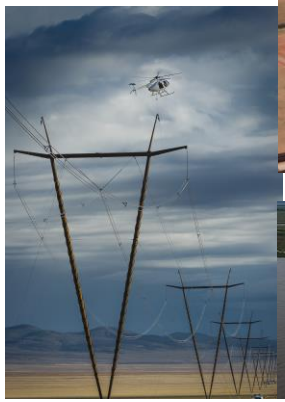
PJM Capacity Market Workshop, March 12, 2021

Tom Hoatson

Marji Rosenbluth Philips





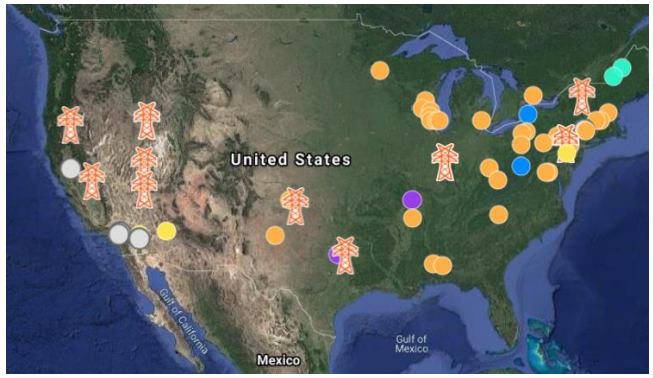
LS Power Group Overview

LS Power is a development, investment and operating company focused on the North American power and energy infrastructure sector

- **Founded in 1990, LS Power has over 270 employees** in NY, NJ, MO, TX and CA, beyond which its projects and businesses have **provided thousands of construction and operations jobs**
- **LS Power has raised over $46 billion to finance and support energy infrastructure investments in the U.S.**
- LS Power actively invests in competitive power markets and
  - **Manages over** 15,000 MW of generation capacity and over 4,000 MW of demand response and energy efficiency, for a total of over **19,000 MW throughout the US**
  - **Makes fuel neutral investments,** including solar, wind, battery energy storage, natural gas, hydro, pumped storage, demand response and energy efficiency
  - **Leaders in distributed energy through EVgo** (the nation's largest public fast charging platform for electric vehicles) **and CPower Energy Management** (leading demand-side energy management company that helps commercial, industrial and government organizations save on energy costs, earn revenue through energy curtailment, enhance sustainability efforts, and contribute to a balanced, reliable grid)
  - **Invests over $2 billion in high voltage transmission projects across the U.S. to support renewables and grid reliability**

LS POWER

Innovation and Investment in Energy



LS POWER

Project Portfolio

LS Power has extensive development and operating experience across multiple regions, markets and technologies

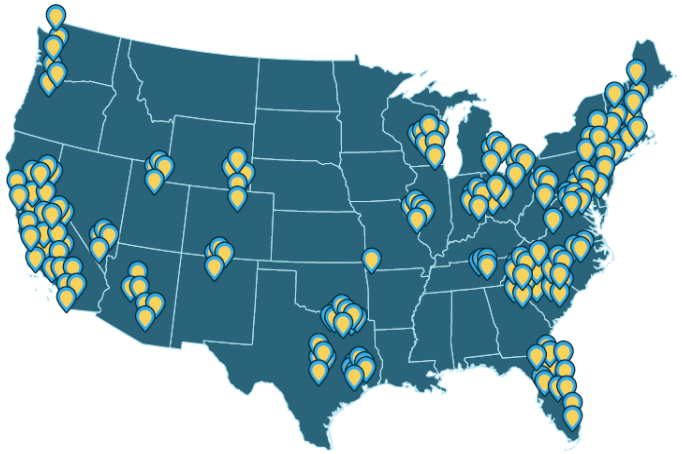
LS POWER

LS Power Distributed Energy Platforms

National Leaders in Electric Vehicle Charging, Energy Efficiency and Demand Response

- **EVgo is the nation's largest and most reliable public fast charging network for electric vehicles**, powered 100% by renewable energy, with more than 800 fast charging locations in 66 metropolitan markets across 34 states. EVgo owns and operates its network, and serves more than 180,000 retail and fleet Consumers, with plans to more than triple its network over the next five years. We believe that EVgo has the best operating record in the industry – more than 98% uptime – and consistently earns the highest consumer scores on PlugShare for U.S. public charging networks

EVgo
FAST CHARGING



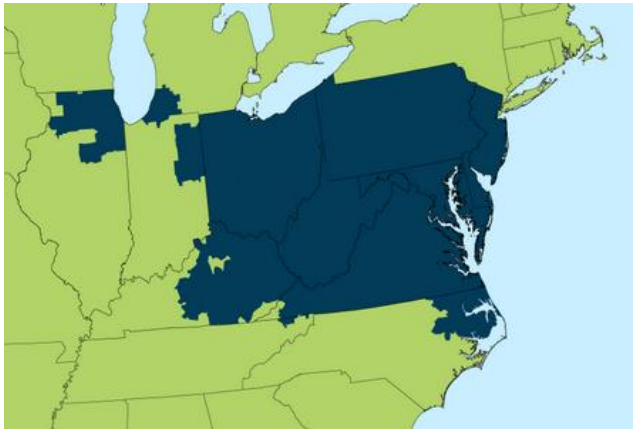
- **CPower Energy Management is the leading demand-side energy management solutions provider in the U.S.,** that helps over 1,400 commercial, industrial and government organizations across North America save on energy costs, earn revenue through energy curtailment, enhance their sustainability efforts, and support the decarbonization and reliability of the electric grid

CPower

LS Power Footprint in PJM

LS Power is the second largest privately held generation company in PJM, with over 11,000 MW of capacity

- Our PJM generation assets include clean supply resources: **hydro pumped storage, and natural gas fired peaking and combined cycle facilities**
- **Affiliate CPower is the largest supplier of demand response and energy efficiency in PJM**
- **LS Power is a leading developer of transmission assets in PJM, for which its solutions were deemed lower cost and environmentally superior** to other options proposed; LS Power established a first-of-its-kind project cost cap to protect electricity consumers from paying for cost overruns – a new, consumer-focused approach



- **LS Power is technology neutral…** including hydro pumped storage, solar, and natural gas fired peaking and combined cycle facilities
- **We will invest where price signals are efficient and transparent to provide an opportunity (but not a guarantee) of a return on its investment**
  - With two-thirds of LS Power's generation portfolio in PJM**, PJM has provided such investment opportunities over its history that have provided significant consumer benefits**

LS Power Advocacy Principles

- Consumers benefit the most when services are procured in a competitive process, as PJM currently does (e.g. energy, capacity…)
  - Procurements should be:
    - Non-discriminatory
    - Transparent
    - Fair
- RTOs are in the best place to manage reliability
- RTOs' No. 1 Job is Maintaining Reliability
- Must Face Reality to Achieve Our Goals

Benefits of the LS Proposal

- What our proposal does:
  - Puts reliability ahead of all other considerations
  - Eliminates so-called “double payment” problem
  - Is a mechanism to transition to a durable longer term solution
  - Is a bridge between the problem of price suppression with no MOPR and enabling state sponsored resources to clear the capacity market
  - Is resource neutral
  - Is compatible with an appropriately designed ELCC mechanism
- What our proposal does not do:
  - Address the need to redefine the reliability product (e.g. 1 in 10 years, on-peak)
  - Address load forecasting concerns
- Proposal enables a compromise, which provides an appropriate amount of time for stakeholders to determine a long term durable resource adequacy construct for the grid of the future

Proposal Advantages

- Accommodates state policy resources while preserving market efficiency and transparency
- Provides reasonable market clearing prices over the near term
  - Eliminates supplier incentive to bid low enough to escape being the marginal unit under the other repricing proposals
- Allows for the transition and development of a durable long term solution
- Protects load so they will never pay more for clearing preferred resources
- Retains the benefit of most of the existing RPM rules
  - Forward looking
  - Must offer commitments
  - Performance Penalties
- This is a COMPROMISE proposal that could be implemented near term and provide PJM and its stakeholders to focus on a long term solution

Overview of Proposal

- Step 1 – BRA is cleared pursuant to existing rules and produces Competitive Clearing Cost
  - Competitive Clearing Cost = Total BRA cleared MW x the Competitive Clearing Price x 365 days
  - Capacity Resource with State Subsidy (subsidized resource) have provided two offers: (i) mitigated MOPR price and (ii) competitive offer price (unmitigated)
- Step 2 - Subsidized resources that did not clear in Step 1 and have unmitigated offer below the Competitive Clearing Cost are added back to the supply stack by allocating, pro-rata, across the LDAs that cleared in Step 1
  - "Inclusive Clearing Price" is determined by dividing the Competitive Clearing Cost from Step 1 by the total quantity of MWs (Step 1 MWs + Subsidized Resources MWs)
- Step 3 – An "Offer Withdrawal" election will be offered to all supply that cleared, Step 1, enabling resource owners to choose whether to accept the reduced payment or exit the market
  - Resources that elected the "Offer Withdrawal" and cleared Step 1 are removed from the supply curve and the clearing price is adjusted
  - This is the "Final Clearing Price" – if no resource elected the "Offer Withdrawal," then the Final Clearing Price would be the "Inclusive Clearing Price"
- Total cost to load remains the same ("Competitive Clearing Cost")

Step 2 - Add-In Subsidized Resources

- Inclusive Clearing Price = (Total system Competitive Clearing Cost from Step 1)/(capacity cleared in BRA + re-introduced subsidized resources)
- Assume the Step 1 BRA results clear 150,000 MWs at $100/MW-Day for total all in costs of $15 MM (the Competitive Clearing Cost)
- Identify subsidized resources with unmitigated offer prices below the clearing price of $100/MW-Day and add back to the total clearing quantity in Step 1 (BRA)
- Assume 5,000 MW of subsidized resources with offer prices below $100
  - 5,000 MW + 150,000 MW = 155,000 MW
  - $15 MM / 155,000 MW = $96.77/MW-Day
- The Inclusive Clearing Price is therefore $96.77/MW-Day
  - The Inclusive Clearing Price is reduced by approximately 3%
- Note: If no resources opted into the Offer Withdrawal, this would be the final Clearing Price

Step 3 - Offer Withdrawal Iterative Process

- PJM then evaluates those resources that elected the “Offer Withdrawal” option
- Starting with the resource with the highest offer price between the Competitive Clearing Cost (established in Step 1) and the Inclusive Clearing Price (after subsidized resources are added back in Step 2), PJM will remove the capacity quantity of that resource and recalculate the clearing price – the price will tick up
- PJM continues in this manner until there are no resources with offer prices above the adjusted price
- This will be the Final Clearing Price that all resources are paid

Step 3 - Offer Withdrawal Iterative Process, continued

- Example
  - Assume resource A is 1,000 MW and is the highest offer price at $98/MW-Day
    - Resource A cleared in Step 1 but did not want a capacity award at the Inclusive Price ($97/MW-Day)
  - Subtract Resource A's quantity from the total quantity -
    - 155,000 MW – 1,000 MW = 154,000 MW
  - Divide the Competitive Clearing Cost by the new quantity –
    - $15 MM / 154,000 MW = $97.40/MW-Day
- Continue this process with the next resource with the highest offer price between $100/MW-Day and $97.40/MW-Day, subtract the quantity from the total quantity and divide the Competitive Clearing Cost by this new quantity to get the new clearing price
- The process stops when there are no resources with an offer price greater than the adjusted price

Clearing Price Impact Factor

- Allows suppliers to make a reasoned judgment on whether to remain in the auction to receive the Final Clearing Price
  - Suppliers will be able to determine the likely price impact of the iterative process through the "Clearing Price Impact Factor"
- The Clearing Price Impact Factor is defined as the potential reduction of the Competitive Clearing Price when subsidized resources are re-introduced to the supply curve
- PJM would calculate and post the Clearing Price Impact Factor as a percentage post as part of the BRA Planning Parameters by taking the aggregated amount of subsidized resources and dividing by the Forecast Peak Load Forecast
- Example:
  - Assume the Preliminary Forecast Peak Load is 150,000 MW
- Assume there are 1,000 MW of subsidized resources
- The Clearing Price Impact Factor = 5,000/150,000 = 3.33%
- This indicates the clearing price can move 3.33% from the BRA (Step1) clearing price

Contact Information

- Marji Rosenbluth Philips
  - mphilips@lspower.com

- Tom Hoatson
  - thoatson@lspower.com