Current Status and Potential Solutions for a Carbon Neutral, Climate Resilient Rutgers

Prof. Robert Kopp and Prof. Kevin Lyons, co-chairs
President's Task Force on Carbon Neutrality and Climate Resilience

April 27, 2021
September 24, 2019: Task Force Established

TASK FORCE GOALS

Develop Rutgers’ strategies for

1. **Carbon Neutrality:** contributing to achieving global net-zero carbon dioxide emissions

2. **Climate Resilience:** Enhancing the capacity of the university and the State of New Jersey to manage the risks of a changing climate
September 24, 2019:  
Task Force Established  

February 3, 2020:  
Pre-Planning Report  

July 17, 2020:  
Interim Report  

February 11, 2021:  
Phase 2 Report
Rutgers is already a leader in climate change research and engagement

• The Rutgers Institute of Earth, Ocean, and Atmospheric Sciences, the Rutgers Climate Institute, and the Rutgers Energy Institute bring together over 200 faculty working to understand our planet and how to live on it in a more sustainable and resilient manner.

• Rutgers is among the top four Big 10 schools in research activity in Earth, ocean, and atmospheric sciences ($27 million in research awards in FY 2020)

• Faculty active in efforts like UN Intergovernmental Panel on Climate Change, the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, and the National Climate Assessment

• Pioneering efforts in community-engaged climate research and engagement, through initiatives like New Jersey Climate Change Alliance, Getting to Resilience, and the Coastal Climate Risk & Resilience graduate program, New Jersey Climate Change Resource Center

• Achieving a more sustainable future for our region and the planet is the centerpiece of Earth 2100, one of the University Big Ideas President Holloway unveiled earlier this year
Rutgers has already taken actions to reduce its emissions

- 10 MW of on-campus solar capacity
- New facilities built to LEED Silver standard
- Sustainability is key objective of 2015 Master Plan
Based on the Phase 2 analysis of the working groups, Rutgers' annual greenhouse gas (GHG) emissions are approximately 470,000 tonnes. For comparison, in 2018, New Jersey's net emissions were 97 million tonnes.

The Task Force began its analysis of baseline GHG emissions in October 2019. The goal was to undertake GHG emission data collection for the New Brunswick, Newark, Camden, and RBHS campuses. This preliminary analysis was updated by working groups during Phase 2. The inventory is based on FY 2019 and does not account for the temporary changes to University operations in response to COVID-19.

The Task Force has selected SIMAP (Sustainability Indicator Management and Analysis Platform) to track emissions. SIMAP is a carbon and nitrogen accounting platform that can track, analyze, and improve campus sustainability. This system has been used extensively by universities for meeting greenhouse gas emissions goals. The program's algorithms, calculations, and assumptions are transparently documented and built on peer-reviewed published literature.

SIMAP is utilized by Second Nature members to track greenhouse gas emissions. SIMAP assisted the Task Force in creating a baseline during this phase of work. In the future, SIMAP can be used to benchmark our performance, create reports, set goals, and analyze progress year to year.

From Phase 2 Report: SIMAP analysis, FY 2019
http://go.rutgers.edu/CTF_Phase2
Potential Energy and Buildings Solutions

**Decarbonize electricity supply**
- Expand on-campus solar (Rutgers-owned)
- Expand on-campus solar (third-party owned)
- Purchase off-campus wind or solar electricity

**Decarbonize heat supply**
- Phase natural gas out of campus heat production

**Reduce building energy demand**
- Retrofit less efficient buildings
- Install metering, monitoring, and control systems
- Decommission old, inefficient buildings
- Adopt new construction and energy standards

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From Phase 2 Report: SIMAP analysis, FY 2019

http://go.rutgers.edu/CTF_Phase2
Potential Transportation Solutions

**Decarbonize Rutgers-owned vehicles and equipment**
- Electrify fleet
- Electrify maintenance equipment

**Reduce Fossil-Fueled Vehicle Miles Traveled**
- Create safe bicycle and pedestrian infrastructure
- Expand telecommuting
- Expand subsidies for public transit
- Providing parking cash-out
- Incentivize reduced business travel
- Provide incentives for EVs
Potential Food and Water Systems Solutions

- Adopt a climate-friendly food labeling system
- Eliminate plastic bags in all retail and foodservice establishments in campus facilities
- Shift to more “Plant Forward” meals
- Continue supporting locally sourced fresh products when in season
- Explore anaerobic digestion and/or commercial composting with the local communities

Potential Supply Chain and Waste Management Solutions

- Implement a comprehensive University source reduction & reuse policy and program
- Purchase products with reduced toxic or hazardous chemicals
- Contract with suppliers that offer end-of-life reuse, recycling, and/or takeback agreement programs. (i.e. pipettes and vials in lab)
Potential Solutions to Promote a Culture of Sustainability

- Create sustainability orientation for new students
- Include sustainability education in New Student Programs, University Housing, University and college ambassadors, and Fraternity and Sorority Life
- Create a sustainability awareness campaign for all students, faculty and staff
- Create a sustainability workshop series that develops student leadership
- Develop a Sustainable Labs Program
Potential Solutions for Expanding Carbon Sinks

Enhance land management practices
• Expand no/eco-mow zones
• Establish design and budgeting standards for landscaping associated with capital projects and require replacement of trees removed for capital projects
• Promote sustainable agricultural practices on Rutgers farms
• Develop an emissions inventory and reduction plan for Rutgers farms

Prioritize carbon sequestration on Rutgers lands
• Develop and implement afforestation plan
• Develop and implement individual campus “urban” forestry master plans.
• Establish line item in University budget for yearly tree plantings
• Convert lawn to trees
• Develop Low Carbon Construction Materials Policy
Potential Solutions for Climate Preparedness

Conduct ongoing risk monitoring
- Monitor changing climate risks, including expanding coverage of Rutgers NJ weather stations to all campuses
- Make data for planning and response efforts available to all stakeholders

Enhance and coordinate resilience planning and communications
- Assess climate vulnerability of critical on-campus infrastructure and develop climate-resilience design standards
- Coordinate with local, state and federal partners to assess climate vulnerability of critical off-campus infrastructure
- Implement climate resilient building, infrastructure, and operations on and adjacent to Rutgers facilities
- Enhance climate/weather risk communication, especially for vulnerable student populations
- Participate in state and county all hazard mitigation planning activities
- Develop all climate hazards mitigation plans for each Rutgers campus in conjunction with neighboring municipalities, counties and state agencies to ensure continuity of teaching, research and service during extreme events
- Develop plans to address student, staff, and faculty vulnerabilities
Potential Solutions for Climate Governance at Rutgers

**Establish a University-wide Office of Climate Mobilization reporting to senior University leadership**

- Amplify, connect, and expand existing interdisciplinary research, teaching and engagement efforts related to climate change, particularly with social equity and economic development lenses
- Establish a Climate Mobilization and Sustainability Dashboard to monitor and report on Climate Action Plan progress and other sustainability metrics
- Develop a detailed financial model for the Climate Action Plan and identify opportunities to integrate climate considerations into the University budget model, including the establishment of a Green Revolving Fund
- Develop a comprehensive strategy for communicating about University climate action to internal and external stakeholders
- Work with Federal Relations, faculty, and staff to shape and respond to opportunities for government financing of climate infrastructure and research
- Oversee periodic revision of the Climate Action Plan
Proposed Principles for Advancing Climate-Positive, Equitable Economic Development as Part of University Climate Action

In pursuit of climate-positive, equitable economic development, Rutgers University will implement policies, programs, and projects that accelerate the socially equitable and inclusive transformation of New Jersey’s economy to one that is powered by clean, renewable energy, produces net-negative carbon emissions, and is resilient to climate and related impacts and shocks.

- Climate-positive, because it absorbs more carbon than it emits.
- Equitable, because everyone gets a fair share of benefits, costs, risks and the opportunity to have a say in making decisions.
- Sustainable, because it promotes economic development while sustaining natural resources and the environment for future generations.
Other University action on climate: Fossil-Fuel Divestment

On March 9, following the recommendation of an ad hoc committee of faculty, students, and staff, the Boards of Governors and Trustees voted to:

• Cease all new investments in fossil fuels;
• Divest from passive index funds with fossil fuel investments within one year and reinvest in more environmentally friendly versions of those indices.
• Actively seek new investment opportunities in renewable energy and energy efficiency categories that deliver competitive rates of return;
• Exit all currently held private fossil fuel investments within 10 years.
Rutgers has joined 126 other universities and colleges, along with 147 cities, 1151 business, 42 investors, 3 states, 2 tribal nations, 41 cultural institutions, 249 faith groups, and 15 health care organizations in signing the America Is All In pledge, calling for:

**Driving economic growth across every sector of the economy through job-creating sustainable investments**, through extraordinary, job-creating investments in clean buildings, low-carbon transportation, grid and infrastructure modernization, natural climate solutions, climate smart-agriculture, and community resilience, all of which will create millions of good-paying jobs and support a clean and just future for all Americans, and undertaking the necessary actions to achieve a 100% clean energy power sector as soon as feasible;

**Expanding U.S. leadership at home and abroad**, including putting forward an ambitious and equitable nationally determined contribution to the Paris Agreement, and committing the United States to a trajectory of net zero emissions by 2050 or sooner;

**Reimagining community partnership to advance just and equitable climate solutions and build resilience to climate change.**
Types of Offsets

University-initiated GHG emission offset and carbon removal projects:

- Projects would be initiated and managed by Rutgers OCM.
- Must be additive (i.e., must be new actions that would not have happened without the CAP) and adhere to other PAVER requirements. Not a passive sink that already exists.
- The amount of carbon equivalent that is being offset by each project would be determined using standard protocols and peer verification.
- Would count toward Rutgers’ GHG emissions reduction or toward the goal of being carbon negative once peer verified.
- Could include many project types
  - Enhancing and Restoring Natural Lands (e.g., afforestation)
  - Offsite Energy Efficiency
  - Waste To Energy
  - Others

Purchased verified GHG emission offsets:

- Carbon credits purchased from a third party.
- Verified for adherence to PAVER standards.
- Further scrutiny of qualifying offset purchases would be provided by an offset advisory group.
- Would count toward Rutgers’ GHG emissions reduction.
- Could include many project types
  - Renewable energy
  - Energy efficiency
  - Afforestation
  - Cookstoves
  - Others
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Should Rutgers set near-term carbon neutrality targets achievable only with offsets?
Our Topics for Breakout Discussion Tonight

- Considerations for prioritization solutions
- Integration of climate solutions into campus culture and academic mission
- Use of offsets in climate targets

Rutgers Climate Task Force Mitigation Solutions Matrix

<table>
<thead>
<tr>
<th>Solution</th>
<th>Potential Emissions Reductions</th>
<th>Initial Cost</th>
<th>Savings over time</th>
<th>Institutional/Cultural Barriers</th>
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</thead>
<tbody>
<tr>
<td><strong>Scope 1 and 2</strong></td>
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<tr>
<td><strong>Decarbonize Energy Supply</strong></td>
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<tr>
<td>Expand on-campus solar (Rutgers-owned)</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>Moderate</td>
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<tr>
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<td>Moderate</td>
<td>Low</td>
<td>Low</td>
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<tr>
<td>Phase natural gas out of campus heat production</td>
<td>High</td>
<td>Very High</td>
<td>Moderate</td>
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<tr>
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<td>Moderate</td>
<td>Unknown</td>
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<td>Moderate</td>
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<tr>
<td>Adopt new construction and energy standards</td>
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<td><strong>Decarbonize Vehicles and Equipment</strong></td>
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Read more: https://climatetaskforce.rutgers.edu/4-27-town-hall/
Task Force Membership

- **Robert Kopp**, Co-Chair, SAS, Rutgers-New Brunswick
- **Kevin Lyons**, Co-Chair, Rutgers Business School, Rutgers-Newark and New Brunswick
- **Anna Agbotse**, SPAA (student), Rutgers-Newark
- **Clinton Andrews**, Bloustein School, Rutgers-New Brunswick
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- **Margaret Brennan**, NJAES, Rutgers-New Brunswick
- **Joe Charette**, Rutgers Dining Services, Rutgers-New Brunswick
- **Wes Coleman**, Procurement, IPO
- **Adam Day**, Associate Treasurer, University Treasury
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