



## PWC COMMUNITY SOLAR PROJECT



2019 APPA National Conference

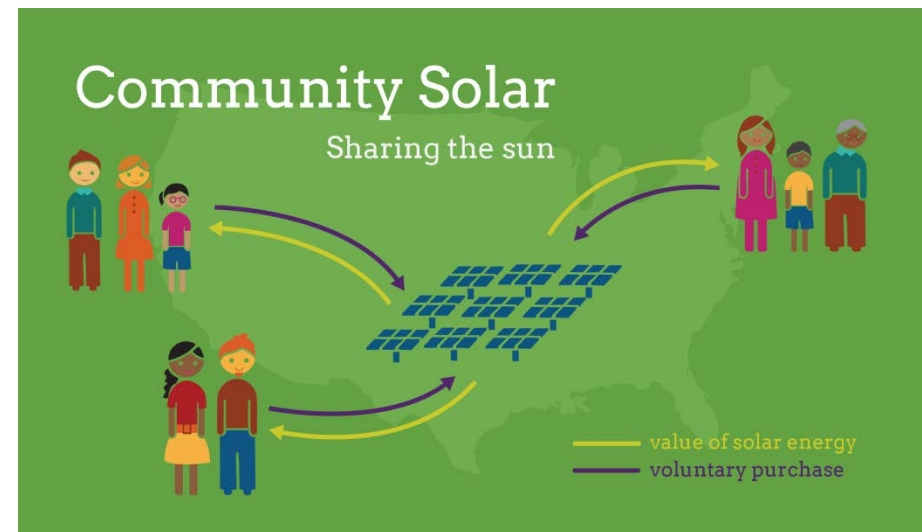
Austin Convention Center

Presented by: Achyut Shrestha NC State Clean Technology Center

Mark Brown Fayetteville Public Works Commission

June 10, 2019

- ▶ Community Solar for the Southeast project
- ▶ Fayetteville PWC Background
- ▶ Project Description
- ▶ Project Status
- ▶ How Would It Work?
- ▶ Economics



# NC Clean Energy Technology Center

- UNC System-chartered Public Service Center administered by the College of Engineering at North Carolina State University
- **Mission** is to advance a sustainable energy economy by educating, demonstrating and providing support for clean energy technologies practices, and policies.
- Objective research, analysis, & technical assistance – no advocacy

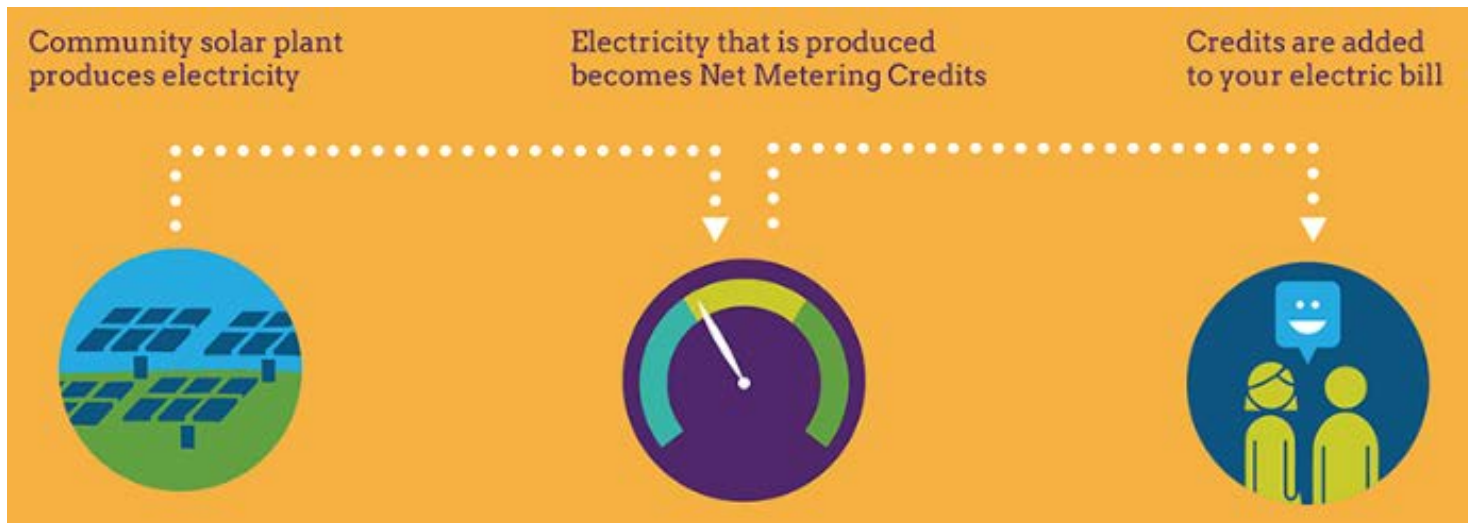


NC STATE

College of Engineering

# What is Community Solar?

- Typically ground-mounted photovoltaic (PV) systems where the output is shared by more than one household.
- Customers can buy or subscribe for a portion of the output from the project as a credit to their electric bills.



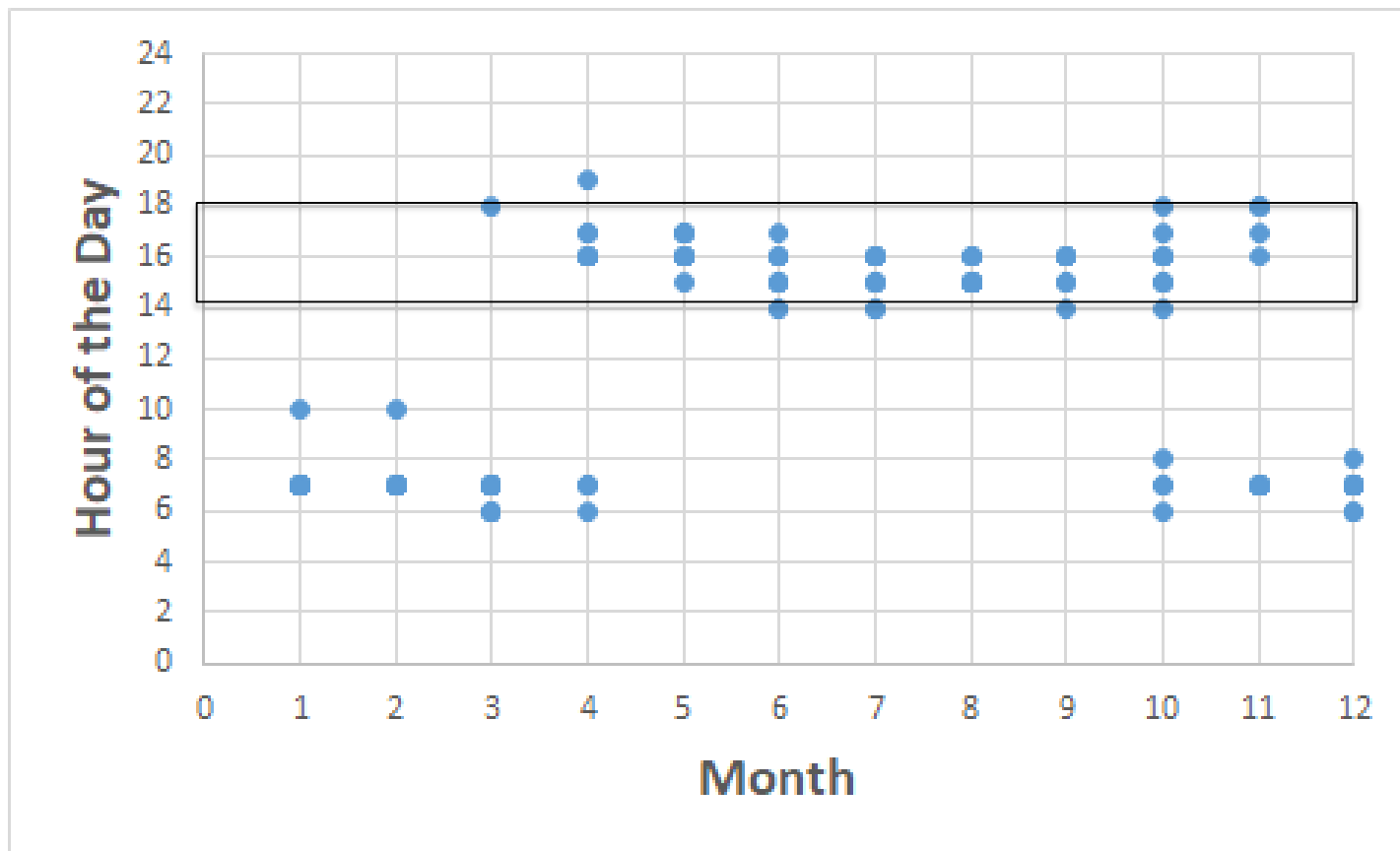
# Benefits of Community Solar program

1. Provides solar PV options for households that do not have suitable roof for solar installation.
2. Provide solar PV for renters
3. Obtain economies of scale (cheaper than rooftop)
4. No need to bother about installation (utility or third party owned)

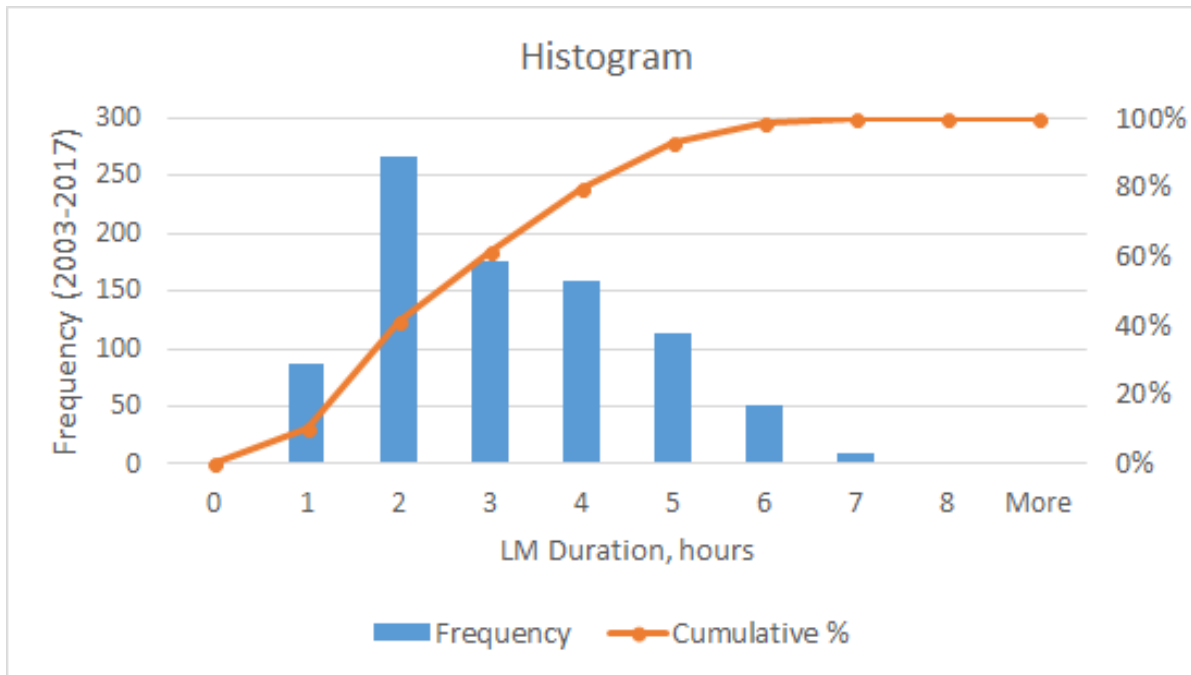
# Community Solar for the Southeast Project

- Provides technical assistance to support development of solar PV and energy storage project for electric coops and municipal utilities in the southeast.
- Project is funded through the U.S. Department of Energy's Solar Energy Technology Office

# CP Load Analysis of NC utility



# Battery sizing



LM Hours	Cumulative %
0	0.00%
1	10.1%
2	41.0%
3	61.3%
4	79.7%
5	92.8%
6	98.7%
7	99.8%
8	100.0%



# Technical Assistance Examples

- Conduct **cost benefit analysis** of solar PV and storage
- **Review** wholesale power contracts
- Solar PV **feasibility screening**
- **Support** solar PV and storage procurement
- **Develop** marketing and outreach materials
- **Design** Community Solar project



- ▶ PWC Partner N. C. State
  - Technology Knowledge
  - Production Modeling
  - Customer Outreach
  - Policy Knowledge
  - Best Practices

# Contact

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- ▶ N C 3<sup>rd</sup> Nationally
  - ▶ State/Federal Incentives
  - ▶ State 400 MW
  - ▶ Expected PWC
  - ▶ Actual PWC
  - ▶ No Net Metering
  - ▶ Commission Policy
- State Mandates
  - Utility Subsidies –  
Net Metering
  - 58,000 homes
  - 1,406 homes
  - 15 (.02%)
  - (Buy All Sell All)
  - No Subsidies



# PWC Background – Utility & Community

## Utility

- ▶ Owned by City(**Created 1905, Commission Governance**)
- ▶ Electric, Water, Sewer (**84,000 Electric Customers**)
- ▶ Largest in North Carolina (**35th Largest in US**)
- ▶ 490 MW Peak Load (**2.2 Billion kWh**)
- ▶ Generation (**Own, Operate**)

## Community

- ▶ 40% Rental Properties (**Rooftop Solar Not Viable**)
- ▶ 20% Customer Turnover (**Fort Bragg Deployments**)
- ▶ Retirees/Low Income (**Affordability**)

# **PWC** Background – Regulatory - Power Supply

Fayetteville's  
HOME TOWN UTILITY

## Regulatory

- ▶ Commission Authority
- ▶ Lowest Prudent Rates
- ▶ 22 million kWh by 2018
- ▶ Compliance Markets

Low Rates

Senate Bill 3 Mandates

4.4 Million kWh Solar

PWC Compliance Cost

## Power Supply

- ▶ Full Requirements
- ▶ \$20 /kWh One Hour

Generation Plant Lease

Less Than \$ .03/kWh

PWC Community Solar is:

- ▶ A Single 1,000 kW Solar Array



(5 -7 acres)

PWC Community Solar is:

- ▶ 500 kW (1,000 kWh)
- ▶ Lithium Ion Battery Installation



(10 feet by 16 feet)



PWC Community Solar is:  
Located on An Existing PWC Site



PWC Installs and Maintains

Two Projects in One

Community Solar

Solar Array

Upfront Cost Reduced by REPS Funding for Compliance

Initial Cost Paid by Participants Through Subscription Fee

Value of Avoided Power Supply Cost Shared by Participants

Ongoing O&M Costs and Future Costs Deducted from Array Value

PWC Retains the RECs

Battery

PWC Manages the Battery to Reduce Peak Costs

Value of Battery Flows to All Electric Customers

- 3,384 Subscriptions Available- One per panel
- Subscriptions available to residential and non-residential PWC electric customers
- Initial allocation based on set asides - held for 60 days

Residential customers (Max 5/customer)	70%	2,374 panels
Small and Medium Power customers	10%	338 panels
Cumberland County Schools	5%	169 panels
Universities - FTCC, FSU, Methodist	3%	102 panels
Other Schools	2%	67 panels
Churches	5%	169 panels
City of Fayetteville	1%	33 panels
Town of Hope Mills	1%	33 panels
Cumberland County	1%	33 panels
Cape Fear Valley Hospital	1%	33 panels
VA Hospital	<u>1%</u>	<u>33 panels</u>
	100%	3,384 panels

Community Solar Subscription Model

Enrollment Fee \$ 10 per Panel

Establishes Reserve Fund to Allow for Variable Array Value and Costs

Subscription Fee \$ 1.43 per Panel per Month

Covers Initial Costs Less REPS Compliance Funding  
Compensates Subscribers for RECs

PWC Retains RECS

Monthly Bill Credits \$ 1.55 per Panel per Month

Based on Estimated Array Value Less O&M and Future Costs

Credit for First Fifteen Months

Established Each December for Calendar Year Based on Array Performance



# Community Solar –Initial Costs

Total Project Cost	\$ 2,444,754
Solar Array Cost	\$ 1,480,910
Battery Cost	\$ 963,845
Estimated REPS Funding	\$ 570,439
Solar Cost for Subscription Fee	\$ 910,470
Number of Panels	3,384
Estimated Total Monthly Subscription Fees	\$4,844
Estimated Monthly Subscription Fee	\$ 1.43
Estimated Monthly Bill Credit	\$ 1.55

Battery Cost	\$ 963,845
Estimated Peak Demand Savings Year 1	\$ 106,464
Estimated O&M Costs	\$ 10,625
Estimated Annual Savings	\$ 95,839
Estimated Simple Payback Years	10.1

- ▶ Construction Complete May 2019
- ▶ Promotion Begins July 2019
- ▶ Subscriptions Begin October 2019



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