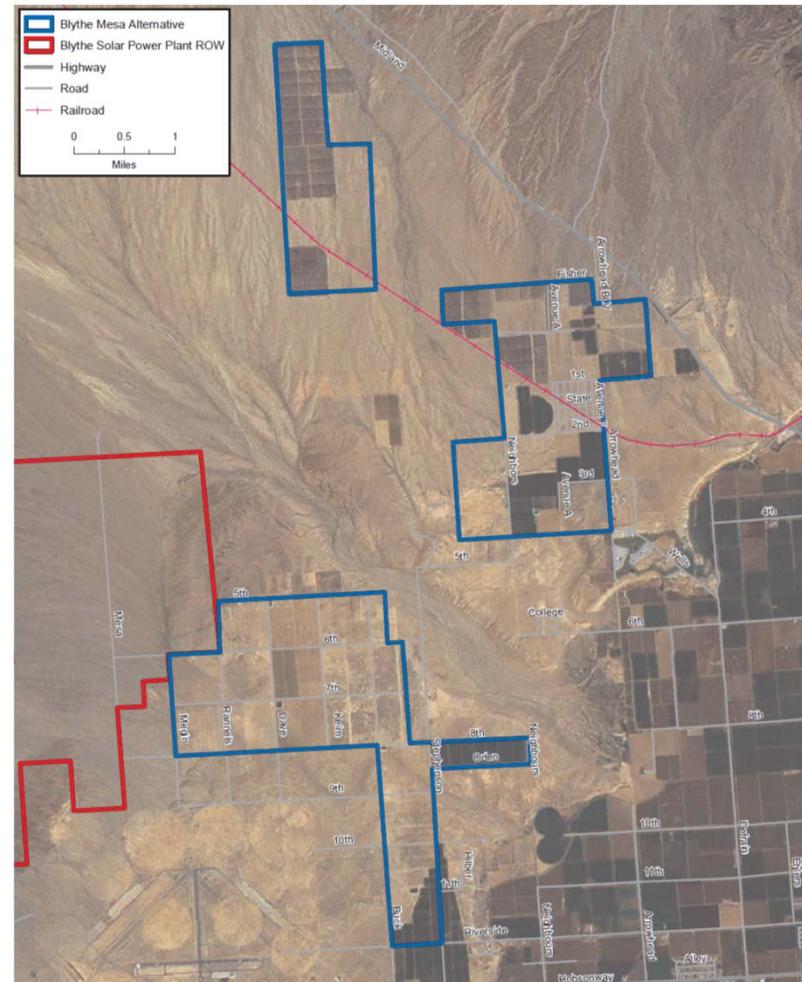
source of photos: B. Powers and Solar Done Right website: http://solar.ehclients.com/images/uploads/env_impacts_of_lg-scale_solar_projects.pdf



1,000 MW Solar Millennium Blythe Solar – disturbed ag land alternative is feasible, ARRA deadline is hurdle

Sept 2010 CEC Decision: <http://www.energy.ca.gov/2010publications/CEC-800-2010-009/CEC-800-2010-009-CMF.PDF>

- Blythe Mesa Alternative would include a 1,000 MW solar facility on three non-contiguous areas totaling approximately 6,200 acres.
- Blythe Mesa Alternative is potentially feasible and meets all but one of the project objectives.
- Private parcel acquisition would likely not occur quickly enough to complete permitting in 2010 to qualify for ARRA funding.



1,000 MW Solar Millennium Blythe Solar will disturb 7,000 acres of undisturbed public land - nearly size of DC

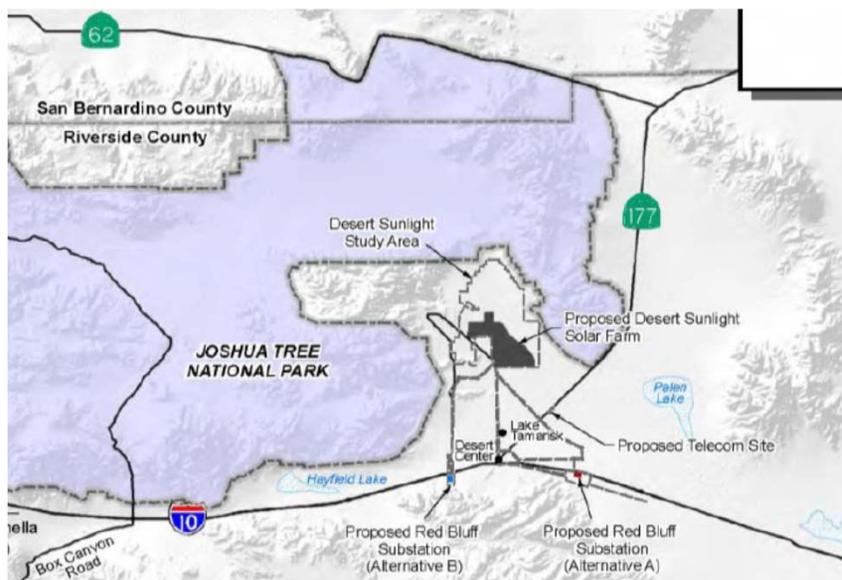
sources: photo of Washington, DC – Google Earth; 7,000 acres of disturbed land - California Energy Commission, Blythe Solar Project
webpage: http://www.energy.ca.gov/sitingcases/solar_millennium_blythe/index.html



550 MW Desert Sunlight in shadow of Joshua Tree National Park – too big and too close

August 2010 BLM DEIS: http://www.blm.gov/ca/st/en/fo/palmsprings/Solar_Projects/Desert_Sunlight.html

December 2010 CEC Decision: <http://www.energy.ca.gov/2010publications/CEC-800-2010-010/CEC-800-2010-010-CMF.PDF>



- Project site surrounded on three sides by Joshua Tree NP
- Disturbed agricultural land nearby in Desert Center (photo)
- Large project not appropriate on border of national park

Recommended guidance to Department of Interior for use in prioritizing 2011 projects

source: California Desert & Renewable Energy Working Group, *Recommendations to Secretary of the Interior Ken Salazar on Ways to Improve Planning and Permitting for the Next Generation of Solar Energy Projects on BLM Land in the California Desert*, December 22, 2010

#1 Low Conflict Areas: timely or expedited permitting/ probable permit approval

- ❑ Mechanically disturbed lands such as fallowed agricultural lands.
- ❑ Brownfields, idle or underutilized industrial areas.
- ❑ Locations adjacent to urbanized areas and/or load centers where edge effects can be minimized.
- ❑ Locations that minimize the need to build new roads.
- ❑ Meets one or more of the following transmission sub-criteria: transmission with existing capacity and substations is already available; minimal additional infrastructure would be necessary, such as incremental transmission re-conductoring or upgrades, and development of substations; new transmission line only if permitted and no legal challenges.

Signers of December 2010 recommended guidance: who's who of utilities, solar developers, NGOs

- **Lisa Belenky**, *Center for Biological Diversity*
- **Darren Bouton**, *First Solar, Inc.*
- **Barbara Boyle**, *Sierra Club*
- **Laura Crane**, *The Nature Conservancy*
- **Kim Delfino**, *Defenders of Wildlife*
- **Shannon Eddy**, *Large-scale Solar Association*
- **Sean Gallagher**, *Tessera Solar*
- **Arthur Haubenstock**, *BrightSource Energy*
- **Rachel McMahon**, *Solar Millennium*
- **Michael Mantell**, *Chair, California Desert & Renewable Energy Working Group*
- **Wendy Pulling**, *Pacific Gas & Electric*
- **Johanna Wald**, *Natural Resources Defense Council*
- **Peter Weiner**, *Solar industry attorney*
- **V. John White**, *Center for Energy Efficiency & Renewable Technologies*

EPA's "RE-Powering America's Land" initiative

see: <http://www.epa.gov/renewableenergyland/>; photo: PV on former landfill, Ft. Collins, CO.

- **Siting Renewable Energy on Potentially Contaminated Land and Mine Sites**
- EPA is encouraging renewable energy development on current and formerly contaminated land and mine sites.
- EPA would be the appropriate lead federal entity to designate "low conflict area" sites for utility-scale solar projects.
- Dept. of Interior/BLM is not the appropriate entity, as many of these low conflict sites are not on BLM land.



Conclusion: U.S. – Mexico border region should not be an energy export zone

- Border is used by U.S. energy companies:
 - As a shield from U.S. regulatory oversight while gaining full access to U.S. market.
 - To avoid U.S.-level environmental compliance while gaining full access to U.S. market.
 - To avoid paying U.S. labor rates, or contributing jobs to the U.S. economy, while primarily or exclusively exporting to U.S. market.
- Mexico absorbs high environmental impact while gaining little in terms of economic development.
- The disadvantages of using the U.S.-Mexico border region as an energy export zone outweigh the advantages for both the U.S. and Mexico.