

CAISO South Regional Transmission Plan for 2006 (CSRTP-2006)

Focus on the Tehachapi Project

Status Briefing for STEP

Dariush Shirmohammadi
Director, Regional Transmission – South

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Background



Projects Background

- **CAISO has been asked to assess three major transmission projects in Southern California Region:**
 - Sun Path project(Approved): Combination of SDG&E's Sunrise Powerlink and Citizens Energy's and IID's Phase 2 Green Path projects connecting Imperial Valley to San Diego area
 - Tehachapi project: Transmission infrastructure to accommodate wind generation in Tehachapi area
 - LEAPS project: Lake Elsinore pumped storage plant and associated transmission line
- **Each of these projects offers unique reliability and economic benefits**
 - All projects also play critical roles in enabling California to meet its Renewable Portfolio Standard (RPS) goals for 2010 and beyond



The Three Projects





Focus on Tehachapi in This Round

- **Sun Path Project was approved by the CAISO Board on August 3, 2006**
 - Sun Path line treated as part of basecase
- **The reliability and economic assessments of the LEAPS Project under the operating scenario to maximize WECC ratepayers' benefit is going through final reviews**
 - We are awaiting direction from the FERC on the operational control of the LEAPS Power Plant as well as the rate treatment before making recommendations to the CAISO Board
- **The reliability and economic assessments of the Tehachapi Project is going final reviews**
- **We intend to make recommendation to the CAISO Board during the October Board meeting under two scenarios:**
 - Scenario 1: Tehachapi Project alone
 - Scenario 2: Tehachapi Project in presence of the LEAPS Project



Tehachapi Project

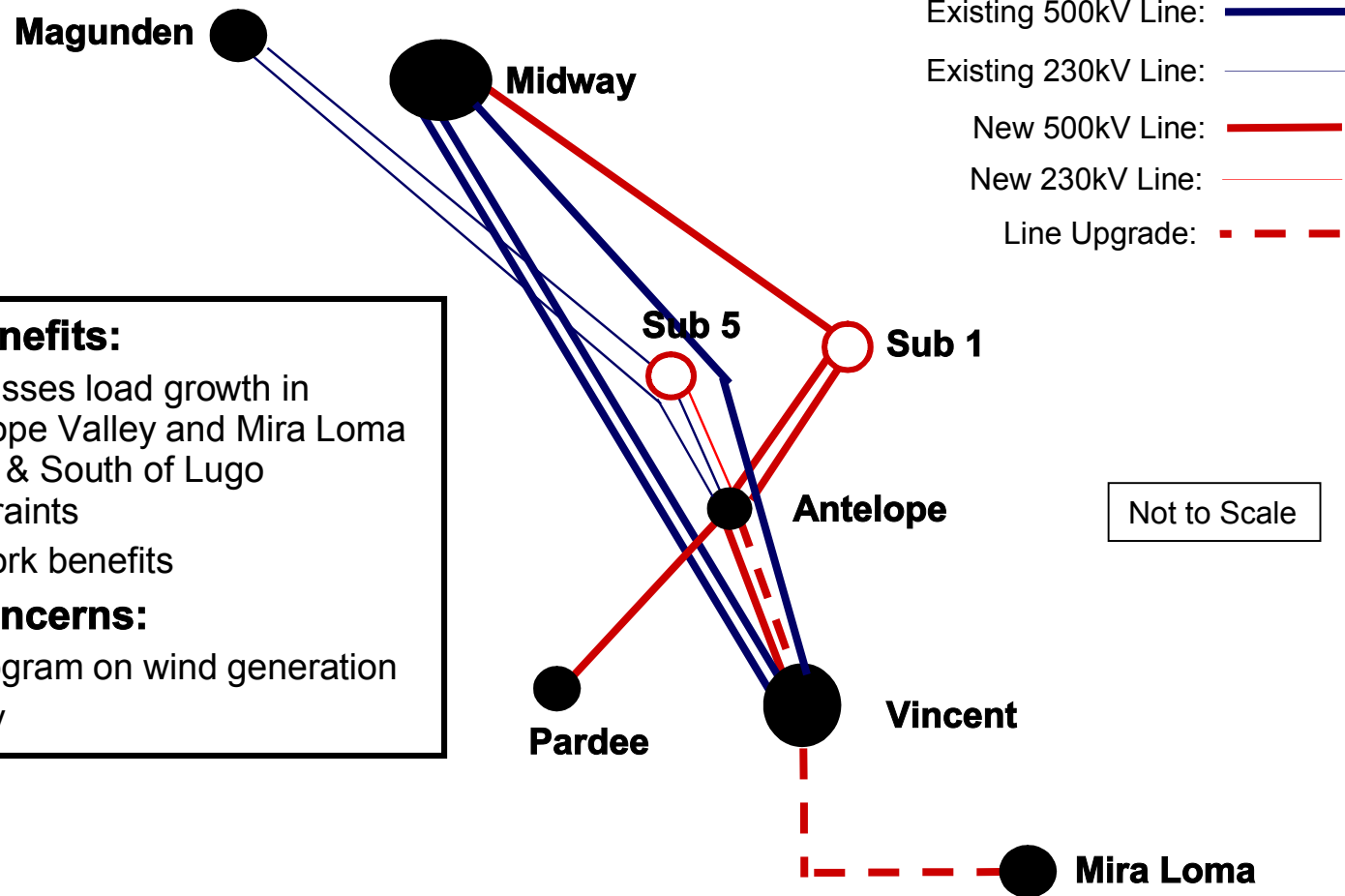
- **A 500 kV transmission infrastructure in the Tehachapi wind generation area to interconnect developing wind generation in that area to the SCE (and the PG&E) transmission systems**
- **Purpose:**
 - Help California reach its RPS goals for the year 2010 and beyond
 - Facilitate access to wind resources in Tehachapi area
 - Improve the reliability of the CAISO South by mitigating congestion on Path 26 and offering new energy sources
 - Include reinforcements to the SCE system for additional flow on Path 26 as well as normal load growth in SCE area
 - Part of the transmission infrastructure may develop prior to full wind generation development
- **Project Sponsors: SCE**
 - PG&E and wind generation developers play critical roles

Evolution of Tehachapi Transmission Infrastructure



Tehachapi Study Collaborative Group

Alternative 1 (Q1, 2006)



■ **Major Benefits:**

- Addresses load growth in Antelope Valley and Mira Loma areas & South of Lugo constraints
- Network benefits

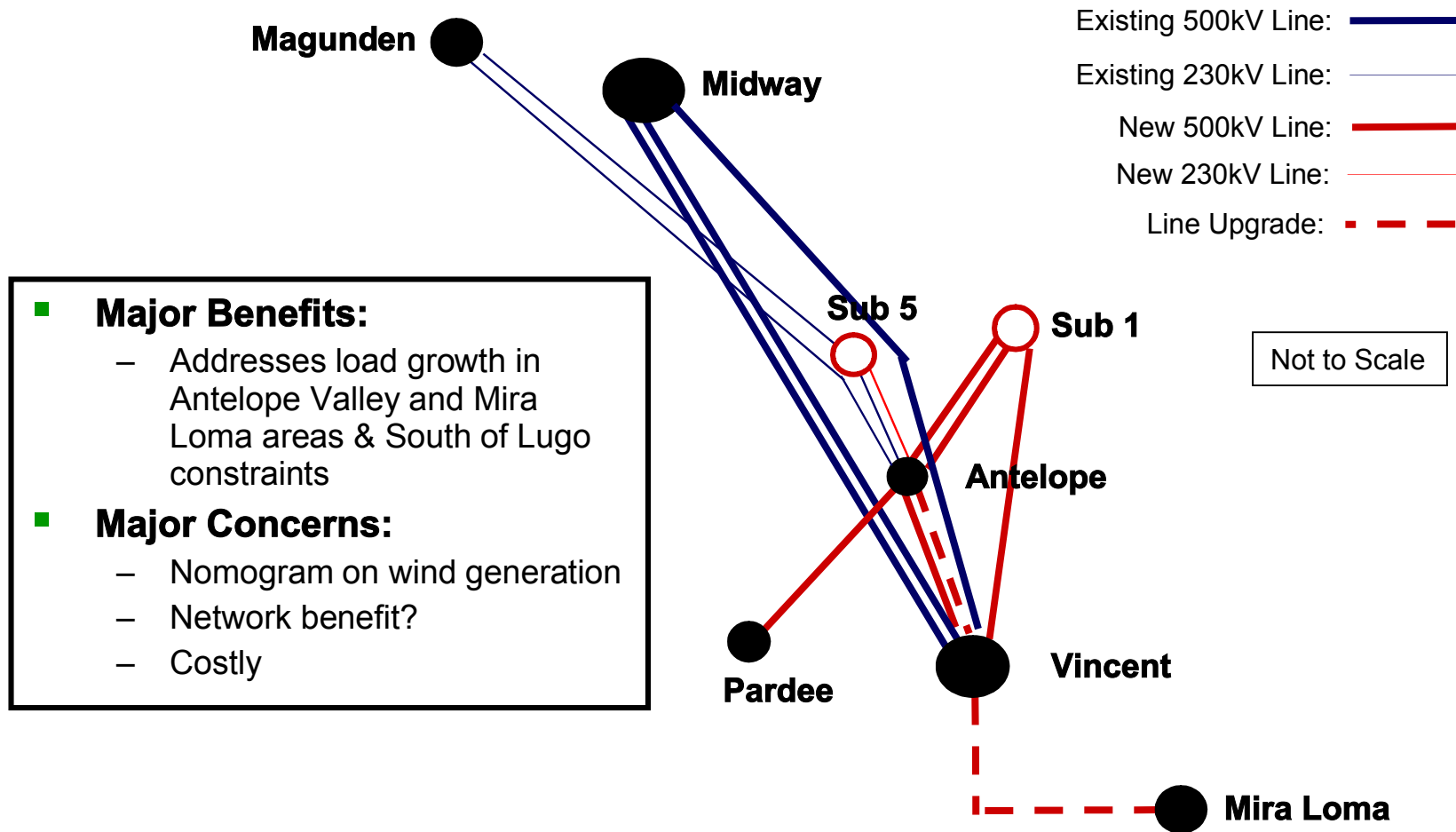
■ **Major Concerns:**

- Nomogram on wind generation
- Costly



Tehachapi Study Collaborative Group

Alternative 2 (Q1, 2006)

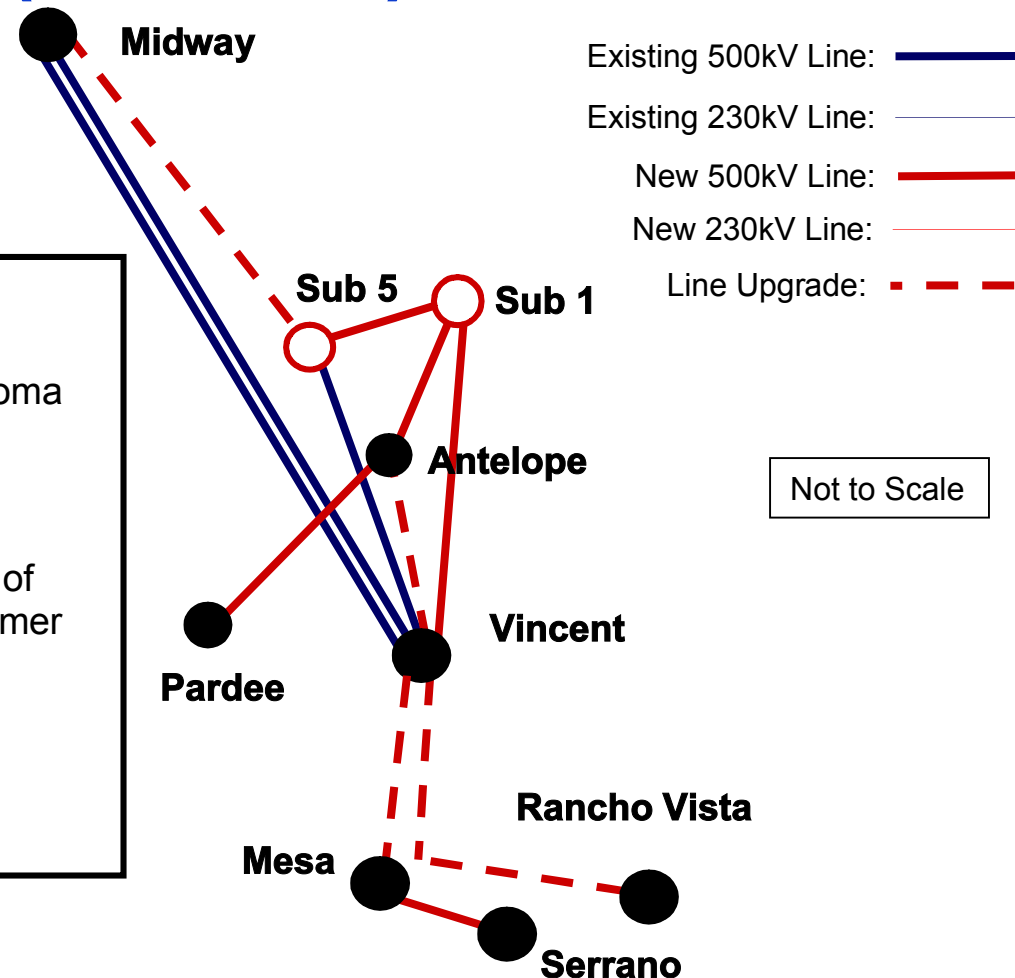


- **Major Benefits:**
 - Addresses load growth in Antelope Valley and Mira Loma areas & South of Lugo constraints
- **Major Concerns:**
 - Nomogram on wind generation
 - Network benefit?
 - Costly



CS RTP-2006 Original Solution (Q2, 2006)

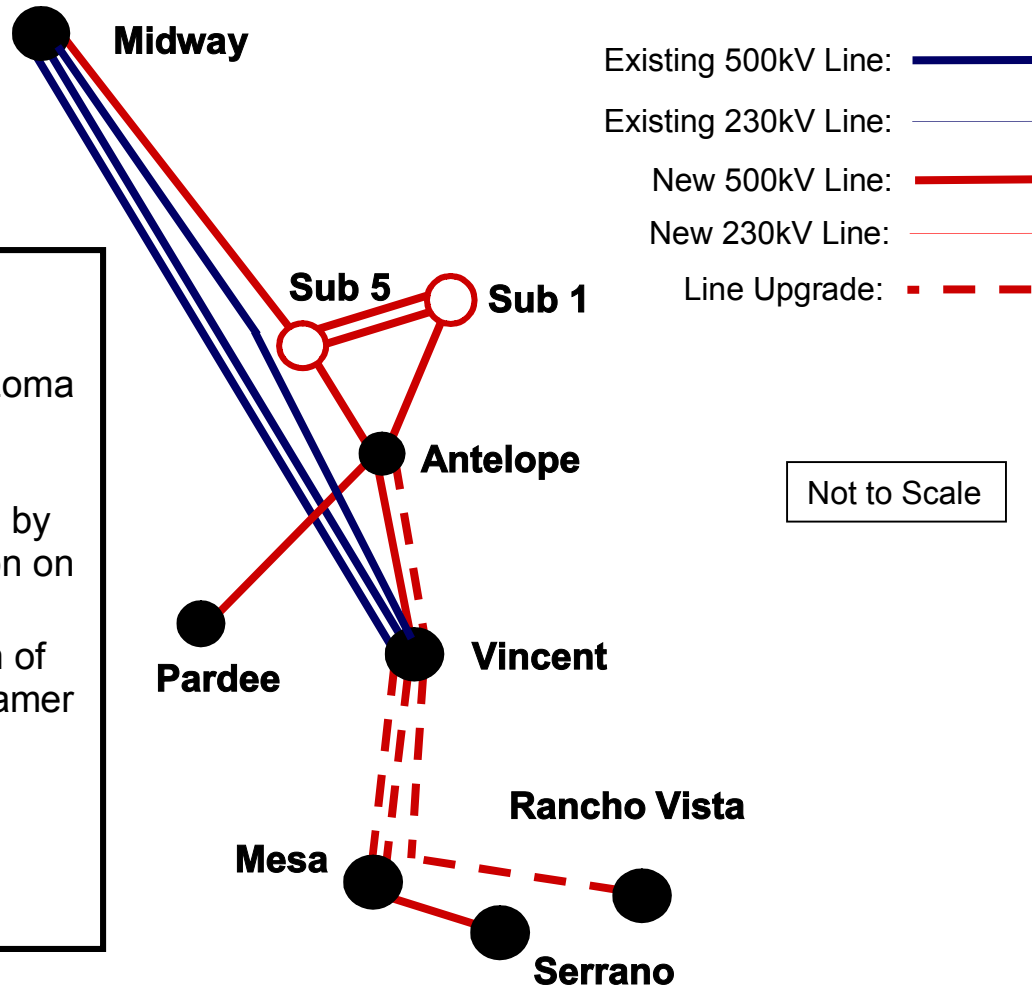
- **Major Benefits:**
 - Addresses load growth in Antelope Valley and Mira Loma areas & South of Lugo constraints
 - Upgrades Path 26 rating
 - Should facilitate integration of renewable resources in Kramer area
 - Network benefits
- **Major Concerns:**
 - Costly





SCE Solution 1 (Q3, 2006)

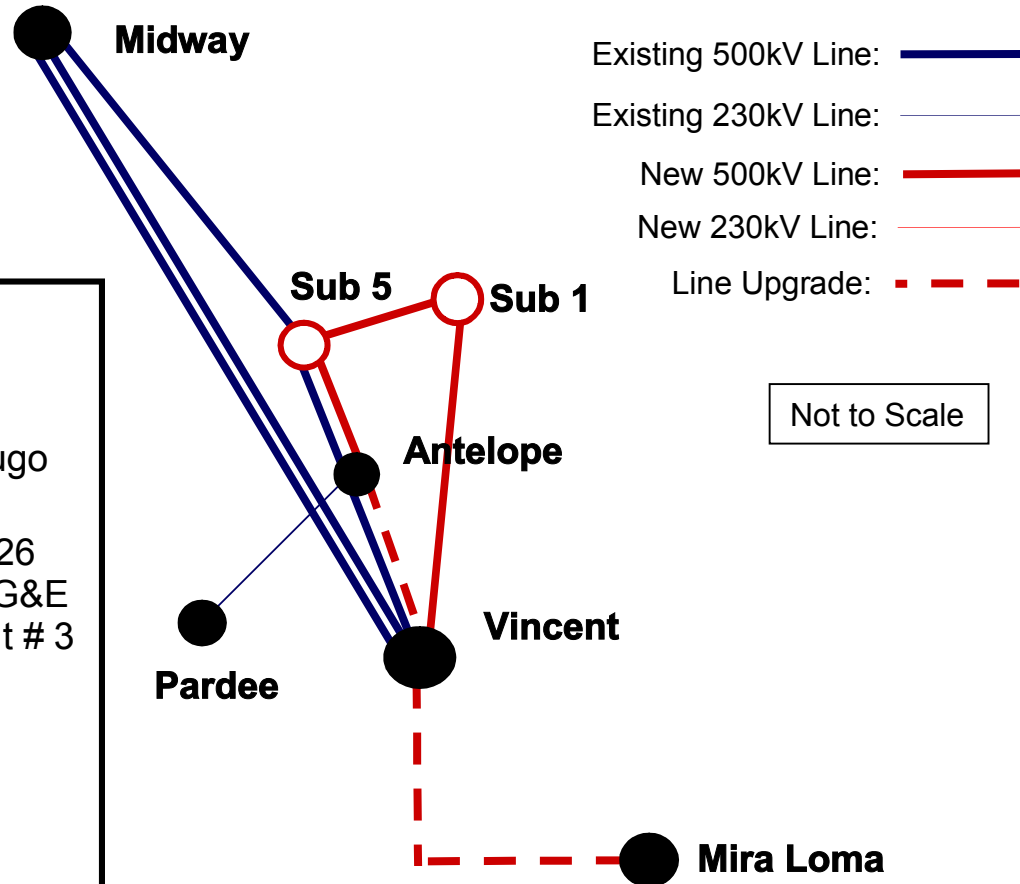
- **Major Benefits:**
 - Addresses load growth in Antelope Valley and Mira Loma areas & South of Lugo constraints
 - Can expand Path-26 rating by upgrading the PG&E portion on Midway-Vincent # 3
 - Should facilitate integration of renewable resources in Kramer area
 - Network benefits
- **Major Concerns:**
 - Very costly





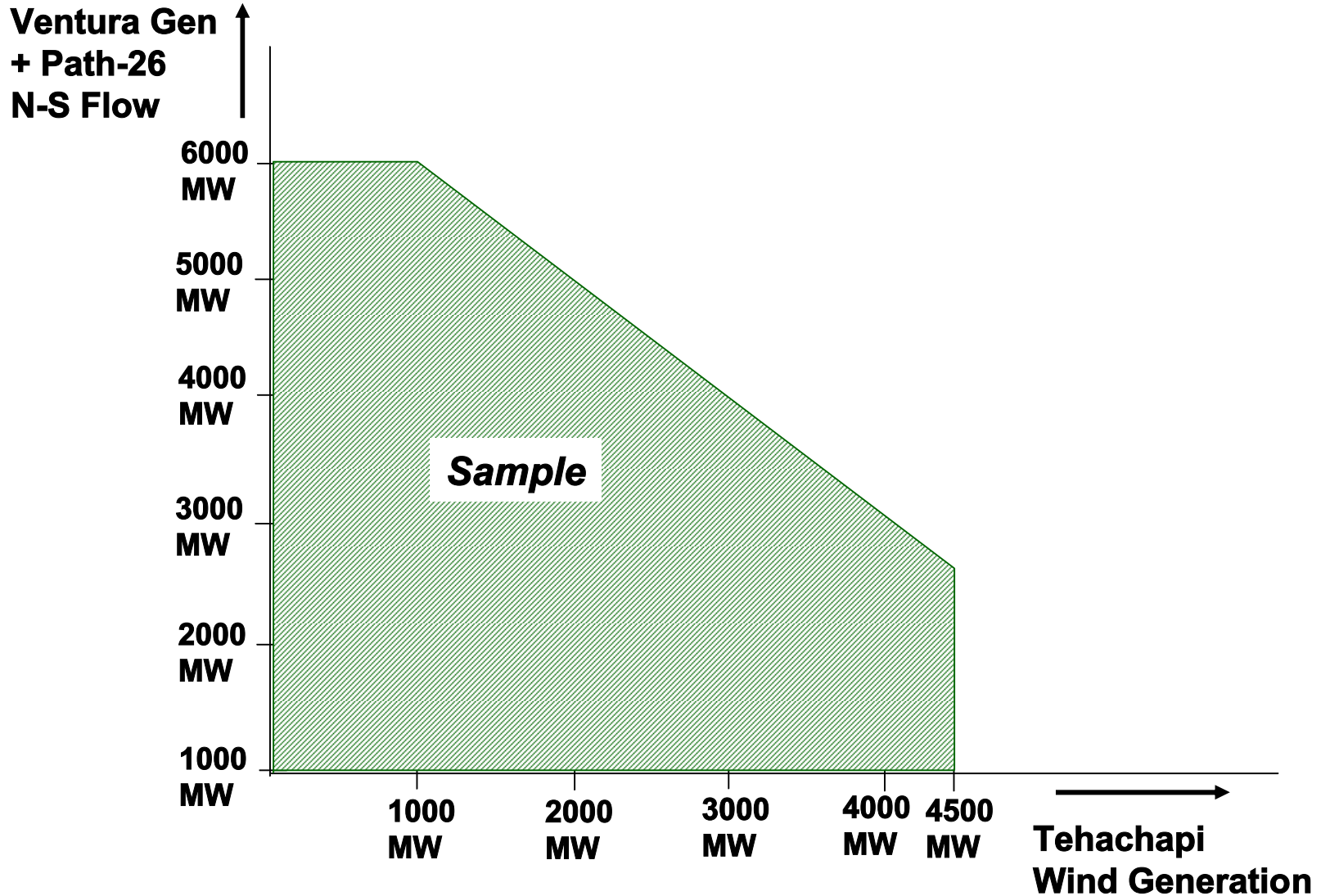
CS RTP-2006 Solution 2 (Q3, 2006)

- **Major Benefits:**
 - Addresses load growth in Antelope Valley and Mira Loma areas & South of Lugo constraints
 - Can readily expand Path-26 rating by upgrading the PG&E portion on Midway-Vincent # 3
 - Network benefits
 - Least cost solution
- **Major Concerns:**
 - Nomogram on wind generation



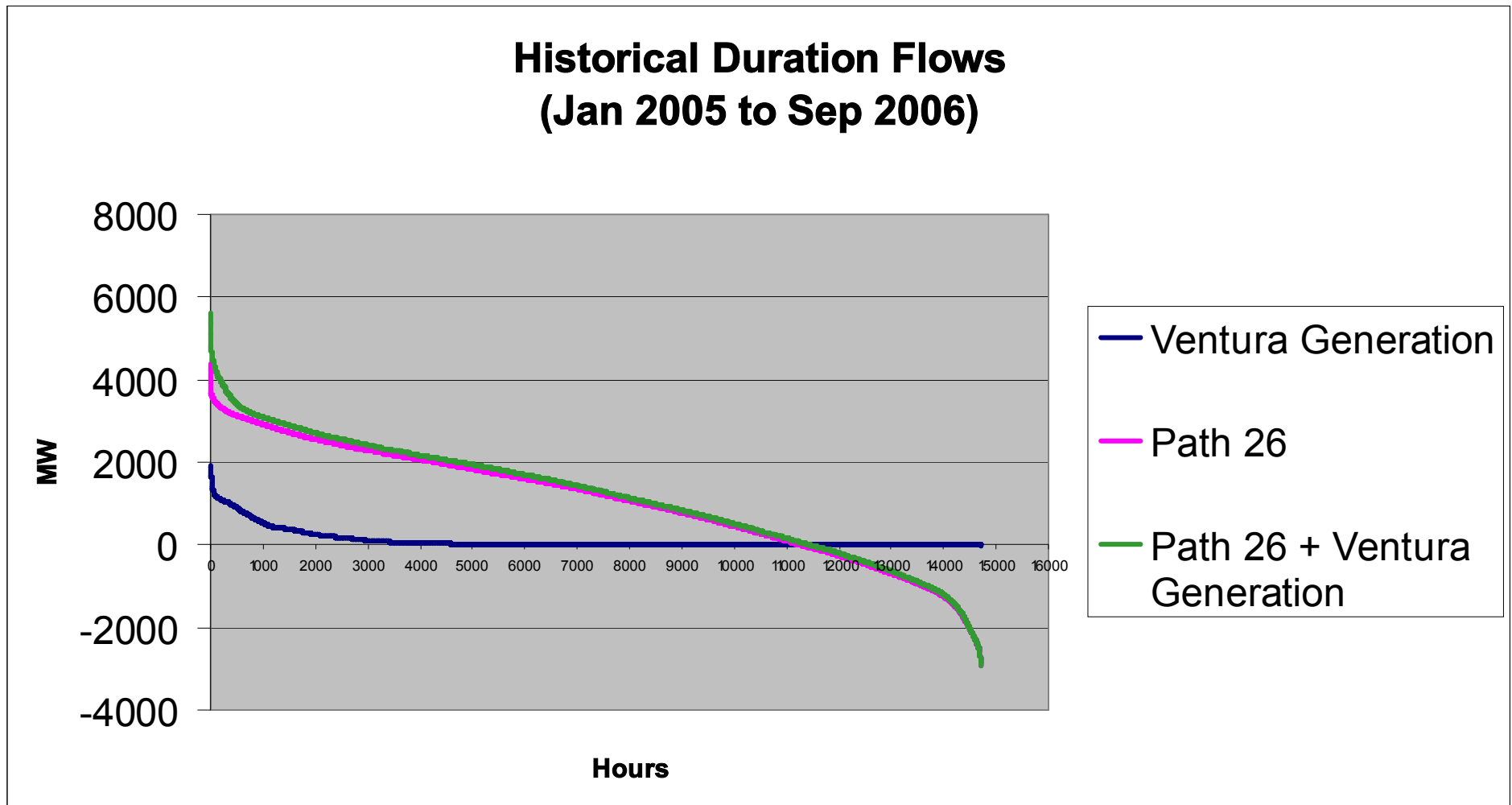


Nomogram for Tehachapi Wind Generation



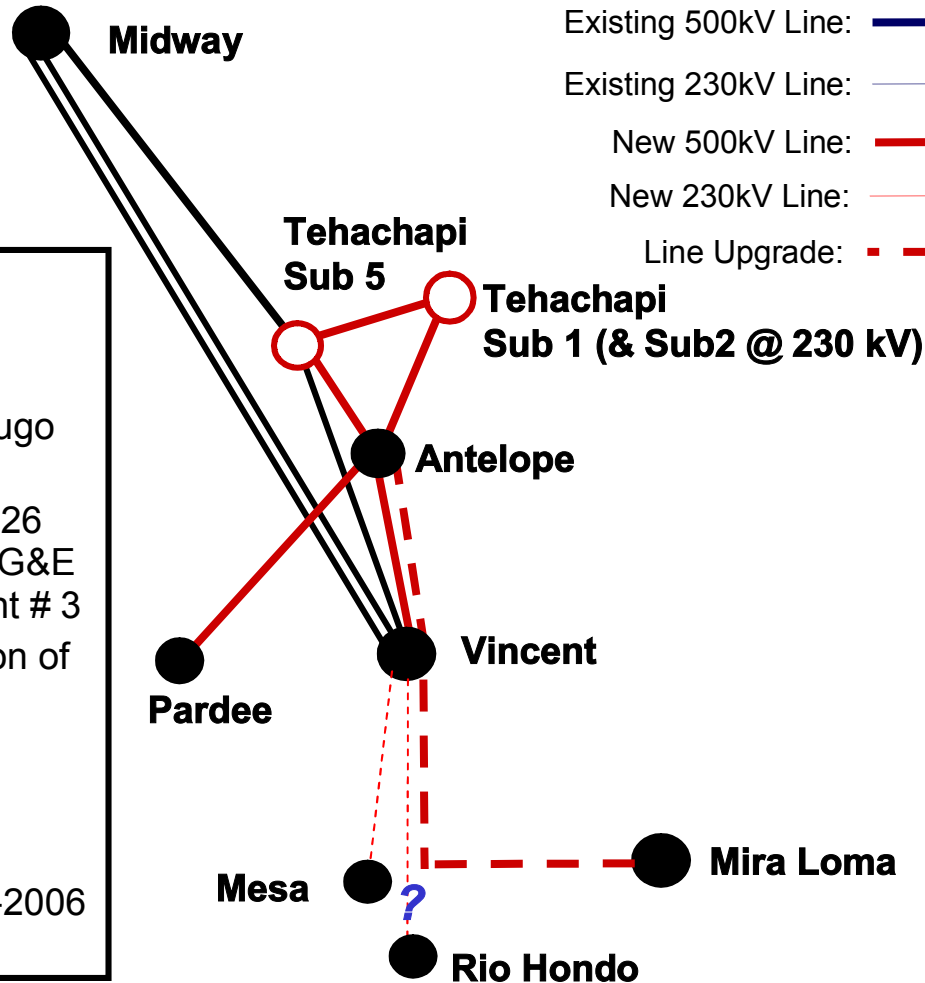
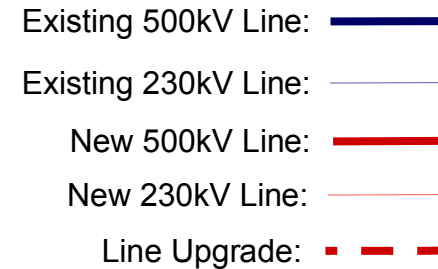


Historical Flow on Path-26 and Ventura Generation





SCE Solution 2 (Q3, 2006)



Major Benefits:

- Addresses load growth in Antelope Valley and Mira Loma areas & South of Lugo constraints
- Can readily expand Path-26 rating by upgrading the PG&E portion on Midway-Vincent # 3
- Should facilitate integration of renewable resources in Kramer area
- Network benefits

Major Concerns:

- More costly than CSRTP-2006 Solution 2



Assessment Approach: Division of Facilities

Tehachapi Project Major Upgrade	Need	
	Wind Integration	Reliability
Antelope - Pardee 500kV line (230kV operation)		✓
Antelope - Vincent #1 500kV line		✓
Sub 1 - Antelope #1 500kV line	✓	
Antelope 500/230kV Substation & Facilities	✓	✓
Sub 1 500/230kV Substation & Facilities	✓	
Sub 5 500/230kV Substation & Facilities	✓	
Vincent 500 kV Substation Upgrades	✓	
Antelope- Vincent #2 500 kV Line	✓	
Sub 1 – Sub 5 500 kV Line	✓	
Antelope – Sub 5 500 kV Line	✓	
Replace 500/230 kV 1-AA transformer bank at Vincent		✓
Upgrade Midway- Vincent # Series Compensation	✓	
Vincent- Mira Loma 500 kV Line		✓
Vincent – Mesa 230 kV Line	✓	



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CS RTP-2006 Process



CS RTP-2006 Process

- **Step 1: Formed technical study teams from project sponsors and impacted PTOs**

- **Step 2: Developed study assumptions and approaches**

- **Step 3: Studied the projects according to their “initial” plan of service in order to assess their individual reliability and economic values as well as to evaluate their interactions with one another**

- **Step 4: Reviewed alternatives to individual project’s plan of service in order to optimize the recommended plan of service**



Guiding Principles for CS RTP-2006 Process

- **Perform studies based on data that can be shared on WECC level – NDA still required for some of the data**
- **Focus solely on the assessment of transmission solutions**
 - CS RTP-2006 process is NOT intended to:
 - Study path ratings
 - Study transmission line routing
 - Study generation or demand side alternatives
- **Provide opportunities to CS RTP-2006 participants to review and comment on the CAISO report**
 - Allow “minority report(s)” in the Board report
- **Inform participants if a decision or a recommendation is based on privileged information**



Public Participation in the CSRTP-2006 Process

- **CSRTP-2006 participation was mainly limited to technical representation from project sponsors, the impacted PTOs, the CEC and EOB**
- **We initiated several efforts to share our information with and receive input from all stakeholders:**
 - Sent out notices of events and comment opportunities to the CAISO, CPUC and STEP lists covering more than 3000 stakeholders
 - Organized an open house in San Diego to present CAISO's role in transmission projects and the CSRTP-2006 approach and interim results
 - Organizing an open house in Tehachapi area
 - Shared our reliability and economic assumptions by posting them on the CAISO website
 - Shared our basecases with CSRTP-2006 members as well as other stakeholders
 - Facilitated the processes to receive comments and suggestions on the study approach and transmission alternatives from all stakeholders and responded to all comments and suggestion openly
 - Modified the direction of our assessment based on such input
 - Presented (and will continue to present) our approach as well as our findings/recommendations at the Southwest Transmission Expansion Plan (STEP) meetings
 - Met with various public groups, including project opponents to address their specific concerns about the CSRTP-2006 process and findings on the Sun Path project



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Concluding Remarks



Concluding Remarks

- **Reviewing SCE's reliability assessment results**
- **Looking into potential Project cost reduction for the SCE Solution 2 based on application of the nomogram**
- **Looking into proper phasing based on maximum wind integration and constructability**
- **Working on framing the rate treatment for the project**