

# Value of Community Solar to LMI families

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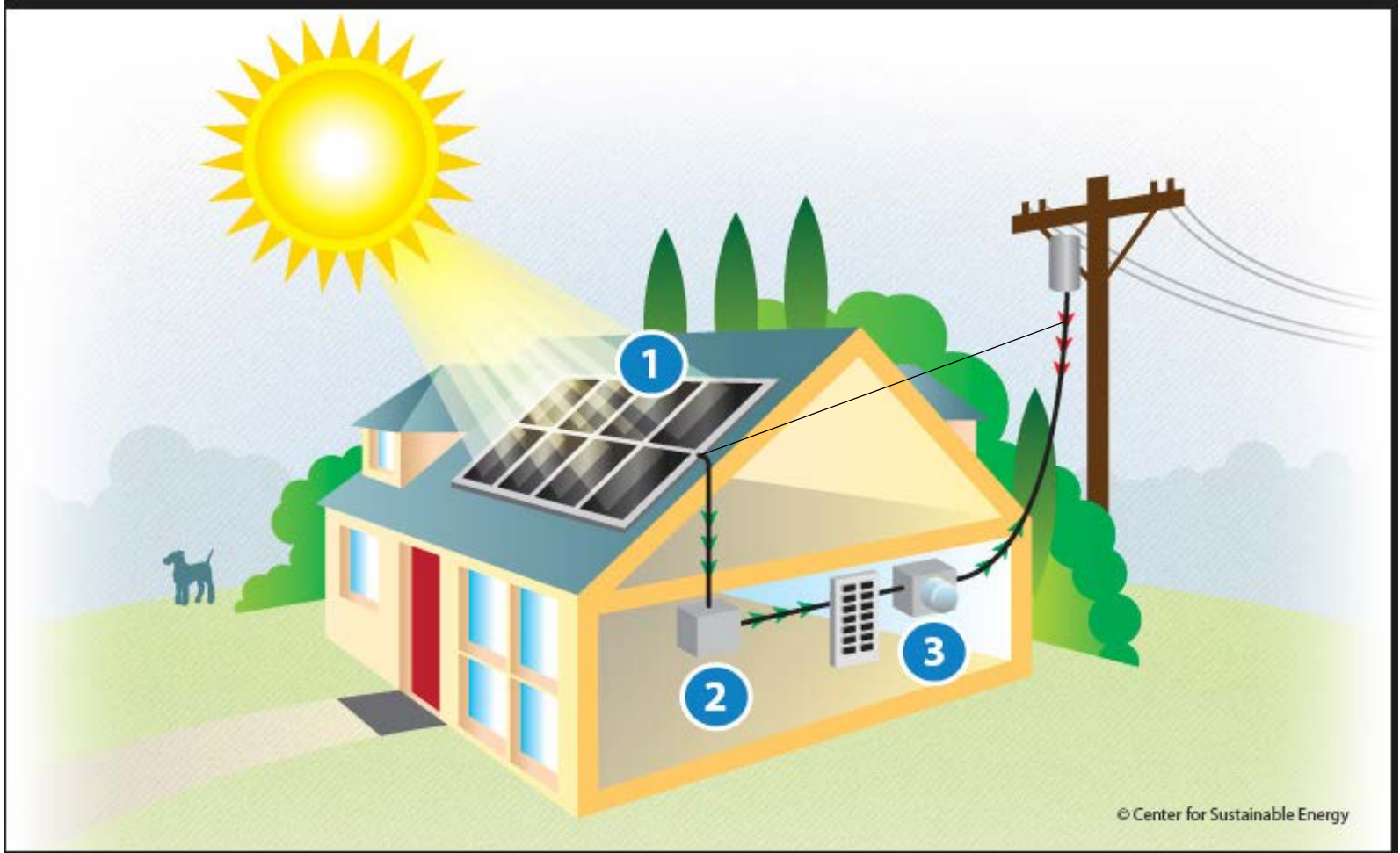
# Basics of customer electricity Bill

- 2 major elements
  - Fixed Facilities Charge - \$12.00
  - Energy Charge per kWh - 10.9 c/kWh

kWh is the amount of electricity used.

If a home uses **1,000** kWh total bill

- Facilities charge - \$12.0
- Energy Charge - \$109.0 ( 10.9 c/kWh x 1000 kWh)
- Total - \$121.0



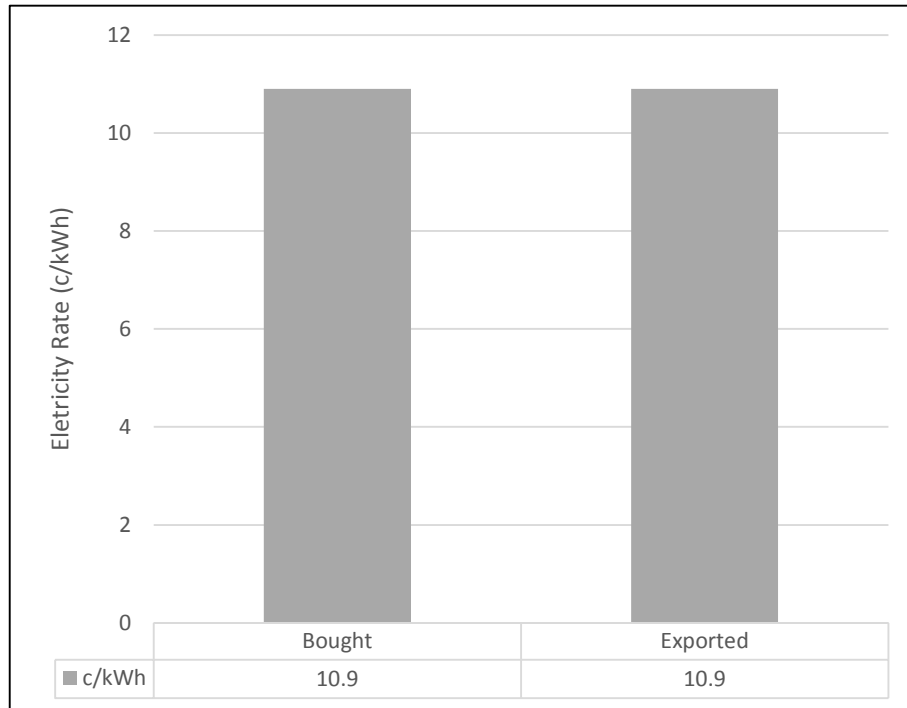
# Community Solar Programs in North Carolina

- **Duke Energy** – HB 589 requires 40 MW of community solar in the state (pending)
- **Electric Cooperatives**- In 2016, 10 coops participated in development in 15 community solar programs in the State
- **Municipal Utilities**- None so far. Pilot project development at FPWC

# Value depends on crediting structure

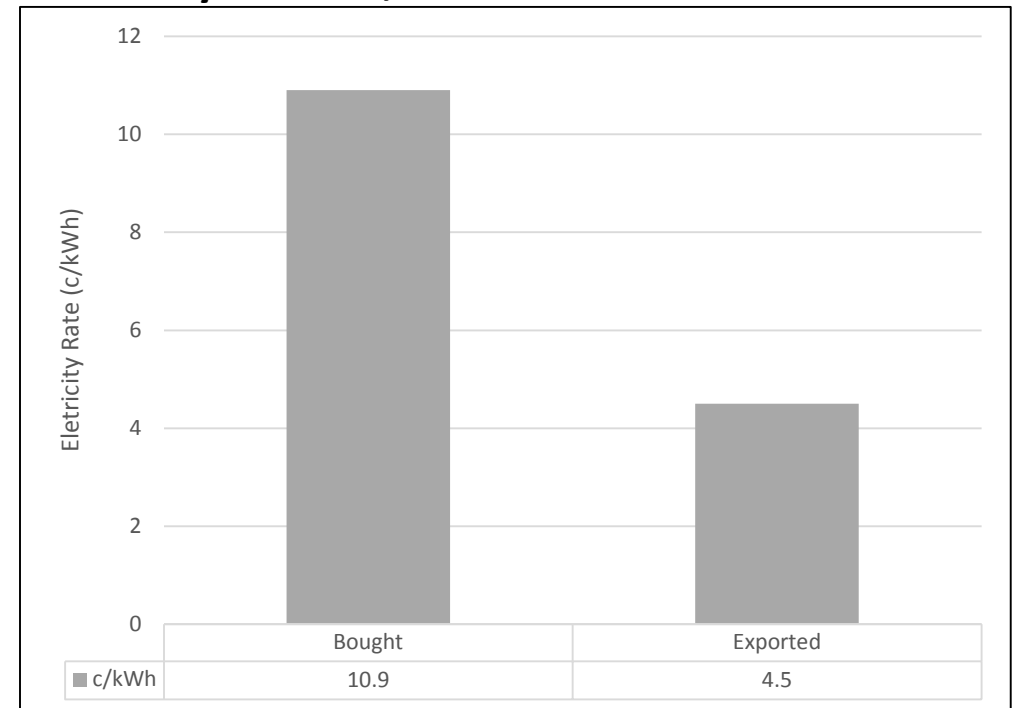
- Retail Crediting

Buy at retail, Sell at Retail

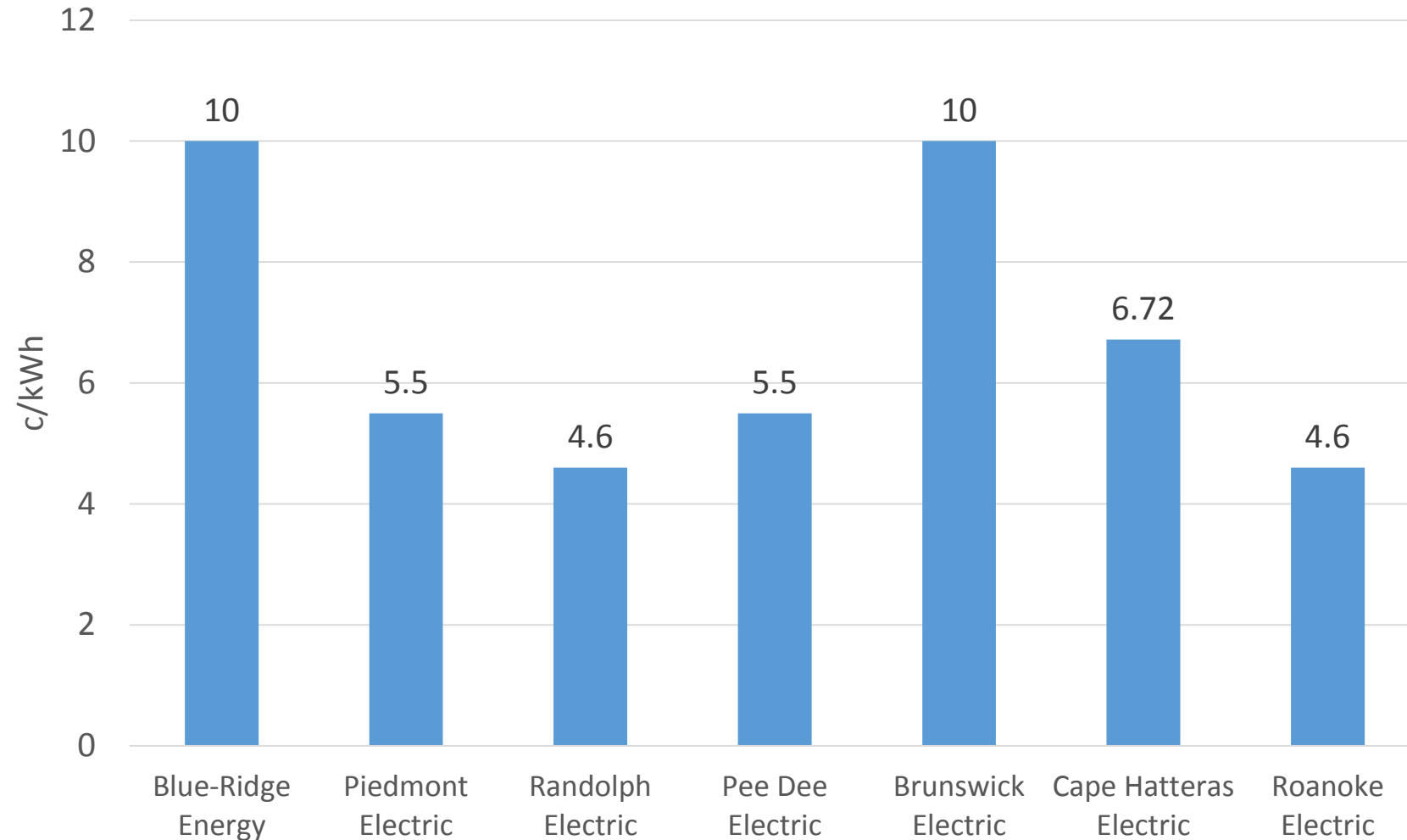


- Wholesale crediting

Buy at retail, Sell at wholesale



# Crediting for Community Solar in NC



# Difference in value

## Retail Crediting

Total Energy Consumed	1000 kWh
Total Energy Generated (10 Panels)	- 500 kWh
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Total Billable energy	500 kWh

## Electricity Bill

Customer Charge	\$12.0
Energy Charge ( <b>500</b> x 0.109)	\$54.90
Subscription charge (2.5x 10)	\$25
<b>Total</b>	<b><u>\$96.9</u></b>

## Whole Sale crediting

Total Energy Consumed	1000 kWh
Total Billable energy	1000 kWh
Total Energy Generated (10 Panels)	500 kWh

## Electricity Bill

Customer Charge	\$12.0
Energy Charge ( <b>1000</b> x 0.109)	\$109
Subscription charge (2.5x 10)	<b><u>\$25</u></b>
Energy from solar (@4.5 c/kWh)	<b>\$22.5</b>
<b>Total</b>	<b><u>\$128.5</u></b>

# Crediting at avoided cost (Current cost)

## Wholesale crediting (existing program)

Total Energy Consumed	1000 kWh
Total Billable energy	1000 kWh
Total Energy Generated (10 Panels)	500 kWh
<u>Electricity Bill</u>	
Customer Charge	\$12.0
Energy Charge (1000 x 0.109)	\$109
<b>Subscription charge (2.5x 10)</b>	<b>\$25</b>
Energy from solar (@4.5 c/kWh)	<b>\$22.5</b>
<b>Total</b>	<b>\$123.5</b>

## Wholesale crediting (future program)

Total Energy Consumed	1000 kWh
Total Billable energy	1000 kWh
Total Energy Generated (10 Panels)	500 kWh
<u>Electricity Bill</u>	
Customer Charge	\$12.0
Energy Charge ( <b>1000</b> x 0.109)	\$109
<b>Subscription charge (2.0x 10)</b>	<b>\$20</b>
Energy from solar (@4.5 c/kWh)	<b>\$22.5</b>
<b>Total</b>	<b>\$118.5</b>



# Crediting at avoided cost (with battery)

500 kW Solar

With Battery 250 kW- 500 kWh

Monthly sub cost = \$3.98

Benefit monthly = \$ 4.20

<b>Whole sale crediting with battery</b>	
Total Energy Consumed	1000 kWh
Total Billable energy	1000 kWh
Total Energy Generated (10 Panels)	500 kWh
<u>Electricity Bill</u>	
Customer Charge	\$12.0
Energy Charge ( <b>1000</b> x 0.109)	\$109
<b>Subscription charge (3.71x 10)</b>	<b>\$37.1</b>
Energy from solar+ Battery	\$42.0
<b>Total</b>	<b>\$ 116.8</b>

# Monthly Bill Summary

- Without Community Solar = \$121.0
- With Only Solar
  - Retail Crediting = \$96.9 (20 % reduction)
  - Wholesale credit (existing) = \$ 123.5 ( **2% increase** )
  - Wholesale credit (future) = \$118.5 ( 2% reduction )
- With Solar + Battery
  - Buy-all, sell-all (battery) = \$116.8 (3.47% reduction)

# Part 1: Pilot Project: Fayetteville PWC

- Serves 80,000 customers
- Largest municipal utility in the state
- 36th largest in the Country



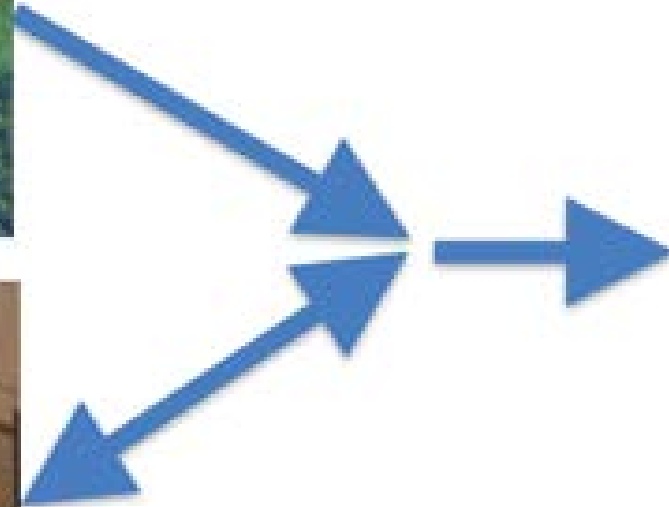
# Proposed Project System: Photovoltaic and Battery Energy Storage



1 MW (~3,700 panels)

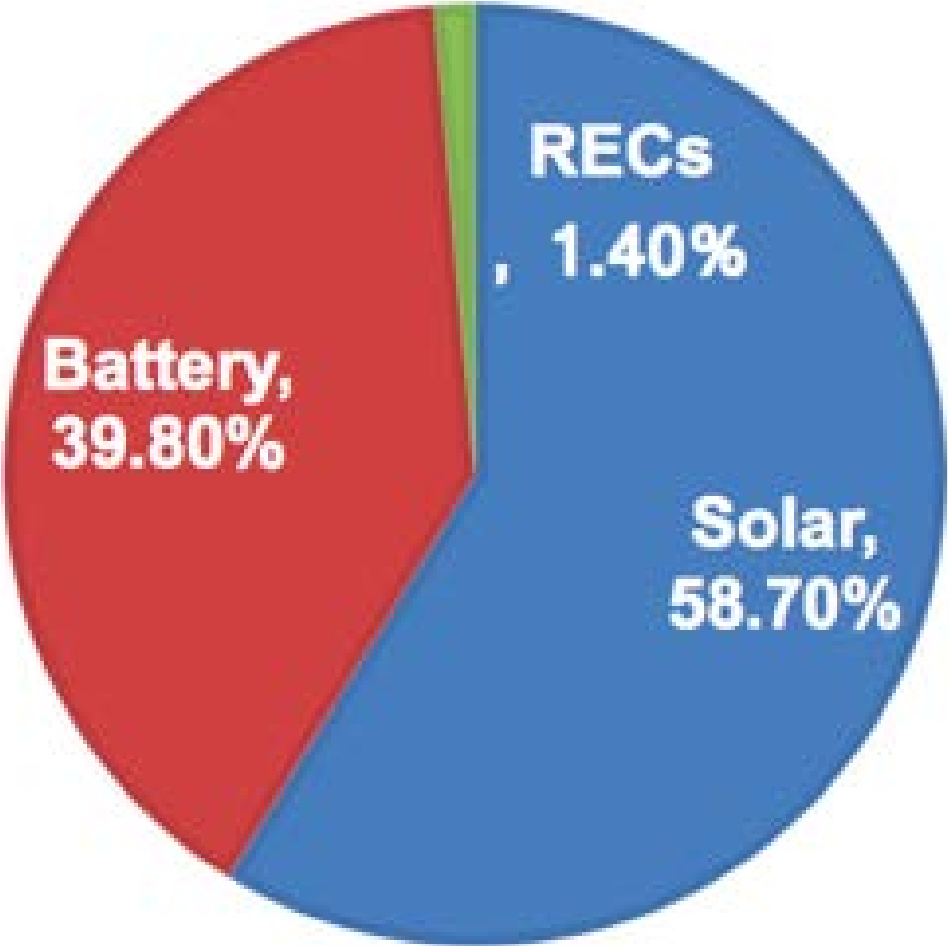


500 kW lithium Ion battery

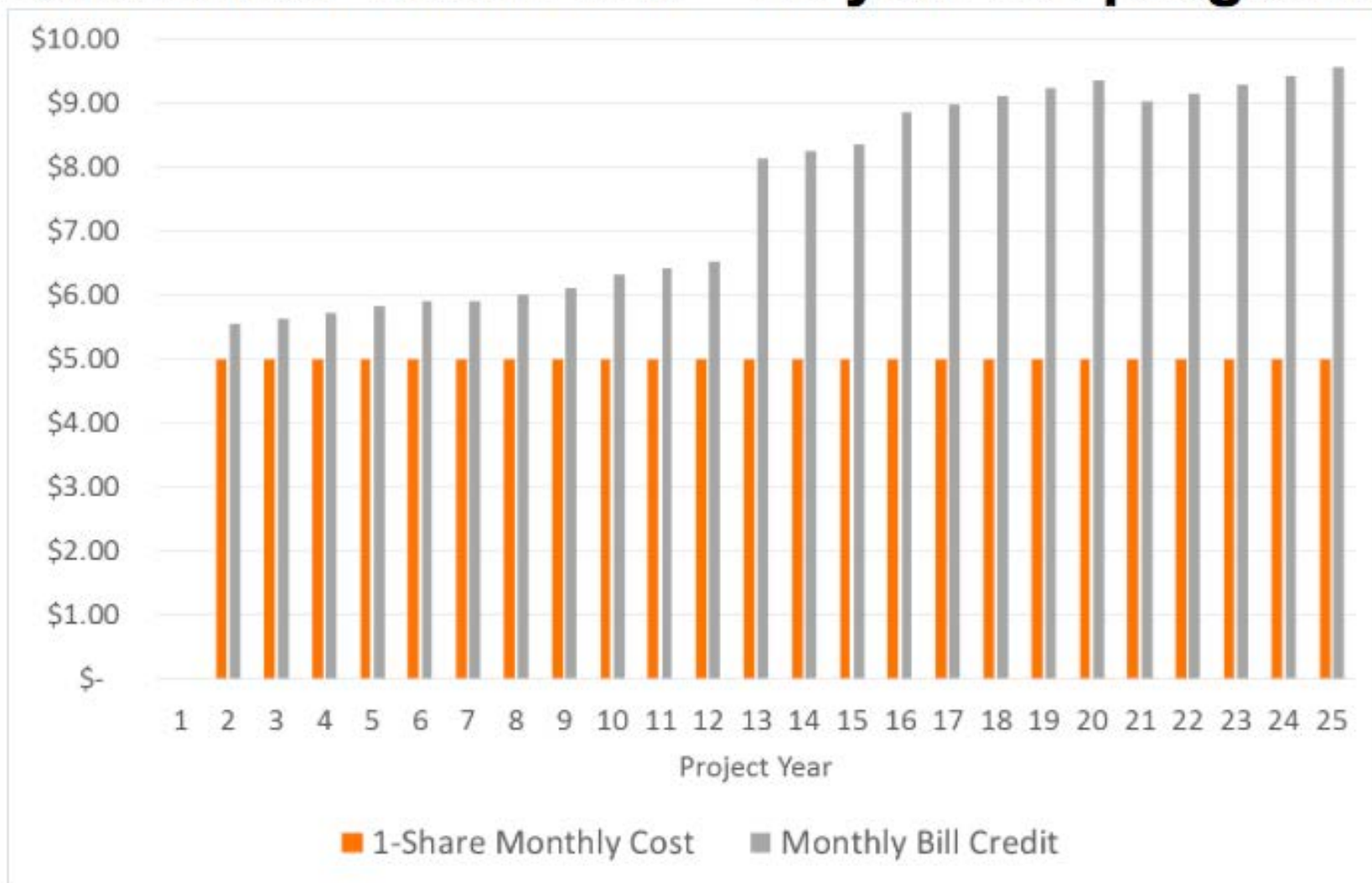


**FPWC  
Distribution  
Grid**

# Value Produced



# Subscriber Cash Flow – 25 year CS program



# Providing access to Community Solar for Low Income Families

# Scenario 1: Lower PPA

Hypothetical:

- With the cost of solar PV decreasing, maybe the utility is able to buy energy from Solar PV at a cheaper rate than their wholesale rate.

Example-

Electric Coop buys from duke at 4.5 c/kWh

BUT

Electric Coop buys from Solar Developer at 3.5 c/kWh (1c/kWh Saving)

Identify LMI families and charge them \$9 c/kWh instead of \$10 c/kWh

Savings \$10 a month!



# Scenario 2: Two Tier Rates

- Design a community solar program with two tiered rates, where 1 group voluntarily subsidizes the community solar subscription for Low Income families.
- Rate Class 1 (80%): Pay \$2.3 per month instead of \$1.7 monthly sub
- Rate Class 2 (20%) (LMI is subsidized 100%): Credited all of solar

# Scenario 3: Upfront cost subsidized by a benefactor

Hypothetical:

- A generous benefactor donates funds to build a community solar program to benefit the Low Income families.
- Initial donation ~ From anywhere to - 1 million dollar (500 kW AC)
- Monthly benefits from the project would be assigned to low income families without a subscription fee.

# Scenario 4: Crediting for the value of community solar

- As discussed above, how the credit is put in place has a big impact on the value of community solar.
- Need to credit the solar output at the actual value of solar energy instead of crediting automatically at retail or whole sale rate.

# Scenario 5: Include community solar as a part of the federal assistance program

- Would be a consideration to include community solar program as part of the weatherization and LIHEAP programs?
- Example: [In October 2017, Colorado](#) became the first state to allow solar PV to be a part of the Weatherization Assistance Program installing solar at WAP eligible homes. (benefits \$6,200 in energy savings over 20 years). Savings ratio greater than 1.

# Scenario 6: Include Community Solar as a part of the On-bill financing program.

- On-bill financing allows to finance energy efficiency as part of the electric bill.
- NC Electric Coops are leading the discussion on On-bill financing (upgrade to \$ave program)

Can On bill financing be a vehicle for community solar access?