Technical Committee Update
April 28, 2011

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Technical Scope

- Detailed studies
  - Technical Consultant
  - Utility System Efficiencies, Inc. (USE)
- Open Stakeholder Process
- Alternative Analysis
- Transfer Capability
- Cost Estimates
- WECC Project Coordination

Technical Committee Stakeholders

Member Participants:

- Black Hills Corporation
- Colorado Clean Energy Development Authority
- Colorado Springs Utilities
- LS Power
- New Mexico Renewable Energy Transmission Authority
- NextEra Energy Resources
- Public Service of New Mexico
- Tri-State Generation & Transmission
- Salt River Project
- Wyoming Infrastructure Authority
- Western Area Power Administration
- Xcel Energy

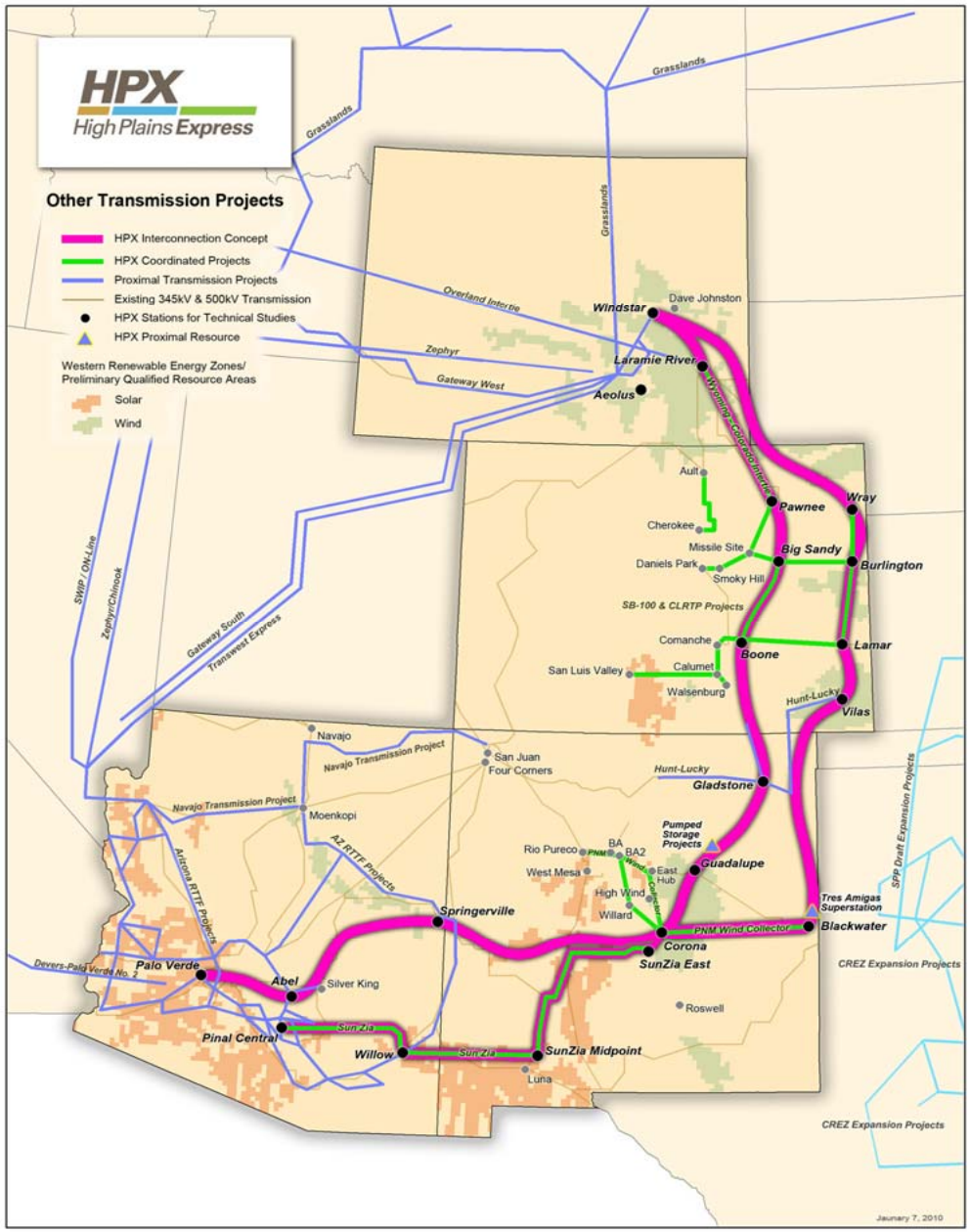
Other Stakeholder Participants:

- Arizona Corporation Commission
- Arizona Public Service
- Basin Electric Power Cooperative
- Colorado Public Utilities Commission
- El Paso Electric
- National Energy Renewable Laboratories
- Platte River Power Authority
- San Diego Gas & Electric
- SunZia / PDS
- Tucson Electric Power

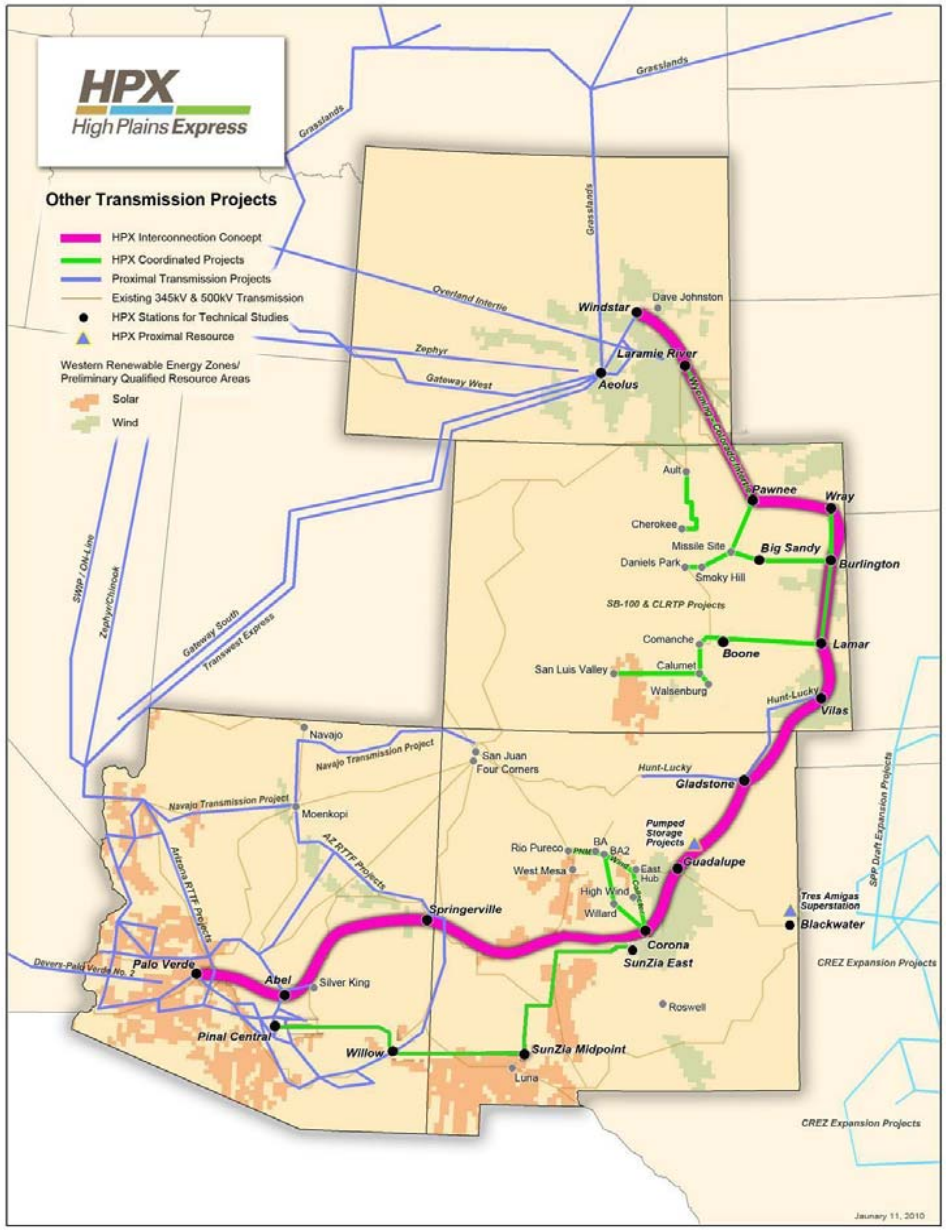
Transmission Alternatives

- Two-Corridor
  - Two Single-Circuit 500 kV
  - Two Double-Circuit 500 kV
- Single-Corridor
  - One Single-Circuit 500 kV
  - One Double-Circuit 500 kV
  - “Progressive” 345 & 500 kV
    - 1x345 kV from Wyoming – Colorado
    - 2x345 kV from Colorado – New Mexico
    - 1x500 kV from New Mexico - Arizona

HPX Map Two-Corridor



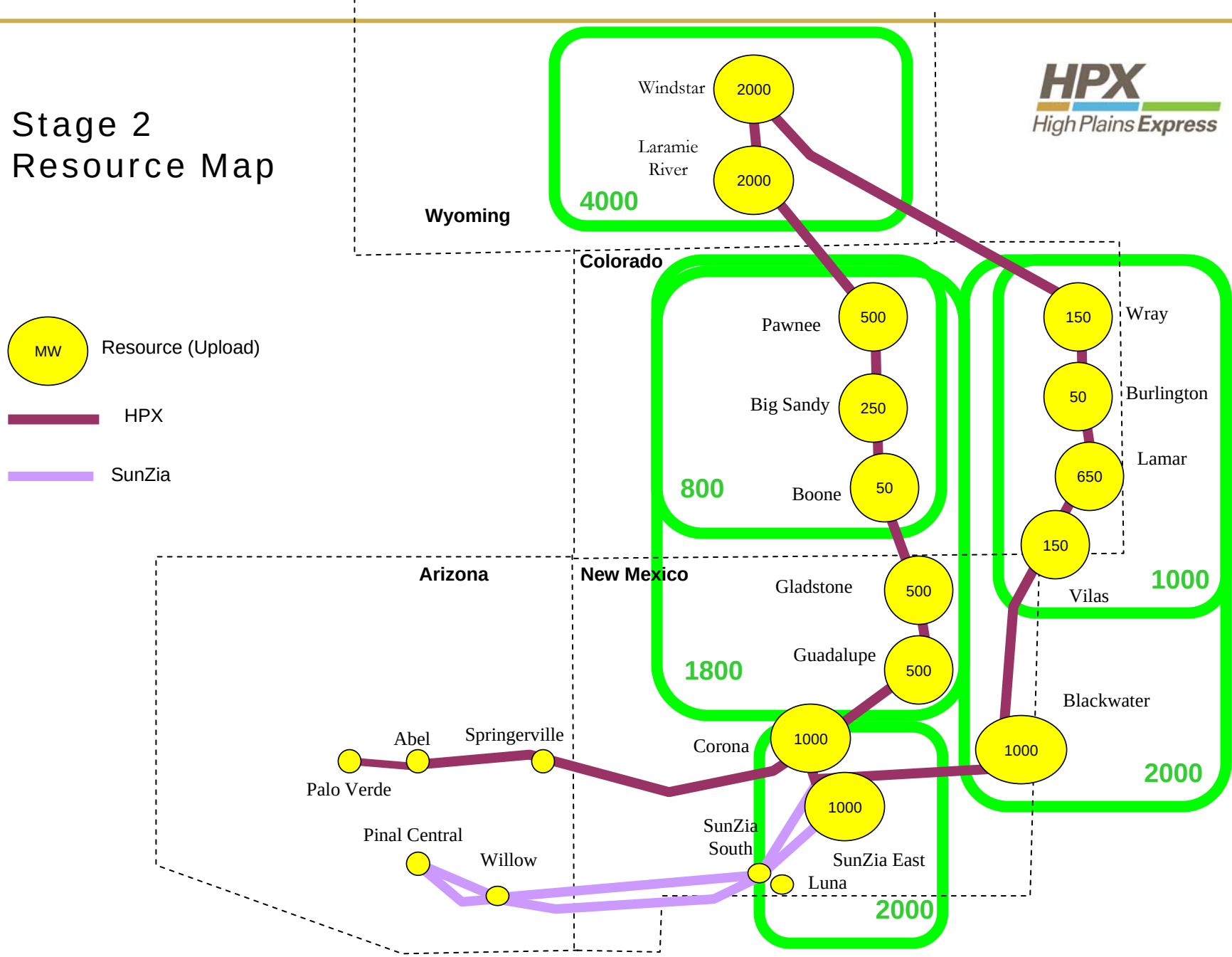
HPX Map Single-Corridor



Resource Modeling

- Wyoming - Source
  - 2 Uploads
- Colorado - Balanced
  - 5-7 Interconnections
  - Reduced Denver-metro Thermal Units
- New Mexico – Balanced
  - 3-4 Interconnections
  - Reduced NM Thermal Units
- Arizona – Sink
  - 3 Interconnections

Stage 2
Resource Map



Transmission Modeling

- Conductor
  - 3-conductor 1590 kcmil “Lapwing”
  - Normal Rating = 2900 MVA
- Series Compensation
  - 70% for All Segments
- Voltage Support
  - Static Voltage Devices (SVD’s)
  - 1.05-1.07 voltage range

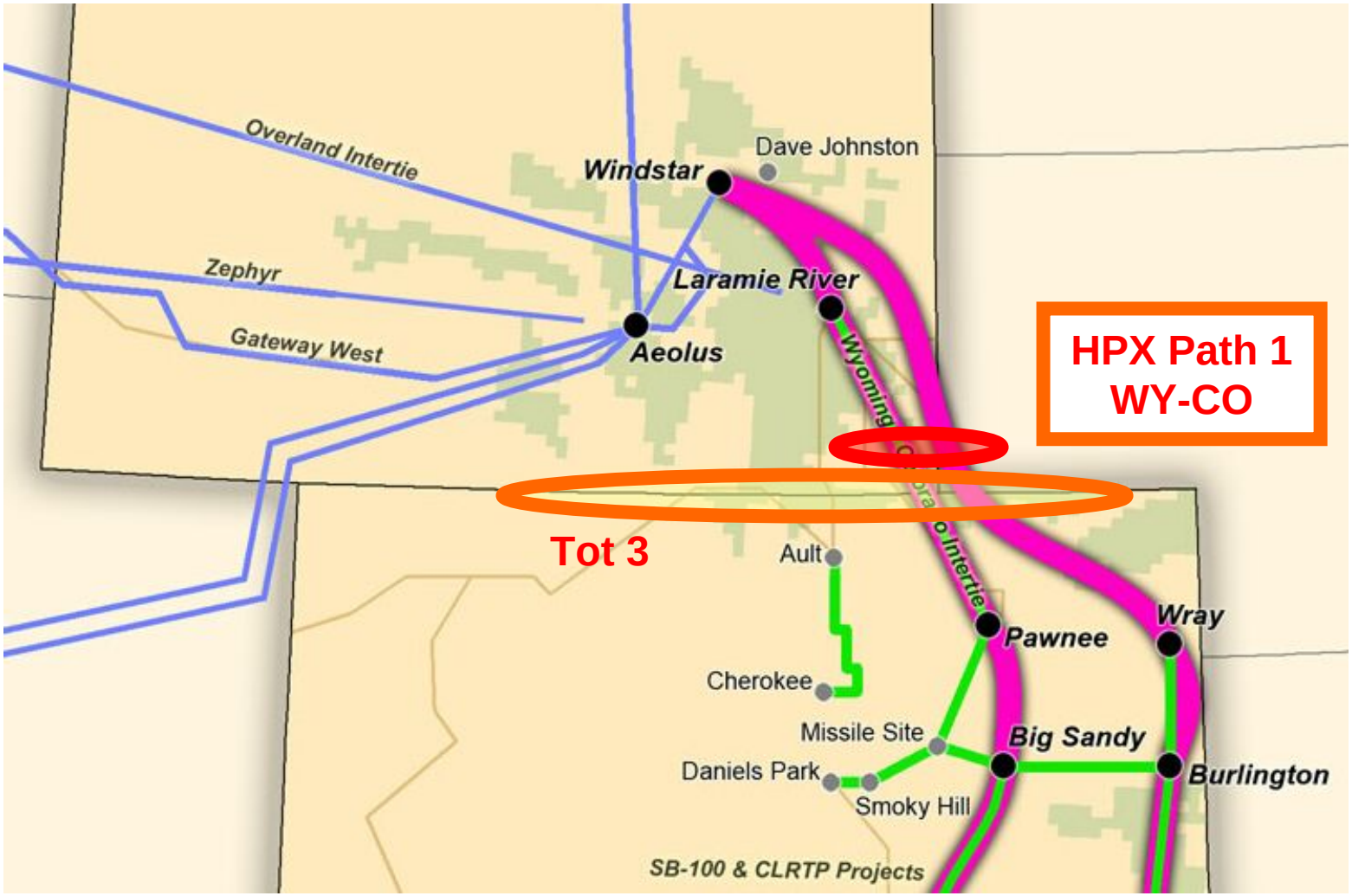
Regional Project Considerations

Project	Component	Issues
WYCO	Potential Laramie River - Pawnee	■Proposed 345kV ■Schedule
SB100	Potential Lamar – Burlington Lamar - Vilas	■Project Definition ■Schedule
NM Collector	Uncertain	■Project Definition ■Schedule
SunZia	Compliment	■Proceeding independently ■Competitive Resources ■DC Option Increases NM-AZ
Gateway, TransWest	Parallel	■Competing Resources ■Project Rating

Transfer Capability

- Three Paths Defined
  - HPX Path 1: Wyoming – Colorado
  - HPX Path 2: Colorado – New Mexico
  - HPX Path 3: New Mexico – Arizona
  - HPX Path 3A: HPX 3 + SunZia
- Limitations
  - N-1 Parallel Contingency Limits
  - 345 & 500 kV Limits

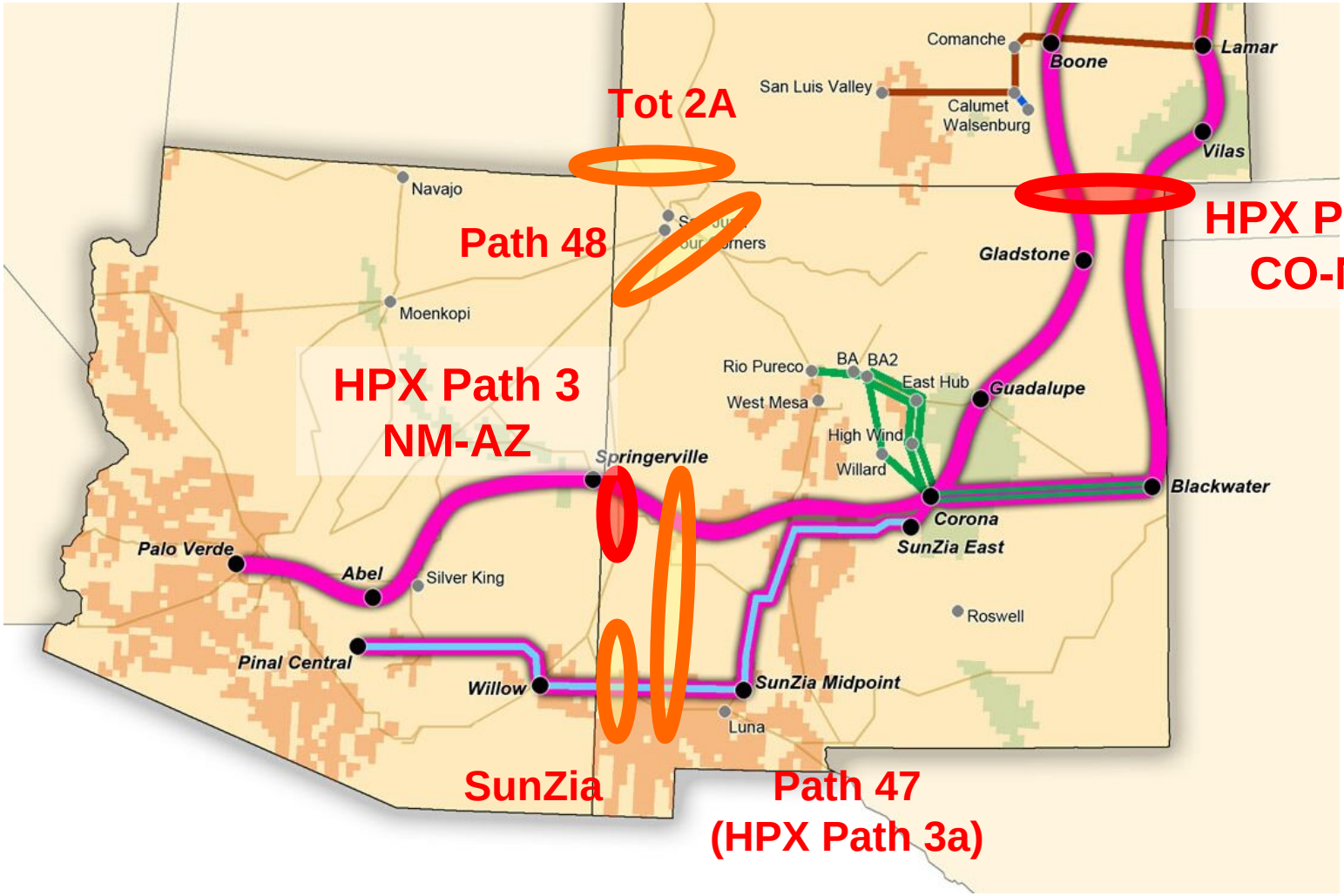
HPX Path 1 – Wyoming - Colorado



HPX Paths 2 & 3

2: Colorado – New Mexico;

3: New Mexico - Arizona



Cost Estimating

- Data compiled from several sources
  - Utility data
  - Western Governors' Association Western Renewable Energy Zones Transmission Model
- Costs developed for transmission lines (per mile), transformers, substations, and reactive devices.
- Cost estimates were developed for each of the HPX transmission alternatives.
- Estimates are in 2010 dollars.

HPX Technical Study Summary

Alternative	Path (MW)				Cost ($Billions)
	1 (WY - CO)	2 (CO - NM)	3 (NM - AZ)	3a (3 + SZ)	
Two Corridor 2XSingle-ckt 500	3500	3700	2200	6000	$5.5 (single-ckt) $7.2 (double-ckt capable)
Two Corridor 2XDouble-ckt 500	6700	6800	4000	7900	$8.3
Single Corridor 1X Single-ckt 500	1600	1800	1600	1600 W/O SunZia	$4.5 (double-ckt capable)
Single Corridor 1X Double-ckt 500	3900	3700	4300	8000	$5.5
Progressive wy/co: 1x345; co/nm: 2x345; nm/az: 1x500	1000	2000	2000	5800	$4.8 (double-ckt capable)

Key Findings

- All Alternatives Technically Feasible
- Multiple HPX “Paths”
- Potential for Project Coordination
- SunZia Impacts
  - NM-AZ (HPX 3A) Capability Enhanced
  - AC/DC Alternative Increases Path 3A
- Series Comp & Voltage Support Required
- RAS (Gen Tripping) for N-2
- New Mexico Upgrades
  - BA - Guadalupe

Questions