

Challenges and opportunities for rapid transition to renewable energy in Buncombe County



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Buncombe County has established among the most ambitious local renewable transition goals of any county in the USA.

Taking strong action where opportunities exist:

___ Installing one of the region's largest solar farms on retired county landfill.

___ Implementing the largest net-metered solar project yet developed for local public facilities in North Carolina.



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40+ county facilities, public schools and community college buildings receiving solar in phase 1 and phase 2 now under development.



North Windy Ridge Intermediate School, Weaverville

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NC is a national leader in solar.
Info from Solar Energy Industry Association, 2021.

7,811 MW installed

National Ranking:
4th (7th in 2021)

Enough Solar Installed to Power:
1,009,138 homes

Percentage of State's Electricity from Solar:
8.07%

Solar Jobs:
6,107

Solar Companies in State:
213

Total Solar Investment in State:
10.5 billion

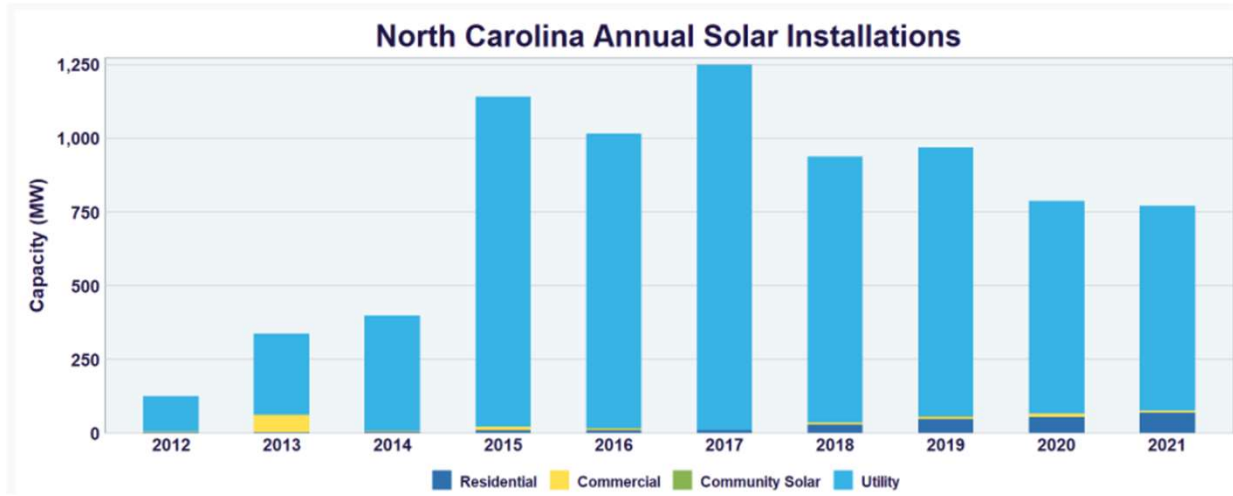
Growth Projection and Ranking:
1,946 MW over the next 5 years (ranks 17th)

Number Of Installations:
28,467



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Vast majority of solar generation in North Carolina is produced by utility-scale solar projects (ie solar farms). Residential and commercial sectors remain modest.



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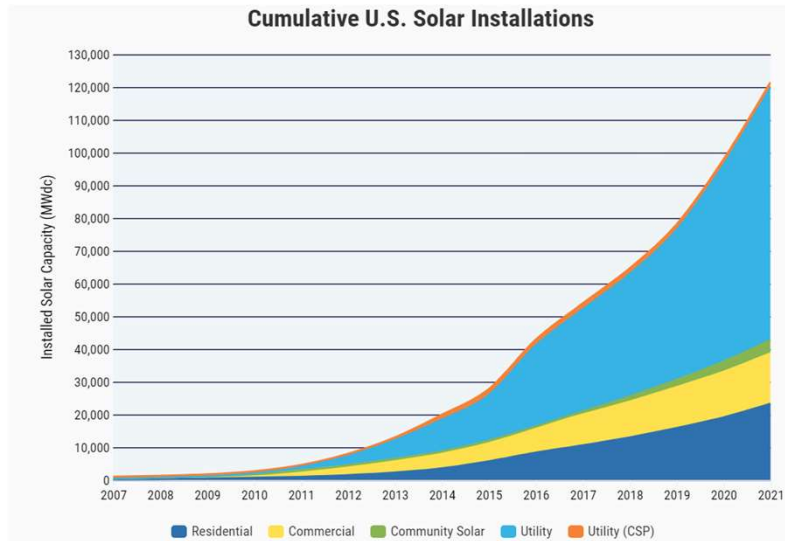
Utility scale solar generates most of the solar generation nationwide:

- _ 45,000 MW of utility scale
- _ 12,000 MW of commercial scale
- _ 29,000 MW of residential scale

Advantages of utility scale solar: 1) Low cost and 2) Scalable.

Average installed cost of utility scale solar in 2021: \$.89 cents a watt. Residential \$2.65 a watt.

One medium sized solar farm generates as much power as 1,000 residential solar installations. (County 5 MW system at landfill = 700 homes).



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Challenges for scaling up solar within Buncombe County:

Utility scale solar needs: 1) large tracts (20 – 200 acres) of relatively flat land, 2) affordable land and 3) sites with adequate grid infrastructure on site or nearby.

Viable sites in Buncombe County are limited by: 1) urbanization 2) steep slopes and 3) high cost of land.

These are common challenges in mountain regions and urban communities around the world who want to transition to renewables.

Buncombe Co, NC



Robeson Co, NC



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Can we just focus on promoting solar on rooftops to meet our community renewable energy goals?

Answer: No

Why not: It's a math problem. Not enough available roof space.

Solar is not feasible on properties where:

- Roof is older/ in poor condition
- Roof design doesn't accommodate.
- Shading is a problem
- Property owner isn't interested/ doesn't have financial capacity.

Ball-park estimate only about one in four homes in Asheville is feasible in near to medium term.



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Solarize Asheville campaign in 2021 was one of the most successful in the country.

180 homeowners have some solar installed – 1.45 MW in total.

A great accomplishment and testimony of community interest.

Similar campaigns may be carried out every 2 – 3 years.

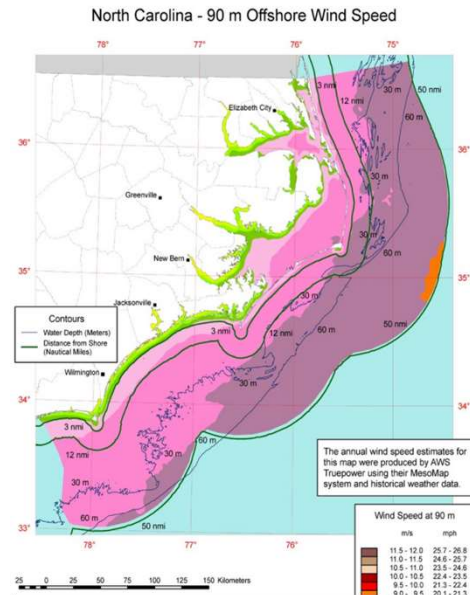
At this rate, around 10 MW of new residential solar will be deployed over the next 15 years.

Duke Energy’s combined cycle gas plant in Asheville is 544 MW.



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Development of off-shore wind and large solar projects in central and eastern NC can potentially produce a high percent of the state’s electricity needs.



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Relying primarily on importation of new renewable energy generation would require extensive construction of new transmission line infrastructure.

High environmental and aesthetic impact. Expensive for residential and commercial ratepayers.

Some new transmission construction will be unavoidable to enable transition to renewables and should be supported to avoid climate disaster. Minimizing it is desirable. Generating more renewables inside western NC will reduce need to import power.

Question: where to put new renewable generation?



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Singapore
Population 5.6 million
281 square miles (smaller land area than Buncombe County)



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The new frontier in deployment of utility scale solar in urban areas and mountain regions – floating solar (FPV). Photo: Singapore.

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Tengeh drinking water Reservoir, Singapore
60 MW floating Solar

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4.4 MW California

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Advantages of floating solar PV

Floating solar arrays tend to generate more electricity than traditional ground mounted solar farms due **the cooler temperatures** on the water body relative to land areas.

Floating solar arrays **increase the amount of clean water supply and capacity** of the reservoir by reducing evaporation, lowering the risk of water shortages during periods of drought.

To ensure that water quality is not compromised, floats are high-density polyethylene (HDPE) – a certified food-grade material that is UV-resistant.

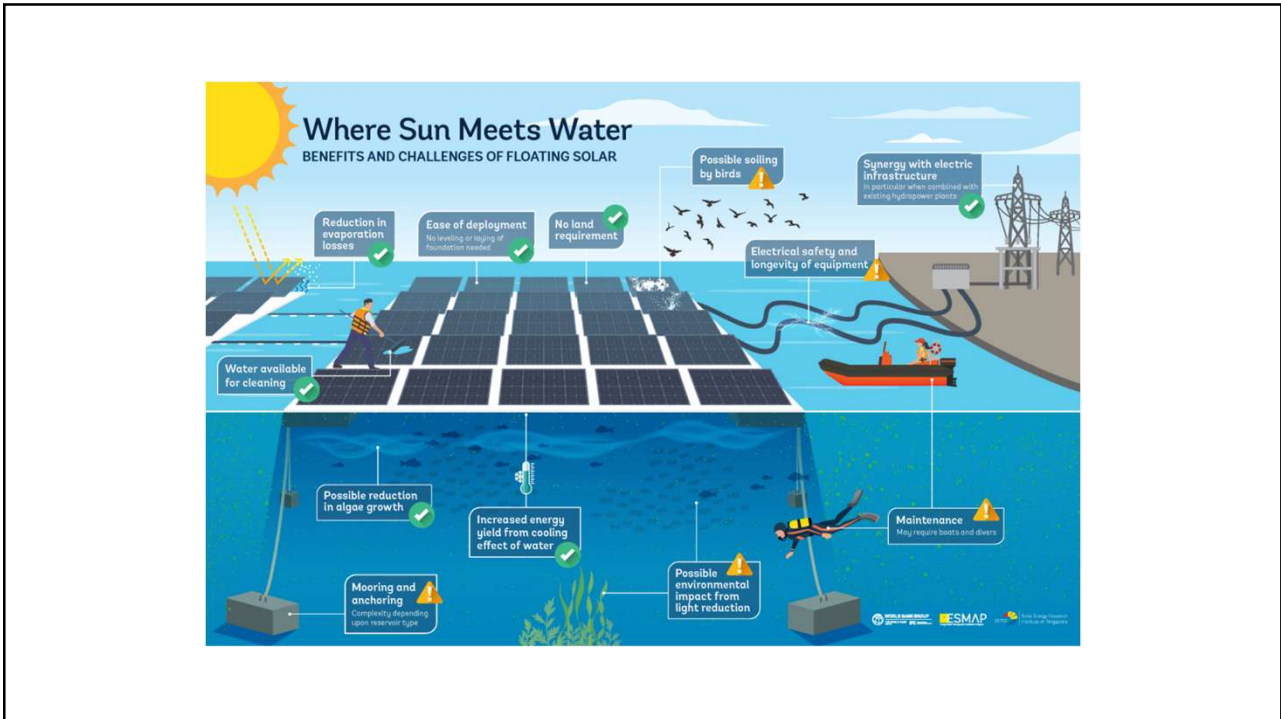


FPV on drinking water reservoir, Manchester, England.

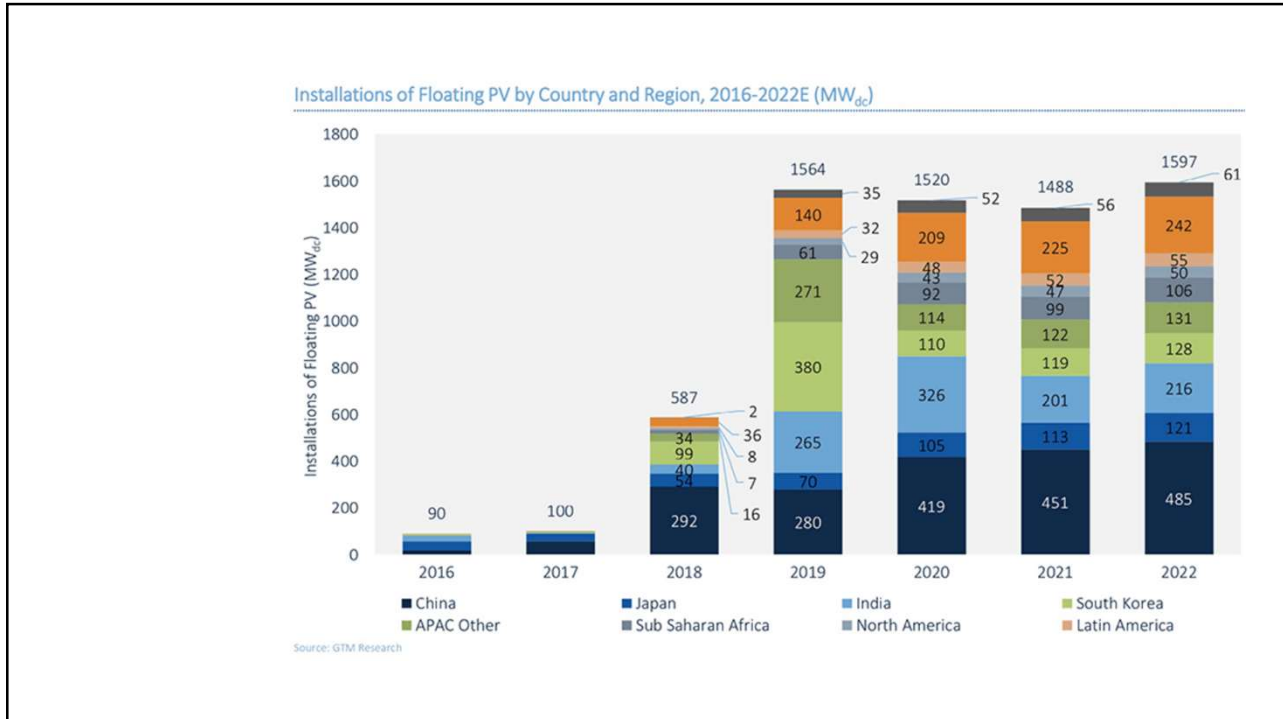
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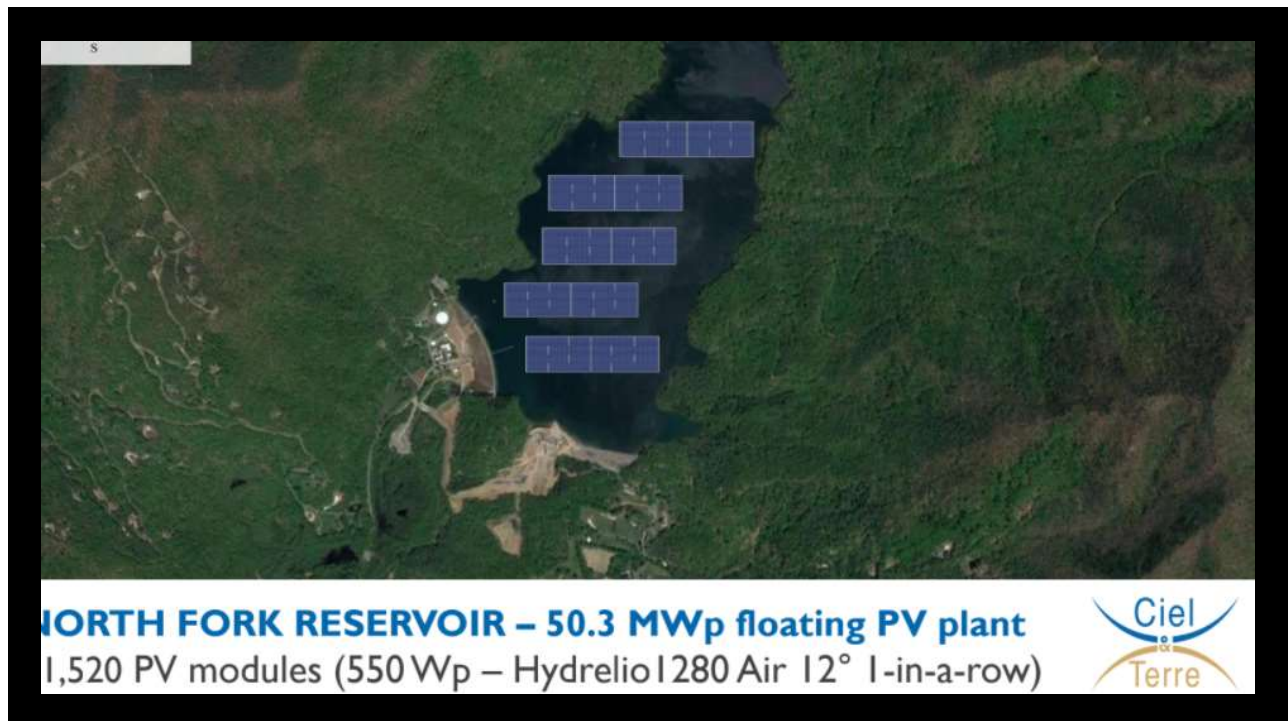
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Lake Julian Site

Waterbody is under jurisdiction of Duke Energy

12 MWdc system

Annual generation 18.8 million kWh

Equivalent to powering 1,800 homes with 100% solar

North Fork Reservoir Site

Waterbody is under jurisdiction of City of Asheville

50 MWdc system

Annual generation 75 million kWh

Equivalent to powering 7,500 homes with 100% solar

For context, there are approximately 5,000 households in Black Mountain and Swannanoa. There are about 40,000 households in Asheville.

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Solar development partnership concept

Buncombe County proposes to support development of FPV projects in partnership with the City of Asheville (for the Lake Julian site) and Duke Energy (at the Lake Julian site).

Buncombe County could provide the financial resources to support feasibility studies and development costs (for interconnection engineering studies, environmental analysis and project development consultants). The most expensive initial development expense is usually the interconnection study application fee, which would be around \$40,000 for a Lake Julian sized project and around \$85,000 for a North Fork Reservoir scale project).

Partner organizations contribute their properties to the project but are not required to financially contribute to development or construction costs for projects. They just contribute the site.

RFP process to select an experienced solar energy company who would finance, construct, own and operate the projects.

Buncombe County and partner organizations could negotiate to retain the Renewable Energy Certificates (RECs) from the projects to contribute towards our public renewable energy goals (similar to our arrangement for the solar farm at the county owned landfill).

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Potential Process:

1. Discussion at county Energy and Environment committee to explore idea among committee members and county staff.
2. If there is potential interest, engage with representatives from Asheville and Duke Energy to discuss the concept and determine if there is potential interest.
3. If either or both partners are open to the idea, retain an experienced developer or consultant to create more detailed development plan. D3 Energy, which specializes in utilize scale FPV, has expressed interest in this. Others may be as well.