



A Touchstone Energy® Cooperative

DG and the Cooperative Model

Community Solar

Chris Bilby
Research Engineer, Holy Cross Energy

March 6th 2019

the power
is in your hands



SEVENTY70THIRTY



Clean power. Lower emissions. By 2030.

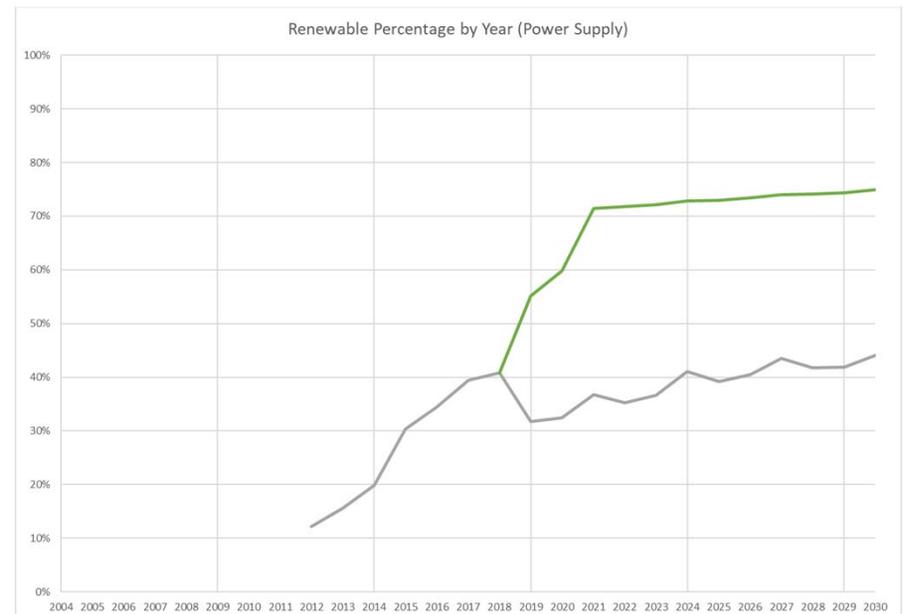
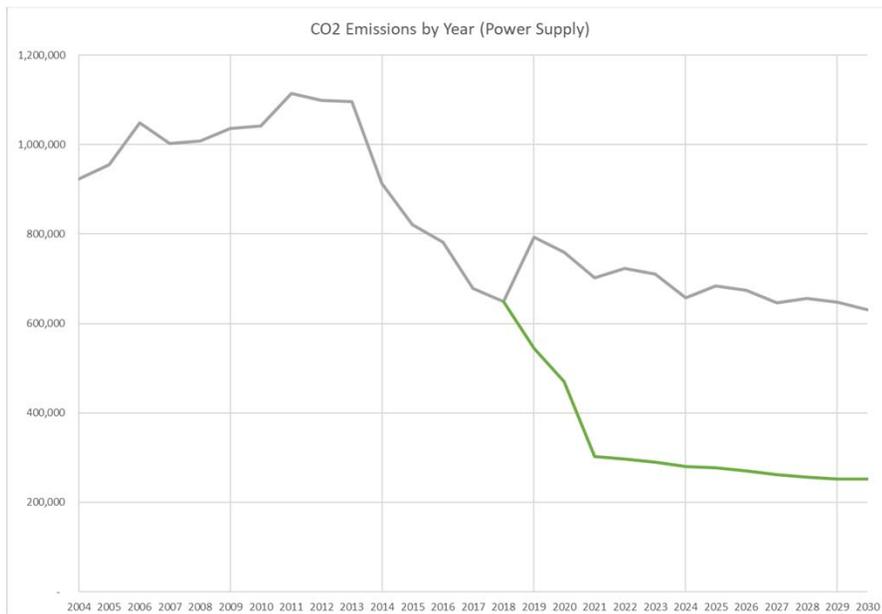
- Use clean and renewable resources to supply at least 70% of the power we provide
- Reduce the greenhouse gas emissions associated with our power supply by 70%
- Accomplish both of these goals with no additional increase in the cost of our power supply

Our commitment
to a clean energy
future.

CO2 Emissions & RE % Projections



A Touchstone Energy® Cooperative



Seventy70Thirty

Resource planning for the future

- Bulk Wind = ~100MW wind PPA, scheduled for 2021 delivery
- Bulk Solar = ~30MW solar PPA, expected for 2022 delivery
 - ~Additional 3.4% Annual Renewable Energy
- Distribution System = ~25MW solar through 2030 @ 5MW/3-years
(includes Gypsum and Woody Creek 5MW projects, in permitting now)
- Behind-the-Meter = ~24MW solar through 2030 @ 2MW/year
(HCE currently has about 33MW of active distributed generation capability installed at ~ 1300 member locations)

Community Solar - Then



A Touchstone Energy® Cooperative

Mission to serve our members... and our members want renewables... but at no increase in cost

Why Community Solar

- Only 22-27% of residential rooftop area is suitable for hosting on-site PV
- Adds options for renters
- Lower upfront cost vs rooftop
- Portable



Community Solar - Then



A Touchstone Energy® Cooperative

HCE was a pioneer in Community Solar in 2010 with a partnership with Clean Energy Collective (CEC)

- 2010 78kW
- 2011 0.9MW
- 2015 1.8MW
- 2016 0.8MW

Total ~3.5 MW



First Installation

- Installation cost
~\$466,000 (\$6/watt) or
\$3.15/watt after rebates
- 1603 Treasury Grant
- Simple payback 12.8y



Income-Qualified Community Solar



A Touchstone Energy® Cooperative

2016: 145 kW with 100% energy allocated to low-income qualified members

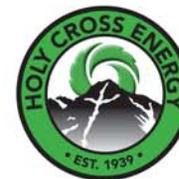
Goal: Offset 50% of electric bill

Participating Members: 43





Community Solar - Then

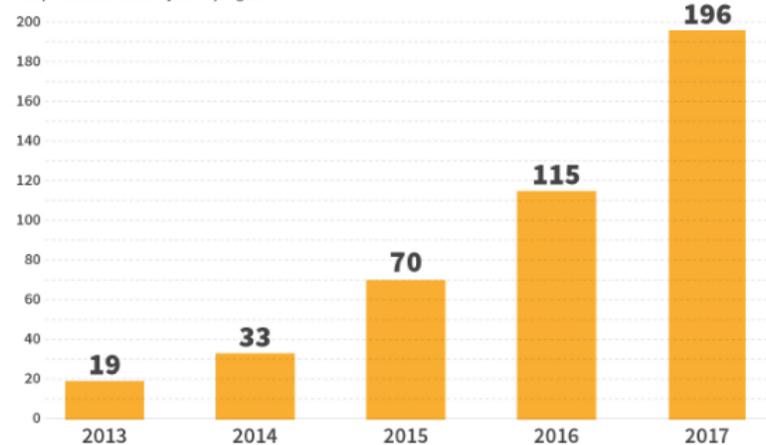


A Touchstone Energy® Cooperative

Payment Escalation vs PV Cost (200kW)



Cooperative community solar programs



Source: NRECA

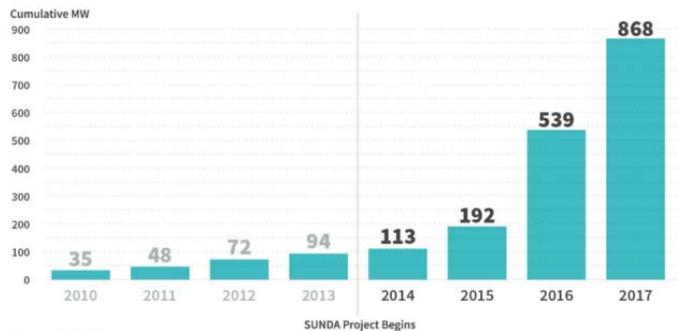
PV System Costs from: NREL. U.S. Solar Photovoltaic System Cost Benchmark: Q1 2018

SUNDA Project

(Solar Utility Network Deployment Acceleration)



A Touchstone Energy® Cooperative



Adapting Community Solar to all Co-ops

System Design

1. Rapid change in technology
2. Rapid change in cost
3. Need for skill development within the utility

Business Model

1. How to finance and share cost among membership
2. How to charge member who are interested
3. How to insure to minimize risk



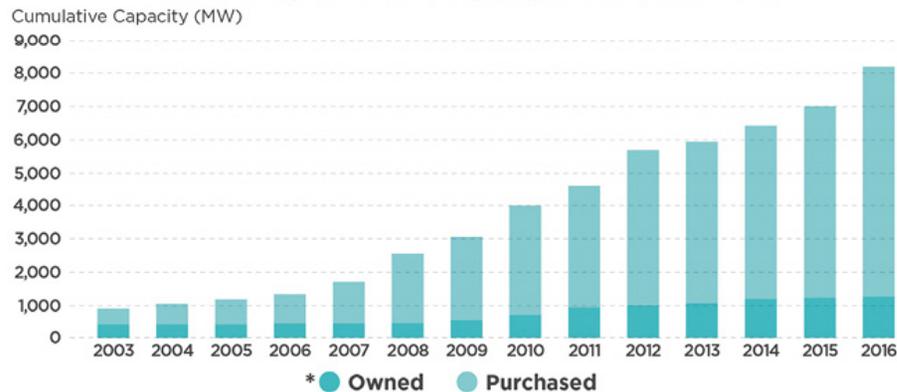
Transitioning an Outdated Energy Economy into the Renewable Age



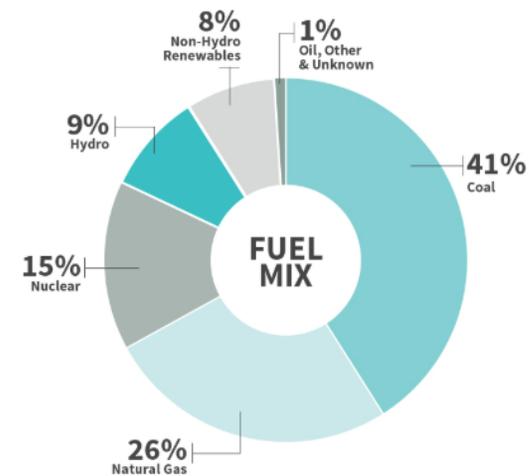
A Touchstone Energy® Cooperative

Although co-op may be leading the way in Community Solar, we need help with integrating Renewables.

Electric Co-op Cumulative Capacity Growth (2003-2016)



Source: NRECA. *Owned: Renewable capacity that is owned by electric co-ops. Purchased: Renewable capacity whose output is purchased by co-ops through a Power Purchase Agreement (PPA).



Source: NRECA Research

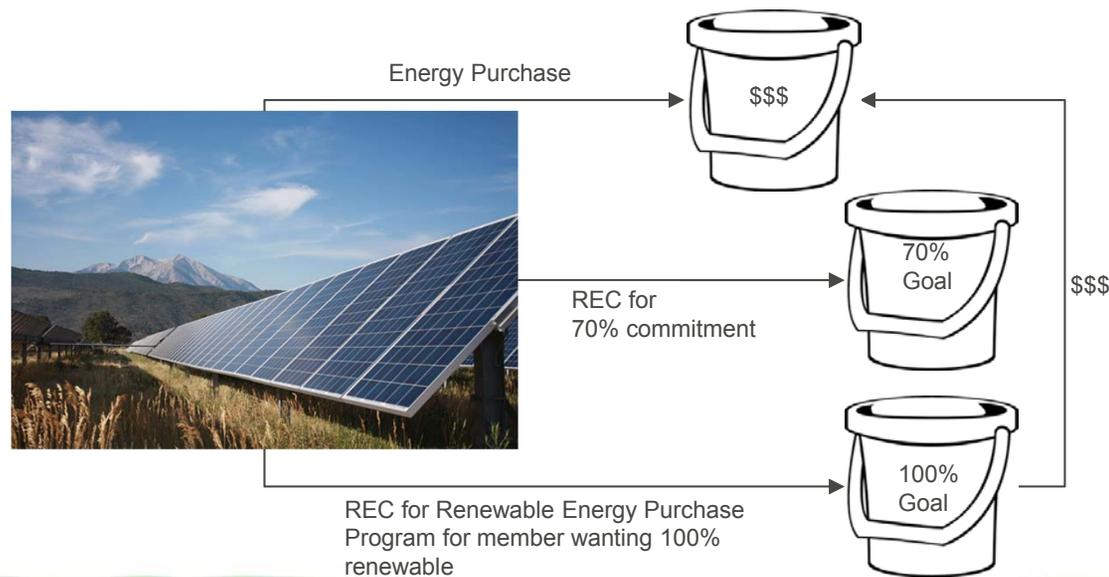


Community Solar - Now



A Touchstone Energy® Cooperative

HCE is currently evaluating a 30MW solar farm outside of our service territory for community solar



Achieve renewable goal and reduce cost

PV must be installed at larger scales

Offered to membership for a 1 year commitment

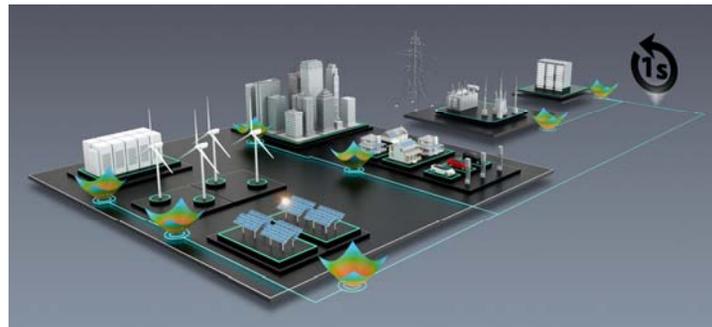


Community DG of the Future



A Touchstone Energy® Cooperative

- Community Energy Storage (CES)
- Community Generation + Transportation (CPV+EV)
- Flexible Capacity & Controllable Renewables
- Microgrid Template to Support Community Models





A Touchstone Energy® Cooperative 

Questions?

Chris Bilby
Research Engineer, Holy Cross Energy

March 6th 2019

**the power
is in your hands**





A Touchstone Energy® Cooperative 

Backup

the power
is in your hands



IEEE1547-2018



A Touchstone Energy® Cooperative 

