



UWIG Technical Workshop

SSG-WI Transmission Report

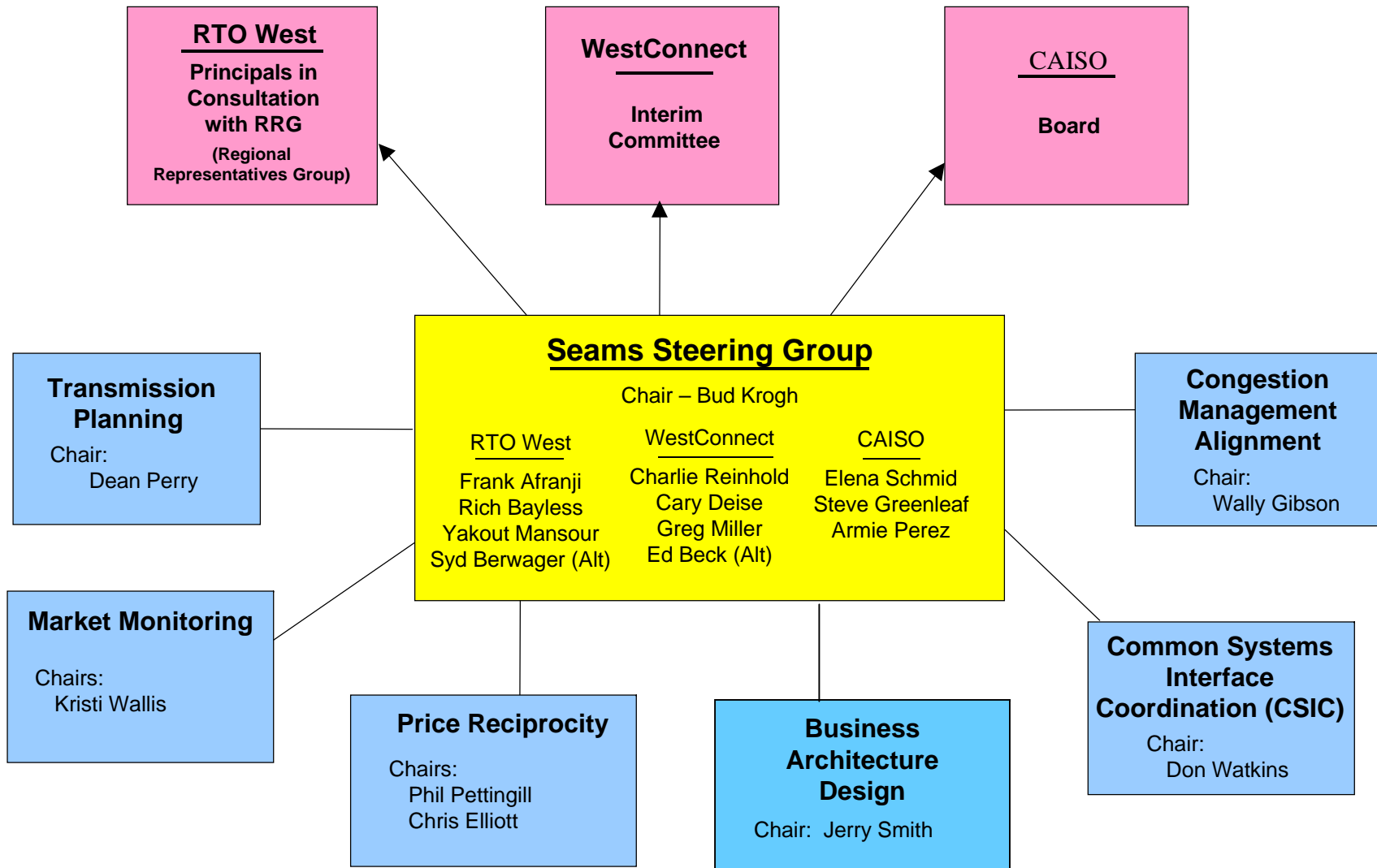
October 23, 2003

SSG-WI

Planning Work Group



SSG-WI Organization Chart





SSG-WI Planning

- **Looking West-wide, not Local**
- **SSG-WI identifies future needs, runs studies, identifies solutions (transmission and non-transmission)**
- **Doing “congestion relief” planning (to expand current capability), not “reliability” planning (to maintain current capability). Utilize reliability planning of individual entities as input.**
- **Analyze historical congestion – Report on SSG-WI Web Site**

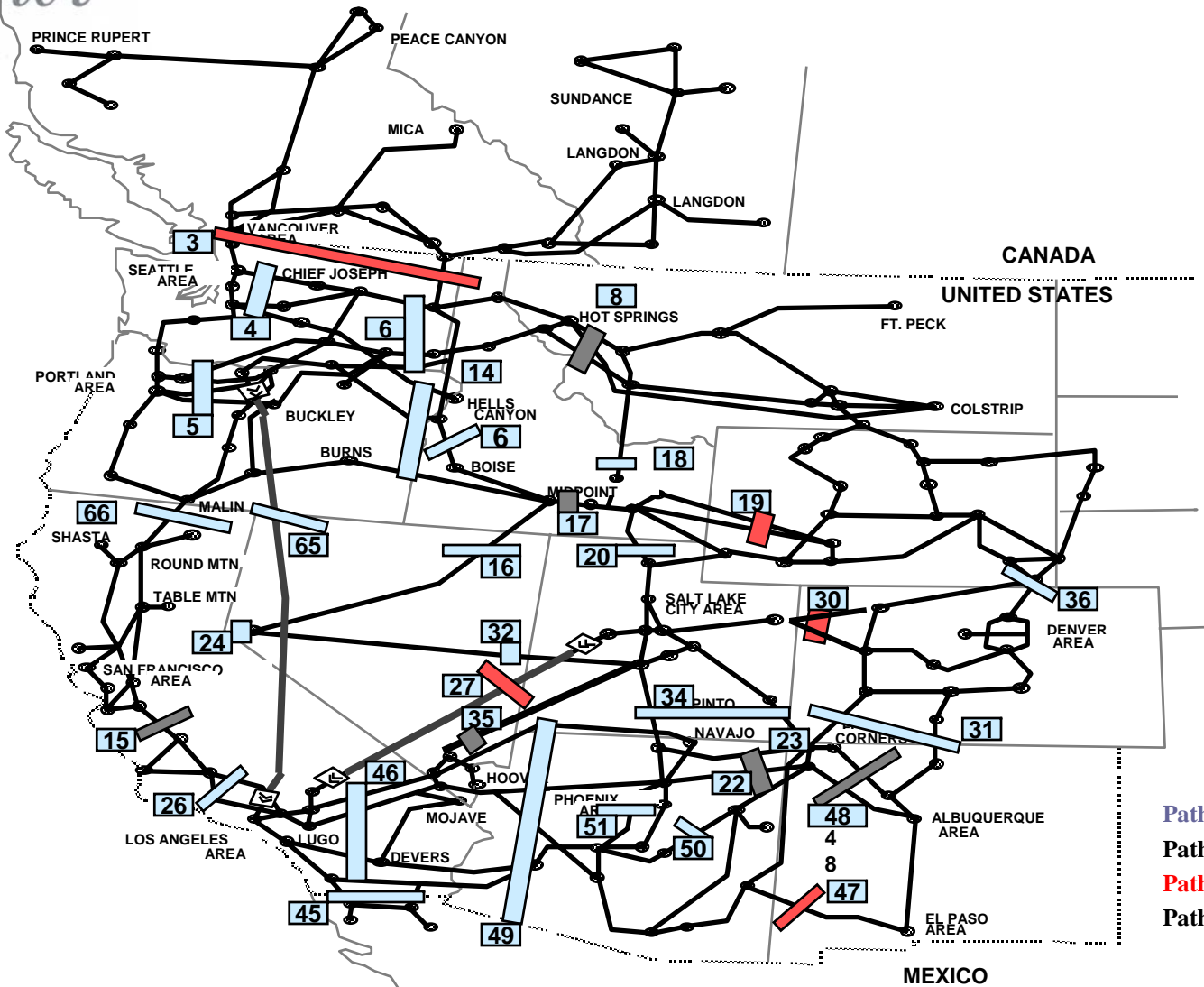


SSG-WI Planning

- **SSG-WI does not sponsor projects or implement projects**
- **SSG-WI will support state siting and permitting processes as requested**
- **Plan to issue Annual Transmission Reports – First report scheduled for release October 31, 2003**



Historical Path Flow Analysis



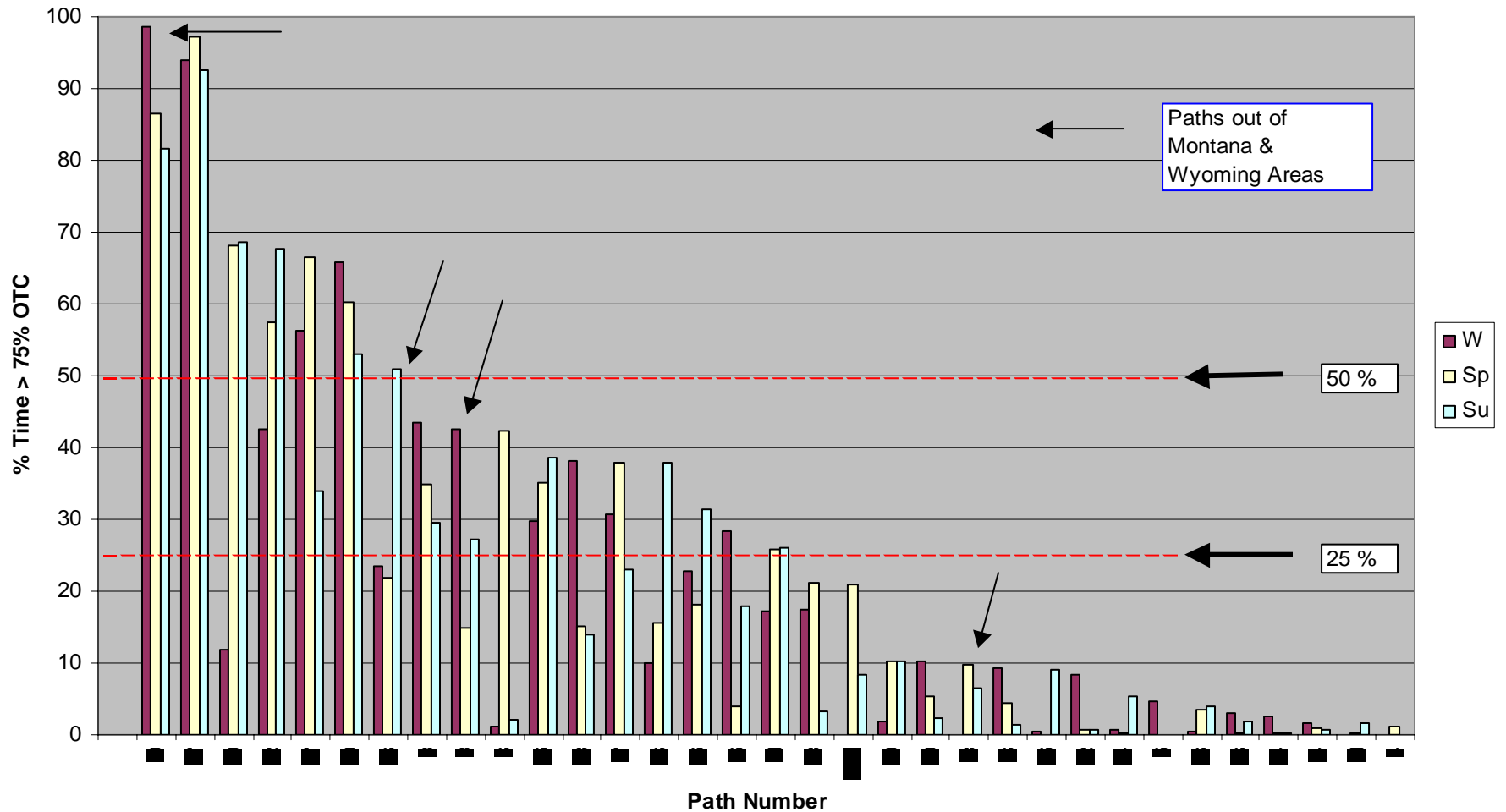
Path 8 – 2200 MW
 Path 18 – 300 MW
 Path 19 – 2200 MW
 Path 36 – 1400 MW

Winter 98-99 thru 01-02 (Based on Heaviest Loading Year)



Actual Flow > 75% of OTC greater than 50% of time
 Actual Flow > 75% of OTC between 25% and 50 % of time
 Actual Flow > 75% of OTC between 0% and 25% of time

Path Loading - % of Time > 75% of Path OTC during a Seasonal Period
Maximum Seasonal Loadings for each Path
Winter 98-99 thru Spring 2002





2003 SSG-WI Study Program

SSG-WI Study Objectives

1. To identify opportunities where the development of additional power transmission facilities could further facilitate competitive and efficient markets.
2. To provide policy-makers with information concerning transmission impacts of various energy policies being considered by State, Provincial and Federal entities.
3. To identify for generation developers major transmission additions that could be necessary to deliver a wide range of generation resources to load.

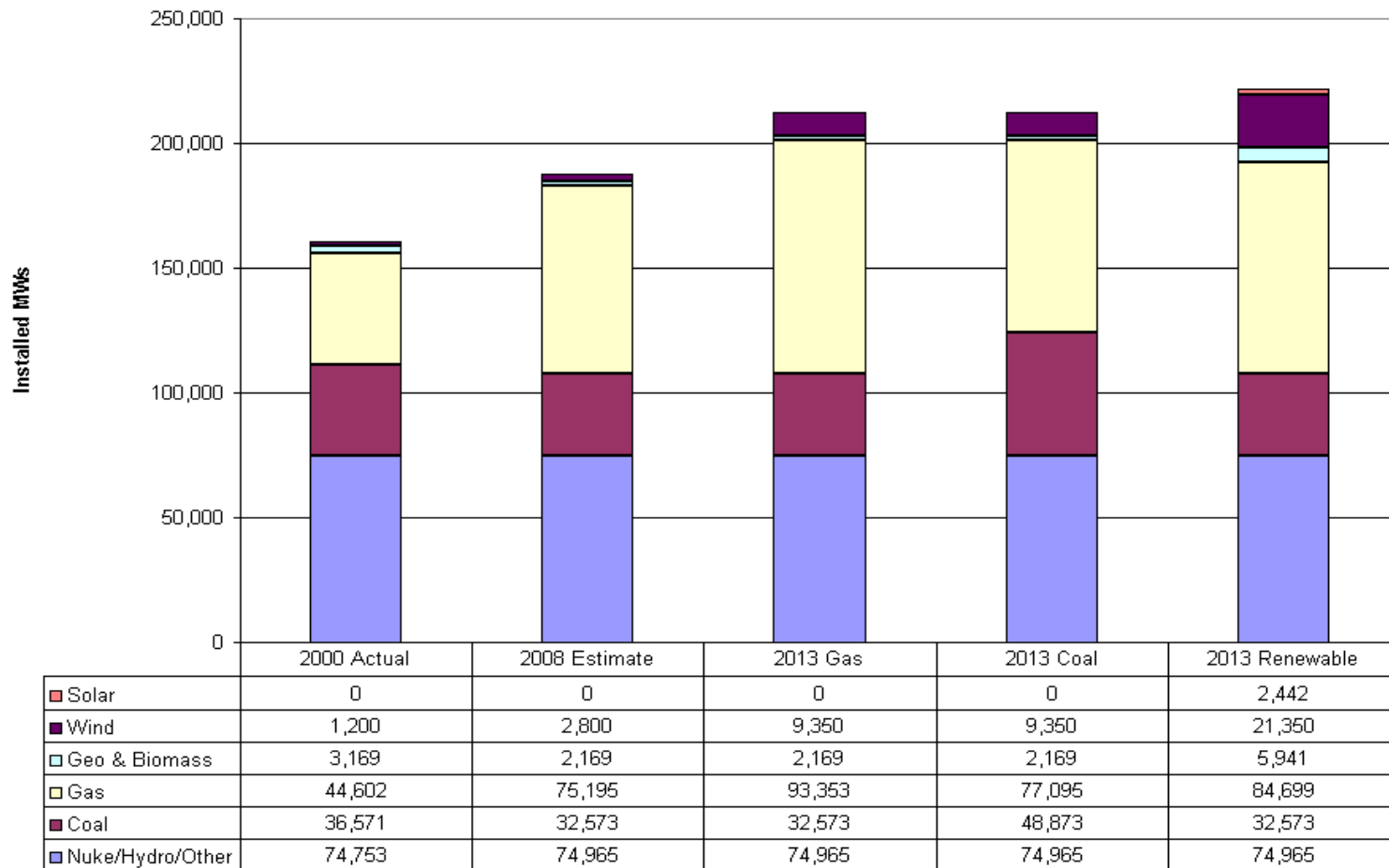


Study Program

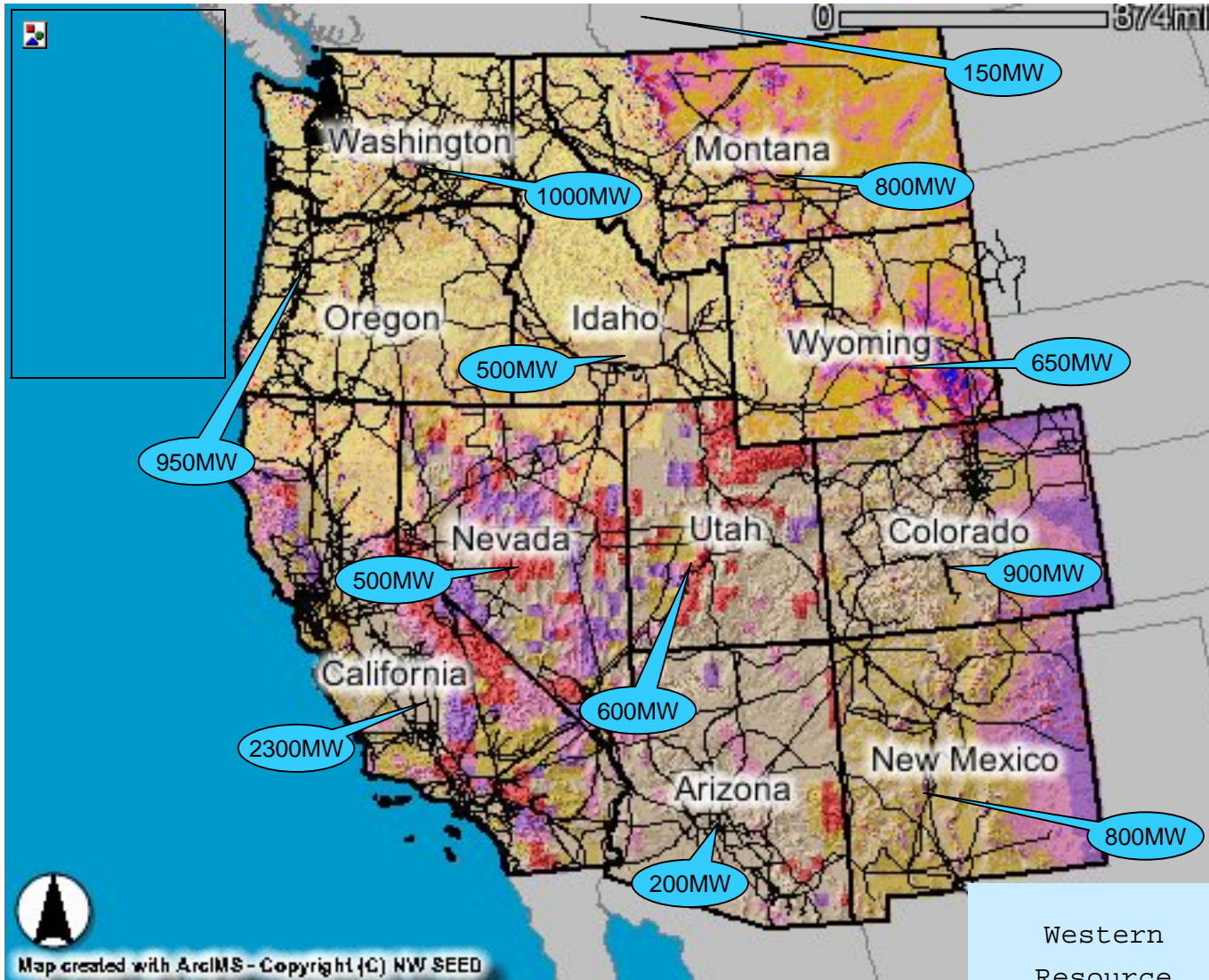
- 2008 – Base Case
- 2013
 - Gas – Assumes 86% of new generation is fueled with gas near load centers
 - Coal – Assumes 66% of new generation is coal fired remote from load centers
 - Renewable – Assumes 72% of new generation is from renewable (wind, etc.) remote from load



WECC Capacity By Energy Source



Wind

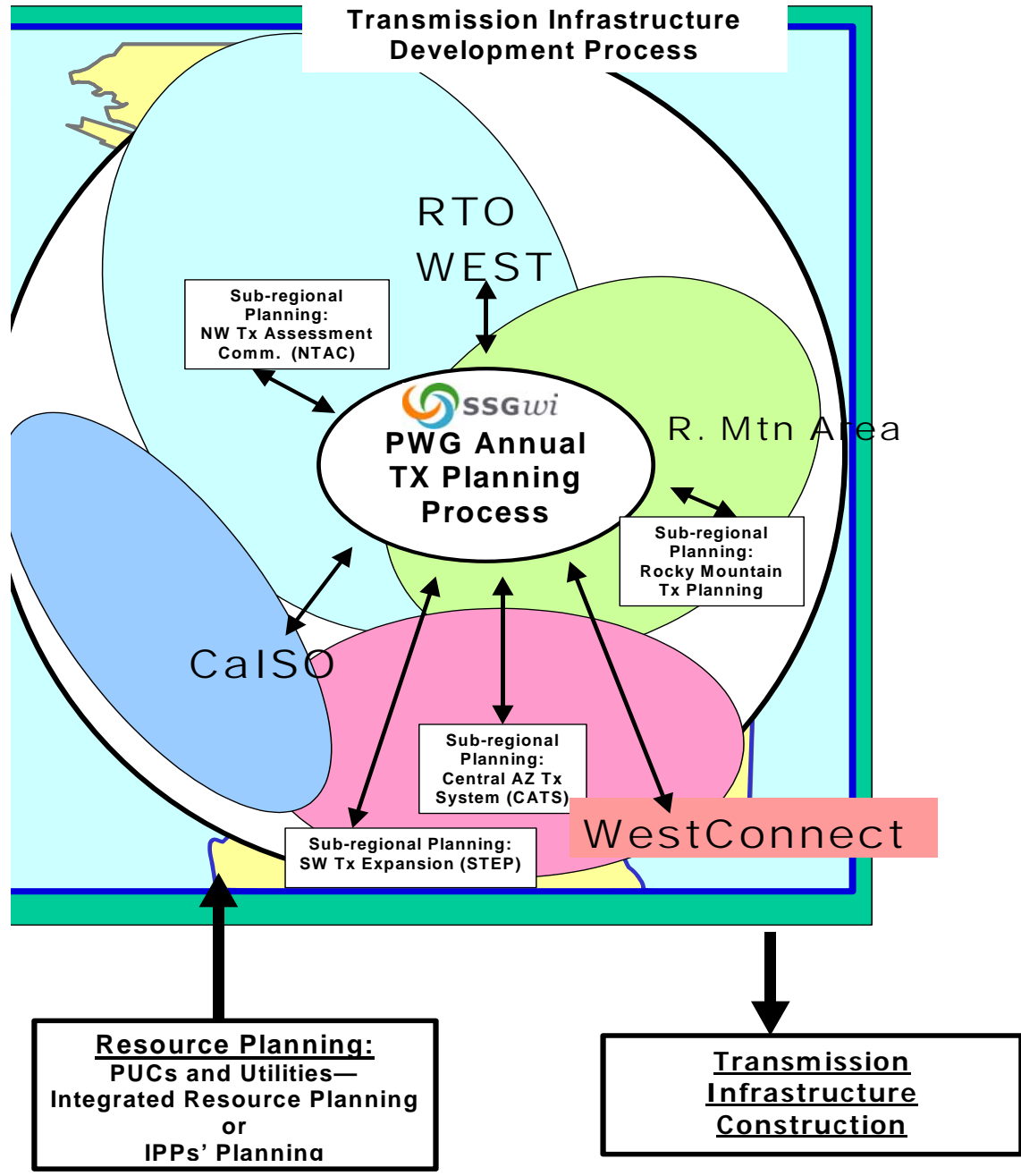


SSG-WI Assumed Wind		
		2013 Base (MW)
AZ	E of Tuscon	100
AZ	Navajo	100
CA	Thch_Wd1	650
CA	SnGrnWd	350
CA	AltmntWD	500
CA	SolanoWd	250
CA	Thch_Wd2	550
CO	CO (E) Ft Collins	400
CO	CO (E) Trinidad	400
CO	CO (W)	100
ID	Burley	200
ID	Mtn. Home	200
ID	Pocatella	100
MT	NW - Conrad/Shelb	400
MT	SC - Livingston	400
NV	N - Tonopah/Eureka	100
NV	S - NW of Vegas	400
NM	E- Tucumcari/Clovis	600
NM	4 Corners	200
NW	Columbia Gorge	650
NW	Bend	300
UT	Monticello	100
UT	St George	100
UT	NE Corner ???	400
NW	Columbia Gorge	200
NW	Ellensburg	500
NW	Spokane	300
WY	Casper/Rawlins	500
WY	Laramie	150
	Canac Alberta	150
		9350

Western
Resource
Advocates



FINDINGS

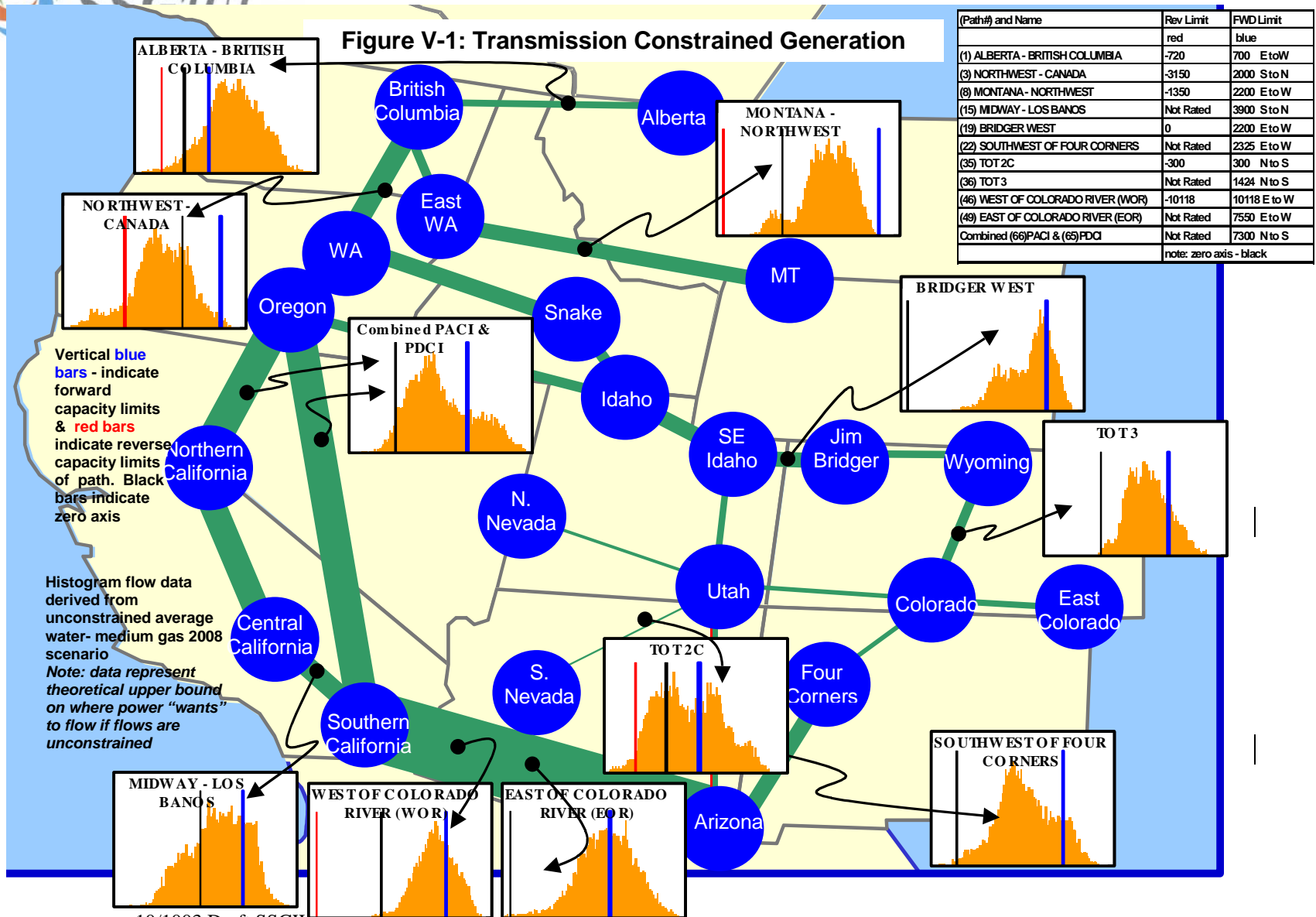




2008 Findings

- Identified paths that may be congested in the near future
- In the 2008 study, identified approximately \$110 million in unrealized production cost savings due to path congestion (with planned facilities).
- In coordination with SSG-WI, STEP (subregional group) is looking at new enhancements between Arizona and California that could save \$60 million per year.

Figure V-1: Transmission Constrained Generation



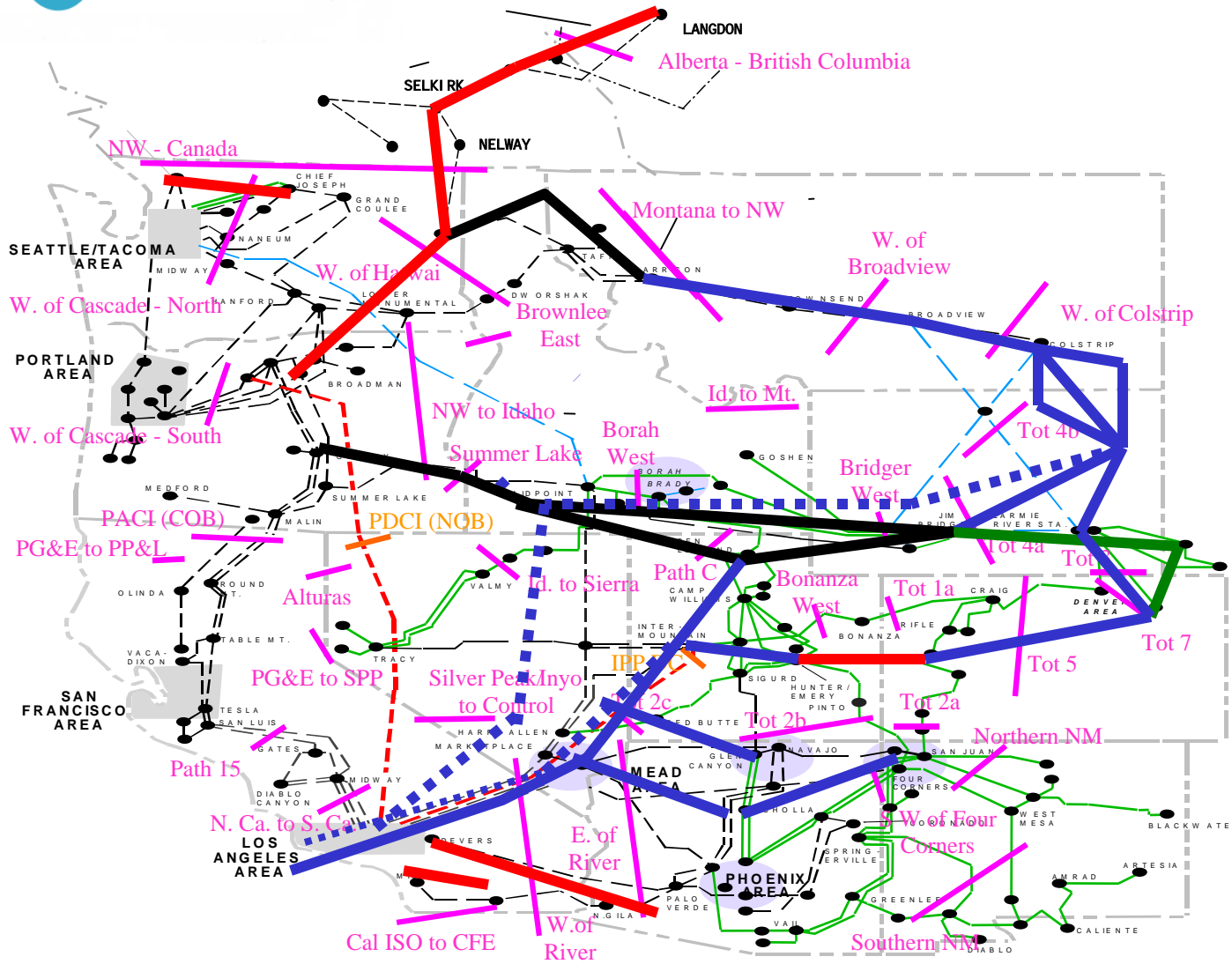
2013 Findings

- Identified transmission facilities necessary to alleviate path congestion for 3 bookend resource scenarios
 - Gas – 1325 miles - \$2.6 billion
 - Coal – 7605 miles - \$16.7 billion
 - Renewable – 3360 miles - \$6.7 billion



Seams Steering Group of the Western Interconnection

Western Interconnect Transmission Paths

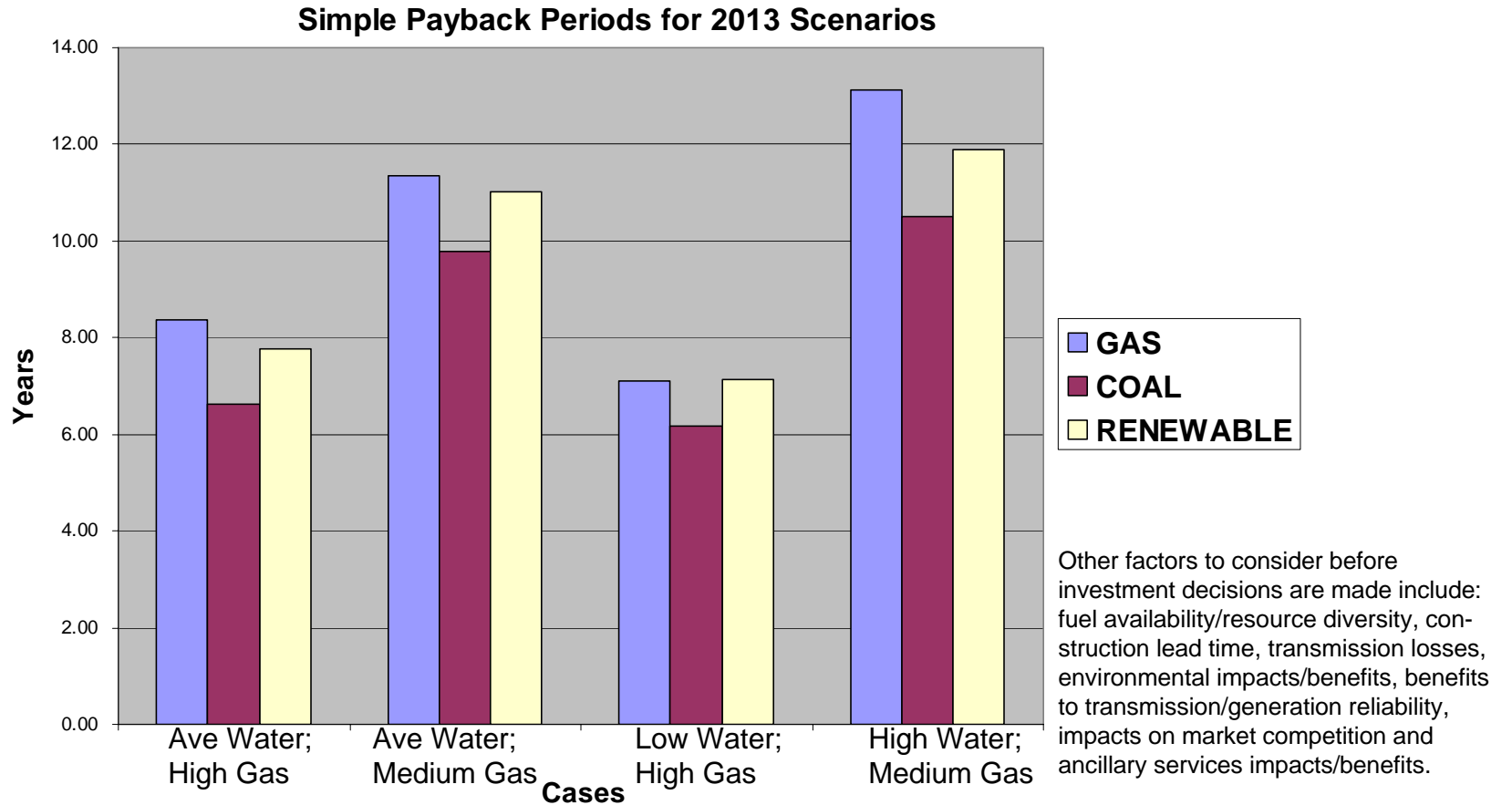


- 1 Alberta-BC
- 2 Alberta – Saskatchewan
- 3 Northwest – Canada
- 4 West of Cascades – North
- 5 West of Cascades – South
- 6 West of Hatwai
- 7 Blank
- 8 Montana to Northwest
- 9 West of Broadview
- 10 West of Colstrip
- 11 West of Crossover
- 12-13 Blank
- 14 Idaho to Northwest
- 15 Midway – Los Banos
- 16 Idaho – Sierra
- 17 Borah West
- 18 Idaho – Montana
- 19 Bridger West
- 20 Path C
- 21 Arizona to Calif
- 23 Four Corners 345/500
- 24 PG&E – SPP
- 25 PacifiCorp/PG&E 115 Intercon.
- 26 Northern – Southern Calif
- 27 Intermountain Power Project
- 28 Intermountain – Mona 345 kv
- 29 Intermountain – Gonder 230 kv
- 30 TOT 1A
- 31 TOT 2A
- 32 Pavant/Intermtn Gonder
- 33 Bonanza West
- 34 see paths 78 & 79
- 35 TOT 2C
- 36 TOT 3
- 37 TOT 4A
- 38 TOT 4B
- 39 TOT 5
- 40 TOT 7
- 41 Sylmar to SCE
- 42 IID – SCE
- 43 North of San Onofre
- 44 South of San Onofre
- 45 SDG&E Comision Fed. de Elect.
- 46 West of Colorado River (WOR)
- 47 Southern New Mexico (NM1)
- 48 Northern New Mexico (NM2)
- 49 East of the Colorado River
- 50 Cholla – Pinnacle Peak
- 51 Southern Navajo
- 52 Silver Peak – Control 55 kv
- 53 Billings – Yellowtail
- 54 Coronado West
- 55 Brownlee East
- 56-57 Blank
- 58 Eldorado – Mead 230 kv Lines
- 59 WALC Blythe – SCE Blythe



Figure E-1: SSG-WI Study Results for 2013 Scenarios

	Gas	Coal	Renewable
New Transmission (Miles)	1325	7600	3360
New Transmission Costs (\$B)	2.64	16.74	6.71
New Generation (GW)	57	57	67
New Generation Costs (\$B)	17.44	30.51	36.76
Range of Production Cost Savings (\$B/yr)	1.53-2.83	4.5-7.65	3.65-6.1



Other Considerations

- This SSG-WI study was a high level first cut at identifying future transmission needs for the Western Interconnection.
- Additional studies are required by SSG-WI and/or Subregional Groups before specific projects can be identified and proposed for implementation.

Next Steps

- **SSG-WI** –
 - Perform annual existing system utilization reviews
 - Perform annual studies of potential future needs and expansion issues
 - Identify modeling improvements to enhance the usefulness of future studies

Next Steps

- **Federal, State policymakers** –
 - address issues such as cost allocation and cost recovery to encourage investment in transmission and demand side alternatives.
- **Subregional Planning Groups and SSG-WI** –
 - Continue to build a close working relationship to address planning and implementation issues.