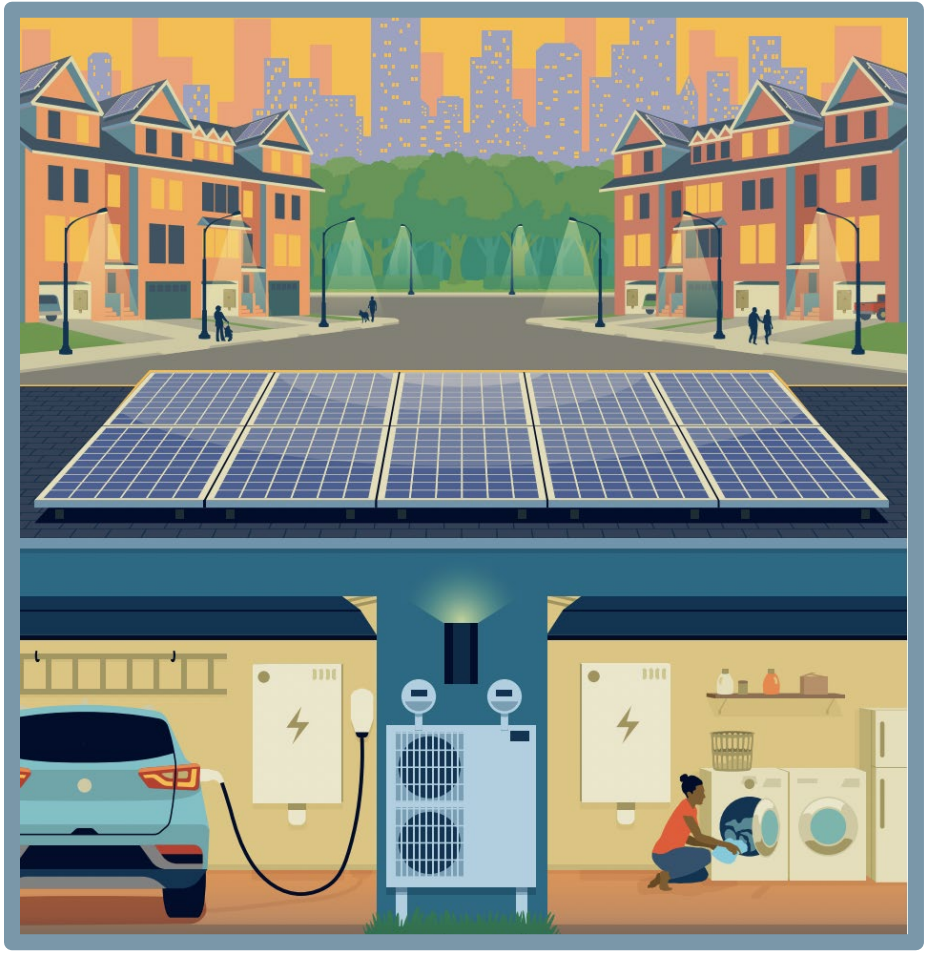
Solar + Storage

The Future Of Carbon Free Electricity



Department of Energy: www.energy.gov/lpo/virtual-power-plants

Sarah Whebbe

All Energy Solar - Policy Analyst
sarah.whebbe@allenergysolar.com
(651)788-2175

- Solar + Storage professional since 2014.
- Minnesota Solar Energy Industries Association - Second Term, Vice President.
- Lifelong Minnesotan.
- Avid backpacker, biker and lover of the outdoors.
- Attending Law School at Mitchell Hamline.

Today's Agenda

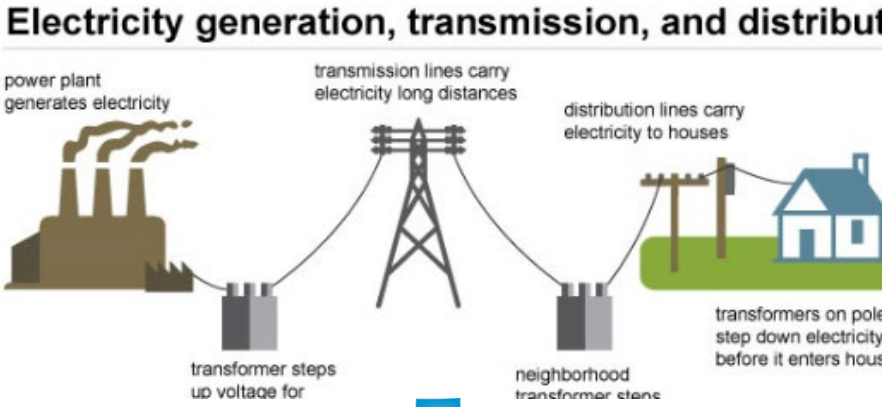
1. Brief Overview of All Energy Solar and MnSEIA.
2. Discussion
   - Current state of the electric grid - why energy storage is needed.
   - Overview of Energy Storage.
   - Home Solar + Storage as Virtual Power Plants.
3. Closing, Q&A

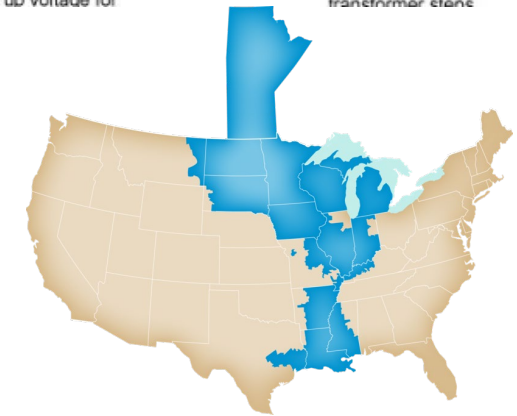
All Energy Solar & MnSEIA Overview

- Family-owned in Minnesota since 2009
- Headquartered in Saint Paul.
- 7,000 + Solar and Storage projects designed and installed.
- Project work across 15 different states and the Caribbean
- 180+ employees with healthcare and benefits
- Direct, in-house customer support for life after installation

- Trade Organization Established in 2009.
- 501(c)6 Non Profit representing the legislative and regulatory interests of 164 members moving clean energy forward in Minnesota.
- Mission to grow the solar and energy storage industries as part of Minnesota's clean energy transition by delivering strong public policy, education, job creation, and sustainable industry development.

Current State Of The Electric Grid

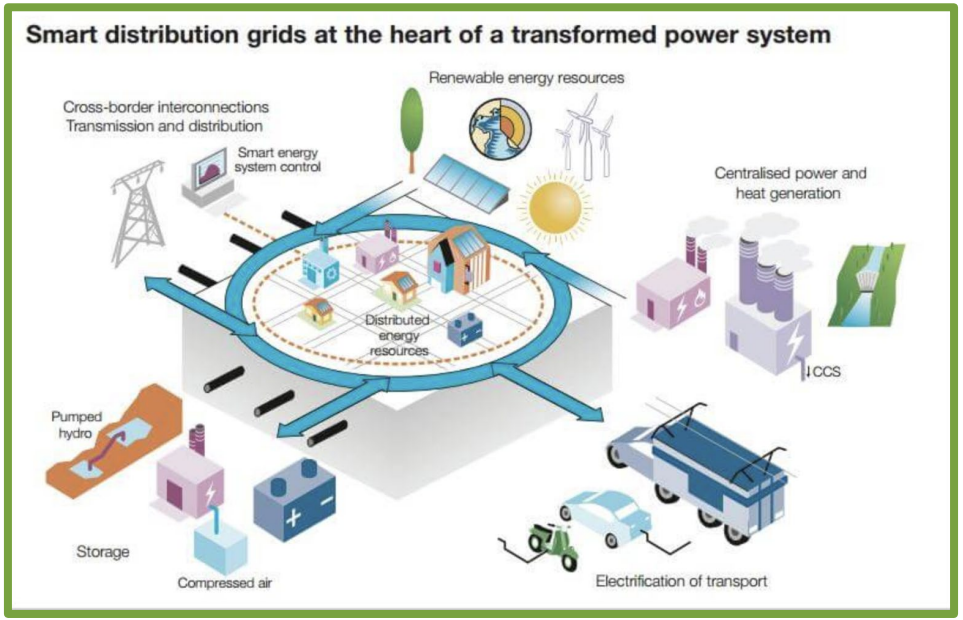




- Engineering marvel spanning the North American continent.
- More than 9,200 electric generating units having more than 1 million megawatts of generating capacity connected to more than 600,000 miles of transmission lines.
- Considered by some to be the the 8th wonder of the world.
- Almost no energy storage today - generation and supply must constantly meet demand.
- Increasingly vulnerable and unable to meet the demands of our climate future.

Energy Storage Overview

- Can include everything from pumped- hydro, compressed-air, Solar thermal-electric power systems, Flywheels and Battery Energy Storage Systems (BESS).
- BESS technologies can serve as an energy resource for Utility-Scale Power, Long Duration/Seasonal Demands, Peak Demand, and Localized Microgrids.
- Adding BESS to Solar and Wind helps renewable energy resources once thought of as "intermittent" become reliable, controllable clean energy power plants.



Source: OECD/IEA Next Generation Wind and Solar Power, 2016.

Virtual Power Plants (VPP's)

- Virtual Power Plants (VPPs): Aggregations of many distributed energy resources systems including rooftop solar paired with BESS, electric vehicles and chargers, electric water heaters, smart building controls, and flexible electricity demand.
- Help balance electricity demand and supply and provide utility-scale and utility-grade grid services like a traditional power plant.
- Rooftop solar paired with Bess - The MVP (most valuable player) VPP.

Solar + Storage - the MVP of VPP's

- Rooftop solar paired with Bess - The MVP (most valuable player) VPP.
- The Texas PUC created the Lone Star state's first Solar + Storage VPP program in 2023.

"Small energy resources found in homes and businesses across Texas have incredible potential to continue improving grid reliability and resiliency by selling the excess power they generate to the ERCOT system," said PUCT Commissioner Will McAdams. "It's a win-win for Texas. Home and business owners get paid for power they supply and consumers in ERCOT get more reliability."

Questions and Answers