



STAFF REPORT – SOLAR FACT SHEET

This report was produced by staff from the Town’s Office of Sustainability and Resilience

September 28, 2022

Clean Renewable Energy in Chapel Hill

100% by 2050

The Town of Chapel Hill adopted a resolution in 2019 to create a Climate Action Plan and achieve 80% clean, renewable energy in the community by 2030, and 100% by 2050. Getting to this goal will require investments in new solar energy resources by the Town and new solar, wind, and hydro power by our utilities. The path forward will build on the Town’s experience with its first three rooftop solar arrays on Town facilities, and the steps it has taken to lower barriers to developing solar arrays in our community. This document lays out what we know about the renewable energy investments that are needed.

Our best new local source for clean renewable energy is solar.

Because there are few opportunities for new hydropower dams and our part of the state does not contain the consistent and powerful winds that can be found in the mountains and at the coast, solar is the most promising source of new renewable energy for our region. Investing in local renewable energy production allows us to take advantage of the new jobs being created in this energy transition.

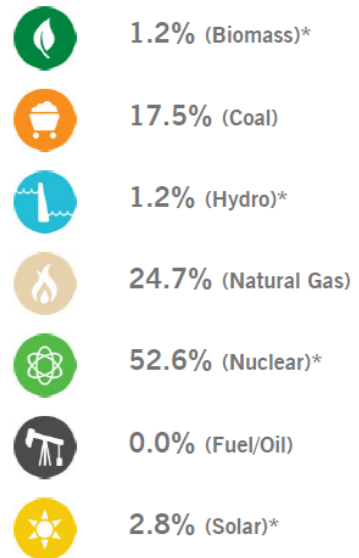
Currently, 4% of our electricity is clean and renewable, and according to Duke Energy 57.8% is carbon free.

Duke Energy Carolinas currently generates electricity to serve Chapel Hill in various ways. Only 4% comes from clean and renewable¹ solar and hydropower plants.

In 2019 Duke Energy announced a Net Zero Goal by 2050 with a target of reducing CO2 by 50% in 2030 (from 2005 levels) and 100% by 2050. Duke Energy is drafting a Carbon Plan to show how they intend to reach this goal. Currently, their draft plan includes new and existing nuclear power as well as new and existing natural gas power plants. So, while our local electrical grid will continue getting cleaner Chapel Hill will need to take additional steps to meet our 100% clean renewable energy goal.

Duke Energy Carolinas

Generation Mix



* Carbon-free sources

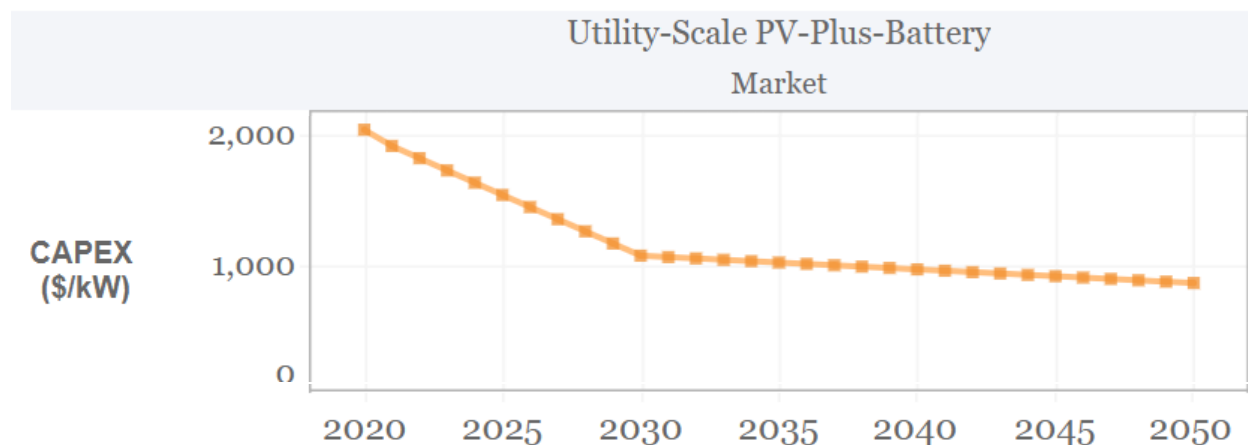
Starting with solarizing electricity in Town buildings gives us the most options.

Adding solar to town facilities and/or investing in large utility-scale solar installations are both options that might help the Town lower the lifetime costs of our electricity. **Staff estimates that a 5 megawatt (MW) solar installation would offset all the electricity currently used by the Town facilities.** Based on current prices for utility-scale solar, this would cost between \$7 - \$8 million and would require just over 20 acres of land.

Electricity is only part of the energy that runs our community.

Electricity is only one of several energy sources our community uses, among gasoline and diesel, natural gas, propane, and others. Luckily, new technologies like heat pumps and electric vehicles allow us to power our lives solely on electricity, and electricity is getting cleaner and more renewable each year.

Town staff estimates that to replace all the energy used by the Chapel Hill community with solar electricity, a utility would need to invest nearly \$2 billion based on current prices and technology. In comparison to the traditional ways of producing electricity, the cost of solar is becoming more affordable to utilities each year. The cost of solar is declining so much in some places that solar energy is already the lowest cost source of energy generation.



There are ways to invest in solar energy today, and more are in development

There are options to buy and operate solar panels as well as to invest in a portion of a large solar installation in another location. Initial research suggests that there is a wide range of costs and complexity when comparing these programs and many are still pilot projects subject to caps on participation. Some programs that are available in other parts of the country are not yet available in North Carolina. Solar energy development programs under consideration by staff include: Duke Energy's Green Source Advantage, Duke Energy's Renewable Advantage, NC GreenPower, and on-site solar.

Joining with our neighboring governments may save us money right away

The costs per megawatt of solar can be lower when several governments join together to invest in a larger project. Orange County, Carrboro, and Hillsborough have all committed to supporting more renewable energy.

Appendix

Figure 1: Community-level solarization cost and acreage estimates assuming 100% of all energy is converted to solar, (not including UNC-Chapel Hill energy usage).

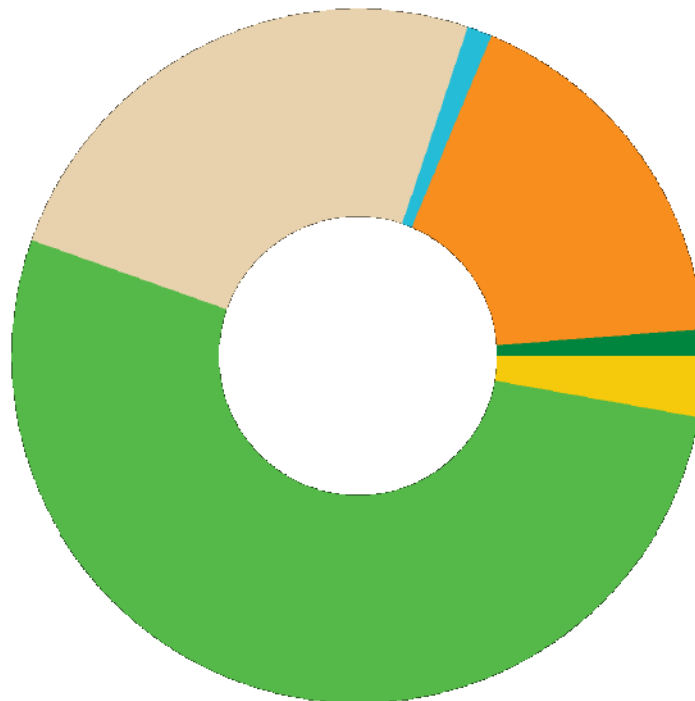
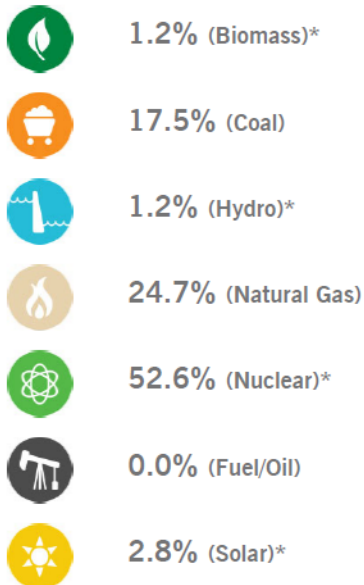
Base Year	Total kWh equivalents	kW solar needed	Total cost if all energy produced by solar + battery storage ⁱⁱ	Total acreage of solar needed ⁱⁱⁱ
2017	2,100,481,345	983,832	\$1,652,837,780	4,699

Figure 2: Current mix of energy sources feeding Chapel Hill’s electric grid.

Duke Energy Carolinas

Generation Mix

YOUR TOTAL: **8** GWh



* Carbon-free sources

Forecast Model: Forecasting models for usage and generation mix are based on historical customer usage and Duke Energy's Integrated Resource Plans respectively.

ⁱ As defined in Chapel Hill’s adopted Climate Action and Response Plan, renewable energy is derived from natural processes that are regenerative over short periods of time or cannot be depleted such as solar, wind or geothermal. Clean energy comes from renewable energy sources that do not generate emissions.

ⁱⁱ Based on 2021 solar prices.

ⁱⁱⁱ Benchmarks from the Lawrence Berkeley National Labs updated in January of 2022 show that as of 2019 current utility scale solar energy densities had reached an average of 447 MWh/year/acre.

<https://ieeexplore.ieee.org/document/9676427>.