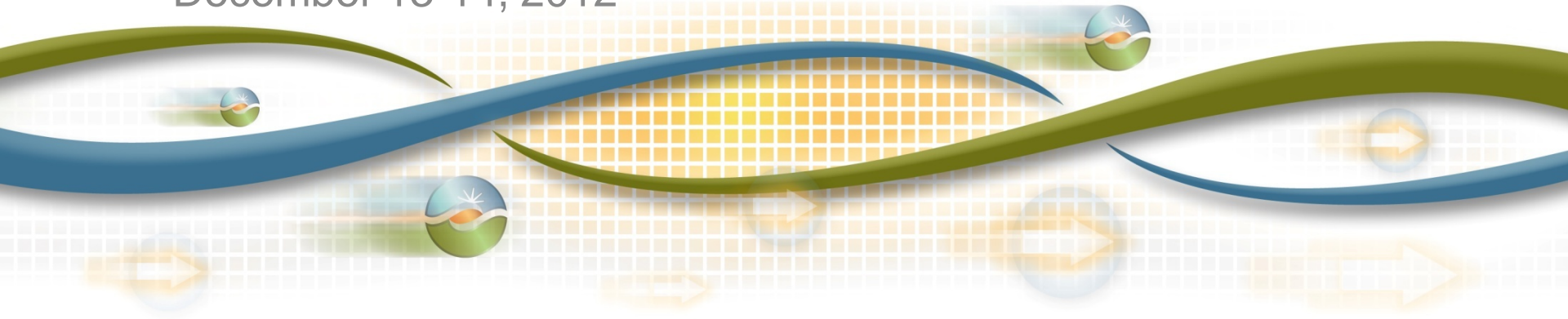


Briefing on Nuclear Generation Studies Preliminary Results

Neil Millar
Executive Director of Infrastructure Development

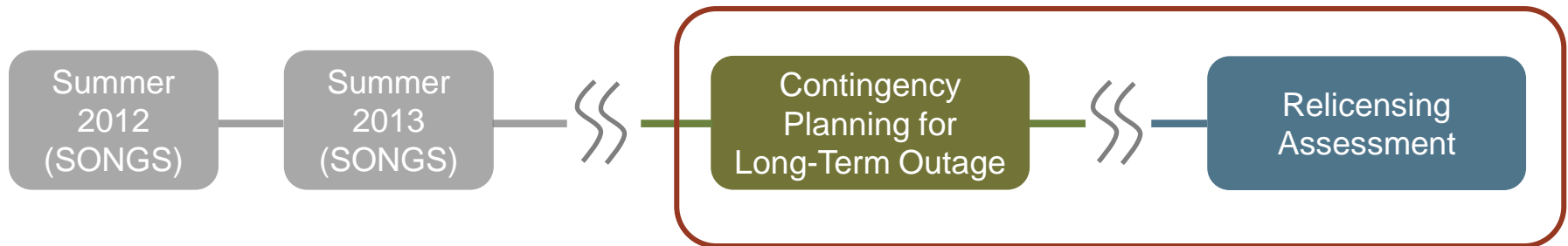
Board of Governors Meeting
General Session
December 13-14, 2012



Studying the impact of absence of the Diablo Canyon and San Onofre nuclear power plants



Study efforts underway



- Mid Term Study – Contingency Planning (2018)
 - Considers what elements of the long term plan should be initiated immediately to help mitigate future unplanned extended outages
- Long Term Study – Relicensing Assessment (2022)
 - Studies focus on transmission system implications of loss of SONGS and DCP
 - Resource requirements, such as planning reserve criteria and flexible resource needs, require further study

The Mid Term Study is contingency planning for future unplanned long-term outages:

- Addresses Integrated Energy Policy Report request from California Energy Commission
- Incorporates once-through cooling policy implications
- Focuses on actions reasonably implementable by 2018

The Long Term Study was undertaken as part of the utilities' relicensing assessments:

Diablo Canyon

Grid reliability implications for northern CA and ISO overall

- Key central transmission paths
- Western Interconnection critical outages (PDCI bipole outage, etc.)

San Onofre

Grid reliability implications for southern CA and ISO overall

- Key southern California transmission paths
- LA Basin
- San Diego
- Western Interconnection critical outages (PDCI bipole outage, etc.)

Focuses on longer term options implementable in 10 years.

Key load forecast and resource assumptions

- 2012 CEC mid forecast
 - Consistent with the 2012/2013 Ten Year Transmission Plan
 - Local area studies use 1-in-10 year weather-related peak load
 - System wide studies use 1-in-5 year weather-related peak load
 - Energy efficiency including continued funding of utility programs as in CEC mid forecast
 - Behind the meter distributed generation as in the CEC mid forecast
- CPUC/CEC renewables portfolios
 - Include both transmission connected resources and system - connected distributed generation
- Demand response is considered a supply resource

Results are preliminary

- Preliminary conclusions:
 - No material mid or long term transmission system impacts associated with Diablo Canyon
 - Loss of SONGS creates transmission impacts (thermal overloading, voltage stability) in LA Basin and San Diego
- Possible mitigations for SONGS have been explored, and are presented on the following slides.

Mid term mitigation alternatives for loss of SONGS:

Continue use synchronous condensers

Construct an 11-mile 230 kV line from Sycamore to Penasquitos

820 MW new or replaced

+

300 MW new generation

+

650 MVAR SVC support
• SONGS and Talega

965 MW new or replaced in northwest San Diego, and 1460 MVAR SVC support

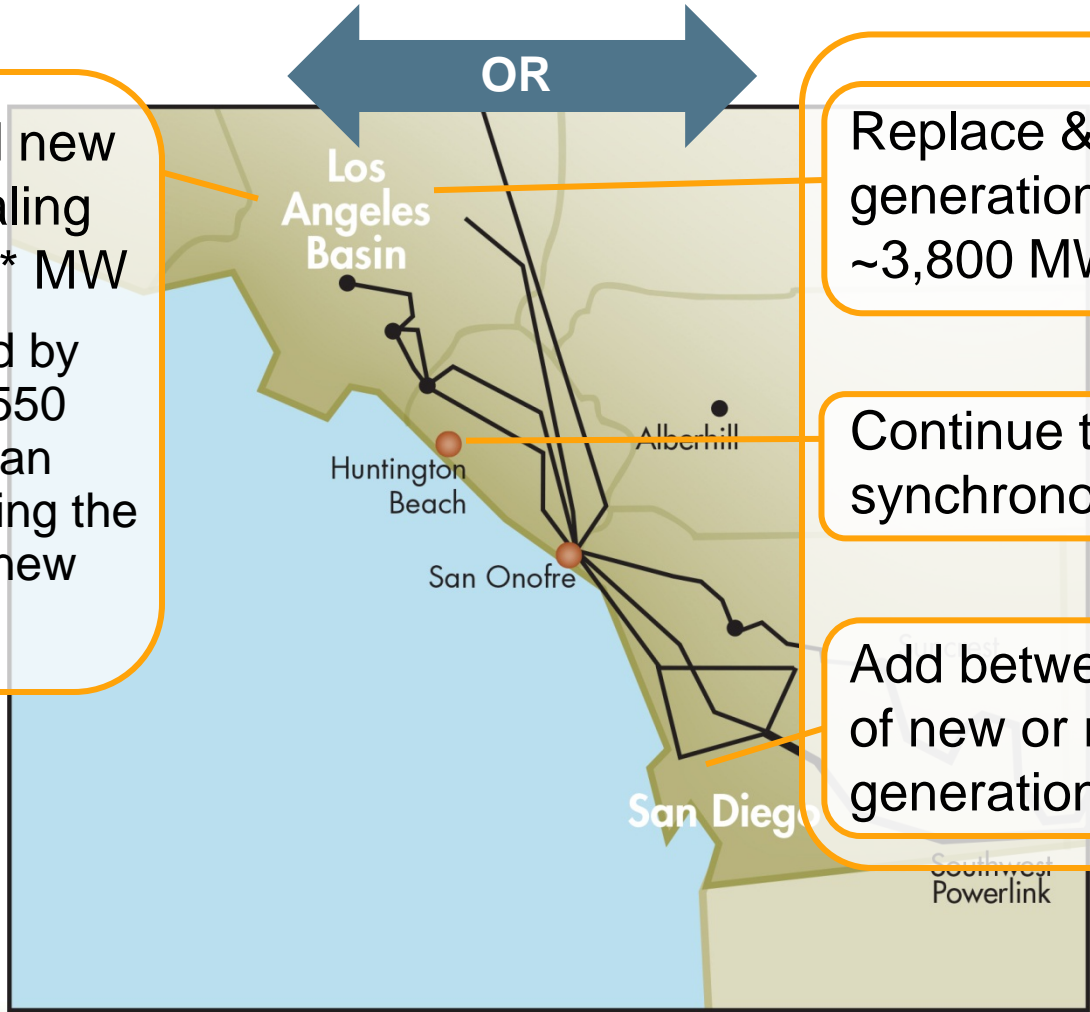
- SONGS, Talega, Penasquitos, San Luis Rey, Mission

OR

Long term generation mitigation alternatives – no added transmission lines (in addition to mid term plan)

Replace & add new generation totaling ~4,300 - 4,600* MW

*May be reduced by adding another 550 MVAR SVC at San Onofre and shifting the locations of the new generation.



Replace & add new generation totaling ~3,800 MW

+

Continue to rely on synchronous condensers.

+

Add between 765-920 MW of new or replaced generation

Long term transmission and generation alternative (in addition to mid term plan)

Replace
3,000 MW
of existing
generation

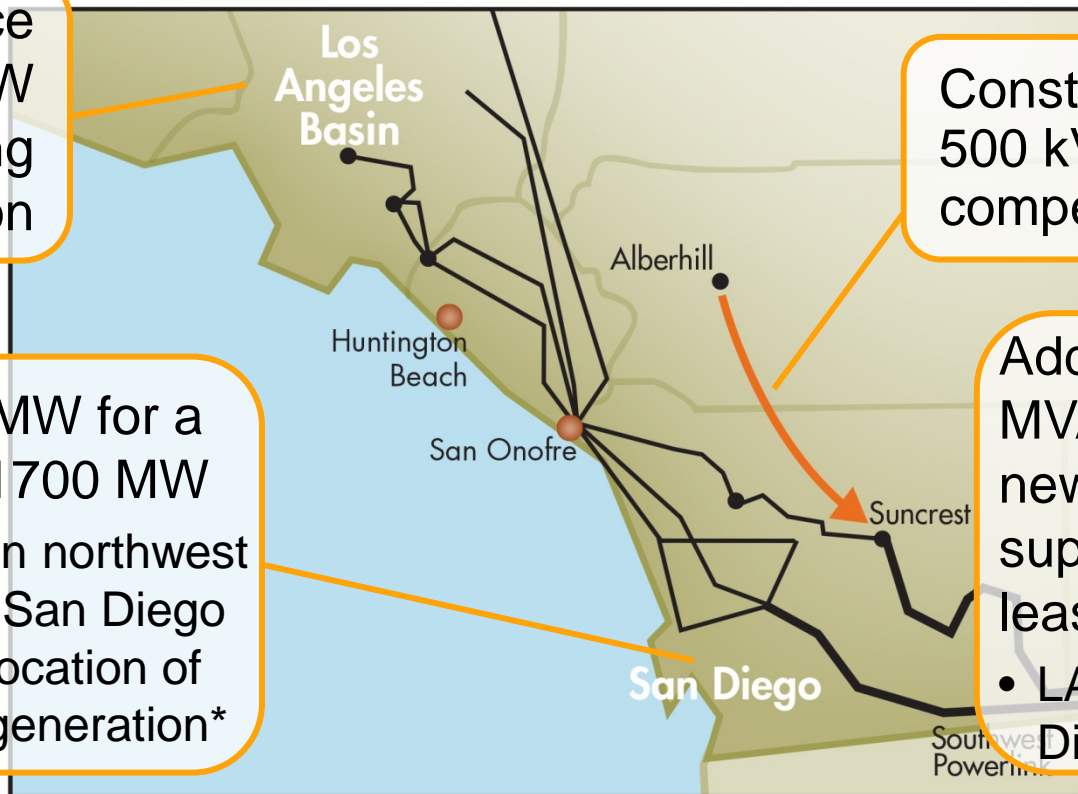
Construct a 65-mile
500 kV line (70%
compensation)

Add up to 660 MW for a
total of 1600 - 1700 MW

- Spread between northwest and southwest San Diego depending on location of mid term plan generation*

Add up to 850
MVAR to bring
new reactive
support up to at
least 1,500 MVAR

- LA Basin & San Diego



***Approximately 700 MW of generation in San Diego can be displaced by additional reactive support, transformer upgrades and 66 kV transmission upgrades in the LA Basin and upgrading line series capacitors and additional transformer upgrades.**

Uncertainty drives preliminary least-regrets conclusions:

- Significant uncertainty is inherent in the studies and conclusions:
 - Future of SONGS
 - Status of pending and future SDG&E procurement
 - Status of meeting flexible generation requirements
 - Increasing levels of energy efficiency
 - Successful deployment of improved demand response
- Management's preliminary conclusions reflect least-regret considerations:
 - Advance Sycamore – Penasquitos 230kV line
 - Advance approximately 700 MVAR of dynamic reactive support
- In 2013/2014 transmission planning cycle:
 - Work with the CEC to develop higher energy efficiency assumptions
 - Work to advance demand response programs suited to transmission mitigations
 - Consider the need for additional mitigation
 - Resource requirements, such as planning reserve criteria and flexible resource needs, require further study