

# Clean Energy 2050 Resolution

October 8, 2018



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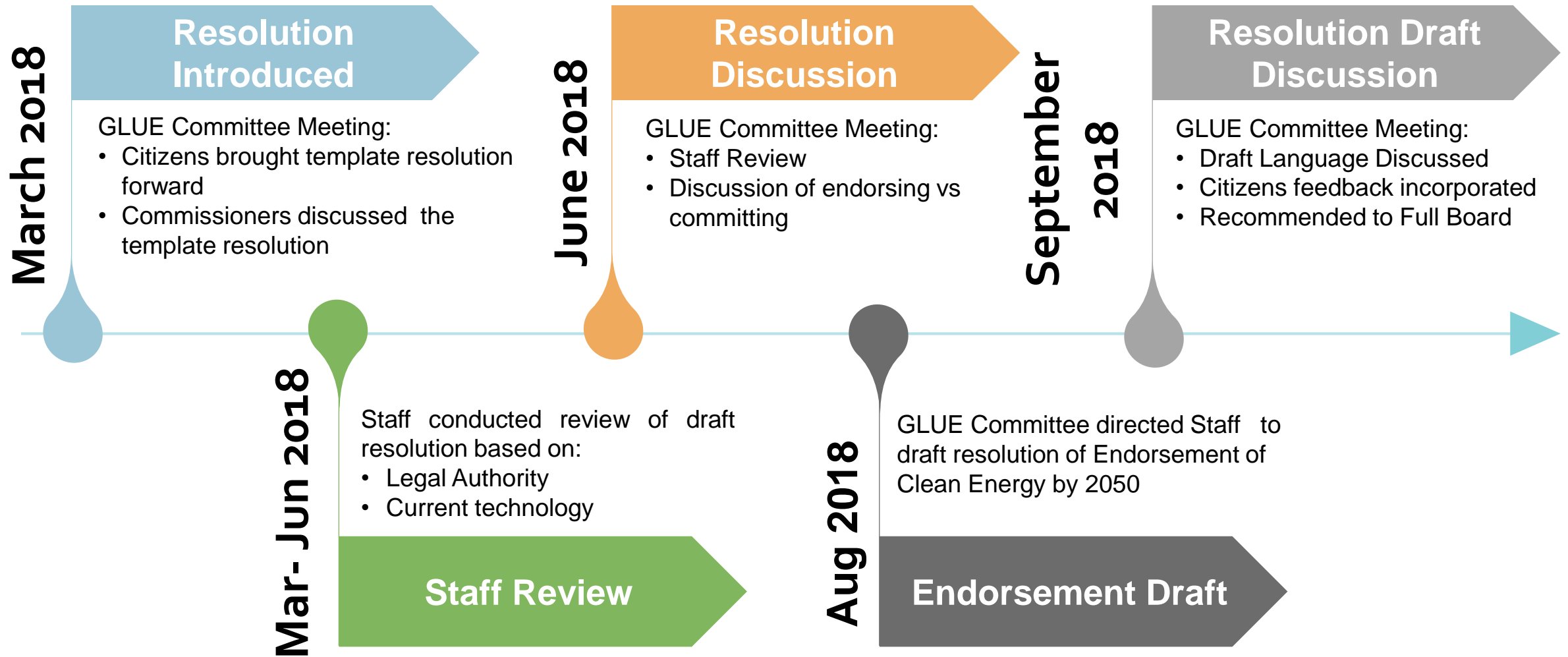
# Why We're Discussing Energy Today

- 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 Section 1.4

# 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

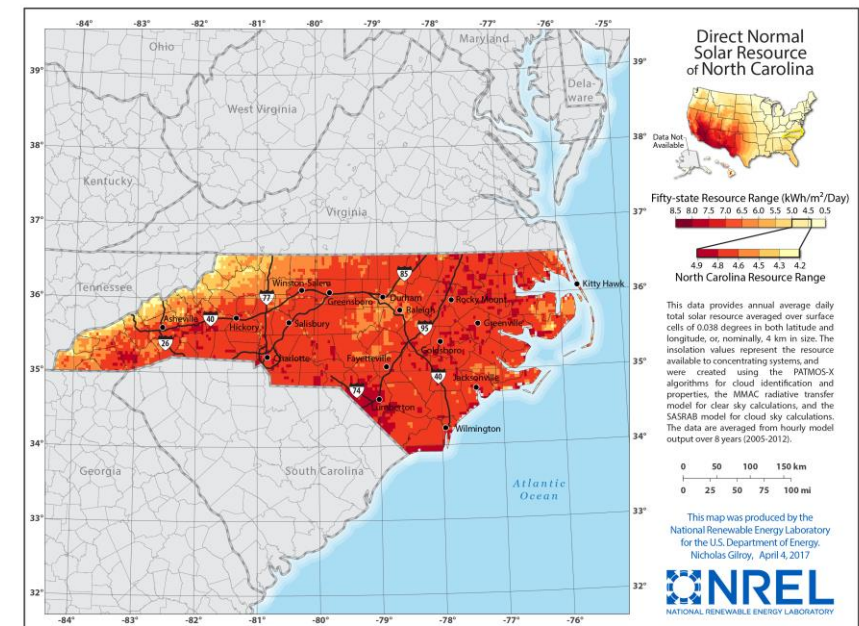
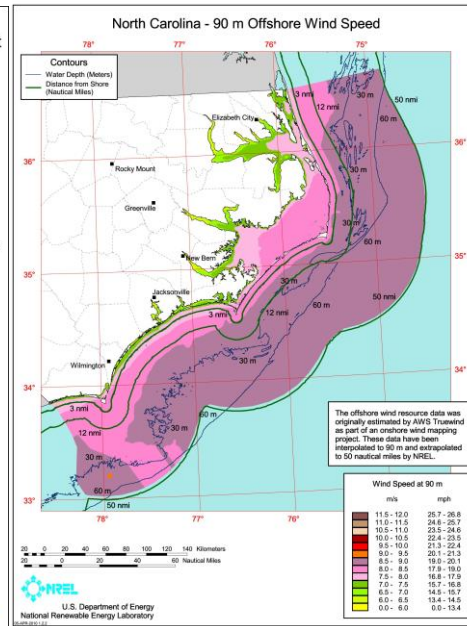
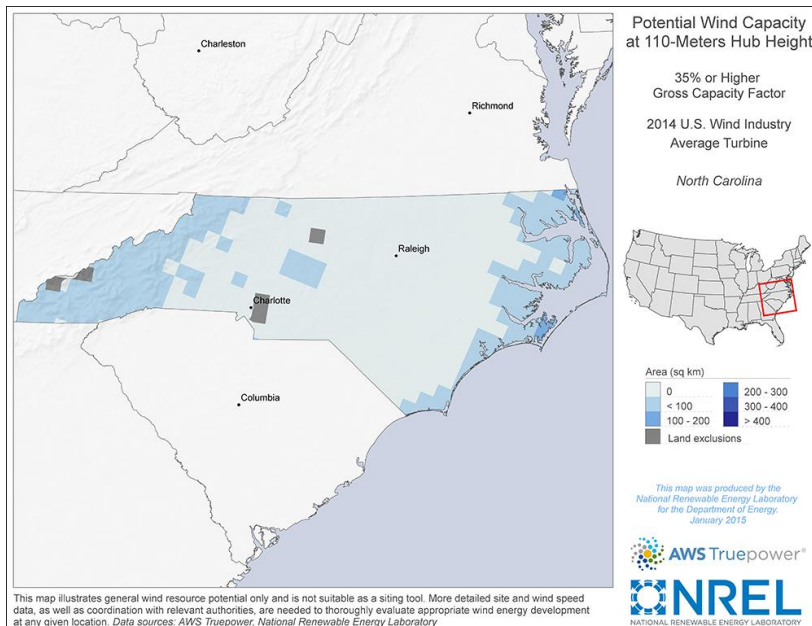
# Why focus on Solar PV?

## Wind Energy

- Resource is geographically limited
- Renewable Energy Credit Potential

## Solar Energy

- Resource Availability
- Technology easily scaled

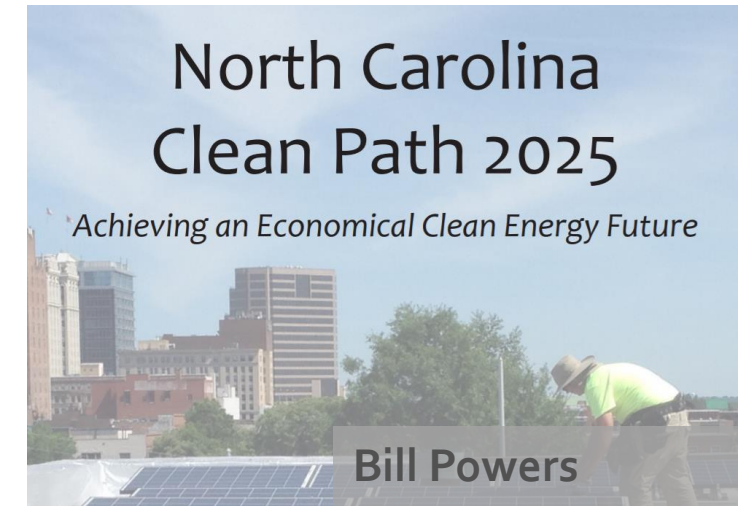
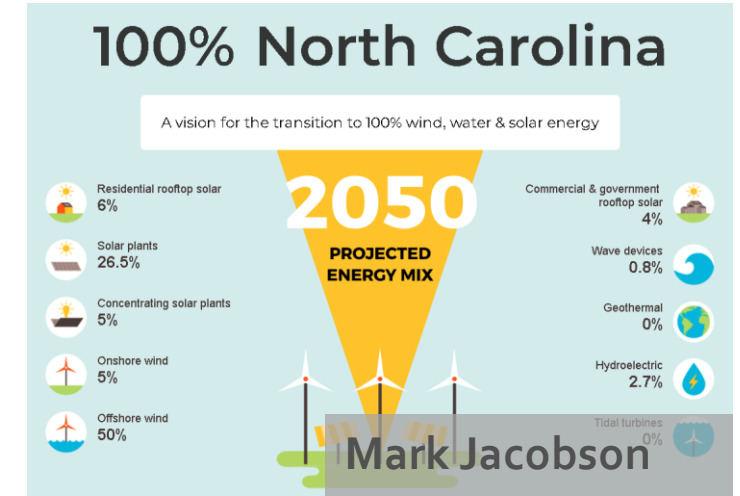




# Methods to Reach 100%

## 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



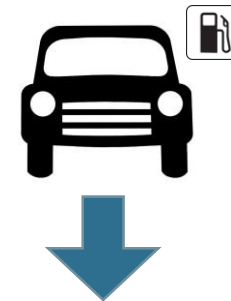
Solar PV  
Install On or Off site  
Solar and/or  
Purchase Clean  
Energy

Natural Gas



Solar PV  
Convert thermal  
equipment to  
electrical

Fleet

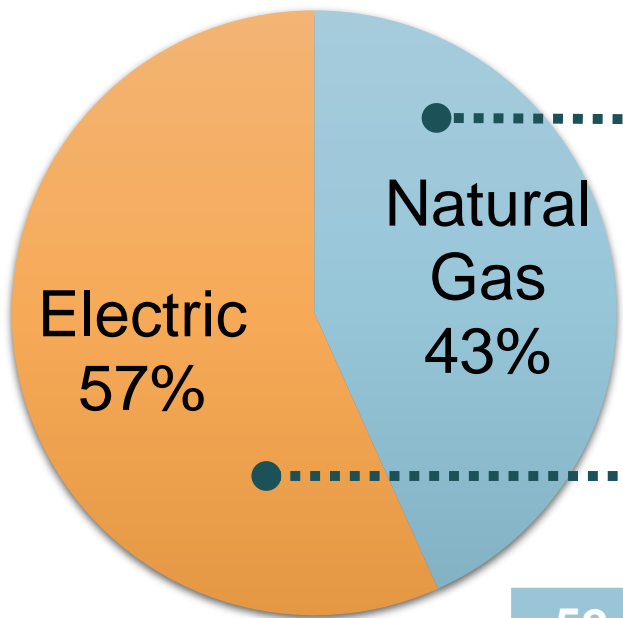


Electric/Hydrogen  
Fuel Cell Fleet  
charged with Clean  
Energy

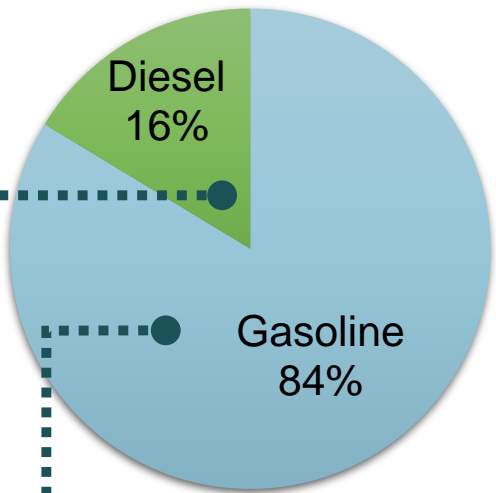
**...solutions require solar. How much solar?**

# County Energy Consumption

Building Energy Consumption

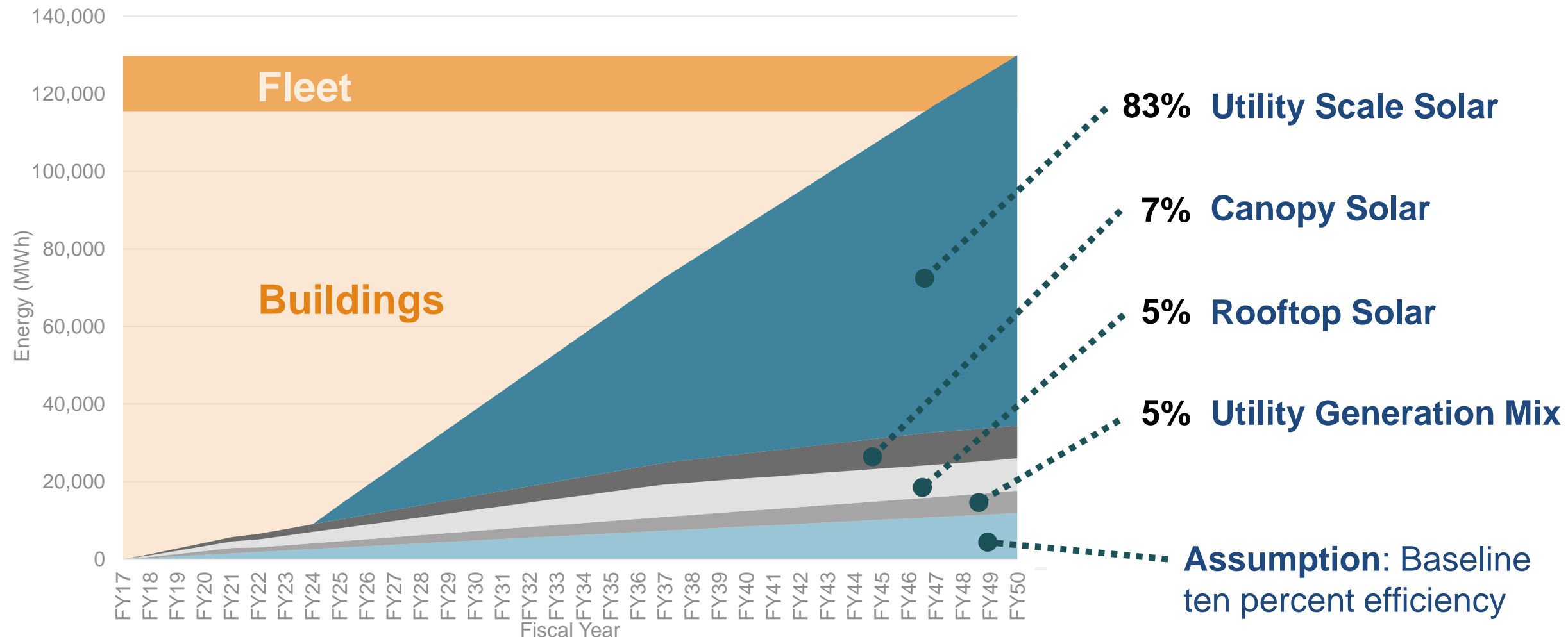


Fleet Fuel Consumption



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%



# 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



# Challenge: Current Solar Technology

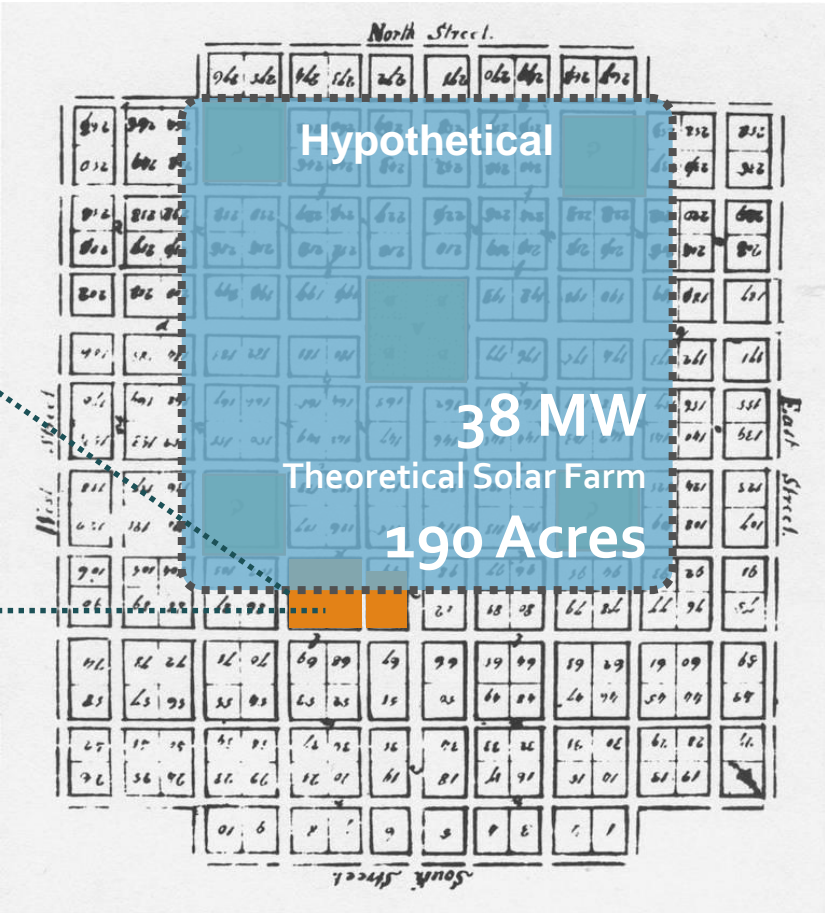
## Theoretical Area for 4 Buildings



**Downtown Quad**  
Electric and Natural  
Gas GHG Equivalent:  
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PV, 190 acres

Significant Area Required

Original Raleigh Plan



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# Challenge: Off-site Solar PV



## Significant Areas Available?

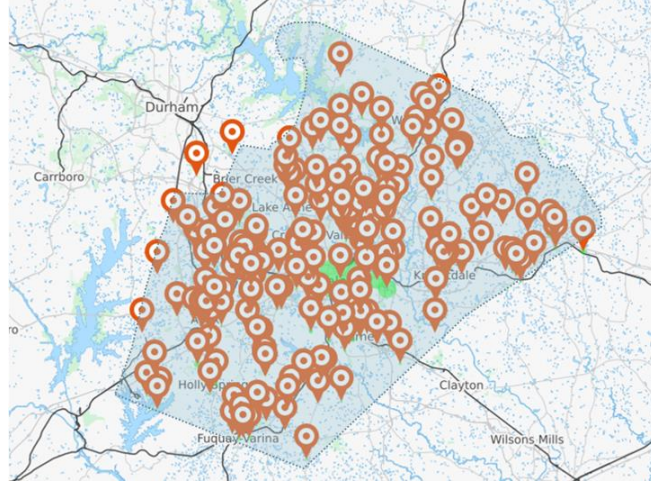
- Would require 350+ acres
- County farm land available, but within future Little River Reservoir
- May or may not be suitable for utility scale development
- Renting land could be an option



# 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