Clean Energy 2050 Resolution

October 8, 2018

WAKE COUNTY
NORTH CAROLINA

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wakegov.com

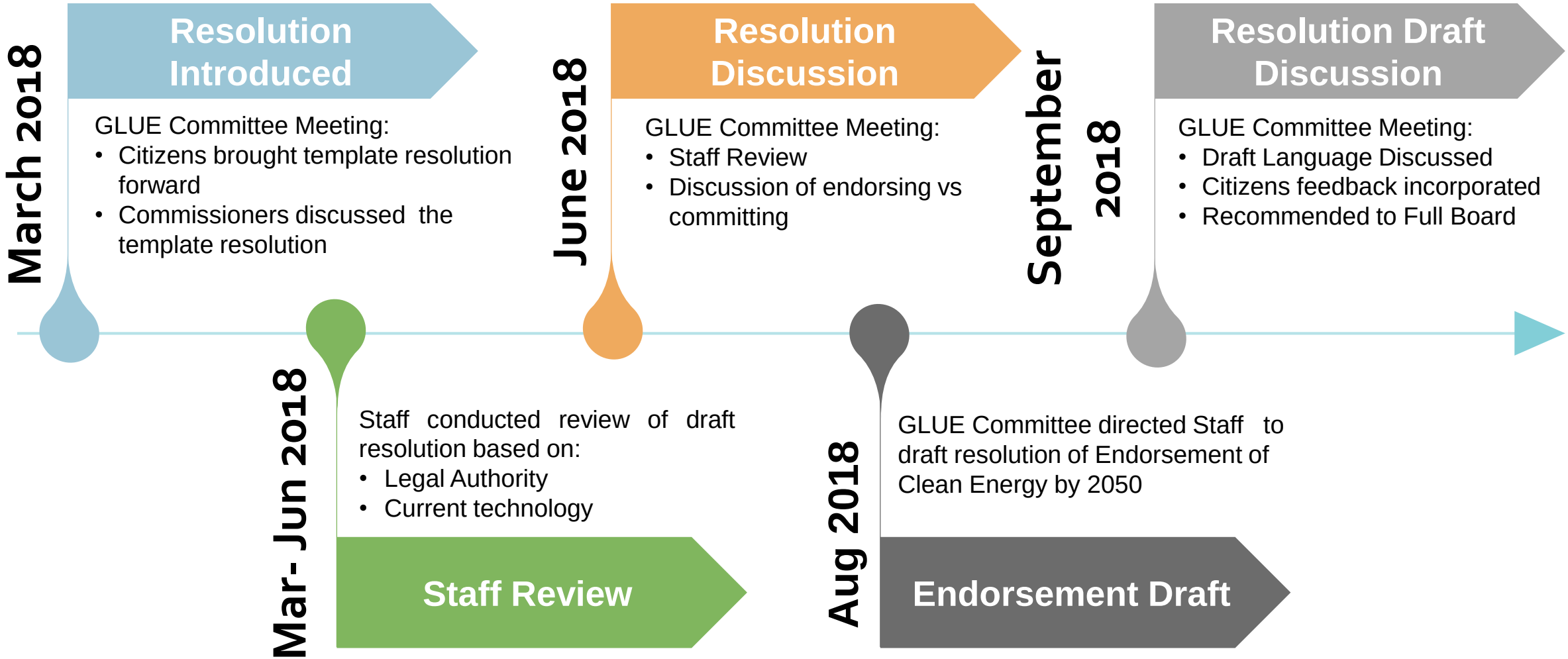
Why We're Discussing Energy Today

- Wake County's commitment to sustainability and energy conservation.
- March 2018 - Commissioner Hutchinson introduced a resolution from 350.Org to ***adopt a county, state, and national goal of 100% clean energy by 2050 and the creation of green jobs***.
- The GLUE committee referred the resolution to staff for feasibility.

What is Clean Energy by 2050?

- Resolution
  - Conversion of 100% energy use from fossil fuels to Clean (renewable) Energy Sources.
- Goal
  - Reduce effects of climate change and benefit low-income communities affected by fossil fuel pollution.
  - Improve local economy through the creation of green jobs.

Timeline of GLUE Committee and Staff Process



Staff Review

Staff Approach: *evaluation based on **current technology***

Evaluation Process*:

- Technical
- Organizational *(first today)*
- Economic

*2018 Energy Design and Management Guideline Section1.4

Organizational Feasibility

Do we have the Authority?

- No legal authority to mandate beyond Wake County Government
- Review addresses ***Wake County Government*** facilities and fleet.

Can we maintain it?

- Yes – Future Technology and cost unknown
- Additional Contract maintenance

Technical Feasibility

Evaluation

- Define Clean Energy
- Assemble Existing Usage
- Identify methods to convert to 100% Clean Energy
- Identify methods to produce/procure Clean Energy

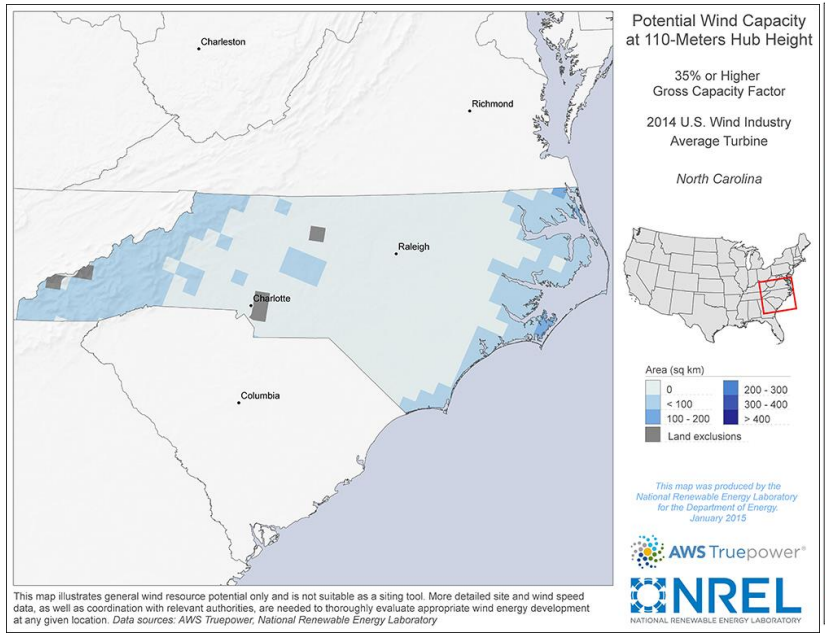
Clean Energy

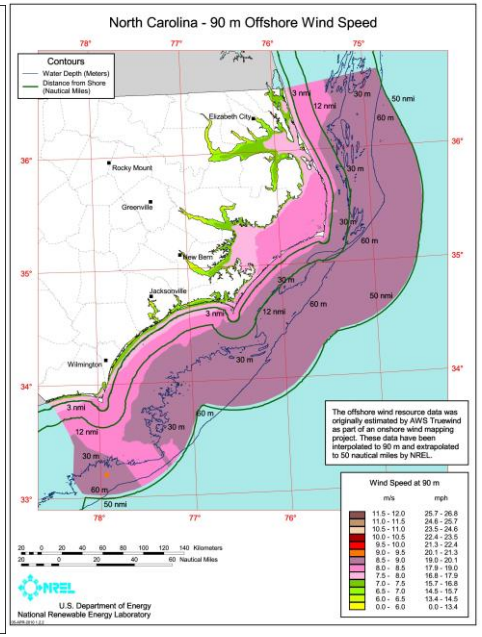
- Solar Power
- Wind Power
- Geothermal Energy
- Hydroelectric Power
- Tidal Power
- Wave Energy

Why focus on Solar PV?

Wind Energy

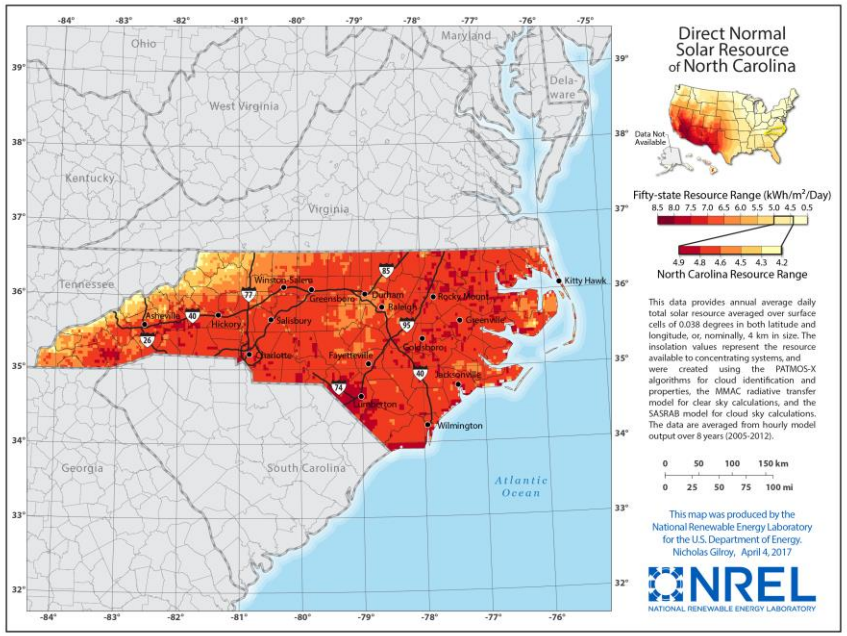
- Resource is geographically limited
- Renewable Energy Credit Potential





Solar Energy

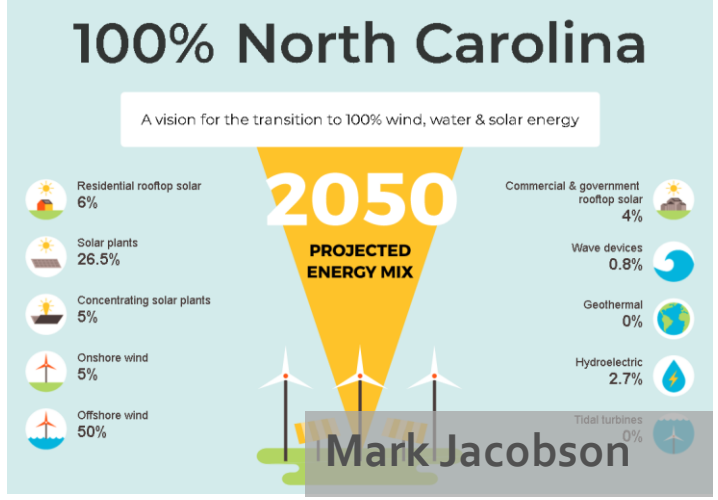
- Resource Availability
- Technology easily scaled

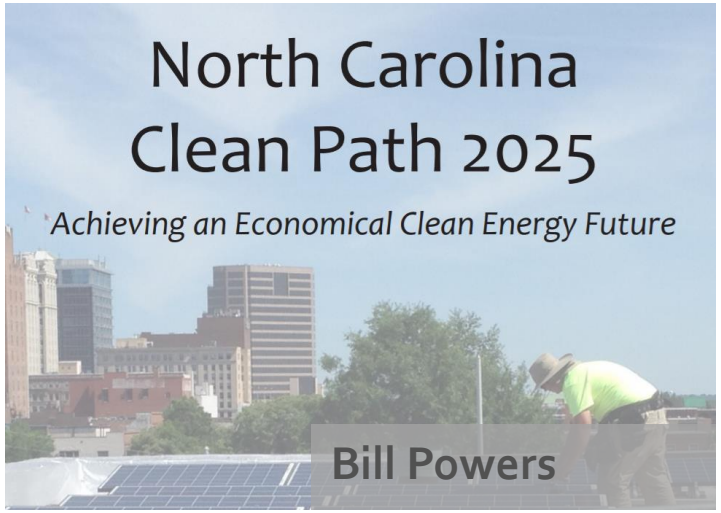


Methods to Reach 100%

Two studies exploring 100% Clean Energy:

- 100% Clean and Renewable Wind, Water and Sunlight, *Mark Jacobson*
  - All sectors electrified by 2050
  - Solar, Wind, etc. and efficiency
- Clean Path 2025, *Bill Powers*
  - All electric Use
  - Solar and energy efficiency
  - Rooftop, Parking Lot, Ground Mounted Solar with Battery Storage





Phasing Out Fossil Fuels

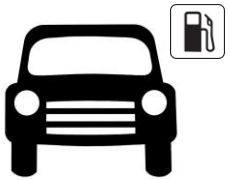
Electricity

Solar PV
Install On or Off site Solar and/or Purchase Clean Energy

Natural Gas

Solar PV
Convert thermal equipment to electrical

Fleet

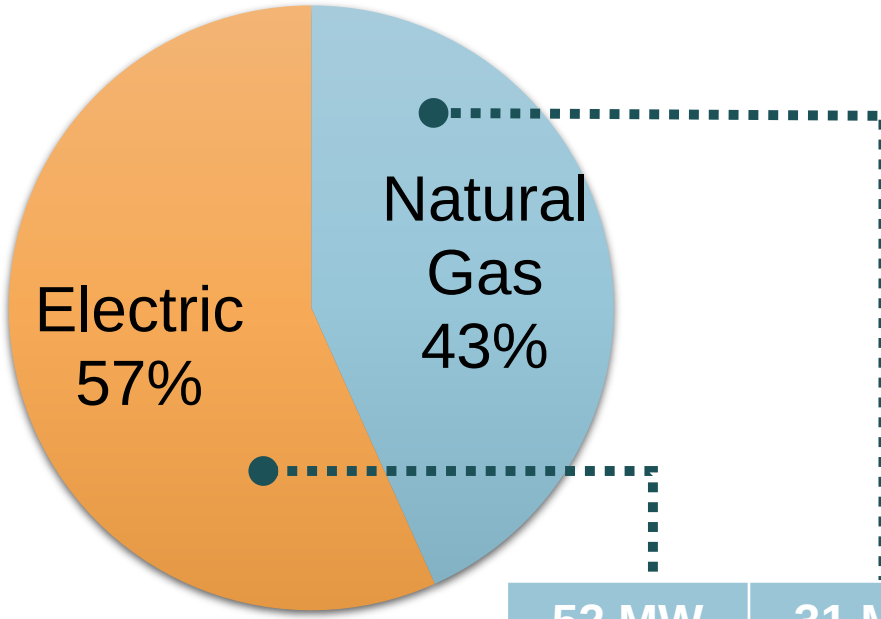


Electric/Hydrogen Fuel Cell Fleet charged with Clean Energy

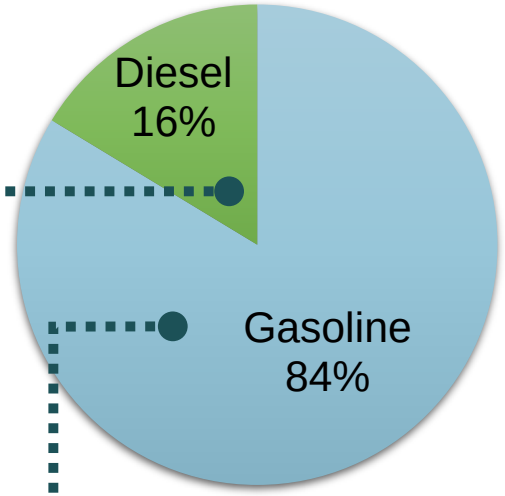
…solutions require solar. How much solar?

County Energy Consumption

Building Energy Consumption



Fleet Fuel Consumption

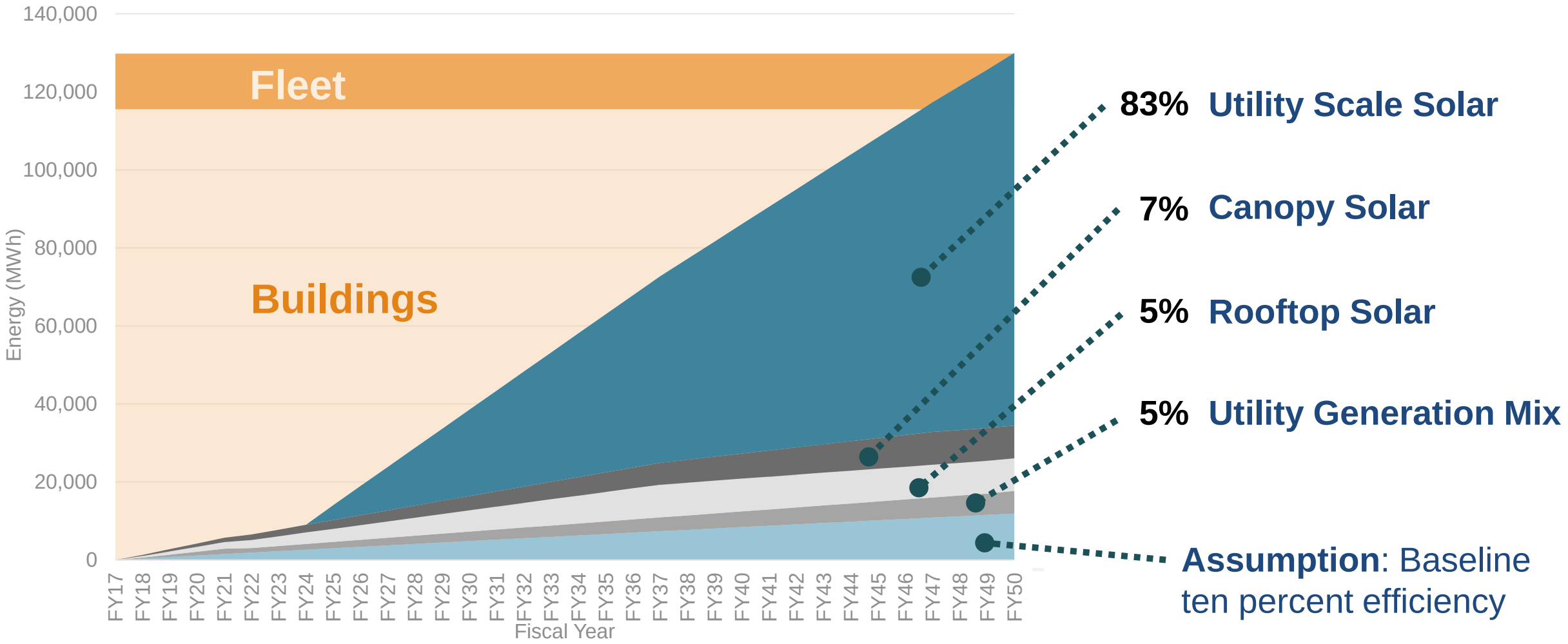


52 MW	31 MW	3 MW	8 MW

Solar PV Equivalent
for 100% Clean Energy
w/ efficiency + utility renewable growth

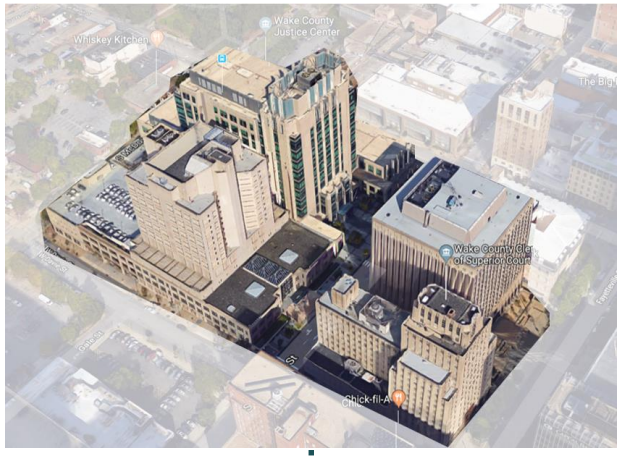
80 MW

Path to 100%


140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
Energy (MWh)
Fleet
Buildings
FY17 FY18 FY19 FY20 FY21 FY22 FY23 FY24 FY25 FY26 FY27 FY28 FY29 FY30 FY31 FY32 FY33 FY34 FY35 FY36 FY37 FY38 FY39 FY40 FY41 FY42 FY43 FY44 FY45 FY46 FY47 FY48 FY49 FY50
Fiscal Year
83% Utility Scale Solar
7% Canopy Solar
5% Rooftop Solar
5% Utility Generation Mix
Assumption: Baseline ten percent efficiency

Challenge: Current Solar Technology

Theoretical Area for 4 Buildings



Downtown Quad

Electric and Natural Gas GHG Equivalent: 38 Megawatts Solar PV, 190 acres

Significant Area Required

Original Raleigh Plan

**William Christmas' Plan for Raleigh 1792*

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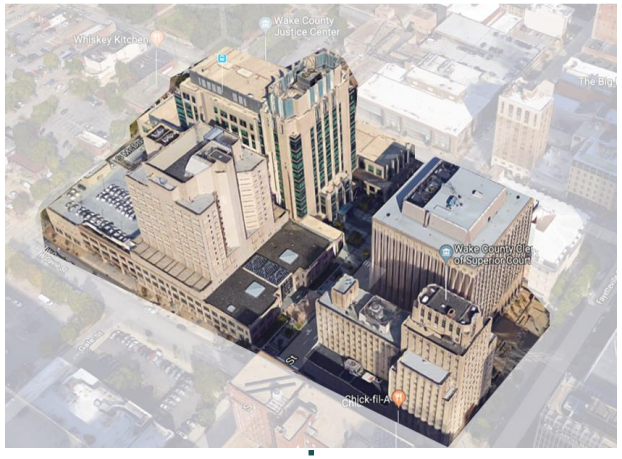

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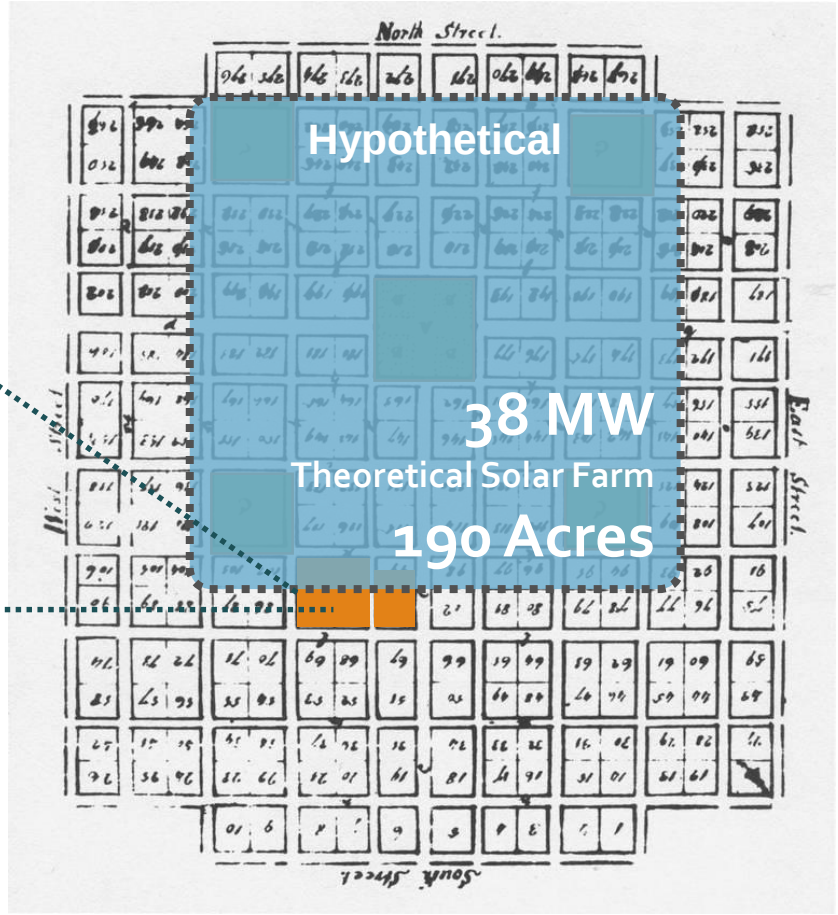


**William Christmas' Plan for Raleigh 1792*

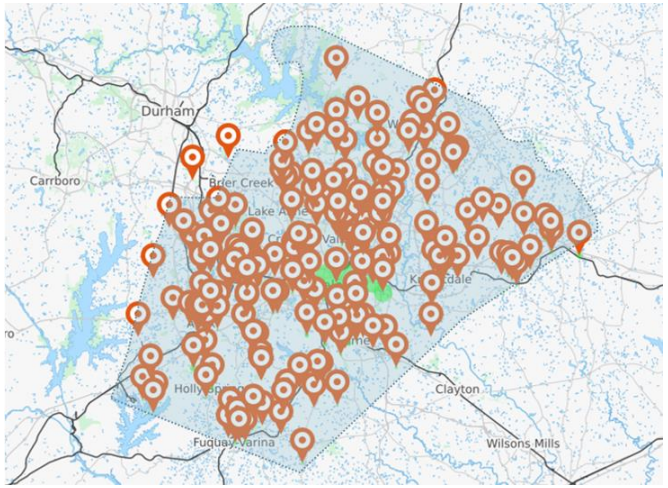
Challenge: Off-site Solar PV

Significant Areas Available?

- Would require 350+ acres
- County farm land available, but within future Little River Reservoir
- May or may not be suitable for utility scale development
- Renting land could be an option

Challenge: 70% of County Energy Use in 10 Buildings

- 70% of County Government energy use is in 10 largest Buildings
- On-site solar offset not possible with current technology
- Renewable Energy Credits for offsets could be explored (requires legal review)



- 30% County Government Energy Use in remaining buildings
- On-site solar could offset 25% building energy use with current technology

- Future planning for fleet conversion problematic
- Electric and Fuel Cell vehicles not commercially available for current vehicle types
- Programmatic changes needed for charging times

Not Technically Feasible

(with current technology)

Economic Feasibility

On Site	
Building Conversions	$10.8 million
Vehicles	$unknown
Efficiency	$1.2 million
Rooftop Solar	$15 million
Canopy Solar	$21 million
$48 Million Plus	

Off Site	
Utility Scale Solar	$135 Million
$135 Million	

Draft Resolution

GLUE Resolved to Endorse

- Staff prepared draft resolution incorporating feedback from:
  - County Commissioners on GLUE committee
  - Energy Advisory Commission
  - County Manager's office
  - GSA and FDC Staff

Reference Resolution Draft Handout

Resolution Highlights

- Endorses the goal of 100% Clean Energy by 2050
- Joins its fellow state and local governments in advocating for the use of Clean Energy
- Through reasonable and foreseeable economic payback … subject to budget availability
- County will commit itself in its own operations, policies, and guidelines …
- Authorizes the County Manager to support efforts toward the Clean Energy by 2050 goal through fiscally responsible budget expenditures
- Encourages all energy sectors of Wake County's economy to adopt similar goals in their own operations

Take Aways

- Endorsing this goal authorizes the County to advance clean energy where:
  - Technically feasible
  - Organizationally feasible
  - Economically feasible
- Using the Board adopted Energy Guideline:
  - Design & Management
  - Pilot Projects
  - Emerging Technology Development

100% Clean Energy by 2050

Discussion and

Board Direction