

# Decision on the 2013-2014 ISO Transmission Plan

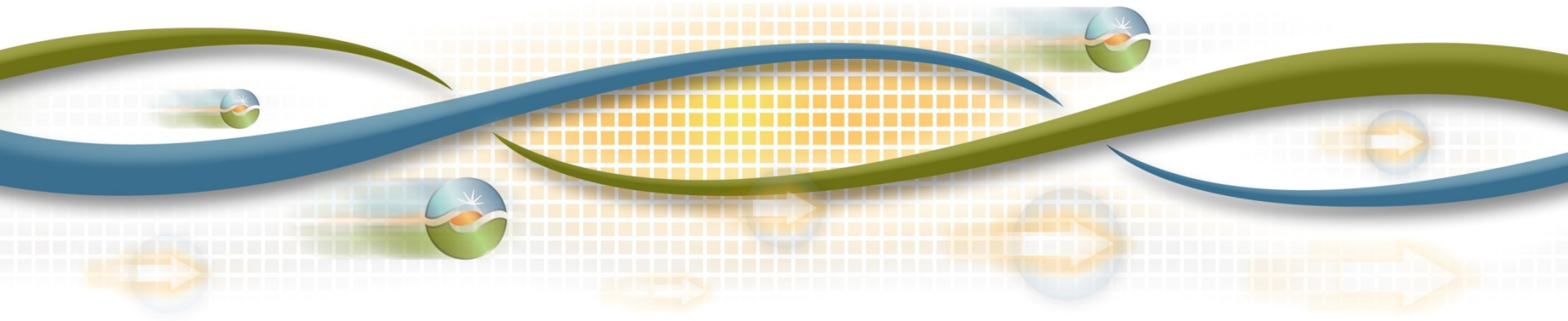
Neil Millar

Executive Director, Infrastructure Development

Board of Governors Meeting

General Session

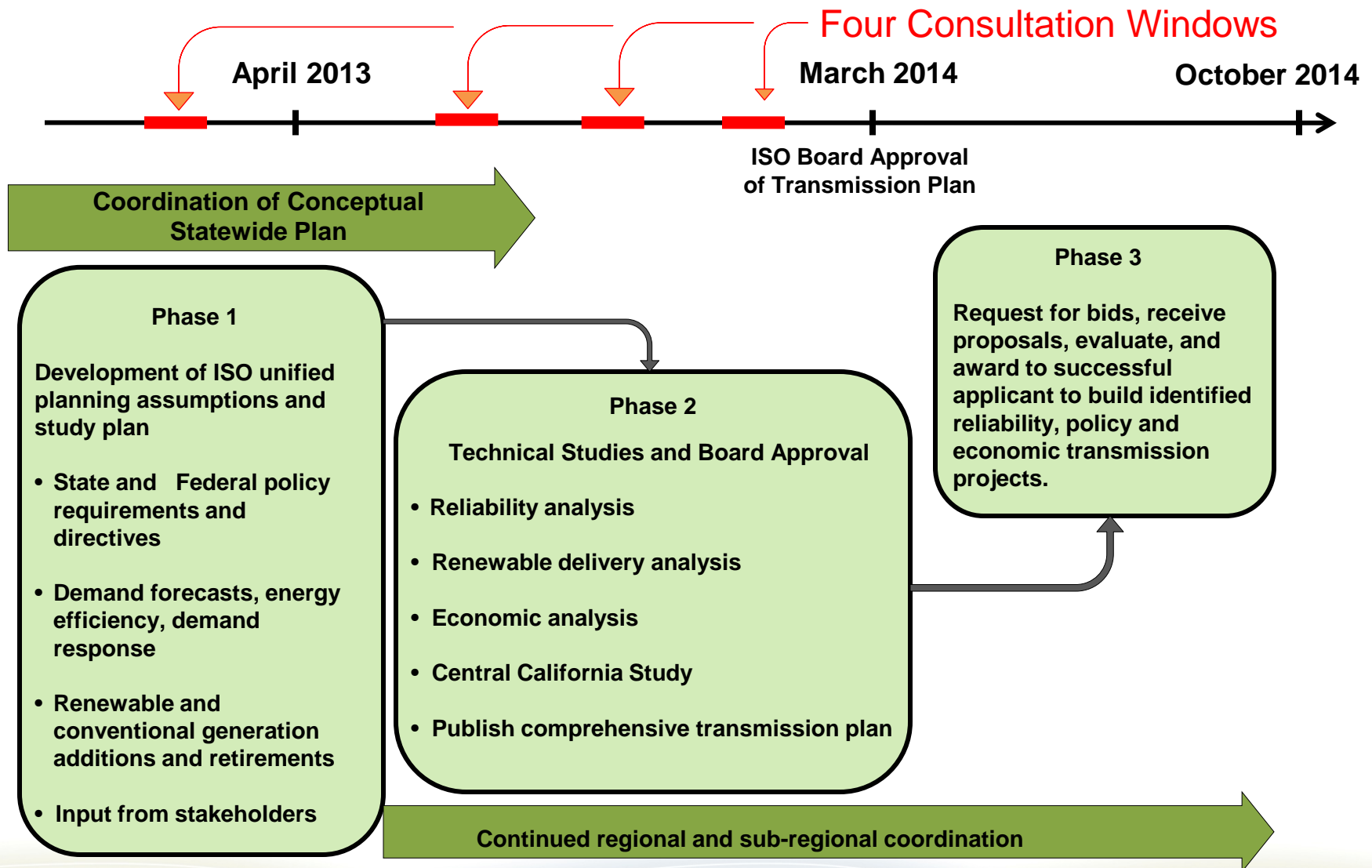
March 19-20, 2014



# Approving the plan means approving determinations and recommendations contained in the plan, including:

- Nine projects – each of which is over \$50 million
  - 6 new transmission reliability projects
  - 2 policy driven projects
  - 1 economically driven project
- Five new transmission reliability projects less \$50 million.

# 2013/2014 Transmission Planning Process



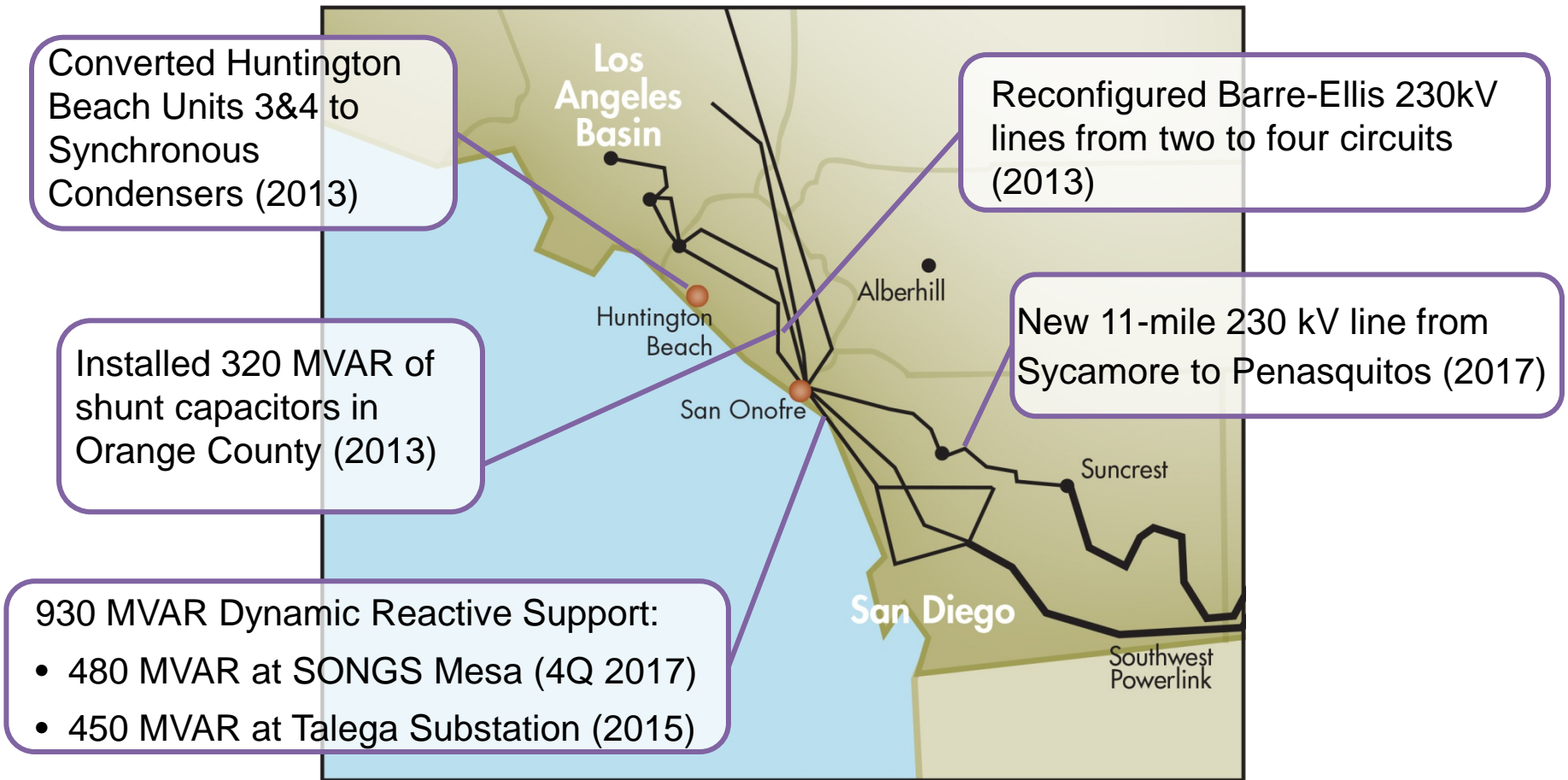
# Summary of Needed Reliability Driven Transmission Projects

Service Territory	Number of Projects	Cost (\$ Million)
Pacific Gas & Electric (PG&E)	14	\$486.4
Southern California Edison Co. (SCE)	2	\$626.0
San Diego Gas & Electric Co. (SDG&E)	11	\$584.0
Valley Electric Association (VEA)	1	0.1
Total	28	\$1,696.5

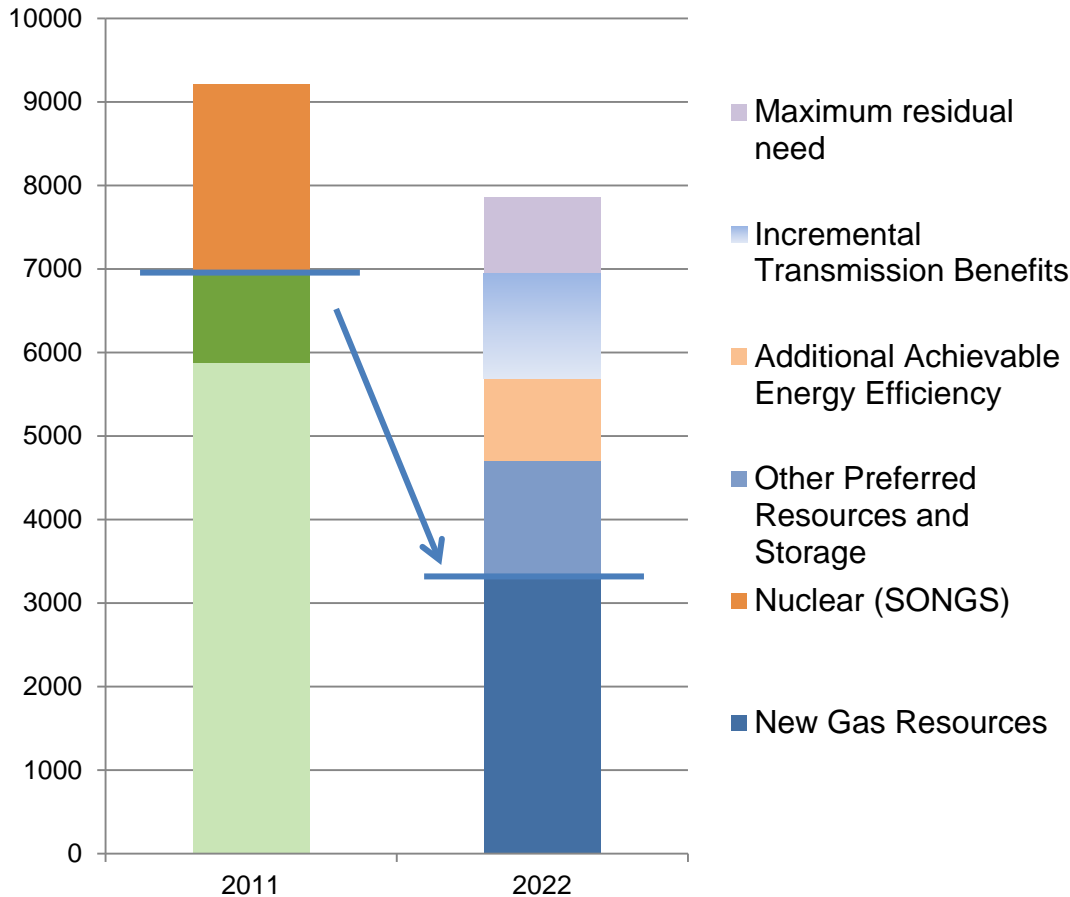
# PG&E has identified a reliability risk for supply to the San Francisco Peninsula.

- The loss of a major substation impacting supply to the entire San Francisco peninsula
- The ISO is expediting a risk analysis with PG&E to establish the need for reinforcement
- A stakeholder process will be conducted to review the need and identify alternatives
- Depending on outcome of analysis and stakeholder process Management may pursue an amendment to the plan at a later Board meeting
- Upgrades to the TransBay Cable previously approved will provide partial relief in the interim

# The needs in the Southern California area are a major focus of the plan, building on previous approvals:



# Less than half of the gas-fired generation retiring in the LA Basin / San Diego area is being replaced with new gas generation – despite 3,000 MW of projected net load growth\* and SONGS retirement.



## New Gas Generation

Walnut Creek	500
El Segundo Energy Center	550
Track 1 SCE - LA Basin Request	1200
Track 4 SCE - LA Basin (gas)	200
Track 1 SDG&E (Pio Pico/Escondido)	308
Track 4 SDG&E Request	550
<b>Total</b>	<b>3308</b>

## Gas Retirements (2011-2022)

Encina	946
El Segundo #3	335
El Segundo #4	335
Alamitos	2011
Huntington Beach	904
Redondo	1342
Etiwanda	640
Long Beach	260
Cabrillo Power II	188
<b>Total</b>	<b>6961</b>

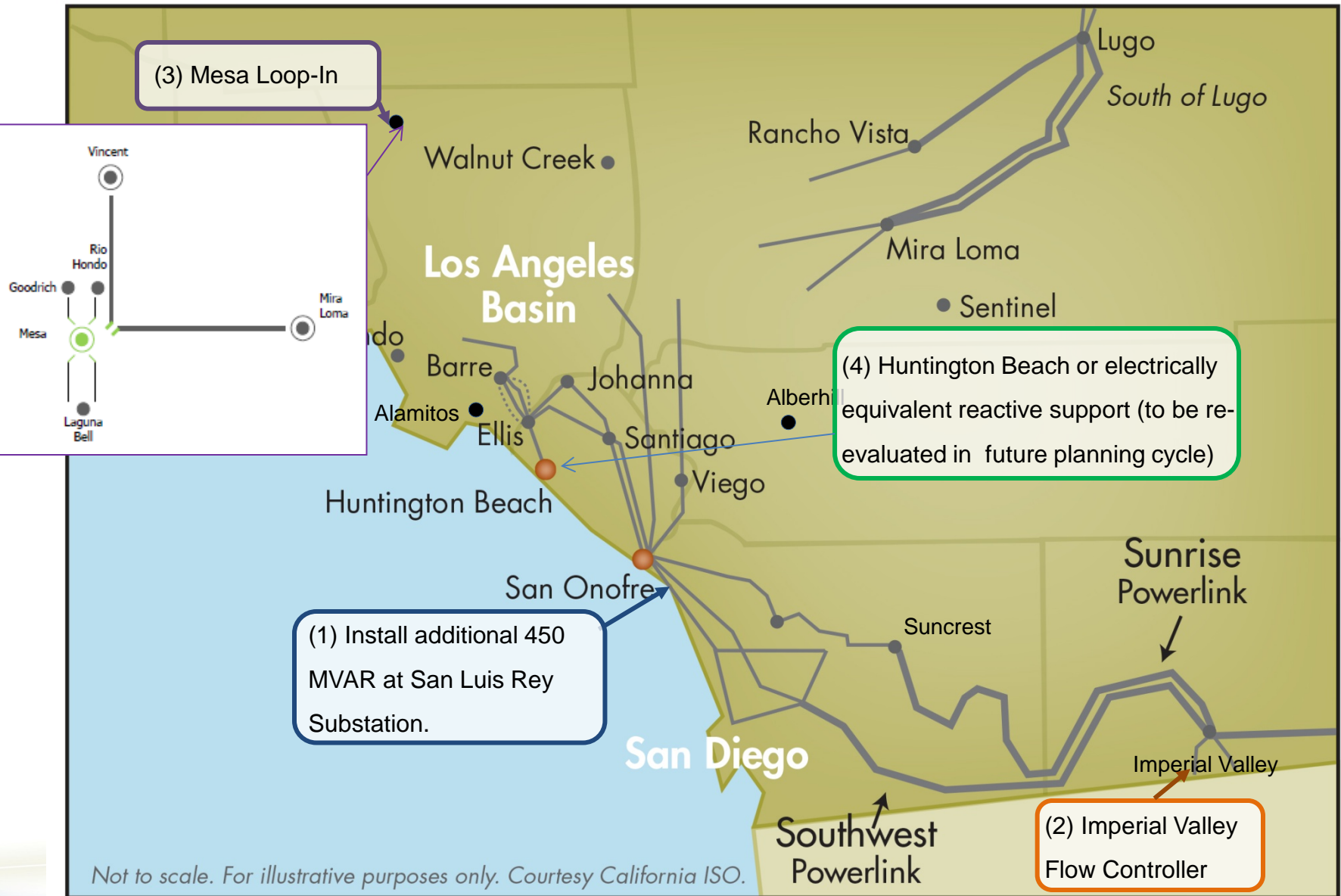
\* The 2012 net load forecast growth in the LA Basin and San Diego already relies on approximately 2400 MW of incremental energy efficiency from approved programs and standards.

## Transmission options evaluated in the Transmission Plan were grouped by similar characteristics:

- Group I - Transmission upgrades optimizing use of existing transmission lines – without new rights of way. *[Recommending 3 projects for approval]*
- Group II - Transmission lines strengthening LA/San Diego connection – optimizing use of corridors into the combined area. *[Recommending further study as potential reliability solution]*
- Group III - New transmission into the greater LA Basin/San Diego area. *[Recommending further study as potential reliability and policy solution]*



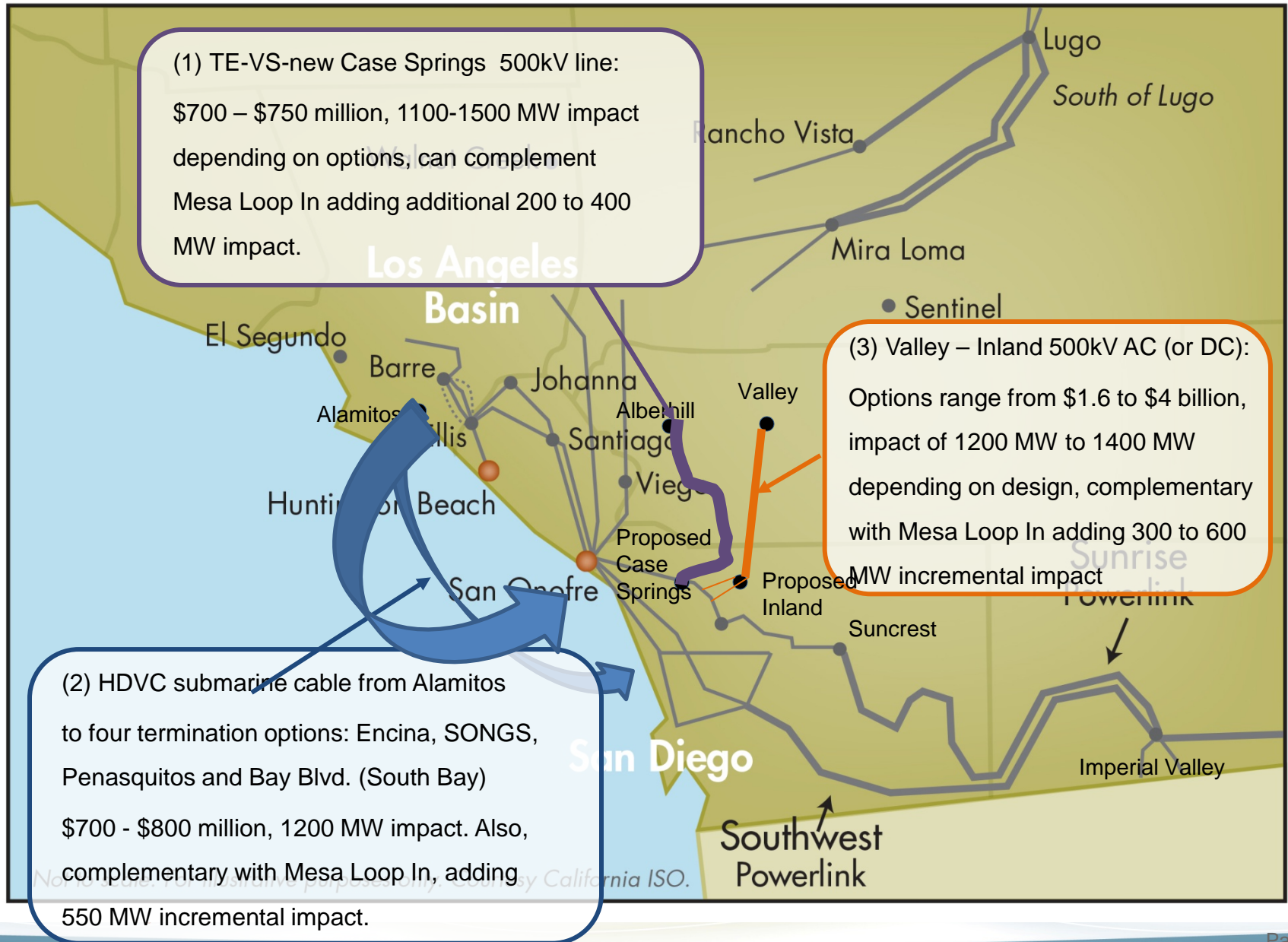
# Group I: Transmission Upgrades Optimizing Use of Existing Transmission Lines



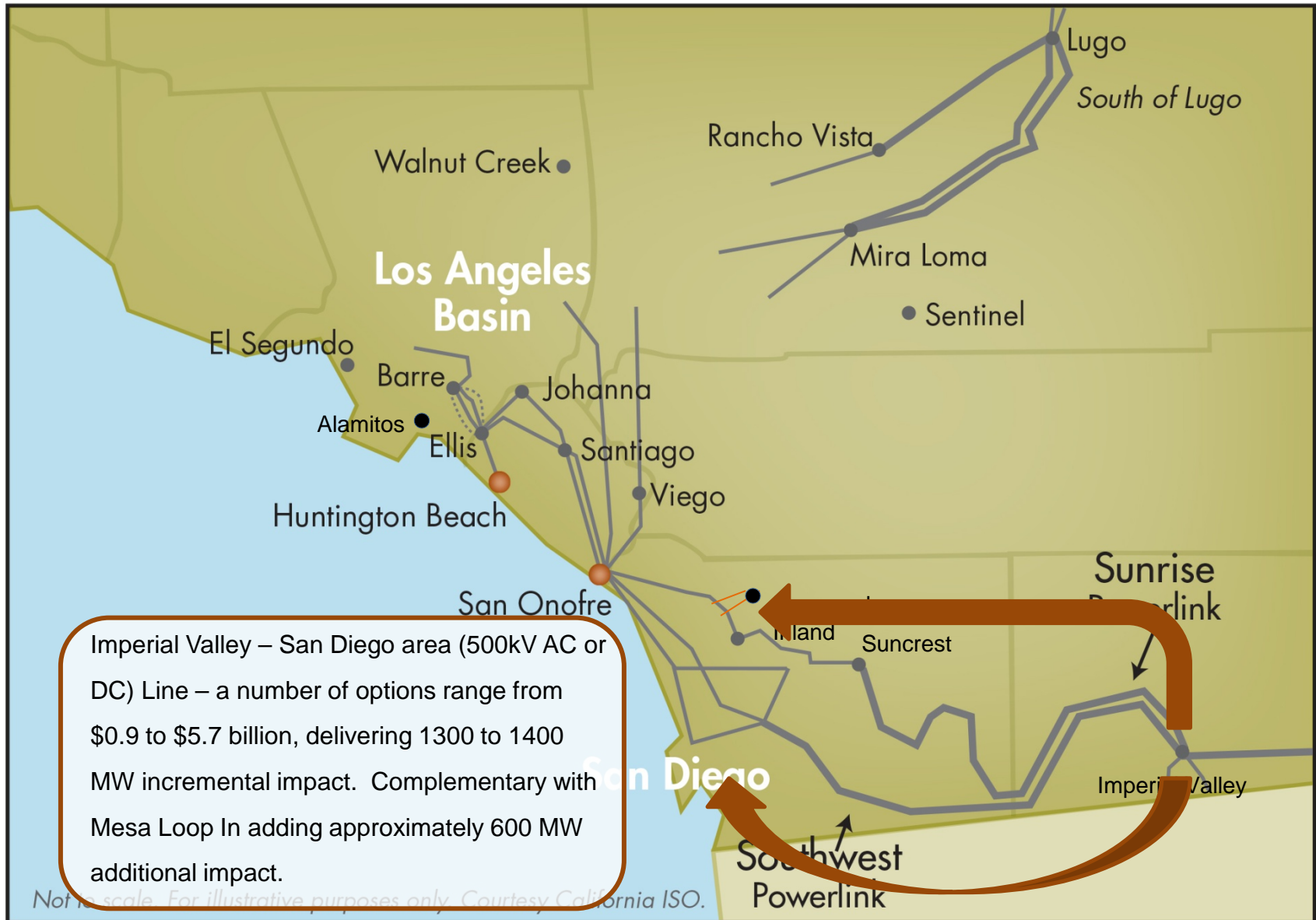
# Summary of Costs and Benefits of Group I Transmission Upgrades recommended for approval:

No.	Transmission Upgrade Option	Proposed In-Service Date	Estimated Cost (\$ Million)	Local Resources Reduction Benefits (MW)
1	Additional 450 MVAR of dynamic reactive support at San Luis Rey (i.e., two 225 MVAR synchronous condensers)	June 2018	~\$80 M	-100 to -200
2	Imperial Valley Flow Controller (Back to back HVDC convertor or Phase Shifting transformer)	June 2018	\$55 - \$300 M	-400 to -840
3	Mesa Loop-In Project	December 2020	\$464 - \$614 M	-300 to -640
<b>TOTAL</b>			<b>\$599 - \$994 M</b>	<b>-800 to -1680</b>

# Group II: New Transmission Lines Strengthening LA Basin and San Diego Connection



# Group III: New Transmission into the Greater LA Basin/San Diego Area



# Six reliability projects over \$50 million are recommended for Board approval.

- ***Mesa Loop-in*** – Looping the Vincent-Mira Loma 500 kV transmission line into the existing Mesa Substation, and upgrading the substation to include a 500 kV bus.
  - ***Install Dynamic Reactive Support at San Luis Rey 230 kV Substation*** – Adding synchronous condensers at the San Luis Rey Substation to provide voltage support to the transmission system in the San Onofre area.
  - ***Imperial Valley Flow Controller*** – Installing a phase shifter or back-to-back HVDC flow control device on path to CFE.
- 
- ***Artesian 230 kV substation and loop-in*** – Upgrading the existing Artesian substation to 230 kV to provide a new source into the 69 kV system.
  - ***Midway-Kern PP #2 230 kV line*** – Reconductoring and unbundling the existing Midway-Kern PP 230 kV line into two circuits and looping one of the new circuits into the Bakersfield substation.
  - ***Wheeler Ridge Junction Station*** – Building a new 230/115 kV substation at Wheeler Ridge Junction and converting the existing Wheeler Ridge-Lamont 115 kV to 230 kV operation.

# Five reliability projects less than \$50 million are recommended for Board approval.

- Greater Bay area:
  - New Spring substation near Morgan Hill
- San Diego area:
  - Bernardo-Rancho Carmel-Poway 69 kV lines upgrade replacing Sycamore-Bernardo 69 kV project
  - Miramar-Mesa Rim 69 kV system reconfiguration
  - 2nd Escondido-San Marcos 69 kV Line
  - Voltage Support at Miguel 500/230 kV Substation

Two policy driven substation-related solutions have been identified and recommended for Board approval.

- 300 Mvar dynamic reactive support at Suncrest, and
- a Lugo-Mohave series capacitor and related terminal upgrades

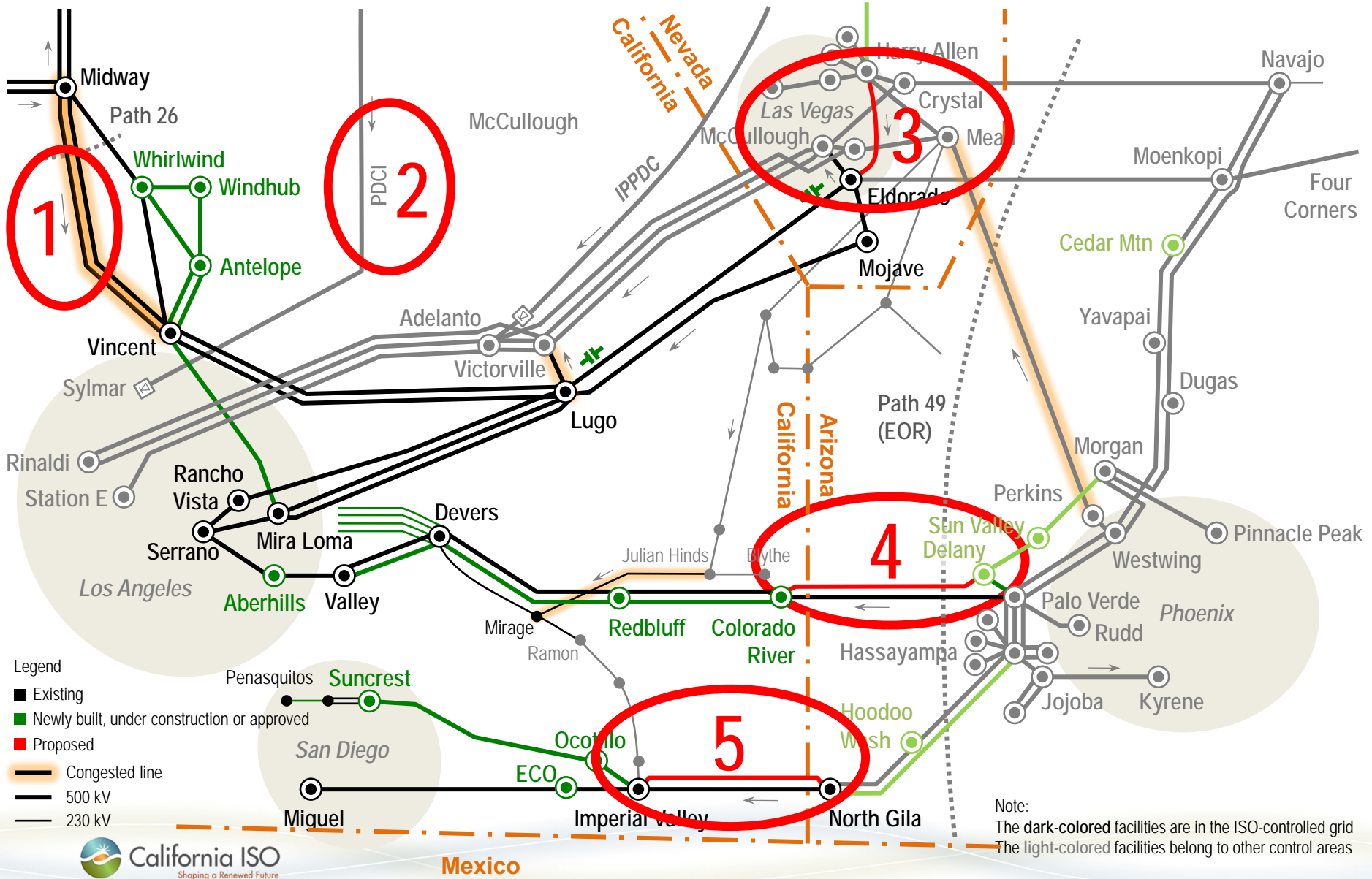
*A deficiency in renewable generation deliverability from Imperial Valley due to the early retirement of SONGS was identified and will require further assessment in the 2014/2015 planning process.*

# Imperial Valley Deliverability Issue

- In 2011, the ISO targeted achieving 1400 MW incremental import capacity from IID
- CPUC directed utilities to consider up to this amount deliverable in procurement, and incorporated this into renewables portfolios
- Prior plans indicated approved transmission upgrades could, once completed, accommodate up to 1700 MW (total) from Imperial Valley
- This year's plan identified that, due to SONGS retirement, no new deliverability beyond existing levels would be available in the long term
- Mitigations proposed in this plan provide up to 1000 MW of additional renewable deliverability from this area in the long term
- The ISO will determine the additional reinforcements to achieve the targeted levels in the 2014/2015 plan



# Five economic studies were performed in this plan:



# The Delaney-Colorado River 500 kV transmission line is recommended for Board approval.

- Benefit to cost ratio averaging 1.02
  - Annual production simulation benefits in the range of \$21 to \$30 million
  - Annual capacity benefits in the range of \$9 million to \$30 million
  - Present value of annual revenue requirement ranging from \$442 million to \$560 million.
- Other benefits include:
  - Assist in achieving targeted import capability from Imperial Irrigation District
  - Reliability benefits

# The Harry Allen-Eldorado transmission line requires further evaluation.

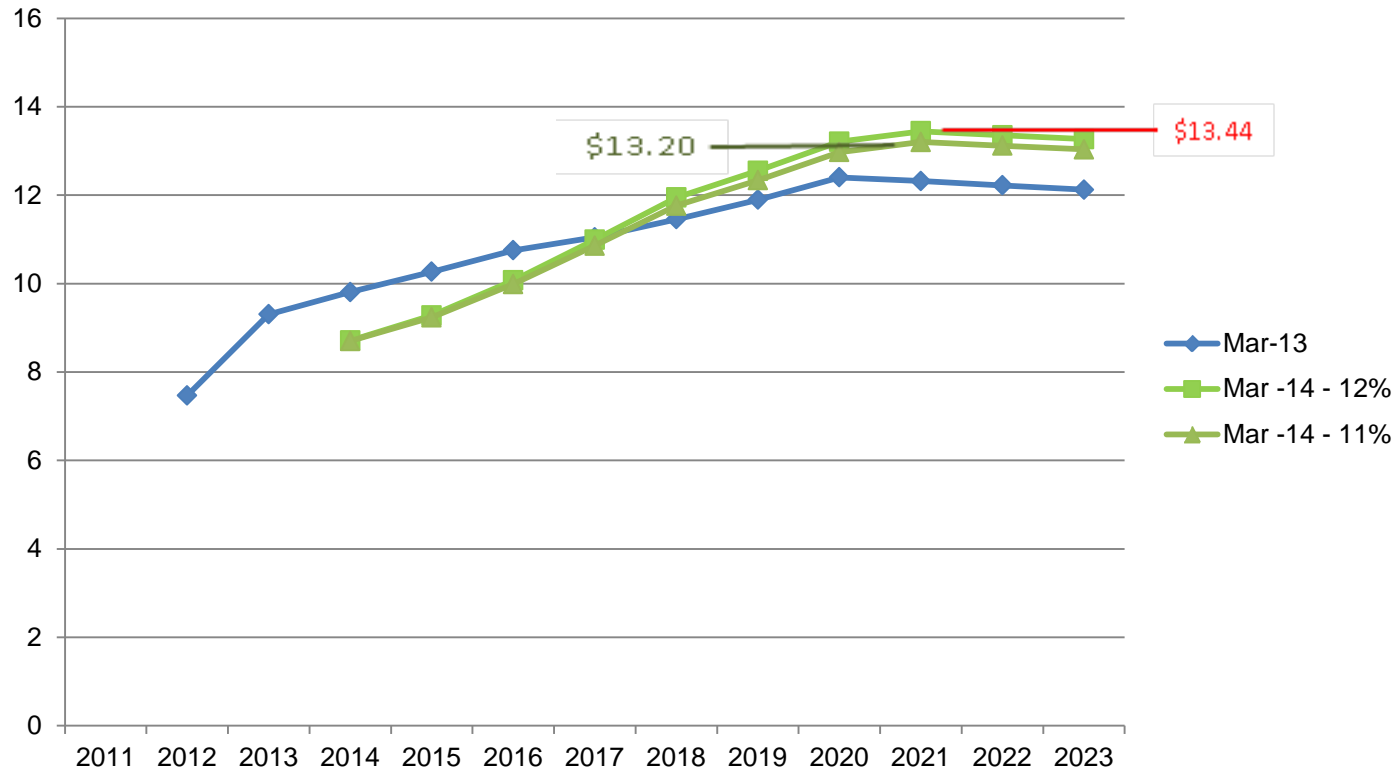
- The analysis in this plan indicated favorable benefit to cost ratios, however, further analysis is needed to:
  - reflect the November 2013 announcement of NV Energy's intention to join the energy imbalance market
  - address data correction in neighboring system identified through Delaney-Colorado River analysis
- Depending on outcome of analysis, Management may bring forward a recommendation to approve this project as an amendment to the 2013/2014 plan later this year.

## Eligibility for competitive solicitation process:

- Reliability-driven:
  - Estrella 230/70 kV substation\*
  - Wheeler Ridge Junction 230/115 kV substation\*
  - Spring 230/70 kV substation\*
  - Miguel reactive support
  - Imperial Valley flow controller (if back to back HVDC)
- Policy-driven:
  - Suncrest 300 Mvar dynamic reactive support
- Economically driven:
  - Delaney-Colorado River 500 kV transmission line

\* Only the 230 kV facilities including the 230/70 kV transformers are eligible for competitive solicitation; the 70 kV facilities are not.

# The high voltage transmission access charge has been projected based on the recommended plan:



Note – existing returns are maintained for existing PTO rate base; the impact of 11% and 12% return on equity have been tested for new transmission capital.

## Stakeholder feedback:

- Concerns about specific projects, methods of analysis, and basis for moving forward
  - Southern California “Group II” projects
  - Mesa Loop-in
  - Delaney-Colorado River
  - Harry Allen-Eldorado
  - San Francisco Peninsula and transparency of ISO planning process
- Analysis about preferred resources and their role
- Structure of plan and articulation of issues

# Management recommends the Board approve the 2013-14 ISO Transmission Plan

- The 2013-2014 ISO Transmission Plan
  - Continues to pursue low emissions strategies in addressing reliability needs of the ISO controlled grid
  - Enables the state's 33% RPS goals
  - Provides for prudent and economic development of the transmission system
- Next steps
  - Initiate ISO competitive solicitation process
  - Continue analysis of potential amendments to this plan:
    - Harry Allen – Eldorado
    - San Francisco Peninsula