

# TransWest Express and Gateway South

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Co-developed by four leading entities:

Arizona Public Service

PacifiCorp

National Grid

Wyoming Infrastructure Authority

Regional Stakeholder Meeting

November 7, 2007

Cheyenne, Wyoming



# Standards of Conduct Non-Disclosure Statement

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**The following procedures have been implemented to provide Standards of Conduct Safeguards:**

- ◆ Ten day advance notice of public meeting
- ◆ All eligible customers invited
- ◆ Telephone participation provided
- ◆ Handouts posted on OASIS prior to meeting
- ◆ Meeting notes will be taken and posted
- ◆ One eligible customer must be in attendance
- ◆ Meetings no more than twice per month

# Our agenda for today...

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1. **Welcome** – Loyd Drain
2. **Co-Development Partnership** – David Smith
  - a. Overview of Partners
  - b. Business Arrangements
  - c. Benefits of Collaborating
3. **Overview of Projects**
  - a. TransWest Express – Peter Krzykos
  - b. Gateway South – Craig Quist
  - c. Potential Co-Development Solutions – David Smith
  - d. Transmission Study Loads and Resources
  - e. Complementary Projects

## **Lunch Break**

4. **Stakeholder Forum**

# Welcome and Introductions

***APS, PacifiCorp, National Grid, and the WIA in accordance with the WECC Regional Planning Review Process, the NTTG and SWAT planning processes, and FERC Order 890, request stakeholder feedback on the TransWest Express and Gateway South projects***

## Projects

Gateway South 

TransWest Express 



*Routes shown are for illustration only and will be selected only following a comprehensive environmental review process.*

# About Arizona Public Service



## Regions Served

- ◆ 11 of 15 counties within Arizona
- ◆ Fastest growing state at 3.5%
- ◆ 3 times the U.S. average

## APS

- ◆ Largest electric utility in Arizona
- ◆ Growth 4 times the U.S. average
- ◆ More than 1 million customers
- ◆ 6,600+ employees
- ◆ \$1B 10-year Transmission Plan



■ APS Retail Service Territory

# About PacifiCorp

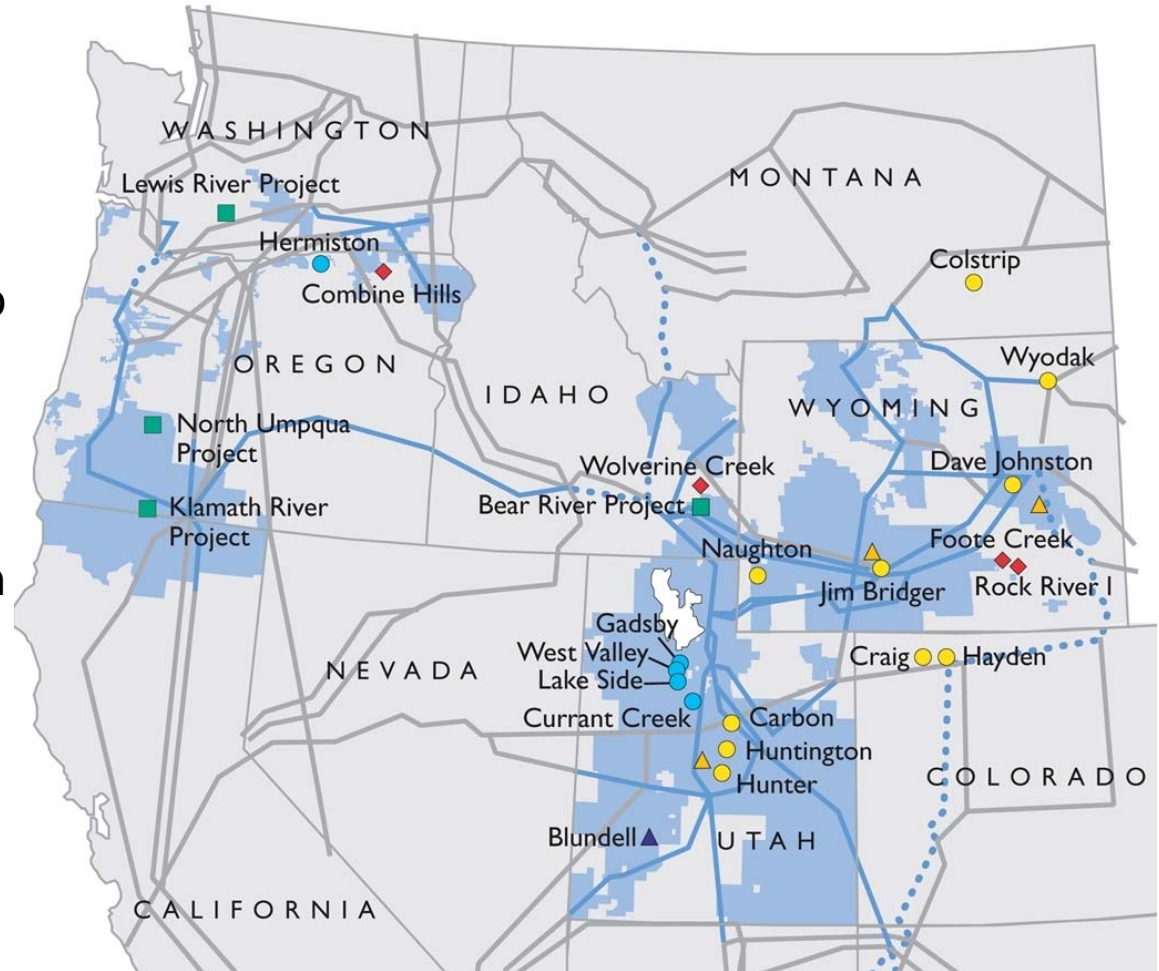


## Regions Served

- ◆ Oregon, Washington and California (Pacific Power)
- ◆ Utah, Wyoming and Idaho (Rocky Mountain Power)

## PacifiCorp

- ◆ 15,000 miles transmission
- ◆ 1.7 million customers
- ◆ 6,600+ employees
- ◆ 9,062 MW of generation



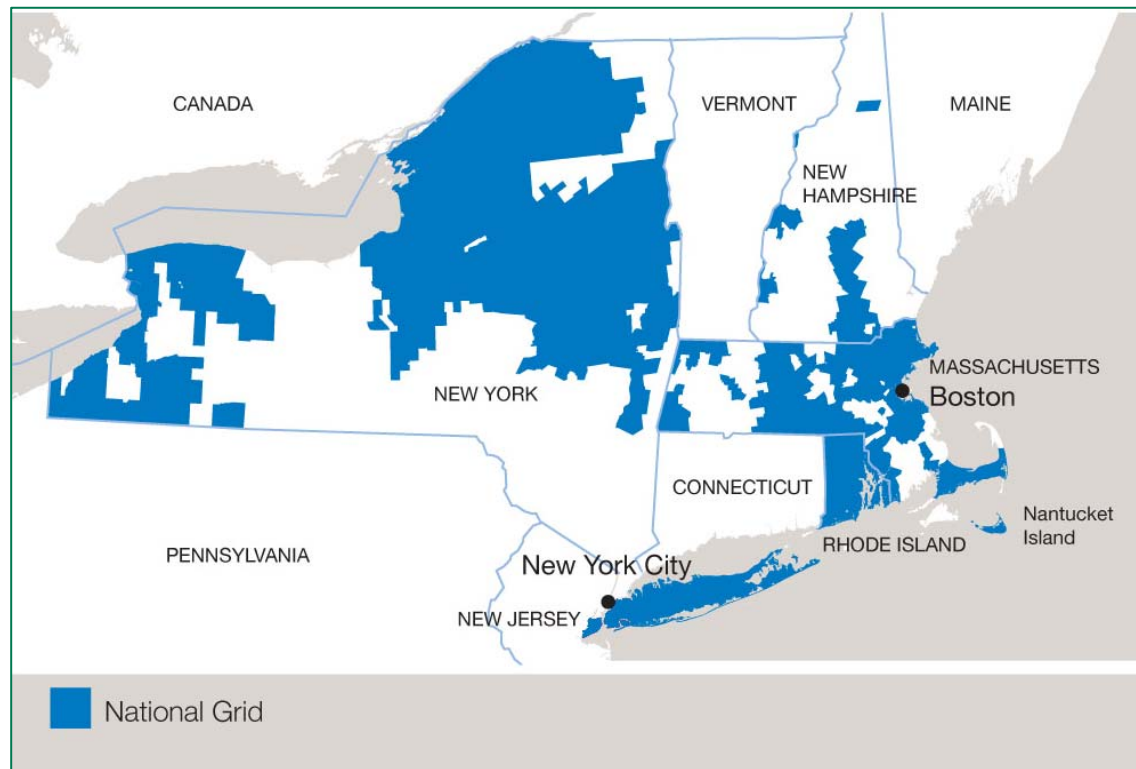
# About National Grid

## Regions Served

- ◆ Northeast US
- ◆ All of UK

## National Grid

- ◆ Transmission Operator and System Operator in U.K.
- ◆ > 4 million electric customers in US
- ◆ > 20,000 employees
- ◆ > 2,000 electric transmission staff
- ◆ Capital investment of ~\$4.5B per year



# About Wyoming



## Wyoming

- ◆ Largest energy exporting state in US
  - ◆ Largest producer of coal
  - ◆ Largest producer of uranium
  - ◆ Second largest producer of natural gas
- ◆ Estimated 3.4GW of > Class 6 wind and over 14GW of developable wind
- ◆ Governor Freudenthal chair of the Western Governors Association



## Wyoming Infrastructure Authority

- ◆ Formed in 2004
- ◆ Mission to diversify and expand the state's economy through improvements in electric transmission infrastructure
- ◆ Authority to issue bonds to finance transmission facilities

# Co-Development Agreement

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## Purpose

- ◆ Governance arrangements with a common steering committee
- ◆ National Grid as lead developer, responsible for deploying the project team
- ◆ Allows initial development steps to be taken while more complex technical and regulatory issues considered

## Agreement

- ◆ Executed August 2007
- ◆ \$3m budget; costs shared by parties
- ◆ Longer term business agreements targeted for 2008 if parties agree this makes sense

# What is Co-Development?

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## Activities undertaken jointly

- ◆ Common project team implementation strategy and deployment
- ◆ Coordinated review of requests from 3rd party users
- ◆ More efficient regional planning and rating review processes
- ◆ Coordinate permitting
- ◆ Stakeholder and public outreach

## Each project to maintain a degree of independence

## Activities undertaken separately

- ◆ ROW filings - purpose and need case, approvals
- ◆ WECC Rating Process
- ◆ Regulatory filings, approvals
- ◆ Financing
- ◆ Construction (separate commissioning dates)

# Meeting Regional Needs

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- ◆ **Consistent with WGA, RMATS, and CDEAC recommendations for transmission expansion**
- ◆ **Improve overall electric reliability for the West**
  - ◆ Reinforces east side of Western Interconnection
  - ◆ Adds import capability into the Desert Southwest
  - ◆ Wasatch Front reinforced from North and South
  - ◆ AC and DC combination
- ◆ **Provides increased access for 3<sup>rd</sup> party transmission users**
- ◆ **Improves regional resource diversity, reliability and economics**
  - ◆ Access to renewables (primarily wind)
  - ◆ Enhance wholesale market vitality

# Benefits of Co-Development

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- ◆ **Meet regional needs**
- ◆ **Better use of transmission corridors**
- ◆ **Opportunities to coordinate permitting**
- ◆ **Economies of scale and cost savings in the development and construction activities**

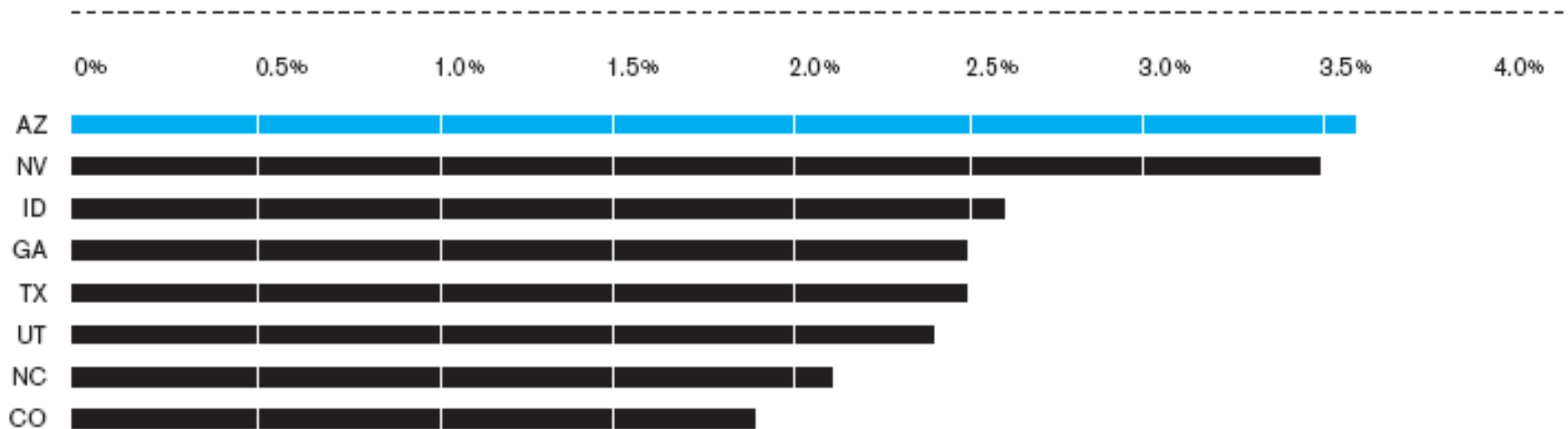
# TransWest Express Need for the Project

## APS Customers and Demand Continue to Grow

*ARIZONA IS THE FASTEST GROWING STATE IN THE COUNTRY.*

*Source: Population Division, U.S. Census Bureau*

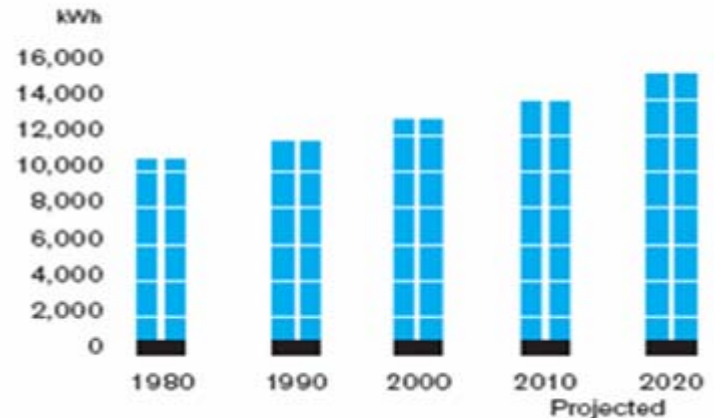
### ANNUAL POPULATION GROWTH



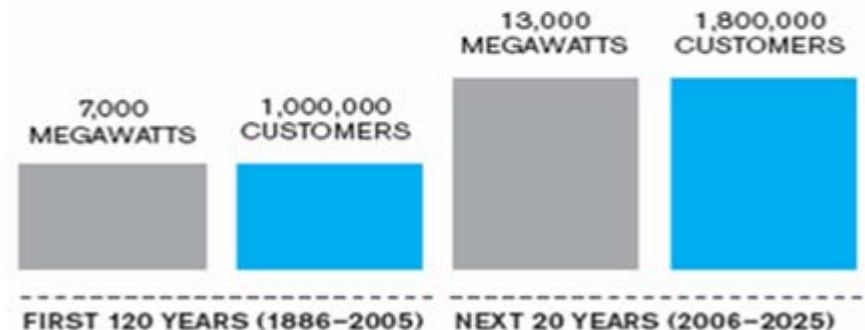
# TransWest Express – Need for the Project

- ◆ APS' summer resource capacity requirement expected to increase 8000MW by 2025
- ◆ APS' annual energy sales expected to increase by 70% by 2025
- ◆ Other Arizona utilities are growing at comparable rates
- ◆ Arizona RPS requires 15% of retail energy sales from renewable resources by 2025
- ◆ TransWest Express is viewed as a viable alternative to local resource development

*APS CUSTOMERS ARE USING MORE ELECTRICITY EACH YEAR.*



*BY 2025, APS WILL BE NEARLY TWICE THE ELECTRIC COMPANY WE ARE TODAY.*



# TransWest Express

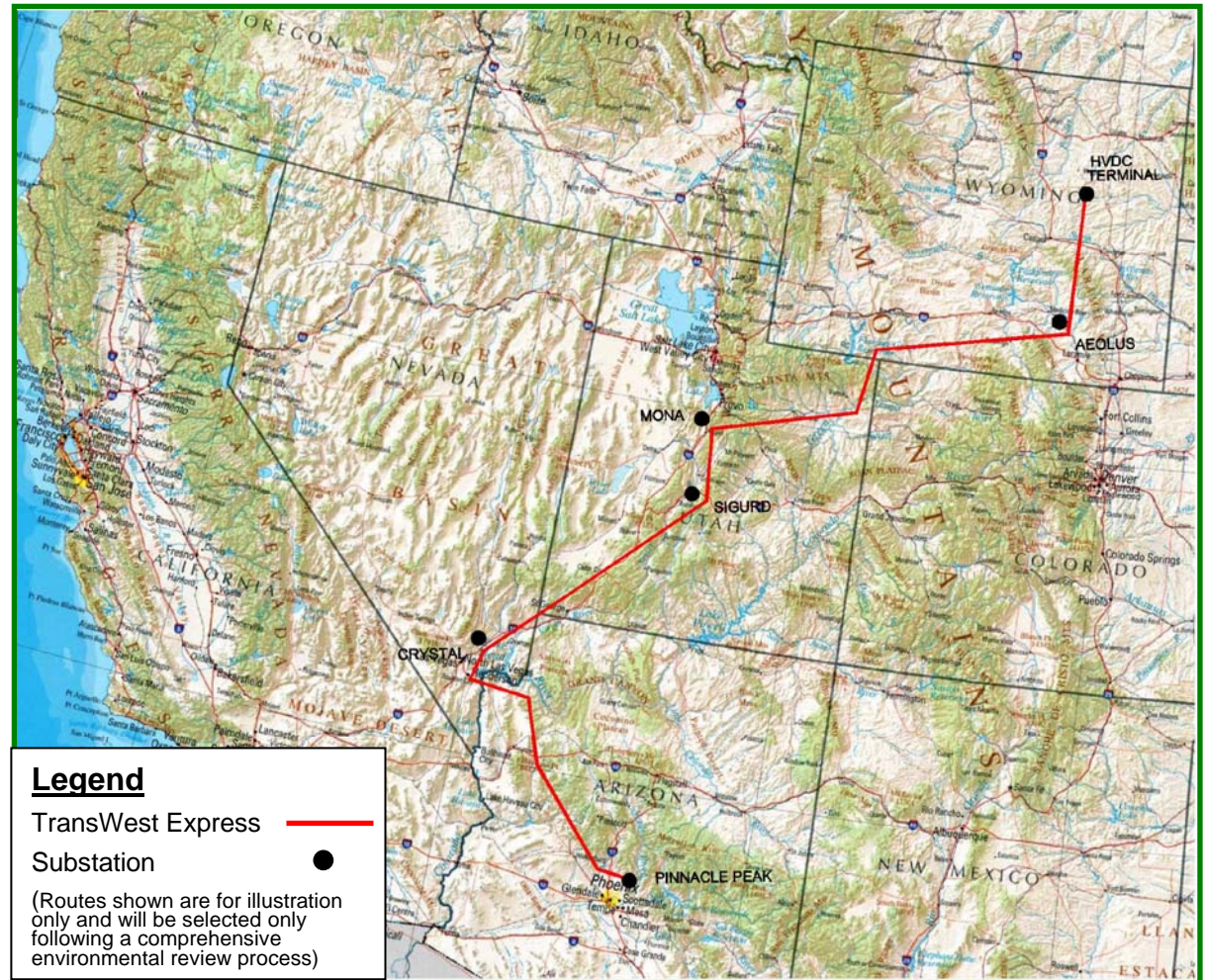
## Stakeholder Input

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- ◆ **Open stakeholder process**
  - ◆ November 2005 kick-off meeting - Phoenix
  - ◆ March 2006 project update meeting – Salt Lake City
  - ◆ June 2006 project update meeting - Jackson
- ◆ **Periodic project updates**
  - ◆ Sub-regional Planning Groups
  - ◆ SSG-WI
  - ◆ WECC
- ◆ **Completed Feasibility Study in December 2006**
  - ◆ Analyzed - 5 route options, 500 & 765 kV AC, 500 kV DC
  - ◆ Economic analysis supports DC or AC/DC hybrid alternatives
  - ◆ Cost \$2.3B – \$3.2B

# TransWest Express Reference Case

- ◆ 3,000 MW
- ◆ 500kV bi-pole HVDC
- ◆ 2015 in-service date
- ◆ Route to preserve option of Las Vegas area terminal



# TransWest Express

## Parties Expressing Interest

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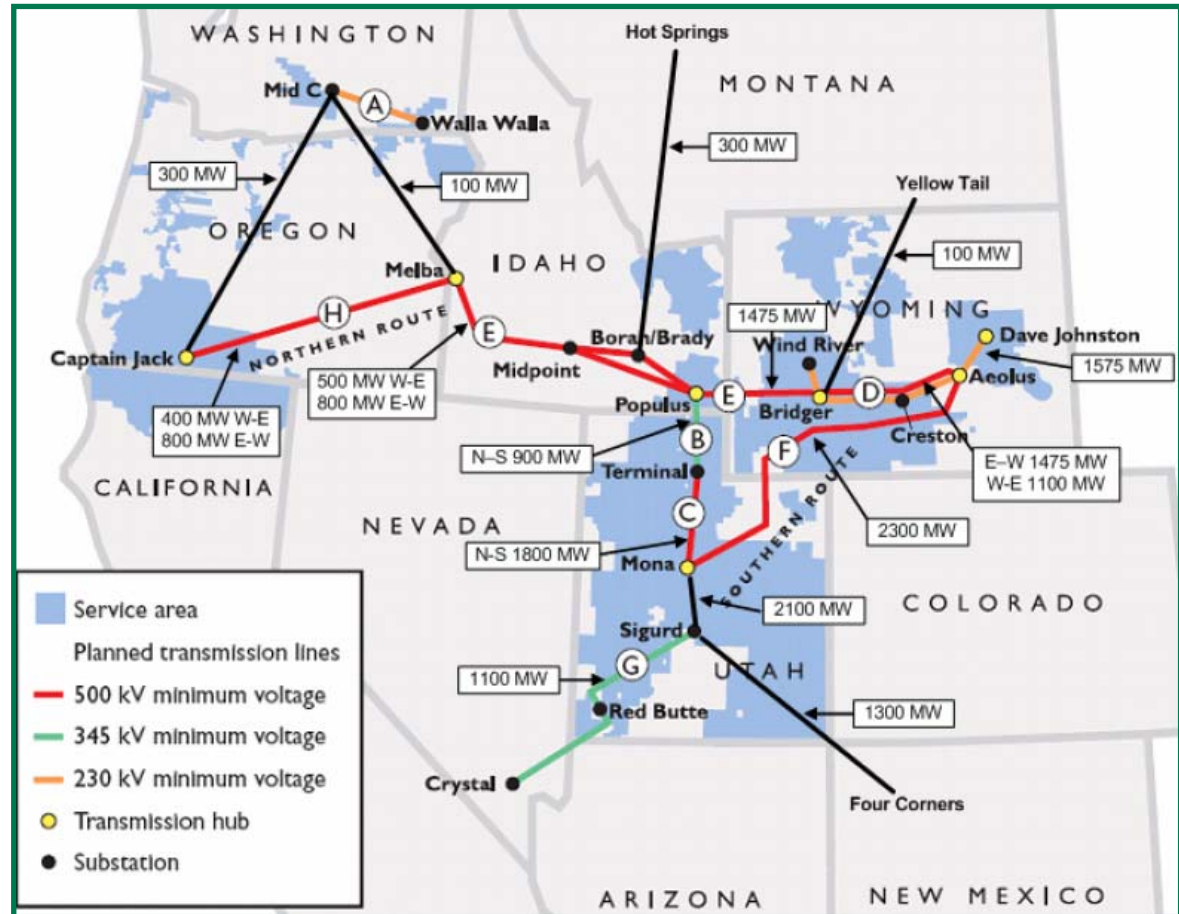
- ◆ Salt River Project, Tucson Electric Power and Southern California Edison expressed interest in participation
- ◆ National Grid, as Development Manager, and WIA joined Project Team
- ◆ PacifiCorp expressed interest in exploring co-development of TWE and Gateway South
- ◆ All parties remain interested in participation and support the work being conducted under the Co-Development Agreement

# Gateway South Need for the Project

- ◆ Wasatch Front annual peak load to increase 2500MW by 2022
- ◆ Southern Utah annual peak load to increase by 500MW by 2022\*
- ◆ PacifiCorp IRP targets 8.5% renewables by 2016
- ◆ Over 5000MW in point to point Transmission Service Requests

\*including Transmission Network Service customers

## Third Party Point to Point Requests on PacifiCorp System



# Gateway South Stakeholder Input

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- ◆ **PacifiCorp Integrated Resource Plan**
  - ◆ Eight public meetings between December 2005 and April 2007 held in Salt Lake City, Cheyenne, and Portland
  
- ◆ **Northern Tier Transmission Group**
  - ◆ Three stakeholder meetings since May 2007 and ongoing to develop NTTG Sub-Regional Transmission Plan

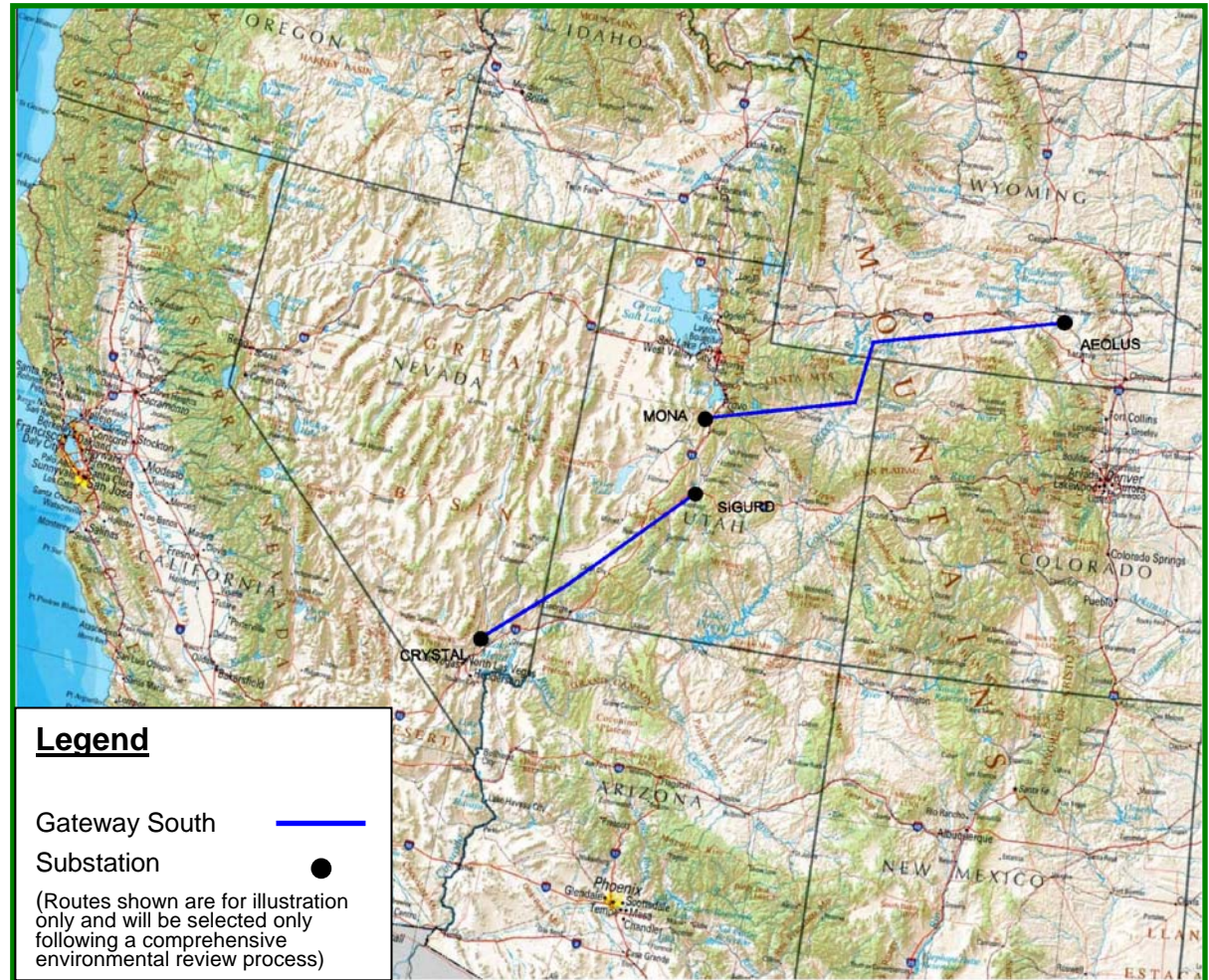
# Gateway South Reference Case

## Wyoming - Utah

- ◆ 3,000 MW
- ◆ 2 - 500kV AC
- ◆ 2014 in-service date

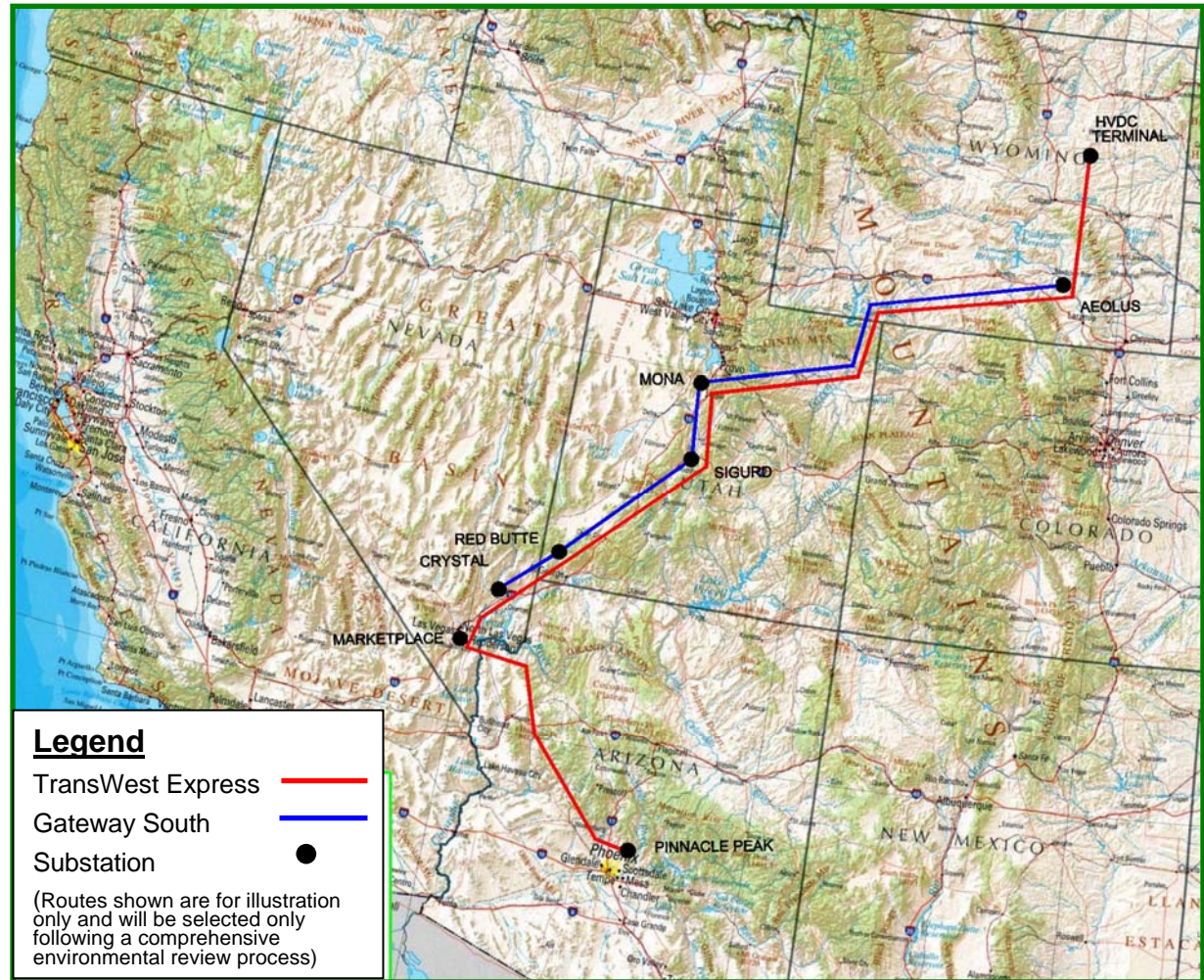
## Utah - Nevada

- ◆ 800 - 1500 MW
- ◆ 345 kV or 500 kV AC
- ◆ 2014 in-service Date



# TransWest Express and Gateway South Potential Design Solutions

- ◆ Size of combined projects dependent on regional and customer needs
- ◆ Capacity options are under review from 4,500 to 7,500 MW export from WY
- ◆ DC circuit options include 3<sup>rd</sup> terminal or termination in southern Nevada



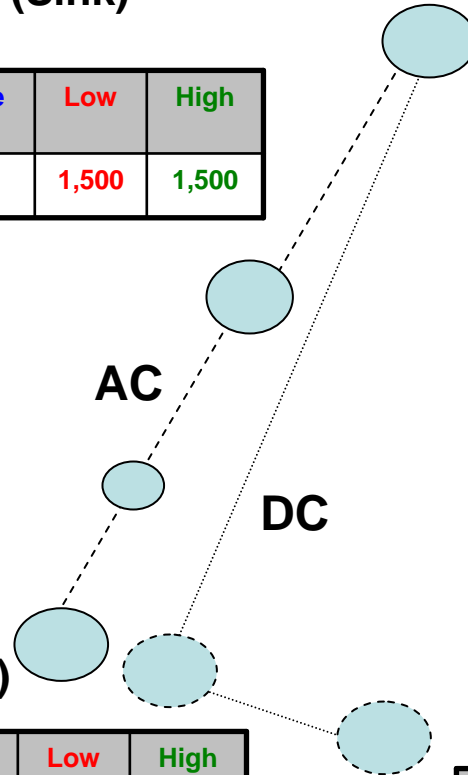
# Gateway South and TransWest Express Projects - Needs Assumptions (MW)

## Central Utah (Sink)

Gateway South	TransWest Express	Reference	Low	High
1,500 – 3,000	0	1,500	1,500	1,500

## Wyoming (Source)

Gateway South	TransWest Express	Reference	Low	High
3,000	3,000	6,000	4,500	7,500



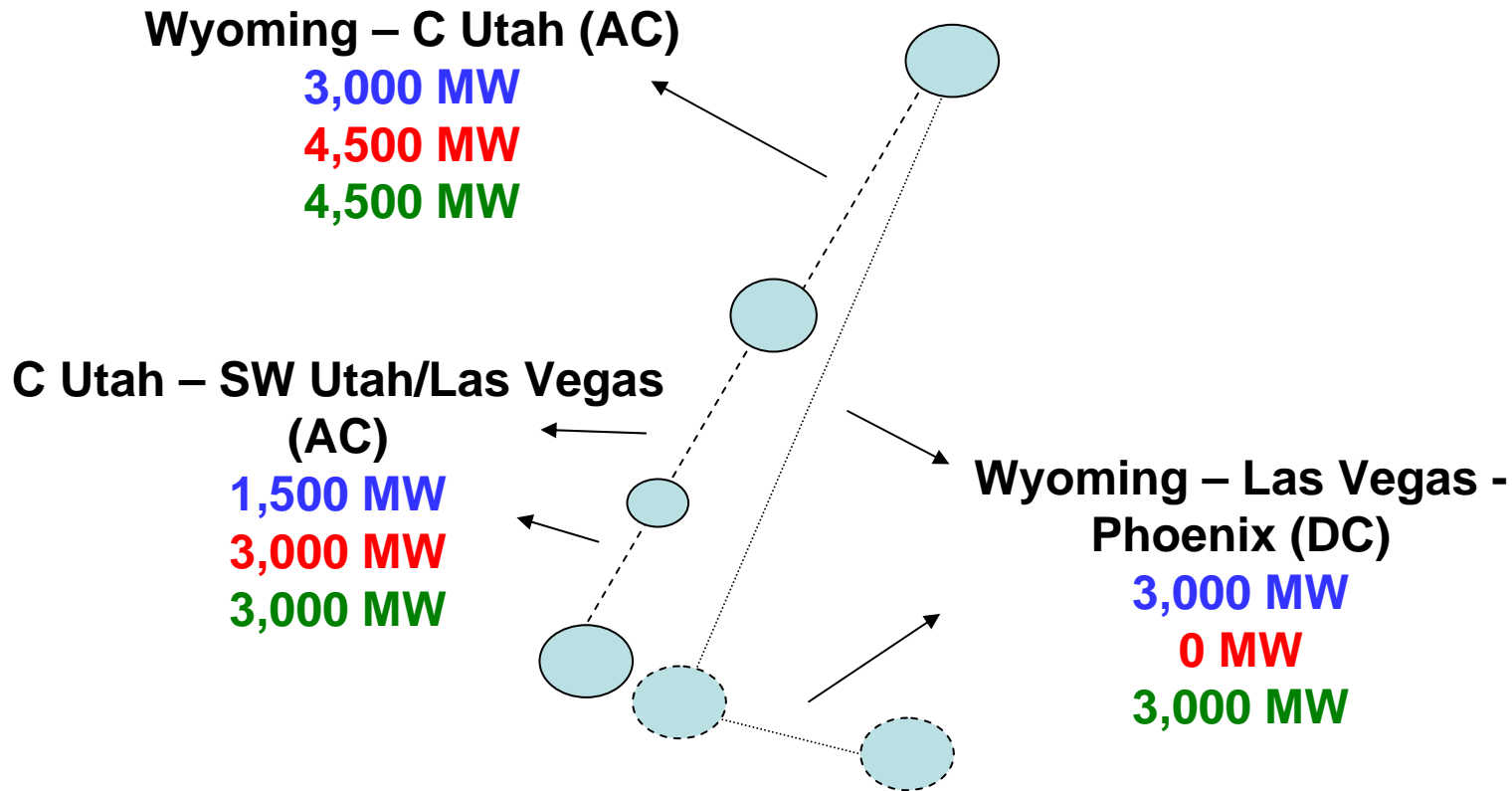
## SW Utah/Las Vegas (Sink)

Gateway South	TransWest Express	Reference	Low	High
0 – 1,500	0	1,500	3,000	3,000
Las Terminal	Vegas Options	1,500-4500	3,000	6,000

## Phoenix (Sink)

Gateway South	TransWest Express	Reference	Low	High
0	3,000	3,000	0	3,000
Las Terminal	Vegas Options	0-3000	0	0-3000

# Potential Design Solutions



<u>Key</u>		
Reference Case	Lower Case	Upper Case

# Gateway and TransWest Express Transmission Study Loads & Resources

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## ◆ Transmission Study Loads

- ◆ WECC 2015 High Summer Case
- ◆ Reduce Las Vegas and western Arizona generation to stress paths

## ◆ Transmission Study Resources

- ◆ These are not the proposed resources for the projects
- ◆ Developed (partially) from Integrated Resource Plans
- ◆ Includes renewable resources above existing RPS levels
- ◆ Wind resource level sufficient to test impacts of non-synchronous generation

## ◆ Actual Resource Development for Projects

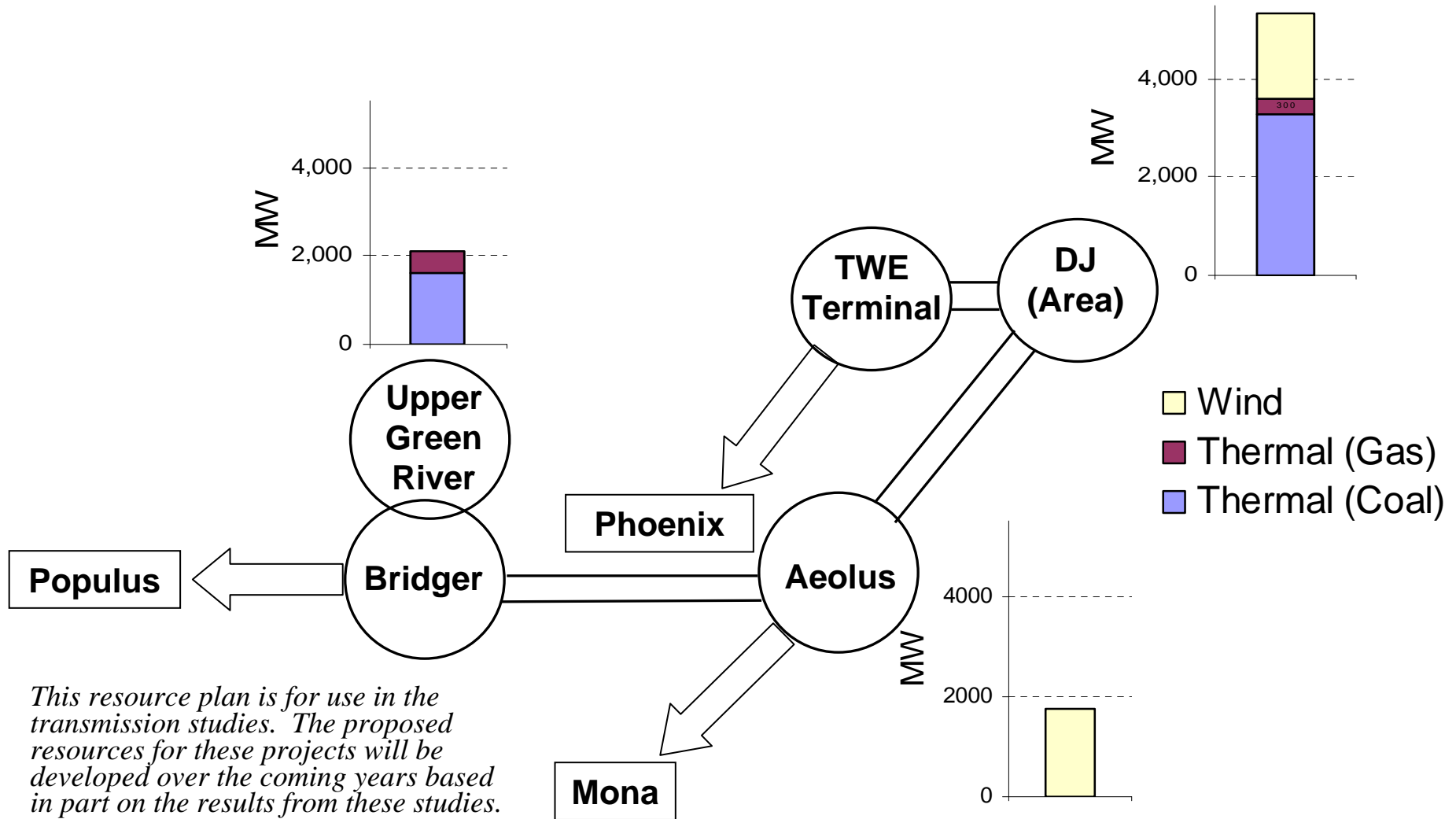
- ◆ Will be responsive to energy policies currently under review by utilities, regulators and other stakeholders
- ◆ Specific economic and technology evaluations and siting/permitting processes also need to run their course

# Gateway and TransWest Express Transmission Study Wyoming Resource Plan

Project	Resource Type	Jim Bridger	Upper Green River	Aeolus	Dave Johnston	Total
Gateway	Coal	1,600			1,800	3,400
	Wind			1,100	1,100	2,200
	Natural Gas		500			500
	<b>Total</b>	<b>1,600</b>	<b>500</b>	<b>1,100</b>	<b>2,900</b>	<b>6,100</b>
TransWest Express	Coal				1,500	1,500
	Wind			650	650	1,300
	Natural Gas				300	300
	<b>Total</b>			<b>650</b>	<b>2,450</b>	<b>3,100</b>
Wyoming Total	Coal	1,600			3,300	4,900
	Wind			1,750	1,750	3,500
	Natural Gas		500		300	800
	<b>Total</b>	<b>1,600</b>	<b>500</b>	<b>1,750</b>	<b>5,050</b>	<b>9,200</b>

*This resource plan is for use in the transmission studies. The proposed resources for these projects will be developed over the coming years based in part on the results from these studies.*

# Gateway and TransWest Express Transmission Study Resource Bubble Diagram

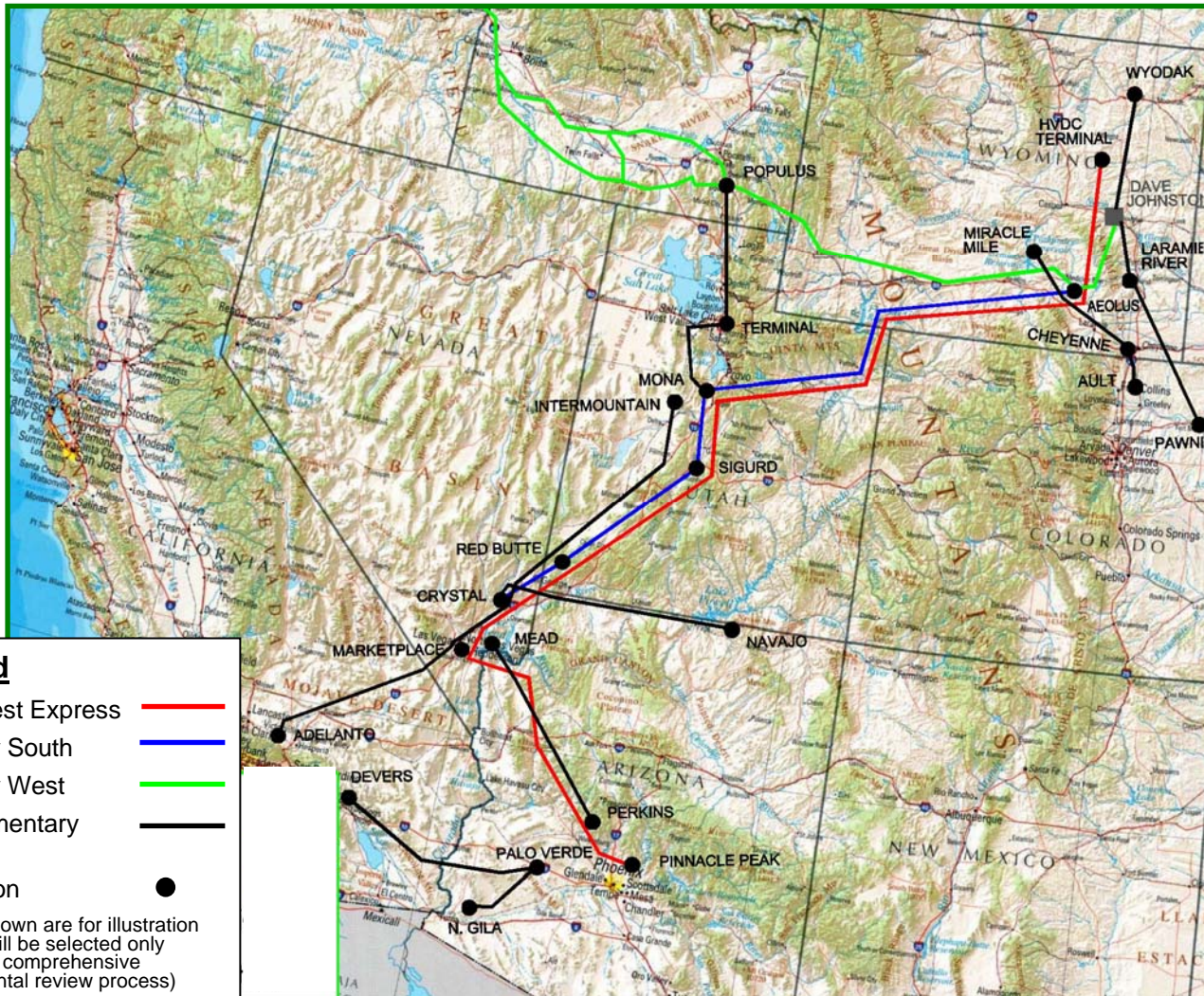


# TransWest Express and Gateway South Complementary Projects

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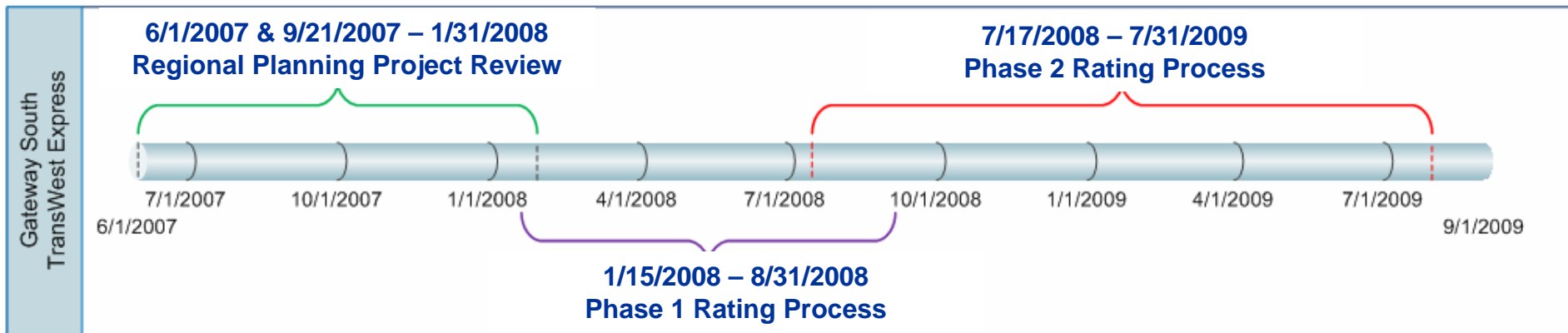
- ◆ Palo Verde - Devers #2 - 500kV line
- ◆ EOR 9300 Project
- ◆ Palo Verde - North Gila #2 - 500kV line
  
- ◆ Gateway West – 2-500kV line
- ◆ Mona – Terminal – 2-500kV line
- ◆ Populus – Terminal – 2-345kV line
- ◆ Path 27 (IPP HVDC Inter-tie) Upgrade
  
- ◆ Miracle Mile – Ault – 230 kV line
- ◆ Donkey Creek – Dave Johnston – 230 kV line
- ◆ Wyoming – Colorado Inter-tie – 345 kV line

# TransWest Express and Gateway South Complementary Projects

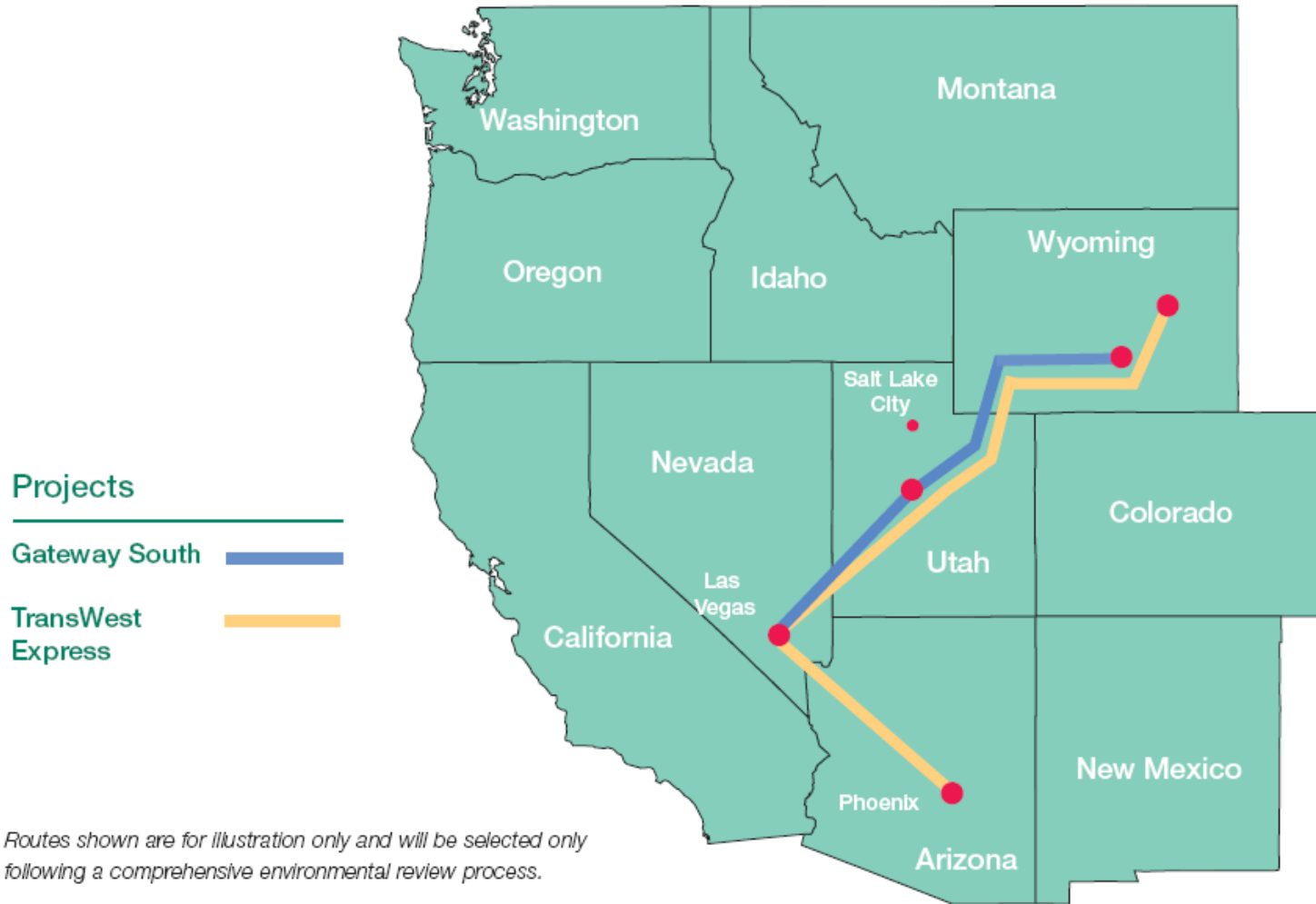


# WECC Review Timeline for Projects

- ◆ **Regional Planning Project Review Stakeholder Meetings**
  - ◆ Salt Lake City – October 17, 2007
  - ◆ Cheyenne - November 7, 2007
  - ◆ Phoenix - December 5, 2007



# Stakeholder Forum



# Represented today by...

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