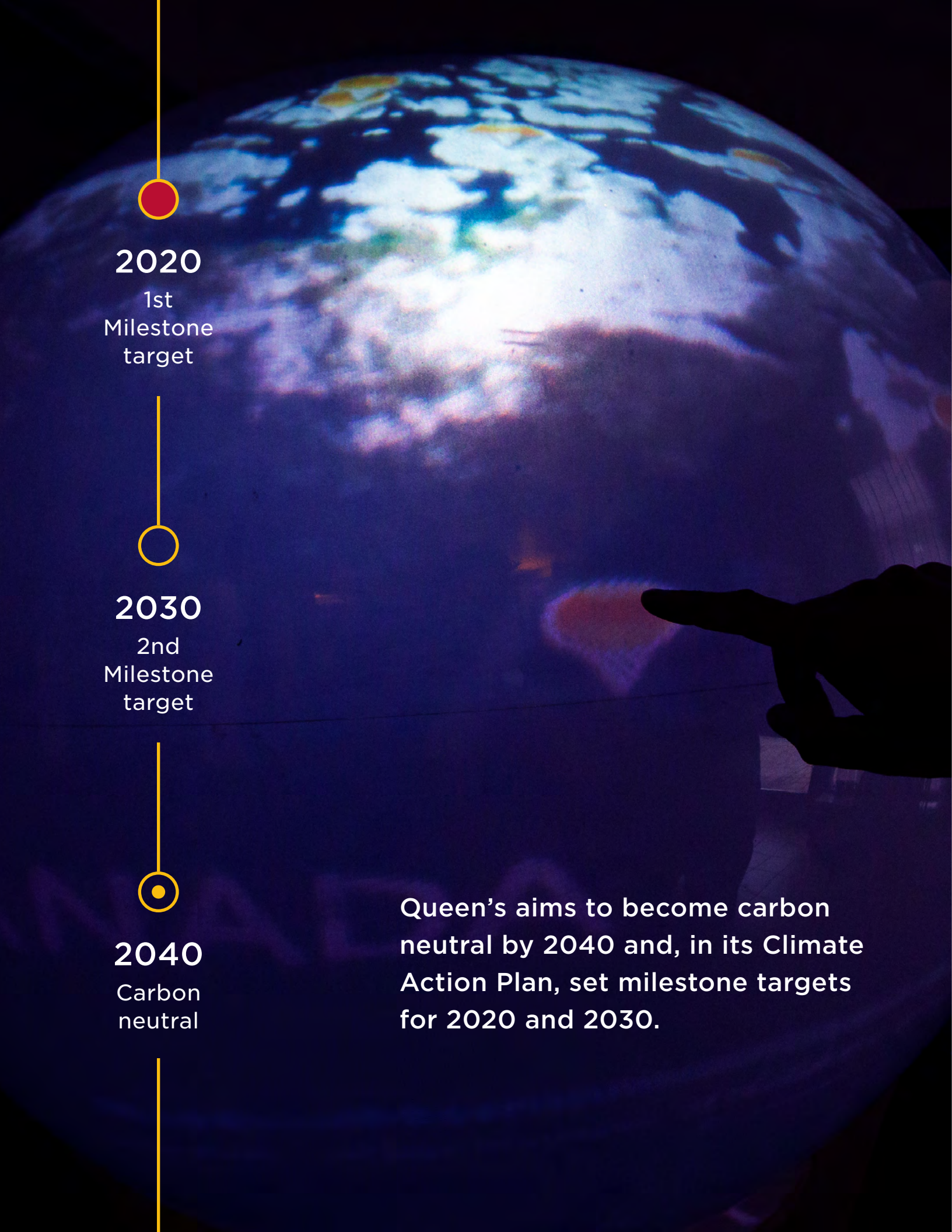
Queen's University

Climate Action Plan

Progress Report

FALL 2022



2020
1st Milestone target

2030
2nd Milestone target

2040
Carbon neutral

Queen's aims to become carbon neutral by 2040 and, in its Climate Action Plan, set milestone targets for 2020 and 2030.

Message from the Principal

When Queen's announced its greenhouse gas (GHG) reduction targets in the university's Climate Action Plan, we made a commitment as a community to combat climate change and respond to one of the world's most urgent challenges. In 2020, we achieved our first milestone by reducing Queen's GHG emissions by 35 percent from 2008 levels. Realizing this target has set Queen's on the path to achieving net-zero GHG emissions by 2040.

In developing our Climate Action Plan, we recognized the dynamic, evolving world in which we live. We have remained open to new ideas and opportunities in support of sustainability. In 2020, Queen's was one of 15 founding signatories on the Investing to Address Climate Change: A Charter for Canadian Universities. In March 2022, Queen's Board of Trustees approved recommendations that will lower the carbon footprint across the university's investment portfolios, and that the university become a signatory to the United Nations Principles for Responsible Investment (UNPRI). Also in 2022, Queen's ranked in the top 10 of the Times Higher Education (THE) Impact Rankings for the second year in a row. The rankings measure the actions universities like Queen's are taking to advance the United Nations' Sustainable Development Goals (SDGs) both within and beyond their local communities.

Reducing GHG emissions has required collaborative effort and significant investment in the university's infrastructure. I would like to thank the staff, faculty, and students who have contributed to the progress we have achieved to date and are now working together to achieve our aim of net-zero GHG emissions. Achieving this aim will not be easy but is a responsibility we take on to ensure a healthy environment for the future and as our legacy for those who follow.

Patrick Deane
Principal and Vice-Chancellor

GHG Emissions Reporting

Queen's conducted its first GHG inventory in 2008 to establish a baseline from which to measure emissions reductions. Since 2008 the university has reported on its **GHG emissions annually**.

Queen's tracks direct (Scope 1) and indirect (Scope 2) emissions for all Queen's facilities and operations within the province of Ontario. This encompasses leased and owned buildings both on and off campus. Satellite offices outside of Ontario, Bader College in England, and student rental homes leased by Queen's Community Housing are excluded.

Scope 1 Emissions

Scope 1 emissions include all emissions directly produced by the university. The main contributor to Scope 1 emissions is our central heating plant that produces steam heat by burning natural gas and oil.

Scope 2 Emissions

Scope 2 emissions include all indirect emissions associated with energy that the university purchases. The majority of Queen's Scope 2 emissions are from grid electricity generated for use in buildings owned by the university.

Queen's calculates Scope 1 and Scope 2 emissions to demonstrate the overall carbon footprint of the university. From this figure, an adjusted emission value is calculated. The emission value is adjusted because approximately twenty percent (20%) of the heat produced by Queen's central heating plant is used to heat the Kingston Health Sciences Centre.

Achieving a 35% Reduction in GHG Levels

Queen's aims to become carbon neutral by 2040 and set milestone targets for 2020 and 2030 to achieve this goal, outlined in the Climate Action Plan.

In 2020, Queen's met its first major GHG target by reducing GHG emissions 35 percent from 2008 levels. A number of actions contributed to this achievement, including the following:

High Efficiency Boiler, Natural Gas, and Provincial Grid Emissions

Approximately 17 percent of the reduction was achieved by 2014 through installation of a new high-efficiency boiler in the Central Heating Plant, conversion to natural gas only as a heating fuel, and a reduction in the Ontario electricity grid emission factor. With the provincial phase out of coal-fired electricity generation in 2014 and increasing reliance on carbon-neutral sources (e.g., wind and solar), the Ontario electrical grid has become a cleaner source of energy. This critical change meant the emissions associated with the electricity Queen's purchases for university buildings (i.e., scope 2 emissions) were significantly reduced.

West Campus District Energy Project

Most of Queen's campus is heated using district energy steam produced at our Central Heating Plant located on the main campus. A significant portion of GHG emissions was due to heat loss from the 2.5-kilometre underground steam line that connected the central heating plant to the west campus. The installation of a new, high-efficiency hot water distribution system at west campus locations allowed Queen's to decommission the inefficient 46-year-old underground steam line and realize GHG reductions of 1,500 tonnes annually.

Energy Reduction Projects

The university continually invests funds in energy reduction projects across campus. The 64-building energy retrofit project called CAPit delivered over 2700 tonnes of reductions through, for example, building heat recovery, and water and lighting use reduction. Strategic operation of our cogeneration units (i.e., reducing running times while maintaining the same benefits to our community) and building automation efficiency projects has yielded another 2500 tonnes of reductions.

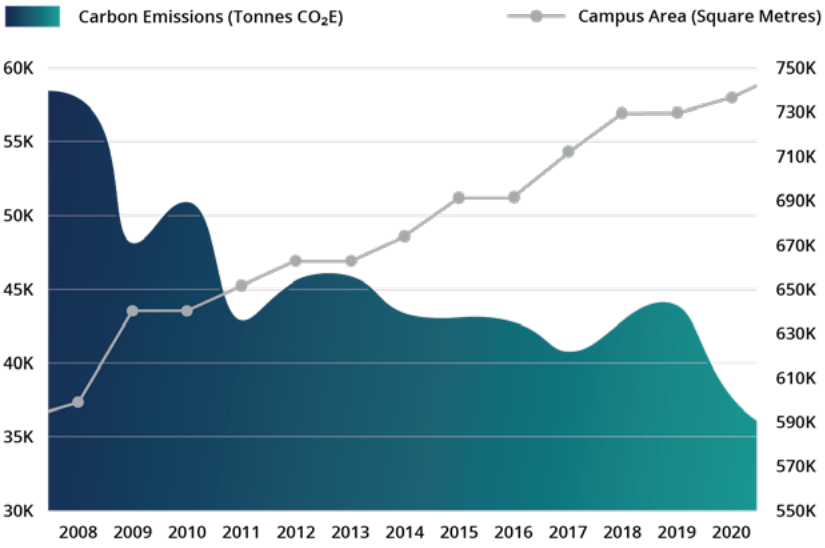
Achieving a 35% Reduction in GHG Levels

Managing Growth

It is important to recognize that the total reduction in GHG emissions Queen's achieved by 2020 was more than the 19,974 tonnes required to reach our 2020 GHG target.

The total reduction was more because our campus grew significantly between 2008 – 2020. As the chart below shows, even as the campus added new buildings and increased student, staff and faculty population, the total emissions decreased.

Campus Growth vs Emissions



Source: Facilities Energy and Sustainability Dept.

To mitigate the impact of campus growth, new building standards were implemented. For example, all new buildings are now required to be Leadership in Energy and Environmental Design (LEED) Gold standard, an internationally recognized standard for green buildings.

Achieving Net Zero

Since Queen's met its first major milestone target for GHG emission reduction in 2020, the university's carbon footprint has continued to decrease and Queen's continues to invest in sustainability projects and strategies, including:

Upgrading the lab ventilation systems in Chernoff Hall, the New Medical Building and Biosciences Complex which will reduce GHG emissions by 1621 tonnes.

Implementing the campus's first geo-exchange heating and cooling system for our new facility at 355 King St. This system is expected to reduce emissions by nearly 200 tonnes.

Enhancing building efficiency.

Recognizing that our goal of net zero by 2040 was a stretch target, over the next year Queen's will be working on a strategy to achieve net zero. We look forward to sharing a plan for achieving this goal with the Queen's community for discussion. Queen's roadmap to net zero will require we address our Central Heating Plant, which currently accounts for 87 percent of our GHG emissions, and make a significant investment in transformation. We are proud of what we have achieved and Queen's will continue to challenge itself and our partners to take action on climate change.

OFFICE OF THE PRINCIPAL
AND VICE-CHANCELLOR