

Microgrids and Renewables

FREEDM 2019 Research Symposium

NC Cooperatives' Microgrids and Herons Nest


April 11, 2019

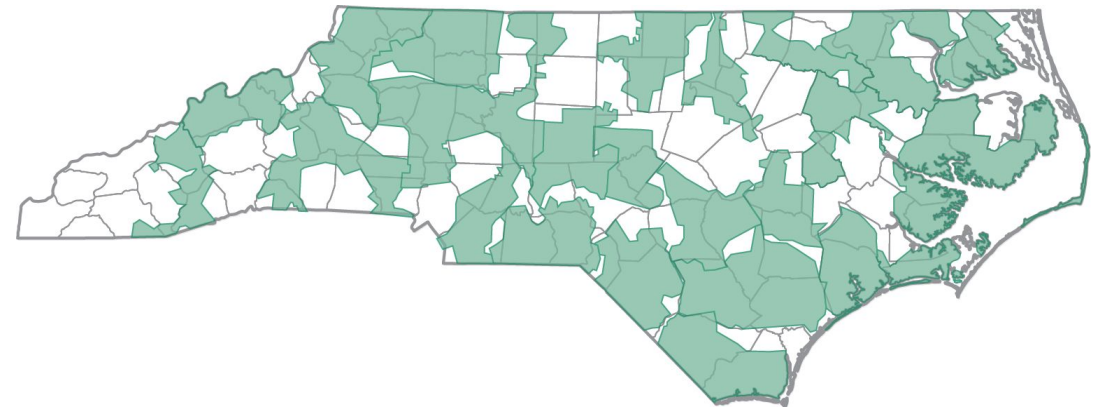
Jim Musilek

Director, Innovation and Business Development



NC Electric
Cooperatives

Your Touchstone Energy® Cooperatives 



Summary

- About Us
- Microgrids: Macro-Benefits
 - Ocracoke Microgrid
 - Butler Farms Microgrid
- Heron's Nest – Neighborhood Microgrid

NC Electric Co-op Territory

950,000

Households and businesses served by NC Electric Cooperatives

93

Counties in NC

NORTH CAROLINA'S
ELECTRIC POWER PROVIDERS
SERVICE AREAS

26

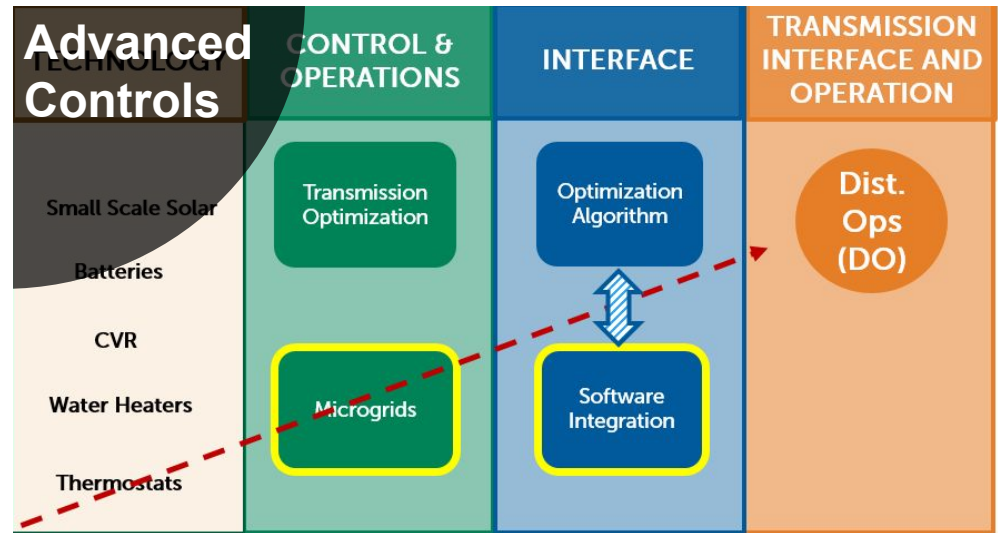
Member owned
not-for profit
cooperatives

Powering Everyday
life for
2.5 Million

24%
of the population

45%
of the land mass

Cooperative Innovation



A Brighter Energy Future



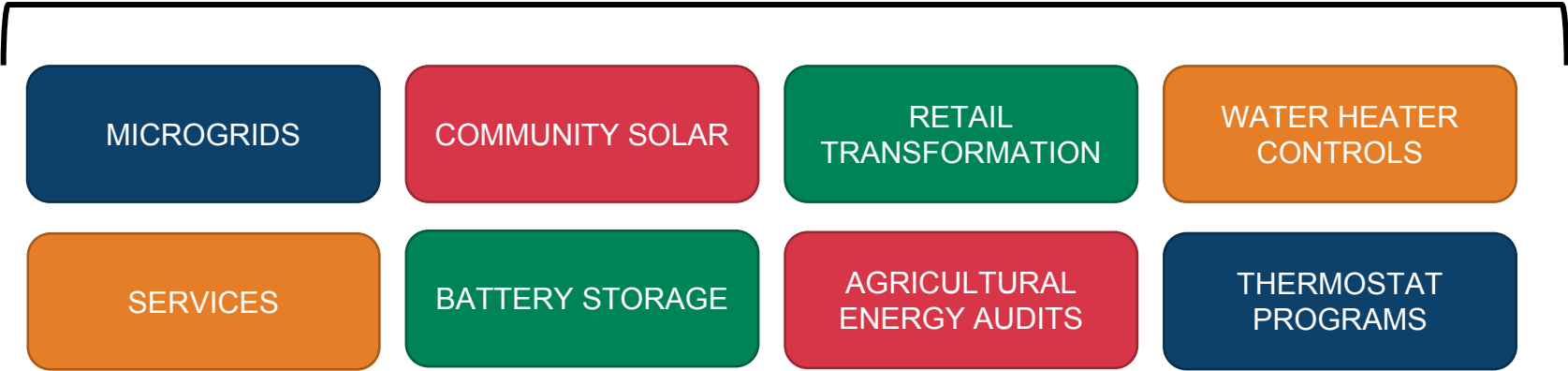
Low Carbon



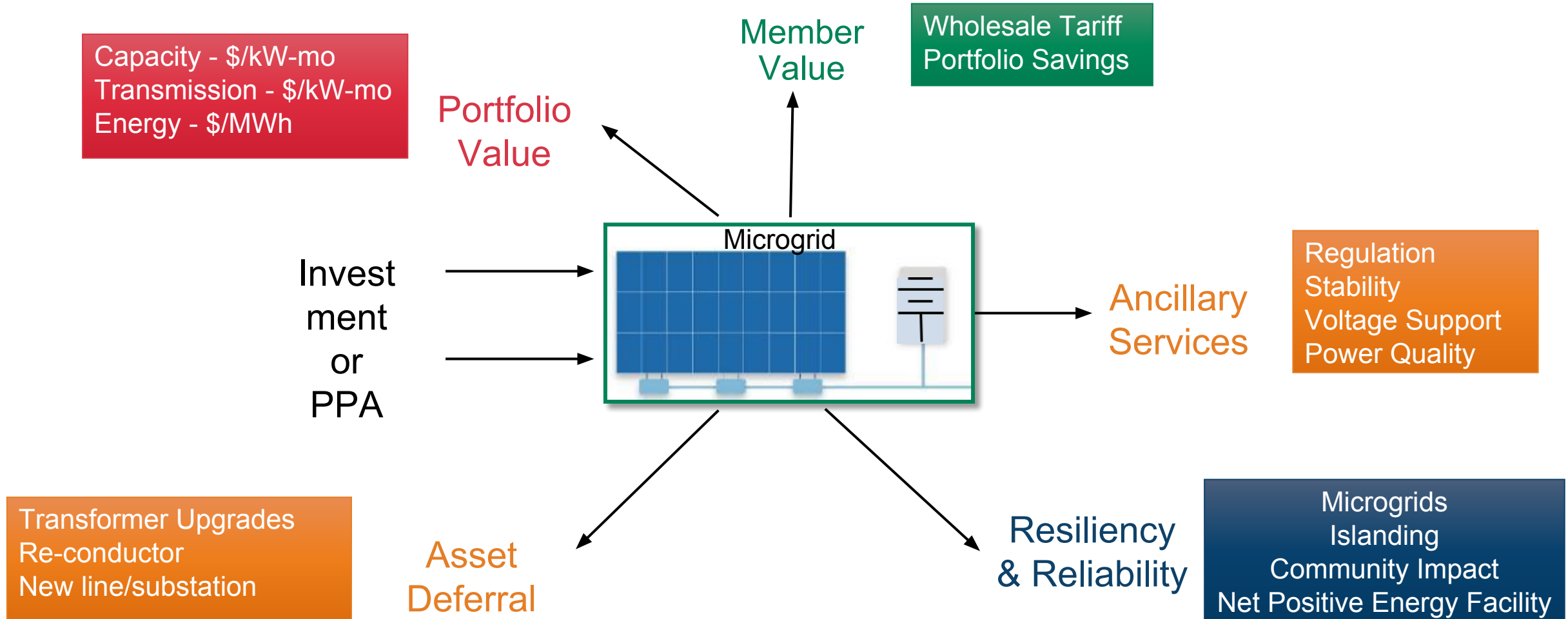
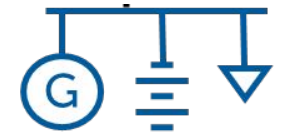
Grid Flexibility



**Beneficial
Electrification**

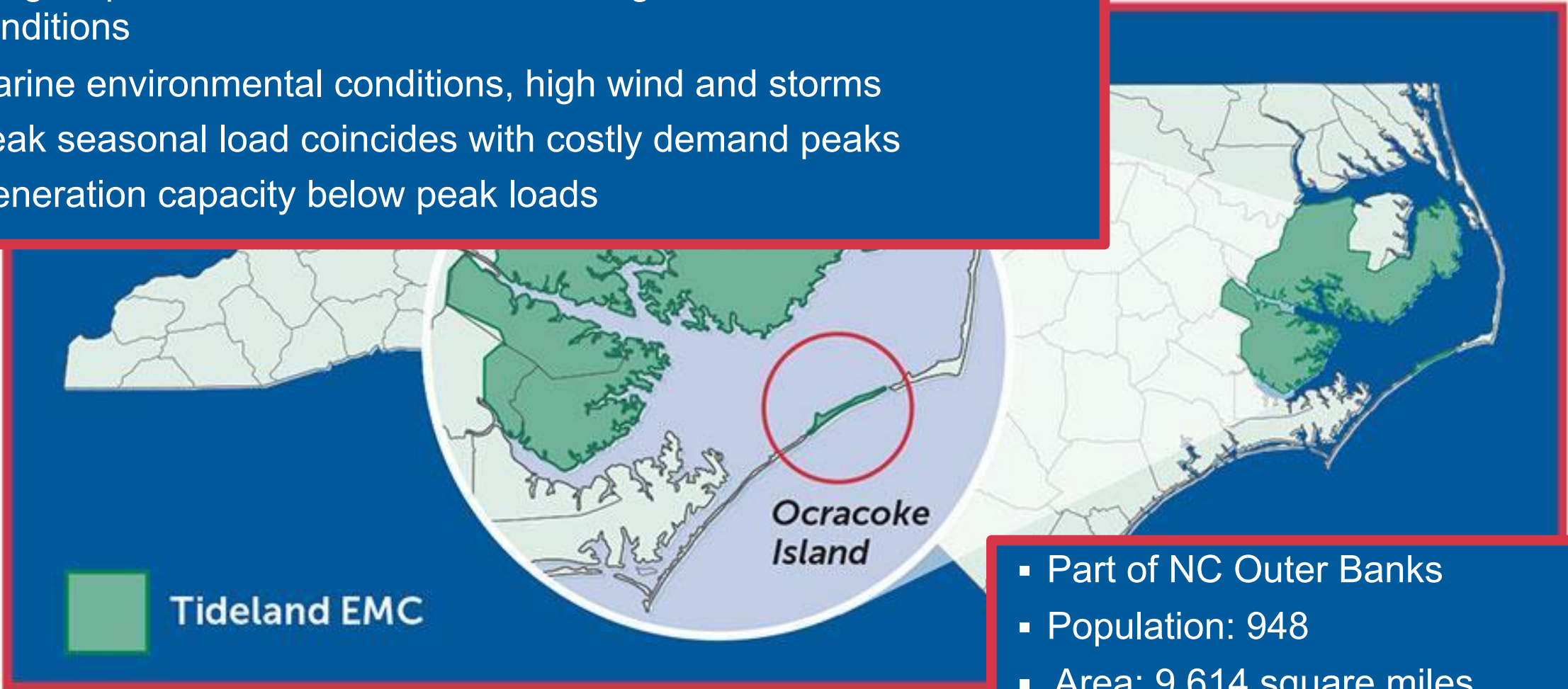


Microgrids: Macro-Benefits



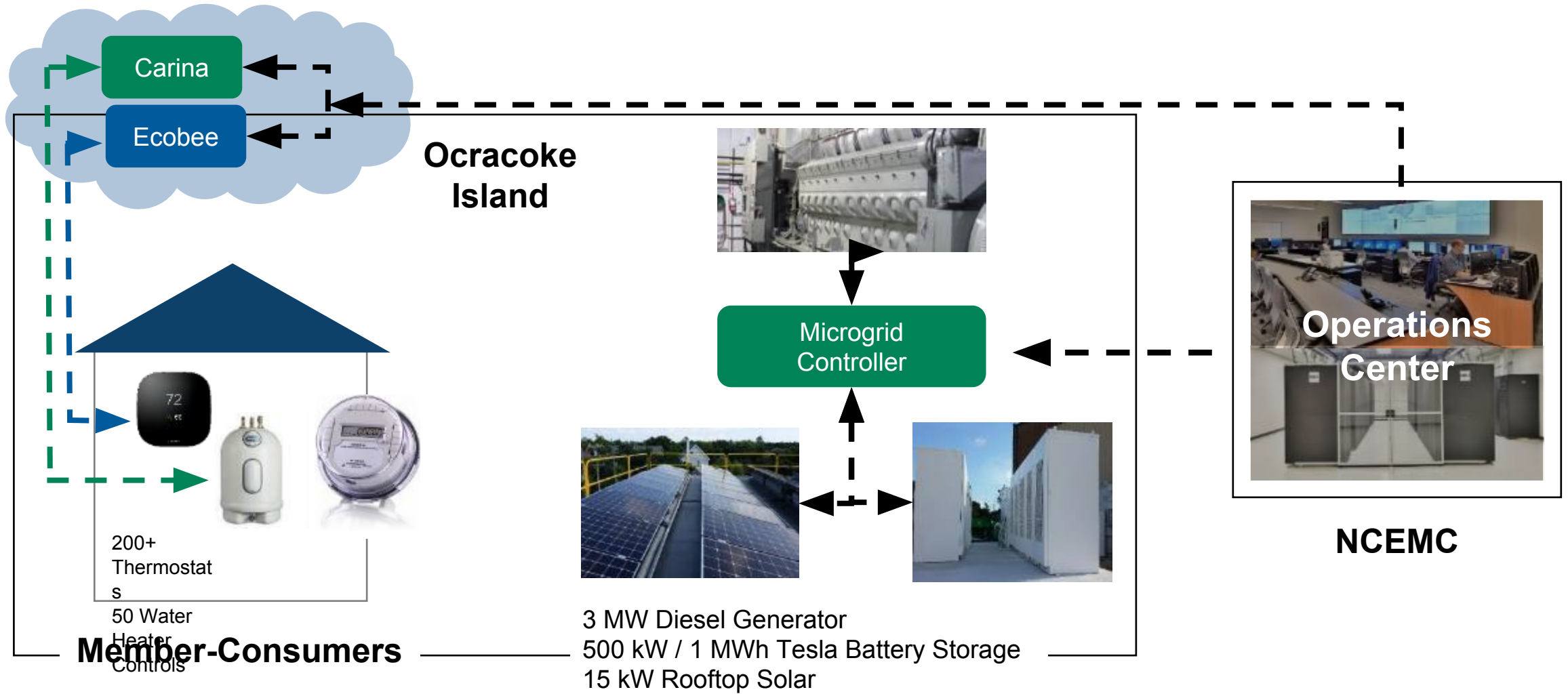
Ocracoke Island Microgrid

- Long, exposed distribution feeder serving the area under normal conditions
- Marine environmental conditions, high wind and storms
- Peak seasonal load coincides with costly demand peaks
- Generation capacity below peak loads

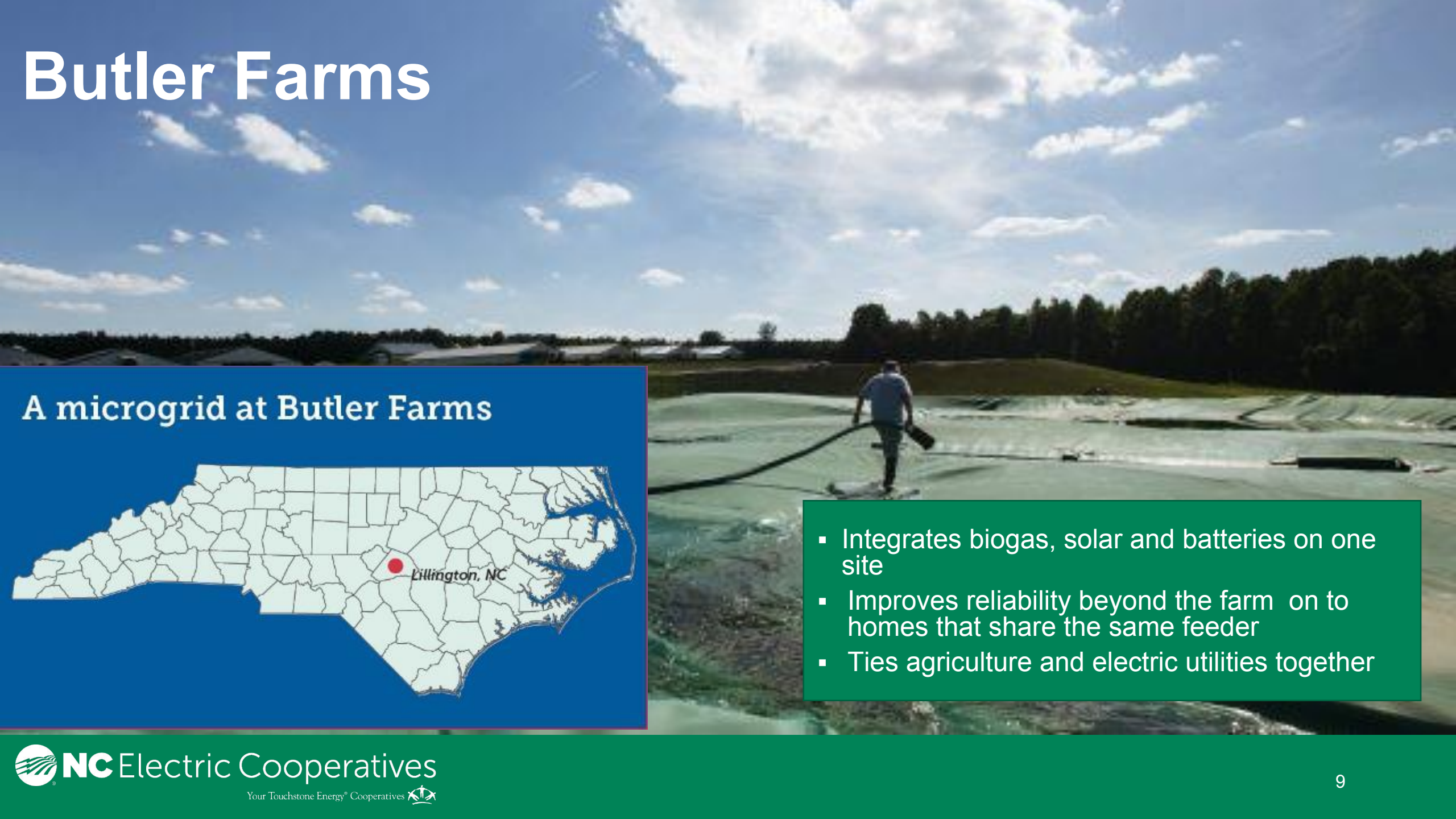


- Part of NC Outer Banks
- Population: 948
- Area: 9.614 square miles

NCEMC System Microgrid



Butler Farms



A microgrid at Butler Farms



- Integrates biogas, solar and batteries on one site
- Improves reliability beyond the farm on to homes that share the same feeder
- Ties agriculture and electric utilities together

Butler Farms Microgrid Components

Resources owned by the farm:



20kW solar
panels



100kW
diesel
generator



185kW
biogas
generator

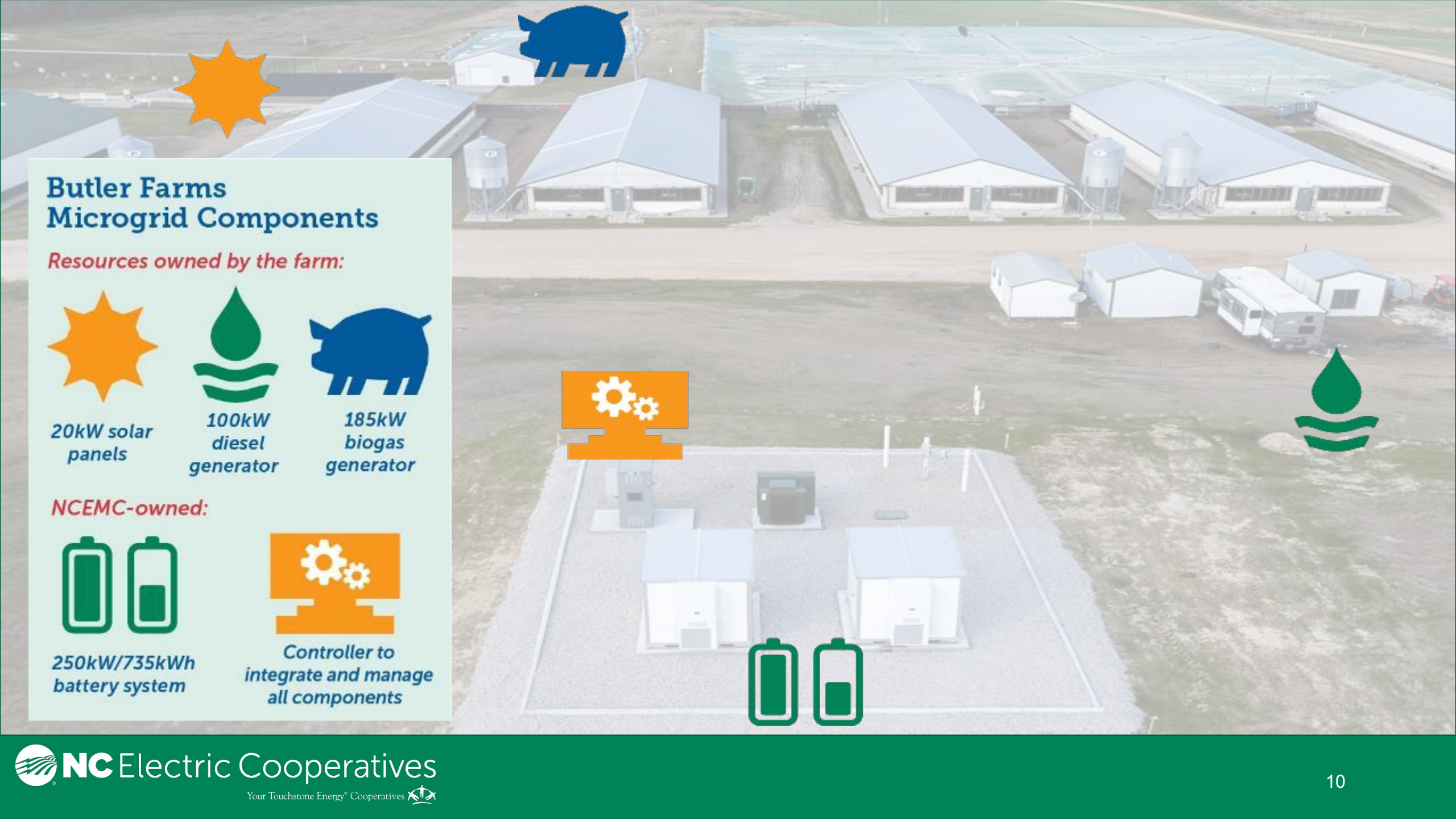
NCEMC-owned:



250kW/735kWh
battery system



Controller to
integrate and manage
all components

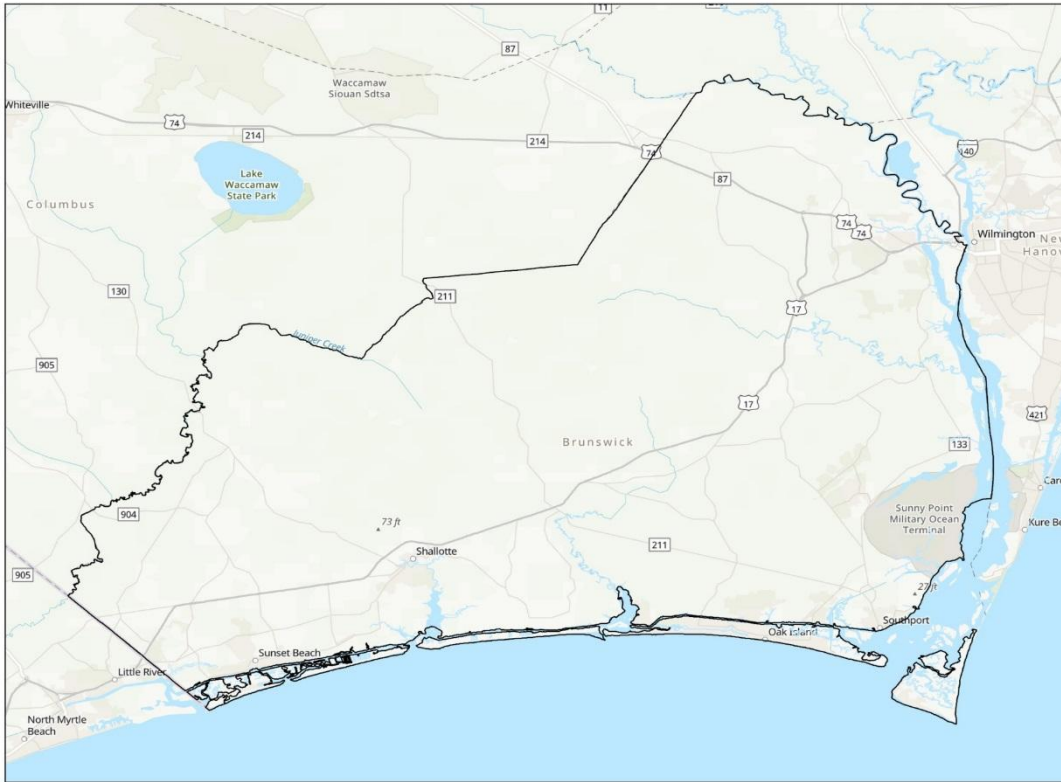


Heron's Nest Microgrid Project



Heron's Nest

- Located on Brunswick EMC's system in Shallotte, NC



Connected Neighborhood



Heron's Nest

- New construction - 33 homes
 - Rooftop solar
 - ecobee4 thermostats
 - Vaughn water heaters with Carina technology
- Hurdles
 - 3 parties involved
 - HOA Covenants

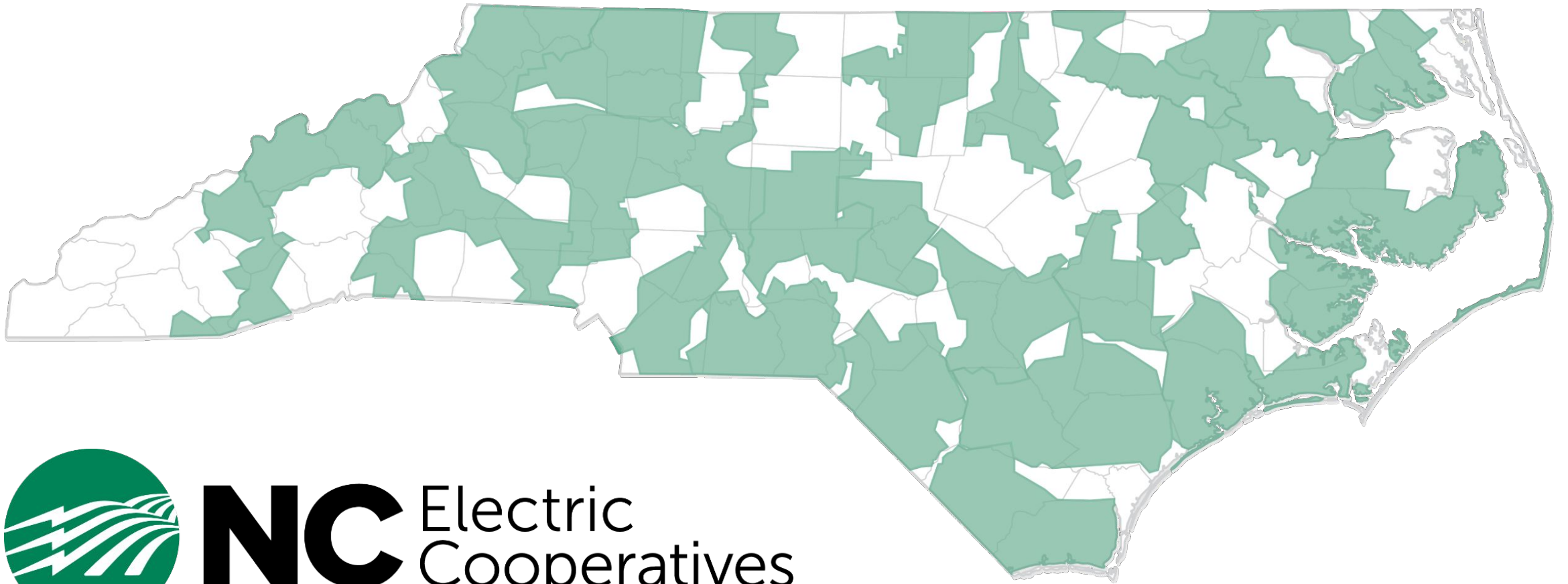


How about making it a microgrid?



- Benefits:
 - Resiliency for consumers
 - Marketing for developer
 - Flexible grid-edge asset for utility
- Hurdles:
 - Coordination
 - Operations





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