



WESTERN AREA POWER ADMINISTRATION TRANSMISSION INFRASTRUCTURE PROGRAM SMRT PROJECT OVERVIEW AND UPDATE

FEBRUARY 2011





TIP PROGRAM – PROJECTS



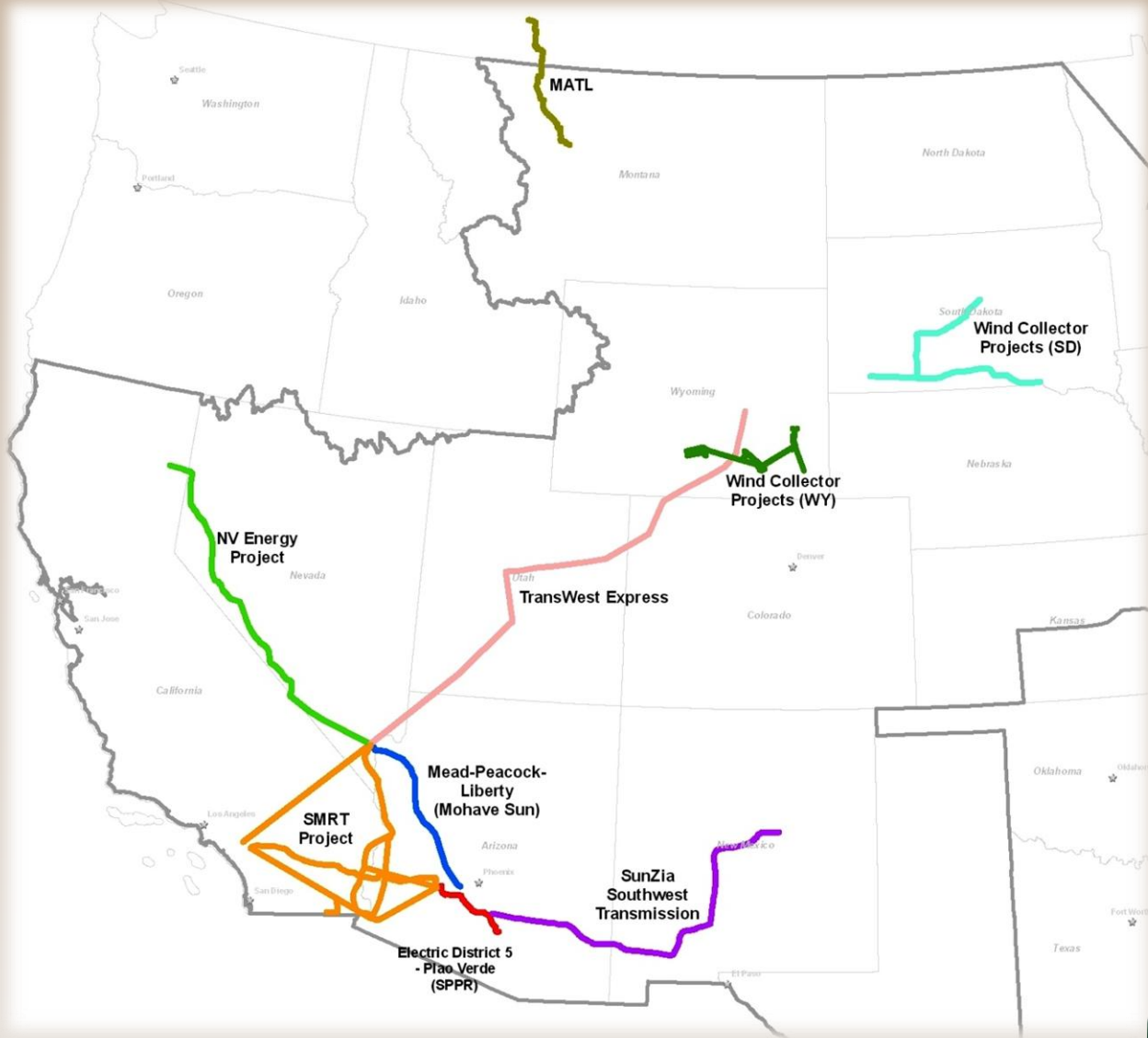
Projects must...

Have one terminus within area served by Western

Deliver, or facilitate the delivery of, power generated by renewable energy resources constructed or reasonably expected to be constructed after 2/17/09



PROPOSALS UNDER DISCUSSION MAP





REGIONAL TRANSMISSION STUDY





WHY SMRT

Primary purpose : regional look at the feasibility of providing:

- transmission capacity for renewable resources
- markets in AZ , CA and NV access to renewables
- more robust transmission grid in the southwestern U.S.



A DIVERSE SET OF SPONSORS

Voluntary group of:

- public utilities/
irrigation districts

- investor-owned utility

- investment firms

- independent
transmission
developers

- Federal agencies

- Arizona Public Service Company
- Citizens Energy Corporation
- Imperial Irrigation District
- Salt River Project Agricultural and Improvement District
- Starwood Energy Group
- Trans-Elect Development Company / Energy Investors Fund
- 21st Century Transmission / Energy Capital Partners
- Wellton-Mohawk Irrigation and Drainage District
- U.S. Dept. of Energy, Solar Technologies Program
- Western Area Power Administration



AD HOC TECHNICAL STUDY GROUP

- diverse expertise
- involved from beginning to end
- hands-on approach, formed the study plan
 - set goals and objectives
 - agreed on study approach
 - selected study area and transmission elements to study
 - selected configurations to evaluate, 230-kV to 500-kV
 - base case coordination
 - determined generation injection points within renewable energy zones



SMRT STUDY – GOAL AND OBJECTIVES

- Goal – determine system impacts associated with new and upgraded lines that would interconnect load centers with new renewable sources of generation
- Objectives
 - perform power system technical analysis to determine injection capacity in pre-defined resource zones
 - determine effects on major transmission paths
 - evaluate viability of interconnecting load centers to regional markets



SMRT – 900 LINE MILES, 500-KV AND 230-KV STUDIED

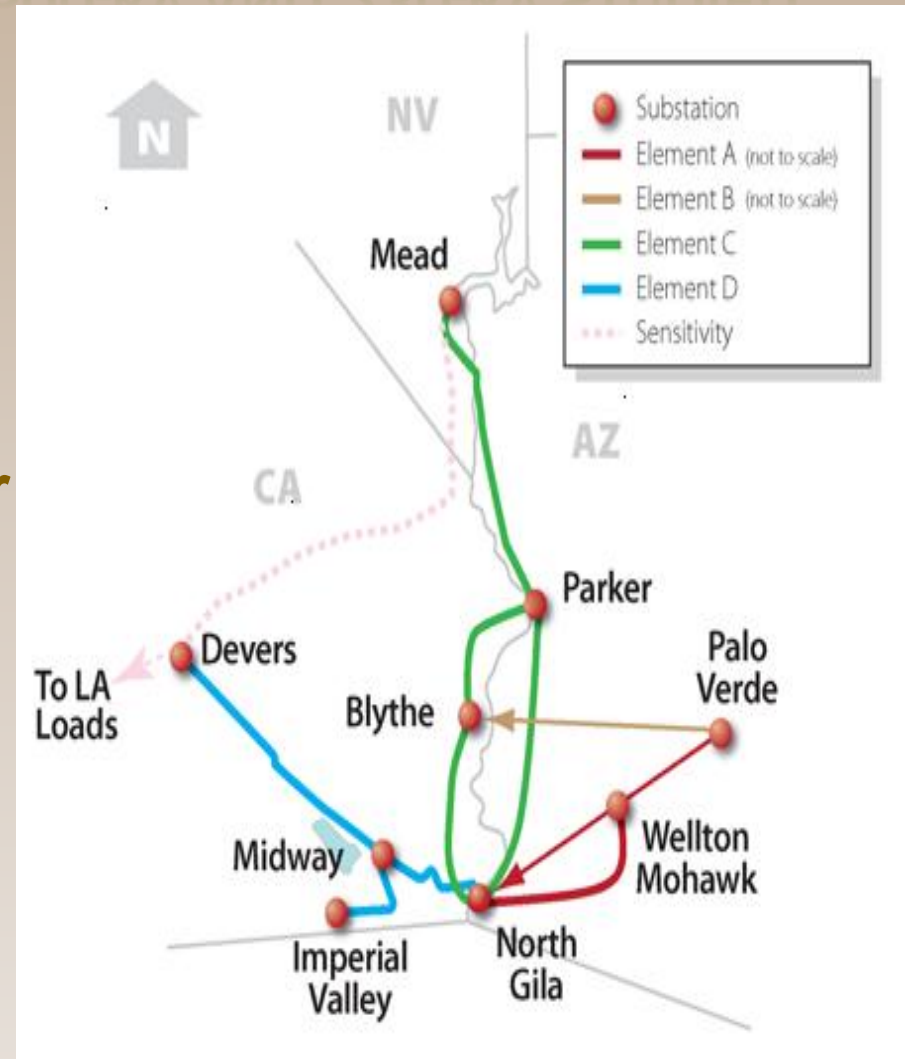
A- Palo Verde-North Gila

B- Palo Verde-Blythe

C- North and South of Parker

D- Imperial Valley

Sensitivity – Las Vegas to Los Angeles



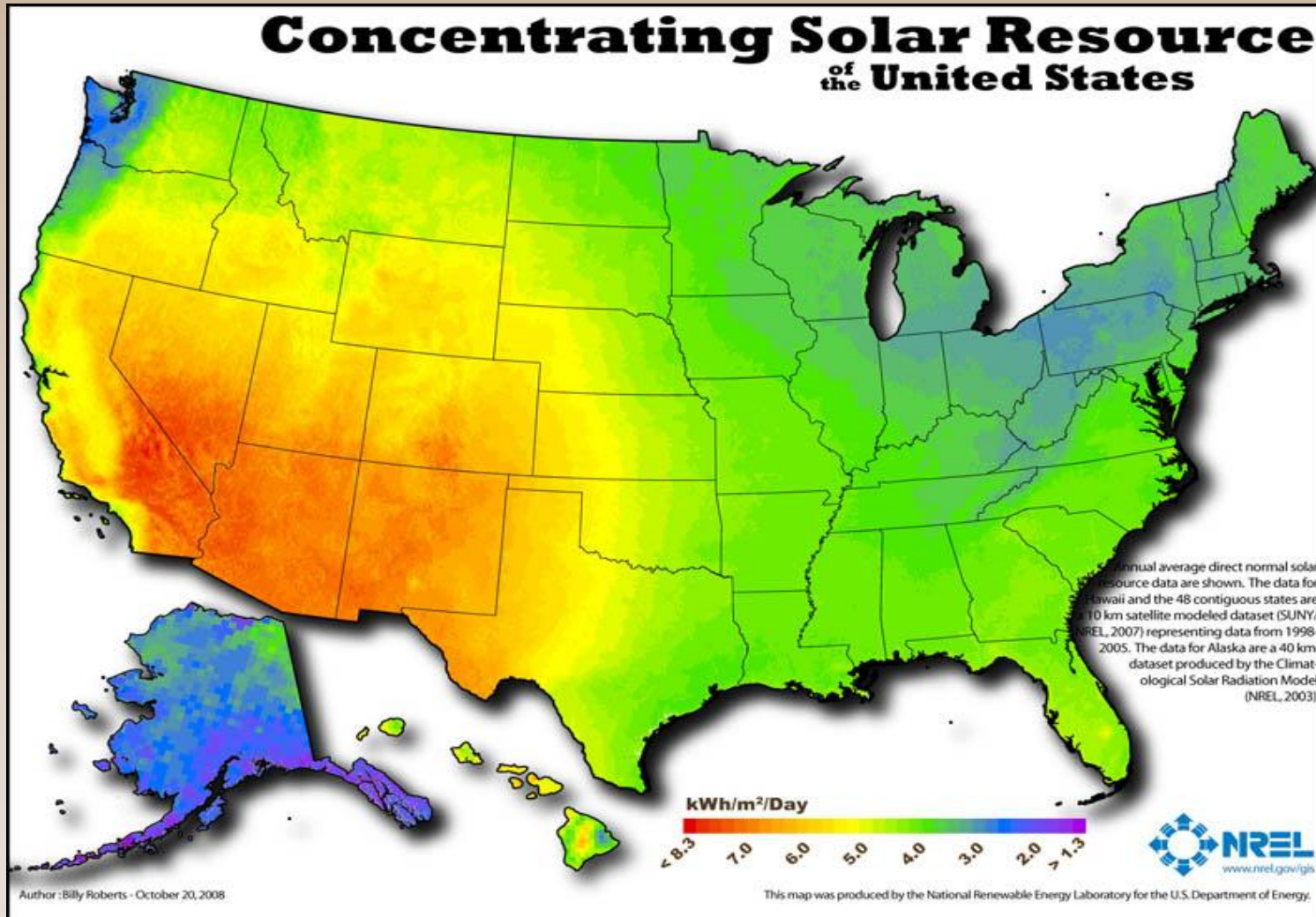


SMRT - STUDY FACTORS

- Renewable interest and transmission barriers to entry
- High solar intensity
- Identified renewable energy zones
- Access to significant markets
- Regional LGI /SGI Queues
- Regional transmission coordination efforts



SOLAR DEVELOPMENT POTENTIAL IN DESERT SOUTHWEST REGION





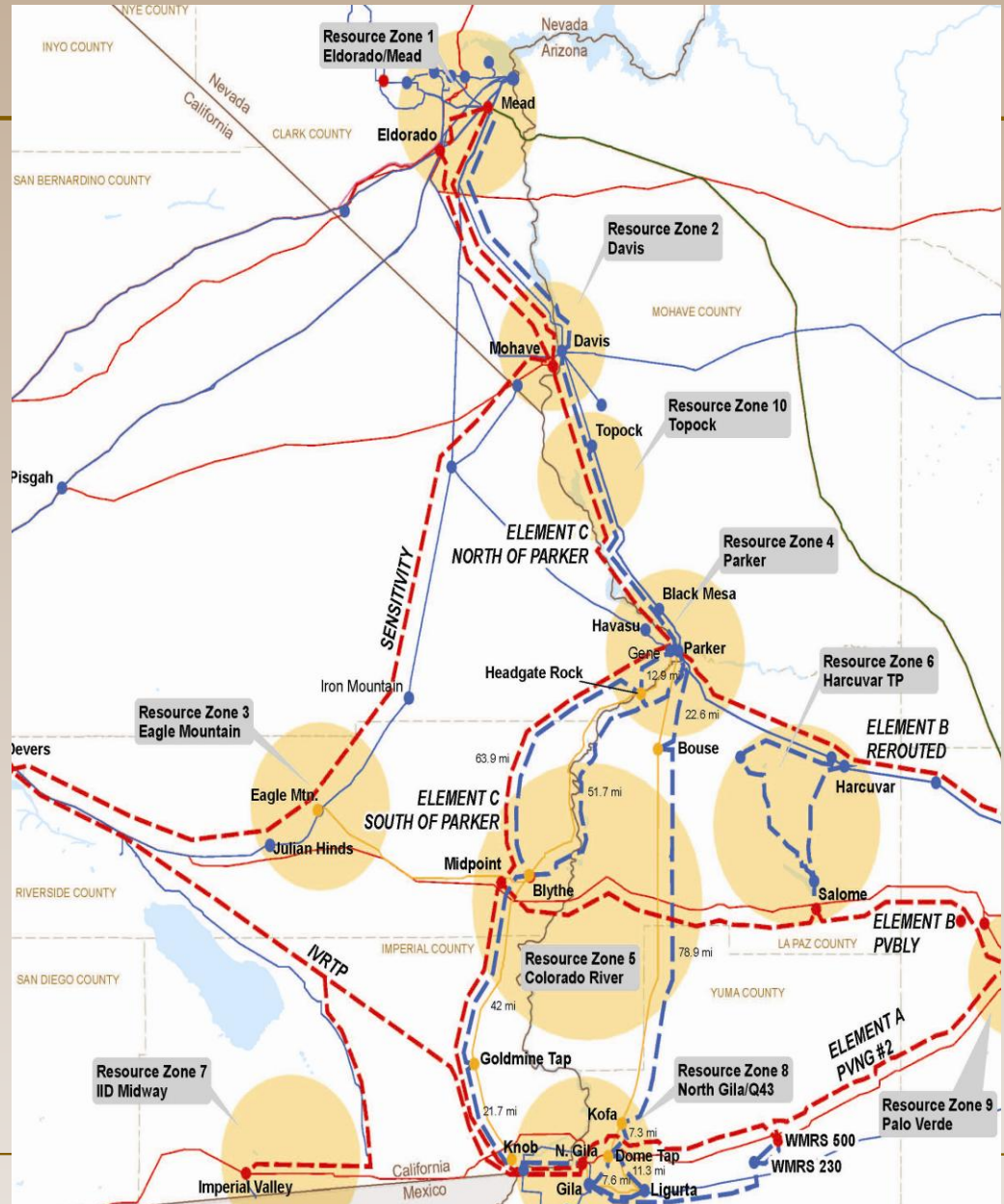
SMRT STUDY METHODOLOGY

- Maximum injection capabilities for 10 renewable energy zones
- 2019 Southwestern Area Transmission base case with Element A embedded
- Injection capability studied for all elements as a whole
- One dispatch scenario for each study case
- Does not attempt to identify optimal system configuration or determine which variation performs best

SMRT RENEWABLE ENERGY ZONES



- 10 renewable energy zones selected
- Generation displacement was distributed to the market areas as follows:
 - 1/7 to NV
 - 2/7 Palo Verde Hub
 - 4/7 to California (45% SCE, 30% LADWP, 15% SDG&E, 10% PG&E)





SMRT STUDY REPORT RESULTS – NOVEMBER 2010

- Technically feasible, large amount of renewables get to markets
- *Under simultaneous conditions:*
 - An incremental increase in the range of 8,000 – 9,500MW of simultaneous injection capability.
 - The Las Vegas to Los Angeles Double Circuit 500-kV incremental increase 1,500 – 3,000MW.
 - The N. Gila – Imperial Valley 500-kV line appears as the bottle neck for the post-project system under both N-0 and N-1 conditions.
 - Of the 12 WECC Rated Paths monitored, only Path 46 (WOR) showed potential overload issues.
 - Injections at the Palo Verde Hub indicated that approximately 67% of the injection flowed west along the East of River (WECC path 49) but not result in overload.



SMRT STUDY REPORT RESULTS - RELATED TO CTPG PHASE 4 REPORT

- CTPG report WOR stress scenario include import from AZ, IID, NV renewable energy in the range of 1100 MW
- Energy collected from Eldorado, Palo Verde, and North Gila.
- The WOR path flow increased from historical peak of 6700 MW to 10100 MW.
- SMRT will strengthen the area grid to support the export.



LIMITATION

- For cost and time reasons, the Study Group decided against evaluating the injection capability of each individual element and only one dispatch scenario was used.
- The scope did not include identifying an optimal system configuration or timing of the proposed element.
- The scope did not include determining which variations of the elements performed best as compared to other variations.



FIRST STEP ONLY

- Study injection levels for comparison purposes
 - ✓ power system stability is not studied
 - ✓ results base case dependent, single 2019 case used with one generation scenario
 - ✓ different element in-service dates could change injection capabilities
- Study preliminary, much more technical work ahead
- Project costs and potential business value TBD



RESULTS ARE PUBLIC

For the study report visit:

<http://www.wapa.gov/recovery/planning.htm>





SMRT NEXT STEPS

- Communicate and coordinate study results
- Solicit interest in transmission service
- Assess economic viability
- Assess potential participation interests



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