

# ***Summary of SSG-WI 2003 Economic Studies***

## ***STEP***

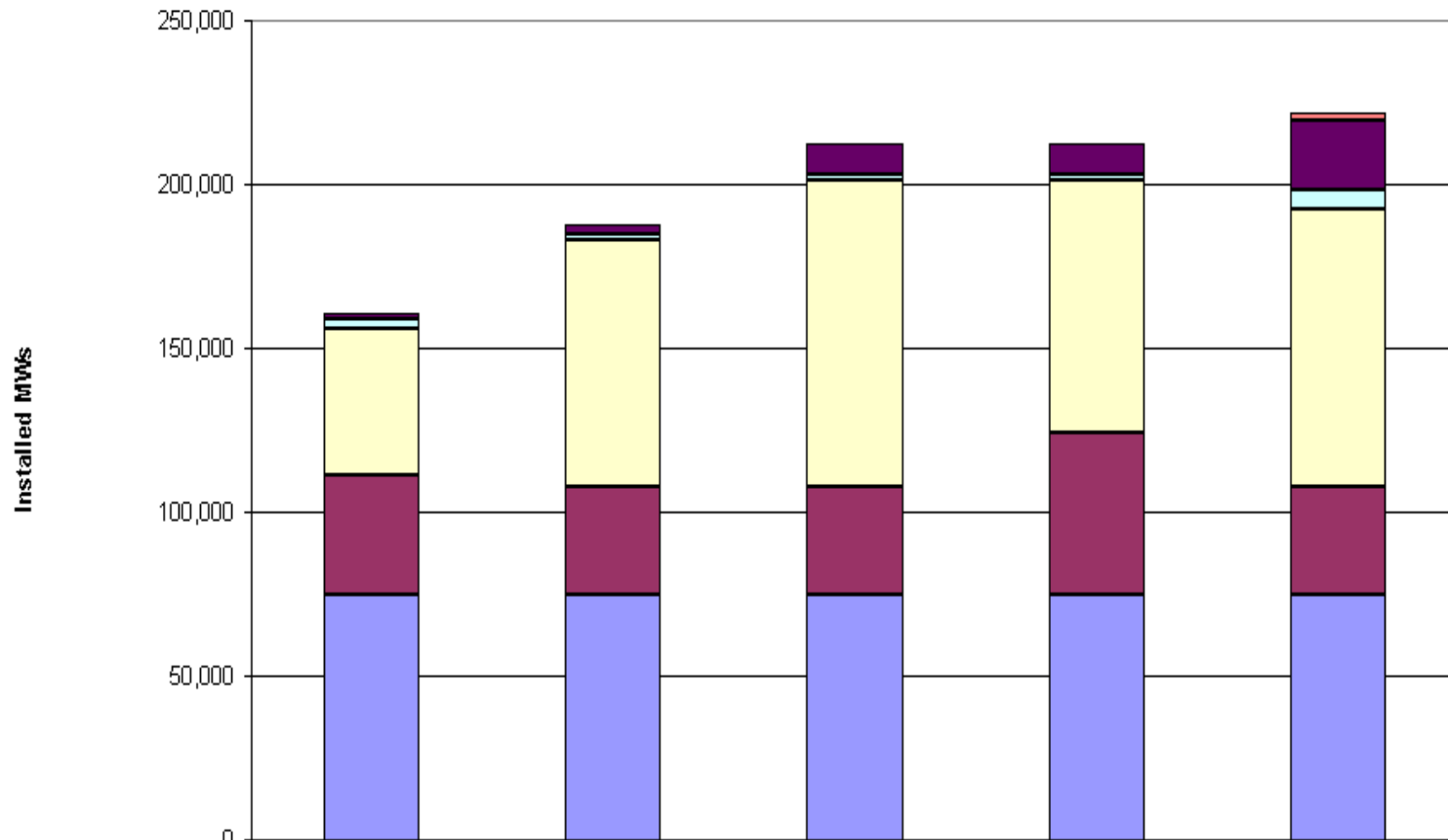
***December 10, 2003***

***Harlow Peterson***

# 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**
- **Sensitivity Studies for Gas Price and Hydro**

# WECC Capacity By Energy Source

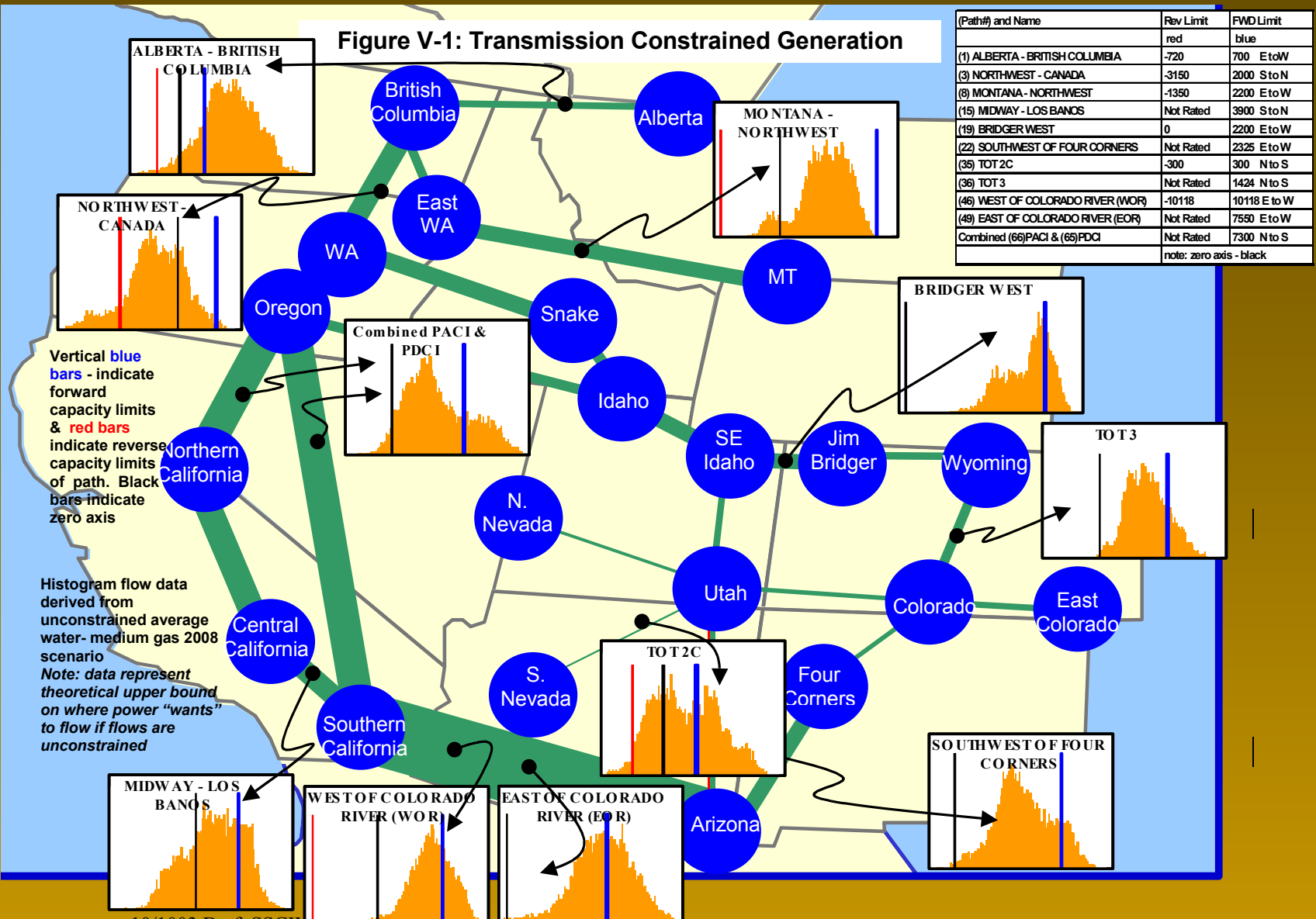


	2000 Actual	2008 Estimate	2013 Gas	2013 Coal	2013 Renewable
■ Solar	0	0	0	0	2,442
■ Wind	1,200	2,800	9,350	9,350	21,350
□ Geo & Biomass	3,169	2,169	2,169	2,169	5,941
□ Gas	44,602	75,195	93,353	77,095	84,699
■ Coal	36,571	32,573	32,573	48,873	32,573
■ Nuke/Hydro/Other	74,753	74,965	74,965	74,965	74,965

# 2008 Findings

- In the 2008 study, identified approximately \$110 million in unrealized production cost savings due to path congestion (with planned facilities).
- Identified paths that may be congested in the near future

**Figure V-1: Transmission Constrained Generation**

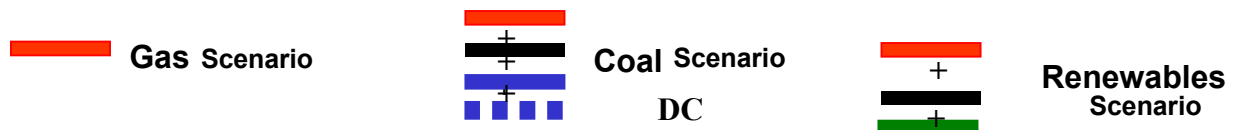
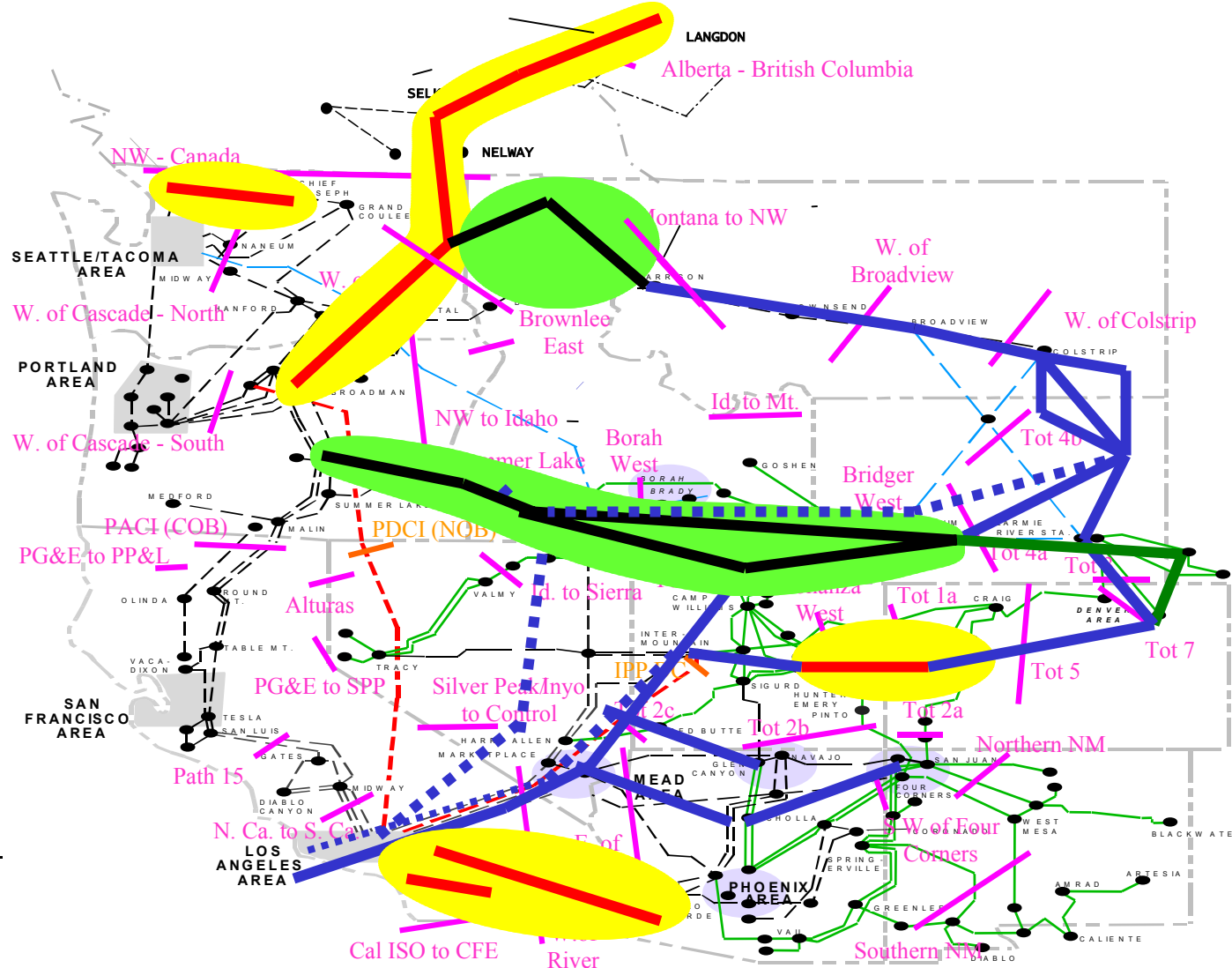




# 2013 Findings

- **Identified transmission facilities necessary to alleviate path congestion for 3 bookend resource scenarios**
  - ◆ **Gas – 1325 miles**
  - ◆ **Coal – 7605 miles**
  - ◆ **Renewable – 3360 miles**
- **Found that certain transmission facilities are common to all 3 resource scenarios**

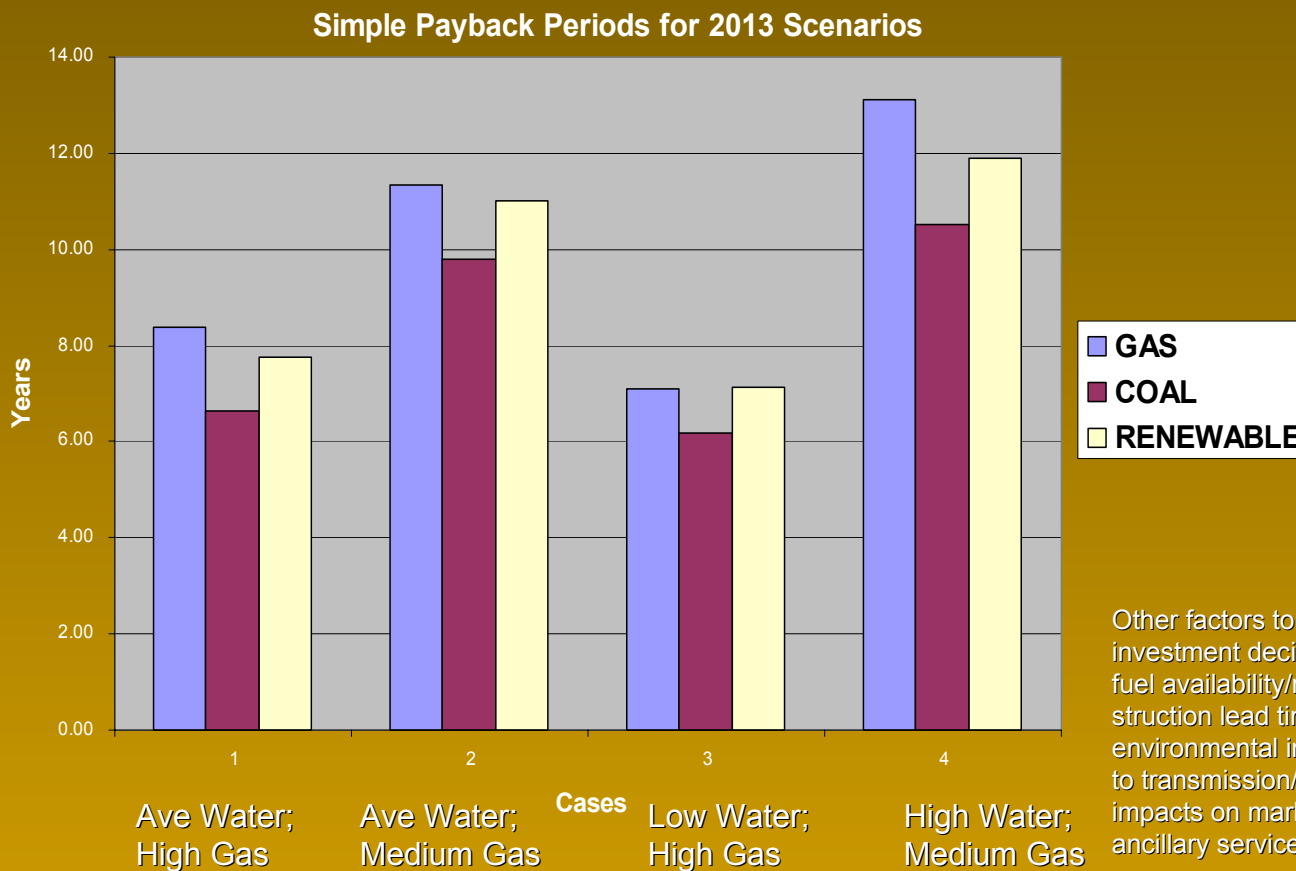
# Western Interconnect Transmission Paths



- 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 TOT3
- 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 Colrado 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

# SSG-WI Study Results for 2013 Scenarios

	<u>Gas</u>	<u>Coal</u>	<u>Renewable</u>
New Transmission (Miles)	1,325	7,600	3,360
New Transmission Costs (\$B)	2.6	16.7	6.7
New Generation (GW)	57	57	67
New Generation Costs (\$B)	17.4	30.5	36.7
Range of Production Cost Savings (\$B/yr)	1.5 - 2.8	4.5 - 7.6	3.6 - 6.1



Other factors to consider before investment decisions are made include: fuel availability/resource diversity, construction lead time, transmission losses, environmental impacts/benefits, benefits to transmission/generation reliability, impacts on market competition and ancillary services impacts/benefits.

# Next Steps

- **Subregional Planning Groups –**
  - ◆ perform additional in-depth studies.
- **Developing Planning Work Group  
2004 Study Objectives**

# Personal Opinion

## Study Value:

1. Provided economic database for 2008 & 2013
2. Improved understanding of economic study tool
3. Valuable tool to compare alternatives
4. Helps regional planning groups to focus on congested areas

# Considerations

- **Additional studies are required by SSG-WI and/or Subregional Groups before specific projects can be identified and proposed for implementation.**
- **Be cautious about drawing resource conclusions from this study – focus was on transmission needs.**