

George Mason University

Climate Action Plan Town Hall

February 18th, 2022

CAP Progress

Process Review



aseline Inventory – 2019



	Emissions Source	MTCDE
Scope 1	Other On-Campus Stationary	22,373
	Direct Transportation	690
	Refrigerants & Chemicals	1,410
	Fertilizer & Animals/ Agriculture	8
Scope 2	Purchased Electricity	33,993



P Target – Direct Emissions Carbon Neutral x 2030

Emissions	s from sources co	ntrolled by the	Scope 2 Emissions from	Scope 3 Indirect emission	าร
University	Fossil fuel Re	frigerant Biodiesel	utilities	Embodie Op d carbon	erational waste
Owned Systems	equipment	senarge	Grid	ma	nagement
Buildings	Fossil fuel Re boilers and di generators	frigerant Gas scharge cooking equipme nt	y	Business, S conference de athletic travel C	Student & employee ommuting
Fleet vehicles	Gasoline and CM diesel	NG/LNG Biodiesel		Water Pu supply and go treatment su	rrchased ods and ervices
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			- <u>7</u> 77 .o.		
	#2	#3	#4	#5	#6
ine torv	Adopt Target	Forecast Emissions	Strategy Selection	Funding & Implementation	Monitor & Track Progress

Isiness As Usual Trajectory



High-level Strategies

Building strategies Central Plant strategies On-site renewables



Carbon Neutral x 2030



Building Efficiency Improvements

Goals:

2025: Identify minor and major retrofits2030: 10% Energy Use Reduction2040: 15% Energy Use Reduction

Reduction Values Year Carbon tCO2e Energy MMbtu 2030 2,000 37,000 2040 850 57,000

Strategies

- LED lighting
- Scheduling adjustments
- Receptacle sensors / time clocks
- Tune ups / RCx
- Increase equipment and fixture efficiency

- Evaluate building resilience in parallel
- Reduced operational costs
- Academic exercise as a learning lab experiment or monitoring program

Central Plant Efficiency Improvements

Goals:

2025: Start building conversion to low-temp hot water2030: Improve chiller efficiency2040: New decarbonized heating plant

Reduction Values				
Year Carbon tCO2e		Energy MMbtu		
2030	740	13,500		
2040	16,300	260,000		

Strategies

- Update connected buildings to low temp hot water
- RCx and tune ups
- Replace inefficient chillers short term
- Replace existing boilers and add supplemental ground-source heat pump plant long-term

- Reduce reliance on utility supply
- Reduced operational costs
- Native / edible / pollinator planting plan for geothermal well areas

Building Electrification

Goals:

2025: Define pilot project scope2030: Pilot 4 electrification prototypes2040: Electrify remaining existing buildings

Reduction Values				
Year	Carbon tCO2e	Energy MMbtu		
2030	360	7,000		
2040	6,000	57,000		

Strategies

- Replace all gas systems with electric water heating, heating, appliances
- Install air-source heat pumps where not applicable to connect to central plant

- Research opportunity for innovative technologies
- Self-sufficient resilience hub as a community resource
- Academic exercise as a learning lab experiment or monitoring program

High Performance New Construction

Goals:

2025: Updated high performance design standards
2030: 40% reduction in average EUI
2040: Continue EUI reduction and connection to central plant heat pumps

Reduction Values Year Carbon tCO2e Energy MMbtu 2030 3,400 65,000 2040 8,800 132,000

Strategies

- Passive building strategies
- Maximized system efficiency
- Air-source heat pumps and or groundsource heat pump where central plant connection available long-term

- Research opportunity for innovative technologies
- Reduced operational costs
- Living building opportunity to integrate nature

On-site Renewable Energy

Goals: 2025: 2MW PV grid connected 2030: 10 MW PV grid connected 2040: PV on new construction as applicable

Reduction Values			
Year	Carbon tCO2e	Energy MMbtu	
2030	2,500	46,000	
2040	700	46,000	

Strategies

- Rooftop and parking canopy arrays
- Anticipated to be mainly on Fairfax and Sci-Tech campuses
- Policy work required to reach amount over 3MW at Fairfax

- Connectivity with EV charging in parking areas
- Finance/engineering academic opportunity
- Battery storage integration and microgrid functionality
- Supports local green job development

Concept PV Potential – Fairfax



Blue areas = 4.6 MW Orange = MP future dev 360 W Panels

Concept PV Potential – SciTech



Blue areas = 4.4 MW

Orange = MP future development

360 W Panels

Offsets

Remaining Scope 1: **2030**: 28,000 tons **2040**: 2,000 tons

Remaining Scope 2: 2030: 130,000 MWh 2040: 207,000 MWh

Strategies

- Evaluation criteria to be refined in implementation phase
- Review of both carbon offset options, and virtual PPA, RECs

- Build co-benefits into evaluation criteria for purchasing
- Community solar development
- Supports green job development

Next Steps

Phase II: April 2022 and forward

Gathering Your Input

Climate Action Plan

HOME / RESOURCES / CLIMATE ACTION PLAN

Looking to the future... of Climate Action

Planning is essential to success, especially when we are already experiencing the initial impacts of global climate warming. In order for Mason to continue on our trajectory toward the "university of the future," we must be rigorous, consultative, and imaginative in formulating strategic climate actions reduce our contribution to global warming. We must identify data-informed opportunities to realize our values so that we can reduce greenhouse gas emissions.

George Mason University is accelerating action in response to the climate crisis by developing a new <u>Climate Action Plan</u> (CAP).

The CAP development is an initiative led by a partnership between <u>GMU Facilities</u> and the Mason Sustainability Council's <u>Carbon Neutrality Task Force</u>. The <u>Mason Sustainability Council</u> is a group of academic and operational leaders from across the University that is tasked with developing and directing sustainability strategy, planning and action, and identifying opportunities that benefit research, curricular, and operational sustainability simultaneously.

Document Library 🔊 ACTION WINS Key Definitions 🗿 at Mason in the last 11 years Mason publishes its first-ever Climate Action Townhalls 📀 Plan detailing how the university will fulfill its commitment to attain carbon neutrality. Mason creates the 'Green Leaf' catalog designation for 12 academic programs and Contact Us 🔊 30 courses that teach Mason joins the United sustainability. Nations Global Compad the world's largest corporate sustainability Mason integrates Environmental Standards into its Design Information Manual, ensuring sustainability is part of all Mason becomes the first university in Virginia to construction and renovation earn a Gold rating from work across Mason's the Association for the campuses. Advancement of Sustainability in Higher Education's (AASHE) President Cabrera signs Sustainability Tracking, Mason to the White Assessment, and Rating House's American System (STARS). Campuses Act on Climate (ACAC) initiative in the lead-up to Conference of the Parties (COP) 21 in Paris, Mason adds a multidisciplinary research nitiative focused on supporting resilient and Mason launches the Institute for a Sustainable sustainable societies" and Earth, fulfilling a key research component of spends \$64 million on Mason's vision for sustainability in academic research in FY18. endeavors and leveraging research to action

 Share climate action strategies and ideas today via Zoom

• Use the CAP website Contact Us form

https://facilities.gmu.edu/resources/climateaction-plan/

Upcoming Schedule

• Final Town Hall: Wednesday, March 9th

• Climate Action Plan: Earth Day, April 22nd

Thank you!