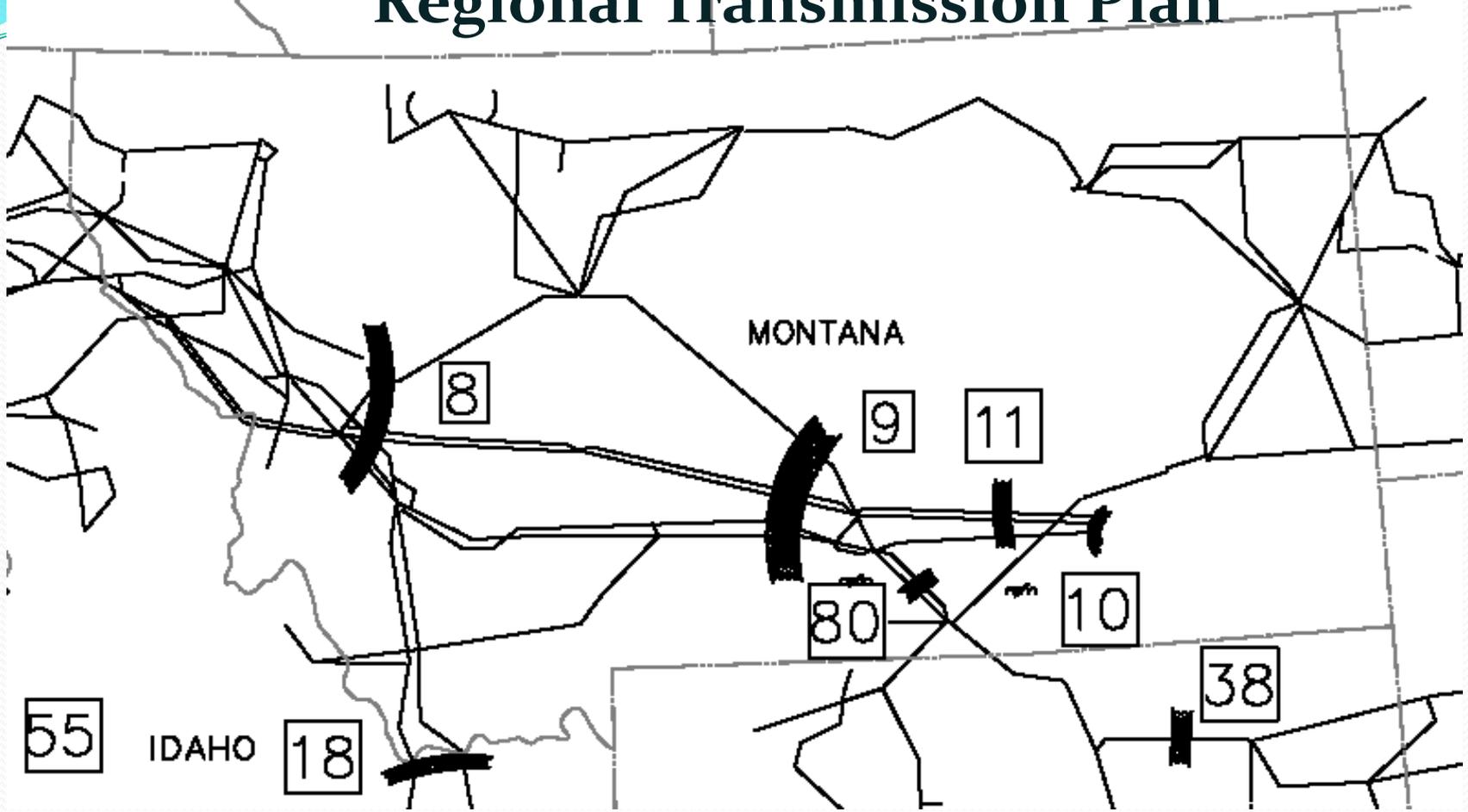


# WECC Draft 10-Year Regional Transmission Plan



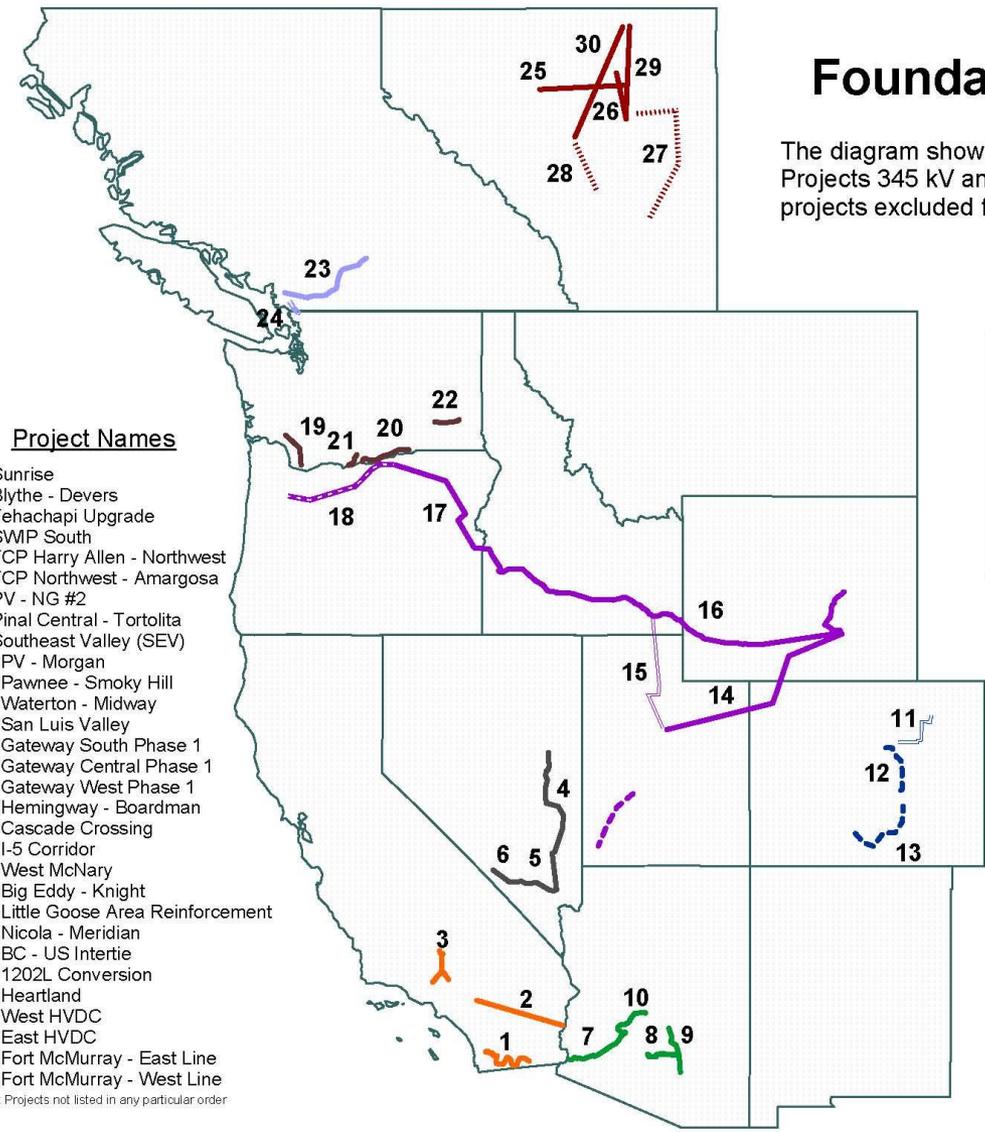
Montana PSC  
Chairman Travis Kavulla  
July 15, 2011



<http://www.wecc.biz/PLANNING/TRANSMISSIONEXPANSION/RTEP/Pages/default.aspx>

# Foundational Projects - 2020

The diagram shows illustrative routings for 30 SCG Foundational Projects 345 kV and higher. There are 10 lower voltage/reinforcement projects excluded from the map for clarity.



## Project Names

1. Sunrise
2. Blythe - Devers
3. Tehachapi Upgrade
4. SWP South
5. TCP Harry Allen - Northwest
6. TCP Northwest - Amargosa
7. PV - NG #2
8. Pinal Central - Tortolita
9. Southeast Valley (SEV)
10. PV - Morgan
11. Pawnee - Smoky Hill
12. Waterton - Midway
13. San Luis Valley
14. Gateway South Phase 1
15. Gateway Central Phase 1
16. Gateway West Phase 1
17. Hemingway - Boardman
18. Cascade Crossing
19. I-5 Corridor
20. West McNary
21. Big Eddy - Knight
22. Little Goose Area Reinforcement
23. Nicola - Meridian
24. BC - US Intertie
25. 1202L Conversion
26. Heartland
27. West HVDC
28. East HVDC
29. Fort McMurray - East Line
30. Fort McMurray - West Line

Note: Projects not listed in any particular order

## Transmission Key

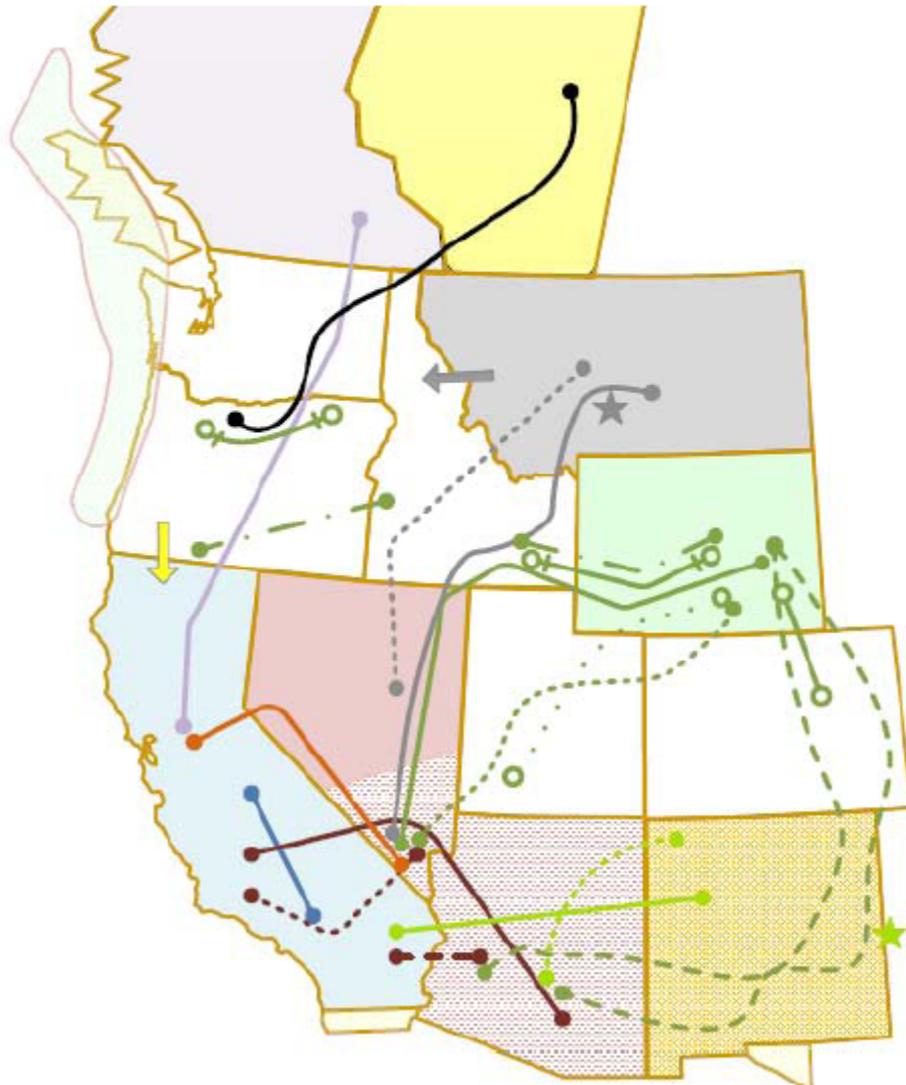
- 500 kV Single Circuit Line
- 345 kV Single Circuit Line
- 500 kV Double Circuit Line
- 345 kV Double Circuit Line
- DC Circuit (various voltages)

## Sub-Region Key

- |              |             |
|--------------|-------------|
| <b>CAISO</b> | <b>NTTG</b> |
| <b>SSPG</b>  | <b>CG</b>   |
| <b>SWAT</b>  | <b>BCH</b>  |
| <b>CCPG</b>  | <b>AESO</b> |



# Transmission Expansion Projects Considered

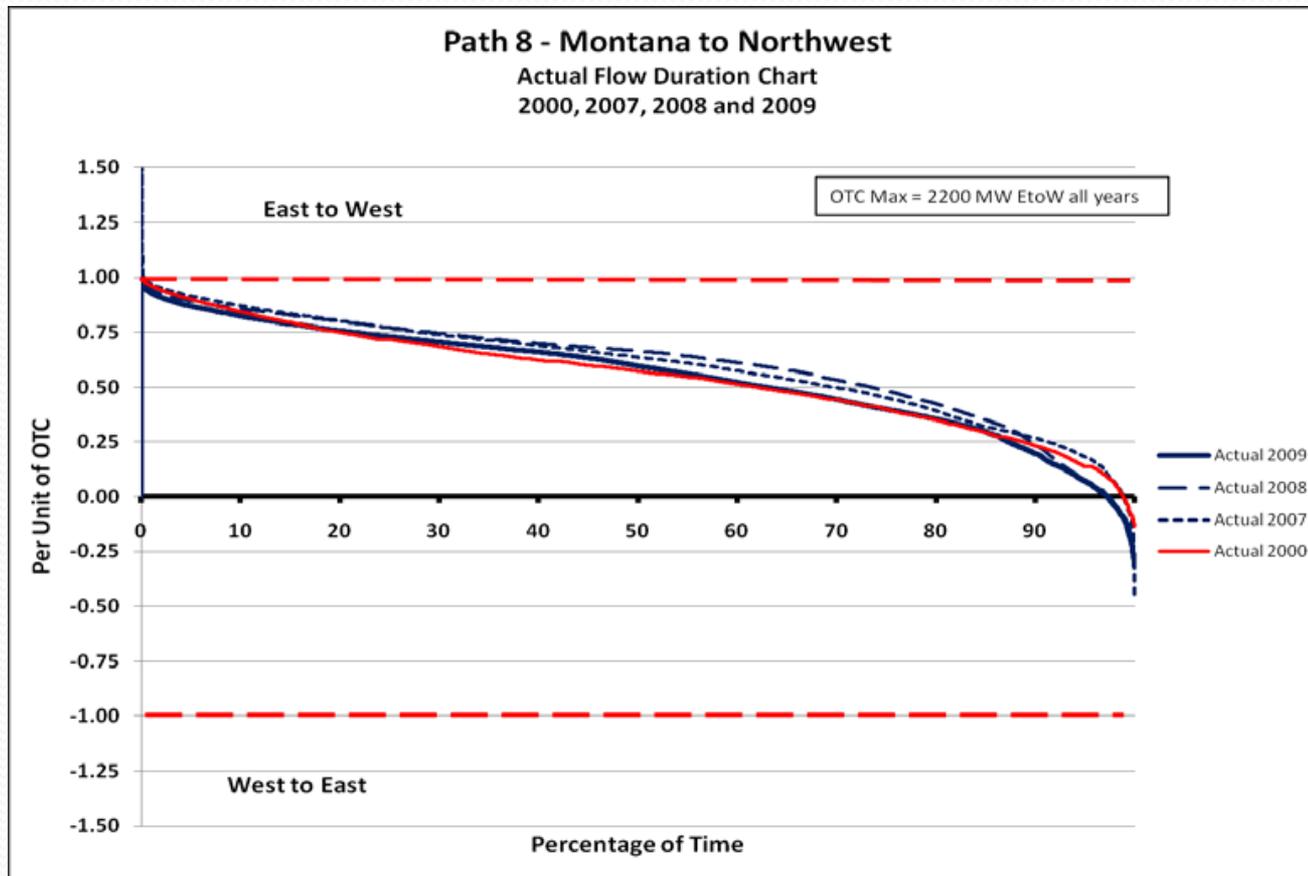


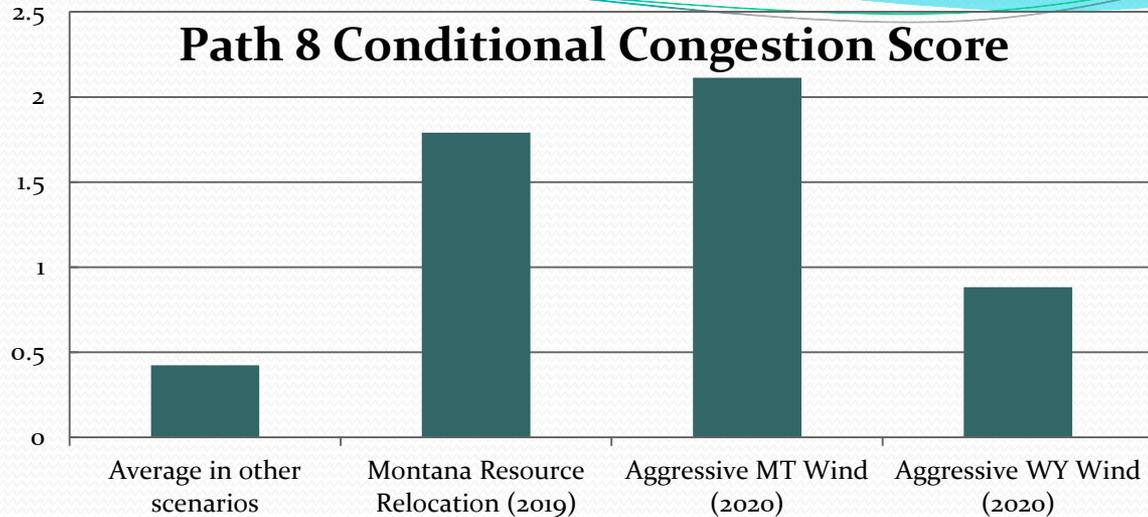
- Central California Clean Energy Transmission Project
- Phoenix-Mead-Adelanto HVDC
- Green Energy Express Transmission Project Phases 2&3
- Palo Verde - Colorado River 500kV Line
- Zephyr Project
- TransWest Express
- Hemingway-Captain Jack & GW#2
- High Plains Express and SunZia
- Cascade Crossing & GW #2
- Wyoming-Colorado Intertie
- Gateway South #2
- Canada-PNW-Northern CA Project
- Reno to Las Vegas 500kV and Two Blackhawk to Tracy/Teale 500 kV lines
- Northern Lights
- Chinook Project
- MSTI and SWIP Projects
- ← MT-NW Path 8 Upgrades
- ★ Add 400MW Pumped Storage
- Santa Fe Project
- SunZia, High Plains Express Projects
- ★ Tres Amigas Added
- Navajo Transmission Project
- ← COI Uprate Project

## Montana to Northwest path – Path 8

- The utilization of and congestion on the Montana to Northwest transmission path (Path 8) increases under most conditions (i.e., renewable generation relocation in Montana) analyzed in support of the Plan.
- WECC recommends consideration by decision-makers for transmission upgrades or other mitigating measures that relieve congestion on path 8 as renewable generation is expanded in Montana.

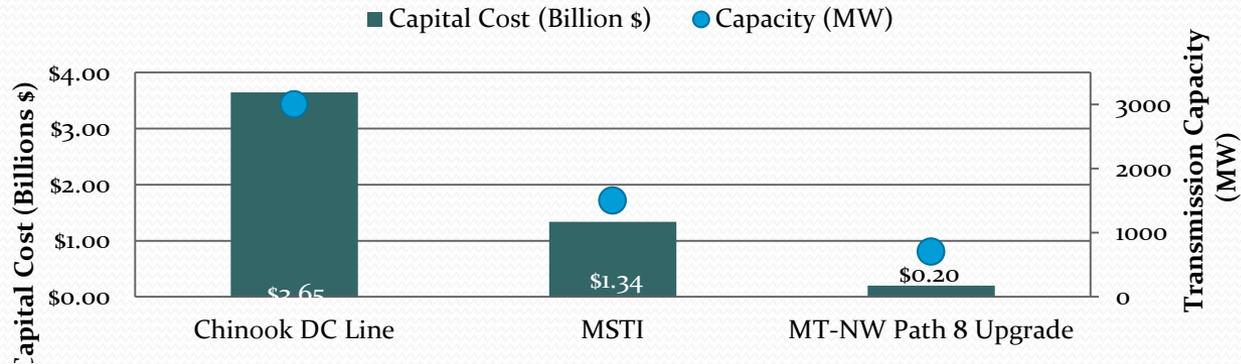
- Of the three export paths used to transfer resources out of Montana, Path 8 seems to be the most congested by all measures.
- Historical data shows that Path 8 has been, and remains, heavily utilized, which is consistent with its original design to move large quantities of base load generation out of Montana to the Northwest.





- In both Montana resource scenarios, Path 8 operated above 90 percent of its limit for at least 40 percent of the year. This extreme level of utilization is reflected in the high conditional congestion score.
- The drastic increase in congestion along Path 8 in these specific Montana and Wyoming resource scenarios is due to the system's inability to integrate the amount of renewable resources modeled while continuing to operate base load coal units in a traditional manner without additional transmission.

# Montana Export Transmission Expansion Projects

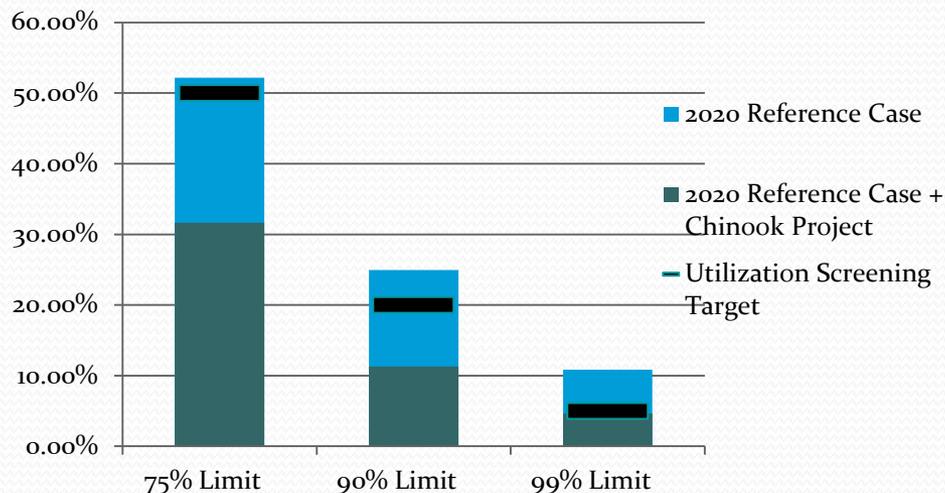


Chinook – 500 kV DC, 3000 MW electric transmission line originating near Harlowton, Montana, traversing Idaho and terminating in the Eldorado Valley, south of Las Vegas, Nevada.

MSTI – 500 kV AC, 1500 MW transmission line, delivering electricity from Montana to customers in the western US. The intent of the MSTI project addresses the need for new electric transmission service: generating sources to customers, and to bolster the western power grid.

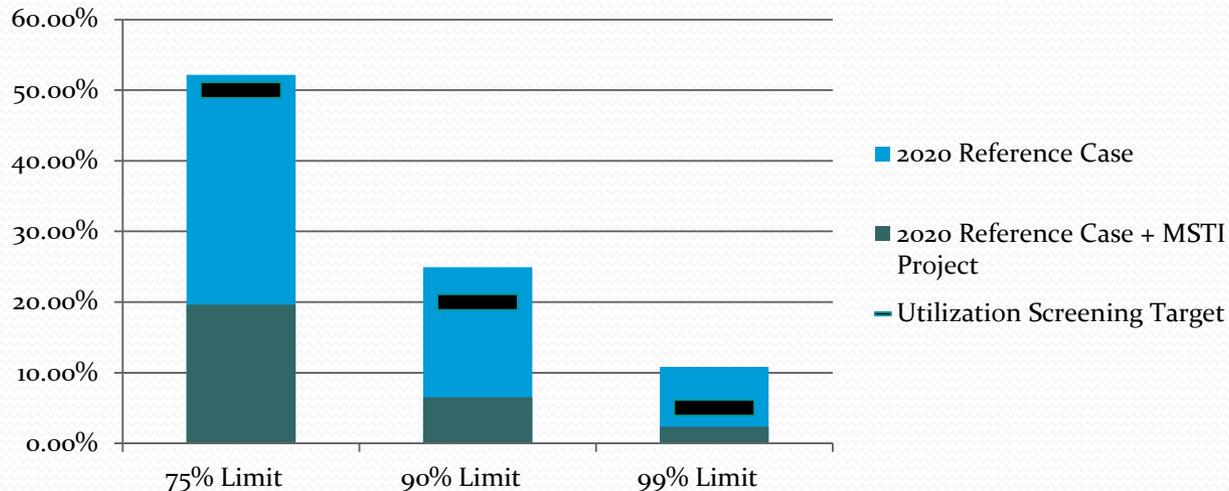
Path 8 Upgrade – A series compensation project that would increase the Path 8 rating from 2200 MW to 2900 MW.

## Montana to Northwest Utilization: Chinook



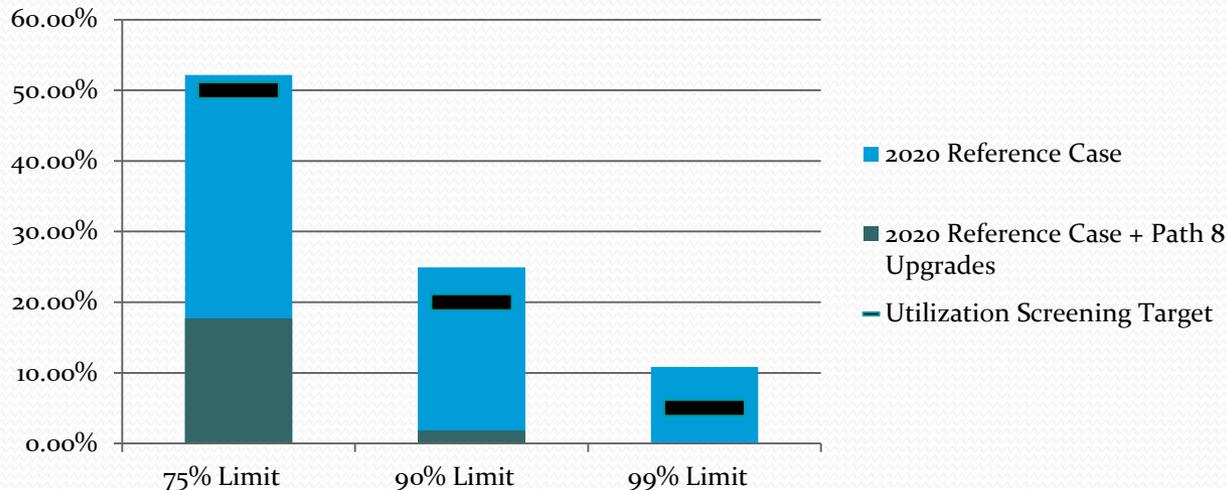
- In addition to reducing the congestion along Path 8, the Chinook project also reduced the WECC-wide average U<sub>909</sub> from 5.74 to 5.64 percent.
- The average U<sub>75</sub> decreased from 15.08 to 13.63 percent, as well. Overall, the Chinook project was effective at reducing congestion along Path 8 and lowering WECC-wide utilization values.

## Montana to Northwest Utilization: MSTI



- The addition of the MSTI project also resulted in the Montana – Northwest no longer passing the utilization screening.
- All three utilization metrics decreased, with more than 30 percent decrease in the U<sub>75</sub> metric.
- In the MSTI scenario, the entire WECC-wide U<sub>90</sub> average did not show substantial change. With the addition of the MSTI project, the total number of paths that passed the utilization screening did not decrease.

## Montana to Northwest Utilization: Path 8 Upgrades



The Path 8 Upgrade project resulted in the greatest decrease in Montana – Northwest utilization metrics. The project effectively increased the east to west limit of the line from 2200 MW to 2900 MW. Path 8 did not pass any of the utilization screenings after the implementation of the upgrades.

The Path 8 Upgrades had no effects on the WECC-wide average  $U_{90}$  value, or the number of paths that passed the utilization screening. For those paths that passed the utilization screening in the Path 8 Upgrade Scenario, there were no significant increases or decreases in utilization.