

Wyoming: Where Power Transmission & Generation Meet

**Wyoming Infrastructure
Authority**

**Loyd G. Drain
Executive Director**

**Multistate Wind Energy
Meeting**

**January 5, 2011
Denver, CO**

**Given our vast resources,
we're the Energy Gateway
to the West**



Wyoming

- *Wyoming is #1 in total energy produced in the U.S.*
- *#1 in coal production—PRB coal is marketed in 37 states*
- *#2 in natural gas production*
- *#1 in developable Class 6 & 7 wind resource in the West*
- *From 4/2010 to 3/2011 WY will add 2BCFD+ of gas pipeline capacity*
 - *El Paso's Ruby Line from Opal, WY to Malin, OR: 1.5 BCFD*
 - *TransCanada's Bison Line from NE WY to ND: .477 BCFD*
 - *MidAmerican's Kern River expansion (WY to CA): .145 BCFD*



Wyoming Infrastructure Authority

- *Created in 2004 by the Wyoming Legislature---*
<http://legisweb.state.wy.us/statutes/statutes.aspx?file=titles/Title37/T37CH5.htm>
- *Mission: diversify and expand the state's economy through improvements in the transmission grid*
- *Tools:*
 - *Can plan, finance, site, own, operate and otherwise promote transmission projects—model used contemplates plan & development only*
 - *\$800,000 +/- annual operating budget supports staff and consultants*
 - *\$10 million venture account to develop projects*
 - *\$1 billion in bonding capability to help finance transmission projects*

Wyoming Infrastructure Authority

Structure:

- *Five (5) member Governor-appointed Board of Directors*
 - *Mike Easley, Chairman: CEO of Powder River Corporation*
 - *Kyle White, Vice-Chairman: VP of Regulatory and Governmental Affairs Black Hills Corporation*
 - *Bryce Freeman, Treasurer: Administrator of the Wyoming Office of Consumer Affairs*
 - *J.M. Shafer, member: Former executive with both Tri-State and Western Area Power Administration*
 - *Bret Jones, member: Sr. Vice President with George K Baum & Co*
- *Staff*
 - *Loyd Drain, Executive Director; Holly Martinez, Administrative Manager; Rob Hurless, Energy Consultant; Tom Dennis, Cassidy & Associates; and other Consulting Support*

Legislative Issues

- 2010 Legislative Session

- *Sales tax exemption on equipment expires on 30 June, 2012*
- *Generation tax of \$1/MWh starting the 4th year of operation*

- Other Issues

- *Legislative Wind Energy Task Force in their 1 November, 2010 report to the Legislature and Governor concluded:*
 - *Eminent Domain right should not extend to wind collector systems*
 - *Defined Collector System*
 - <http://legisweb.state.wy.us/lisoweb/Wind%20Energy/Documents/WETF%20Final%20Report.pdf>
- *2011 Legislation Session commences on 11 January, 2011*

Transmission Authorities in the West

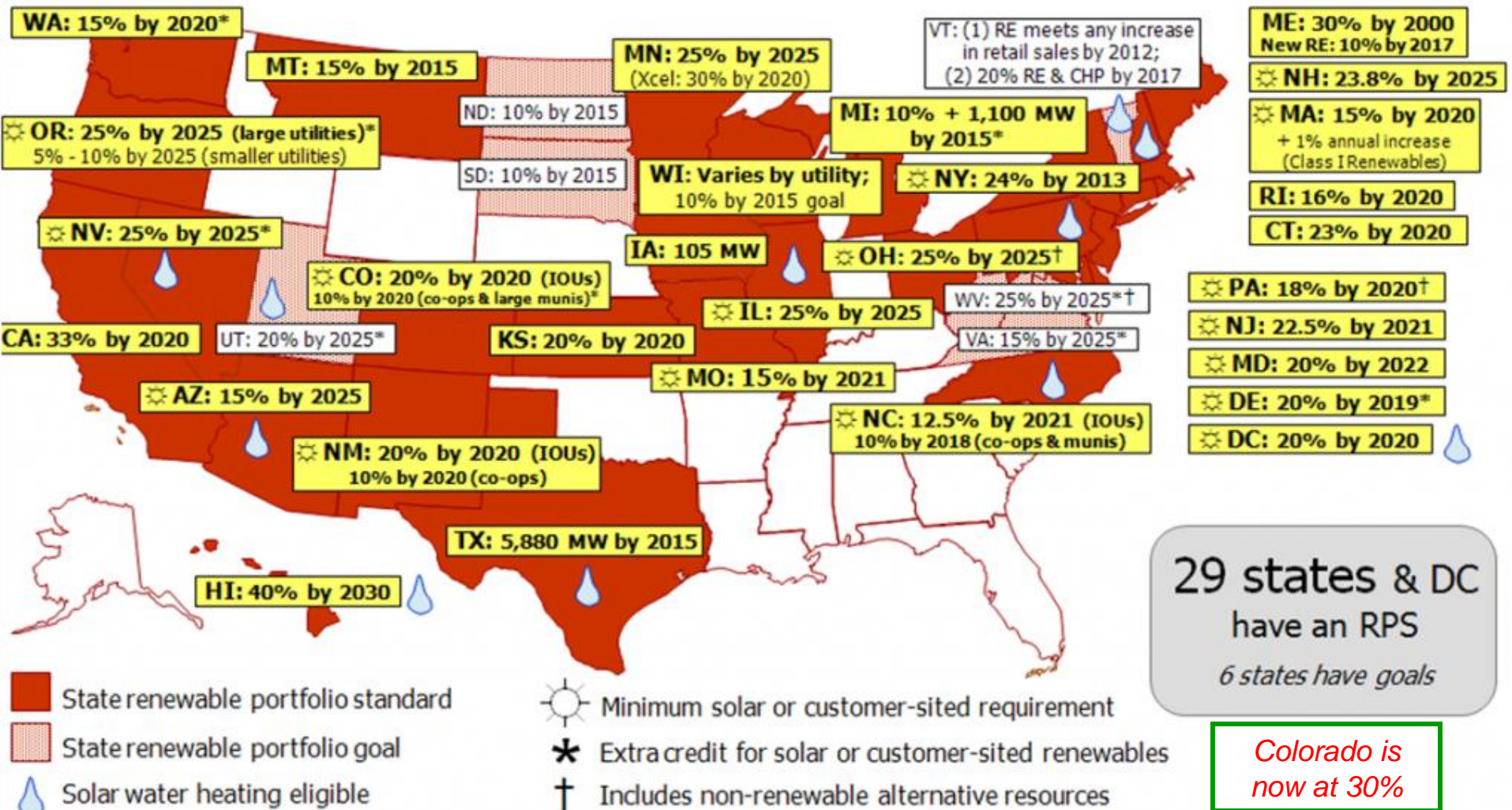
Eight States have dedicated varying resources to support transmission infrastructure and Development

- *Wyoming Infrastructure Authority (2004)*
- *Idaho Energy Resources Authority (2005)*
- *Kansas Electric Transmission Authority (2005)*
- *North Dakota Transmission Authority (2005)*
- *South Dakota Energy Infrastructure Authority (2005)*
- *Colorado Clean Energy Development Authority (2007)*
- *New Mexico Renewable Energy Transmission Authority (2007)*
- *Utah Generated Renewable Energy Electricity Network (2010)*

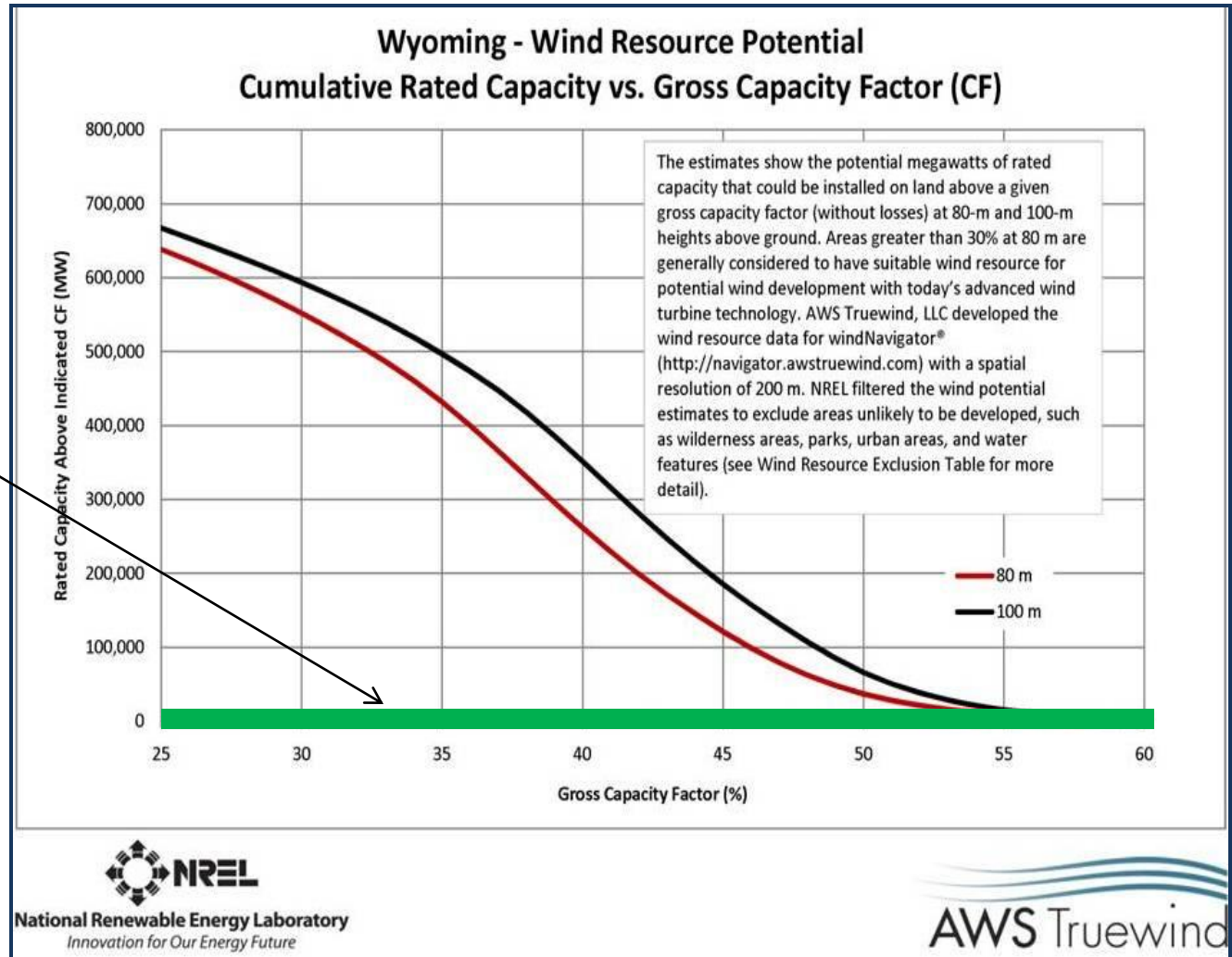


Renewable Portfolio Standards

www.dsireusa.org / November 2009



Wind Quality and Availability in Wyoming



Amount of transmission and wind development that is possible to be constructed in the next 10 years

Transmission & Generation Project Data







- *3 of the 7 lines are DC lines to mitigate line losses*
- *Line distance is from 180 miles to 2,000 miles*
- *Project Cost is from less than \$300 million to over \$6 billion*
- *Generation cost ranges from \$1.2 million to \$2.0 million per MW for gas-fired and wind generated power*
- *4 to 5 years to obtain an EIS at a cost of \$40-\$60 million*

DC Converter Stations—you need 2 and they list for only \$500,000,000 each



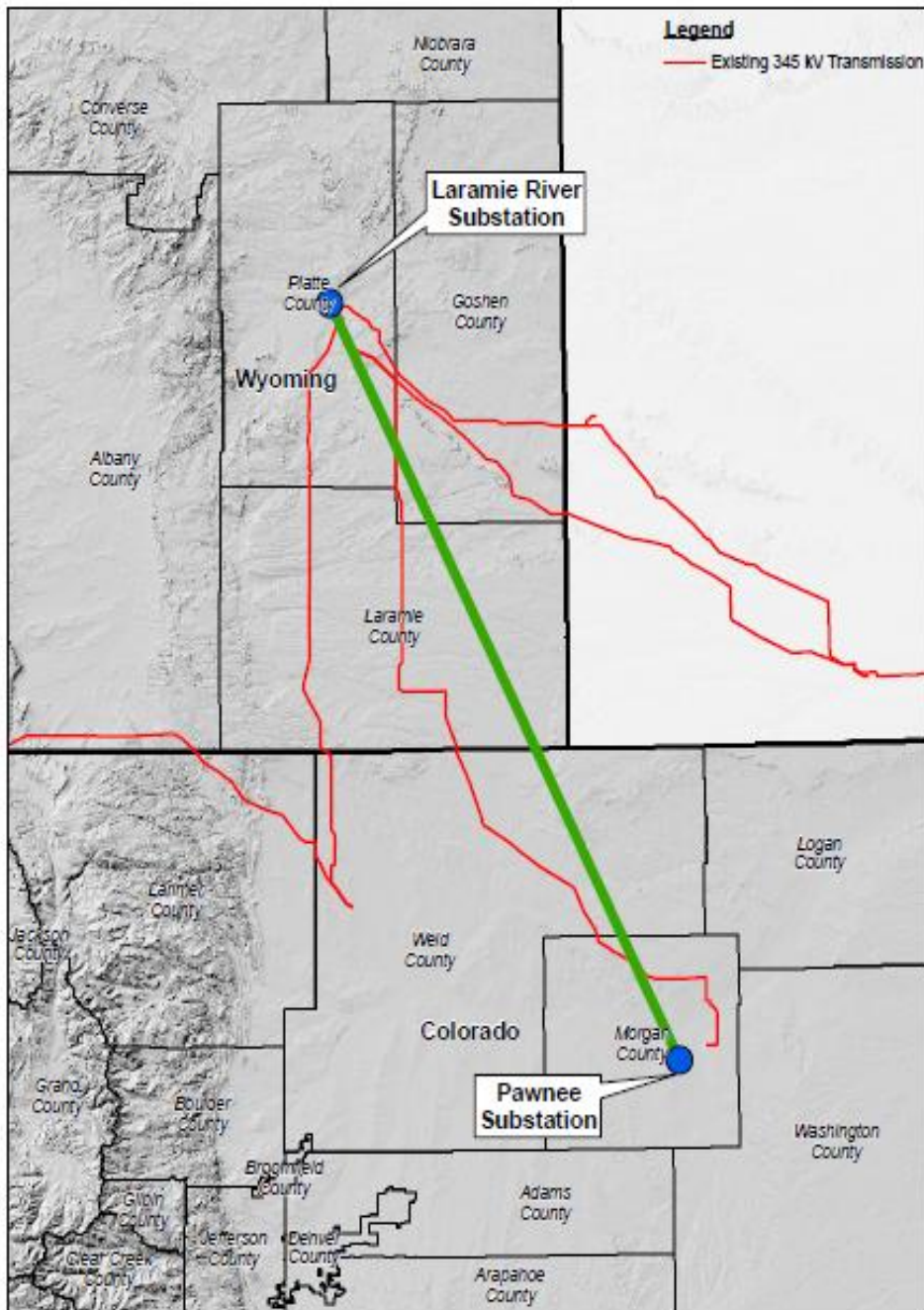
Wyoming-Based Transmission Projects in the Development Stage

Projects

Wyoming-Colorado Interie	
Energy Gateway (West & South)	
TransWest Express	
High Plains Express	
Zephyr	
Overland Transmission	



Routes shown are for illustrative purposes only & will be finalized following the permitting and siting process



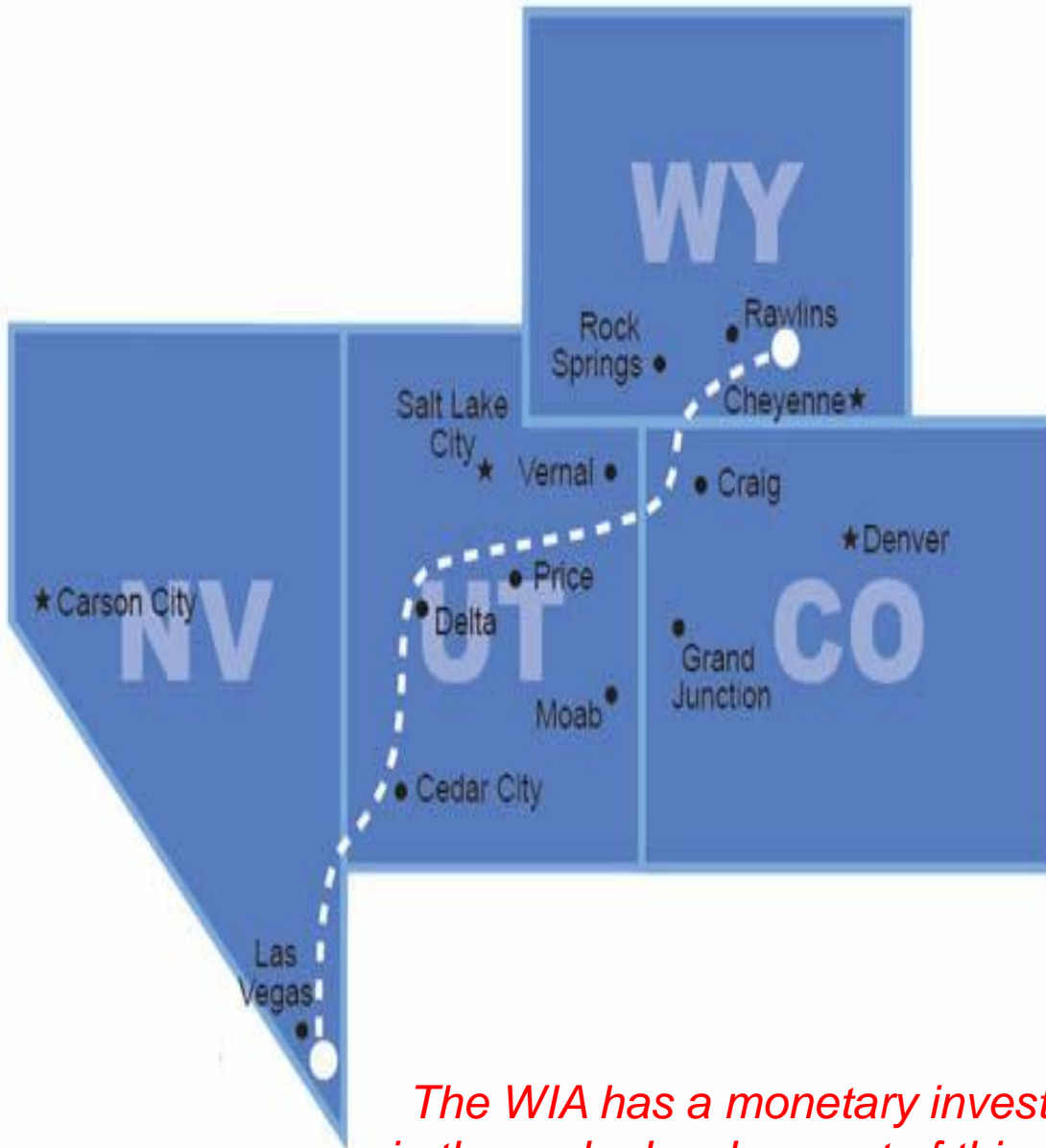
Wyoming-Colorado Intertie Project

*LS Power & WIA—850 MW
 from LRS to Colorado
 345 kV Line AC—180 miles
 As early as 2013
 \$180 million*

*The WIA has a 50% interest
 in the development of this project*



TransWest Express Project

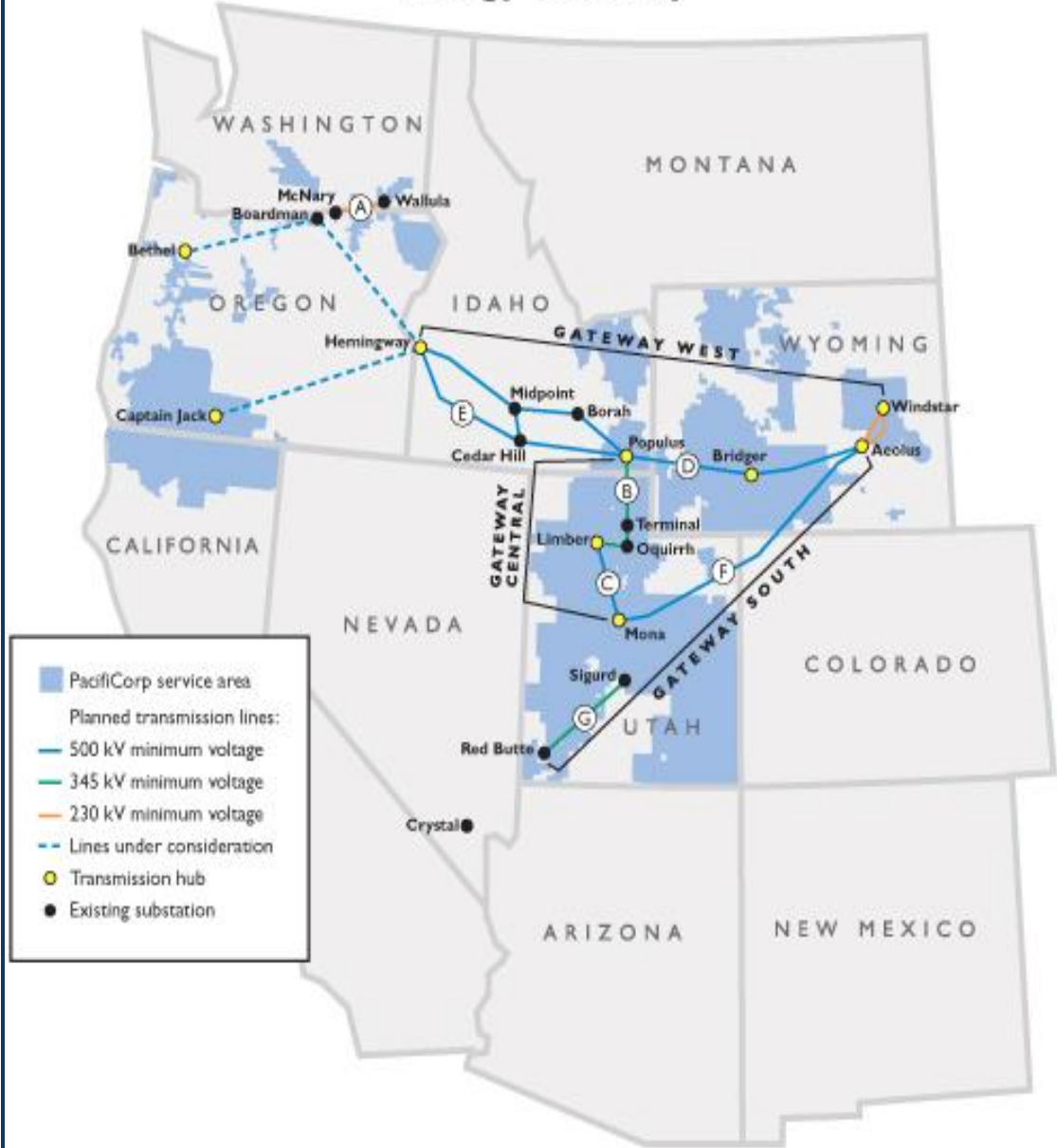


*TransWest Express, LLC:
3,000 MW from WY to
CAISO south of Las Vegas
600 kV DC line—725 miles
As early as 2015
\$3 billion*

*The WIA has a monetary investment
in the early development of this project*



Energy Gateway



Energy Gateway Projects

*PacifiCorp/MEHC & Idaho Power: 3,000 MW total from WY to Idaho & Utah
2,000 miles when complete
2014-2019--\$6.1 billion
500 kV and 230 kV AC*



This map is for general reference only and reflects current plans.
It may not reflect the final routes, construction sequence or exact line configuration.



Zephyr Project

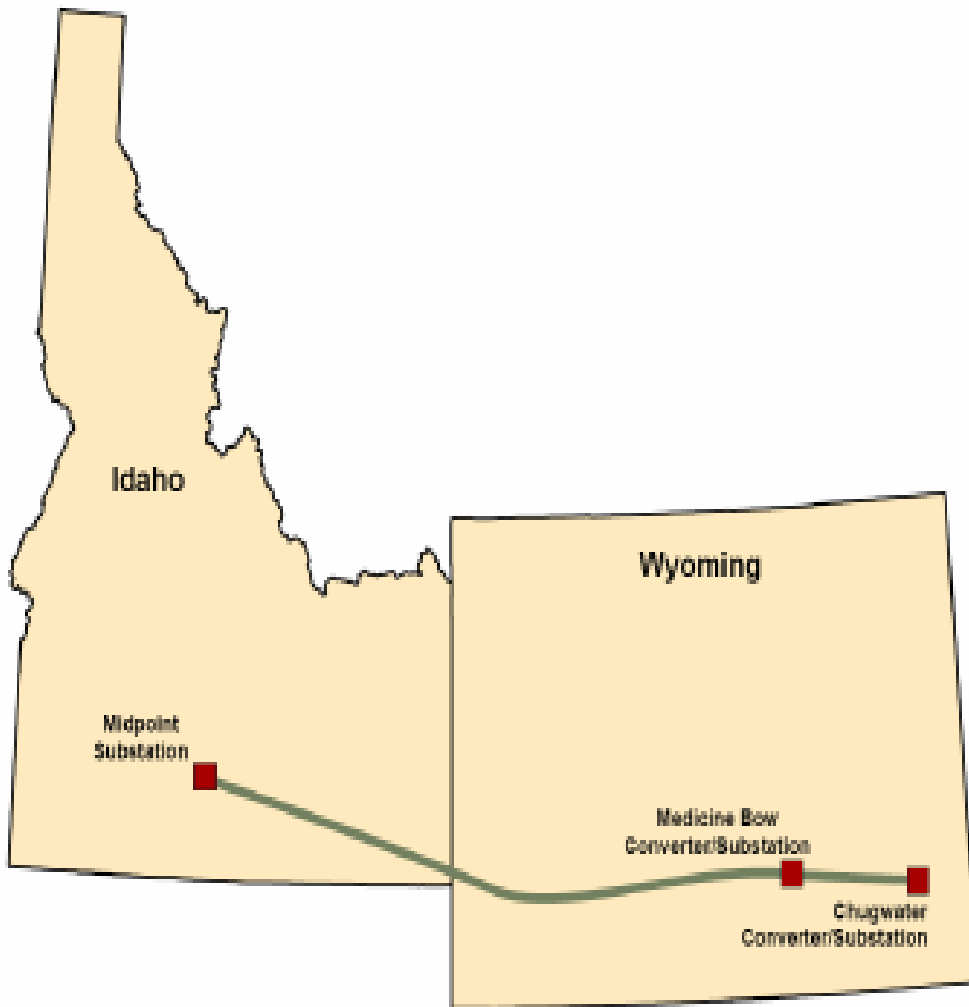
TransCanada: 3,000 MW from WY to a DC/AC converter station south of Las Vegas
Double-circuit 500 kV DC
1,100 Miles as early as 2016
\$3 billion

Open season results—Pathfinder, Horizon & BP



Overland Intertie Project

*Jade Energy Associates,
LLC: up to 3,000 MW from
WY to Midpoint in Idaho to
interconnect with SWIP
Double-circuit 500 kV DC
As early as 2016—625
miles--\$1 billion +*

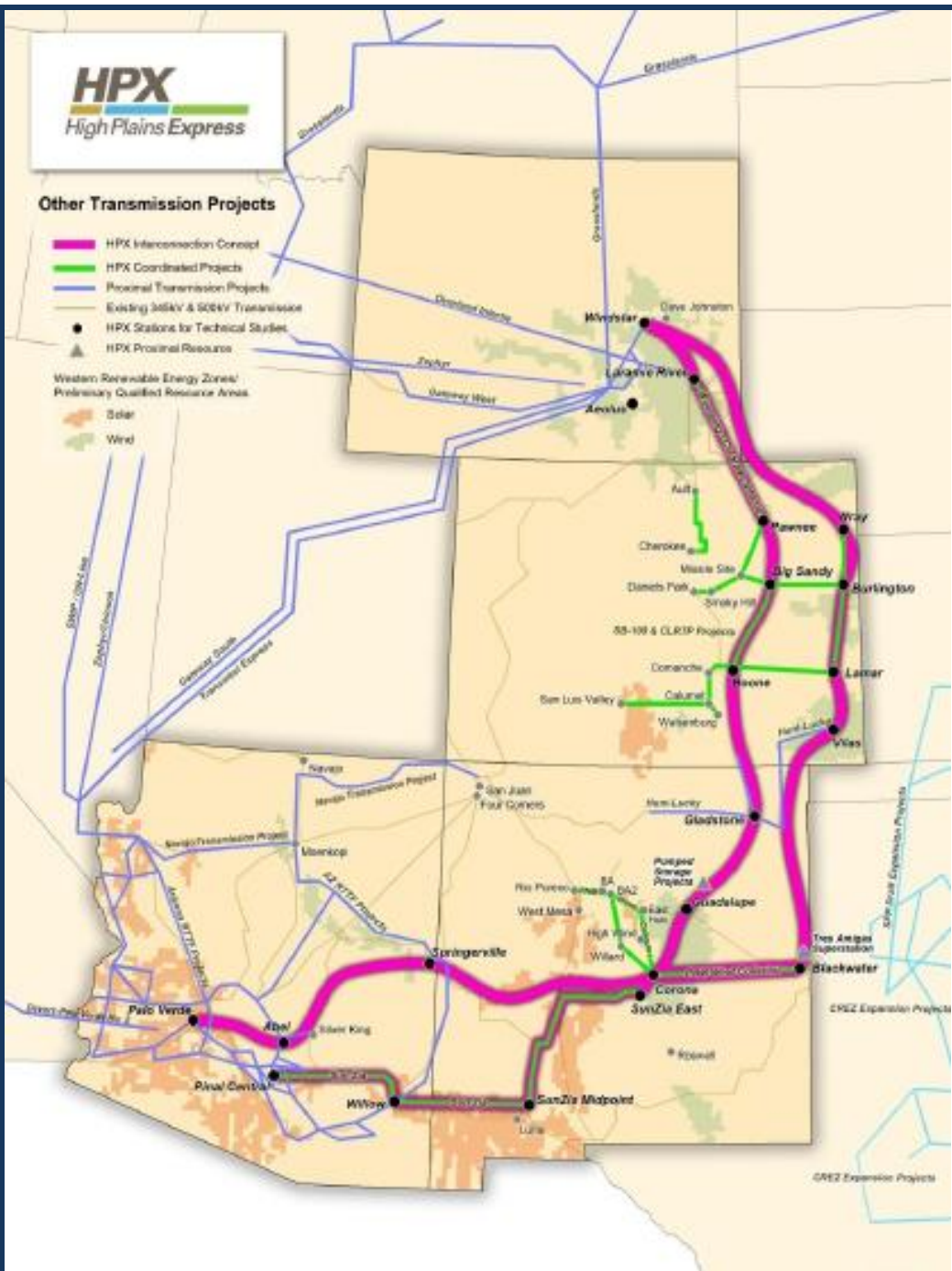


Other Transmission Projects

- HPX Interconnection Concept
- HPX Coordinated Projects
- Proximal Transmission Projects
- Existing 345kV & 500kV Transmission
- HPX Stations for Technical Studies
- ▲ HPX Proximal Resources

Western Renewable Energy Zones/
Preliminary Qualified Resource Areas

- Solar
- Wind



High Plains Express Project

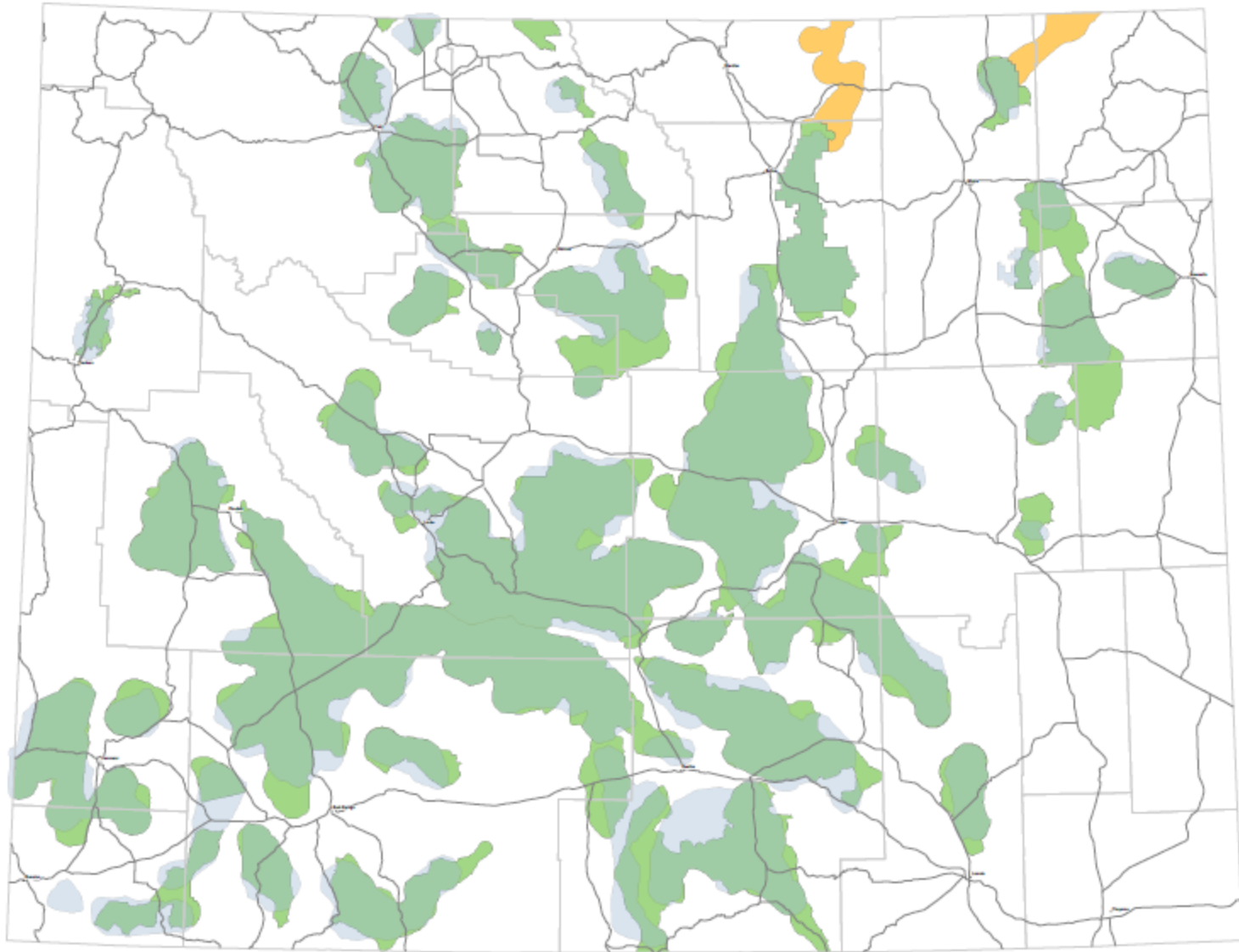
*3,500 MW from WY to CO,
NM and AZ*

*Double-circuit 500 kV AC
line--\$5 billion*

The Project participants include:

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

Version 3 Sage-Grouse Core Areas 06.29.10



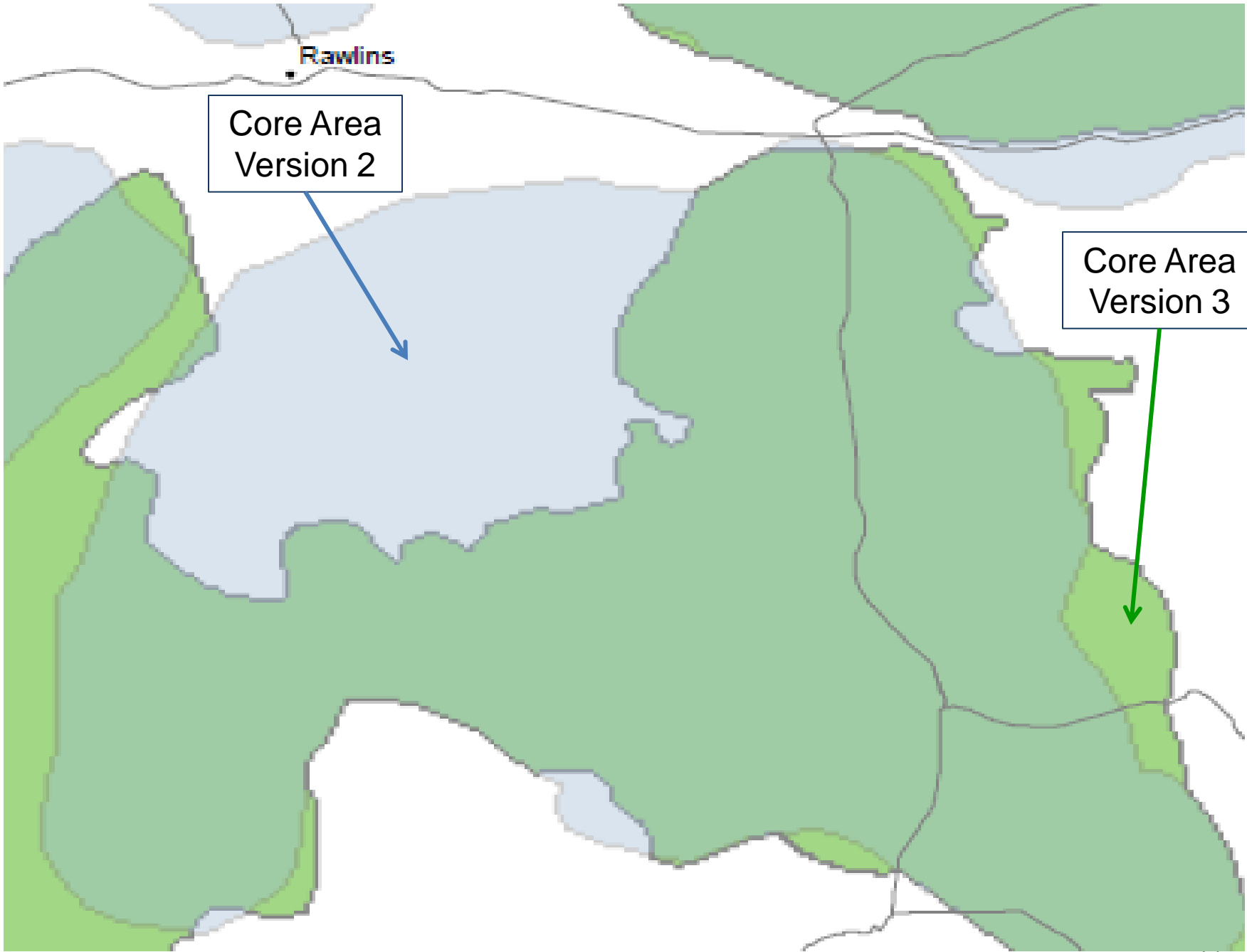
Nyssa Whitford
Sage-Grouse GIS Analyst
Lander Regional Office
06.26.10



0 15 30 60 90 120 Miles

- Cities
- Roads
- Counties
- Connectivity Corridors
- Core Area Version 2
- Core Area Version 3

Core Areas shown were updated from the version two core areas. The version three core areas were updated with efforts from the Sage-Grouse Local Working Groups and the Governor's Sage-Grouse Implementation Team. The version 3 core areas were finalized on 06.29.10.



Core Area
Version 2

Core Area
Version 3

It's not just about Wind

- *While wind is the catalyst that will drive new transmission, the WIA is fully supportive of:*
 - *Natural gas-fired generation—studies suggest that it makes economic sense to site such generation in Wyoming to support wind development*
 - *Strides continue to be made in the Carbon Capture and Sequestration field and is important for energy security in the future*
 - *New transmission lines will remain operational for 80-100 years and no one knows what the source of electrons flowing down the lines will be in the future*

ICF's Phase 2 Collector System Study & Corridor Mapping

- *With the support of DOE funding, the Wyoming State Energy Office managed a study which examined commercial models for a collector system as well as dispatchable generation (primarily natural gas) sources to address the variability of wind energy*
- *The Study will be released to the public in January; posted on the WIA website; and the findings will be presented at WIA's Winter Board Meeting on 1 February, 2011 in Jackson, WY*
- *In addition, Western Area Power Administration funded a Corridor analysis which will be released before the end of January, 2011*

NREL Economic Benefits & Job Creation Study

- *The WIA has commissioned NREL to conduct a study which will consider the following development:*
 - *9,000 MW of transmission to the marketplace*
 - *9,000 MW of wind generation*
 - *9,000 MW collector system*
 - *1,800 MW of natural gas-fired generation*
- *Based on other studies which have been conducted, the WIA expects that the annual monetary benefit to the State of Wyoming will be in excess of \$1 billion annually for the 20 year economic life of the generation plus the construction period and the transmission line will still be carrying electrons 80 to 100 years from now!*
- *\$20,000 DOE grant was applied-for and obtained mitigating WIA's cost*
- *Study is scheduled for release in late January, 2011 and will be presented at WIA's Winter Board Meeting on 1 February, 2011 in Jackson, WY*

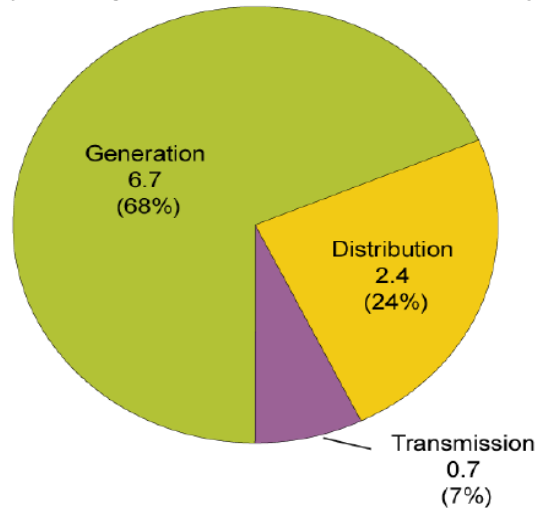
Other Significant WIA funded or assisted Studies/Reports

- *2010: Phase 1 Collector System Study by ICF can be found on the WIA site at: <http://wyia.org/documents/reports>*
- *2010: Transmission Line Separation Study by ICF can be viewed at: <http://wyia.org/documents/reports>*
- *2009: The WIA is a member of the Collector System Task Force (CSTF) comprised of WAPA, PacifiCorp, Anschutz Corp, LS Power and TransCanada, Bob Easton (WAPA), Chairman—the CSTF published a Transmission Report to the Wyoming Legislative Task Force and may be viewed at: <http://wyia.org/documents/reports>*

Common Issues to Address

- *Transmission Corridors across public lands*
- *Expedited EIS schedule which currently takes 4 to 5 years*
- *Tax exempt bonds for the financing of transmission infrastructure*
- *Cost recovery solutions---especially for transmission projects which add reliability to the grid*

■ **Major Components of U.S.
Average Electricity Price, 2008**
(Cents per KWh and Share of Total)



Source: U.S. Energy Information Administration, *Annual Energy Outlook 2010*, Reference Case, Table A8: Electrical Supply, Disposition, Prices, and Emissions, Prices by Service Category (2009).

Questions?

**For more information, please visit our website at www.wyia.org
200 East 17th Street
Cheyenne, WY
307-635-3573**

***You are invited to attend the WIA Winter Board Meeting
on February 1, 2011 in Jackson Hole, WY
<http://wyia.org/events/quarterly-board-meetings>***



WYOMING INFRASTRUCTURE AUTHORITY