

FILED 12/03/20 04:59 PM

Southwest Intertie Project (SWIP)-North



November 2020

LS Power

Power generation and transmission company formed in 1990 Asset 40,000+ MW \$1+ billion Management Project **Power generation** Development High voltage transmission placed into operations development, construction Regulatory, Legal & since 2013 or operations experience LS Compliance Power Marketing Project Accounting, Tax & Treasury Transmission Planning \$45+ billion \$1+ billion Engineering Capital raised to finance High voltage transmission & Construction Licensing & and support investments in in permitting or **Environmental** energy construction CAISO, ERCOT, MISO, NYISO, PJM **Transmission competitively** awarded to LS Power



Project Portfolio



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Southwest Intertie Project (SWIP)



SWIP-North is the final link in a proposed 1000 MW firm transmission pathway from Idaho to California

Phase I - ON Line (Robinson to Harry Allen) – Operating

- 231-mile 500 kV transmission line in Nevada
- Began commercial operations in January 2014
- First connection between Nevada Power Company and Sierra Pacific Power Company

Phase II - DesertLink (Harry Allen to Eldorado) – Operating

- 60-mile 500 kV transmission line near Las Vegas
- LS Power selected by CAISO via competitive solicitation pursuant to FERC Order 1000
- Robust cost containment package including caps on construction costs (\$145.5 million), capital structure and ROE
- Operating since August 2020

Phase III - SWIP North (Midpoint to Robinson) – Permitted, Seeking Cost Recovery

- 275-mile 500 kV transmission line in Idaho & Nevada
- Links PacifiCorp, Idaho Power and BPA to CAISO
- This project is nearly construction ready and could be online as early as June 2024.



IRP TPP Portfolio Comments and Recommendations

- > Need CPUC leadership to act urgently in evaluating "least regrets" new transmission alternatives to meet reliability and resource adequacy needs
 - ➢ Given long lead times for new transmission projects and differences in TPP and IRP timelines (as shown on next slides), each year delay makes it more difficult new transmission to be in place in time for new resources to come online to replace retiring plants.
 - Evaluate need for new transmission required to deliver OOS wind to CAISO boundary station. Currently CAISO TPP does not answer the question whether transmission is available to get to CAISO boundary stations.
- > Analyze the role of generation and load diversity in meeting net peak demand and the ability of OOS resources to provide diversity benefits in light of August 2020 heatwave and outage events
- Capture and quantify all benefits of new out-of-state transmission projects in CPUC IRP and CAISO TPP processes
 - > Update IRP models to include Idaho wind project data submitted to the Modeling Advisory Group
 - Analyze benefits of increased import limits and discourage reliance on operating solutions (in response to contingency events) that could potentially reduce imports into CAISO
- If CPUC and CAISO take timely action in approving new transmission, then thousands of MWs of diverse OOS resources can help address the imminent supply constraints California is expected to see around the time of Diablo Canyon and OTC retirements.



Projects Need to be Included in 2020-21 TPP to be online by 2024





SWIP-North Benefits to California

- Opens a 1000 MW new transmission path from Idaho to California
 - Permitted and could be online as early as June 2024
 - More than 50% of the path already in service and cost allocated on interregional basis
- Creates access to diverse renewable resources to meet evening peak demand and prevent future outage events
 - Over 4000 MW of renewable and storage projects in Idaho Power Company's interconnection queue; primarily wind, including a 1050 MW Lava Ridge wind project, being developed by LS Power affiliate that is scheduled to be online in 2024.
 - Alternate pathway for more Pacific NW hydro, NW wind and NV geothermal
 - Two, 250MW up to 8 hour Battery Energy Storage Systems available as early as Summer 2024 to shift renewable imports into evening peak hours (1 each at Northern and Southern terminus of SWIP-N)
- Improves near term reliability to hedge against 5000+MW of Diablo Canyon and Once-Through Cooling (OTC) plant retirements.
- Establishes parallel path to provide congestion relief on existing Northern CA intertie paths (PACI/COI & NOB)
 - COI was de-rated by ~650 MW during the August events straining the system during a time of crisis.
- Reduces renewable curtailments and GHG emissions by allowing an additional transmission path to deliver excess CA solar



SWIP-N – a "least regrets" transmission project

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Reliability Benefits

- Access to increased firm capacity to improve reliability and RA in time for retirement of Diablo Canyon Power Plant and OTC plants.
- Directly resolves certain transmission constraints on the import path into Northern CA as identified in CAISO 2020-21 TPP.
- Load diversity benefits among CA and Pacific NW.

Policy Benefits

- Enables access to diverse wind, geothermal, hydro which can provide GHG emission free energy to CAISO and support meeting net demand during evening peak hours and multi-day low renewable production events.
- Reduces risk of loss of load due to wildfires. SWIP-N path is in low wildfire risk area and provides a gateway for energy from Pacific NW should transmission lines in the northern CA get de-energized due to fires, such as during mid-August 2020 heat wave.

Economic Benefits

- Relieves economic congestion by offering a parallel path to Northern CA interties (PACI, NOB) which are consistently costing ratepayers between \$50M-\$100M every year. CAISO 2020-21 TPP study estimates COI congestion to be \$44M per year for Sensitivity scenario.
- Provides pathway to deliver excess CA solar to ID, Pacific NW, reduce renewable curtailments which offers capital cost savings.
- Enhances EIM benefits by allowing more transmission capacity to several EIM participants and enhance future EDAM benefits.

Policy

 Access to diverse GHG-free renewables & reduction in renewable curtailment in CA
Low wildfire risk pathway

SWIP-N

Economic

Path to deliver excess

• EIM and EDAM benefits

• Relieves PACI/NOB

solar and reduce

congestion

curtailment

Reliability

- •Increased firm capacity into CA with diverse generation
- Online in time for Diablo Canyon and OTC retirement
- Addresses overloads

Resource Diversity to Support Net Demand Peak

SWIP-N Access to Idaho Wind Offers Complimentary Profile to California Solar to Meet Summer Evening Peak Load, and During Multi-Day Low Renewable Energy Production Events



CA Solar vs Idaho Wind - August Daily Profile

LS Power developed Figure 1 using California solar using PVsys based on generic Fresno County solar data, Idaho wind data based on meteorological site data from Idaho wind. Both data represent average production during the month of August and displays all hours of the day.



About LS Power



LS Power is a U.S. development, investment and operating company focused on power generation, electric transmission and energy infrastructure.

- 42,000 MW of pow er generation development, construction and operations experience throughout the U.S. including California
- \$45 billion capital raised to finance and support investments in energy
- 660 miles of competitively awarded transmission by CAISO, ERCOT,
- MISO and PJM
- 800 EVgo fast charging locations in 66 markets across 34 states including California
- 1,400 commercial and industrial customers at nearly 9,000 sites in the U.S. including California served by CPow er's demand-side energy management expertise
- Offices in CA, MO, NJ and NY 200+ employees formed in 1990
- Committed to low -cost, clean energy solutions
- California projects support SB 350 and SB 100



California Focus

An active California market participant since 2006, LS Power currently owns and operates 300 MW of solar. It also has over 600 MW of energy storage and 550 miles of transmission lines in operation, construction or advanced development to serve California. EVgo, headquartered in California, was acquired by LS Power in 2019 and is the nation's largest and most reliable public fast charging network for electric vehicles and the first EV charging network in the U.S. to be powered by 100% renewable energy. LS Power's workforce engagement, environmental stewardship and giving philosophy are locally driven. Civic input and community plans help shape projects.



Supporting SB 350 and SB 100 by building, owning and operating 615 MW of California energy storage that reduces the need for fossil fueled power plants and associated greenhouse gas emissions, and optimizes the integration of renewable generation.

Gateway Energy Storage

- Otay Mesa, CA San Diego County
- 250 MW, operating since August 2020
- Currently the worlds largest battery storage facility
- Improves deliverability of Imperial County renew ables to San Diego
- Expanding to improve grid reliability (Summer 2021)

Diablo Energy Storage

- Pittsburg, CA Contra Costa County
- 200 MW, under construction
- Benefits a disadvantaged community (SB 350)
- Contracted to provide resource adequacy (Summer 2021)

Vista Energy Storage

- Vista, CA San Diego County
- 40 MW, operating since 2018
- Benefits a Qualified Opportunity Zone
- Expanding to improve grid reliability (2021/2022)

LeConte Energy Storage

- Calexico, CA Imperial County
- 125 MW, anticipated operation 2022
- Co-located with Centinela Solar Energy
- Able to store excess Imperial County solar generation midday and deliver reliable capacity during evening peak



Building, operating and connecting 566 miles of a 500 kV transmission line from Idaho to California providing economic and policy benefits to CAISO ratepayers. Developing critical reliability projects under the direction of the CAISO.

Southwest Intertie Project (Phases I - III)

- Links CAISO to NV Energy, PacifiCorp, Idaho Power and BPA
- Total investment of all three phases expected to be approximately \$1.5 billion.

Phase I - ON Line (Robinson to Harry Allen)

- 231-mile 500 kV transmission line connecting Northern Nevada to Southern Nevada
- LS Pow er ow ns 75% w ith capacity leased to NV Energy w ho ow ns 25%
- Operating since 2014

Phase II - Desertlink (Harry Allen to Eldorado)

- 60-mile 500 kV transmission line connecting NV Energy to CAISO
- LS Pow er selected by CAISO as Approved Project Sponsor in 2016, expanding deliverability of renew able generation
- Operating since August 2020

Phase III - SWIP North (Midpoint to Robinson)

- 275-mile 500 kV transmission line connecting PacifiCorp and Idaho Pow er to NV Energy and CAISO
- Completes approximately 2,000 MW, 500-mile link betw een Desert Southw est and Pacific Northw est electric systems
- Provides pathw ay for wind, hydro and pumped storage with direct connection to CAISO enabling Bucket 1 status for Resource Adequacy
- Anticipated operation 2024

Round Mountain and Gates 500 kV Dynamic Reactive Support Projects

- Projects awarded pursuant to CAISO competitive solicitation
- Critical reliability projects that will mitigate high and low voltages on the transmission grid
- Anticipated operation for both projects 2024

