Joe McDonald
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VEC Stats

Serve 11,000 members
2,100 miles of line
5 members / mile
30 employees
7 counties (Vernon, La Crosse, & Monroe)
Project Sites:
Projects are all located in Dairyland’s service territory.

Developers:
- groSolar
- SoCore Energy
VEC Solar Projects

- Community Solar Project
  - Chose Clean Energy Collective

- Turned into 2 projects
  - DPC 500 kW – 60 homes $1.5 m
  - Community Solar Project 305 kW

- No member subsidy (fairness)
- No money investment from VEC
- Education for all of us
VEC Community Solar

- First in Wis. & members own panels
- Was the largest in Wis. 305 kW
- Lowest cost in country (<$2 / watt)
- First to pay less than retail rate
- 12 to 13 year payback
- SOLD OUT THE FASTEST IN U.S.
  - 921 panels sold in 2 weeks
$600 Panel

One panel – 380 kWh / year estimated
Paying 10¢ a kWh

$38 year (based on sun, $3.16 monthly credit on electric bill)
$2 escrowed for maint. & insurance

Escalation for rate increases
12 – 13 year payback
6% X $600 = $36
Estimate life of 25 years
LEGAL CHALLENGES

Need to be a utility
Purchase power agreement
Own your distribution lines
Pay by electric bill credits

Costs
How much do you pay per kWh?
FINANCING CHALLENGE

30% Federal Tax Credit
- need to find a partner
- own it 5 years

Clean Energy Collective LLC
Leader in community solar
Colorado
A Few of Our Utility Partners

1. Holy Cross Energy
2. Poudre Valley REA
3. Xcel Energy
4. Green Mountain Power
5. WH Solar Community
7. Kit Carson Cooperative Community Solar
8. Vermont Electric Coop
9. Yampa Valley Electric Association
10. NSTAR
11. National Grid
12. Vernon Electric
13. San Miguel Power Association
14. Colorado Springs Utilities
15. City of Fort Collins Utilities
16. Western Massachusetts Electric
Solar Ribbon Cutting
June 25, 2014
Panel Signing Event
Lessons Learned

- 10X more complex than I thought
- Tax, legal, PPA, ...devil in the details
- Use a renewable energy attorney
- Don’t set precedents
- How much control do you want
- Price point ????
- Limit number of panels purchased
- Negotiate – Negotiate – Negotiate
- No snow removal
- Zoning was easy for us – view & run off
- Need economy of scale
Community Solar (Educational)

MONTHLY BILL CREDIT/PANEL

[Chart showing monthly bill credit/panel for January 2015 to December 2017 with values ranging from $0.97 to $4.23]
Mowing grass with “wool” power
Solar Update

- Several community solar projects
- MGE & Xcel
- Solar & all renewables
  - cross subsidizations
  - buy solar 8¢, coal 3-6¢, wind 3¢
  - retail is 12¢
- Net metering & revenue erosion
- Fixed costs recovery
- Battery storage
- Business & cities going 100% green
Electric Vehicles Are Coming!
49 Wind Turbines

Enough to power approximately 37,000 homes
Cooperative Purpose

The Quilt Block Wind Farm was named the "Renewable Energy Project of the Year" at the 2018 RENEW Wisconsin's Summit!
NRTC and SoCore Partnering to Support Co-op Solar Development

“We researched several solar developers and we chose SoCore because of its experience...developing multi-scale systems increasingly relevant to cooperatives. We expect that an alliance with a developer of SoCore’s reputation on an exclusive basis will give us a competitive edge in supporting member bids and needs for C&I and utility-scale solar projects.”

– Tim Bryan, CEO, NRTC
United Power Announces Construction of Colorado’s Largest Battery Storage System

October 24, 2017

Photo: Jerry Marizza, New Business Director, in front of United Power’s first community solar system. Photo courtesy of United Power.

United Power announced plans to construct its first commercial scale energy storage project. Located in Firestone, CO and developed in collaboration with Chicago based SoCore Energy, the 4 MW / 16 MWh battery storage system will be the largest facility in the State of Colorado and one of the largest systems owned and operated by an electric co-op anywhere in the country.
Storage pilot example: Central Rural Electric Co-op

- In March 2016, CREC awarded SoCore Energy an EPC contract to design, install, and commission a lithium-ion energy storage system (ESS)
  - **System:** Tesla PowerPack® 250 kW / 475 kWh
  - **Use case:** Microgrid component in conjunction with solar (PV), building controls, and natural gas generation

- Ribbon-cutting was held in August with the CREC team completing microgrid programming in September

- CREC’s energy park is designed to meet the co-op’s current needs while providing the opportunity to expand to meet future needs of the campus

- This project was awarded a Greentech Media “Grid Edge” award in 2017.

“Central is excited to be implementing these cutting-edge technologies. Our employees being the first in the state to integrate the solar array, battery storage and interconnection equipment has been a great opportunity for them to gain experience and grow for the future,”

- David Swank, CEO of Central Rural

Tucson Electric signs solar + storage PPA for 'less than 4.5¢/kWh'

- Tucson Electric Power has signed a power purchase agreement for a solar-plus-storage system at "an all-in cost significantly less than $0.045/kWh over 20 years," according to a company official. Exact prices are confidential, but a release pegged the PPA for the solar portion of the project at below $0.03/kWh.

The project calls for a 100 MW solar array and a 30 MW, 120 MWh energy storage system
What do storage projects look like?

2MW/4.4MWh containerized storage system in Glacier, USA owned by RES using BYD batteries. This is a fairly typical illustration of what this type of battery system looks like.
What do storage projects look like? (cont.)

20 MW / 80 MWh storage system owned by Southern California Edison using Tesla batteries in Ontario, CA. The Tesla product is highly modular, thus suitable for both small and large systems.
Renewables and natural gas comprise most of the capacity additions through the projection period in the Reference case—
The projected mix of electricity generation technologies varies widely across cases—
Increasing wind and solar capacity additions in the Reference case—

Utility-scale wind, solar, and storage operating capacity
gigawatts

- Wind
- Solar Photovoltaic
- Storage
The “four legs of the stool”

**Offtake:** subscribe members or rate base?

**Interconnection:** distribution through co-op, transmission through MISO

**Real Estate:** Land lease / purchase / co-op owned land

**Permitting:** Local gov., zoning, construction permit, stormwater, and neighbors.