

Environmental Impacts of Transmission Siting

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- **Independent Power Producer (“IPP”) that develops, constructs, owns and operates utility-scale solar power facilities**
 - Founded by **William Kriegel**, former Chairman and CEO of **Sithe Energies Inc.**
 - Backed by Global Fortune 500 Investor (**Barclays PLC**)
 - Team backgrounds include **AES, Barclays, Goldman Sachs, Sithe, Trina Solar, Tessera Solar, Native American Rights Fund and Tribal Assets Management**
- **K Road has a dual development strategy:**
 - Greenfield Projects in Indian Country
 - Acquisition of strong projects already in development outside Indian Country
- **The K Road team has developed and operated over 20,000 MW of power assets, in the US and internationally**
 - Developed over **260 MW of utility-scale solar facilities** in Europe and the United States, and **2,300 MW solar pipeline** of projects in the Southwest
 - Advanced projects include **Calico Solar (California)** and **Moapa Solar (Moapa Reservation near Las Vegas)**
- **K Road promotes sustainable, renewable energy development in concert with environmental and social responsibility in order to:**
 - Improve economic conditions of host communities
 - Respect traditions and heritage of all stakeholders
 - Protect the natural environment and reduce society’s greenhouse gas emissions

- 1) What are the current regulatory processes governing transmission siting?
- 2) What are the major factors that currently determine the length of time from project conception to project operation?
- 3) How can environmental impacts be appropriately taken into account without causing delays in planning and construction?
- 4) What are the most effective ways to limit the environmental impacts of transmission expansions: building in existing corridors, using underground transmission lines. building “local-to-load” rather than “distant-to-load”?

- **The Transmission Cycle**
 - Planning
 - Regional/system driven
 - Reliability, economics, policy
 - Generator Interconnection driven
 - Permitting Preparation
 - Data collection, biological surveys, archaeological surveys, etc
 - Pre-filing Notification (six months in advance of permit application)
 - Permitting/licensing
 - Certificate of Public Convenience & Necessity (CPCN)
 - Federal Environmental review and permitting
 - Construction
- **CAISO Generator Interconnection Reform:** “In certain customer Large Generator Interconnection Agreement (LGIA) negotiations during 2010, the situation arose where the time to complete the network upgrades was particularly long (some 84 months).”
 - **Estimate:** two years for CPCN prep, two-three years for permitting, two-three years for construction
 - Transmission planning precedes this period

How are Transmission Projects Identified?

- **Regional Transmission Planning**
 - WECC Transmission Planning Policy Committee (TEPPC), “evaluate[s] long-term regional transmission needs that factor in variables including electric demand, generation resources, energy policies, technology costs, impacts on transmission reliability, and emissions”
 - California Transmission Planning Group (CTPG), “focused on identifying any transmission infrastructure additions essential to attain the state-mandated renewable portfolio standard (RPS) requirement of 33% by 2020”
- **Transmission Operator Planning**
 - CAISO
 - Annual Transmission Plans identify reliability, economic and policy-driven transmission
 - Generator Interconnection requests
 - Municipal Utilities (LADWP, IID, TANC)
- **Renewable Generation & Transmission Planning**
 - California Renewable Transmission Initiative (RETI): identified renewable energy zones and recommended “least regrets” transmission projects in California
 - Western Renewable Energy Zones (WREZ): identified identified renewable energy zones throughout the west and planning for a transmission network that will bring those resources to market
- **Other Processes**
 - Nevada Renewable Energy Transmission Access Advisory Committee
 - New Mexico Renewable Energy Transmission Authority
 - Arizona Renewable Transmission Task Force

- **Data Collection in Advance of formal permitting**
 - Can take 1-2 years to collect data and prepare applications!
 - Timing is critical, e.g. spring surveys for desert projects
- **CPUC Process**
 - Transmission **projects 200kv and above** require a Certificate of Public Convenience and Necessity
 - Environmental Review under the California Environmental Quality Act (CEQA) with statutory notice periods
 - Need Determination - is the project justified from a system need and ratepayer cost perspective?
 - Projects **below 200kv** and most substation-only projects require a Permit to Construct
 - CEQA required but no need determination
 - **Alternatives** must be considered, including other transmission routings and other means of meeting the project need (e.g. local generation)
- **Parallel Federal Process**
 - A transmission project of any significant size or length will cross federal land, requiring federal environmental review under the National Environmental Policy Act (NEPA), generally led by BLM or US Forest Service
 - Federal approval is almost necessarily after the CPUC's approval,
 - Agencies typically prepare a joint environmental review document, which the CPUC approves shortly after it becomes final. BLM often allows an additional comment period on the Final Environmental Impact Statement



Planning, Permitting, & Construction Timelines

Year	Economic/Reliability/Policy	Interconnection Driven
0	Project dreamed up by utility, planners, or independent transmission company	Phase 1 interconnection studies commence
1	Project proposed to CAISO	Phase 1 interconnection results, initial posting of security and commencement of Phase 2 studies
2	CAISO Transmission Plan Approval	Phase 2 interconnection results
3	Utility prepares permit application for Certificate of Public Convenience & Necessity (CPCN)	Negotiate and execute LGIA
4	Utility files CPCN, and federal application, usually with Bureau of Land Management (BLM) or US Forest Service (USFS)	Utility prepares CPCN filing
5	Draft Environmental Impact Report (EIR) and Environmental Impact Statement (EIS)	Utility files CPCN (and federal application)
6	CPCN approval (and BLM/USFS approval)	Draft EIS/EIR
7	Construction commences	CPCN approval (and BLM/USFS approval)
8	Construction complete	Construction commences
9-11		Construction complete

Transmission Permitting Timelines



Name	Description	CPCN filed	CPUC Decision	Duration
Antelope Pardee 1	New 500 kv, some existing ROW	12/9/04	3/1/07 FS Aug 2007	28 months 33 months for FS
Antelope Pardee 2&3	New 500 kv, some existing ROW	12/9/04	3/15/07	28 months
Tehachapi Renewable Transmission Project	Eight 500 kv segments, mostly upgrades in existing ROW	6/29/07	12/17/09 FS October 2010	30 months 40 months for FS
Devers-Palo Verde 2	2d 500 kv in existing/adjacent ROW	4/11/05	1/25/07	21 months
Sunrise Powerlink (SDGE)	New 500 kv, mostly new ROW	8/4/06	12/18/08 BLM Jan 2009 FS 2010	28 months 29 months for BLM 42 months for FS
Cross Valley loop	New 230kv, new ROW	5/30/08	7/29/10	26 months
El Dorado Ivanpah	Upgrade 115 to 230, existing ROW	5/28/09	12/16/10 BLM 5/19/11	19 months 24 months for BLM

Example # 1: Tehachapi Renewable Transmission Project

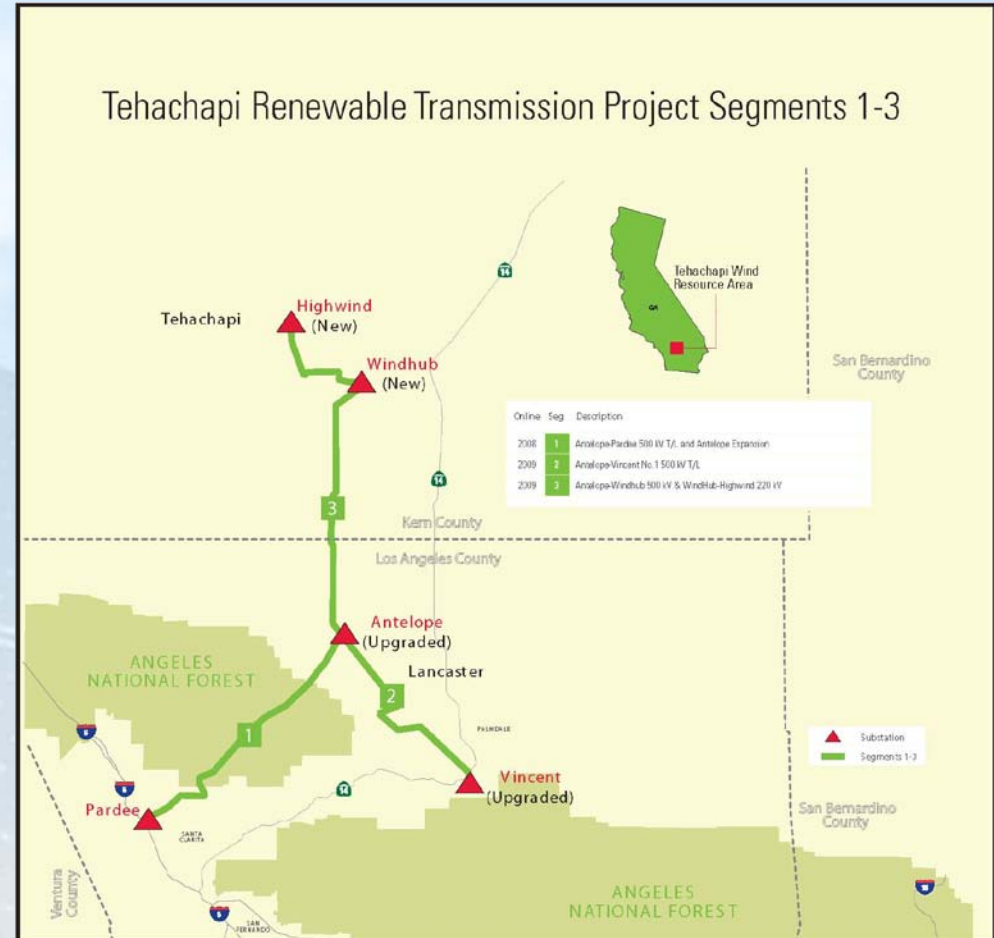
- **New 500 kv Transmission and transmission upgrades to access Wind Resources**
 - CPUC June 2004: “The Tehachapi area contains the largest wind resource in California and, if more fully developed, could meet a significant portion of the goals for renewable energy development in California. However, the lack of transmission in the area currently prevents new wind installations. . . . We find that “business as usual” transmission planning approaches, which would plan and size Tehachapi transmission upgrades based solely on transmission needs of generation projects that have submitted interconnection requests, is unlikely to achieve the most cost-effective size, configuration, or timing of Tehachapi upgrades”
 - CPUC made preliminary determination of need for the project up front – before environmental review process commenced
 - Significant solar development in the area now in addition to wind projects



Example # 1: Tehachapi Renewable Transmission Project

Timing

- **2001** CPUC evaluation begins
- **2003** CEC Resource Report
- **June 2004** CPUC Ordered SCE to file applications for the first phases of Tehachapi Transmission
- Applications for Antelope Transmission Project (TRTP Segments 1-3) filed **December 2004**, approved **April 2007**
 - 700 MW of transmission capacity in service 2009
- Application for TRTP Segments 4-11 filed **June 2007**
- CPUC Approval for TRTP Segments 4-11 **December 2009**
- US Forest Service Approval for TRTP Segments 4-11 **October 2010**
- Construction complete: **2015**



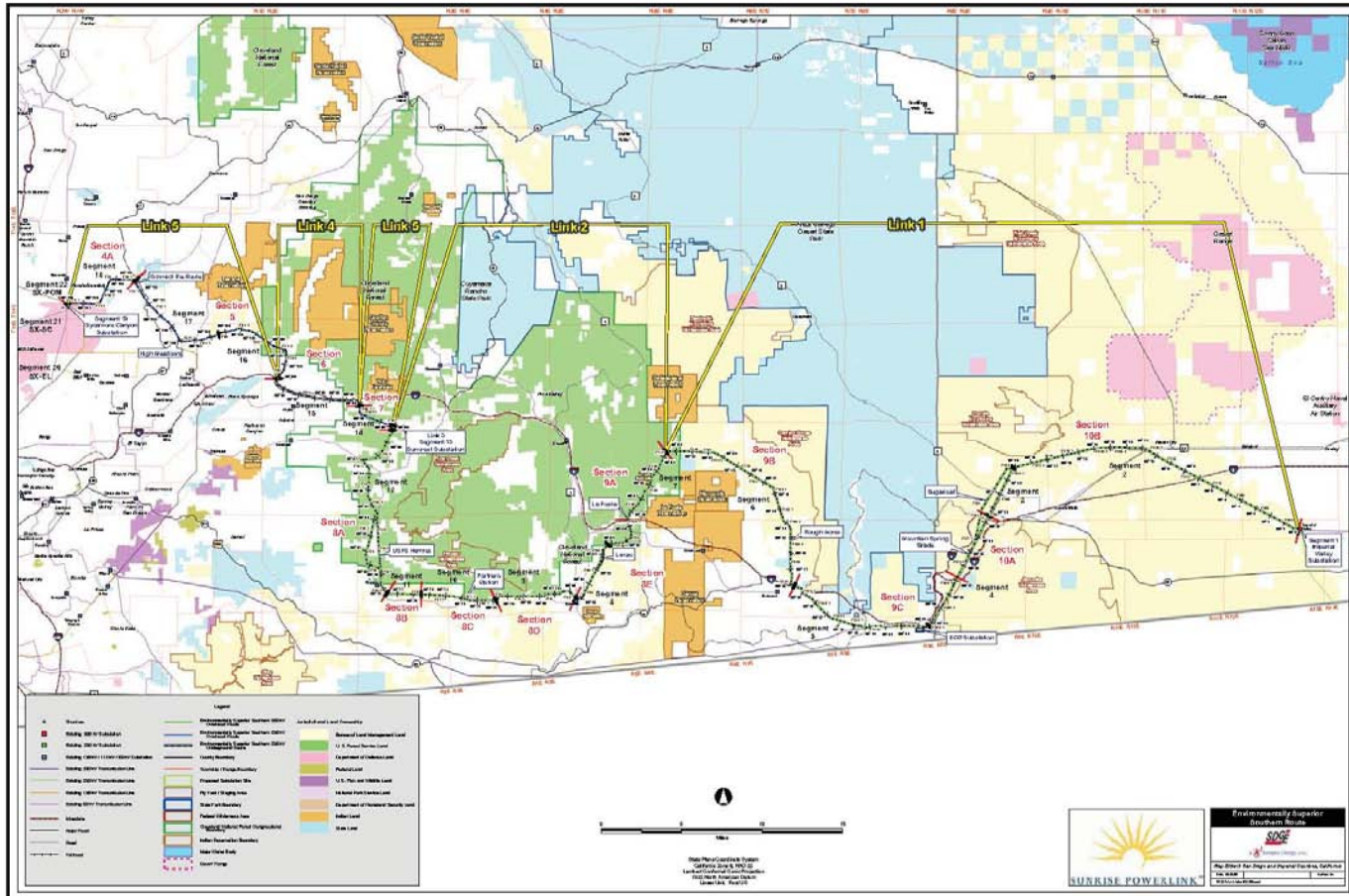
Example # 1: Tehachapi Renewable Transmission Project

- Policy and legal issues
 - Jurisdictional dispute and FERC rate treatment for Segments 1-3
 - CAISO planning attempted to play catch-up after CPUC orders
- Relatively straightforward state permitting
 - Local interests in Chino objected to expansion of existing 230kv facilities to 500kv in existing ROW
 - Need issues largely determined by reference to RPS
 - But wind projects with PPAs in 2005-06 suffered
 - One result of the length of Tehachapi transmission development was RETI – attempt to better align generation and transmission timelines
- State-Federal Coordination
 - USFS permit process added about a year for Segments 4-11
- Massive project with multiple segments requires multi-year construction schedule



Example # 2: Sunrise Powerlink

- **Second 500 kV link from SDG&E load pocket to Imperial Valley and points east**
 - Rationale: “Three-legged stool:” reliability, economics, and renewables



Example # 2: Sunrise Powerlink: Alternatives Fully Evaluated in the EIR/EIS

Imperial Valley Link Alternatives

- FTHL Eastern Alternative
- SDG&E West of Dunaway Alternative
- SDG&E West Main Canal–Huff Road Modification Alternative

Anza-Borrego Link Alternatives

- Partial Underground 230 kV ABDSP SR78 to S2 Alternative (with All Underground Option).
- Overhead 500 kV ABDSP within Existing 100- Foot ROW (with East of Tamarisk Grove Campground 150- Foot Option)

Central Link Alternatives

- Santa Ysabel Existing ROW Alternative
- Santa Ysabel Partial Underground Alternative
- Santa Ysabel All Underground Alternative
- SDG&E Mesa Grande Alternative

Inland Valley Link Alternatives

- CNF Existing 69 kV Route Alternative
- Oak Hollow Road Underground Alternative
- San Vicente Transition Alternative
- Chuck Wagon Road Alternative

Coastal Link Alternatives

- Pomerado Road to Miramar Area North Alternative
- Los Peñasquitos Canyon Preserve and Mercy Road Alternative
- Black Mountain to Park Village Road Underground Alternative
- Coastal Link System Upgrade Alternative

Substation Alternatives to Central East Substation

- Top of the World Substation Alternative

Southwest Powerlink (SWPL) Alternatives

- Interstate 8 Alternative (with five segment options)
- BCD Alternative (with South BCD Option)
- Route D Alternative (North of I-8)
- Modified Route D Alternative (South of I-8) (with Star Valley Option)

Non Wires Alternatives

- New In-Area Renewable Generation (wind, solar thermal, solar photovoltaics, and biomass/biogas)
- New In-Area All-Source Generation (renewable components and conventional [gas-fired] generation).

Full Project Route and System Alternatives

- LEAPS Transmission-Only Alternative
- LEAPS Generation and Transmission Alternative

No Project / No Action Alternative

- A variety of renewable and conventional generation projects and smaller transmission projects including “Mexico Light” and the “Path 44 Upgrade”

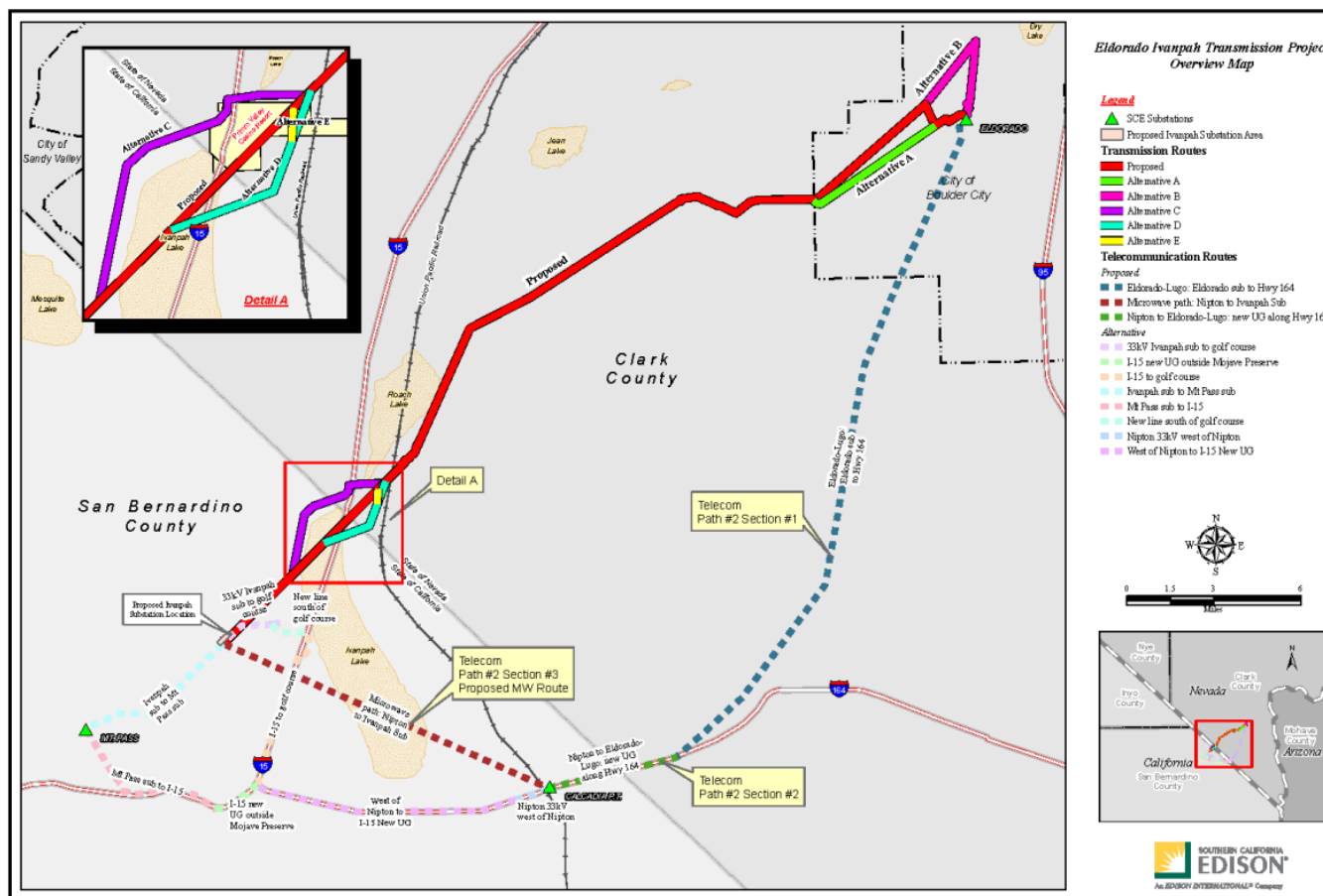
Example # 2: Sunrise Powerlink

- **Environmental issues**
 - Anza-Borrego Desert State Park
 - Local Opposition in alternate routes
 - Challenging terrain
 - USFS delays
 - Explosion of alternatives
 - 11,000 page environmental document
- **Need for project questioned by both environmental concerns and ratepayer advocates**
 - Law requires CPUC to determine need for proposed project
 - Opponents claimed alternatives could satisfy need more economically
 - Distributed renewable generation (e.g. rooftop solar)
 - Local fossil generation
 - Hotly contested and oft-changing assumptions about economic inputs led to multiple rounds of economic modeling and widely varying results
- **Solutions**
 - Extensive economic modeling undertaken by CAISO
 - 33% RPS case produced most economic benefits
 - Undergrounding in Alpine, where canyon geography and Indian reservations limited practical alternatives
 - \$244 million cost for 6.2 miles of undergrounding (~\$39 million/mile)
 - Compare to ~\$15 million/mile cost for entire 123 mile project
 - Aggressive procurement of long lead time items by SDG&E allows for compressed construction schedule



Example # 3: Eldorado-Ivanpah Transmission Project

- Upgrade of existing 115kV lines to double circuit 230kV, in existing right of way
 - Driven by Renewable Energy project interconnection requests
 - Interstate line from California – Nevada (all on CAISO system)



Example # 3: Eldorado-Ivanpah Transmission Project



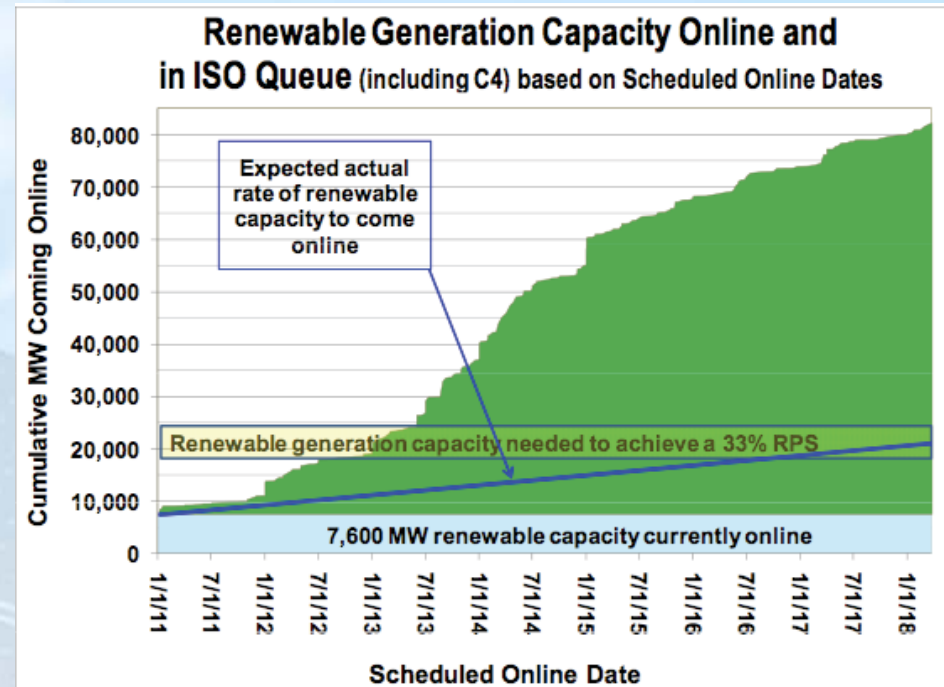
Transmission Timeline

2006	Interconnection request filed
2007	Interconnection study results received and first letter agreement (to fund work in advance of signed Interconnection Agreement) between developer and SCE
2008	Second letter agreement
2009	SCE filed permit application and commenced environmental review (CPCN) at CPUC
2010	Interconnection Agreement (LGIA) executed and filed at FERC
2010	SCE filed application at PUC of Nevada
2010	CPUC approval of transmission project
2011	PUCN and BLM approval
2011 ?	Construction start?
2013 ?	Transmission on-line

Generation Timeline

2006	Bilateral negotiations commence between developer and Utility
2007	Developer commenced permitting and environmental review for generation project
2008	Power Purchase Agreement (PPA) Initially filed at CPUC
2009	Amended PPA filed and approved by CPUC
2010	Generation project approved by permitting agencies and construction commenced
2012 ?	Generation on-line

- **Potential for delays at multiple steps in the process**
 - Planning/interconnection
 - CAISO is overwhelmed by interconnection requests
 - Pre-permitting
 - Legal/policy arguments
 - Data acquisition
 - Permitting/Need determination
 - Some time requirements built in to law
 - Delays can compound as new information is obtained
 - USFS consistently slower than BLM
 - Construction



- **Avoiding delays**
 - CAISO continues to refine transmission planning and Generator Interconnection processes
 - Interconnection customers tend to favor stringent measures (e.g. higher security payments) intended to “weed” the queue – until their own projects are impacted
 - Regional Planning Processes (e.g. FERC Order 890) have yet to bear much fruit
 - But: CAISO MOU with Valley Electric
 - CAISO and FERC approval for policy-driven projects paves the way for renewable transmission projects with less than obvious reliability and/or economic benefits
 - Locus of Need Determination?
 - Since formation of CAISO there has been a debate over what entity should make the need determination
 - CAISO is responsible for maintaining reliability
 - CPUC has responsibilities to ratepayers
 - CEC Strategic Transmission Plan
 - Better up-front planning by Transmission Owners can reduce permitting timelines
 - Avoid treasured state parks!
 - Use existing ROW where practical - “Garamendi principles”
 - Undergrounding is expensive but can solve some geographic problems
 - Spring surveys for desert projects
 - Intelligent project scoping by permitting agencies can limit overly cumbersome alternatives analysis



Thank You
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