GRIDLIANCE

Governor's Committee On Energy Choice

Technical Working Group on Generation, Transmission & Delivery

December 12, 2017

Agenda

- Introduction to GridLiance
- Observations on Non-Traditional Transmission Planning and Development
  - Competitive transmission processes
  - Takeaways from Texas' CREZ projects
- GridLiance's development efforts in Nevada and California

Introduction to GridLiance

Introduction to GridLiance

- Incorporated in 2014, GridLiance is the first independent transmission business primarily **focused on partnering with municipal utilities, joint action agencies, and electric cooperatives**
  - We work with our partners to **develop unique solutions** to their transmission needs including providing access to renewable energy
  - We currently **own and operate 400 miles of transmission** lines and related facilities
  - We have **long-term relationships** with partners in Nevada, Missouri, Oklahoma, and Kansas
  - Our **leadership team is experienced** and has the strategic and financial support of **Blackstone Energy Partners, L.P.**—a leading energy infrastructure investor
  - We have **highly-capable independent board members** including Terry Boston (former CEO, PJM Interconnection) and Mike Morris (former CEO, American Electric Power)

Current Public Power Partnerships

Valley Electric Association, Inc.
A Touchstone Energy® Cooperative

MJMEUC
Missouri Joint Municipal Electric Utility Commission

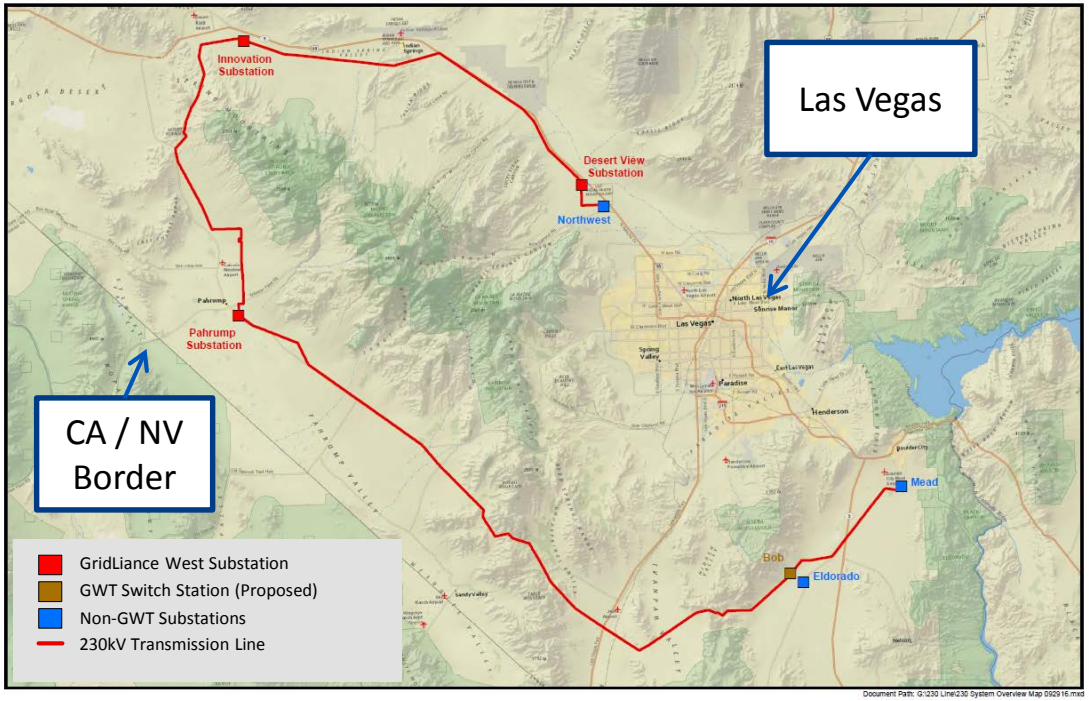
KANSAS POWER POOL
Smart Municipal Energy

TCEC

OMPA Oklahoma Municipal Power Authority

GridLiance West's 230 kV Transmission System

- These transmission facilities are located in Nevada and are **part of the California Independent System Operator (CAISO) system**
- We are currently implementing a project to physically connect to the CAISO system **(the Bob Switch Project)**
- The area has **tremendous potential for renewable energy development**
- We are developing a 230 kV transmission project **(Nevada West Connect)** to:
  - **Improve grid resiliency** by adding a third path connecting Southern California to other states
  - **Deliver renewable energy** to California in support of its greenhouse gas reduction and renewable portfolio standard objectives



Observations on Non-Traditional Transmission Planning Processes

Competition in transmission benefits utility customers

- **Demonstrable savings from lower capital costs**
  - Winning proposals have been approx. 20% - 40% below planning level cost estimates
  - Without competition, capital cost typically overruns planning level cost estimates
- **Concrete risk reduction**
  - In nearly every case, winning proposals include binding cost containment commitments
  - Cost caps shift risk to developers from utility customers
- **Commercial creativity**
  - Developers have offered to cap other inputs to revenue requirement, including forgoing ROE incentives, capping base ROE, capping O&M expenses and others

Project Award	Region	Planning Estimate	Cost Cap	Savings
Suncrest Reactive Power	CAISO	$50-$75 M (2014)	$42 M	15-43%
Estrella Substation	CAISO	$35-$45 M (2014)	$25 M	30-45%
Delaney-Colorado River	CAISO	$337 M (2014)	$241 M	28%
Harry Allen-Eldorado	CAISO	$159 M (2014)	$147 M	8%
Walkemeyer-North Liberal	SPP	$17 M (2015)	$7 M[1]	54%
Duff-Coleman	MISO	$60 M (2015)	$47 M[2]	28%

1: Lowest capital cost with cap identified by SPP, however this bid was not selected.
2: Lowest capital cost bid was not selected by MISO; the lowest cost bid with a cost cap was $32 M.

Outside competition cost overruns are common

- **Utility customers bear the burden** of these cost overruns
- The table below shows examples of increasing cost estimates for RTO-approved projects developed outside competitive processes

Projects	Planning Estimate	Current Estimate	Difference (% Overrun)
MISO MVP15-MVP17	$3,070 M	$4,140 M	$1,070 M (35%)
MISO Huntley-Wilmarth	81 M	101 M	20 M (25%)
SPP Balanced Portfolio Projects	691 M	831 M	140 M (20%)
SPP Priority Projects	1,960 M	2,170 M	210 M (11%)
ISO-NE Major Projects	2,160 M	3,860 M	1,700 M (79%)
Total	**$7,962 M**	**$11,102 M**	**$3,140 M (39%)**

*MISO's Huntley-Wilmarth project would have been competitively bid but for Minnesota's state right-of-first refusal statute.

Texas' CREZ process offers useful takeaways

- **History:**
  - In 2005, Texas initiated a process to identify transmission for Competitive Renewable Energy Zones (CREZ)
  - Transmission service providers (**including incumbent and non-incumbent developers**) proposed transmission solutions; Public Utilities Commission of Texas selected developers
- **The result:**
  - **3,500 miles of transmission** at a total cost of $6.8 billion
  - Wind generation increased **from 2,700 MW in 2006 to 21,000 MW today**
- **Three useful takeaways:**
  - Involving **non-incumbent developers can help** (e.g., additional solutions to consider)
  - Advancing **transmission outside of traditional processes can lead to renewable development**
  - **Broad cost allocation helps** move transmission for renewables forward

GridLiance Efforts in the West

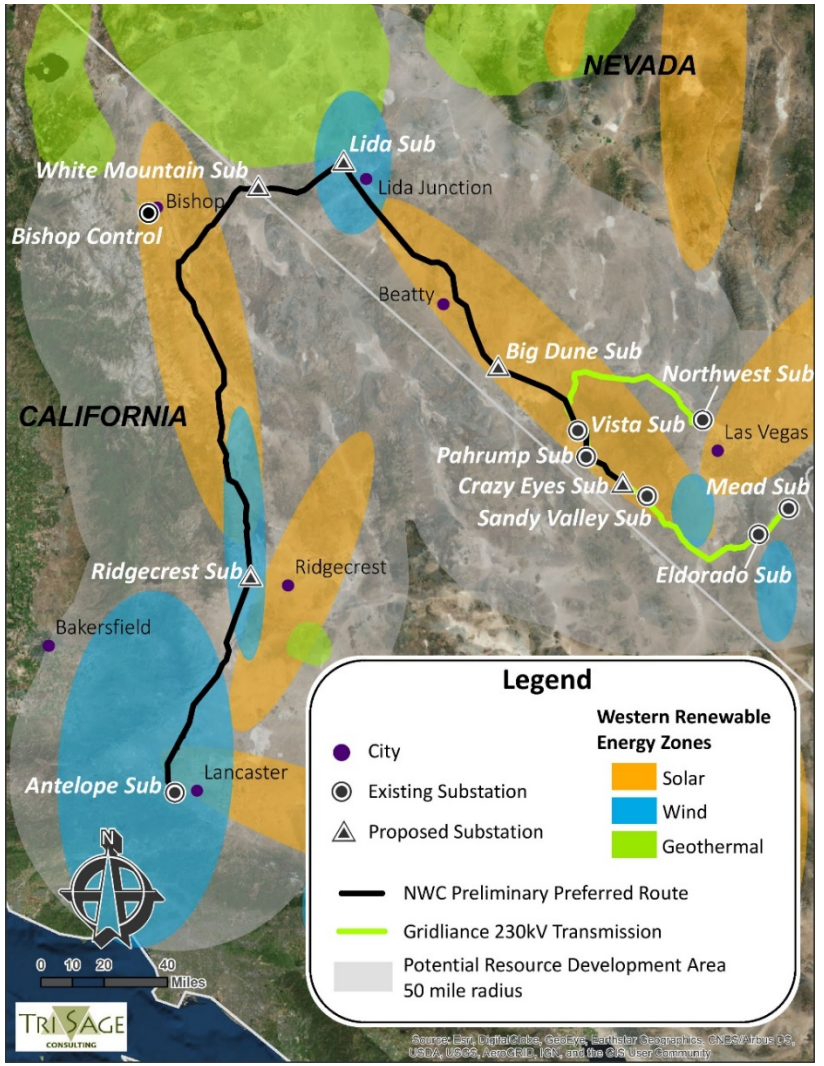
Nevada West Connect Project

- Nevada West Connect is a conceptual project that will **provide access to a balanced portfolio of renewable resources** to the benefit of both California and Nevada
- There is a **balanced portfolio of low-cost, renewable resources** in Nevada that can directly connect to the CAISO system
  - For California, these resources can help meet state renewable and greenhouse gas objective at low cost
  - For Nevada, development of these resources will lead to meaningful economic and fiscal development
- There are also economic and reliability benefits including production cost savings
- **California and Nevada can enjoy these benefits if the CAISO approves the Project** in its annual transmission planning process

GridLiance West Transmission System

Balanced Mix of Low-Cost, Easily-Sited Resources

- **Balanced:** There are diverse resources available in Nevada including solar, wind, and geothermal
- **Low Cost:** In California's Integrated Resource Plan modeling, southern Nevada solar resources are some of the least expensive available
- **Easily Sited:** The BLM has established Solar Energy Zone's in Nevada
- **Easily Integrated to CAISO:** Transmission facilities now owned by GridLiance were placed in CAISO in 2013, with physical connection to be complete in 2019



Source: 2022 Resources from CAISO IRP data base; "BLM Issues Rule Changes to Encourage Solar/Wind Development on Federal Lands" Renewable Energy World, 12/22/16

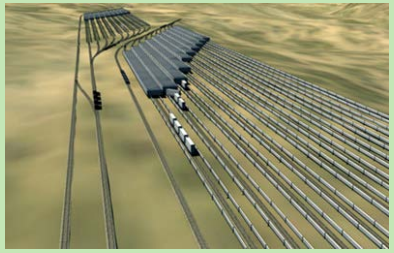
Nevada West Connect can help integrate intermittent resources

- With as much as **30,000 MW of additional renewable capacity needed**, integration of intermittent resources is an important aspect of achieving California's environmental objectives[1]
- In addition to solar photovoltaic and wind opportunities, **Nevada offers other resources that can help integrate more renewable generation**, especially storage
  - Geothermal (e.g., ORMAT projects)
  - Solar with thermal energy storage (e.g., Solar Reserve projects)
  - Energy storage (e.g., battery storage, ARES rail energy, and others)

Geothermal

Solar with Thermal Storage

Energy Storage



1: Southern California Edison, "The Clean Power and Electrification Pathway," November 2017

Three keys steps to realizing the benefits of the project

1 **CPUC's Reference System Plan**	• The CPUC's Integrated Resource Plan needs to reflect the attractiveness of Nevada-based renewable resources (expected December 2017)
2 **CPUC's Preferred System Plans**	• During 2018, California utilities will file proposed Preferred System Plans with the CPUC • These plans, set to be approved during 2018, must also recognize the value of Nevada-based renewable resources
3 **CAISO Transmission Plan**	• CAISO's transmission plan needs to include the Nevada West Connect project as soon as possible • CAISO could approve Nevada West Connect, based on the Reference System Plan with a "final check" based on final Preferred System Plans

Thank You

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