



# Steps to Zero-Carbon for Mecklenburg County Facilities

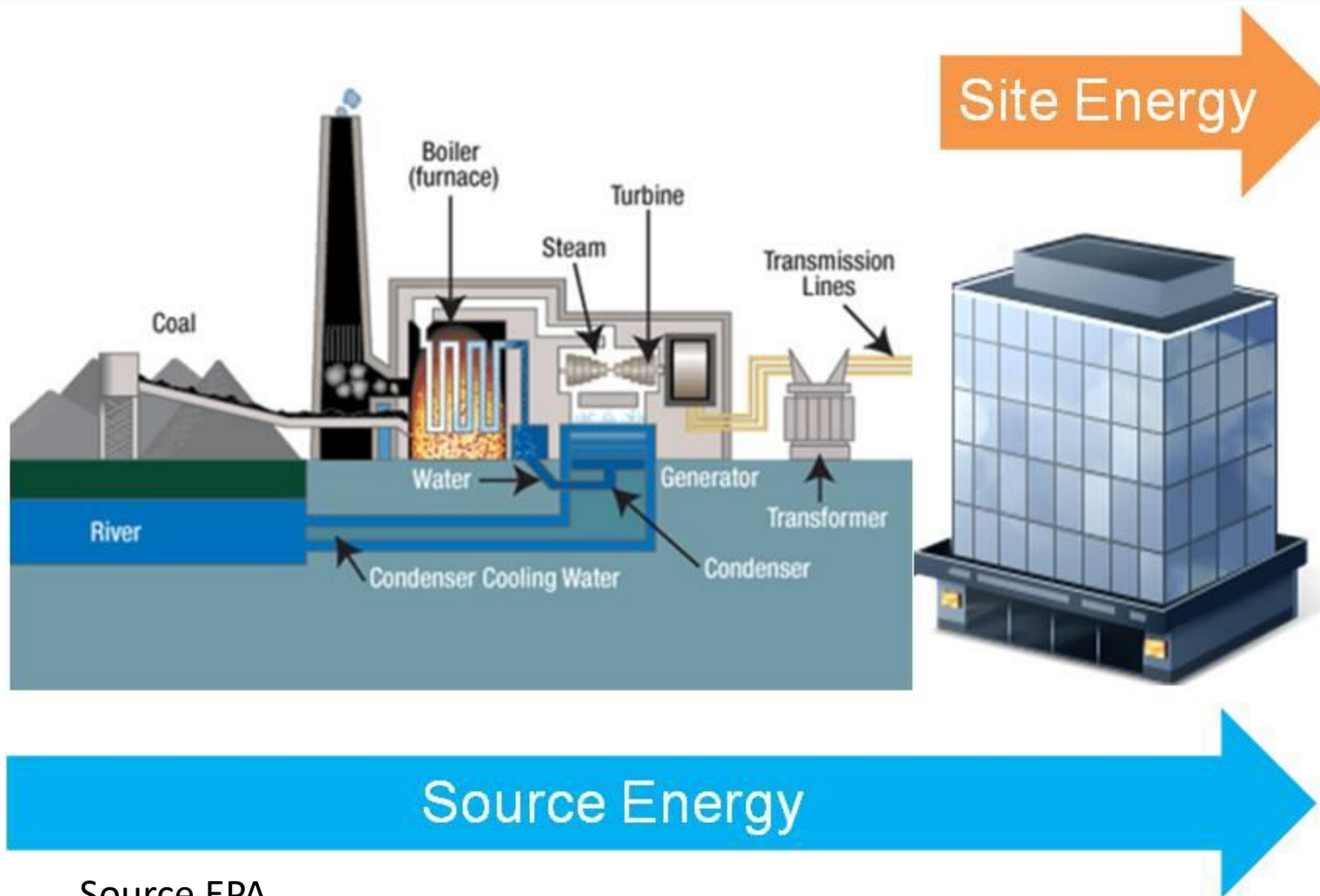
# Electricity Use is Largest Source of GHG

## Mecklenburg County Government 2018 CO<sub>2</sub>e Emissions by Source

Source of GHG Emissions	CO <sub>2</sub> e (Tons)	% of Total	Sector Where Source is Found
Electricity Usage	37,177	68.3%	Buildings and Facilities
Natural Gas Combustion	8,703	16.0%	Buildings and Facilities, Fleet
Gasoline Combustion	5,586	10.3%	Fleet
Diesel Combustion	2,735	5.0%	Fleet
Hydrofluorocarbon Refrigerants	230	0%	Buildings and Facilities, Fleet
Total	54,430		



# THE SOURCE OF CARBON



*Carbon is emitted when coal and natural gas are burned to make electricity at the generating plant*

*Carbon is also emitted when natural gas is used in facilities for heating*

**'Net zero'** is an overall balance between carbon emissions and carbon removed from the atmosphere (offset)

Source EPA

As Duke Power phases out coal and gas the amount of carbon used in electricity production will drop.



# OBJECTIVES

- Outline strategies to move Mecklenburg County facilities to net zero carbon.
- Emphasize strategies that have direct local benefits
- Outline one possible fast track scenario with costs to move to net zero by 2030

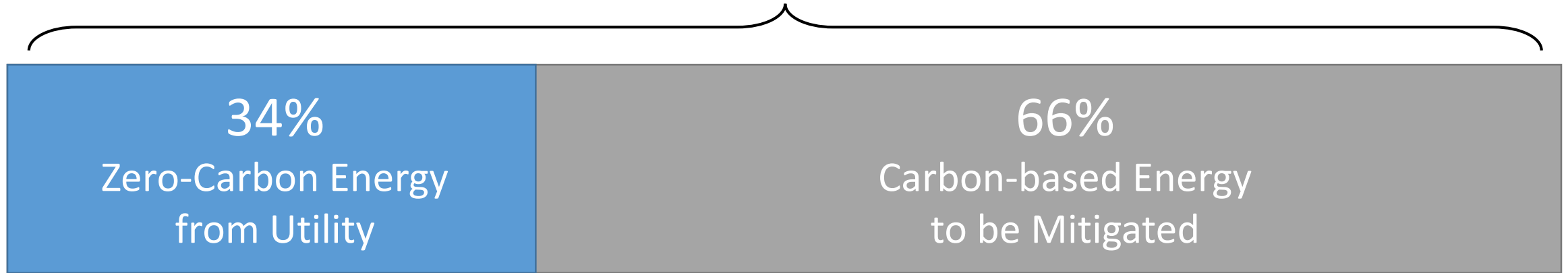


## Total Energy Used By Existing Facilities

137,000 Megawatt hours



## Total Energy Used By Existing Facilities



# STEPS TO ZERO CARBON

**Improve Energy Efficiency**

**Install Onsite Renewable Energy**

**Develop Offsite Renewable Energy**

**Purchase Renewable Energy  
Certificates or Offsets**



# IMPROVE ENERGY EFFICIENCY

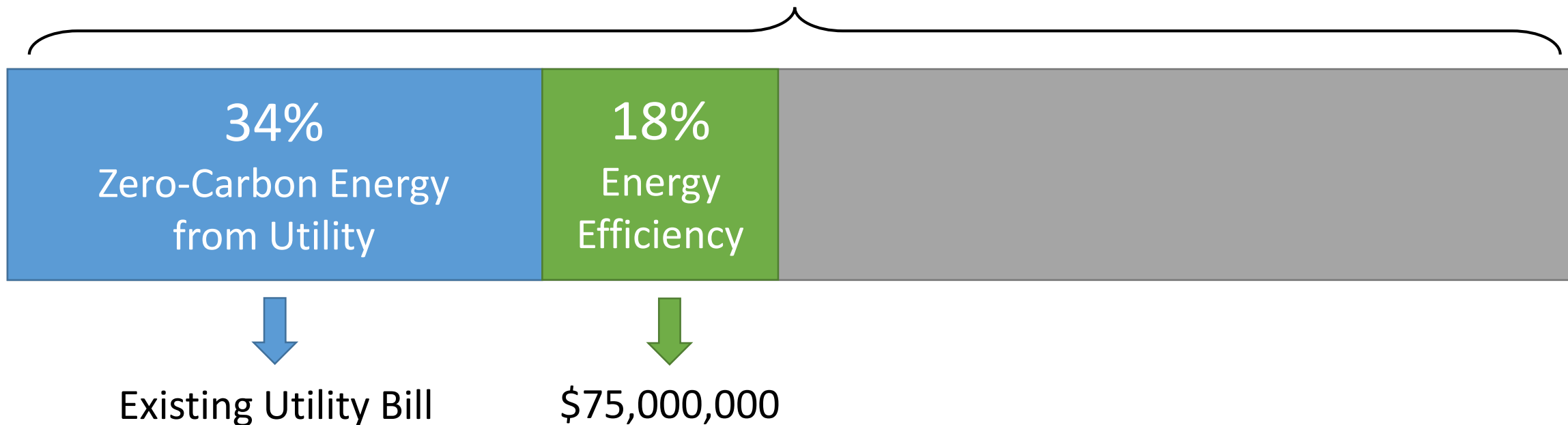
- Continue replacing inefficient equipment and lighting
- Retrofit existing facilities for deep energy reductions
- Use more advanced technology – heat exchangers, geothermal, chilled beams, etc.
- Establish energy/GHG goals and training for maintenance providers
- Transition to all electric heating sources where it makes sense; to allow for more renewable energy
- Upgrade building control systems and add analytics
- Enforce energy conserving policies: ex. heating 70F, cooling 76F setpoints





# STEPS TO ZERO CARBON BY 2030

## Total Energy Used By Existing Facilities



*Fast Track Scenario: estimates based on engineering judgement. Actual cost will vary.*

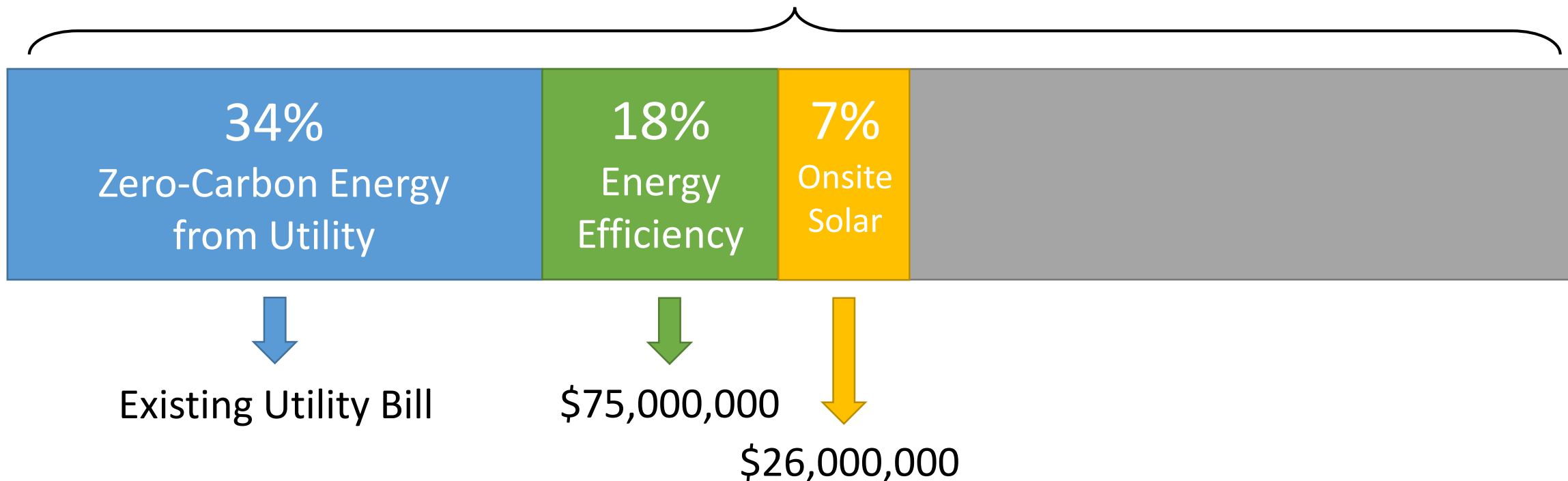
# INSTALL ONSITE RENEWABLE ENERGY

- Install solar power on facility rooftops and parking lots
- Many County facilities that are large energy users, such as the Court buildings, have limited space for onsite solar
- Onsite solar energy production is currently limited
- This limits how much solar can be installed
- Some accounts can be switched to permit more solar at a cost premium



# STEPS TO ZERO CARBON BY 2030

## Total Energy Used By Existing Facilities



*Fast Track Scenario: estimates based on engineering judgement. Actual cost will vary.*

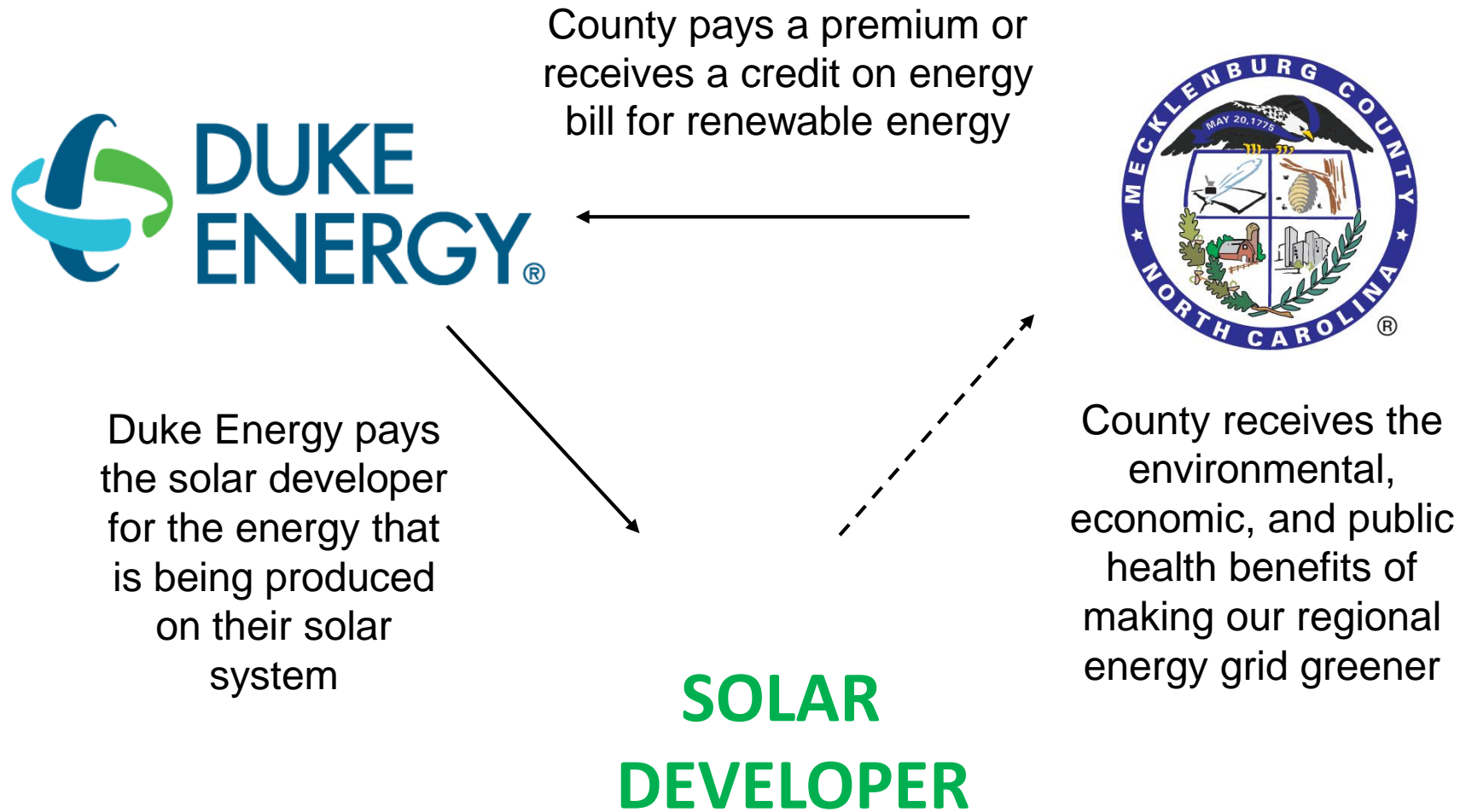


# DEVELOP OFFSITE RENEWABLE ENERGY

- Duke's Greensource Advantage program allows offsite solar up to 125% of County electrical demand.
- This requires making a 20-year power purchase agreement with a solar developer and Duke Energy.
- It may not require upfront capital, because it is payed over time through an extra, incremental cost on the County's energy bills.
- The program is first-come, first-serve and availability is limited.
- This power represents an "offset" to County power consumption. Power would not directly feed County buildings. It will feed onto the grid ("greens" the region's grid).

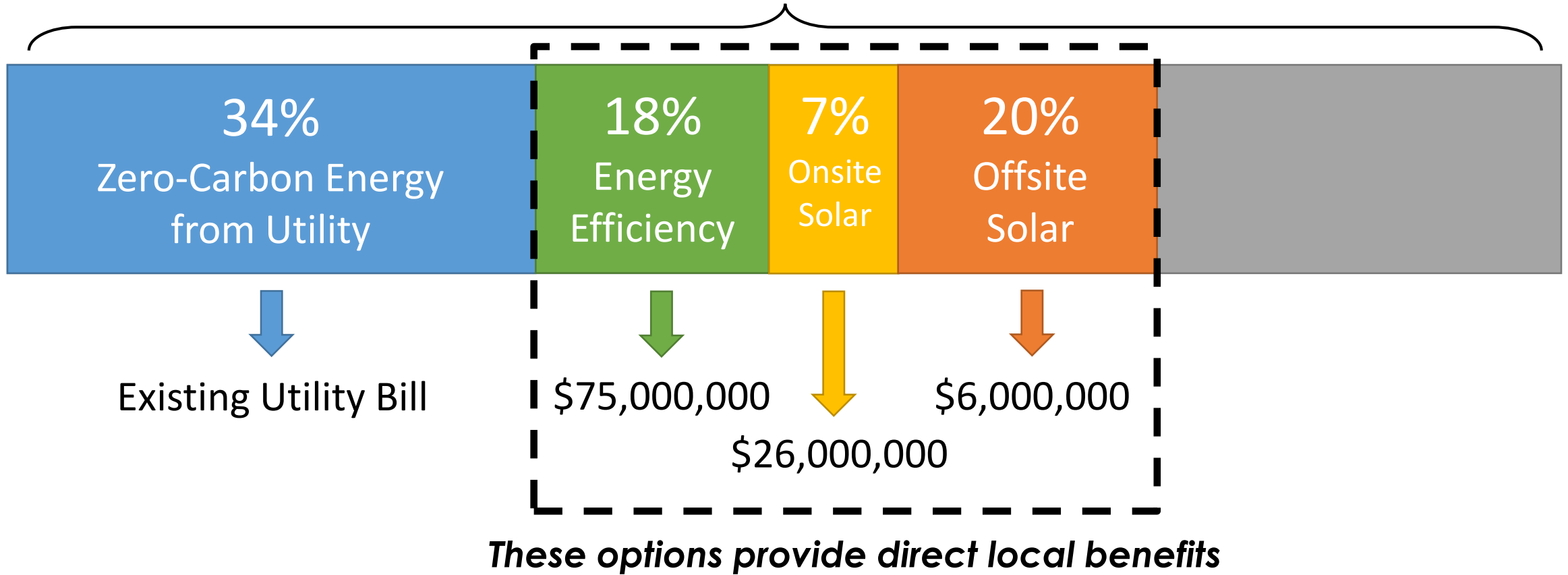


# GREEN SOURCE ADVANTAGE



# STEPS TO ZERO CARBON BY 2030

## Total Energy Used By Existing Facilities



*Fast Track Scenario: estimates based on engineering judgement. Actual cost will vary.*

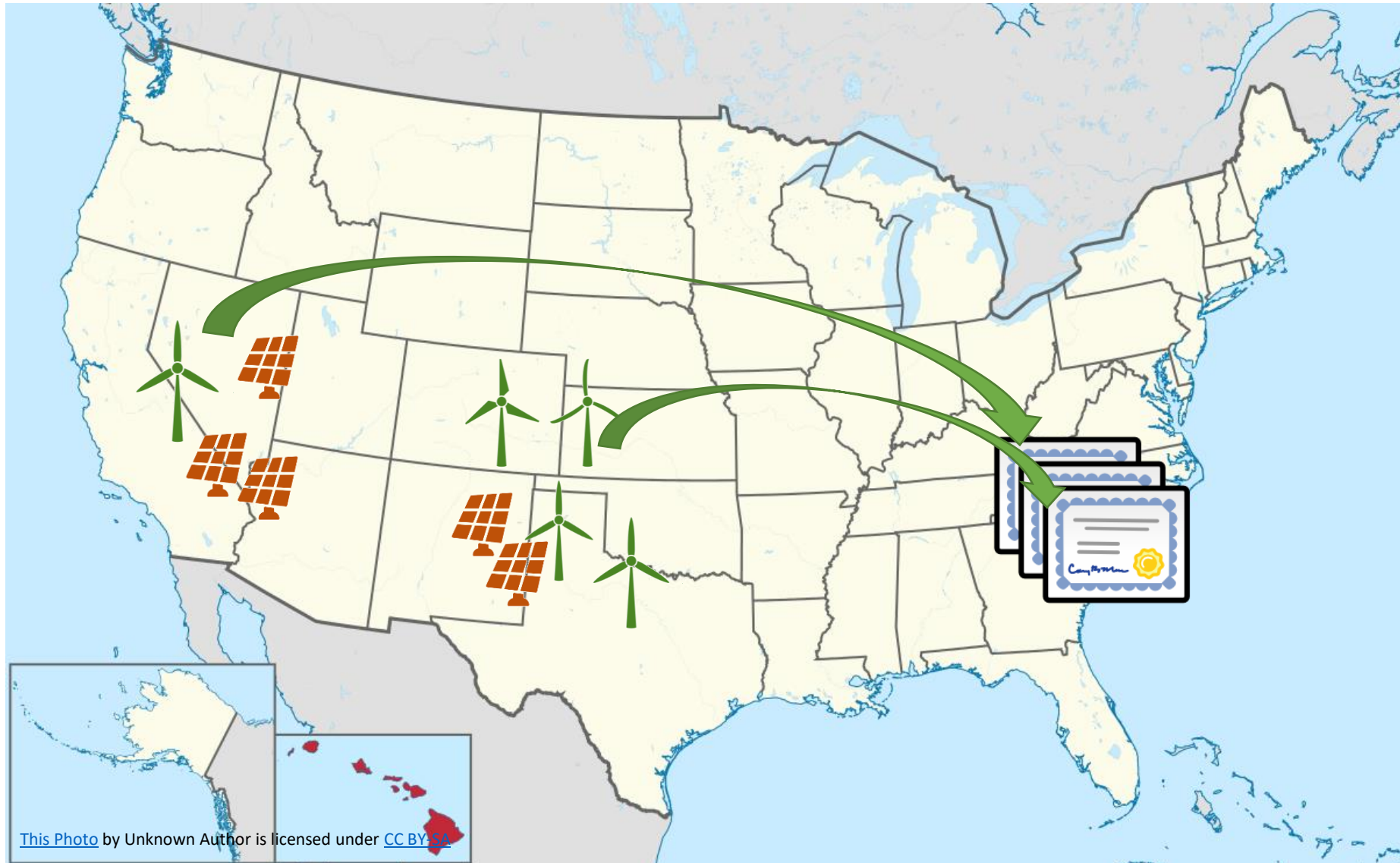


# Purchase Renewable Energy Certificates or Offsets

- Renewable Energy Certificates (RECs) and Carbon Offsets can be purchased to claim credit for the renewable energy generated by someone else.
- Available on the open market and are sold in 1 MWh lots.
- Represents an investment in renewable energy.
- Not likely to reduce local emissions but does reduce global emission and creates market incentives for renewable energy generation.
- RECs and Offsets are market driven and may go up in cost



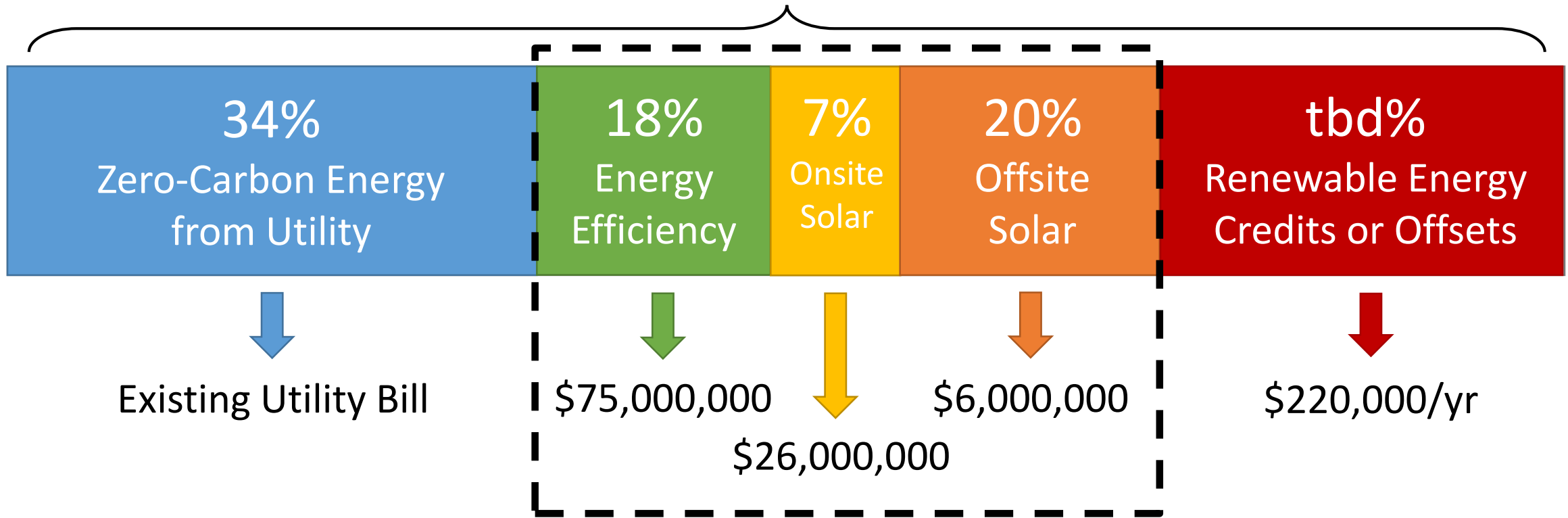
# Renewable Energy Certificates





# STEPS TO ZERO CARBON BY 2030

## Total Energy Used By Existing Facilities



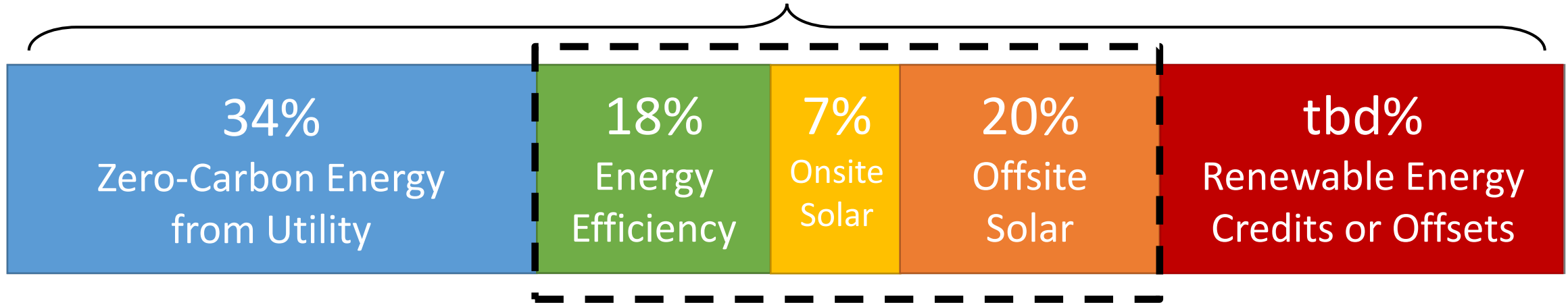
Total Cost ~ **\$107,000,000** over 10 years

*Fast Track Scenario: estimates based on engineering judgement. Actual cost will vary.*



# STEPS TO ZERO CARBON BY 2030

## Total Energy Used By **Existing** Facilities



Also, **NEW** facilities will need to be built to net-zero, which will add 25% to the standard project budget.



*Fast Track Scenario: estimates based on engineering judgement. Actual cost will vary.*

# FAST TRACK SUMMARY

## Existing Facilities

~ **\$107,000,000** over 10 years

## New Facilities

**+25%** of project budget



*Fast Track Scenario: estimates based on engineering judgement. Actual cost will vary.*

# DUKE NET ZERO BY 2050 GOAL

## Duke Energy to accelerate coal-plant closings, target 'net zero' carbon emissions by 2050

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# SUMMARY

- There are options for reducing Carbon emissions.
- Some options cost more than others
- It's unlikely net Carbon emissions could be brought to zero through energy efficiency and local renewable energy production alone
- RECs and Offsets could bridge the gap until technology has advanced, regulations change, or the amount of source carbon in electricity drops substantially
- But, RECs don't have the local benefits of the other strategies
- Note, in the fast track scenario presented, projected costs do not factor in projected life cycle savings from reduced energy demand



# QUESTIONS?

