Wyoming: Where Power Transmission & Generation Meet

Wyoming Infrastructure Authority

Loyd G. Drain
Executive Director

AWEA/WPPC Road Show

7/28/2011—Laramie

8/17/2011--Wheatland

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

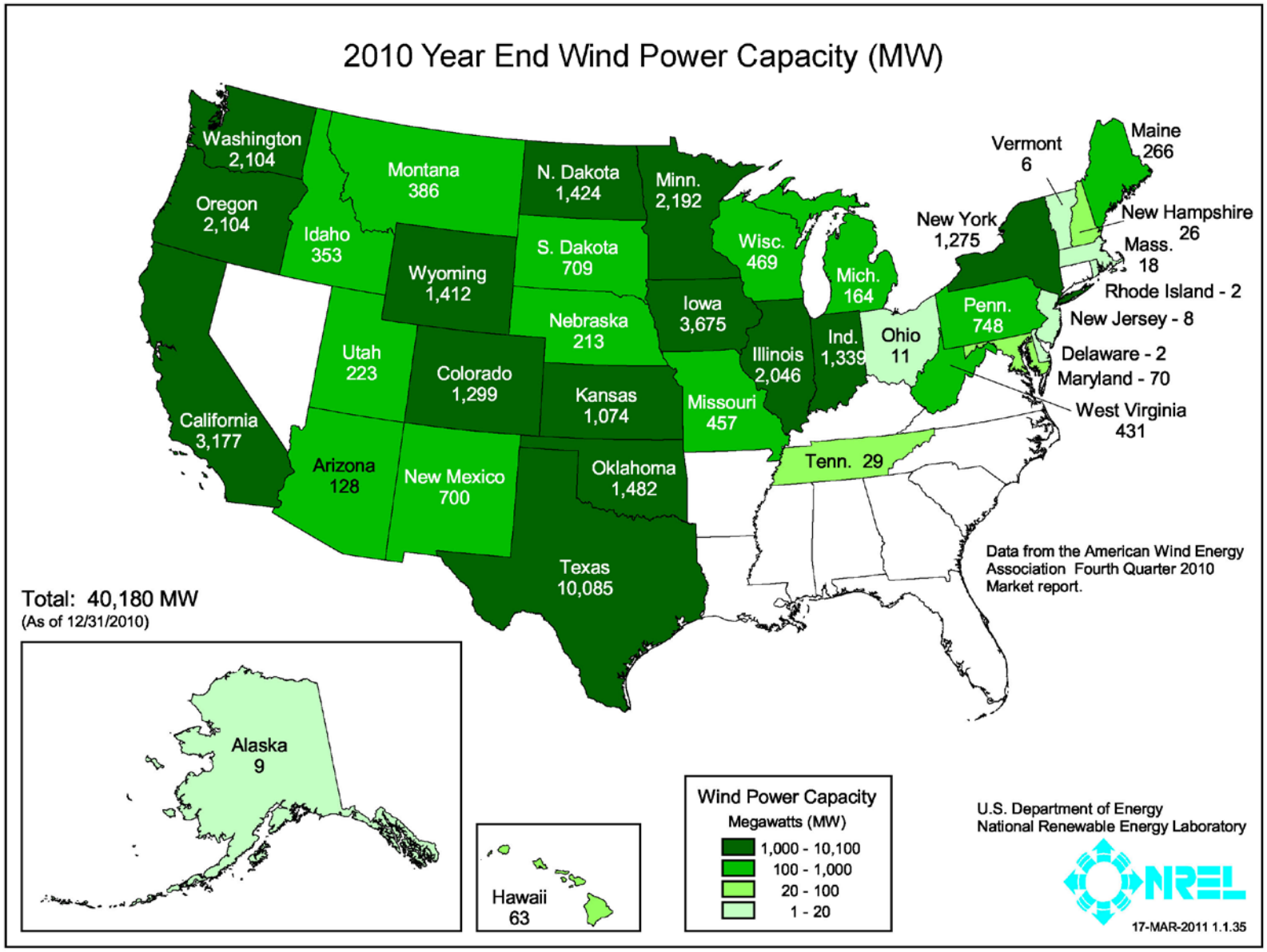
Wyoming™
INFRASTRUCTURE AUTHORITY
An Instrumentality of the State of Wyoming

Update:
Wyoming Infrastructure Authority

Wyoming Infrastructure Authority

Structure:

- *Five (5) member Governor-appointed Board of Directors*
  - ***Mike Easley**, Chairman: CEO, 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*
  - ***Dave Sparks, member: Executive Vice President, TransCore***
- *Staff*
  - ***Loyd Drain,** Executive Director*
  - ***Holly Martinez,** Administrative Manager*
  - ***Rob Hurless**, Energy Consultant*
  - ***Tom Dennis**, Cassidy & Associates; and other Consulting Support*

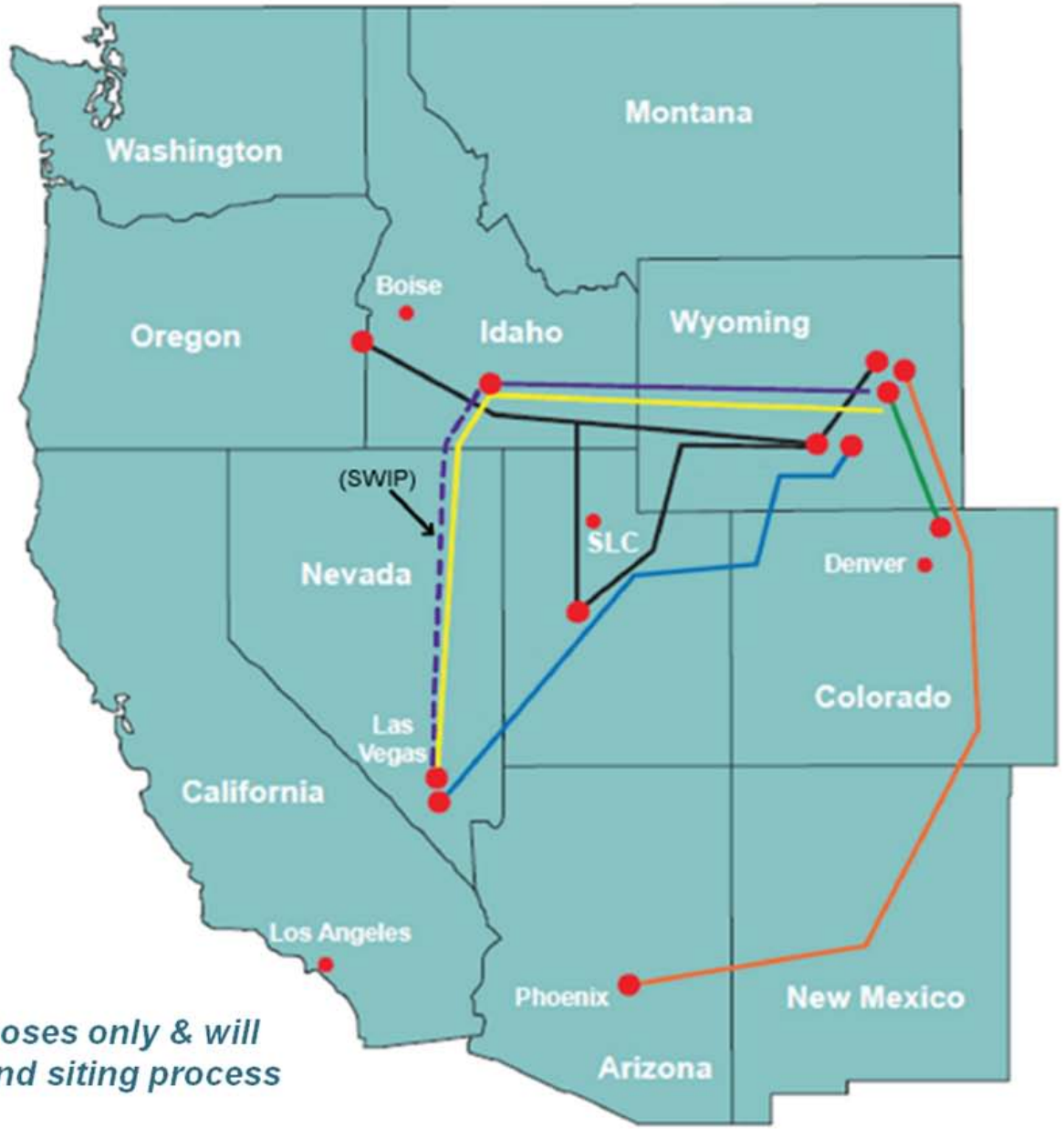


Looks like Wyoming's number is understated—it may be closer to 2,500 MW

Transmission Projects under development in Wyoming

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

Permitting & Siting Status of Transmission Projects in Wyoming				
Project	Developer	Initiated NEPA Process?	Est. Draft EIS	Est. In-Service Date
Gateway West	PacifiCorp	YES	2011	2016-2018
Gateway South	PacifiCorp	YES	Late 2012	2017-2019
TransWest Express	TransWest LLC/Anschutz	YES	Mid 2012	2016-2017
Zephyr	TransCanada	NO		2018
Overland	LS Power	NO		2018
Wyoming-Colorado Intertie	LS Power/WIA	N/A	N/A	2014-2015
High Plains Express	12 Developers	NO		2019

NEWS RELEASE

For Immediate Release

Date: July 14, 2011
Contact: Adam Gassaway, LS Power
Email: agassaway@lspower.com
Phone: 636.532.2200

WYOMING COLORADO INTERTIE ANNOUNCES TRANSMISSION SERVICE REQUEST

July 14, 2011 – Wyoming Colorado Intertie, LLC (WCI) has received a request for 100% (up to 900 megawatts) of the Initial Long-Term Firm Point-to-Point electric transmission service on the Wyoming Colorado Intertie Project. Pursuant to the terms of its Open Access Transmission Tariff, WCI must hold an auction if any qualified party submits a competing request, subject to minimum bid criteria and security requirements, on or before August 11, 2011. Any party interested in purchasing transmission service on the Wyoming Colorado Intertie Project is encouraged to visit www.WCIntertie.com for more information.

The Wyoming Colorado Intertie Project is a planned electric transmission facility between Southeast Wyoming and Northeast Colorado. The project is being developed through a public/private partnership between the Wyoming Infrastructure Authority, an instrumentality of the State of Wyoming, and WCI, a member of the LS Power Group.

BLM publishes Draft Environmental Impact Statement for Chokecherry and Sierra Madre Wind Energy Project

Important milestone marks start of 90-day public comment period

July 22, 2011 – The Bureau of Land Management has released its Draft Environmental Impact Statement for the Chokecherry and Sierra Madre Wind Energy Project, a 2,000-3,000 megawatt wind farm proposed by Power Company of Wyoming LLC in south-central Wyoming.

The Notice of Availability of the Draft EIS is published in today's edition of *Federal Register*, the official daily publication of the federal government, and begins a 90-day comment period.

The approximately 1,100-page Draft EIS document results from more than three years of analysis, public input and collaboration among federal, state and local cooperating agencies.

The report informs the public of various factors associated with the wind power plant, including its ecological, aesthetic, cultural, economic and social effects. BLM is preparing this EIS pursuant to the National Environmental Policy Act because about half of the PCW wind project is sited on federal land…….

Important Issues being addressed

- *Exploring ways to mitigate the time required and cost relative to the NEPA process for transmission which currently takes 4 to 5 years at a cost of $40 to $60 million*
  - *A committee has been formed with members of State and Federal rep's to expedite the permitting and siting of* ***generation projects*** *on public land*
  - *A task force to expedite* ***transmission projects*** *is in the early stage of formation via a joint effort between Governor Mead's Office and the WIA*
- *A market that wants to develop indigenous renewable resources*
- *Studies suggest that Wyoming wind will provide geographical diversity benefits when combined with renewable resources closer to the load which will result in the mitigation of ramping events with a corresponding savings relative to integration costs*
- *Wyoming's Joint Revenue Committee has been tasked with reviewing the current tax policy on wind*
  - *had a meeting in Saratoga in May, 2011*
  - *Scheduled to meet in Buffalo on August 25-26*

NREL Study for Wyoming

NREL
NATIONAL RENEWABLE ENERGY LABORATORY

Jobs and Economic Development from New Transmission and Generation in Wyoming

Clipper Windpower turbine near Medicine Bow, Wyoming
Photo credit: PIX 14903

Introduction

Wyoming is a significant energy exporter, producing nearly 40% of the nation's coal and 10% of the nation's natural gas. However, opportunities to add new energy exports in the form of power generation are limited by insufficient transmission capacity. This fact sheet summarizes results from a recent analysis conducted by NREL for the Wyoming Infrastructure Authority (WIA) that estimates jobs and economic development activity that could occur in Wyoming should the market support new investments in power generation and transmission in the state.

Modeling Inputs

New infrastructure projects considered in this analysis would be developed for the purpose of exporting Wyoming wind and natural gas generation throughout the West and include four high voltage (HV) transmission lines, a network of transmission lines that collect new power generation for export outside the state, 9 GW of new wind power, and 1.8 GW of new natural-gas-fired power. The estimated capital investment and the Wyoming share of this investment are detailed in Table 1.

Results[1]

Given today's economic structure, the investments flowing through the Wyoming economy are estimated to support:

- An average (as opposed to peak) of 4,000–5,900 Wyoming jobs per year for 10 years from construction-related activities; 8,000–14,000 Wyoming jobs per year during peak construction activity.
- Wages and benefits to Wyoming workers averaging $200 million–$330 million per year during the 10-year construction period.
- 2,300–2,600 Wyoming jobs during the operations period of the infrastructure life cycle (at least 20 years, based on typical financing for new wind power projects).
- Wages and benefits ranging from $100 million–$120 million per year during operations.
- Economic activity (output) on the order of $1.2 billion in 2016 and $1.4 billion in 2019 (during peak construction) and $380 million per year during operations-only years.
- Total Wyoming economic output on the order of $12 billion–$15 billion (construction plus 20 years of operations); this represents approximately 30% of the total potential economic activity associated with these projects.

In this scenario, development of wind energy yields the greatest number of Wyoming jobs and economic development activity, although new transmission and natural-gas-fired projects also produce large numbers of Wyoming jobs. Economic development activity is highest during peak construction periods but remains considerable during operations, both in terms of employment and economic output (Figure 1 and Figure 2).

Table 1. Wyoming Share of Project Spending (For Equipment Installed within Wyoming)

Infrastructure Type	Units Installed	Total Installed Cost	Wyoming Share	Annual Operating Expenditures	Wyoming Share
Wind Generation	9,000 MW	$18 billion	16%–22%	$225 million	37%
Natural Gas Generation	1,800 MW	$2.3 billion	22%–33%	$42 million*	18%**
500 kV HVDC Transmission	2	$2.2 billion	21%–32%	$60 million	25%–37%
500 kV HVAC Transmission	2	$1.3 billion	32%–49%	$35 million	26%–32%
230 kV HVAC Transmission	Multiple***	$660 million	25%–40%	$17 million	26%–32%
Total		**$25 billion**	**19%–26%**	**$380 million**	**31%–34%**

[1]Results are generally reported as a range due to uncertainty in the ability of Wyoming-based business, contractors, and service providers to participate in the development, construction, and operations of these projects. However, Figure 1 and Figure 2 show the results from our base case estimation and are based on the best available information to date.

*Excludes fuel cost as no incremental change in Wyoming-based gas production is expected from these projects.

**Weighted average fixed and variable costs.

***Various lines and substations associated with a basic collector system.

Note: Totals may not add due to rounding.

NREL is a national laboratory of the U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, operated by the Alliance for Sustainable Energy, LLC.

Figure 1. Base case employment by type of infrastructure
Note: Datasets stacked to show the total jobs resulting from all investments combined

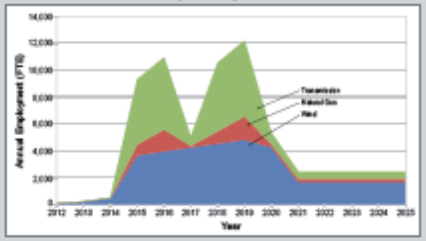
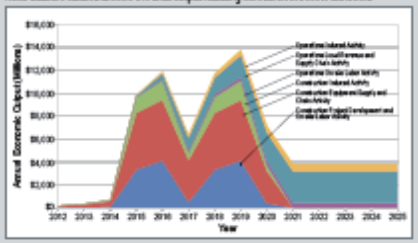


Figure 2. Base case economic output over time
Note: Datasets stacked to show the total output resulting from all investments combined



Discussion

The heavy construction sector is expected to see a significant boost in activity from this development; however, the economic activity resulting from these projects is not limited to this sector. Other Wyoming businesses and industry would see significant economic activity. Wyoming businesses that supply the construction sector, including quarries, cement producers, and hardware suppliers, would see increased activity. Metal fabricators, equipment sales firms, legal and financial services personnel, engineers, and even Wyoming banks may likewise see increased demand for services. To the extent that existing or new Wyoming manufacturers could supply these projects, a whole array of potential manufacturers could see business growth. Finally, service providers, including restaurants, retailers, childcare providers, and grocery stores, among many others, would see increased demand as construction workers and other project beneficiaries spend their paychecks in Wyoming.

The distribution of economic activity by infrastructure type and over time is primarily a function of the level of deployment (for each infrastructure type) and the timing in which projects begin construction and are placed in service. These results are based on hypothetical deployment of new transmission and generation capacity between 2012 and 2021. The hypothetical deployment scenario used in this analysis was developed by the WIA in conjunction with industry stakeholders. The scenario is grounded in the array of proposed HV transmission projects, which, if built, could result in significant new wind and natural-gas-fired generation. Natural-gas-fired generation is expected to be used to mitigate the variability of wind and take advantage of excess transmission capacity, when available. While this scenario is intended to represent real market potential, it is not intended to forecast transmission and power generation development in Wyoming. Whether this specific scenario is achieved will depend on an array of market, state and federal policy, and other variables.

Ultimately, to realize this potential, demand for Wyoming wind energy is critical. In addition, the development of the new transmission infrastructure to export the Wyoming wind and natural-gas-fired generation across the West is important. Should infrastructure development on the level of that envisioned here become a reality, an array of factors will also influence whether Wyoming will capture this level of economic activity. Parallel deployment of wind, transmission, and natural-gas-fired generation could limit Wyoming's ability to contribute local goods and services to these projects at the level they have been able to for individual projects in the past and reduce the Wyoming-specific economic activity estimated here. Alternatively, the development of a Wyoming labor force that can support this type of infrastructure development, along with a modest amount of Wyoming manufacturing capacity to support these types of projects, could greatly increase the economic activity occurring in Wyoming from these projects.

Methodology

Economic development estimates were generated by NREL's Jobs and Economic Development Impacts (JEDI) models: JEDI Wind, JEDI Natural Gas, and JEDI Transmission models were used in this analysis. JEDI model inputs, including project costs and Wyoming local share values, were determined by research, interviews, and conversations with various Wyoming wind, transmission, and natural gas developers and industry stakeholders as well as companies that conduct energy sector and other business (e.g., legal services) in Wyoming. Detailed interviews with leading engineering, design, and construction firms working in the Rocky Mountain region and publicly available data sources were also utilized.

Photo credit: PIX 06589

NREL
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National Renewable Energy Laboratory
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NREL is a national laboratory of the U.S. Department of Energy
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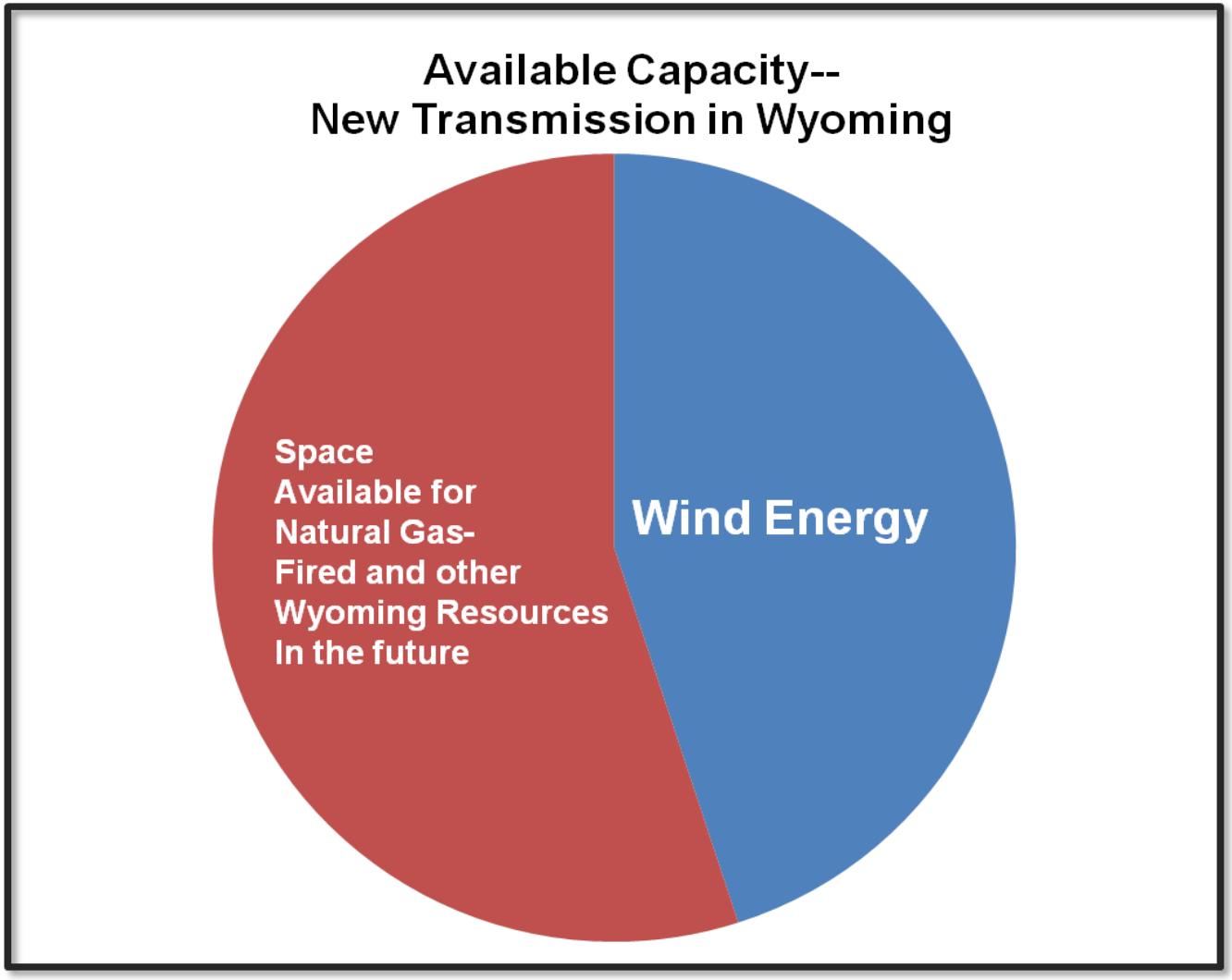
NREL/FS-6A20-51346 • May 2011

Wind is the catalyst but it's more than just wind




Healdsburg
SMUD
Hercules
Lodi
Stockton
Alameda
Area is served by both
Port of Oakland
MID & PG&E
Valley Electric
MID
TID
County & City
of S.F.
Palo Alto
Merced
Silicon Valley
Power
LADWP -
Owens Valley
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Burbank
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Banning
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Anza Electric
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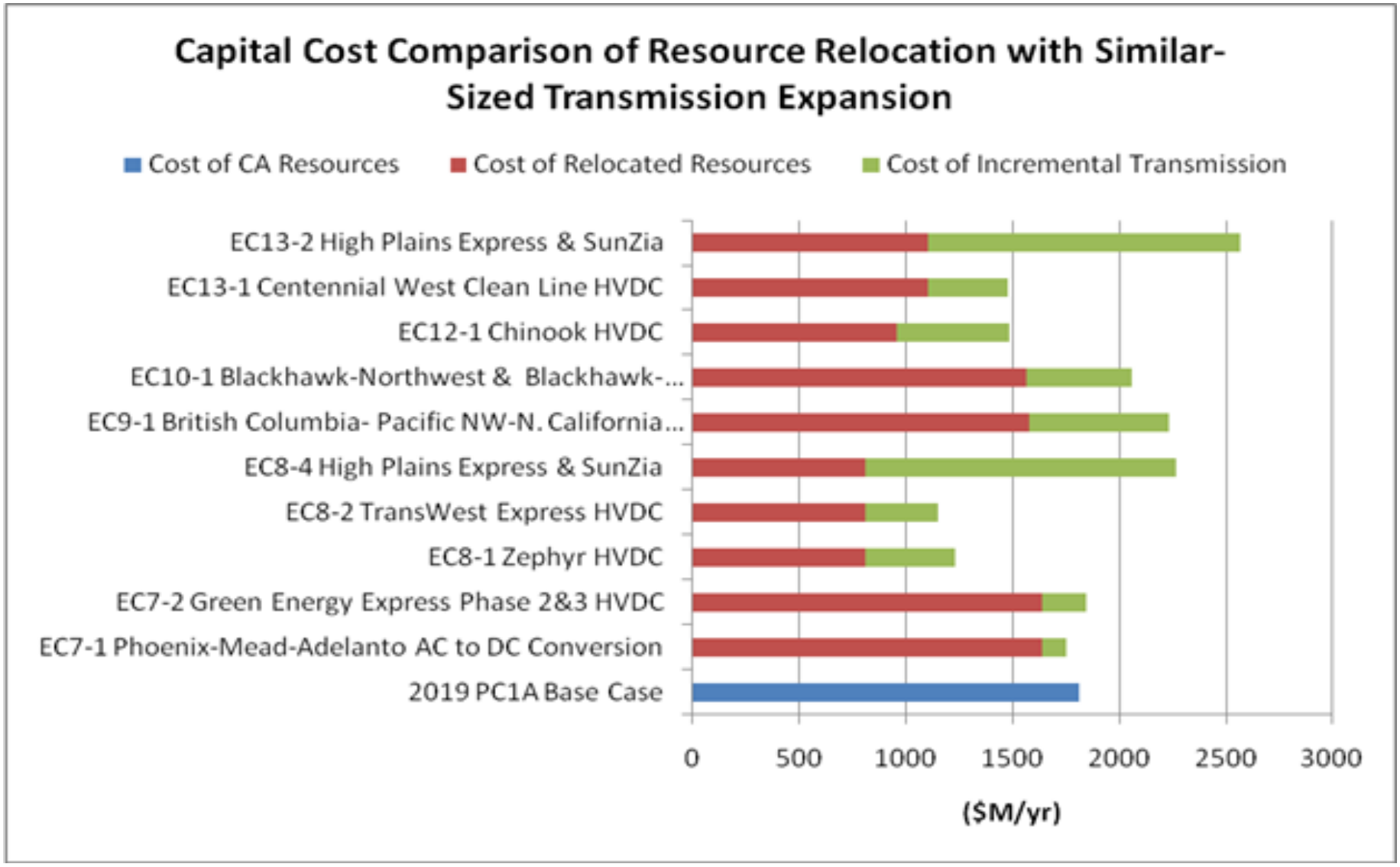
Market Information

DEVELOPABLE RENEWABLE ENERGY SUPPLY IN THE WEST	
STATE	**SURPLUS (TWh/yr)**
Colorado	**27.0**
Arizona	**14.5**
Nevada	**11.5**
New Mexico	**5.0**
Wyoming	**23.6**
Montana	**23.6**
California	**262.6**
TOTAL:	**367.8**
California's requirements from 2011 to 2025	**75.0**
Surplus	**292.8**
Ratio of Supply to Demand	**3.9 to 1**
Number of 3,000 MW projects that <u>will not be built</u> between now and 2025	***approximately 25 throughout the West***
Number of 100 MW projects that <u>will not be built</u> between now and 2025	***approximately 750 throughout the West***

Preliminary Data from WECC 10 year plan



Questions?

For more information, please visit our website at www.wyia.org

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INFRASTRUCTURE AUTHORITY

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