

GETTING TO NET ZERO – Case Studies

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Madison, Wisconsin



Commitment to Net Zero Carbon



March 21, 2017: The City of Madison became the 25th city in North America to set a goal of powering city operations with 100% renewable energy and net zero carbon emissions. The resolution was passed unanimously by the Common Council.

First Step: Engage Stakeholders

- Stakeholders:
 - Public Service Commission
 - Local utilities
 - Non-profits
 - Sustainable Madison Committee
 - Members of the public.



ICLEI Emissions Tracking Protocol

Sources of City Operation Emissions

City Buildings

- Fire stations
- Police stations
- Libraries
- Monona Terrace
- Housing
- Parking structures
- Metro bus barn
- Recreation
- Offices
- 40% of City-County Building (CCB)

Does not include:
Schools, MMSD (sewer district), County buildings, Truax Airport



Vehicle Fleets

- Garbage trucks
- Fire trucks
- Police cars
- Metro buses
- Water utility fleet
- General fleet vehicles



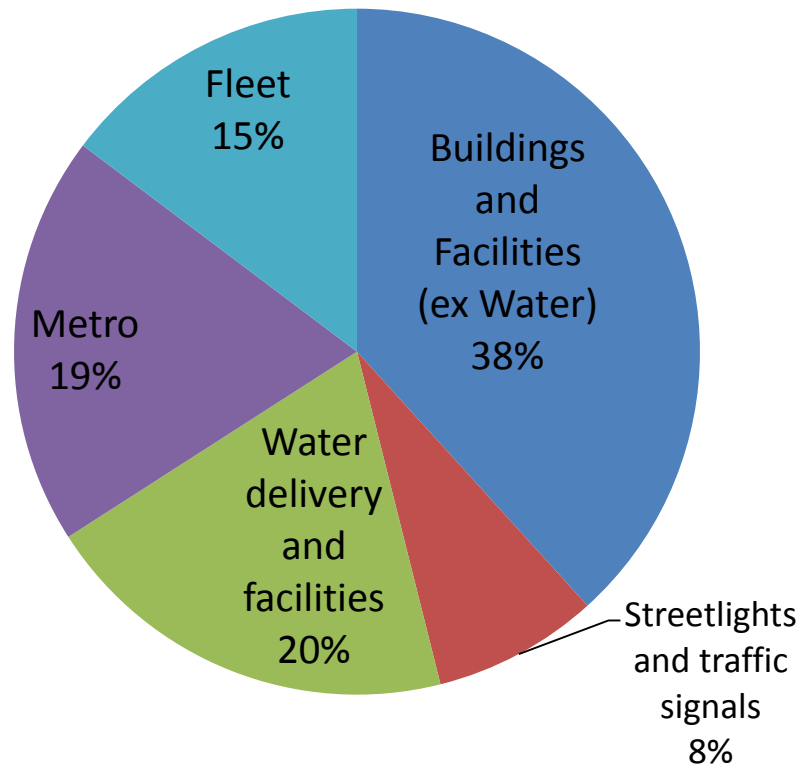
Other

- Water utility pumping
- Street lights and traffic signals
- Retired City Landfills
- Employee vehicle commute

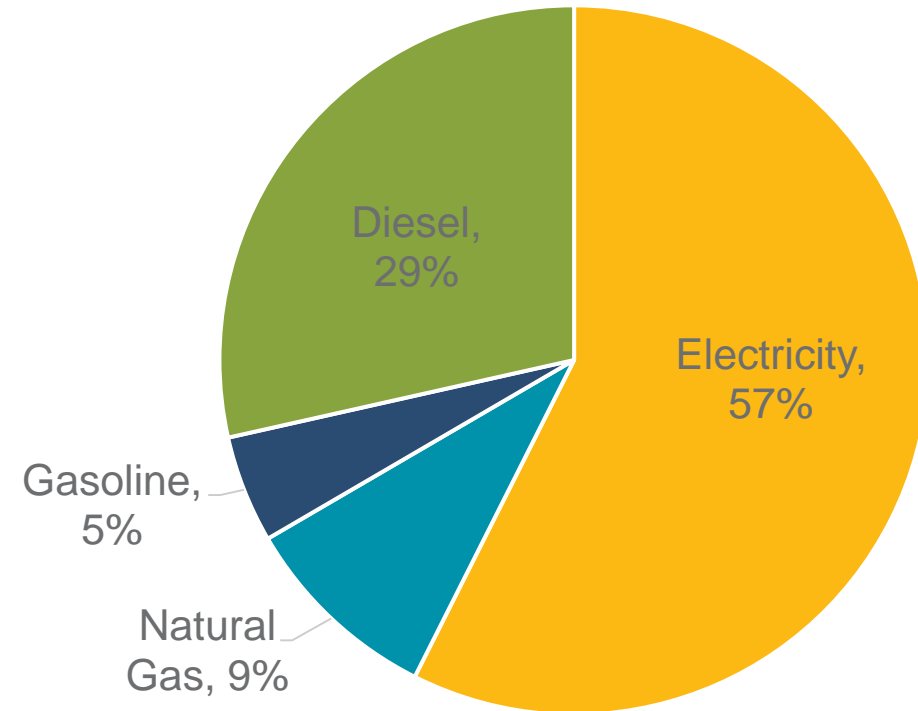


2016 Carbon Emissions Breakdown

***Emissions Data by Category**



***Emissions Data by Fuel**

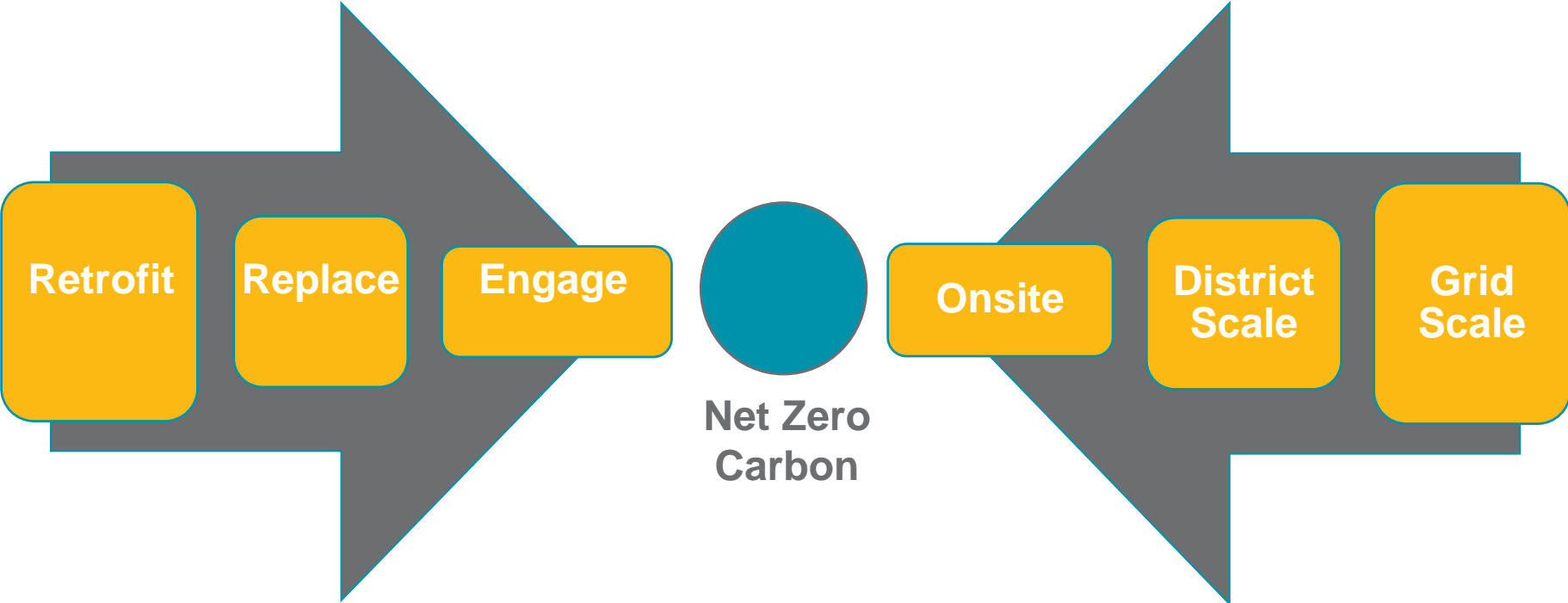


*Excludes landfill emissions and employee commute emissions

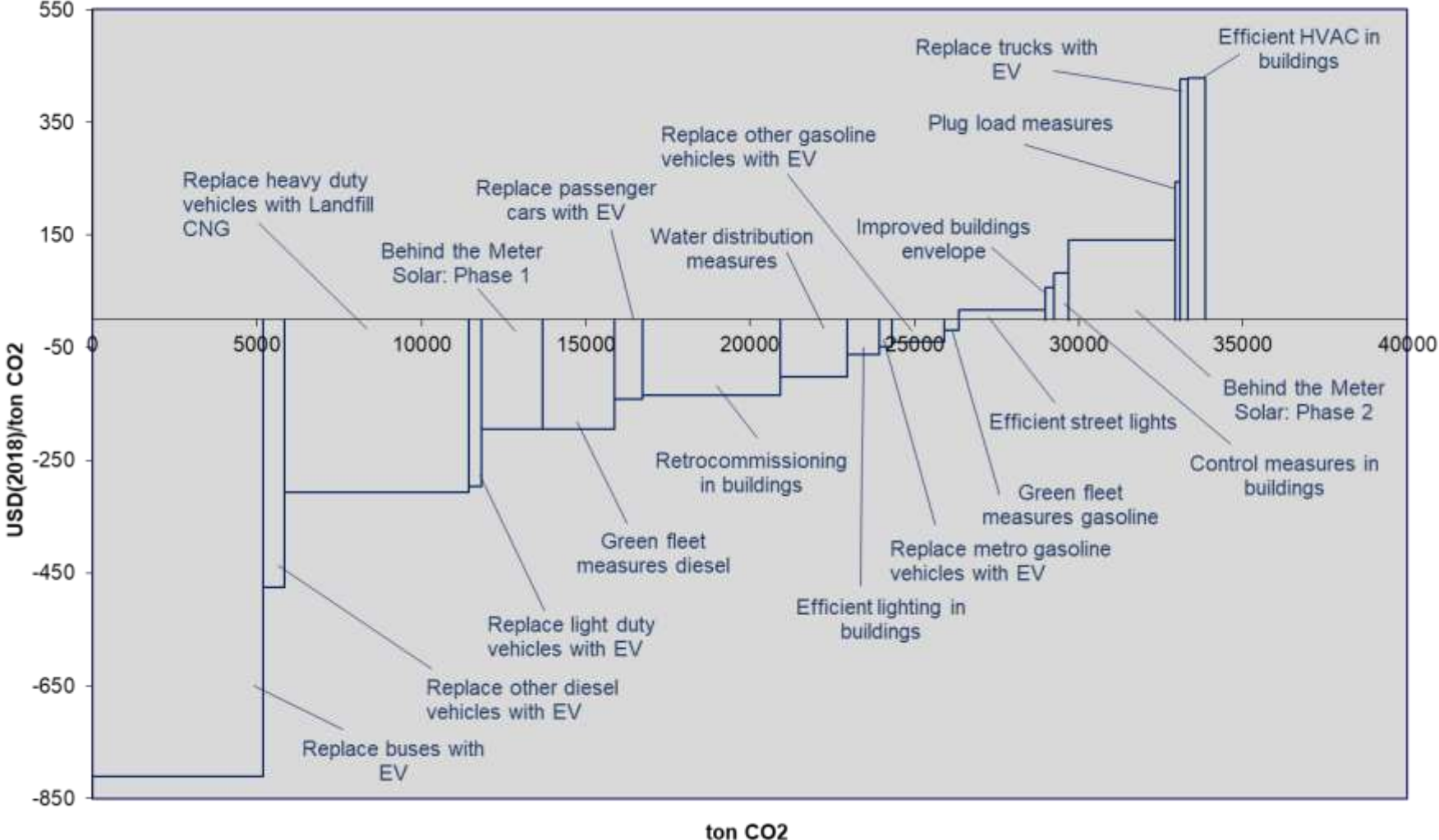
Getting to Net Zero Carbon

Demand Side

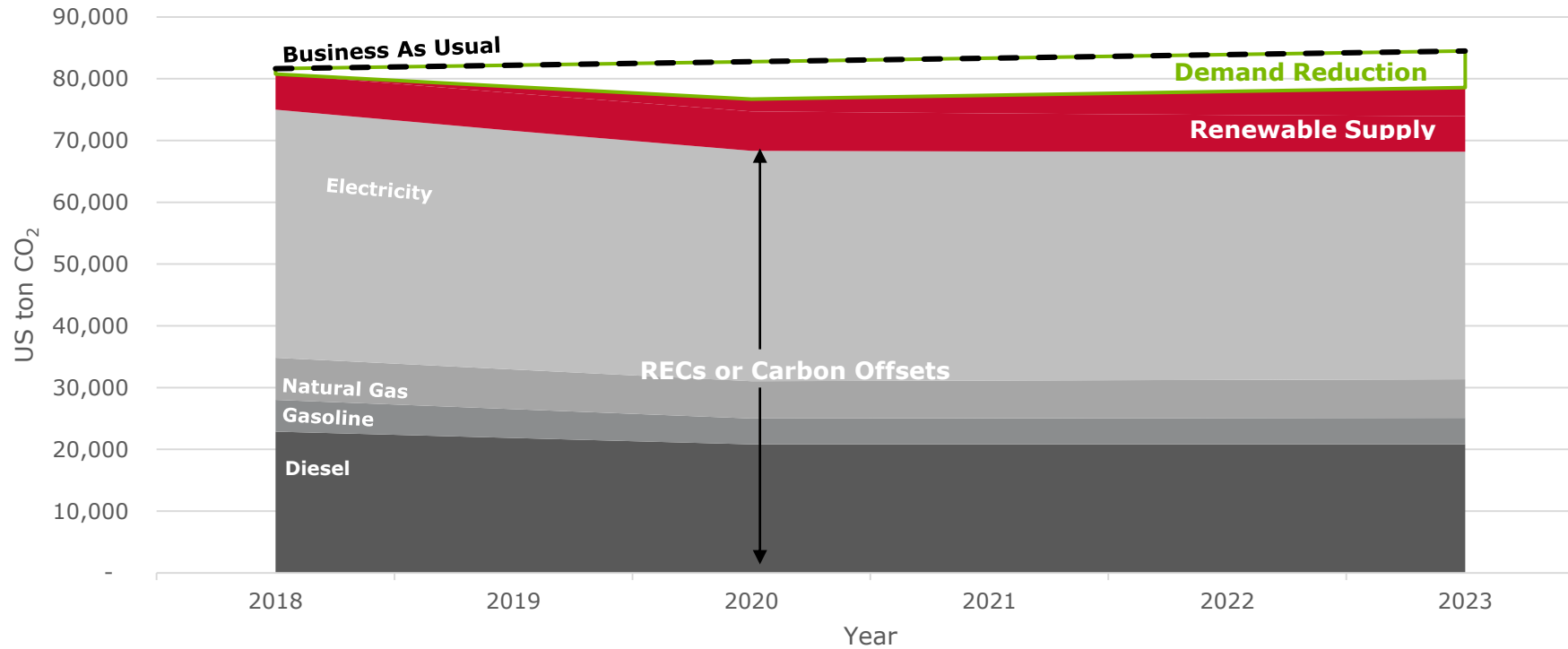
Supply Side



Cost of CO2 Reduction – Marginal Abatement Costs

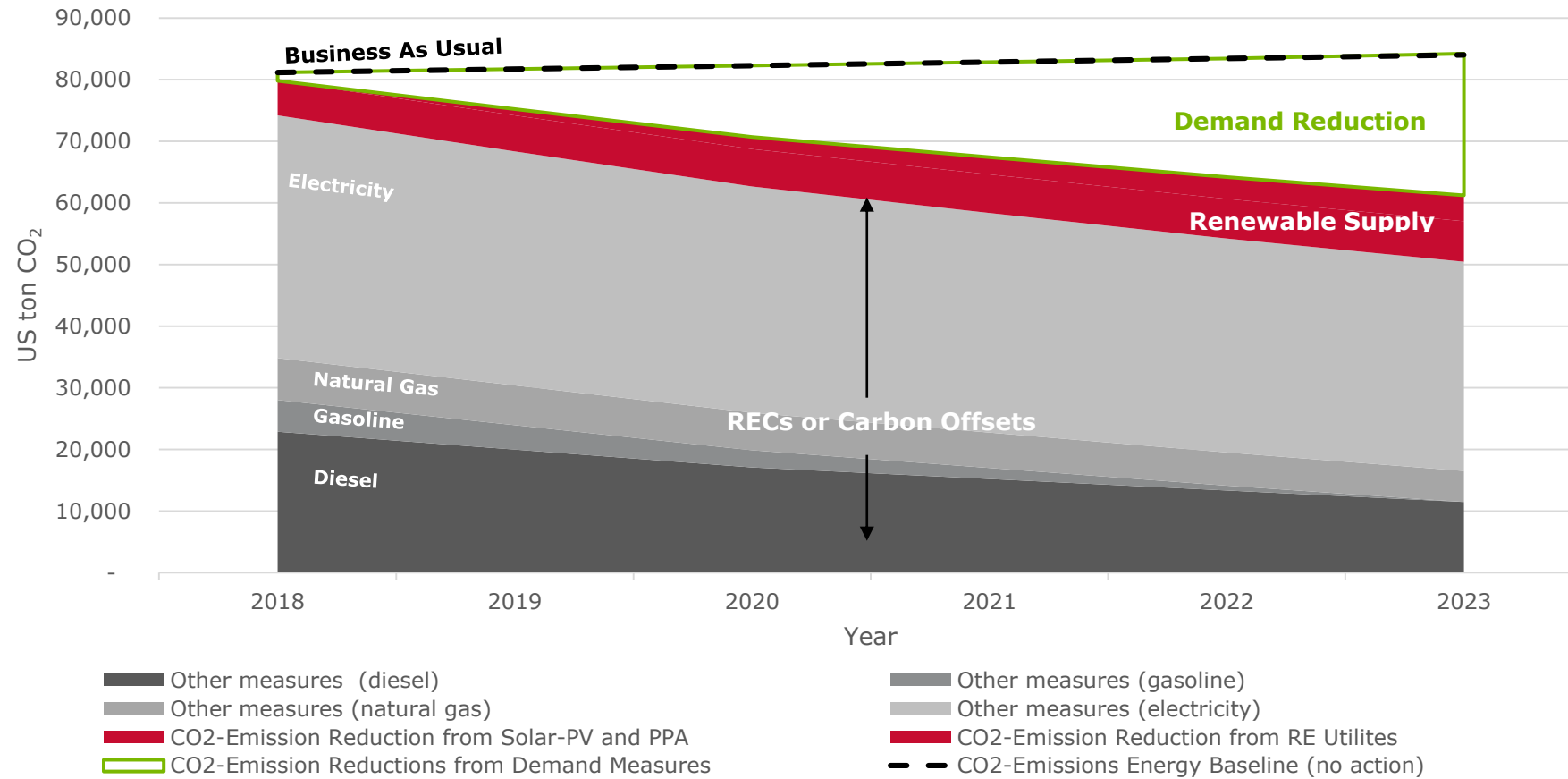


Scenario #1 – Net Zero Emissions by 2020



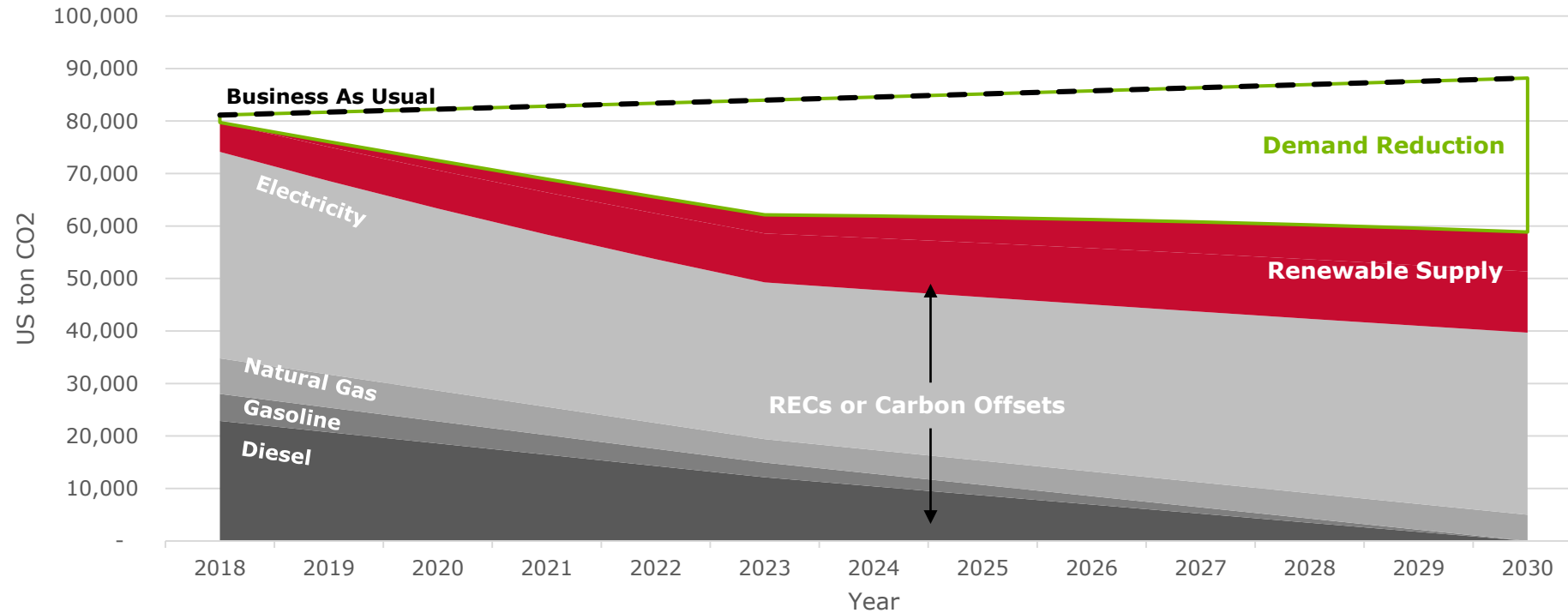
- Other measures (diesel)
- Other measures (gasoline)
- Other measures (natural gas)
- Other measures (electricity)
- CO₂-Emission Reduction from Solar-PV and PPA
- CO₂-Emission Reduction from RE Utilites
- CO₂-Emission Reductions from Demand Measures
- CO₂-Emissions Energy Baseline (no action)

Scenario #2 – Net Zero Emissions by 2023



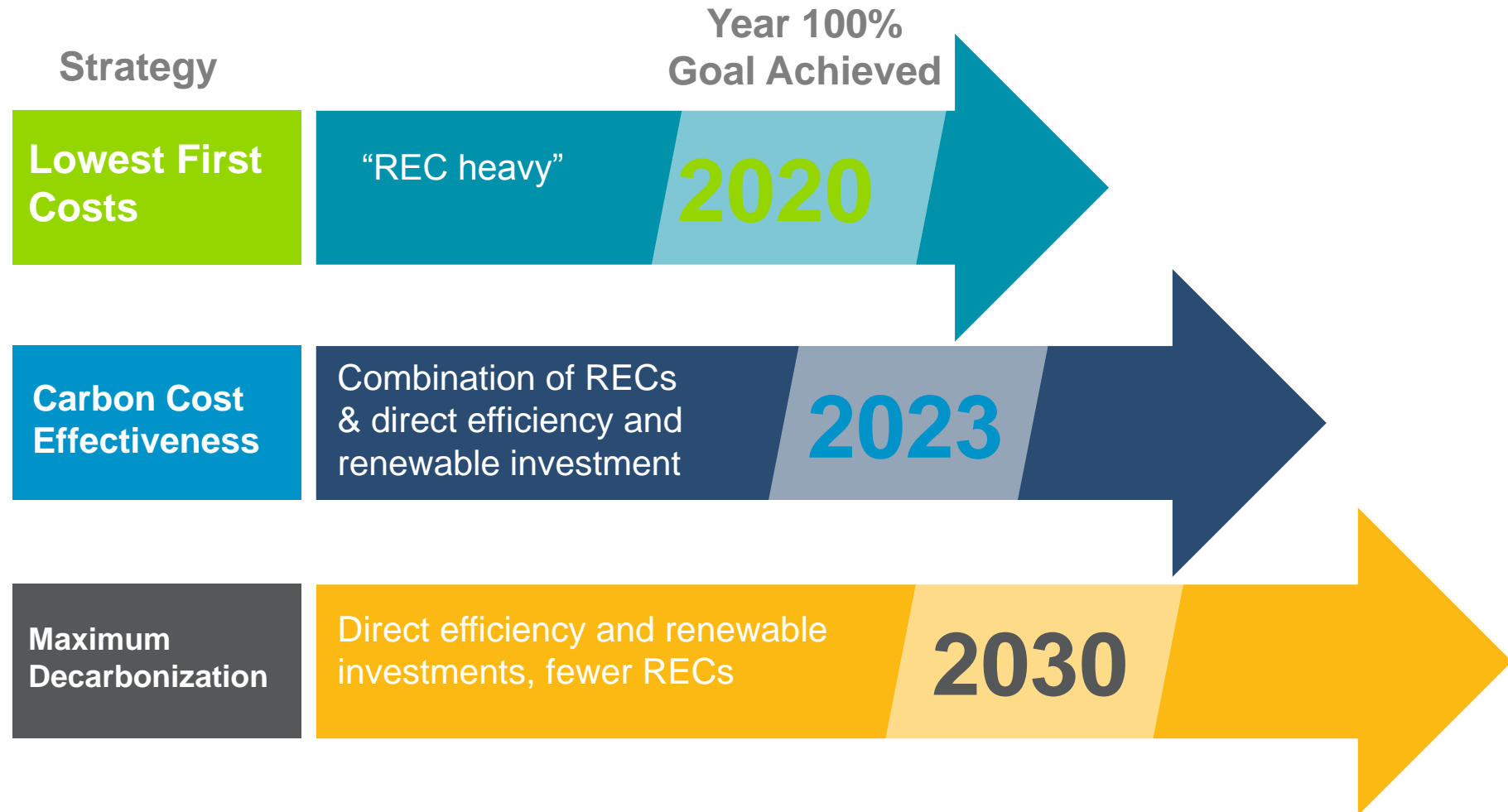
Scenario #3 – Net Zero Emissions by 2030

Results 2030 scenario



- Other measures (diesel)
- Other measures (natural gas)
- CO2-Emission Reduction from Solar-PV and PPA
- CO2-Emission Reductions from Demand Measures
- Other measures (gasoline)
- Other measures (electricity)
- CO2-Emission Reduction from RE Utilites
- CO2-Emissions Energy Baseline (no action)

Getting to Zero - Summary



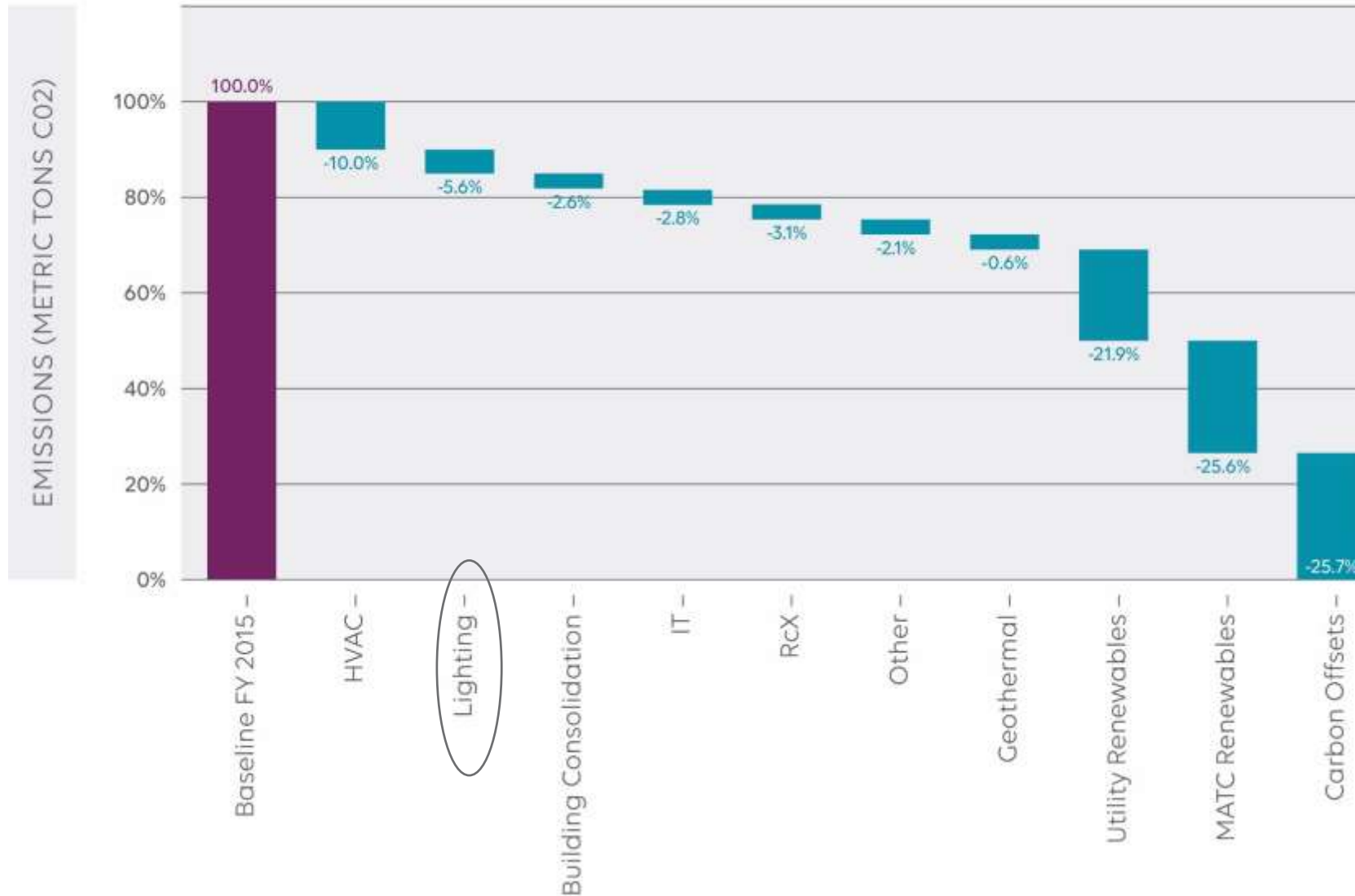
Case Study #2: Milwaukee Area Technical College

- (29) Buildings on (4) campuses
- 2,800,000 sqft of building area
- Sites total 376 acres land
- Carbon Neutral by 2030

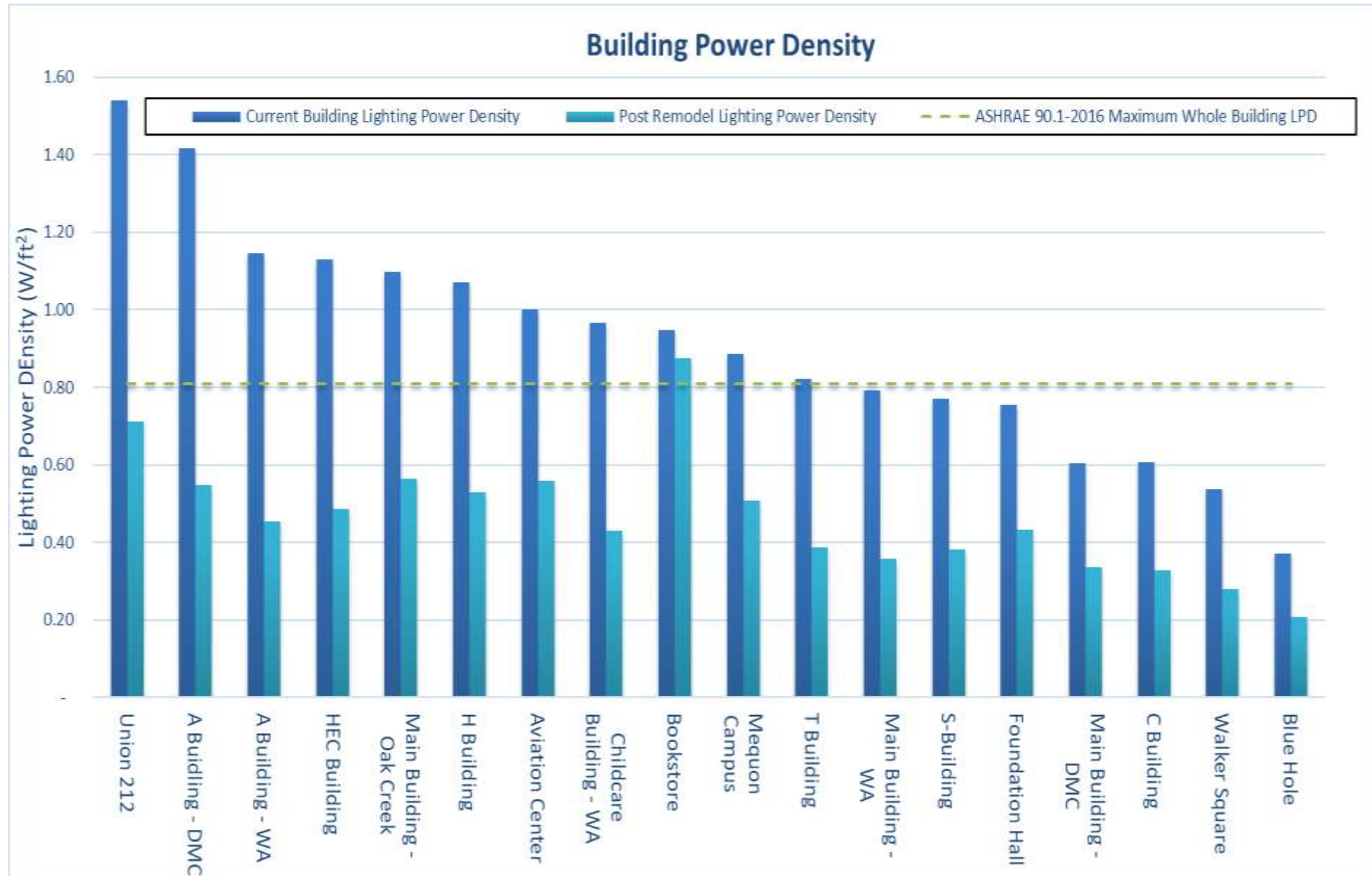


Measures to Reach Net Zero Carbon by 2030

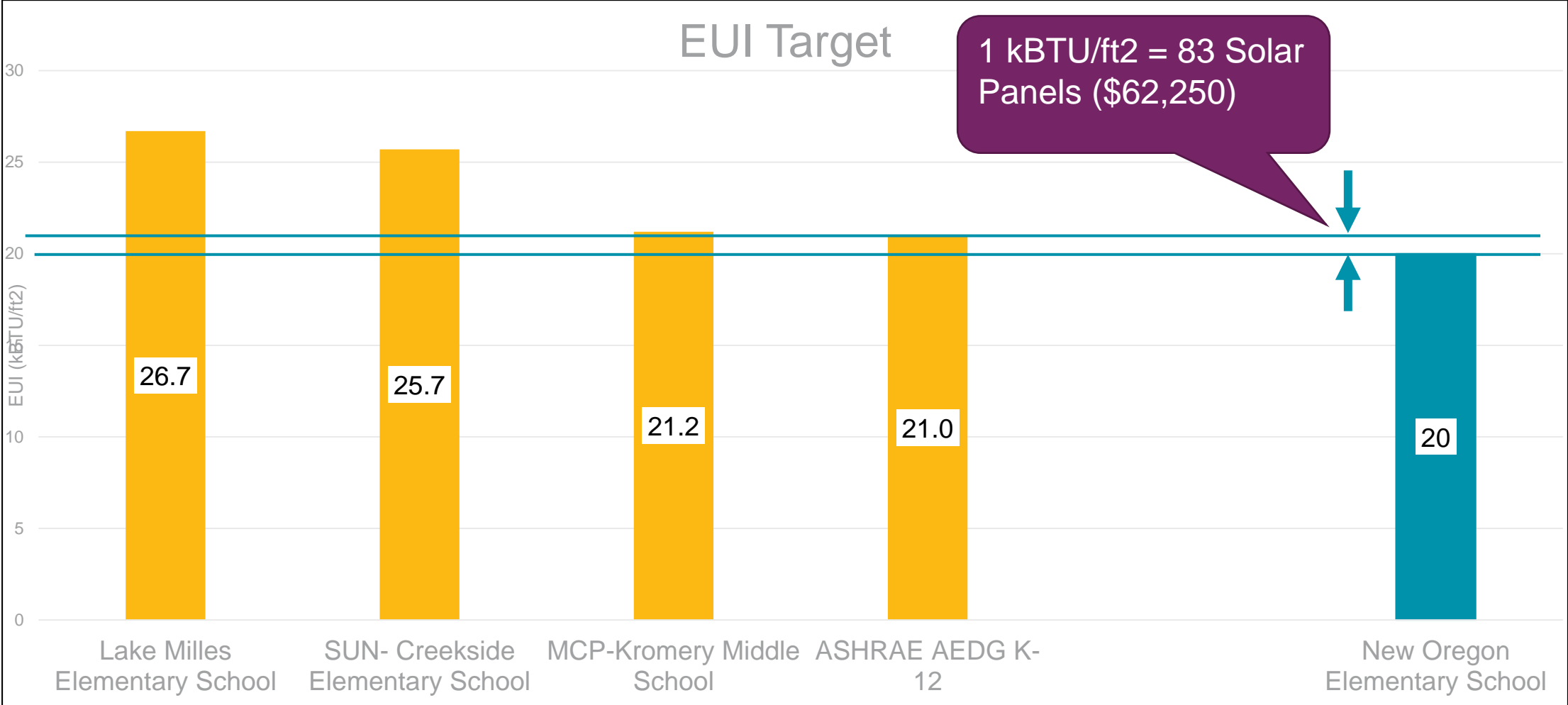
TIMELINE 1 – SOURCES OF EMISSION REDUCTION



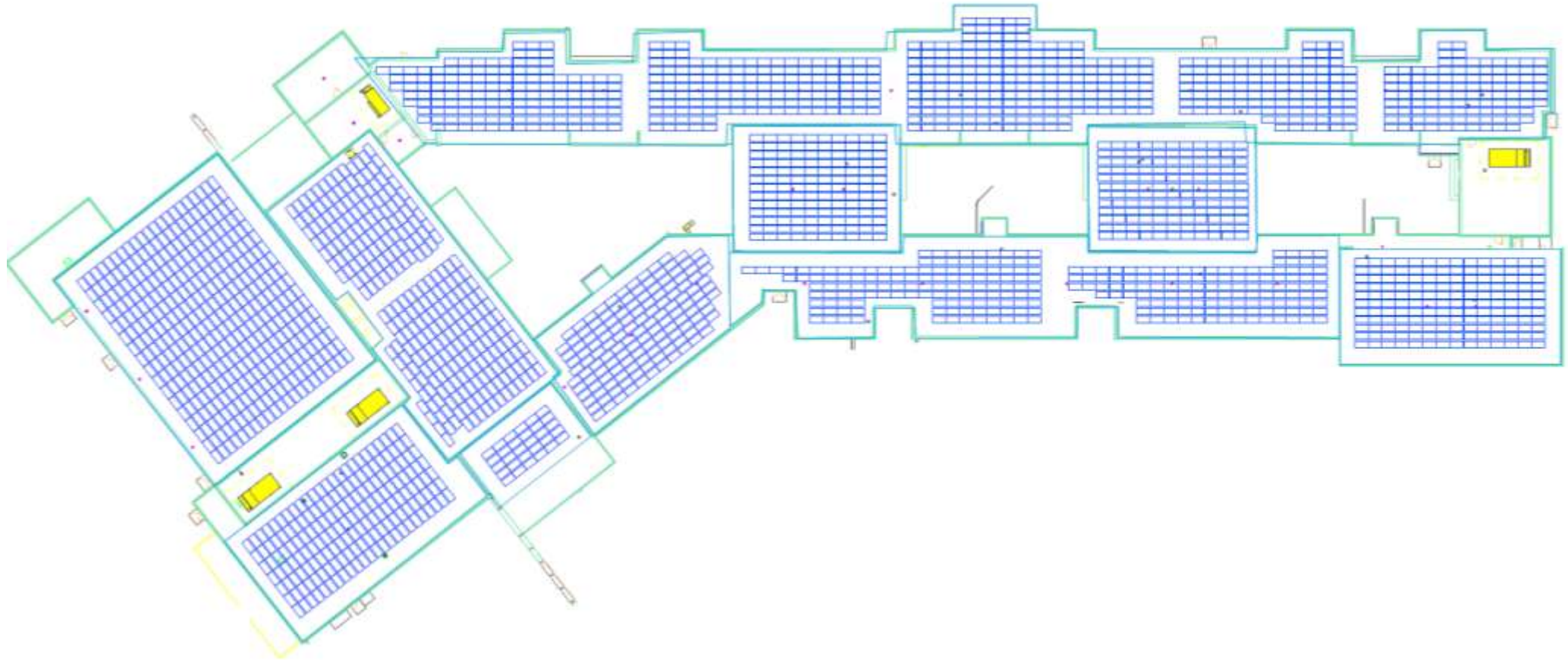
Example - Lighting Measure



Case Study #3 - Net Zero Energy School – 125,000 sqft



Solar PV Layout – Net Zero School



Q&A