

Southwest Transmission Expansion Plan (STEP)

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CALIFORNIA ISO

New Generation

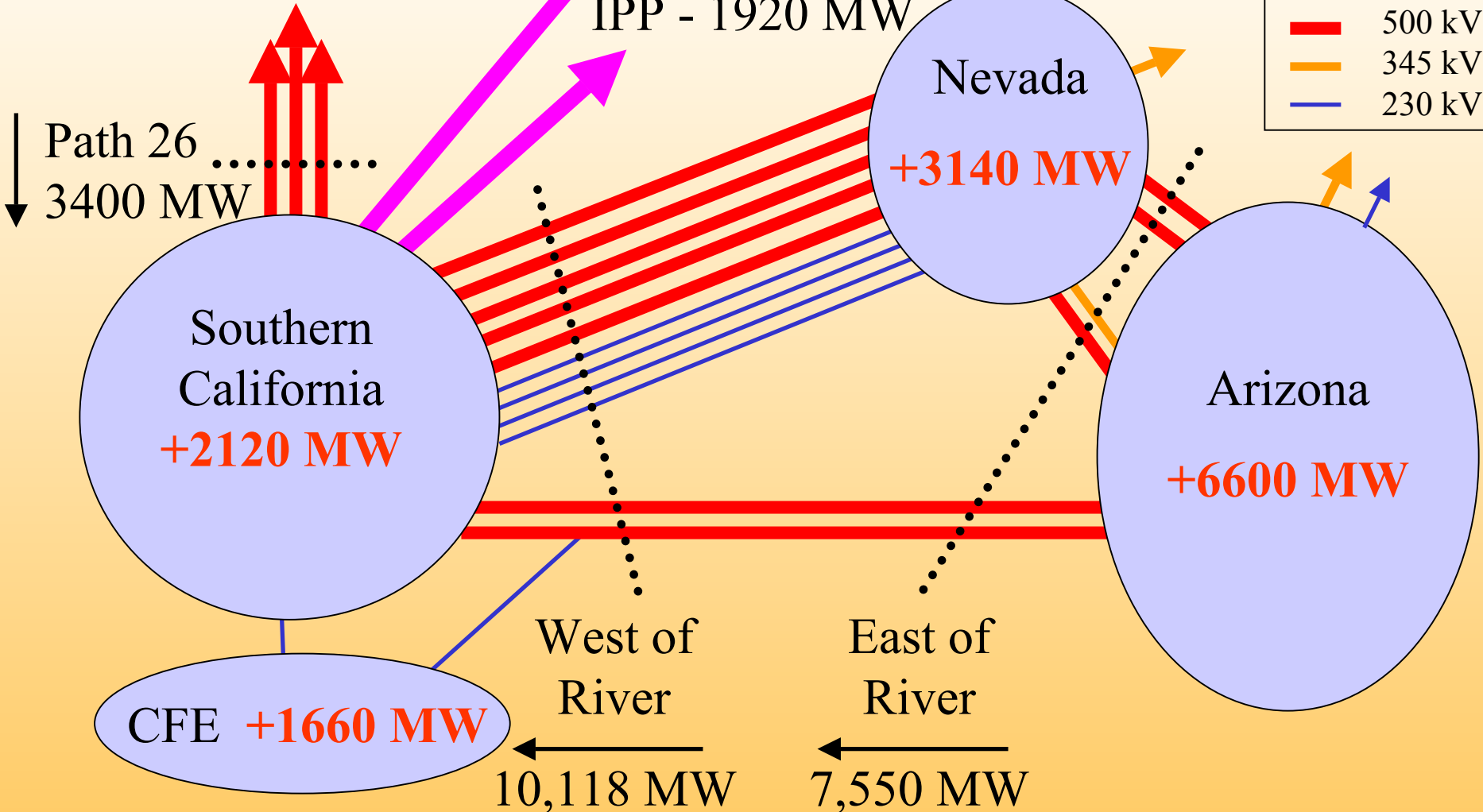
13,520 MW

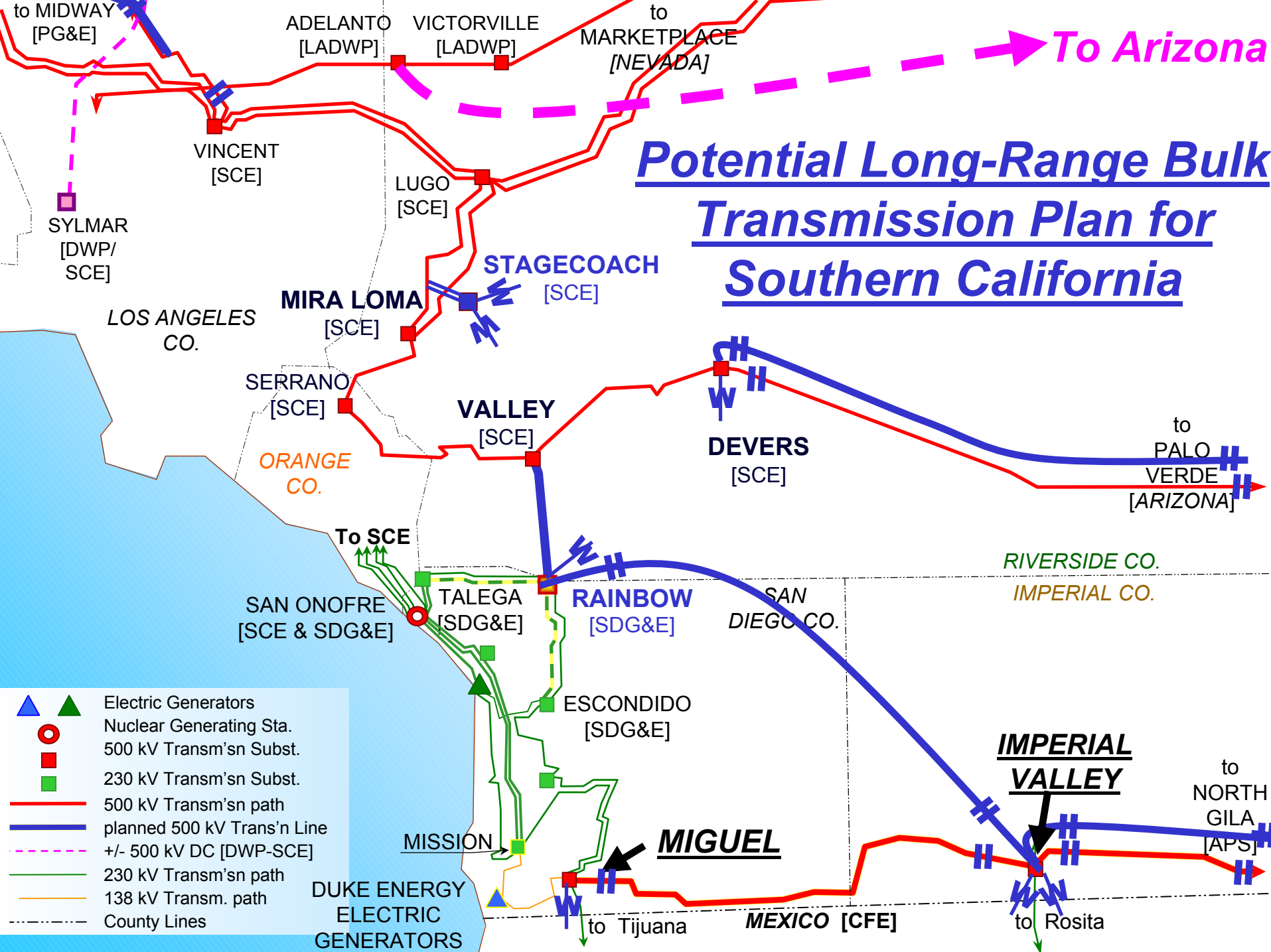
Northern California

PDCI - 3100 MW

IPP - 1920 MW

	DC
	500 kV
	345 kV
	230 kV





Potential Long-Range Bulk Transmission Plan for Southern California

- Electric Generators
- Nuclear Generating Sta.
- 500 kV Transm'sn Subst.
- 230 kV Transm'sn Subst.
- 500 kV Transm'sn path
- planned 500 kV Trans'n Line
- +/- 500 kV DC [DWP-SCE]
- 230 kV Transm'sn path
- 138 kV Transm. path
- County Lines

To Arizona

to PALO VERDE [ARIZONA]

to NORTH GILA [APS]

to Rosita

to Tijuana

MEXICO [CFE]

DUKE ENERGY ELECTRIC GENERATORS

IMPERIAL VALLEY

MIGUEL

RIVERSIDE CO.
IMPERIAL CO.

SAN DIEGO CO.

SAN ONOFRE [SCE & SDG&E]

RAINBOW [SDG&E]

TALEGA [SDG&E]

ESCONDIDO [SDG&E]

MISSION

DEVERS [SCE]

VALLEY [SCE]

SERRANO [SCE]

MIRA LOMA [SCE]

STAGECOACH [SCE]

LUGO [SCE]

VINCENT [SCE]

SYLMAR [DWP/SCE]

MARKETPLACE [NEVADA]

VICTORVILLE [LADWP]

ADELANTO [LADWP]

to MIDWAY [PG&E]

LOS ANGELES CO.

ORANGE CO.



STEP's Goal – “To provide a forum where all interested parties are encouraged to participate in the planning, coordination, and implementation of a robust transmission system between the Arizona, Nevada, Mexico, and southern California areas that is capable of supporting a competitive, efficient, and seamless west-wide wholesale electricity market while meeting established reliability standards. The wide participation envisioned in this process is intended to result in a plan that meets a variety of needs and has a broad basis of support.”



Two Parallel Processes

- Coordination Process
 - Provides project sponsors with a forum to coordinated the development of their project
 - STEP provides technical input via STEP Technical Group
- Study Process
 - Actual studies conducted in the STEP forum



Overall Approach

- Develop Transmission Plan – Identify projects necessary to integrate generation currently under construction
- Develop Implementation Plan – Identify logical sequence of transmission project to accomplish transmission plan
- Project Implementation – Implement projects determined to be economic

New Generation Assumptions





6600 MW in Western Arizona

- Red Hawk - 1000 MW in service
- Arlington Valley - 600 MW in-service
- Mesquite - 1250 MW in 2003
- Harquahala - 1170 MW in 2003
- Panda power - 2080 MW in 2003
- West Phoenix 5 – 500 MW in 2003



3140 MW in Southern Nevada

- Las Vegas Cogen II (Black Hills) – 230 MW in 2003
- Apex (Mirant) – 550 MW in March of 2003
- Bighorn – 570 MW in 2003
- Silverhawk (Gen West) - 590 MW in 2004
- Moapa (Duke) – 1200 MW (Currently on-hold but 70 % complete)



1660 MW in Mexico

- Ciclo Combinado Mexicali (InterGen) – 750 MW in 2003
- Central La Rosita II (InterGen) – 310 MW in 2003
- Termoelectrica de Mexicali (Sempra) - 600 MW in 2003



2120 MW in Southern California

- Blythe #1 – 520 MW
- Pastoria Phase 1 – 750 MW
- High Desert – 850 MW



Study Approach

- Assess system normal performance
- Assess single contingency performance
- Study transient stability, post-transient, short circuit, subsynchronous resonance, multiple contingencies, etc.
- Develop cost estimates
- Use production cost studies to assess project economics
- Pursue the development of economic transmission alternatives



Study Schedule

- **May** – Complete power flow base case and identify potential projects
- **June** – Complete initial power flow analysis
- **August** – Complete initial stability and voltage support analysis
- **September** – Complete initial production cost analysis. Select preferred plan
- **November** – Complete implementation plan