

Introduction to Sempra Energy

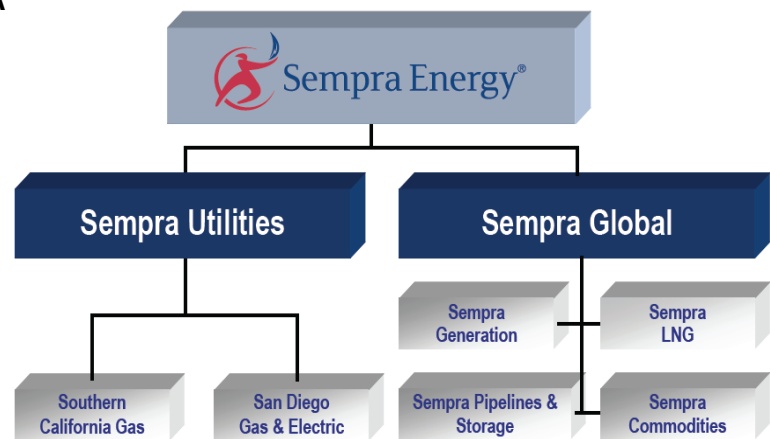


BUILDING OUR ENERGY FUTURE

September 18, 2008

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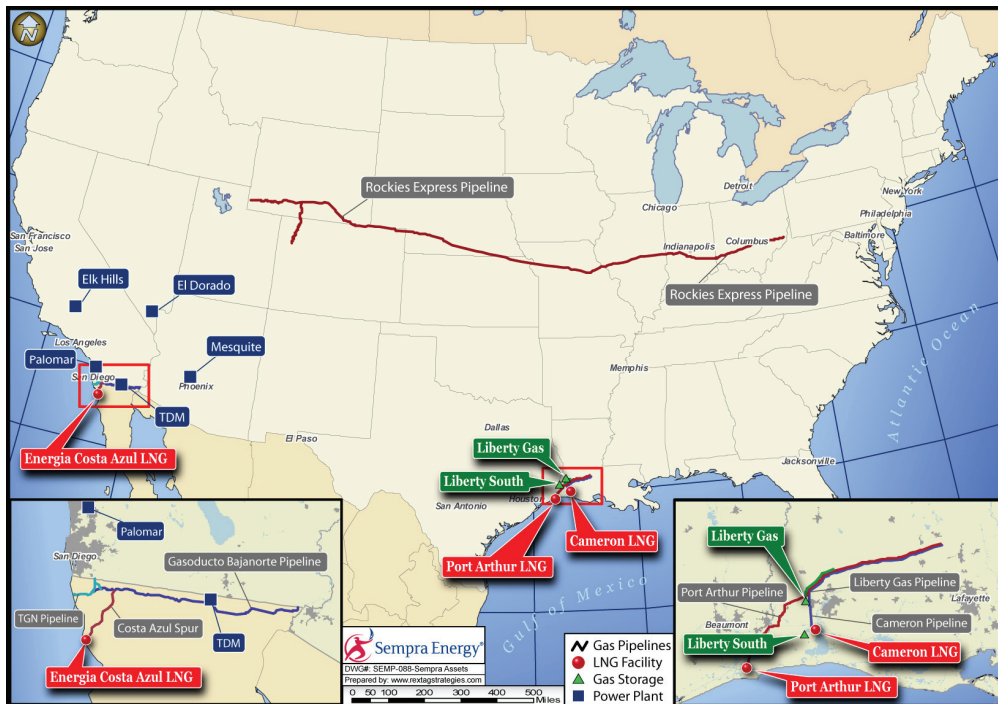
- ▶ **Sempra Energy Develops Owns and Operates Large-Scale Energy Projects**
- ▶ **Sempra Generation is Focused on Wind and Solar Energy Projects in the Southwest**
- ▶ **Sempra has Substantial Financial and Technical Resource to Support Project Development**
- ▶ **Founded:** June 26, 1998
- ▶ **Headquarters:** San Diego, CA
- ▶ **Revenues:** \$11.4 billion
- ▶ **Net Income:** \$1.1 billion
- ▶ **Assets:** \$30.1 billion
- ▶ **Employees:** Over 14,000
- ▶ **Generation:** 2,600 MW
- ▶ **Customers:** 29 million



- ▶ **Sempra has a long-standing commitment to the communities where we live and work**
- ▶ **We maintain our focus of investing our energy, talent and financial resources to improve the quality of life for our neighbors, customers and employees**
- ▶ **In 2007 alone, Sempra Energy companies and its employees invested more than \$16 million dollars internationally in areas including:**
 - **Environment & Sustainability:** Integration of a sewage treatment plant into our Mexicali power plant – TDM - to process water for the facility. Program sponsorships also include community clean-ups, conservation drives, recycling programs
 - **Health & Safety :** Partnerships with fire, police and hospitals to keep communities safe
 - **Education & Workforce Development:** Company-sponsored math & science alliance provides stipends to teacher for classroom equipment and materials, and fieldtrips/projects
 - **Economic Development & Diversity:** Supporting organizations that bring create economic health in the region and that celebrate the diversity of our rich communities
 - **Employee Involvement:** Employees donated more than 20,000 volunteer hours and over \$250,000 from their own paychecks in support of community programs and events in 2007



Recent Sempra Infrastructure Projects

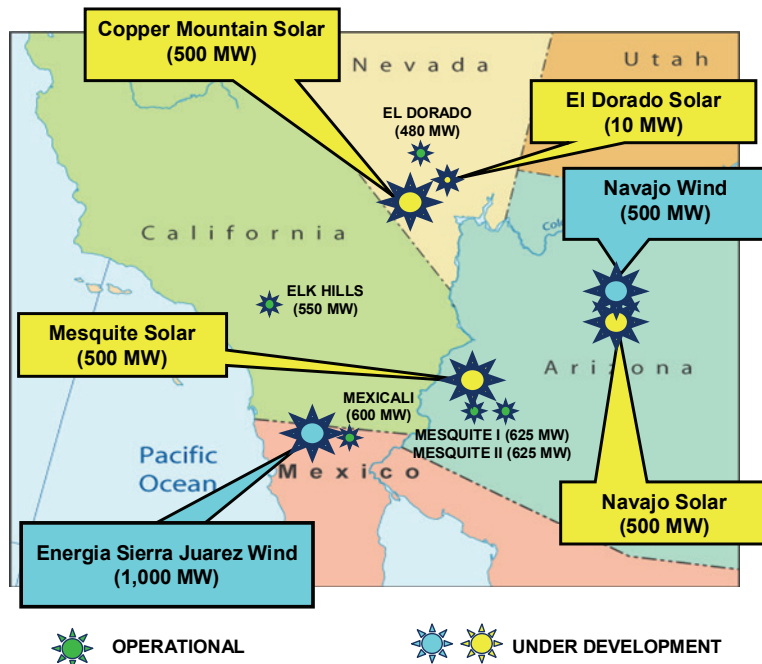




- ▶ Capital of \$4.4 billion; Sempra's share is 25%
- ▶ Executed construction contracts for REX – West
- ▶ Entrega segments operational
- ▶ Filed for FERC approval for REX – East
- ▶ Received FERC approval for REX – West
- ▶ Purchased all pipe and compression



- ▶ First West Coast LNG receipt facility
- ▶ 1.0 Bcf/d with expansion up to 2.5 Bcf/d
- ▶ Approximately \$945M capital cost
- ▶ Construction completed Q2 2008
- ▶ Capacity fully contracted



▶ **Currently owns and operates 2,630 MW of natural gas-fired generation**

- Located in high-growth region
- Natural gas is the competitive fuel of choice in California
- Focus on contracting off-take long-term; currently 75% hedged

▶ **Developing large-scale Solar projects adjacent to existing natural gas-fired generation**

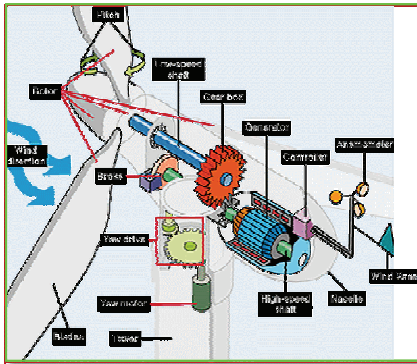
- 2,000+ MW of potential capacity

▶ **Developing a large-scale Wind project in Mexico to serve U.S.**

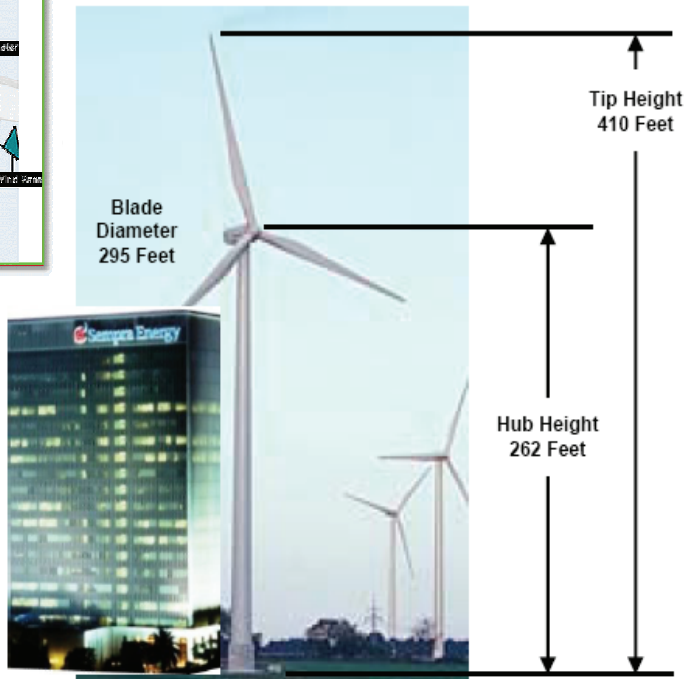
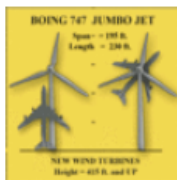
- 1,000+ MW of potential capacity
- 20-year PPA with SCE for the 250 MW first phase of project

▶ **Developing large-scale Wind and Solar projects on Navajo Nation**





A 2.5 MW Wind Turbine is taller than the 19-floor Sempra Headquarters and has a blade diameter wider than a Boeing 747



- ▶ The size of PV projects has grown dramatically over the last 2 years
- ▶ This 40 MW project is currently under construction in Germany
- ▶ A 100 MW project in the desert southwest will require approximately 1 square mile of land



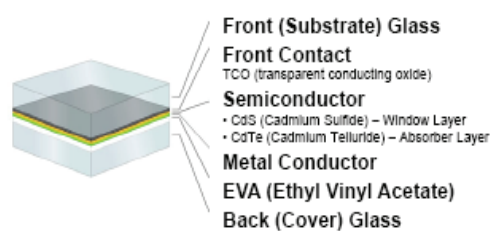
The Photovoltaic Effect – Electricity from Sunlight

- ▶ When Sunlight (photons) is absorbed by the photovoltaic (PV) module, the energy of the photons is transferred to electrons in the PV cell.
- ▶ PV modules have multiple cells with negative (sunny side) and positive (dark side) layers which enable electricity to flow.
- ▶ The flow of electrons from the module is “direct current”, or DC voltage.

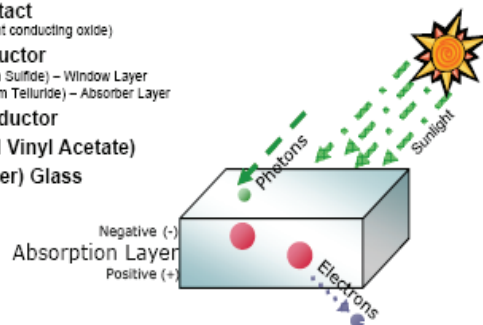
FS Series PV Module



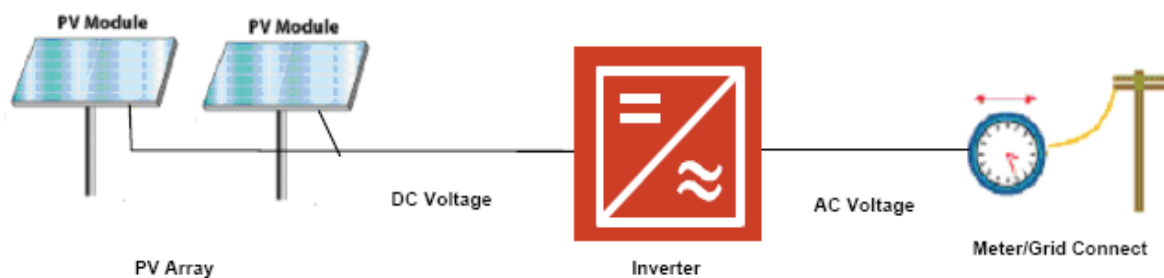
Module Cross Section



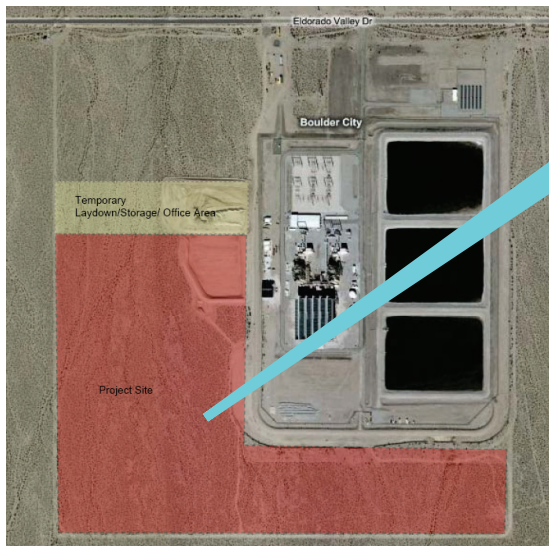
The PV Effect



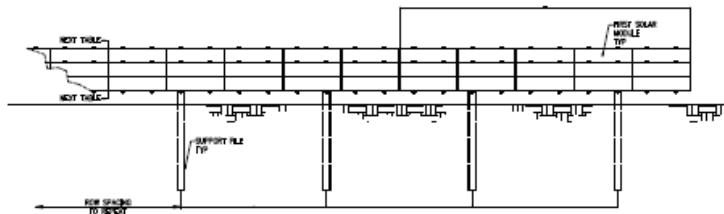
- ▶ Modules mounted on fixed structures and convert the sun's energy into DC voltage
- ▶ Modules are plugged together to form series "strings"
- ▶ Pre-fabricated wire harnesses and junction boxes connect the multiple strings, provide safety protection and deliver the DC voltage to the inverter
- ▶ The inverter converts the DC voltage to AC voltage compatible with the utility grid
- ▶ Standard utility meters and switch gear connect to the utility grid for delivery to retail consumers



- ▶ **Sponsors:** Mike Allman (CEO) and Jim Sahagian (VP Corporate Development)
- ▶ **Planning:** Mitch Dmohowski, Bill Engelbrecht
- ▶ **Land/Community:** Mike Sullivan
- ▶ **Corporate Finance:** Joanne Wang
- ▶ **Development:** Joe Rowley, Alberto Abreau
- ▶ **Legal:** Rueben Rosen, Marie Lewis
- ▶ **Transmission:** Leslie Padilla
- ▶ **Origination:** Leesa Nayudu
- ▶ **Legislative:** Wayne Sakarias
- ▶ **Regulatory:** Shawn Bailey, Dan King
- ▶ **Public Relations:** Art Larson
- ▶ **Financial Analysis:** Jean Massrou, Tina Chase
- ▶ **Operations:** Mike Gallagher, Ed McMurren
- ▶ **Engineering:** Bill Keller, Dan Hyatt, Tom Jennings
- ▶ **Accounting:** Bruce Folkmann
- ▶ **Tax:** Debra Urman-Botkin
- ▶ **Permitting/Environmental:** Joan Heredia
- ▶ **Wind Consultant:** Ryan Zwilling at Garrad Hassan

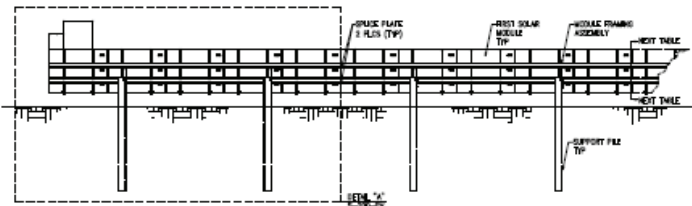


Location	Boulder City, Nevada adjacent to Sempra CCGT
Capacity	10 MW with potential for expansion to 100+ MW
COD	12/01/2008
Capex	\$40 Million
Key Components	168,300 FS Series 2 Modules 20 Xantrex GT500E Inverters 22,440 ea 8.5' steel posts
Capacity Factor	27%
PPA Off-taker	TBD (SCE, PG&E, SDG&E, LADWP, APS, SRP)
PPA Term	TBD
PPA Price	TBD
Land	88 acre flat desert site Boulder City Solar Energy Zone
Interconnect	4160 VAC (through EDE auxiliary bus bar)
Construction Schedule	6 months

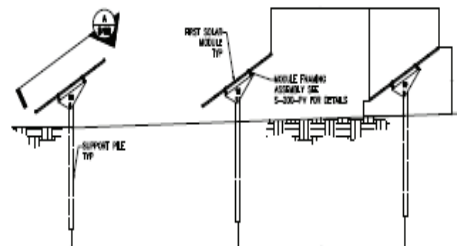


1
ARRAY ELEVATION
FRONT VIEW
 SCALE: 1/4" = 1'-0"

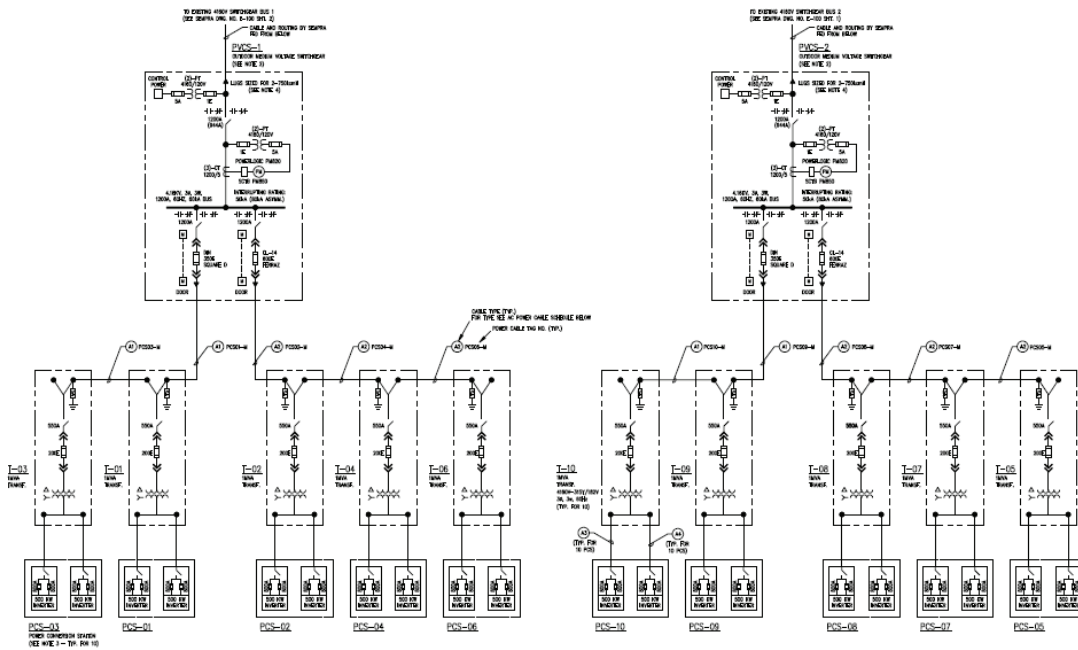
Typical Arrangement



2
ARRAY ELEVATION
REAR VIEW
 SCALE: 1/4" = 1'-0"



3
ARRAY ELEVATION
SIDE VIEW



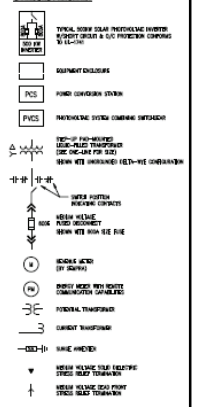
REVISIONS

1. DEL. NO. 1-2017 TYPICAL VOLTAGE NETWORKS
2. DEL. NO. 1-2017 PFC ON-LINE SYSTEM - SET. 1
3. DEL. NO. 1-2017 PFC ON-LINE SYSTEM - SET. 2
4. DEL. NO. 1-2017 PFC ON-LINE SYSTEM - SET. 3

NOTES

1. DEL. DRAWING REPRESENTS THE PREVIOUS ARRANGEMENT AND IS SUBJECT TO CHANGE UNLESS SHOWN AS REVISED.
2. INDICATE THE DATA ON THE DRAWING SHALL BE PROVIDED AT THE TIME OF THE PROJECT TO ELECTRICAL CONTRACTOR.
3. POWER FACTOR CORRECTION (PFC) SYSTEMS ARE PROVIDED BY THE SUPPLIER AND SHALL BE INSTALLED IN ACCORDANCE WITH THE SUPPLIER'S INSTALLATION MANUAL.
4. REFER TO PFC ON-LINE SYSTEMS DRAWING SET FOR SUPPLIER'S MANUAL AND PFC ON-LINE SYSTEMS TO CHECK SYSTEM SPECIFICATIONS.

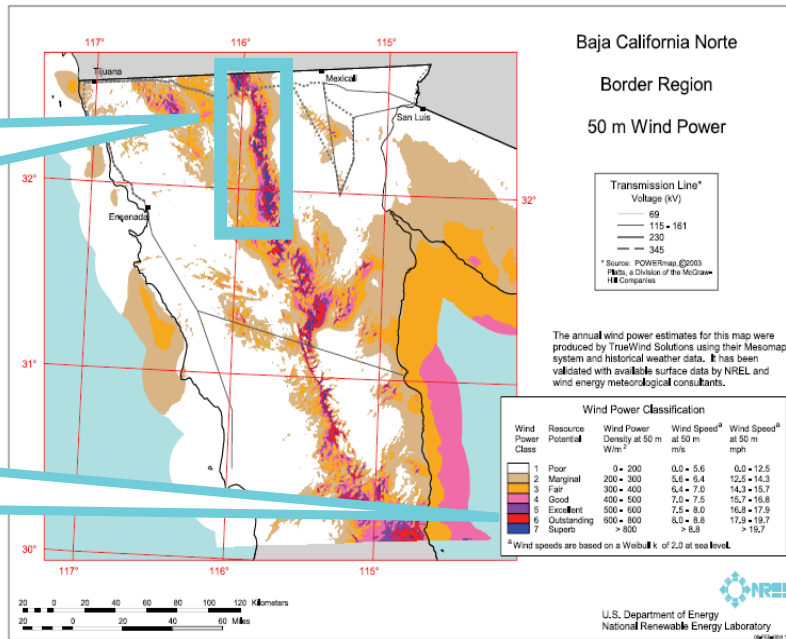
SYMBOLS / LEGEND



The border region of Northern Baja Mexico has a high quality wind resource available for more than 1,000 MW of project development

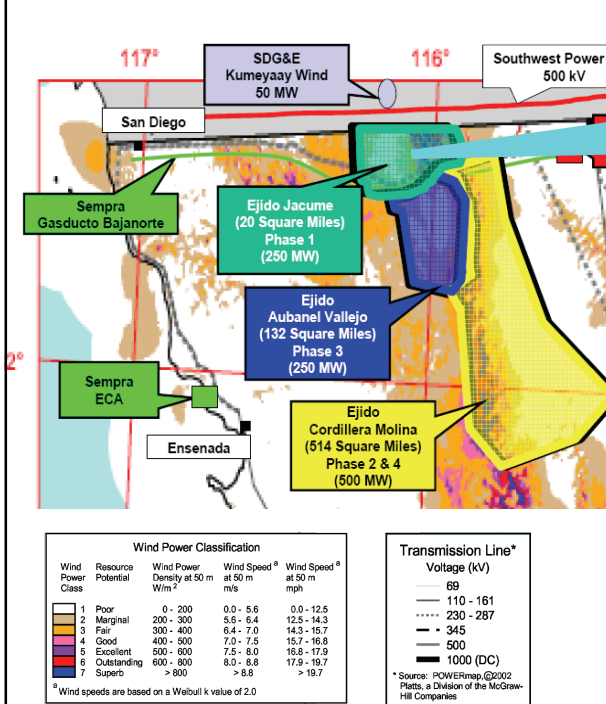
Potential wind project sites in Baja located near the border 75 miles east of San Diego would have easy access to the US transmission system

Average wind speeds in the region are above 7.5 meters/second and can generate net capacity factors between 33% - 36%

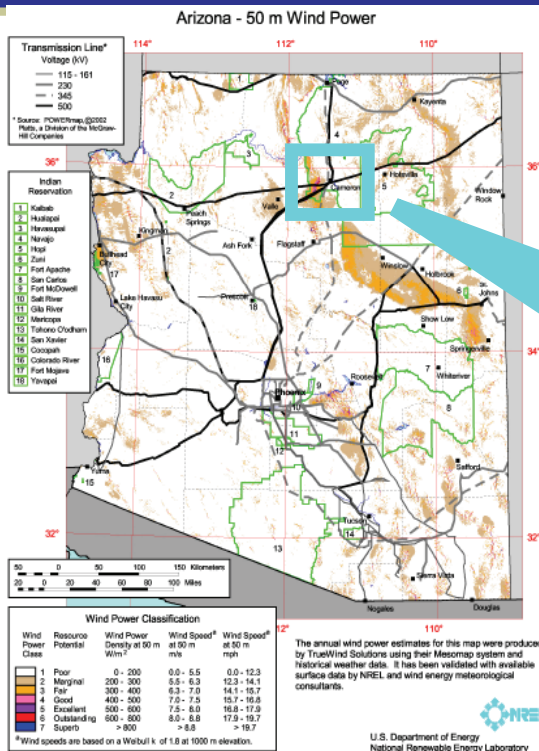


Source: NREL

Energia Sierra Juarez Wind



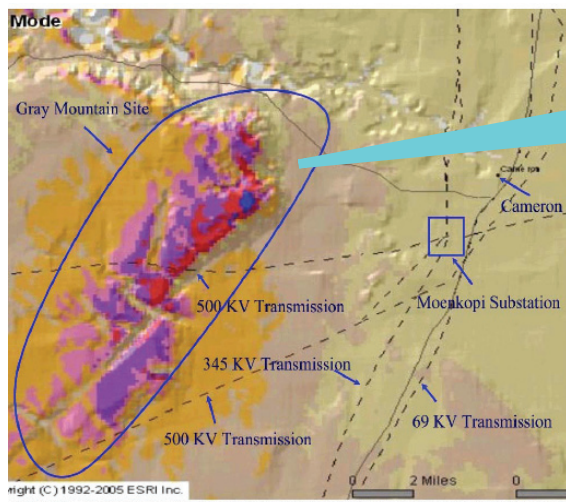
Location	Rumorosa, Mexico
Capacity	250 MW with potential for expansion to 1,000 MW
COD	12/01/2011
Capex	\$500 Million to \$2 Billion
Opex	\$45,000/MW
Capacity Factor	33 - 36%
PPA Off-taker	SCE Phase I (250 MW)
PPA Term	Confidential
PPA Price	Confidential
Land	60 miles of Sierra Juarez Ridgeline Mexican Ejido Land
Interconnect	ICR filed in 2006 for 1,000 MW at SWPL 500 KV Line
Wind Data	On-site data collected since June 2005 9 met towers in operation



The Navajo Nation, and Grey Mountain in particular, possess some of the best wind resources in Arizona according to analysis by NREL, NAU, AWS TrueWind, and 3Tier



Grey Mountain
 250 - 500 MW
 2011 - 2012 COD



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Wind Power Classification				
Wind Power Class	Resource Potential	Wind Power Density at 50 m W/m ²	Wind Speed ^a at 50 m m/s	Wind Speed ^a at 50 m mph
1	Poor	0 - 200	0.0 - 5.6	0.0 - 12.5
2	Marginal	200 - 300	5.5 - 6.4	12.5 - 14.3
3	Fair	300 - 400	6.4 - 7.0	14.3 - 15.7
4	Good	400 - 500	7.0 - 7.5	15.7 - 16.8
5	Excellent	500 - 600	7.5 - 8.0	16.8 - 17.9
6	Outstanding	600 - 800	8.0 - 8.8	17.9 - 19.7
7	Superb	> 800	> 8.8	> 19.7

^a Wind speeds are based on a Weibull k value of 2.0

Transmission Line ^a Voltage (kV)	
—	69
—	110 - 161
----	230 - 287
- - - -	345
—	500
—	1000 (DC)

^a Source: POWERmap, ©2002 Phillips, a Division of the McGraw-Hill Companies

Location	Grey Mountain at Cameron, Arizona
Capacity	250 to 500 MW
COD	12/01/2011
Capex	\$500 Million to \$1 Billion
Opex	\$45,000/MW
Capacity Factor	30 - 33%
PPA Off-taker	TBD (SCE, PG&E, SDG&E, LADWP, APS, SRP)
PPA Term	TBD
PPA Price	TBD
Land	45,000 acre mountain site Navajo Nation Tribal Land
Interconnect	ICR filed in 2007 at Moenkopi 500 KV Sub System Impact Study in Process
Wind Data	Identified by TrueWind, 3Tier, and NAU as one of the best wind sites in Arizona On-site data collected since June 2005 5 additional 60-meter met towers installed 2Q08

Sempra Energy

- ▶ Is a Fortune 500, \$11 billion revenue energy company based in San Diego, CA
- ▶ Has demonstrated success in developing large-scale energy projects
- ▶ Has substantial financial and technical resources to develop, own, and operate these projects
- ▶ Is actively developing large-scale Wind, Solar Photovoltaic, and Biomass Projects
- ▶ Wants to develop Wind, Solar Photovoltaic, and Biomass projects in Hawaii