



Royal Roads  
UNIVERSITY



# 2022 PSO CLIMATE CHANGE ACCOUNTABILITY REPORT

Royal Roads University

May 2023

**LIFE.CHANGING**

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# CLIMATE CHANGE ACCOUNTABILITY REPORT OVERVIEW

## Declaration Statement

This Public Sector Organization (PSO) Climate Change Accountability Report for the period January 1, 2022 to December 31, 2022 summarizes our greenhouse gas (GHG) emissions profile, the total offsets to reach net-zero emissions, the actions we have taken in 2022 to minimize our GHG emissions, and our plans to continue reducing emissions in 2023 and beyond. By June 30, 2023 our final 2022 *Climate Change Accountability Report* will be posted to our website at [www.royalroads.ca/about/plans-reports](http://www.royalroads.ca/about/plans-reports).

## Overview

Climate action and sustainability are core to Royal Roads University’s (RRU) mandate and values. The university undertakes projects to reduce GHG emissions in accordance with the BC *Climate Change Accountability Act*, the Carbon Neutral Government Regulation and our own climate commitments and reduction targets. This report lays out RRU’s 2022 GHG emissions, examines trends and details actions undertaken and plans for continued mitigation, adaptation and sustainability initiatives.

In 2022, Royal Roads produced 1015 tonnes of carbon dioxide equivalent (tCO<sub>2</sub>e). This represents a 6 per cent increase over 2021 figures (958 tCO<sub>2</sub>e) and is attributed mostly to an increase in energy consumption for building operations (direct fuel combustion and purchased energy). Since 2010, RRU has reduced its overall GHG emissions by over 32 per cent.

Notably, in 2022 RRU conducted an energy and resilience audit and began to implement its [Climate Action Plan 2022 - 2027](#) which includes 70 actions that span education, collaboration, partnerships, research and events. Much of RRU’s progress with the plan was made on governance aspects which establish foundational elements for implementation and climate leadership in the years to come.

## 2022 Emissions and Offset Summary

<b>Table 1: Royal Roads University 2022 GHG Emissions and Offsets Summary</b>	
<b>GHG emissions for the period January 1 - December 31, 2022</b>	
Total BioCO <sub>2</sub>	1.29
Total Emissions (tCO <sub>2</sub> e)	1016
Total Offsets (tCO <sub>2</sub> e)	1015
<b>Adjustments to Offset Required GHG Emissions Reported in Prior Years<sup>1</sup></b>	
Total Offsets Adjustment (tCO <sub>2</sub> e)	3
<b>Grand Total Offsets for the 2022 Reporting Year</b>	
Grand Total Offsets (tCO <sub>2</sub> e) to be Retired for 2022 Reporting Year	1012
Offset Investment (\$25 per tCO <sub>2</sub> e)	\$25,225

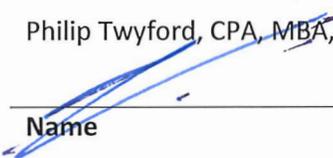
<sup>1</sup> Emissions reported in previous years are updated as a result of new information becoming available, errors discovered in previously entered data, or consumption adjustments made by energy providers.

### Retirement of Offsets

In accordance with the requirements of the *Climate Change Accountability Act* and Carbon Neutral Government Regulation, Royal Roads University (**the Organization**) is responsible for arranging for the retirement of the offsets obligation reported above for the 2022 calendar year, together with any adjustments reported for past calendar years (if applicable). The Organization hereby agrees that, in exchange for the Ministry of Environment and Climate Change Strategy (**the Ministry**) ensuring that these offsets are retired on the Organization's behalf, the Organization will pay within 30 days, the associated invoice to be issued by the Ministry in an amount equal to \$25 per tonne of offsets retired on its behalf plus GST.

### Executive Sign-Off:

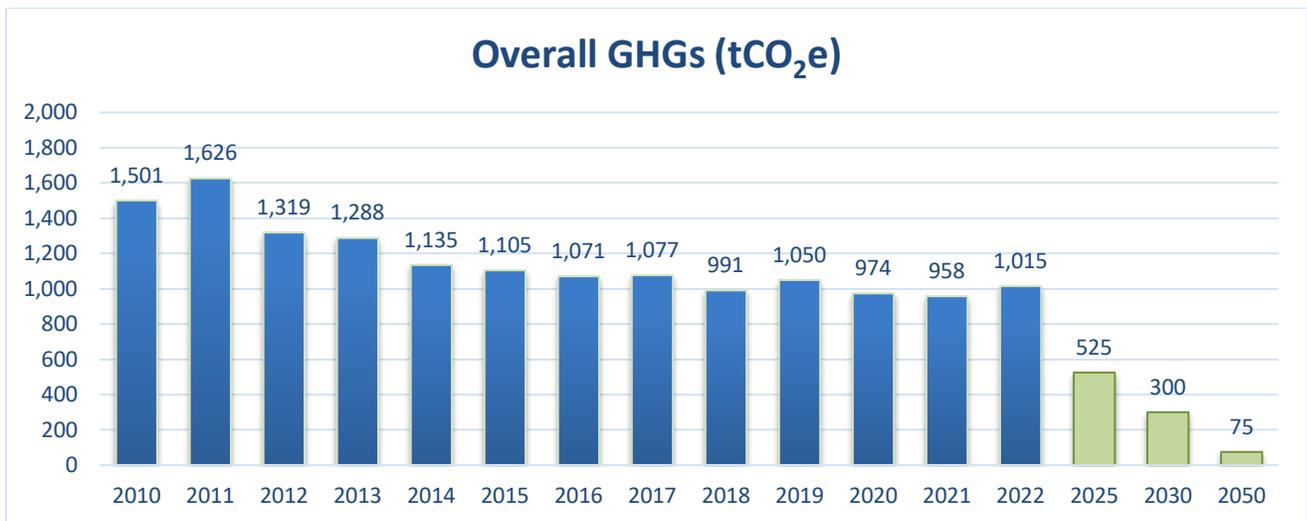
April 25, 2023

Signature	Date
 Philip Twyford, CPA, MBA, C.Dir	Vice-President Finance & Operations Royal Roads University
Name	Title

## 2022 GREENHOUSE GAS EMISSIONS PROFILE

In 2022, Royal Roads University’s GHG emissions totalled 1015 tCO<sub>2</sub>e, a 32 per cent reduction from 2010 levels. This reduction has been achieved by undertaking retrofits, updating to electricity in smaller houses and improving energy efficiency. RRU’s target for 2020 was a 50% reduction (750 tCO<sub>2</sub>e) which we have not yet achieved. Significant shifts and a holistic decarbonization strategy are needed to remain on track to our 2025 target of 525 tCO<sub>2</sub>e (see Figure 1).

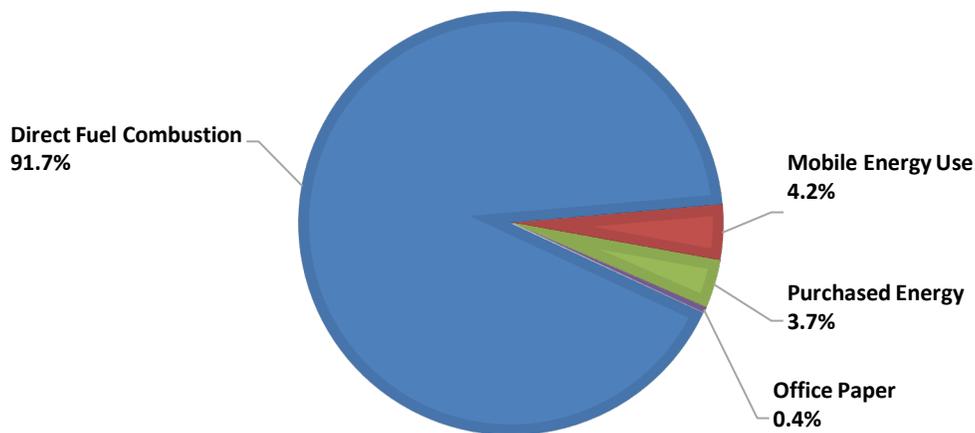
**Figure 1: RRU’s GHG Emission Trend 2010 – 2022 and Future Targets (2025, 2030 & 2050)**



### Emissions by Source

Building heating (direct fuel) accounts for the largest source of GHG emissions at RRU, followed by electricity (purchased energy), fleet (mobile energy use), and, finally, paper (see Figure 2 below).

**Figure 2: Per Cent Total GHG Emissions by Source (tCO<sub>2</sub>e), 2022**



Since 2019, campus emissions have been affected by the COVID-19 pandemic response and subsequent requirements for increased air filtration. At the same time, increased electrification of our fleet and of some buildings have had a positive impact. A trend summary for each source is provided in Table 2 below, and these trends are explained in more detail in corresponding sections of this report. For ease of comparison, both GHG emissions (tCO<sub>2</sub>e) and energy consumption in Gigajoules (GJ) are included.

<b>Table 2</b> Comparison of GHG Emissions (tCO <sub>2</sub> e) and <i>[Building Energy consumption] (Gigajoules), 2020 -2022</i>					
<b>Emission Source</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>Trend chart</b>	<b>Trend summary</b>
Direct Fuel combustion (methane gas)	805 [16,125]	878 [17,609]	931 [18,679]		Reduced building energy needs during the pandemic have rebounded as ventilation needs have increased.
Purchased Energy (electricity)	123 [11,026]	30.7 [11,396]	42.2 [13,204]		Actual consumption (in GJs) has remained relatively consistent but GHGs dropped in 2021 due to Electricity Emission Factor (EEF) updates <sup>2</sup> . An increase in electricity consumption is expected as gas boilers are replaced by electric boilers and the fleet transitions to electric/hybrid vehicles.
Mobile Energy Use	40.5	42.9	37.4		Continued decrease of mobile fuel due to pandemic-related adjustments and the addition of hybrid vehicles.
Office Paper	6.46	2.86	4.43		Electronic processes and behaviour change led to decrease, while supply chain issues affecting availability of low GHG paper caused an increase in 2022.
<b>Total Emissions</b>	<b>974</b>	<b>955</b>	<b>1015</b>		<b>Slight decrease and then an overall rebound.</b>

<sup>2</sup> Annual updates to the electricity emission intensity factors (EEIF) for BC Hydro’s integrated grid reflect the emissions intensity of electricity provided. Source: [https://www2.gov.bc.ca/assets/gov/environment/climate-change/cng/guidance-documents/2022\\_best\\_practices\\_methodology\\_for\\_quantifying\\_greenhouse\\_gas\\_emissions.pdf](https://www2.gov.bc.ca/assets/gov/environment/climate-change/cng/guidance-documents/2022_best_practices_methodology_for_quantifying_greenhouse_gas_emissions.pdf)



## STATIONARY SOURCES FUEL AND ENERGY FOR BUILDINGS

The largest source of GHG emissions at RRU is from stationary fuel combustion. This is primarily comprised of direct fuel from heating buildings with methane gas<sup>3</sup> but also includes purchased energy from electricity. In 2022, methane gas consumption made up 91.7 per cent of RRU's total emissions (931 tCO<sub>2</sub>e) and electricity contributed 4.2 per cent (42 tCO<sub>2</sub>e). Cumulatively, these two forms of energy make up 96 per cent of the RRU's GHGs in 2022 (972 tCO<sub>2</sub>e). Since 2010, GHG emissions associated with stationary sources have declined 32 per cent.

Royal Roads has 26 buildings on campus with a total building area of 45,608 m<sup>2</sup>. The Colwood campus has a unique mix of buildings including seven with Federal Heritage Designations and 11 constructed prior to the Second World War. Although shifts are underway, fourteen buildings were powered by methane gas from FortisBC while the rest of campus was powered by electricity from BC Hydro.

In the Fall of 2021, RRU acquired its downtown Langford property as part of the government-approved West Shore initiative. Several existing buildings were part of this acquisition and will be demolished as the construction of the Langford campus progresses (see page 14 for more about this new campus). Two buildings were added to our 2022 billing and reporting inventory and, in 2023 any that consume energy will be added as well.

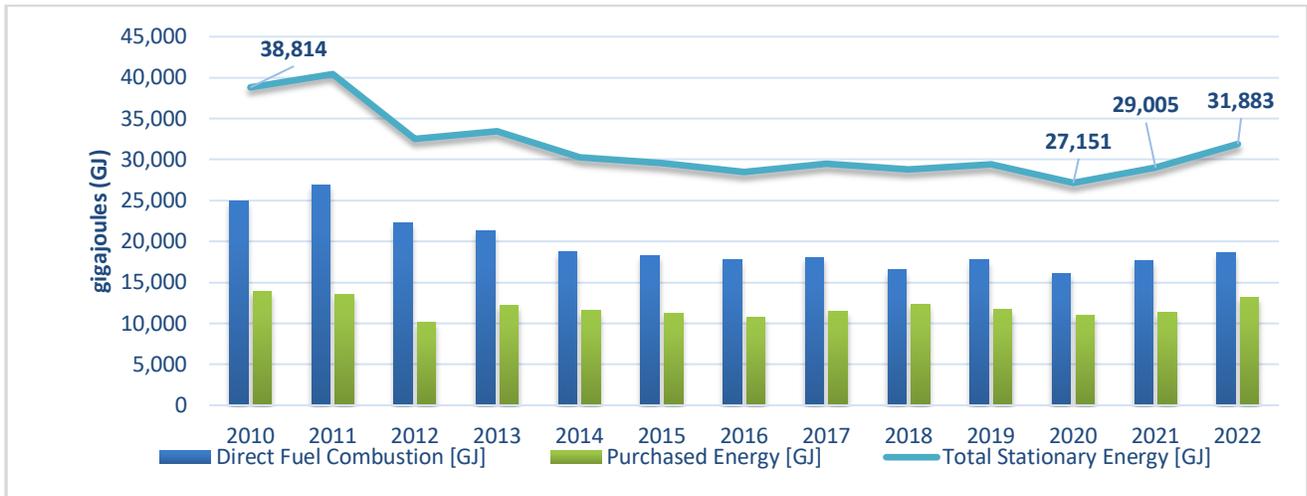
### Building Energy Consumption Trends

Building energy consumption data (measured in Gigajoules or GJs) provides another useful means of tracking energy usage trends and reductions (independent of GHGs which can vary somewhat due to emission factors). Purchased energy (electricity) consumption accounts for 4.2 per cent of RRU's GHG emissions and has remained relatively consistent over time. Direct fuel consumption (methane gas) contributes the largest portion of RRU's GHG footprint at 92 per cent and unfortunately has not shown a significant downward trend. Direct fuel consumption has remained in the 16,000 to 18,000 GJ range since 2014 - with last year's consumption rate at the highest point it's been in 8 years. Both energy types trended upward in 2022. RRU's stationary energy trends are illustrated in Figure 3 below.

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<sup>3</sup>Methane gas is also known as "natural gas." RRU's main source for this fuel is FortisBC, which supplies gas that is 95% methane (FortisBC). Methane has a global warming potential 25 times stronger than CO<sub>2</sub> (BC Ministry of Environment and Climate Change, 2020). Studies have shown that using the terminology of "natural gas" implies a clean source of energy and an undeservedly positive public perception (Yale, 2022). In recognition of these factors, RRU has changed its terminology.

**Figure 3: Stationary Energy Use (GJs), 2010 – 2022**



A key factor to increased energy consumption in 2022 was unseasonably cold weather in both shoulder seasons; energy usage spiked beyond expected consumption in April, May and October. Electricity use for those months was 30 to 40% higher than the year before. Increased consumption can also be attributed to RRU’s new and increasing reliance on electricity for heating those buildings that have shifted to heat pumps and, to a minor degree, charging hybrid fleet vehicles. With regular maintenance, RRU’s geo-exchange system for heating and cooling of the Dogwood auditorium is now fully operational.

### Plans to reduce building energy consumption

In 2023, RRU plans to hire an energy manager to establish a robust energy management program and initiate recommendations from phase one of the Energy Audit. Improved metering, monitoring and management will enable RRU’s continued progress from energy efficiency to greater electrification, renewable energy and decarbonization. Reductions in building energy consumption and decarbonization considerations are included in RRU’s new 10-year Capital Plan which is currently under development and on track for being tabled for Executive and Board approval in the summer of 2023.

To achieve its 2025 and 2030 emission reduction targets, the university must complete a significant amount of work in a very short timeframe. Although some smaller buildings have been electrified, large core campus facilities continue to use methane gas and would benefit from envelope and other upgrades in addition to electrification. As identified by the Energy Audit, priorities include:

- The retirement of identified buildings and deep retrofits of the Millward, Nixon, and Grant buildings (energy efficiency upgrades, fuel switching from gas to electric, and the interim use of biomethane<sup>4</sup>).
- The implementation of a building level campus wide energy management system.
- Campus electrical service upgrades to accommodate fuel switching from gas to electricity and to incorporate on-site renewables.

<sup>4</sup> Biomethane is another name for Renewable Natural Gas (RNG). In keeping with our use of “methane gas” in place of Natural Gas we will use the terminology that acknowledges the methane content of this biogas.



## MOBILE SOURCES FLEET ENERGY USE

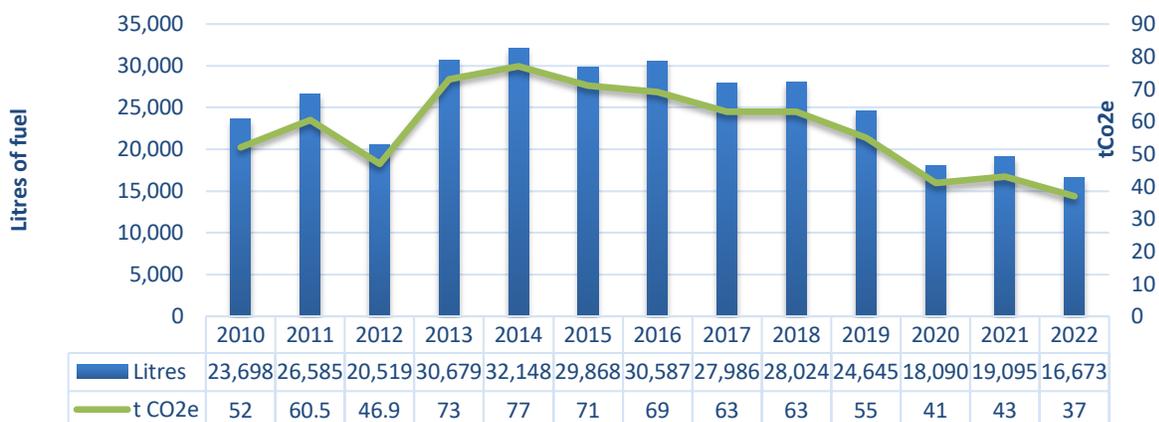
In 2022, the RRU fleet produced 37 tCO<sub>2</sub>e (mobile fuel combustion). This accounted for 3.6 per cent of the university’s total GHG emissions. Since 2010, RRU has reduced fleet associated GHGs by 34 per cent (Figure 4). Continued fleet management, efficiency improvements to fleet vehicle use and electrification have all led to lower fleet emissions this year. The installation of EV chargers for fleet vehicles supported the [purchase of three hybrid vehicles](#) early in 2022 and two others later in the year.

RRU is on track to its goal of electrifying all regular-use vehicles by 2028. The timeline to transition to an electric variant of the heavy-duty truck is dependent on greater availability and better pricing. Going beyond fleet, RRU has started the work of tracking, reporting and reducing indirect emissions with a faculty-led air travel emission baseline study. See page 13 for more about this study and our baseline.

Currently, the university has a mixed fleet that includes:

- 14 gas-powered vehicles (utility vans, trucks, and minivans)
- 5 hybrid electric vehicles (minivans and SUVs)
- 1 diesel-powered heavy-duty vehicle (dump truck)
- 32 electric golf carts
- 12 gas-powered working vehicles (tractors, mowers, and garden utility vehicles)

**Figure 4: Mobile Energy Use, 2010-2022<sup>5</sup>**



<sup>5</sup> Fleet-related GHGs have been adjusted slightly due to the change in the emission factor calculation (this retroactively lowered totals for 2016-2021 by a range of 2 to 5 tCO<sub>2</sub>e).



## PAPER CONSUMPTION

In 2022, emissions associated with office paper accounted for 4 tCO<sub>2</sub>e which is less than 1 per cent of the university's total GHG emissions. Although the shift towards online course delivery and electronic processes continues, there was an uptick in paper purchases as the residual stock of pre-pandemic paper was used up.

Additionally, GHG emissions associated with paper procurement rose due to supply chain issues affecting sugar cane paper, RRU's choice for a low GHG paper (Figure 6). For the first half of 2022, we were unable to order sugar cane paper for all 8 ½" x 11" paper orders as is RRU's standard practice.

The supply of sugar cane paper stabilized for the latter half of the year and our procurement department is aware of lower GHG alternatives should we have issues again.

**Figure 5: Paper Purchased and Associated GHG Emissions, 2010-2022**



# CLIMATE RISK MANAGEMENT



Climate risk, resilience and adaptation are key organizational priorities within RRU's *Climate Action Plan*. RRU is committed to improving its preparedness in a broad, holistic fashion with a focus beyond operations and built spaces. This work is in early phases but will be ramping up in the coming years.

As an early step, climate resilience was included as a consideration within phase one of the expanded 2022 Energy Audit. A preliminary "resilience baseline" was developed; campus buildings were assigned approximate risk factors (low/medium/high) that allow for relative comparison to other campus buildings. The assessments were based on climate risks of overheating, flooding, fire, and "other" potential risks (this primarily being related to building envelope (moisture)). While this was not a detailed risk analysis, it forms a preliminary starting point for further assessments and action.

Other risk management initiatives in 2022 included the development of an emergency response procedure for extreme heat and efforts to incorporate climate resilience considerations into the design of the Langford campus.

## What's next?

In the coming years, RRU will be developing our climate resilience through the following actions:

- **Preparedness:** testing of emergency backup power under significant loads to assure acceptable performance in a significant event of loss of commercial power to campus
- **Assessment:** undertaking a Climate Risk and Vulnerability Assessment to determine priority risks and impacts under a range of climate scenarios
- **Adaptation Plan:** developing a Climate Adaptation Plan (informed by the risk assessment) to integrate climate risk and resilience into RRU's Enterprise Risk Management (ERM) Framework and university governance, administration, operations, business development and service delivery models
- **Integrate Disaster Risk Reduction:** integrating disaster risk reduction and climate adaptation considerations within emergency plans and business continuity plans
- **Manage for Risks:** assessing, monitoring, reporting on and managing institutional climate risks within the ERM Framework
- **Infrastructure Readiness:** ensuring new buildings and major renovations integrate climate risk and adaptation considerations
- **Water Management:** developing a water management plan that includes climate risks (e.g. extreme weather, stormwater surge) and regional factors
- **Applied Learning:** developing a roster of student research projects and volunteer opportunities that integrate with campus mitigation, climate risk and resilience goals

# OTHER CLIMATE & SUSTAINABILITY INITIATIVES



## CAMPUS OPERATIONS

### Waste Audit

In 2022, Bachelor of Business Administration in Innovation & Sustainability students conducted an audit of the university's waste, recycling and compost streams. The last audit was completed in 2019 and diversion rates have decreased 37.5 per cent since then. Several recommendations emerged from this report and the implementation of these will allow RRU to improve diversion rates, but also reduce overall waste production and waste-related emissions.

### R22 Phase out & roof replacements

The project to replace HVAC systems, phase out R22 (a harmful refrigerant which leads to climate change and ozone depletion) and upgrade roofing is on schedule and will be complete in 2023. In addition to [federal compliance](#) regulations, this project is also expected to improve building envelope performance.

### Langford Campus Design

The first new building on the University's Langford campus will meet [Zero Carbon Building™ Design Standards](#), complementing and exceeding its LEED® Gold certification. This major project will integrate sustainability, accessibility and low carbon design throughout its life cycle, including during construction and operation. The first building will be primarily constructed of mass timber in compliance with British Columbia's *Wood First Initiative*. In addition to the lower embodied carbon associated with the mass timber, the use of [carbon concrete](#) is anticipated to achieve a 31 per cent reduction in embodied carbon over provincial averages. To enhance the project's climate risk resilience, the design team will also incorporate measures to mitigate the long-term impacts of climate change, particularly the increased temperature and cooling requirements, smoke and air quality risks, rainfall events and snow loads.

### Baselines & reductions – Race to Zero

RRU is a signatory to the [Race to Zero group for post-secondary institutions](#) and has committed to submitting the required decarbonization plans for all emissions (scopes, 1, 2 and 3), tracking and reporting by June of 2023.

Early work has started on establishing baselines and meeting our commitments to this pledge. The 2019 baseline for business-related air travel emissions is a key part of RRU's Scope 3 emissions baseline and sets the standard for establishing baselines in the other 14 categories.

## PROGRAMS & OUTREACH

### Biodiversity Map

As part of their program, undergraduate students in the School of Environment and Sustainability created an interactive [biodiversity map](#) of the campus and surrounding lands. Not only did the students map out the diversity of species and ecosystems in an accessible and engaging manner, but this project also provided a framework for other mapping projects and the groundwork for increased biodiversity protection.

### RRU's Food Farm

In its first year, the university's small-scale [farm produced a food crop of over 1000 pounds](#). This harvest from the "Giving Garden" was distributed to various community organizations. With success seeded, the program plans to provide food for use on campus and for those in need in nearby communities. Additionally, [the Farm at Royal Roads](#) will provide an interactive teaching and learning space as part of its living laboratory program and with the key intention of decolonizing curriculum.

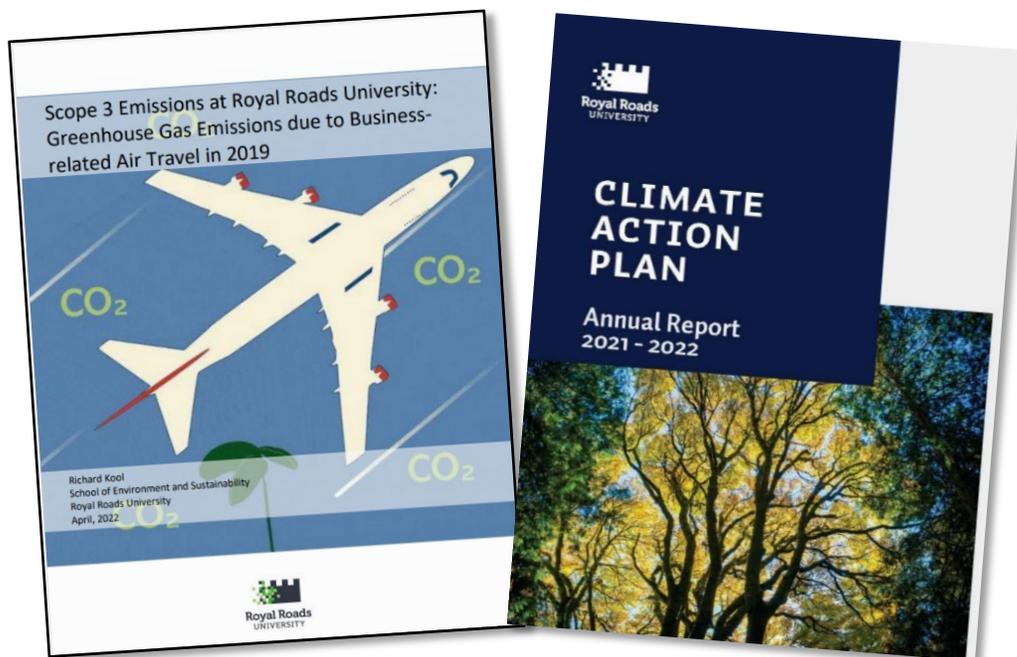
## SUCCESS STORY

Royal Roads University launched its [Climate Action Plan 2022 - 2027](#) (CAP) with a public [commitment video](#) and [climate declaration](#). In 2022, the foundational work of establishing strategic oversight and a distributed leadership model across university portfolios took priority.

Early on, the Climate Leadership Committee (CLC) was established to provide governance, coordination and leadership of CAP implementation. This committee includes broad representation from across the university with staff, faculty and students from a range of departments. It is chaired by the Vice President Research and International and includes all RRU vice presidents and Lekwungen Elder Butch Dick. CAP implementation is guided by an accountability framework that spans the portfolio areas and assigns responsibilities for climate action throughout the university.

Transparency and accountability are integral components of the CAP. In June, the first [Climate Action Plan Annual Report](#) was presented to the Board of Governors. Later in the year, three Advisory Working Groups were launched to support, advise on and activate key CAP priorities. The three groups are focused on 1) Climate Education and Research, 2) Mitigation and Adaptation, and 3) Outreach, Partnerships and Engagement.

As part of our overall commitments to emission reductions across all emission categories (scope 1, 2 and 3), RRU faculty member Rick Kool conducted an [air travel emission baseline study](#) (using 2019 business travel data). This study determined that RRU employees travelled more than 4.2 million kilometres resulting in over 1,200 tCO<sub>2</sub>e of emissions and exceeding our campus emissions for that year (1,050 tCO<sub>2</sub>e for building heating, electricity, fleet and paper). This study kicks off our work in establishing other scope 3 category baselines and is a critical step in our journey to zero emissions.



# CLIMATE AND SUSTAINABILITY INITIATIVES PLANNED FOR 2023



In the year ahead, the following initiatives will bolster RRU’s climate and sustainability leadership and our organization’s contributions toward urgent and meaningful impact.

## **CAMPUS OPERATIONS**

### **Decarbonization across all scopes**

RRU has committed to reducing its emissions across all scopes. This includes the 65 per cent reduction target by 2025 for direct emissions and a 50 per cent reduction target for scope 3 categories by 2030. To accomplish this we need to establish scope 3 baselines for categories beyond business air travel and then develop an overall emission reduction strategy. In 2023, RRU will be revising its travel policy and procedures, as well as the purchasing policy. Climate and sustainability aspects will be considered for both revisions. The intention is to include some level of engagement and buy-in across the community to buttress policy and process updates.

### **10 Year Capital Plan**

Through the University’s new 10-year Capital Plan initiatives identified in support of climate action objectives will be prioritized and sequenced over a multi-year planning horizon. The plan includes a focus on a shift from fossil fuels to full electrification of our campuses wherever possible and explores renewable options including wind and solar. The plan also considers future growth for the university and the construction of new buildings to meet the needs of students and nearby communities.

### **Smart chargers**

The installation of smart EV chargers in our public parking areas across campus is still planned. The existing non-cost recovery charging units will be integrated into the fleet charging infrastructure.

### **Rose Garden Cottage**

The Rose Garden cottage renovation will be finalized in 2023 and will be the first campus project to meet [Zero Carbon Building \(ZCB\) Design Standards™](#). It is also expected to qualify for Rick Hansen Foundation Gold

certification and, as the future home to RRU’s [Cascade Institute](#), it will serve as an aspirational example for future renovation and building projects.

### **Opening of RRU’s Langford Campus**

Set to be completed in September of 2024, the new Langford campus will host programming offered by Royal Roads University, the University of Victoria, Camosun College, the Justice Institute of British Columbia, and will include space for the Sooke School District. This [collaborative campus](#) will offer opportunities for post-secondary education in a region with a demonstrated and increasing need of local offerings. The new campus will also model low carbon building standards and sustainable design within an area of BC that’s growing rapidly.

## **PROGRAMS & OUTREACH**

### **Climate Education & Training**

RRU will continue to advance the high number of programs and courses focused on climate action, adaptation, leadership, and sustainability. Through unique offerings such as Living Labs, community-based courses, customized training, and micro-credential programs we will amplify climate knowledge and the skills needed for our future.

In late 2022, RRU’s Resilience by Design (RbD) Lab, in collaboration with Climate Risk Institute (CRI), announced [CanAdapt](#), a go-forward plan for the Adaptation Learning Network and the re-development of CRI’s Climate Change Adaptation Community of Practice. CanAdapt is a climate adaptation capacity-building hub that provides a responsive platform for training, education, communities of practice, and information resources. CanAdapt will help sustain and build the momentum needed to drive climate resiliency leadership and practice across sectors and professions in Canada and abroad.