

Utility-Scale Distributed Solar Generation

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Agenda

- Geronimo Energy
- What is Utility-Scale Distributed Solar Generation?
- The Aurora Utility-Scale Distributed Solar Project
 - MN Competitive Resource Acquisition Process



Geronimo Energy

Leading Renewable Developer in the Midwest

- Have won more wind Power Purchase Agreements (PPA) than any other developer in the Midwest since 2010
- Over 1,000 MW of wind and solar under PPA throughout U.S.A.
 - Over \$2 billion in capital investment
- End to end development and commercial expertise in house



Utility-Scale Distributed Solar Generation

What Is Utility-Scale Distributed Solar Generation?

- Strategic installation of multiple solar sites throughout a utility's service territory
- Sites selected based on proximity to substations, load and permitting/land use restraints
- Economies of scale = cost savings for utilities



The Benefits of Utility-Scale Distributed Solar Generation

- **Flexibility & Control**
 - Utility-owned or PPA
 - Phase projects to meet fluctuating resource needs
- **Meet Statutory Demands**
 - Obtain Solar Renewable Energy Credits
 - Promote clean, renewable energy

The Benefits of Utility-Scale Distributed Solar Generation

- **Reduce:**
 - Line Loss
 - Capacity requirements and generation from other sources
 - Substation, transmission and interconnection upgrades
 - Point source system failure
- **Increase**
 - Reliability
 - Ease of interconnections and communications

The Aurora Utility-Scale Distributed Solar Project



Why Geronimo Developed Aurora As A Customized Utility-Scale Solution

- March 2013: MN PUC determined Xcel in need of up to 500 MW of additional capacity for 2017-2019
- MN PUC ordered Xcel undergo Competitive Resource Acquisition Process



What Was Proposed?

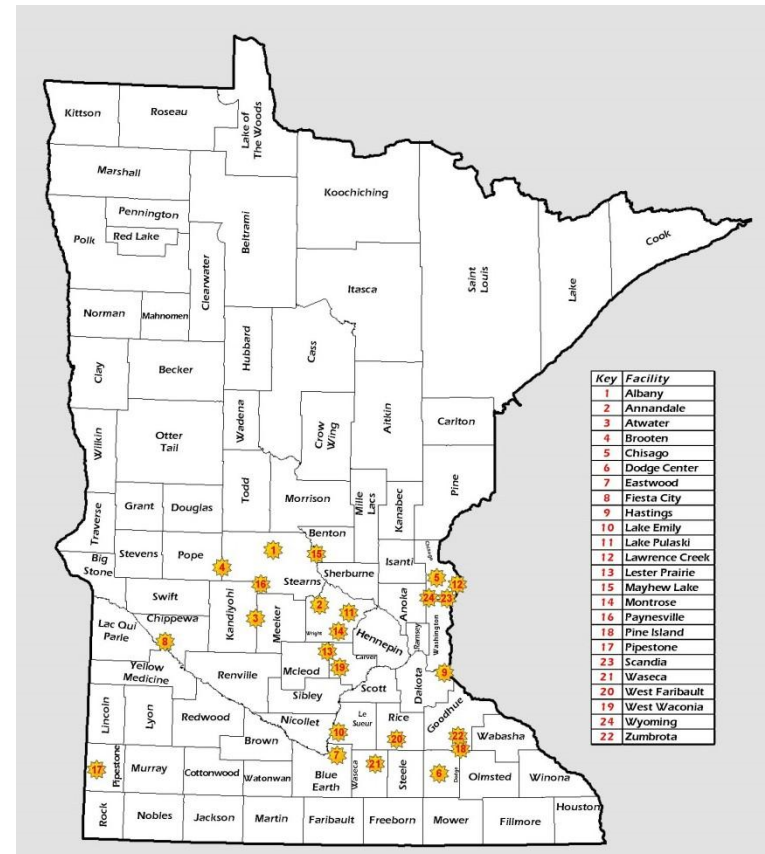
- **Xcel:** 3 208 MW Combustion Turbines (CTs)
- **Invenergy:** 3 160 MW CTs
- **Calpine:** 345 MW expansion of Mankato Combined Cycle (CC)
- **GRE:** 200 MW short term capacity credits
- **Geronimo:** Aurora Solar





Project Specifications

- Operational Capacity: 100 MW
- Location: 16 Minnesota counties
- Construction Timeline: 2015 - 2016, or 4-9 months for each site
- Number of Sites: up to 24
- Project Cost: ~\$250 million
- Local Tax Revenue: up to \$240,000 annually*
- Expected COD: December 1, 2016



The Benefits of Aurora

- 71 MW of MISO-accredited capacity
- 200,000 MWh of energy and associated solar renewable energy credits
 - Fixed price/ no fuel costs
 - Emission free
 - Quiet
 - Zero water use
- No transmission line losses
- Distribution system connections enhance local reliability
- Avoided upgrades of transmission and distribution system

Regulatory Process

- Certificate-of-Need-Like Process
- Contested Case
- Strategist Modeling by Xcel and Department of Commerce
- ALJ Recommendation
- MPUC Decision



ALJ Lipman's Recommendation

- Xcel's actual need is uncertain
- Aurora is most economical option
 - Least cost option based on Strategist modeling
 - Lowest Levelized Cost of Energy (LCOE)
- Scalability
 - Solar modular design and short lead time is more suited in a situation where the need is rapidly changing.

ALJ Lipman Determines Aurora Solar Is Most Economical Option

"Since 1991, Minnesota has had a statutory preference in favor of renewable energy sources. Yet, that preference is overridden when the nonrenewable source has a lower total cost. Notwithstanding the statutory preference, it seemed that nonrenewable energy sources always won the head-to-head cost comparisons. Not anymore." – ALJ Lipman

Minnesota Public Utilities Commission (MN PUC) Decision

- March 2014: MN PUC rules that Aurora is a cost-competitive option for Xcel and should be selected first
- Historic and transformative for solar industry:
 - Solar is best option to meet state energy goals
 - Aurora is the largest distributed solar project in the U.S.A.
 - Aurora level permitted as a single project at the state

Next Steps: After Aurora

- MN PUC ordered Xcel to negotiate a contract
- On September 23, 2014, Xcel filed a Power Purchase Agreement (PPA)
- MN PUC is considering the PPA
 - anticipated decision in early December



Summary

Utility-Scale Distributed Solar Generation

- Start to think of solar as a solution
 - Cost-competitive
- Solar solves common utility problems
 - Reduces line loss
 - Reduces need for upgrades
 - Reduces failure potential for source system
 - Increases reliability and ease of interconnection



Thank You



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