George Mason University

Climate Action Plan Town Hall

January 28th, 2022

Agenda

Brief Review of Climate Action Plan Process

Electric Grid Impacts

Future Trajectory Scenarios

Next Steps & Idea Gathering

Objectives

- Share the CAP progress
- Review levels of influence and control
- Understand different future scenarios
- Outline points of engagement

CAP Process

Mason's Climate Commitments

THE GLOBAL GOALS
For Sustainable Development

2007: Pres. Merten signs Second Nature Climate Commitment (ACUPCC)
→ carbon neutrality by 2050

2007: Board of Visitors pledges LEED Silver+ standard for new buildings.

2010: 1st Climate Action Plan (CAP) → -50% energy intensity & -20% net GHG by 2020

2014: Natural resource stewardship as core value in 2024 Strategic Plan

2015: Pres. Cabrera signs White House's American Campuses Act on Climate initiative.

2019: Pres. Holton re-commits to carbon neutrality by 2050 + new CAP w/benchmarks. at student-led 'Fridays for Future' climate change rally.

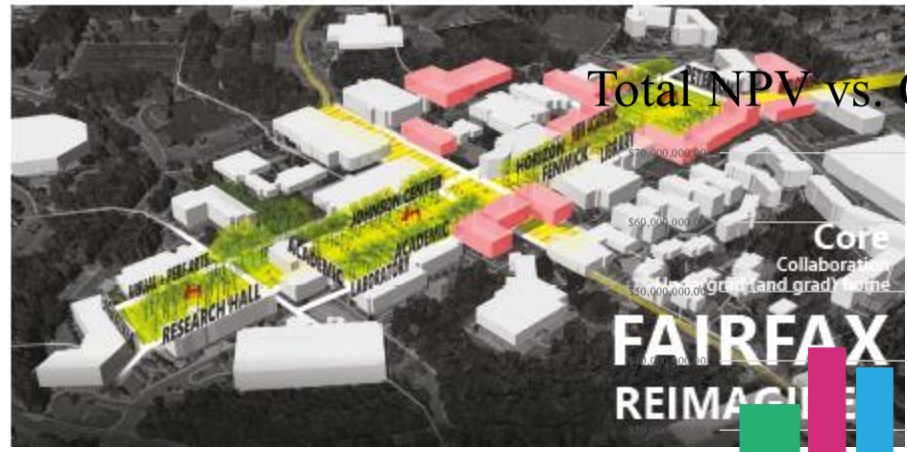
2020: Pres. Washington signs "America Is Still In." >1,500 orgs for US net-zero by 2050.

2022: Renewable to power 30% of VA government electricity, per VA EO 43 (2019).

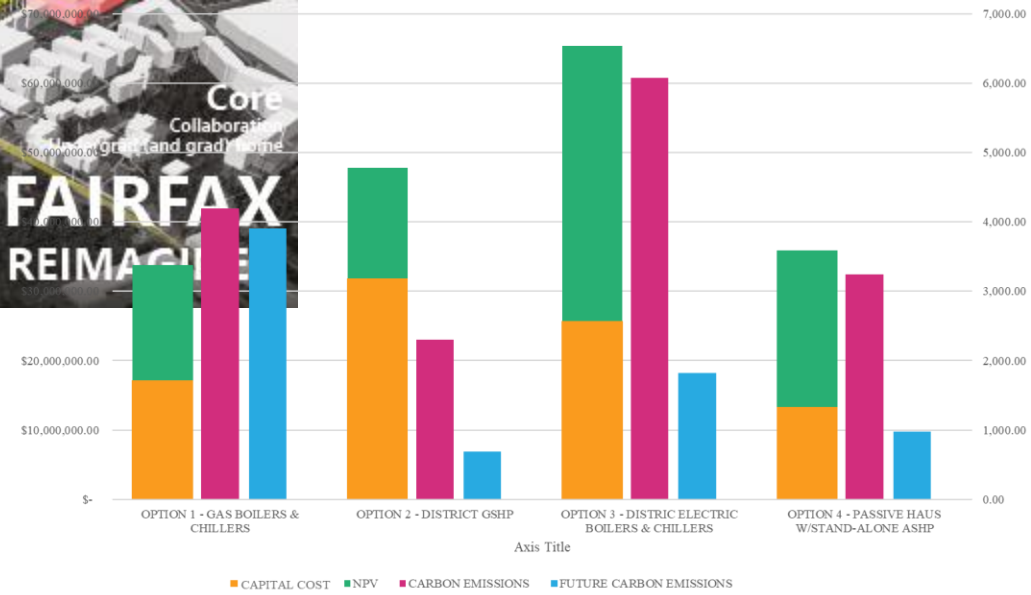
GEORGE MASON UNIVERSITY

Climate Champions

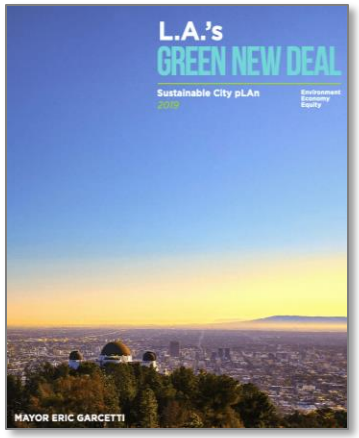
Mason Students' Climate Rally (2019)

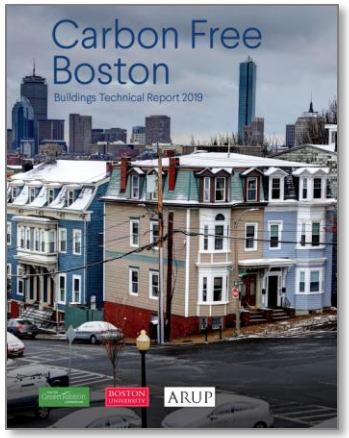


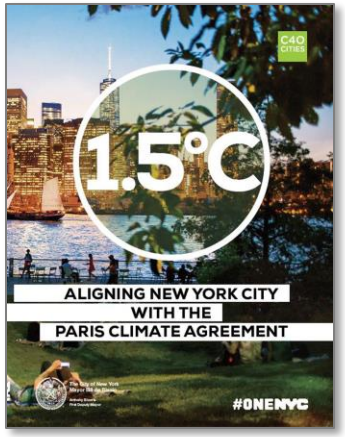
Total NPV vs. Carbon Emissions

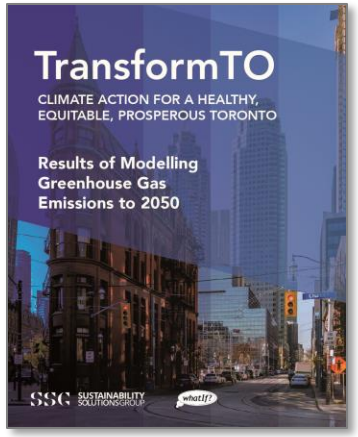


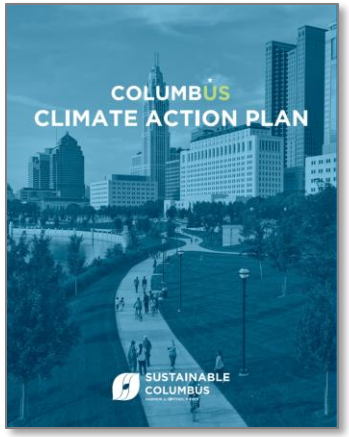
What is a Climate Action Plan?

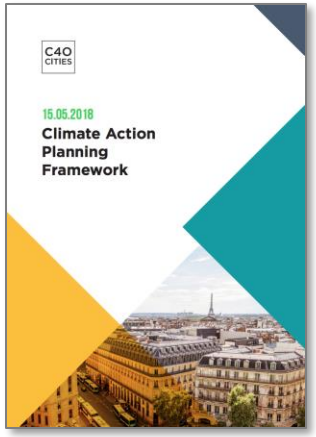




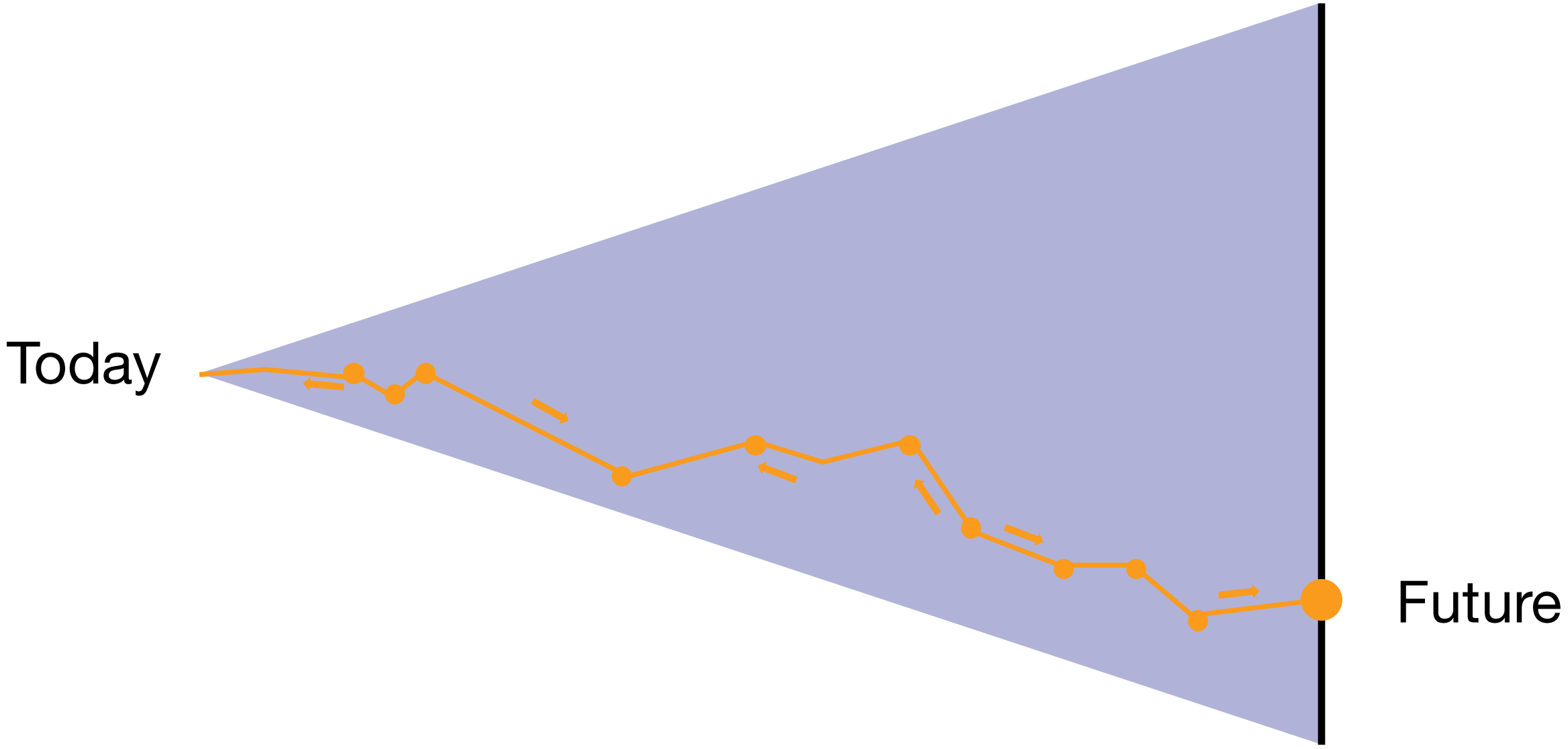








Creating a Roadmap



GHG Emissions Definition

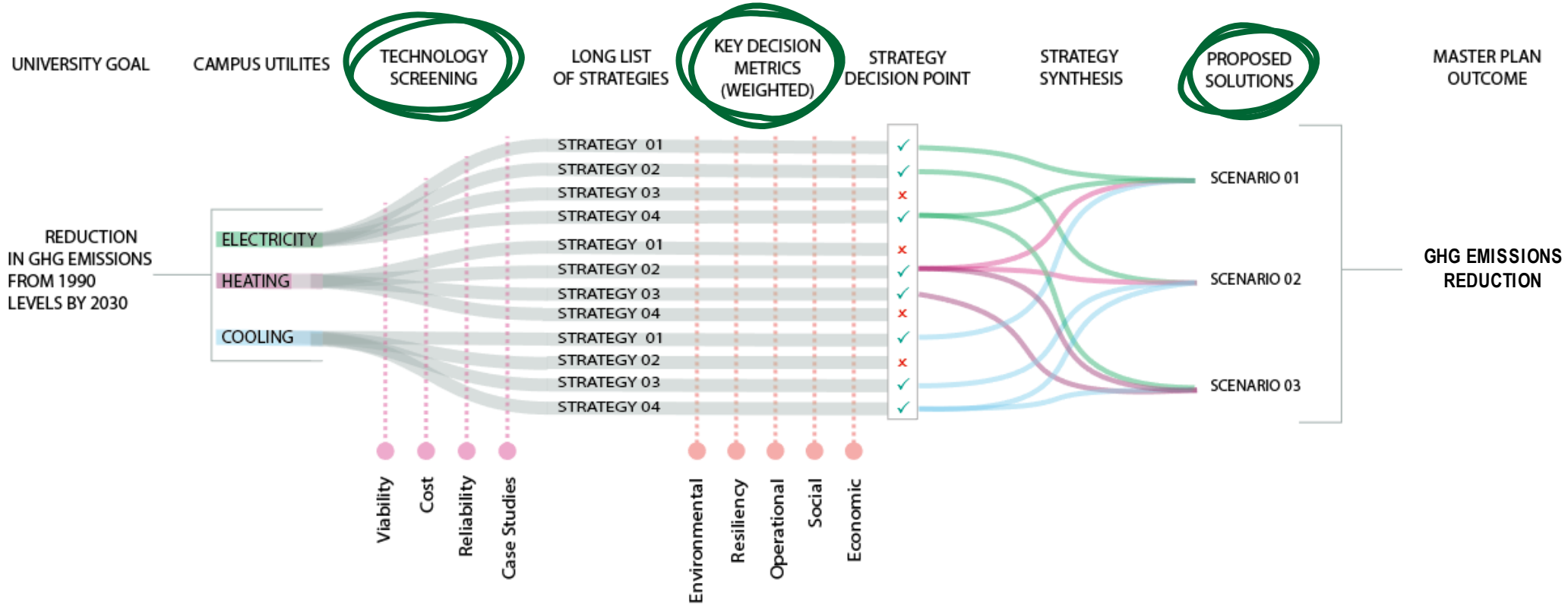
Carbon Neutrality

Carbon neutrality is defined as having no net greenhouse gas (GHG) emissions, to be achieved by either;

a. eliminating net GHG emissions, or
b. by minimizing GHG emissions as much as possible and using carbon offsets or other measures to mitigate the remaining emissions.

Second Nature – The Presidents' Climate Leadership Commitments
https://secondnature.org/signatory-handbook/frequently-asked-questions/

CAP strategy and evaluation criteria



Strategy Decision Making and Prioritization

Evaluation Criteria

Carbon / GHG reduction

Operational energy use

Water use

Capital costs

O&M costs

Co-Benefits

Economics / Job Creation

Resilience

Social Justice / Community Engagement

Environmental/Ecological

Education/Curriculum opps

Health and Wellness

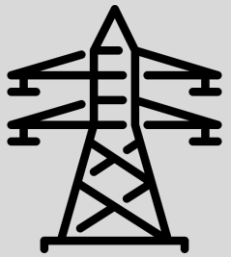
Electricity Impact on GHG Emissions

mission Scopes

Scope 1
Emissions from sources owned / controlled by the University

GMU Owned Systems	Fossil fuel powered equipment	Refrigerant discharge	Biodiesel
Buildings	Fossil fuel boilers and generators	Refrigerant discharge	Gas cooking equipment
Fueled fleet vehicles	Gasoline and diesel	CNG/LNG	Biodiesel

Scope 2
Indirect emissions from utilities purchased by the University



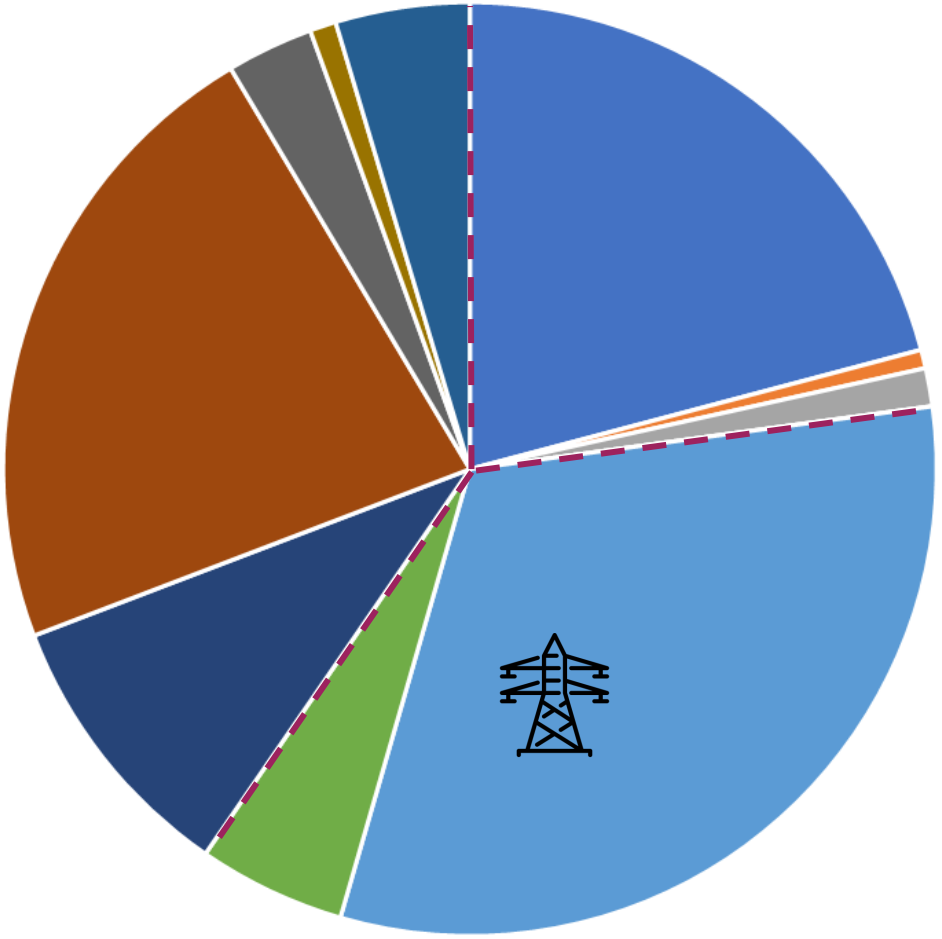
Grid Electricity

Scope 3
University emissions from activities which sources are not owned / controlled by the University

- Embodied carbon
- Operational waste management
- Business, conference & athletic travel
- Student & employee commuting
- Water supply and treatment
- Purchased goods and services

Included in Second Nature Carbon Commitment

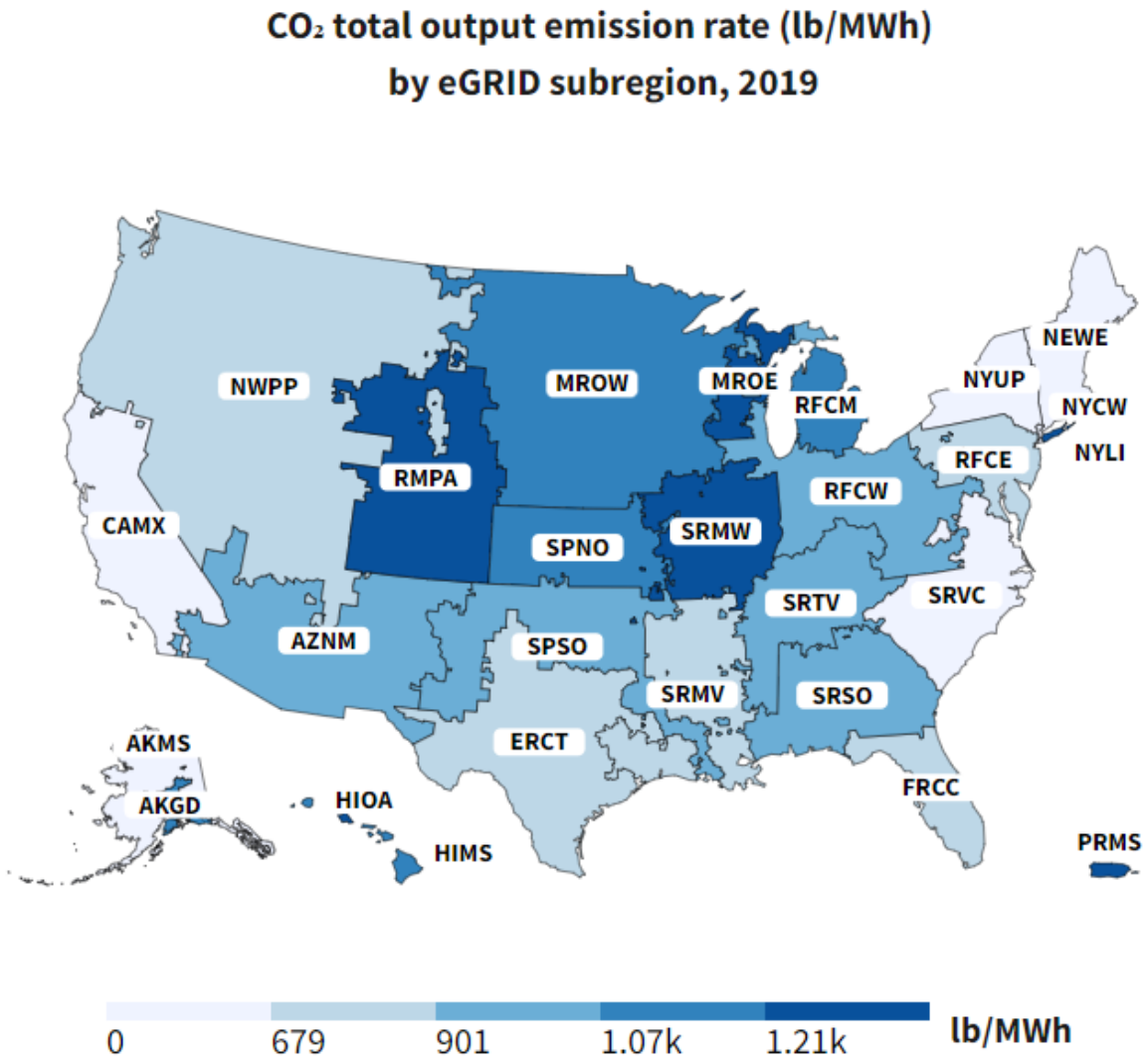
19 GHG Inventory

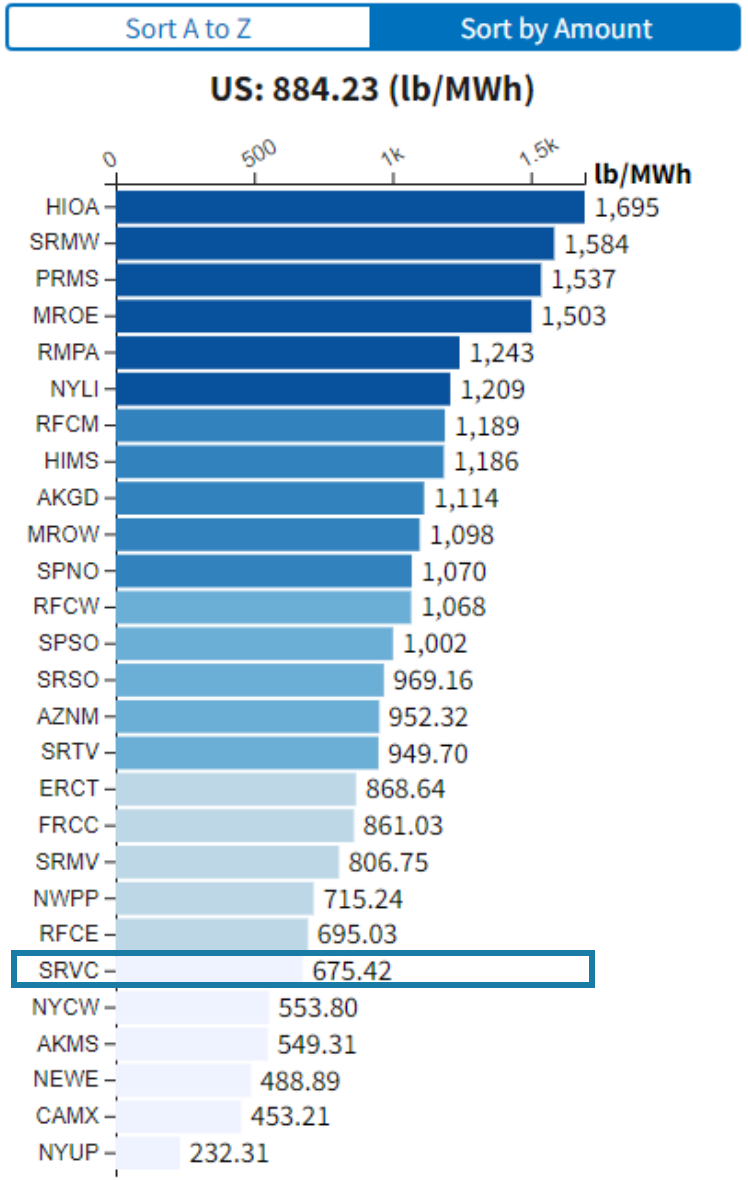


Scope		Emissions Source	MTCDE
1		Other On-Campus Stationary	22,373
		Direct Transportation	690
		Refrigerants & Chemicals	1,410
		Fertilizer & Animals/ Agriculture	8
2		Purchased Electricity	33,885
		Electricity from CHCP	***5,480***
3		Faculty / Staff Commuting	10,290
		Student Commuting	23,818
		Directly Financed Air Travel	3,225
		Other Directly Financed Travel	974
		Study Abroad Air Travel	4,984

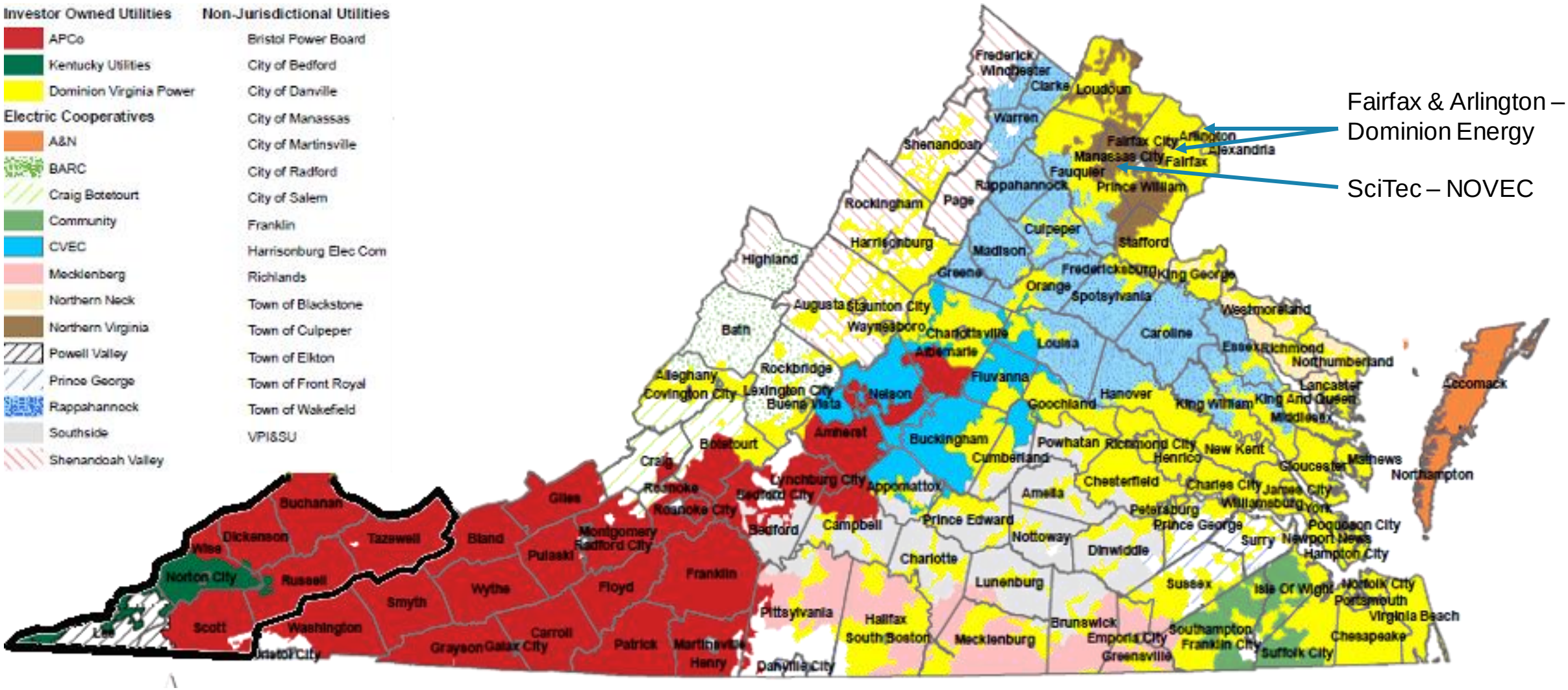
*Emissions from CHCP Electricity is estimated based on EPA eGRID emissions factor

Electric Grid – Carbon Intensity

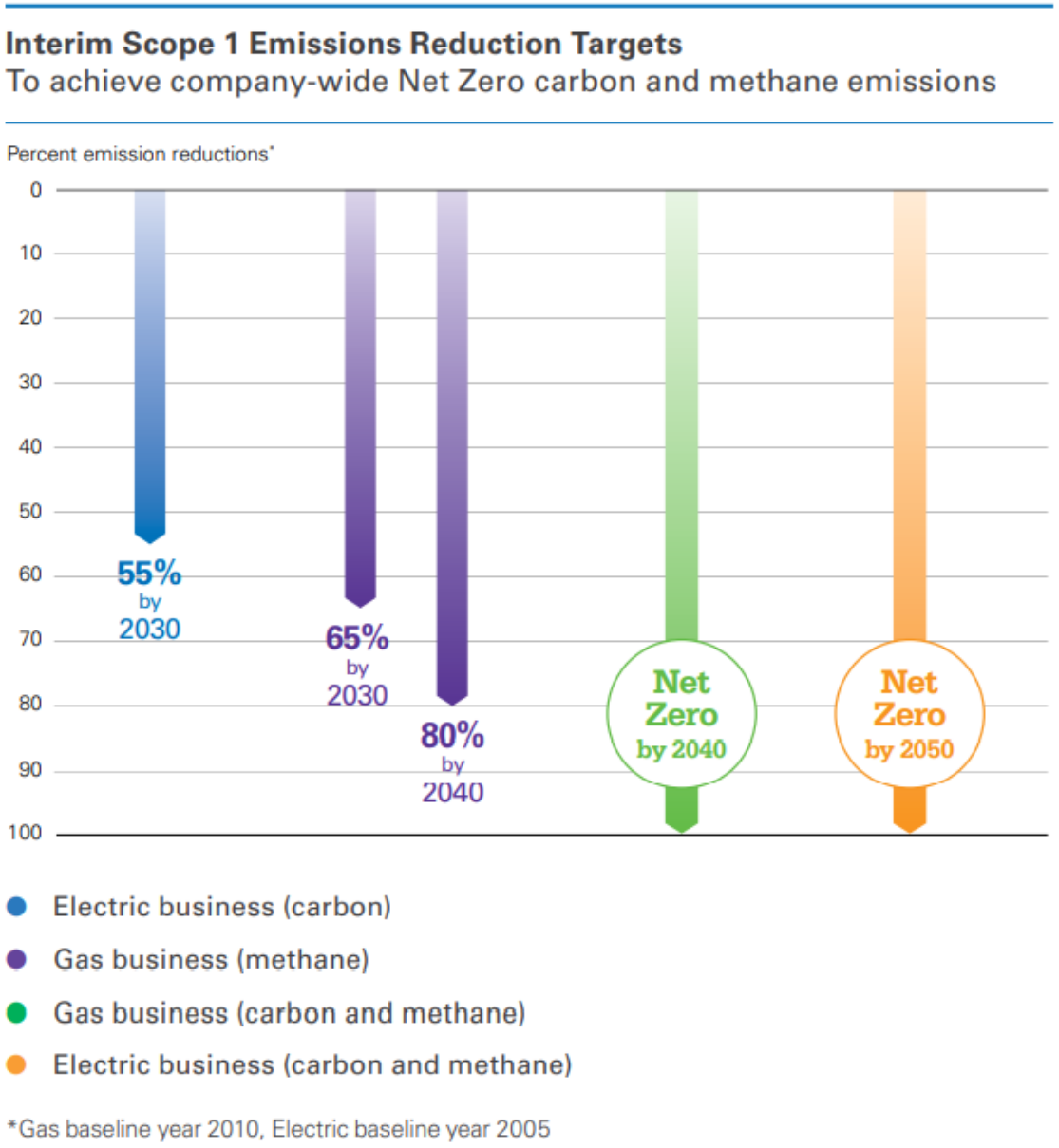




Virginia Electric Utilities



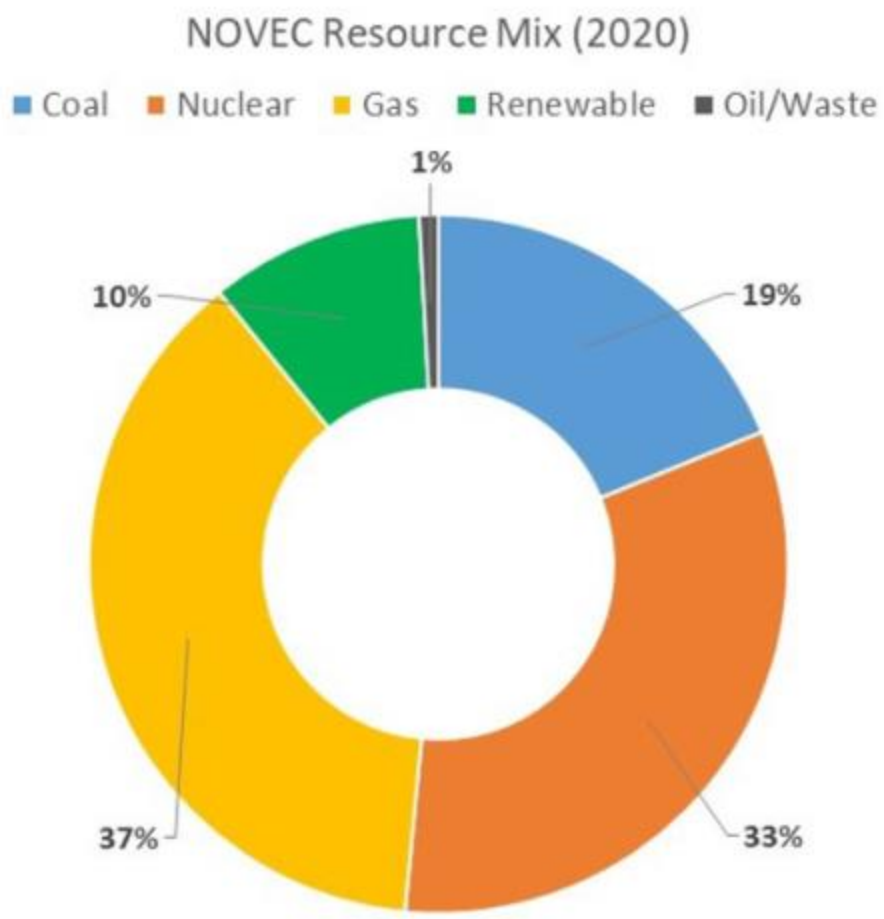
Dominion Energy – Scope 2 Impact

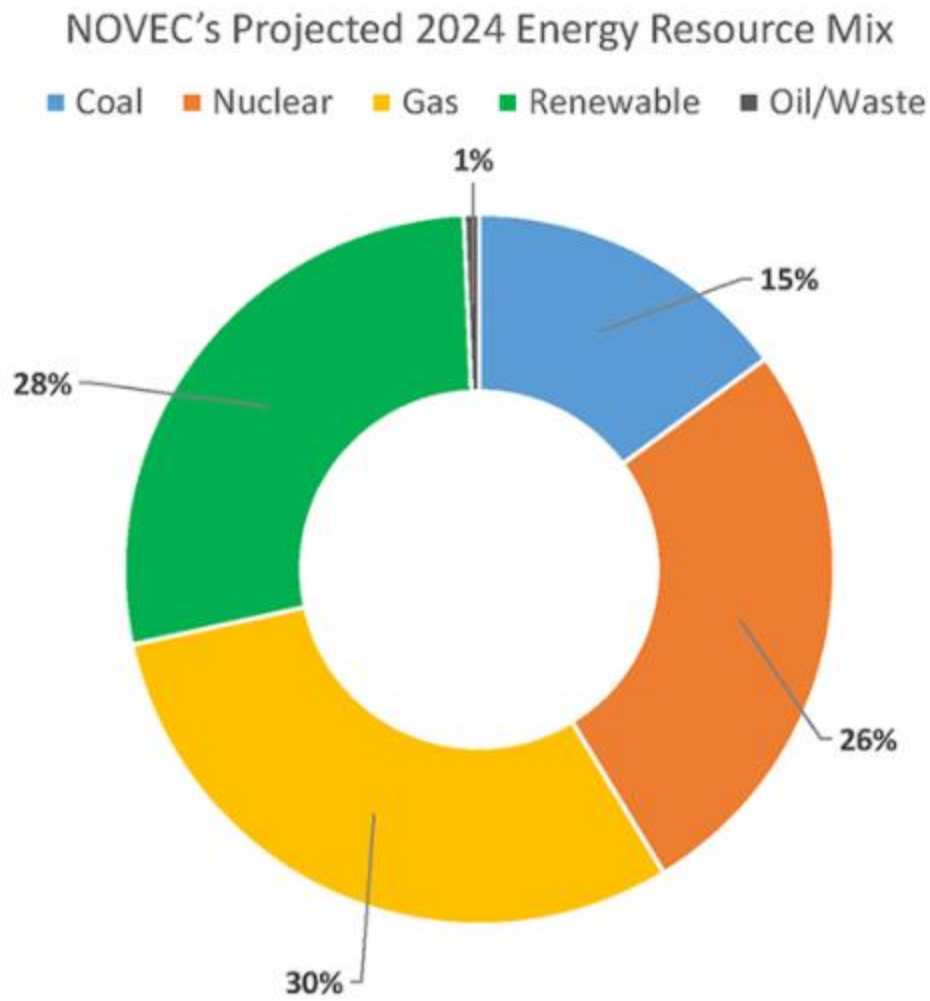


"Dominion Energy is accelerating the transformation of the energy sector through our pursuit of achieving Net Zero emissions by 2050 in our clean energy strategy."

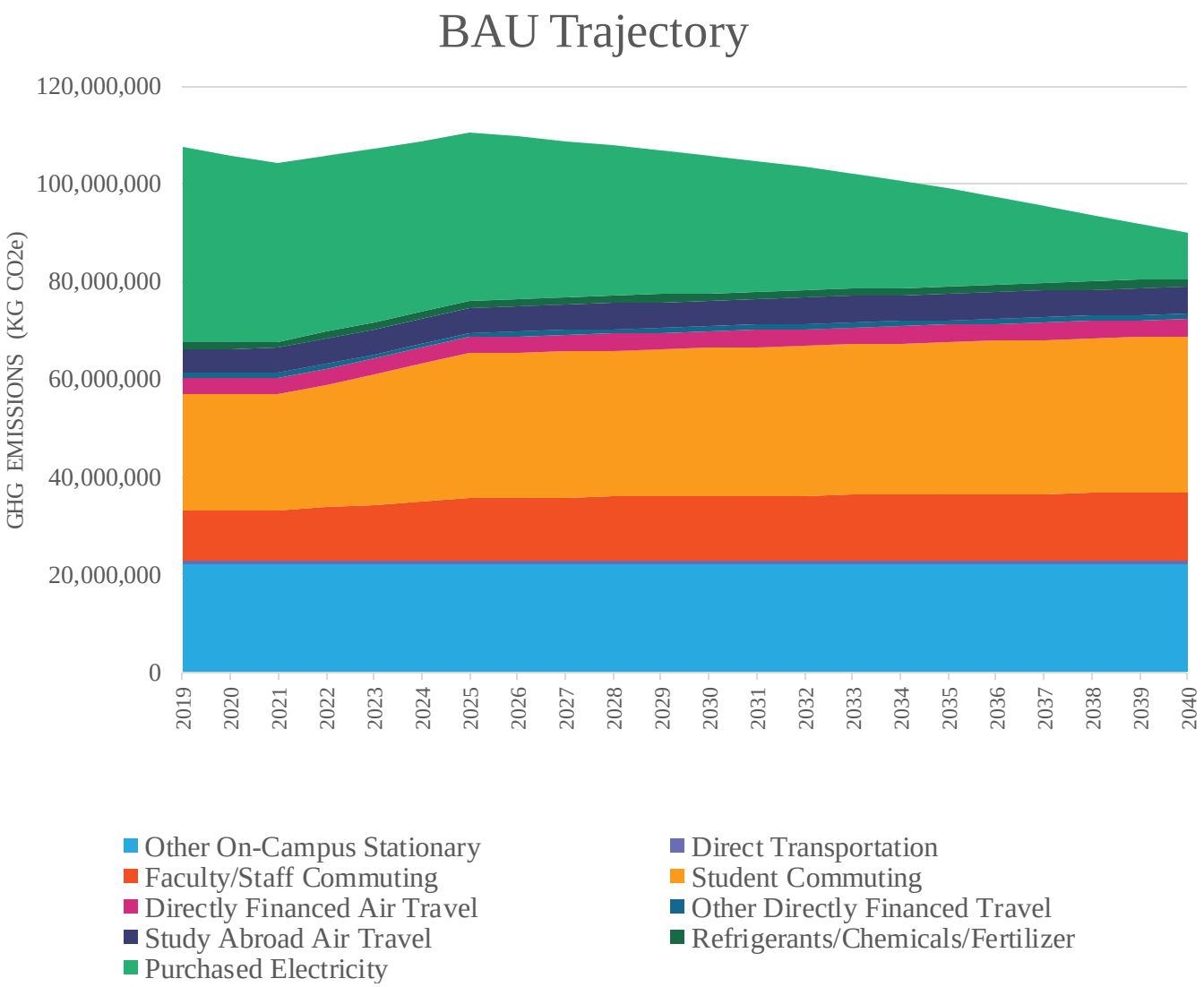
Dominion Energy Climate Report 2021

NOVEC – Scope 2 Impact





CAP Business as Usual Growth Assumptions



	Current	2025 President's Goals	2026 – 2050 Annual Growth
Total Building GSF	8,830,000 GSF	9,657,212 GSF	+1.828%
On-Campus Students	6,118 FTE	6,118 FTE	+0.816%
Off-Campus Students	19,248 FTE	23,248 FTE	+0.215%
Virtual Student	3,890 FTE	6,890 FTE	+1.451%
On-Campus Faculty/Staff	4,394 FTE	5,445 FTE*	+0.509%
Virtual Faculty/Staff	488 FTE	605 FTE*	+0.562%
SRVC Grid	85% reduction by 2040		

*Assumptions based on current student : faculty/staff ratios

Future Scenario Trajectories

Scenarios Overview

- High level mitigation strategies charted against BAU trajectory
  - 2030, 2035 & 2040 goals
  - Initial, high level list of strategies

- Reduction impact minus offsets from remaining emissions
  - Carbon offset purchases for Scope 1 & 3
  - RECs/PPA for Scope 2

- Timelines influence ability to implement and finance projects

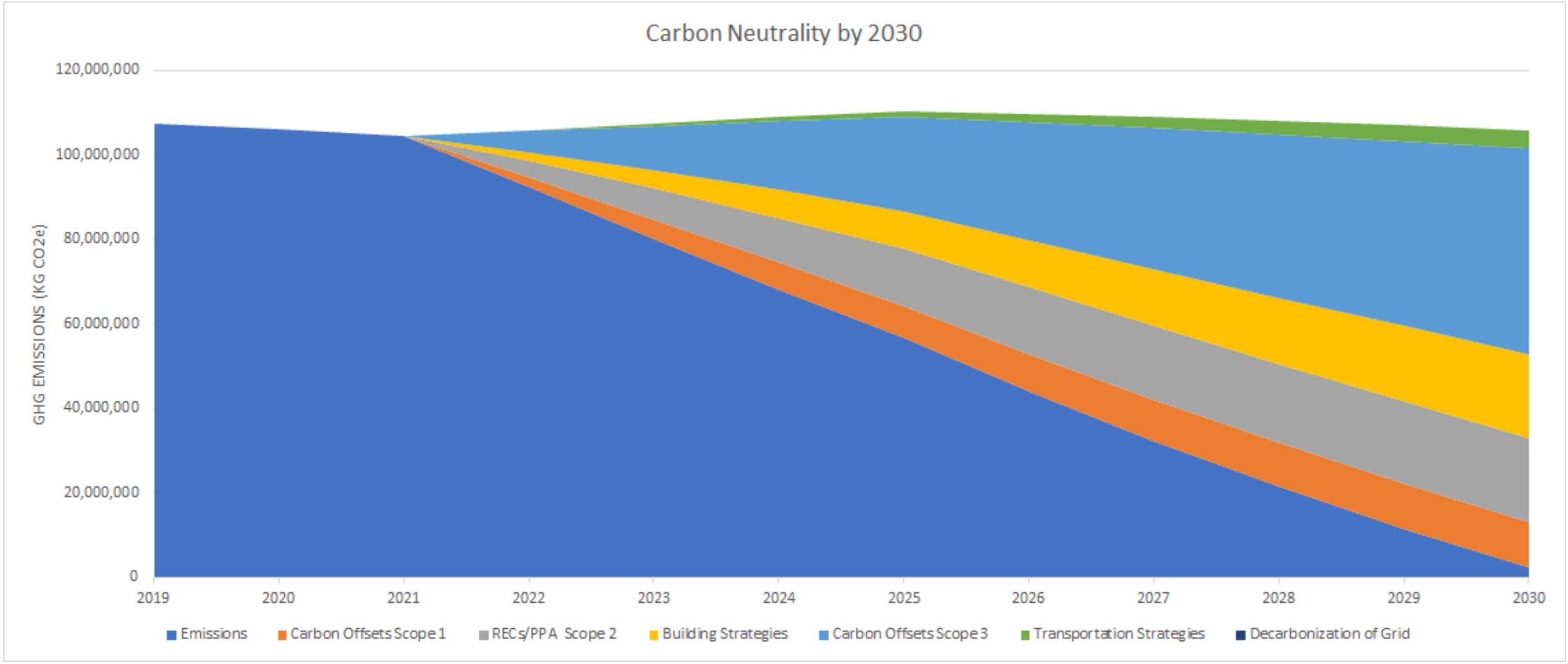
Carbon Neutral x 2030

Scope	Strategy	Metric	GHG Impact (MT)
1	Standalone Building Efficiency	10% increase from baseline	2,000
1	Building electrification	N/A – increase in this timeline	N/A
1	Existing Central Plant Efficiency (FFX)	15% increase from baseline	3,000
1	Central Plant Upgrades/Expansion (FFX)	N/A – longer timeline	N/A
1	Remaining Scope 1 Carbon	Remaining tons	20,000
2	On-site renewables	2 MW PV	500
2	Remaining Scope 2 – Electricity Purchasing	Remaining 130,000 MWh	25,00

Carbon Neutral x 2030

Scope	Strategy	Metric	GHG Impact
1	Standalone Building Efficiency Increase	10% increase from baseline	2,000
1	Building electrification	N/A – increase in this timeline	N/A
1	Existing Central Plant Efficiency (FFX)	15% increase from baseline	3,000
1	Central Plant Upgrades/Expansion (FFX)	N/A – longer timeline	N/A
1	Remaining Scope 1 – Carbon Offset Purchasing	Remaining tons	20,000
2	On-site renewables	2 MW PV	500
2	Remaining Scope 2 – Electricity Purchasing	Remaining 130,000 MWh	25,00
3	Single Occupant Vehicle Miles Traveled	10% decrease	2,000
3	Mode Shift Emissions Factor	15% decrease	4,000
3	Remaining Commuter Emissions – Carbon Offsets	Tons remaining	43,000
3	Air/Business Travel Emissions – Carbon Offsets	Tons remaining	10,000

Carbon Neutral x 2030



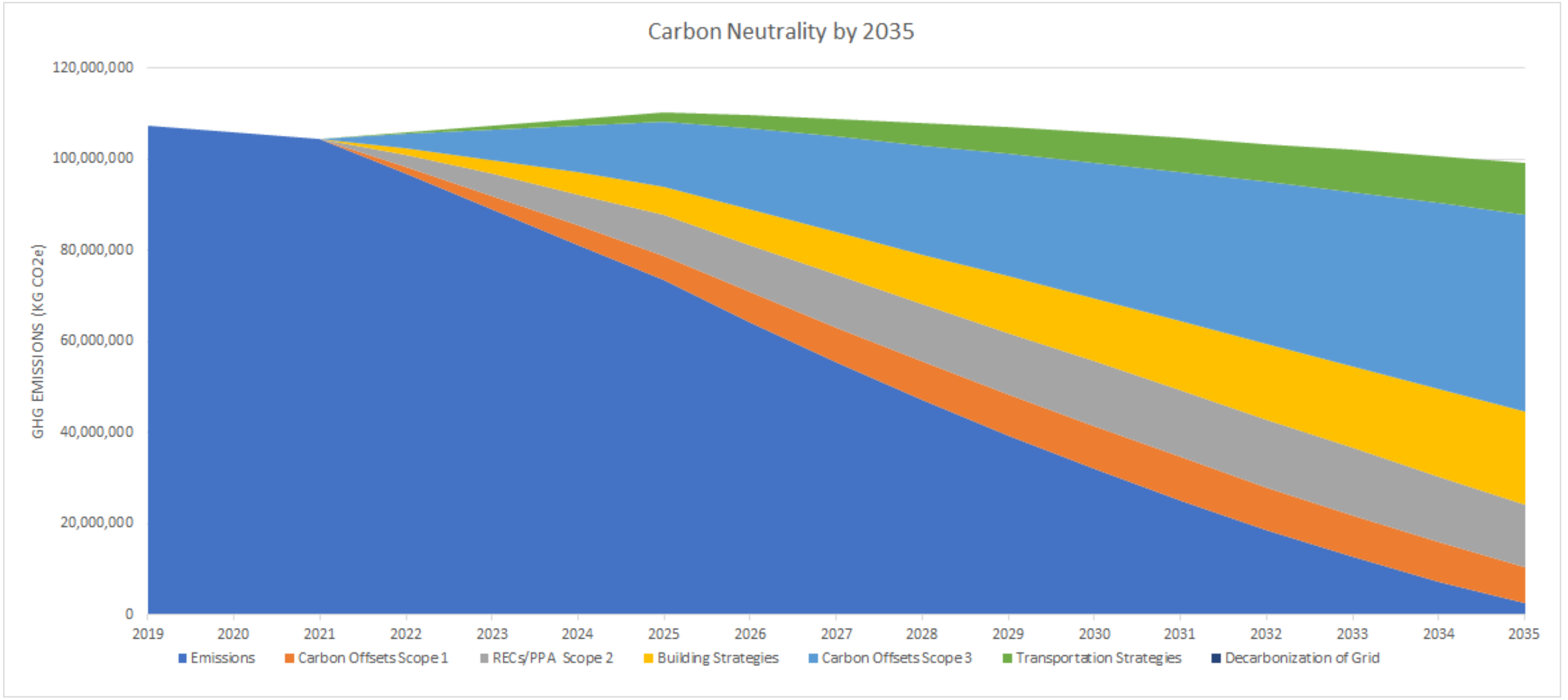
Carbon Neutral x 2035

Scope	Strategy	Metric	GHG Impact (MT)
1	Standalone Building Efficiency	10% increase	2,000
1	Building electrification	20% of existing buildings	400
1	Existing Central Plant Efficiency (FFX)	20% increase	3,500
1	Central Plant Upgrades/Expansion (FFX)	All new construction	4,000
1	Remaining Scope 1 Carbon	Remaining tons	18,000
2	On-site renewables	4 MW PV	650
2	Remaining Scope 2 – Electricity Purchasing	Remaining 150,000 MWh	14,000

Carbon Neutral x 2035

Scope	Strategy	Metric	GHG Impact
1	Standalone Building Efficiency	10% increase	2,000
1	Building electrification	20% of existing buildings	400
1	Existing Central Plant Efficiency (FFX)	20% increase	3,500
1	Central Plant Upgrades/Expansion (FFX)	All new construction	4,000
1	Remaining Scope 1 Carbon	Remaining tons	18,000
2	On-site renewables	4 MW PV	650
2	Remaining Scope 2 – Electricity Purchasing	Remaining 150,000 MWh	14,000
3	Single Occupant Vehicle Miles Traveled	15% decrease	3,000
3	Mode Shift Emissions Factor	25% decrease	5,000
3	Remaining Commuter Emissions – Carbon Offsets	Tons remaining	44,000
3	Air/Business Travel Emissions – Carbon Offsets	Tons remaining	10,000

Carbon Neutral x 2035



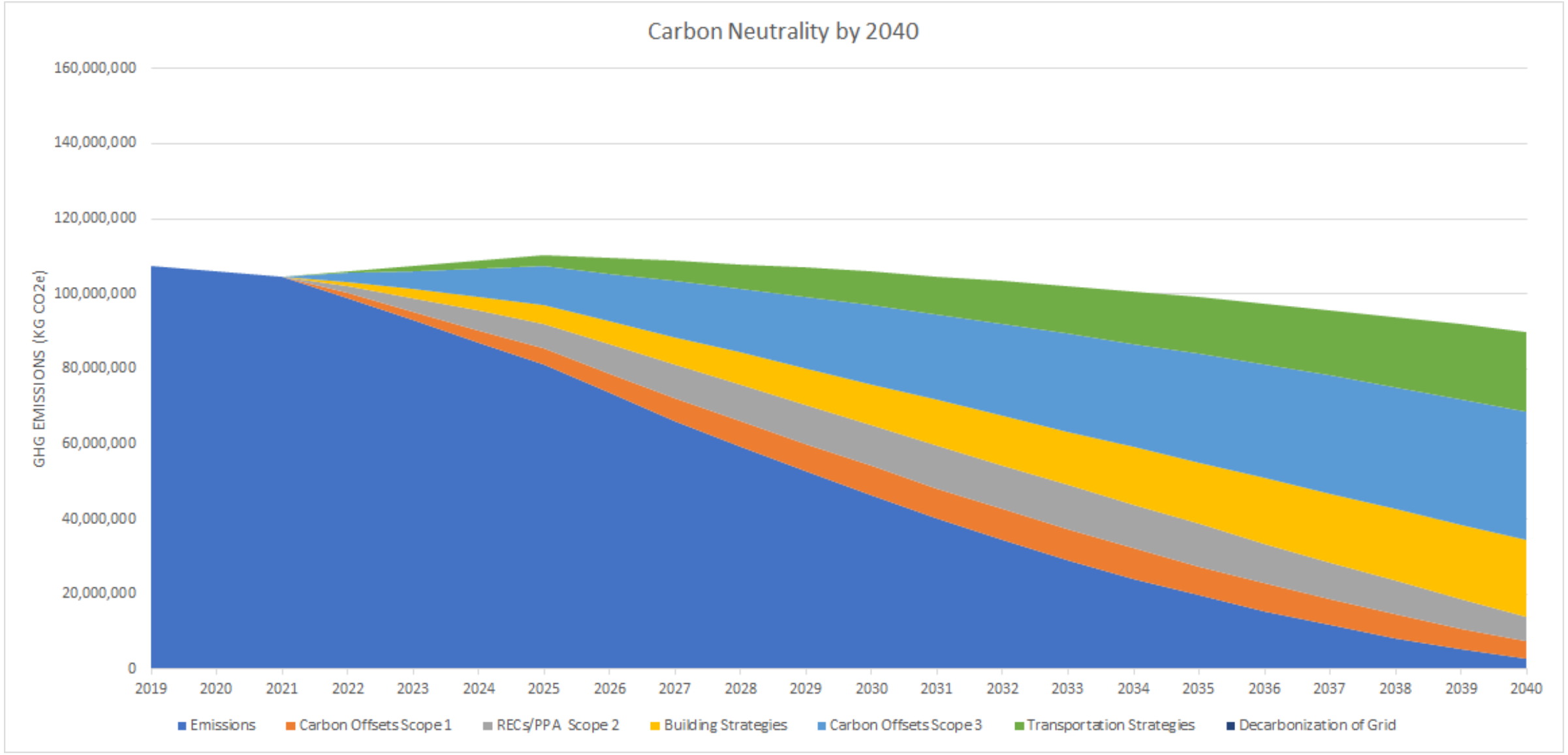
Carbon Neutral x 2040

Scope	Strategy	Metric	GHG Impact (MT)
1	Standalone Building Efficiency	25% increase	1,000
1	Building electrification	35% of existing buildings	2,000
1	Existing Central Plant Efficiency (FFX)	20% increase	4,000
1	Central Plant Upgrades/Expansion (FFX)	All new construction	2,500
1	Remaining Scope 1 Carbon	Remaining tons	17,000
2	On-site renewables	6 MW PV	400
2	Remaining Scope 2 – Electricity Purchasing	Remaining 160,000 MWh	5,000

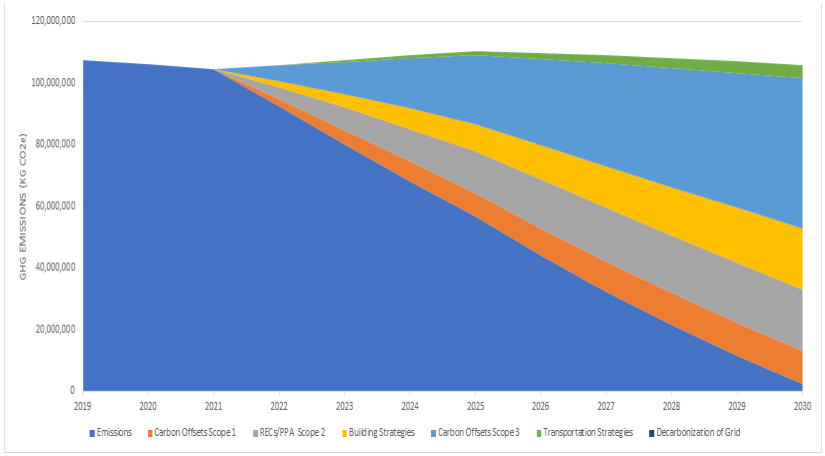
Carbon Neutral x 2040

Scope	Strategy	Metric	GHG Impact
1	Standalone Building Efficiency	25% increase	1,000
1	Building electrification	35% of existing buildings	2,000
1	Existing Central Plant Efficiency (FFX)	20% increase	4,000
1	Central Plant Upgrades/Expansion (FFX)	All new construction	2,500
1	Remaining Scope 1 Carbon	Remaining tons	17,000
2	On-site renewables	6 MW PV	400
2	Remaining Scope 2 – Electricity Purchasing	Remaining 160,000 MWh	5,000
3	Single Occupant Vehicle Miles Traveled	15% decrease	4,000
3	Mode Shift Emissions Factor	25% decrease	8,000
3	Remaining Commuter Emissions – Carbon Offsets	Tons remaining	45,000
3	Air/Business Travel Emissions – Carbon Offsets	Tons remaining	10,000

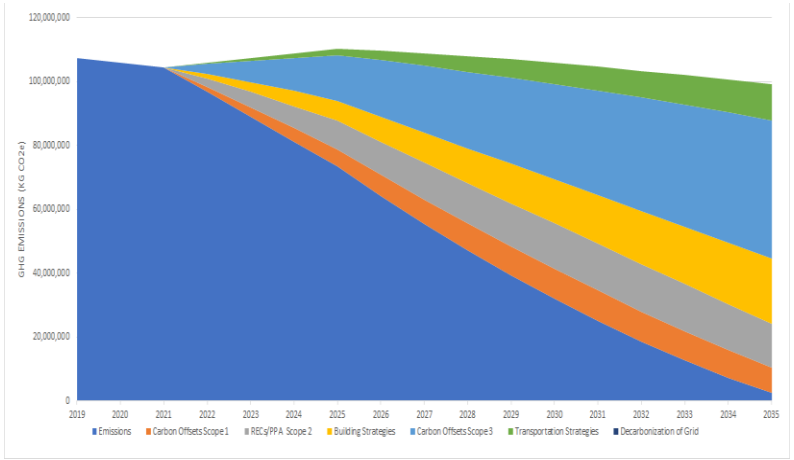
Carbon Neutral x 2040



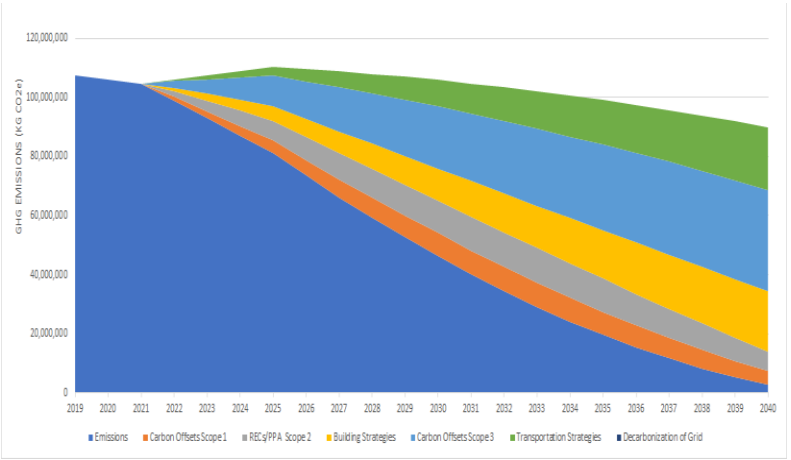
2030



2035



2040



Next Steps

Climate Action Planning Timeline

Phase I: September 2021 to April 2022

Phase II: April 2022 and forward

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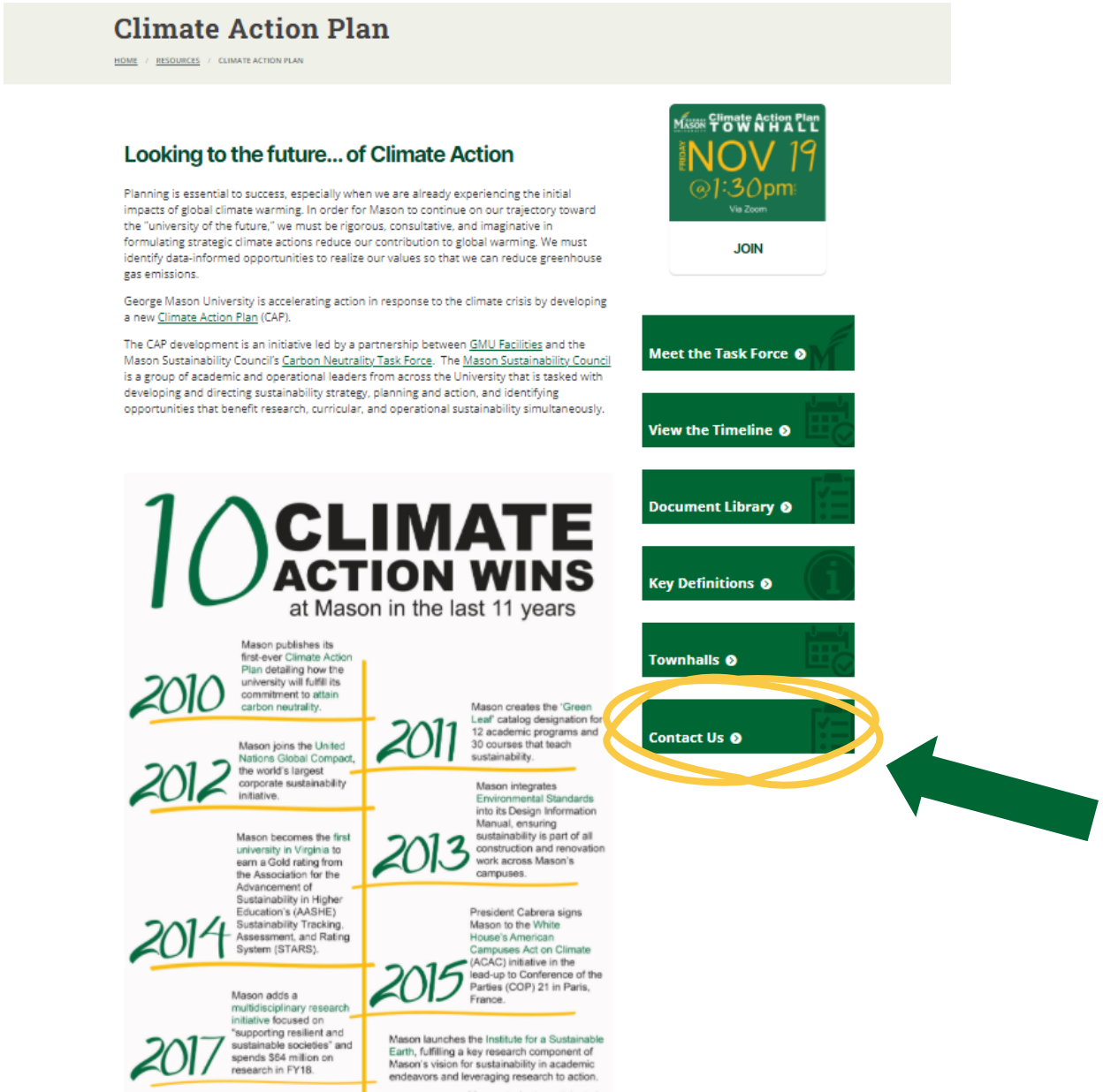
Gathering Your Input

- Share climate action strategies and ideas today via Zoom

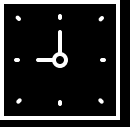
- Use the CAP website Contact Us form

https://facilities.gmu.edu/resources/climate-action-plan/



Upcoming Town Hall Schedule

- Friday, February 18th
- Wednesday, March 9th



Thank you!