Royal Bank of Canada

Task Force on Climate-related Financial Disclosures Report 2021

BluEarth Renewables' Yellow Lake and Burdett Solar Facility in Alberta, Canada – RBC is proud to have a power purchase agreement with this facility.

Caution regarding forward-looking statements

From time to time, Royal Bank of Canada and its subsidiaries (RBC, we, us or our) make written or oral forward-looking statements within the meaning of certain securities laws, including the "safe harbour" provisions of the United States Private Securities Litigation Reform Act of 1995 and any applicable Canadian securities legislation. We may make forward-looking statements in this Financial Stability Board's Task Force on Climate-related Financial Disclosures Report (2021 TCFD Report or this Report) in other filings with Canadian regulators or the U.S. Securities and Exchange Commission (SEC), in other reports to shareholders and in other communications. Forward-looking statements in this 2021 TCFD Report include, but are not limited to, statements relating to the causes and impacts of climate change globally, including our economies and communities in which RBC and our clients operate, our strategies to identify, mitigate and adapt to climate-related risks, our approach to identifying and managing climate-related opportunities, and our climate-related objectives, vision, goals, metrics and targets. The forward-looking information contained in this 2021 TCFD Report is presented for the purpose of assisting our stakeholders in understanding the ways we intend to address climate-related governance, strategy, risks, opportunities, and metrics and targets, and may not be appropriate for other purposes. Forward-looking statements are typically identified by words such as "believe", "expect", "expectation", "aim", "foresee", "forecast", "anticipate", "predict", "intend", "estimate", "commit", "goal", "plan", "strive", "objective", "target" and "project" and similar expressions of future or conditional verbs such as "will", "may", "should", "could" or "would".

By their very nature, forward-looking statements require us to make assumptions and are subject to inherent risks and uncertainties, which give rise to the possibility that our predictions, forecasts, projections, expectations or conclusions will not prove to be accurate, that our assumptions may not be correct, and that our objectives, vision, commitments, goals, targets, and strategies to mitigate and adapt to climate-related risks and opportunities will not be achieved. Moreover, many of the assumptions, standards, metrics and measurements used in preparing this report continue to evolve and are based on assumptions believed to be reasonable at the time of preparation, but should not be considered guarantees. We caution readers not to place undue reliance on these statements as a number of risk factors could cause our actual results to differ materially from the expectations expressed in such forward-looking statements.

These factors – many of which are beyond our control and the effects of which can be difficult to predict – include: climate-related conditions and weather events, our ability to gather and verify data regarding environmental impacts, our ability to successfully implement various initiatives throughout the company under expected time frames, the compliance of various third parties with our policies and procedures, the legal and regulatory environment, regulatory compliance (which could lead us to being subject to various legal and regulatory proceedings, the potential outcome of which could include regulatory restrictions, penalties and fines), strategic, reputation, competitive, legal and regulatory environment and systemic risks and other risks discussed in the risk sections and Impact of COVID-19 pandemic section of our 2021 Annual Report for the year ended October 31, 2021 (2021 Annual Report) and the Risk management section of our Quarterly Report for the three-month period ended January 31, 2022 (Q1 2022 Report to Shareholders). In addition, as we work to advance our climate commitments, goals and targets, external factors outside of RBC's reasonable control may act as constraints on their achievement, including varying decarbonization efforts across economies, the need for thoughtful climate policies around the world, more and better data, reasonably supported methodologies, technological advancements, the evolution of consumer behaviour, the challenges of balancing interim financed emission reduction targets with an orderly and just transition, and other significant considerations such as legal and regulatory obligations.

We caution that the foregoing list of risk factors is not exhaustive and other factors could also adversely affect our results. When relying on our forward-looking statements to make decisions with respect to us, investors and others should carefully consider the foregoing factors and other uncertainties and potential events.

Material economic assumptions underlying the forward-looking statements contained in this TCFD Report are set out in the Economic, market and regulatory review and outlook section and for each business segment under the Strategic priorities and Outlook headings in our 2021 Annual Report as updated by the Economic, market and regulatory review and outlook section of our Q1 2022 Report to Shareholders. Except as required by law, we do not undertake to update any forward-looking statement, whether written or oral, that may be made from time to time by us or on our behalf. While certain matters discussed in this report may be significant, any significance should not be read as necessarily rising to the level of materiality used for the purposes of complying with securities laws and regulations, even if we use the word "material".

Additional information about these and other factors can be found in the risk sections and Impact of COVID-19 pandemic section of our 2021 Annual Report and in the Risk management section of our Q1 2022 Report to Shareholders.

Important notice regarding this report

This report provides a summary of our progress to date in advancing how we manage climate-related risks and opportunities and in implementing the TCFD recommendations. This report is provided solely for informational purposes, and does not constitute an offer or a solicitation to buy or to sell any security, product or service in any jurisdiction; nor is it intended to provide investment, financial, legal, accounting, tax or other advice, and such information should not be relied or acted upon for providing such advice.

Climate metrics and data and other information contained in this report, including but not limited to those relating to scenario analysis, financed emissions, carbon-related assets, and emissions from our own operations are or may be based on significant assumptions, estimates and judgements. In addition, as discussed herein, some of the information provided, including regarding financed emissions, is based on estimated data with very limited support. Given their inherent uncertainty and complexity, and the significant issues with some of the underlying data, assumptions, estimates and judgements believed to be reasonable at the time of preparation of the report may subsequently turn out to be inaccurate. In addition, many of the assumptions, estimates, standards, methodologies, metrics and measurements used in preparing this report continue to evolve and may differ significantly from those used by other companies and those that may be used by us in the future. Legislative and regulatory changes, market developments and/or changes in data availability and reliability could materially affect the assumptions, estimates, standards, methodologies, metrics and measurements used by us and/or other companies, and could materially affect the comparability of the information and data across industries or companies and from one reporting period to a subsequent reporting period, as well as our ability to achieve our commitments, goals and targets. Any commitments, goals and targets discussed in this report, including but not limited to the net-zero related commitments, goals and targets set out on pages 7, 15, 27 and 48, are aspirational and there can be no assurance that any such commitments, goals or targets will be achieved. See "Caution regarding forward-looking statements".

This report and the information contained within it is unaudited. Certain metrics and data contained in this report have been subject to limited assurance. You can read more about the scope of this work, including the metrics and data in scope of the assurance on page 9 of our 2021 ESG Performance Report.

This report is intended to provide information from a different perspective and in more detail than that required to be included in mandatory securities filings and other regulatory reports, including filings with Canadian securities regulators and the SEC. While certain matters discussed in this report may be of interest and importance to our stakeholders, the use of the terms "material", "significant", "important" or similar words or phrases should not be read as necessarily rising to the level of materiality used for the purposes of securities or other laws and regulations. We have no obligation to update the information or data in this report.

All data and examples in this Report reflect activities undertaken during the 2021 fiscal year (November 1, 2020 – October 31, 2021), unless otherwise noted. In many cases, we have provided data for fiscal 2021 as well as the two preceding years to present a wider view of trends in our performance over a three-year period.

All amounts in this document are in Canadian dollars unless otherwise noted. U.S. dollars and British pounds are converted using the spot exchange rate, as at October 31, 2021 (C$1.00 = US$0.808; C$1.00 = 0.590£). Measurements used in this Report are metric.

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CEO Message

David McKay
President & Chief Executive Officer, Royal Bank of Canada

Urgent and thoughtful action is required to place our planet on a more sustainable path.

RBC is committed to change and progress, and we will play an active leadership role in accelerating the transition to a net-zero world by working with our clients to support and enable their plans, and in our own operations. We have a clear climate strategy and roadmap – combining short- and long-term actions and commitments that support achieving net-zero in our lending by 2050.

As one of the largest global financial institutions based on market capitalization, we will engage through our people and capabilities in every sector and community to make a difference in four key ways:

- **Helping clients as they transition to net-zero** by working with them to understand and shape their journeys, and supporting them with financing, products and services
- **Holding ourselves accountable** by setting interim financed emission reduction targets aligned with our clients' plans, and transparently measuring and monitoring progress through our lending portfolio
- **Informing and inspiring a sustainable future** by advancing climate solutions and policy through thought leadership, active partnerships across public and private sectors, and support of technology innovation
- **Advancing net-zero leadership in our own operations** by moving to 100% renewable energy sources and minimizing our reliance on carbon offsets, both by 2025, as a way to reach net-zero

Underpinning our approach is a fundamental belief this multi-decade transition must be orderly – one that balances the needs of individuals, companies, regions, society and the economy. We have to work with our clients across all sectors, particularly higher-emitting sectors, to enable their journeys, with client-by-client risk and opportunity decisions along the way.

In 2021, I was proud of the significant progress RBC made in all four areas of our climate strategy. Notable achievements include:

- To support our clients, RBC announced our commitment to deploy $500 billion in sustainable finance by 2025, an increase from our previous commitment of $100 billion, which was achieved in 2020. We continued to make significant progress against our goal, developing financing products that provide incentives to reach climate goals.
- We joined the Net-Zero Banking Alliance (NZBA), a global, industry-led initiative to accelerate and support efforts to address climate change, while strengthening the prospects of people, communities and economies. By the spring of 2023, or earlier if possible, we intend to disclose interim financed emission reduction targets for clients in our oil & gas, power & utilities, and automotive & transportation portfolios. Subsequently, within 12 months of disclosing such targets, we will disclose how we are advancing plans to achieve those targets.
- We produced a major report, "The $2 Trillion Transition", to contribute to Canadian public policy and conversations on the transition plan, presenting six pathways for changing how we live, travel, grow and power our lives in ways that don't leave jobs, communities and businesses behind. This is a powerful framework our country can use to make progress in partnership with the public and private sectors.

CEO Message

- We created management accountability across the bank to focus on climate, including in key functions such as Risk Management and Strategy. Climate is a management responsibility in each business and function, bringing additional focus and resources dedicated to our climate commitments and actions.
- We accelerated our climate risk analysis capabilities to conduct an initial measurement of our financed emissions to establish a baseline and systematically assess the impact of, and integrate climate risk into, the various risk types that we monitor and manage across the enterprise. We are now well advanced in building the data foundation and methodologies to anticipate and proactively manage risks.
- We provided over $10 million to more than 110 universities and charities that are solving pressing environmental challenges like climate change by leveraging technology and innovation capabilities. This brings our total investment through RBC Tech for Nature to over $27 million since 2019 as part of our $100 million commitment by 2025.

New in 2021, this TCFD Report details our initial estimates of financed emissions in our lending portfolio. Business loans and project finance represent the vast majority of RBC's financed emissions, with oil & gas, agriculture, and utilities representing our top emitting sectors. While we have seen significant financing activity in the energy sector in 2021, we have demonstrated through progress against our $500 billion sustainable finance commitment that we are working closely with clients in these sectors to enhance reporting transparency and support their transition plans. We will set our interim financed emission reduction targets to align with our clients' plans while holding them to high standards and making client-by-client risk decisions including exiting relationships if transitions don't progress along a path to achieve net-zero in lending by 2050.

As we move forward, RBC will take a thoughtful and measured approach to financed emission disclosure and target setting. We'll be doing significant work in 2022 in support of meeting this commitment, including using approved decarbonization scenarios such as sector-specific scenarios. We will also consider client and sector-level emissions (absolute- and intensity-based), client decarbonization plans and progress in achieving these, and sectoral transition pathways.

We view data and measurement as much more than a risk issue – they are key to RBC's winning strategy to identify climate-related opportunities and strategies, and meet client demand for capital to decarbonize. Currently, the availability, accuracy and validity of data underpinning financed emissions is challenged. However, taking the time to engage with our clients to understand their transition and net-zero plans will improve data quality and better inform RBC's actions, disclosures and emission reduction goal setting.

Looking ahead, RBC will build upon our significant progress to date, charting a path forward with our clear strategy and principles, guided by our Purpose to help clients thrive and communities prosper.

Importantly, our focus will not just be on the destination, but the journey to net-zero. This transition represents a once-in-a-lifetime opportunity to place the communities where we live and work on an inclusive, sustainable and, in turn, more prosperous path. It requires coming together with common purpose. This is our most ambitious path, and RBC will be there every step of the way.

Dave McKay
President & Chief Executive Officer, Royal Bank of Canada

RBC net-zero roadmap

Next 1–3 Years[1]

- Expand climate-related products, services and client solutions
- Work with clients to understand and support their transition plans
- Provide more investment options for clients with climate-related objectives
- Further embed climate factors and data in our decision-making
- Disclose interim financed emission reduction targets for clients in key high-emitting sectors[2]
- Produce research on climate issues and policies, and convene stakeholders
- Foster climate innovation including new investment vehicles and platforms, such as RBC Tech for Nature™
- Champion and support climate literacy and awareness
- Maintain carbon neutrality in our global operations
- Meet our near-term commitments under the Net-Zero Banking Alliance[3]

By 2025[4]

- Facilitate $500 billion in sustainable financing
- Reduce greenhouse gas (GHG) emissions from our operations by 70%[5]
- Increase our sourcing of electricity from renewable and non-emitting sources to 100%
- Provide up to $100 million in support to universities and charities that are developing technology solutions to address climate change
- Work with our Capital Markets clients in key high-emitting sectors[2] to endeavour to have clients representing 80% of available loan balances[6] reporting their Scope 1 and 2 emissions to RBC, and clients representing 65% of available loan balances disclosing a plan to reduce GHG emissions to RBC

By 2030

Achieve interim financed emission reduction targets with our clients in high-emitting sectors[2]

By 2050

We will achieve

Net-Zero[7]

Governance

Governance

We are committed to high standards of governance that are consistent with regulatory expectations and evolving best practices.

Figure 1: Overview of the organizational structure for the governance of climate risks and opportunities

Board Oversight

Board of Directors and its Committees

Oversee and approve our climate strategy and how we manage climate risks and opportunities

Risk Committee

Oversees our significant and emerging risks, and recommends for board-approval our Enterprise Risk Appetite Framework which requires consideration of climate-related risks

Governance Committee

Advises the Board and oversees and coordinates climate matters at the Board and its Committees, including climate-related disclosures and reporting

Human Resources Committee

Oversees compensation principles, policies and programs and recommends CEO and GE compensation for Board approval, which includes risk and strategic objectives that consider environmental sustainability

Audit Committee

Oversees our financial reporting, internal controls over financial reporting and disclosure controls and procedures

Management Oversight

Group Executive and Group Risk Committee

Oversight of and responsibility for providing strategic direction and implementation regarding climate-related goals, risks and disclosure

Chief Administrative & Strategy Officer

- Integrates, coordinates and drives adoption of the climate strategy across the enterprise
- Produces climate disclosures
- Advances net-zero objectives in RBC operations
- Manages reputational risk associated with climate

Business Group Heads

- Develop and expand climate-related products, services and client solutions
- Work with clients on climate-related goals and transition plans

Chief Risk Officer

- Embeds climate into the Enterprise Risk Appetite Framework
- Measures financed emissions and conducts scenario analysis
- Identifies, assesses, manages and mitigates climate-related risks

Chief Legal Officer

- Responsible for advising on legal, regulatory, governance and reputational matters related to climate change

Chief Financial Officer

- Responsible for financial reporting, including TCFD disclosures, and establishing and maintaining adequate internal controls

Enterprise Climate Strategy Steering Committee

Coordinate and advise on climate efforts with Enterprise Strategy, Business, Risk, Finance & Law, supported by key enablers.

Enablers

Thought Leadership (Office of the CEO)

- Produces economic research and insights to help clients and communities understand the forces shaping the net-zero economy
- Convenes stakeholders to stimulate and effect meaningful action and progress

Technology & Data

- Advances enterprise climate data strategy and capabilities to support client needs
- Ensures access to sufficient data to meet reporting needs and future regulatory requirements

Board oversight

Kathleen Taylor
Chair of the Board,
Royal Bank of Canada

The effects of climate change are increasingly evident in Canada and around the world. And while no single institution or sector has the resources to tackle climate change alone, RBC will continue to contribute meaningfully to reduce and eliminate GHG emissions from economic activity. It's a strategic imperative borne not only out of necessity, but ambition. Because we firmly believe that an orderly and just transition to a net-zero world can lead to a more inclusive, sustainable and prosperous future for RBC clients, communities and colleagues.

As part of the Board's oversight responsibilities and to support the Bank's commitment, the Board actively engages management on the direction of its climate strategy so that opportunities and risks are fully considered, and the interests of the Bank's stakeholders, including shareholders, are fully considered. We also review and continue to refine Board engagement on climate-related matters to keep pace with rapidly evolving scenarios and expectations, and ensure RBC continues to benefit from industry-leading governance practices.

The Board approves the Bank's climate strategy and its ongoing efforts to ensure we all thrive and prosper in a healthier environment and cleaner economy. The Bank's efforts will help accelerate a coordinated transition to a net-zero world.

Climate strategy and oversight

The Board oversees RBC's strategic planning process, the identification and management of risks to our business, and our enterprise approach to environmental and social (E&S) matters. RBC's enterprise approach to our climate change action plan was an important area of focus for the Board in 2021. It included evaluating RBC's strategy for clarity and viability, and assessing the measurement and milestones necessary to gauge meaningful progress. The Board carefully assessed whether management's sustainability commitments and plans appropriately balanced strategic opportunities with risk discipline, and aligned with our Purpose – to help clients thrive and communities prosper. It also recognized the need to align RBC's ambitions with the broader aspirations of society for a well-coordinated transition to net-zero, ensuring our efforts best serve the national and regional interests where we operate.

The Board actively engaged with the CEO, Group Executive and members of the Climate Strategy Steering Committee on the RBC Climate Blueprint[4], which is our climate strategy, our Net-Zero Banking Alliance commitments,[3] measuring and reporting our financed emissions and on solutions, product innovation and advice to support our clients' transitions to net-zero.

Board oversight

Committee oversight

The **Risk Committee** oversees significant and emerging risks to RBC, including climate risks. Our board-approved Enterprise Risk Appetite Framework requires consideration of E&S risks, including climate risks, when making risk management decisions, and in its Climate Blueprint, RBC commits to refining our climate risk appetite. Members of the Committee engaged with the Chief Risk Officer on climate risk management to ensure these risks were embedded in our risk frameworks, policies, and procedures and received regular updates and reporting on climate risk throughout the year. In 2021, the Audit and Risk Committees also met jointly to discuss the results of our annual enterprise-wide stress testing, which factored in physical and transition risks for the first time.

The **Governance Committee** advises the Board on ESG matters, including on climate, and the status and adequacy of efforts to ensure RBC's business is conducted to meet high standards of ethics and E&S responsibility. The Committee oversees RBC's corporate citizenship strategy, which includes RBC Tech for Nature,[8] one of our four signature initiatives. The Committee approved this TCFD Report[9] and our 2021 ESG Performance Report[10]. It received updates on regulatory and political developments related to climate change and trends in investor and proxy advisor perspectives.

The **Audit Committee** oversees our financial reporting, internal control over financial reporting and disclosure controls and procedures. It reviewed and recommended for Board approval our 2021 Annual Report,[11] which includes disclosure of RBC's E&S risks as well as TCFD-related disclosure in the 2021 Annual Report.

The **Human Resources Committee** oversees RBC's compensation principles, policies and programs, and recommends for approval by the Board the CEO and Group Executive (GE) compensation. Committee members considered ESG factors, including environmental sustainability and social and governance results in their evaluation of CEO and GE 2021 performance against Risk and Strategic objectives in our short-term incentive program.

Directors' expertise in ESG and climate education

To best support the Bank in achieving its Purpose to help clients thrive and communities prosper, all director nominees are required to have experience in ESG matters. Our directors have acquired this experience in a variety of ways, including through their professional experience or their educational background. With regard to environmental matters, expertise is derived from experience as senior executives, directors or advisors of large energy or natural resources companies or at organizations focused on climate- or sustainability-related matters.

Effective climate oversight and board engagement require directors to keep pace with the rapidly evolving and complex climate landscape. To that end, the Board, in addition to regularly engaging with management, received external perspectives and insights, including an education session on climate change in the global context and key considerations for boards of directors. A number of directors also attended ESG and climate-related seminars and educational sessions, including those offered by the Canadian Institute of Corporate Directors, the U.S. National Association of Corporate Directors and the Global Risk Institute. As well, our directors also participated in external conferences related to ESG, which included climate change, in 2021.

See page 31 for Our approach to environmental, social and governance matters and page 41 for how we are Helping directors succeed in their roles in our 2022 Proxy Circular.

Management oversight

RBC Group Executive (GE) is responsible for implementing the enterprise climate strategy, the RBC Climate Blueprint.[4] GE has taken steps to further anchor climate in our management structure and business models throughout the enterprise. Our key businesses have an assigned executive to climate change and are configured to address the sustainable financing, investment and client needs associated with the net-zero transition.

In 2021, we also formed the new executive Climate Strategy Steering Committee and created the Climate Strategy and Governance (CS&G) team sitting under the Chief Administrative and Strategy Officer. Working together, they take a coordinated enterprise approach to accelerate our climate ambitions, targets and public engagement, working with a broad set of RBC leaders to ensure full RBC alignment and coordination on our climate strategy and actions.

Below is a detailed description of a number of key groups across RBC that have specific accountabilities for climate-related matters:

Chief Administrative & Strategy Officer

Responsible and accountable for RBC's enterprise climate change strategy and the coordination of our enterprise-wide reporting, stakeholder engagement and communications on climate. The CS&G team established in 2021 sits within CAO. Corporate Real Estate and Procurement are key functions within CAO and responsible for driving our net-zero ambitions in our global real estate portfolio and supply chains. Corporate Citizenship is responsible for RBC's global Citizenship mandate, overall ESG strategy, reporting, corporate donations and employee volunteer programs.

Chief Risk Officer

Oversees the management of E&S risk such as climate change, and has a dedicated E&S team responsible for identifying, assessing, managing and, where possible, mitigating issues that may pose a risk to RBC. The E&S team is focused on embedding climate risk assessment into our existing risk framework, building our emissions baseline, building out scenario analysis capabilities and implementing our plan for achieving net-zero in the loan book by 2050.

Chief Financial Officer

Oversees preparation of RBC's Annual Report[11], which includes TCFD disclosures. Together with the CEO, responsible for establishing and maintaining adequate internal control over financial reporting, supported as applicable by GE members and other senior management.

Chief Legal Officer

Responsible for advising on legal, regulatory, governance and reputational matters arising across all jurisdictions in which RBC operates. Oversees Law Group's advice related to mitigating climate risks and advancing its climate opportunities, including advising on products and services that are helping clients transition to net-zero, engagement with stakeholders, RBC's operations and suppliers, as well as climate disclosure and reporting.

RBC Capital Markets (CM)

Responsible for integrating ESG factors into RBC Capital Markets' core platforms. The CM Sustainable Finance Group[12] focuses on providing advice and delivering solutions that help advance their clients' own ESG strategies to access the sustainable finance market.

RBC Wealth Management[13]

RBC Wealth Management's Responsible Investing team coordinates activities under the Responsible Investing umbrella within RBC's Wealth Management global businesses. This includes interacting with our investment teams as they integrate ESG and climate factors into their investment processes, educating our Investment Advisors and producing thought leadership.

The RBC Global Asset Management[14] (RBC GAM) Corporate Governance and Responsible Investment (CGRI) team is responsible for implementing our responsible investment activities, stewardship activities, client reporting and product development.

Personal and Commercial Banking (P&CB)

P&CB has established a Climate Strategy team responsible for embedding climate strategy and priorities across our P&CB lines of business. They focus on helping clients transition to net-zero through products, services and advice.

Strategy

Strategy

Taking action on climate change is not only the right thing to do, it's also a driver of business strategy and innovation, and an opportunity to grow our business. We are strategically aligned across the organization to harness the full capabilities and strength of RBC and together, are committed to accelerating change to support clients, communities and governments.

Christoph Knoess
Chief Administrative
& Strategy Officer,
Royal Bank of Canada

Global plans to drastically reduce greenhouse gas emissions to achieve net-zero by 2050 requires the largest change to our economies in our lifetime, one that RBC is fully committed to supporting.

In 2021, we asked big questions about what is important to us, our stakeholders and society at large. We worked with key stakeholders and peers to better understand and define our role as a financial institution in supporting the net-zero transition. This exercise helped us identify where we need to strengthen our enterprise strategy and supporting goals, plus it helped to validate many of our current actions.

The RBC Climate Blueprint[4] (Blueprint) is our enterprise climate change strategy to accelerate clean economic growth and support our clients in an inclusive transition to a net-zero economy. The Blueprint was updated in 2021 and now outlines four strategic priorities that are anchored by our strengths in finance, investment, risk management, innovation, economic and policy research, and community investments.

In 2021, we committed to aligning our lending activities to net zero emissions by 2050, which also aligns with the global goals of the Paris Agreement[15]. To support our net-zero ambition, we joined the NZBA[3], a global, industry-led initiative to accelerate and support efforts to address climate change. Joining NZBA reinforces our commitment to play a significant role in financing the climate transition and supporting collaborative approaches between the public and private sectors to reach net-zero.

It is a time for action, which is why along with Blueprint commitments, we also present in this report details on our net-zero goals and examples of how our strategy is creating impact today. We will enhance our strategy over time as new climate scenarios, client demand and stakeholder expectations evolve. We also recognize the critical role that regulators and governments must play to support and facilitate pathways to net-zero emissions. Canada's net-zero commitment by 2050 is legally binding, and as part of this, the government must plan and regularly report on the path to net-zero emissions. We look forward to seeing ambitious national policies to align with this goal.

Strategy

Our Purpose

To help clients thrive and communities prosper

Our Climate Ambition

To accelerate clean economic growth and support our clients in an inclusive transition to net-zero by 2050

RBC Climate Blueprint

Our Strategic Priorities	Our Actions and Commitments		
Help clients as they transition to net-zero	Work with our clients to understand and support their transition plans and **facilitate $500 billion in sustainable financing by 2025**[16]	**Expand our products, services and client solutions** to help businesses and individuals accelerate their climate goals and overcome barriers for adoption	**Provide more investment options for clients** with climate-related objectives and more tools for investment teams to understand climate-related risks and opportunities
Hold ourselves accountable	**Achieve net-zero emissions in our lending by 2050,** with interim targets aligned with our clients' plans and NZBA commitments, with transparent measurement and reporting	**Further embed climate factors and data in our decision-making** to anticipate future impacts within our enterprise risk appetite and make client-by-client decisions	**Partner with our industry peers, standard setting bodies, government and other players** to advance shared methodologies, accounting frameworks and disclosure best practices
Inform and inspire a sustainable future	**Produce research on climate issues and policies, and convene stakeholders** to stimulate and effect meaningful actions and incentives for progress across all sectors	**Foster climate innovation including new investment vehicles and platforms such as RBC Tech for Nature™,** our pledge of $100 million by 2025 to universities and charities developing solutions to address climate change[8]	**Champion and support climate literacy and awareness** to accelerate the pace and scale of the climate transition across all parts of society
Advance net-zero leadership in our own operations	**Reduce greenhouse gas emissions by 70% by 2025**[5]	**Increase our sourcing of electricity from renewable and non-emitting sources to 100% by 2025**	**Maintain carbon neutrality in our global operations** with a decreasing reliance on offsets annually

Help clients as they transition to net-zero

We are partnering closely with our clients, through the provision of advice and sustainable finance products and services, to help them achieve their sustainability objectives and support global efforts to lower GHG emissions. We believe these efforts will have a meaningful impact in successfully achieving net-zero and supporting economic prosperity

Lindsay Patrick
Head, Strategic Initiatives & ESG, RBC Capital Markets

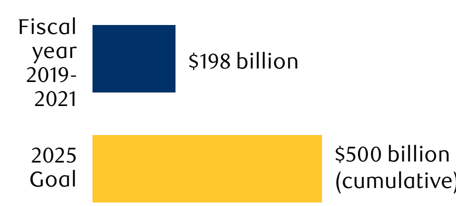
Sustainable Finance

In April 2019, RBC announced a commitment to provide $100 billion in sustainable finance by 2025, and after just two years we surpassed that goal. In 2021, we increased our commitment to provide $500 billion in sustainable finance by 2025.[16] As part of achieving this goal, RBC has a number of business-specific strategies to integrate ESG factors into its core business platforms.

Figure 2: RBC's sustainable financing progress to date

Performance metrics[16]	2021	2020	2019
Credit extended to eligible clients and projects[17]	**$7.3 billion**	$8.8 billion	$7.4 billion
Value of green loans and sustainability-linked loans[18]	**$17.5 billion**	$2.9 billion	$1.2 billion
Value of sustainable bonds underwritten[19]	**$15.6 billion**	$5.9 billion	$4.8 billion
Capital raised for eligible clients and projects[20]	**$7.4 billion**	$3.9 billion	$3.4 billion
Value of M&A deals for eligible clients and projects[21]	**$9.8 billion**	$13.5 billion	$1.1 billion
Value of eligible U.S. municipal bonds underwritten[22]	**$23.0 billion**	$36.5 billion	$21.4 billion
Tax credit investments closed[23] in affordable housing	**$0.9 billion**	$1.5 billion	$1.4 billion
Tax credit investments closed[23] in renewable energy	**$0.2 billion**	$0.3 billion	$0.1 billion
Value of sustainable bond holdings[24]	**$2.1 billion**	N/A	N/A
Structured notes[25]	**$0.01 billion**	N/A	N/A
Total value of sustainable finance	**$83.8 billion**	**$73.3 billion**	**$40.8 billion**

Progress on our commitment to provide $500 billion in sustainable financing by 2025



Help clients as they transition to net-zero

Capital Markets

RBC Capital Markets integrates ESG factors into its core capital markets platform. The Sustainable Finance Group[12] works in collaboration with partners across RBC Capital Markets to deliver advice and solutions to clients, including coordinating green, social and sustainability-linked financial products, structured investment solutions that integrate ESG factors, advisory on best practices in ESG integration in corporate strategy and investment management, ESG due diligence advisory for private equity and M&A transactions, and alignment of reporting practices with sustainability standards.

Sustainable finance & advisory

Our 2021 performance in the sustainable finance market builds on our longstanding efforts to support the development and the growth of the green bond market.

- RBC Capital Markets was the number one dealer in underwriting green bonds and maintains the largest market share of Canadian public sector green bond deals in Canada.[26]
- Launched the ESG Credit Group within RBC Capital Markets. The team works closely with the Sustainable Finance Group, Loan Portfolio Management, Corporate Banking and Enterprise Risk to integrate ESG considerations into the lending process and support the measurement of financed emissions from our lending activities.
- RBC also created the Energy Transition Working Group within RBC Capital Markets. The group's mandate is to originate and execute equity, debt and advisory mandates to capitalize on the build out of a lower carbon energy future.
- RBC hosted our first annual ESG Conference and our eighth annual Sustainable Debt Conference, bringing together industry leaders, investors and companies to share best practices.

Public sector finance

Investments in infrastructure are required to mitigate and adapt to climate change through the expansion of public electric-vehicle-charging stations, increased investments in public transit and measures to adapt roads and buildings to improve resilience to flooding, fires and sea-level rise.

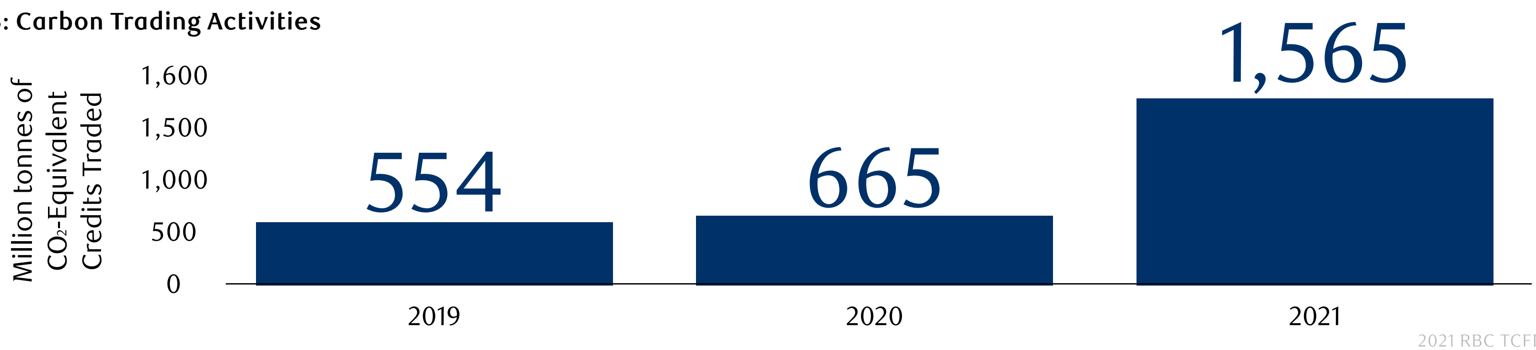
RBC community investments

- **Tax equity investments in renewable energy**[27]**:** Our Community Investments group provides equity for low income housing and renewable energy technologies through tax credit programs in the U.S. As of October 31, 2021, this team has financed over 2.1 gigawatts of energy capacity generated by 35,000 renewable energy assets since inception in 2015.

Environmental commodity trading[28]

- RBC recognizes the important role of market-based approaches to reducing GHG emissions and, through its Environmental Commodities Desk established in 2008, was the first Canadian bank to participate in the carbon markets. RBC continues to be active in the North American and European carbon markets, trading over 1.5 billion tonnes of CO_2-equivalent credits in 2021, a growth of 135% over fiscal year 2020.

Figure 3: Carbon Trading Activities



Help clients as they transition to net-zero

Case Study // Recent examples of sustainable and transition financing

Ford

US$2,500,000,000

Green Bond
3.250% due 2032

Joint Active Bookrunner
November 2021

United Kingdom Debt Management Office

£6,000,000,000

Green Bond
1.500% due 2053

Joint Lead Manager
October 2021

SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL Company

US$1,248,019,000

364-Day Senior Unsecured
Green Term Loan
Use of proceeds related to wildfire mitigation programs

Administrative Agent & Green Loan Structuring Agent
May 2021

TELUS

C$750,000,000

Sustainability-Linked Bond
2.85% due 2031
Coupon linked to GHG emission reduction target

Joint Bookrunner & Lead Structuring Agent
June 2021

VATTENFALL

€1,600,000,000

Sale of 49.5% stake in the Hollandse Kust Zuid offshore wind farm

Exclusive Financial Advisor
June 2021

Couche-Tard

US$350,000,000

Green Bond
3.625% due May 2051
Use of proceeds related to clean transportation, energy efficiency, renewable energy, pollution prevention & control, sustainable water & wastewater management, and green buildings

Joint Active Bookrunner & Co-Green Bond Structuring Agent
May 2021

Help clients as they transition to net-zero

Wealth Management

ESG is increasingly important to our clients – whether they are focused on partnering with a wealth manager that shares their values, using their personal wealth for positive impact, or understanding the long-term benefits of ESG-based investment. Our clients put their trust in us and we feel a responsibility to provide them with investment advice, products and solutions that align with their values, including global climate goals to achieve net-zero emissions by 2050 or sooner.

Melanie Adams
VP & Head, Corporate Governance & Responsible Investment,
RBC Global Asset Management

Responsible Investing

Our commitment to integrating material ESG factors into our investment approach spans all of RBC Wealth Management (WM).[13] Some examples include:

- **RBC Global Asset Management[14] (RBC GAM):** RBC GAM's investment teams oversee $597 billion in assets under management, and all teams integrate material ESG factors into their investment approach. GAM publishes an annual TCFD report on climate-related risks and opportunities that includes disclosures on GHG emissions and climate scenario analysis for assets under management.
- **InvestEase responsible investing:** RBC InvestEase[29] is an online investment management service that simplifies investing and adds the expertise of real advisors. Their portfolios include Responsible Investing Portfolios, which are built with a focus on companies that score highest on a wide range of ESG factors, including GHG emissions, labour management, product safety & quality, and business ethics. These portfolios are ideal for clients wanting to make a positive impact on the world without necessarily sacrificing returns.
- **Thought leadership and education:** WM and RBC GAM published several publications and newsletters to aid advisors and clients in responsible investing. Understanding the different forms of responsible investing and how to apply them to a portfolio is at the core of any conversation.
- **Managed solutions:** In 2018, RBC U.K. Wealth Management launched the first discretionary ESG portfolio, RBC Global ESG Solution Suite. In 2019, RBC U.S. Wealth Management (USWM) launched RBC ESG Select Portfolios.[30] In 2020, USWM began refining and expanding its suite of responsible investing solutions, and WM Canada launched RBC Multi-Asset Portfolio Solutions ESG Global Balanced Portfolio.[31]
- **ESG consideration in equity portfolios:** The Portfolio Advisory Group (PAG)[32] performs research on and constructs equity portfolios. In early 2020, they began formally considering ESG factors when building these portfolios. This is an important step towards ESG integration. PAG is now considering ESG factors when making investments and plans for further integration in the years to come.

Help clients as they transition to net-zero

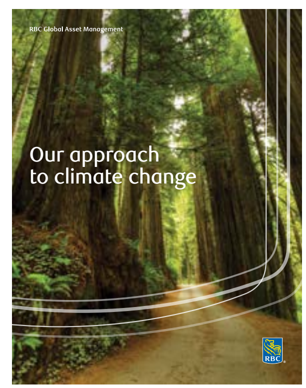
Global Asset Management

RBC GAM supports the global goal of achieving net-zero emissions by 2050 or sooner. We also recognize and support the need to achieve a just and orderly transition to net-zero that promotes widely shared economic prosperity.

We believe integrating ESG factors into our investment approach may help enhance the long-term, risk-adjusted performance of our portfolios and supports our fiduciary duty. Climate change is one such factor. Our approach to climate change lays out the commitments and actions we are taking: integrating climate-related risks and opportunities in our investment approach, using active stewardship to actively engage on climate-related issues and providing climate-based solutions and reporting that meet the needs of our clients.

In 2021, RBC GAM undertook a number of activities to advance our commitment to climate change:

- **Published** our net zero ambition. This confirms RBC GAM's support for the global goal of achieving net-zero emissions by 2050 or sooner, and establishes commitments to measure and monitor net-zero alignment of our investment approach, provide transparency and disclosure on net-zero to our clients and maintain net-zero operations.
- **Measured and monitored portfolio GHG emissions**, asset stranding risk, temperature alignment, and conducted scenario analysis for 100+ core equity and fixed income funds on a quarterly basis.
- **Continued to build climate change knowledge and expertise** within our investment teams, our advisor network and clients. Includes the publication of insights and thought pieces on our website, dedicated internal training sessions and an internal climate education series featuring external speakers and experts on various climate-related topics.
- **Conducted portfolio GHG emissions analysis and climate scenario analysis** for RBC GAM assets under management, as described in the RBC GAM TCFD Report 2021.
- Participated in collaborative engagements with several issuers as part of Climate Action 100+.[33]
- Became a founding participant in Climate Engagement Canada,[34] an investor-led initiative focused on engaging collaboratively with Canadian companies to advance Canada's transition to a net-zero economy.
- Became a founding signatory to the Canadian Investor Statement on Climate Change,[35] which demonstrates the collective ambition and action of Canadian investors in recognizing the need to accelerate the transition towards a net-zero economy.
- Provided climate-based products and solutions to meet clients' investment goals. This included providing thematic climate strategies to clients in certain jurisdictions, and providing clients with bespoke reporting on climate-related metrics.
- Published our second RBC GAM TCFD Report 2021.



Help clients as they transition to net-zero

Personal & Commercial Banking

Supporting our enterprise climate ambitions, P&CB has delivered key products to enable our clients' climate journey, including Electric Vehicle loans, energy saver loans, the InvestEase responsible investing portfolio and the market-linked ESG GIC. Going forward, we will continue to be a climate leader in the market with content, advice, products and solutions for our personal and business clients.

Dave Mun
SVP, Strategy, Performance & Marketing,
RBC Personal & Commercial Banking

Personal & Commercial Banking (P&CB) has formed a Climate Strategy team responsible for embedding climate strategy and priorities across our P&CB lines of business and is focused on helping clients transition to net-zero through products, services and advice. The team also identifies and executes on opportunities to reduce P&CB's operational and financed emissions.

Lending & Advisory
Opportunities to support Personal & Commercial Banking clients in the net-zero transition are emerging:

- RBC maintains strong partnerships with vehicle manufacturers to provide key financing options for hybrid and electric vehicles. In 2019, we launched the Clean Energy Vehicle Financing Program[36] to further support our clients who want to purchase low- and zero-emissions vehicles. The amount of financing that we provide annually for hybrid and electric vehicles has more than doubled between 2018 and 2021.
- **Energy retrofit financing[37]:** As governments introduce new energy retrofit rebate programs for homeowners and commercial building owners, corresponding lending and advice solutions become an opportunity; we provide support to help homeowners kick start the process with resources on arranging home energy audits.
- **Clean technology advisory and lending solutions[38]:** RBC is one of the only Canadian financial institutions with a dedicated, national cleantech practice through RBCx, the technology and innovation banking group of RBC. To support the growth of this sector, we work with a number of partners, such as MaRS Discovery District, Export Development Canada (EDC), Business Development Canada (BDC), Sustainable Development Technology Canada (SDTC) and various cleantech venture capital firms in the ecosystem, to identify and overcome the hurdles to commercialization.

Savings & Deposits
RBC is exploring opportunities to enable Personal & Commercial Banking clients to deploy their funds to support the net-zero transition:

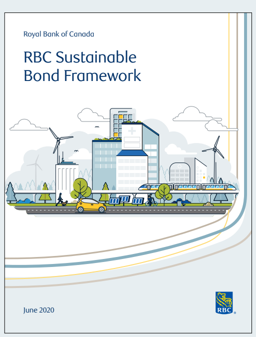
- **ESG Market Linked GIC[39]:** In July 2021, P&CB, in partnership with RBC Capital Markets, launched the RBC ESG Market-Linked GIC. To be included in the index, all companies must pass a set of rigorous ESG standards.

Help clients as they transition to net-zero

Case Study // Our US$750 million green bond

In July 2021, we announced the successful completion of a five-year US$750 million green bond offering.[40] The transaction is RBC's second green bond offering, following its inaugural EUR500 million five-year green bond in 2019. The proceeds will finance or refinance a portfolio of assets primarily in the categories of renewable energy, green buildings, sustainable land use and clean transportation. The joint lead managers represent broker dealers owned and/or operated by leaders across underrepresented groups, including people of colour, women and service-disabled veterans.
The engagement of these diverse broker dealers in the transaction elevated the offering, facilitating allocations into unique pockets of demand and further enhancing distribution.

Importantly, it represents RBC's first issuance through its Sustainable Bond Framework, which was launched in 2020 as part of RBC's commitment to advancing our sustainable finance and ESG leadership.



For more information visit:
RBC $750M Green Bond deal

Hold ourselves accountable

In line with our vision of being one of the world's most trusted and successful financial institutions, we are committed to transparent disclosures that highlight our progress against our climate strategy. Our TCFD Report is a key component of our overall suite of ESG-related disclosures which we are continuously evolving to provide our stakeholders with enhanced data and deeper insights.

Nadine Ahn
Chief Financial Officer,
Royal Bank of Canada

Financed emissions

In 2021 RBC joined the Partnership for Carbon Accounting Financials (PCAF)[41] to align with a globally recognized GHG emissions accounting and reporting standard and advance our capabilities in measuring the emissions associated with our lending and investments (GHG Protocol, Scope 3, category 15, "financed" emissions).[42] As of January 2022, over 190 financial institutions representing over $57 trillion in total assets are members of PCAF.

The PCAF accounting methodology covers six asset classes: Listed Equity and Corporate Bonds; Business Loans and Unlisted Equity; Project Finance; Commercial Real Estate; Mortgages; and Motor Vehicle Loans.

Although the accounting methodology for measuring the emissions of each of these asset classes differs in certain respects, consistent across them all is a recognition that the financed emissions calculation is based on varying levels of data accuracy. Figure 5 sets out the five PCAF quality scores, which range from 1 (more certain) to 5 (less certain).

PCAF's accounting standard uses a basic attribution principle whereby a portion of a borrower's or investee's annual emissions, as determined by the ratio of (a) the outstanding amount of loans and investments of a financial institution (numerator) to (b) the total equity and debt of the company, project, etc. that the financial institution is invested in (denominator). For example, if RBC extends a mortgage to a homeowner where the home value is $500,000 and the outstanding amount of the mortgage is $250,000, the value of the emissions attributed to RBC (RBC's financed emissions for the mortgage loan) would equal 50% of the total emissions for the home.

Figure 4: General approach to calculate financed emissions

$$\text{Financed emissions} = \sum_i \text{Attribution factor}_i \times \text{Emissions}_i$$

(with i = borrower or investee)

Figure 5: PCAF general data quality score card[43]

More Certain

PCAF Data Scores	Description
Score 1	Audited GHG emissions data or primary energy data
Score 2	Non-audited GHG emissions data or other primary data
Score 3	Averaged data that is peer/(sub-)sector specific
Score 4	Proxy data on the basis of region or country
Score 5	Estimated data with very limited support

Less Certain

Hold ourselves accountable

Financed emissions

We have conducted an initial measurement of the emissions associated with our portfolio across all six PCAF asset classes. This first disclosure represents our clients' Scope 1 and 2 emissions (see Figure 6). For this exercise we have combined two of the six assets classes, business loans and project finance, as the calculation methodology is similar for both asset classes.

Due to limitations in emissions data availability, this first disclosure for all six asset classes is overwhelmingly at PCAF data quality Score 5 (see Figure 7), which PCAF defines as uncertain (estimated data with very little support). Consequently, we are viewing our initial results as estimates of our total financed emissions. Our goal is to improve our data quality score over time, as both emissions data availability and our capabilities related to measuring our financed emissions improve.

Initial results

In total our initial estimates are that RBC's portfolio of financed emissions account for approximately 45MtCO_2e, with business loans and project finance collectively representing 83% of our total financed emissions.[44]

Our residential mortgage portfolio makes up our second largest contributor of financed emissions by PCAF asset class, accounting for 7% of our total financed emissions. Business loans, project finance and mortgages combined make up 90% of RBC's total financed emissions.

The relevance of data quality

As mentioned above, financed emissions calculated using PCAF data quality Score 5 may be materially different from financed emissions calculated using PCAF data quality Score 1. Data quality Score 5 primarily uses estimated data with very little support. PCAF data quality Scores 1 and 2 use primary data (data collected from first hand sources), which is currently very limited and only available for certain clients within a small number of industry sectors. PCAF data quality Scores 3 and 4 represent additional, varying degrees of certainty, which we will be evaluating as we move forward with this work.

Figure 6: Initial estimates of RBC's financed emissions by asset class[44]

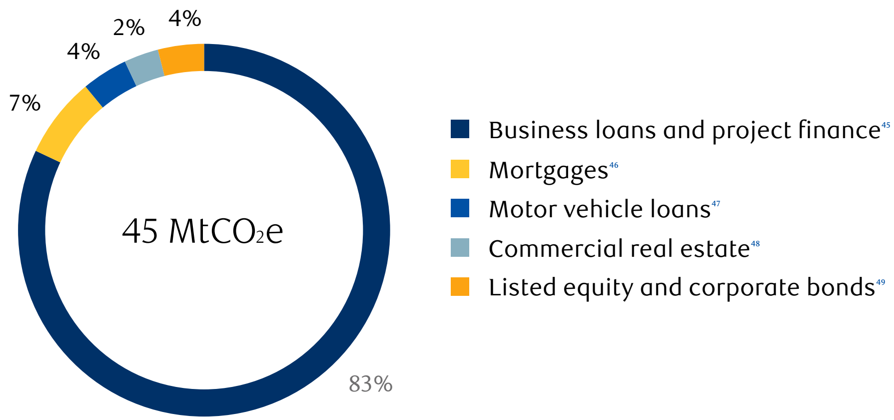
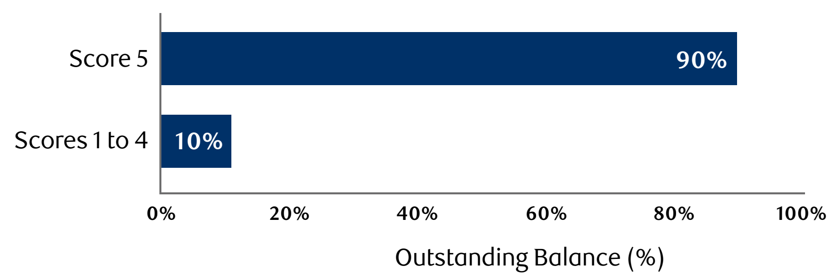


Figure 7: PCAF data quality score for initial estimates of financed emissions



Hold ourselves accountable

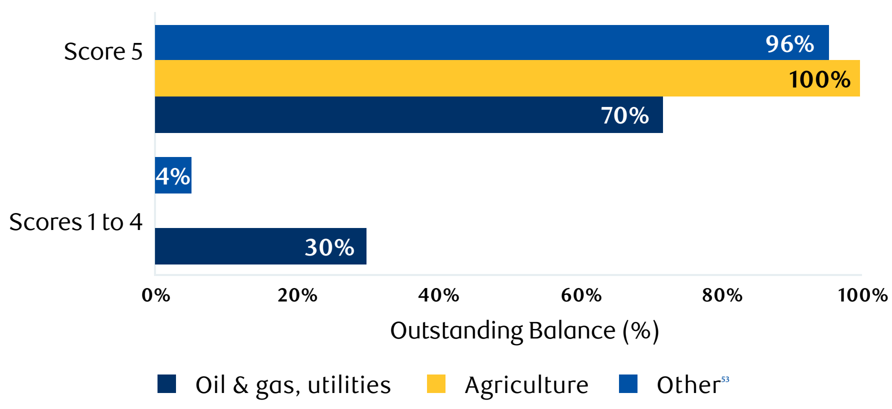
Business loans[45] and project finance

Business loans and project finance represent a significant majority of RBC's financed emissions. Based on the guidance from the PCAF standard this asset class is comprised of business loans and lines of credit for general corporate purposes that are not traded on a market and are held on RBC's balance sheet. Revolving credit facilities, overdraft balances and business loans secured by real estate, such as CRE-secured lines of credit, are also included. Off-balance sheet loans and lines of credit are excluded. Unlisted equity is not currently measured as part of the business loan measurement.

Data availability

The availability of data to measure financed emissions at a higher, more accurate PCAF data quality score differs considerably depending on the sector (see Figure 8). In sectors such as oil & gas and utilities, many of our borrowers and investees are disclosing their Scope 1 and Scope 2 emissions, which RBC in turn uses to measure our financed emissions. Because these Scope 1 and 2 emissions data are reported they have a higher data quality score and are more accurate and reliable. By contrast, for other sectors (for example, agriculture) reported emissions data is not readily available, which means that RBC has to use PCAF sector-based data (averages), at PCAF data quality Score 5, to measure our financed emissions. Improving our data quality score is a key area of focus for RBC, and we will continue to work toward improving our data quality by working closely with others including with PCAF, as well as with clients on enhancing their reporting transparency.

Figure 8: PCAF data quality score for initial estimates of RBC financed emissions in business loans and project finance

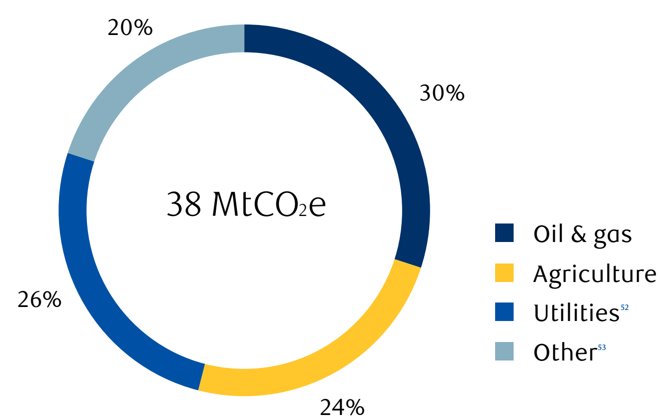


Our top three emitters: oil & gas, agriculture and utilities

Measuring our financed emissions has given us an initial look at the financed emissions broken down by sector, within the business loans and project finance PCAF asset classes. This has helped us to prioritize specific areas of our portfolio as part of our net-zero strategy.

We are collaborating with our clients, governments, environmental groups, organizations such as PCAF[41], RMI[50] and B4ICA[51], as well as groups across the global financial sector to improve our data, tools and capabilities to measure financed emissions across sectors and develop pathways toward reducing global emissions.

Figure 9: Initial estimate of emissions from RBC's business loans and project finance[45]



Hold ourselves accountable

Net-zero lending

Achieving net-zero emissions in our lending will require absolute GHG emissions reductions across a number of key sectors that are both high-emitting and critical to the Canadian economy. These sectors include, but are not limited to, oil & gas, utilities, agriculture, industrial products, transportation and mining & metals.

It is our ambition to capture a disproportionate share of the business opportunity presented as the economy works to decarbonize. We are encouraged to see that many of our clients in these key sectors are committing to reducing their GHG emissions, accelerating meaningful action and making multi-decade investments in cleaner production and products, and alternative energy sources. And we believe that clients who are strategic, have credible GHG emissions reduction plans and execute those plans will be successful in the net-zero transition. The challenge is how to accelerate the transition with a focus on getting to net-zero with a sense of urgency while at the same time managing and planning complex change across geographies and economies.

The early actions we are taking related to our net-zero lending commitment focus on understanding and tracking our clients' plans to reduce GHG emissions, plans that aggregate up to our targets with a view of net-zero by 2050. This includes consideration of client and sector-level emissions (absolute- and intensity-based), client GHG emissions reduction plans and progress in achieving them, being mindful of sectoral transition pathways. We will continue to work with clients to help them improve transparency and reporting and, where appropriate, make this a requirement of the financing relationship. We will continue to evaluate clients on several key factors through our Environmental and Social Risk Management process with client-by-client risk decisions. We disclose what we will and will not finance through our published Policy Guidelines for Sensitive Sectors and Activities.

Our path forward

As the next step in our journey towards net-zero lending by 2050, we will work with our clients to support their climate-related disclosures and decarbonization plans. Having established an initial view of our financed emissions through the PCAF methodology, and in line with our NZBA commitments, we are initially prioritizing our efforts to focus on key high-emitting sectors within our portfolio. Focusing our actions will support us in delivering meaningful progress towards our climate goals and to improve data accuracy, given the constraints we currently face within businesses, sectors, and clients that are at varying levels of maturity with respect to data, technologies, disclosures and transition plans.

Figure 10 presents the early actions we are taking to manage our business in a way that is consistent with the net-zero lending goal in the RBC Climate Blueprint[4] and our commitments under the NZBA[3]. With the support and actions from other stakeholders such as governments, industry bodies and our peers in the financial sector, we believe that our new commitments are aligned with the efforts required to achieve our goals.

Hold ourselves accountable

Figure 10: Net-zero lending plan

Hold ourselves accountable

Achieve net-zero emissions in our lending by 2050, with interim targets aligned with our clients' plans and NZBA commitments, with transparent measurement and reporting

Further embed climate factors and data in our decision-making to anticipate future impacts within our enterprise risk appetite, and make client-by-client decisions

Partner with our industry peers, standard-setting bodies, government and other players to advance shared methodologies, accounting frameworks and disclosure best practices

How do we plan to do this?

We have established the following specific goals for certain key high-emitting sectors[2], in accordance with our NZBA commitments:

- In 2022, we will update our primary enterprise-wide Environmental and Social Risk Policy to reflect our enhanced climate commitments and objectives as well as the strategic choices we are already making towards these goals.
- For Capital Markets clients in high-emitting sectors in our oil & gas, power & utilities, and automotive & transportation portfolios, we will endeavor to have by the end of fiscal 2025:
  - Clients representing 80% of available loan balances[6] reporting their Scope 1 and 2 emissions to RBC.
  - Clients representing 65% of available loan balances[6] disclosing a plan to reduce their GHG emissions to RBC.
- By the spring of 2023, or earlier if possible, we intend to disclose interim financed emission reduction targets for clients in high-emitting sectors in our oil & gas, power & utilities, and automotive & transportation portfolios. Subsequently within 12 months of disclosing such targets, we will disclose how we are advancing plans to achieve those targets.

We have chosen to focus on Capital Markets clients in high-emitting sectors within our oil & gas, power & utilities, and automotive & transportation portfolios at this time because they represent a significant portion of the emissions in our overall portfolio, and client-level emissions data and transition scenarios are more readily available. As we progress along our net-zero journey, we will expand our efforts to obtain this information from other sectors and clients as part of meeting our broader commitments under the NZBA.

What have we already accomplished?

- In October 2021, RBC joined the NZBA, a global, industry-led initiative to accelerate and support efforts to address climate change.
- We have initiated systematic, climate-focused client engagements in key high-emitting sectors[2] and other sectors to understand where our clients are on their transition journey and how we can help.
- We have built and expanded our internal capabilities and knowledge to better support our clients in their transition journey.
- We have published Policy Guidelines for Sensitive Sectors and Activities, which includes clear guidelines on our lending activities to clients and projects operating in the coal power and mining sectors, Arctic and UNESCO World Heritage Sites.
- We have developed internal systems and capabilities to provide an initial view into our financed emissions. We have disclosed, for the first time, financed emissions data associated with a large proportion of our exposures using the PCAF methodology.

Hold ourselves accountable

Case Study // RBC joins Net-Zero Banking Alliance

In October 2021, RBC joined the Net-Zero Banking Alliance (NZBA), a global, industry-led initiative to accelerate and support efforts to address climate change.[3] We joined the NZBA as we believe global banking collaboration is key to driving collective and credible progress toward achieving net-zero emissions by 2050. The NZBA will also provide a structured forum to support banks' and our clients' transition to net-zero in an inclusive way that takes account of such things as the resource-based and export-oriented nature of the Canadian economy. Also of key importance is the NZBA's commitment to a just and orderly transition to net-zero that will strengthen individuals, communities and economies.

As we work to advance our climate goals and NZBA goals, external factors outside of RBC's reasonable control may act as constraints on their achievement, including varying decarbonization efforts across economies, the need for thoughtful climate policies around the world, more and better data, reasonably supported methodologies, technological advancements, the evolution of consumer behaviour, the challenges of balancing interim emission reduction targets with an orderly and just transition and other significant considerations such as legal and regulatory obligations.

For more information on NZBA signatory expectations, visit:
Net-Zero Banking Alliance – Frequently Asked Questions

Inform and inspire a sustainable future

We're working with clients, communities, governments, environmental groups and the global financial sector to understand what's needed from each of us to achieve a net-zero future — and to share those insights as widely as we can, because we believe a shared understanding of the challenges can lead us to better solutions for all. And we will continue to fund, partner, listen and bring together communities, Indigenous leadership, technology experts, and public and private sectors to discover and innovate new climate solutions where it matters most.

John Stackhouse
SVP, Office of the CEO,
Royal Bank of Canada

Thought leadership and research

A summary of our key thought leadership and research reports are presented below:

RBC Economics[54]

Provides timely economic forecasts and analysis on important topics and issues.

The $2 Trillion Transition: Canada's Road to Net-Zero.[55] Our flagship net-zero report charts a path through the challenges and opportunities facing Canada in the green transition (see page 31 for summary).

Border Carbon Taxes Are Moving from Idea to Reality. How Exposed Is Canada? This report examines the potential impacts of a carbon-focused international trade environment after the EU announced plans for implementing a border carbon adjustment.

Why Isn't Canada Investing Enough in Green Projects, Despite Ambitious Climate Targets? This report examines where current financial flows are not aligned with the task of decarbonizing the Canadian economy. It offers recommendations on how to broaden and diversify sustainable finance flows in Canada.

Closing the Global Sustainable Finance Gap. In the context of COP26's finance day, we highlighted where Canada has been lagging behind peers and where accelerated sustainable financing for developing nations could help the world meet its emissions targets.

COP26 Summary: Net Zero: A Long Way from Glasgow. Following two weeks of international climate discussions in Glasgow, this report summarizes five key takeaways from the summit for a Canadian business audience.

RBC Disruptors[56]

An RBC podcast series co-hosted by John Stackhouse and Trinh Theresa Do about reimagining Canada's economy in a time of unprecedented change.

The Climate Conversations (special four-part miniseries). The series features provocative insights from the leading thinkers on climate change, including renowned climate scientist Katharine Hayhoe and UN Special Envoy on Climate Action and Finance Mark Carney.

Why Blockchain Holds the Key to a Greener Planet. Blockchain might just hold the key to better climate solutions. In this special Earth Day episode, Disruptors spoke with two experts: Joseph Pallant, founder of the Blockchain for Climate Foundation and director of climate innovation for Ecotrust Canada; and Carolyn DuBois, executive director of The Water Program of The Gordon Foundation.

Charging Ahead: Canada's Role in The E-V Revolution. A deep dive into the rapidly evolving world of EVs. For the first part of the conversation, Sarah Houde, the CEO of Propulsion Quebec, and Kostyantyn Khomutov, the CEO of Ottawa-based GBatteries, discuss the state of play, the opportunities ahead and what needs to happen to take advantage of them. In part two, David Paterson from General Motors Canada gives us a big-picture perspective, and shares his company's vision for a fully electrified future.

Inform and inspire a sustainable future

RBC ESG Stratify™ [57]

ESG Stratify™ encompasses all of RBC Capital Markets' ESG thought leadership and insights, including industry-specific publications from RBC's Equity Research Group to deliver the very latest ESG insights from our industry experts.

The Energy Transition series is comprised of one-hour panel sessions involving executives and industry experts dedicated to improving awareness of various elements of the energy transition, as well as identifying investment opportunities for corporate and institutional investors. Select titles produced in 2021 are listed below:

- Carbon Capture, Use and Storage - The Opportunities, Limitations and Economics
- Exploring the Hydrogen Economy
- The Role in the Grid in Delivering Net-Zero
- Power Purchase Agreements and Financing Renewable Developments
- The Consumer Sector's Approach to the Energy Transition
- Digitization of the Energy Sector

Our **Equity Research** team includes analysts and associates located across North America, the UK, Europe and the Asia-Pacific region that publish research on a wide variety of ESG and climate-related topics. Select climate-related publications in 2021 are listed below:

- Electric Vehicle Adoptions Set to Rise, but Challenges Lie Ahead
- Investors Pour Record Assets into Climate Funds

The **Sustainability Matters** client newsletter highlights key themes and insights, and provides an analysis of current events and emerging trends and their impact on the ESG landscape.

RBC GAM ESG Insights [58]

RBC GAM's thought leadership provides the latest investment insights and market updates to clients.

The GAM Corporate Governance and Responsible Investment (CGRI) team helps advance the integration of ESG factors into RBC GAM's investment approaches.

The CGRI and Investment teams produce ESG insights and thought leadership. Select titles produced in 2021 are listed below:

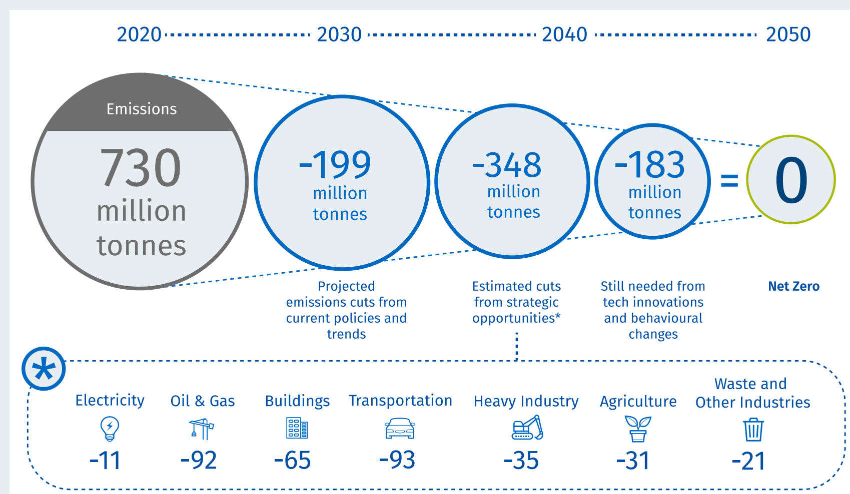
- Understanding Carbon Markets
- Key Takeaways from COP26
- Net-Zero Greenhouse Gas Emissions: Changing Investor Attitudes
- Climate Change: Investor Attitudes and Shareholder Proposals
- An Investor's Guide to Net-Zero Emissions
- Climate Change: Active Stewardship vs. Divestment
- How Is Asia Driving EV Battery Technology?
- Capturing Asia's Decarbonization Opportunity
- The Future of Emerging Markets: Green Infrastructure
- The Connected Revolution Through an ESG Lens

Inform and inspire a sustainable future

Case Study // The $2 Trillion Transition: Canada's Road to Net Zero

RBC Economics and Thought Leadership set out on a year-long research project to map out some of the necessary pathways for Canada's ambitious targets for achieving net-zero – reduce emissions by 40% by 2030 and reach net-zero by 2050.[55] The research projected over 30 years, what the estimated long-term costs and benefits could be, understanding that many uncertainties exist around climate, technology and behavioural trends, and such forecasts will continue to evolve.

From reimagining energy systems to how we design and build living spaces or how we grow food and power our lives, the research shows the immense scale of the changes needed at all levels of our economy. Looking at the sectors poised to take advantage of the opportunities in the transition, the report provides an economic roadmap to reach net-zero through six pathways: electricity, oil & gas, buildings, transportation, heavy industry, and agriculture. Changes will need to occur at all levels of our economy, from consumer behavioural change to technological adoption to bold policy changes. As such, the report makes eight bold policy recommendations that could accelerate Canada on the path to reach net-zero.



Inform and inspire a sustainable future

RBC continues to work with leading organizations, together with our peers, industry sectors, regulators, governments and civil society, to accelerate clean economic growth and inform our understanding of climate-related risks and opportunities:

Partnerships

Advancing Sustainable Finance, Transition Pathways & Clean Innovation

Canadian Standards Association (CSA): RBC collaborated with the CSA and a group of Canada's largest banks, pension funds and insurance companies to further the development of transition finance principles and guidance for Canada.

Global Financial Markets Association (GFMA): RBC Capital Markets was a contributing member to the GFMA on the Climate Finance Markets and the Real Economy report, published December 3, 2020.

Institute for Sustainable Finance: RBC became a founding contributor in 2020 to support the first ever collaborative hub to advance Canada's sustainable finance capacity through education, training and research.

Climate Engagement Canada: A collaborative initiative that brings together Canadian institutional investors and companies to encourage a just and orderly transition to a net-zero economy. RBC GAM became a founding participant in 2021.

Sustainable Finance Action Council

The Sustainable Finance Action Council: The early emphasis will be on enhancing climate-related financial disclosures in Canada's private and public sectors, aligned with the TCFD recommendations.

International Capital Market Association (ICMA): RBC Capital Markets is a member of the Climate Transition Finance Working Group of the ICMA.

RMI Center for Climate Aligned Finance: RBC joined RMI as a strategic partner in 2021 as we recognize the need to work collectively on sector-based solutions together with our clients and with other financial institutions to pursue a net-zero economy.

Smart Prosperity: A cross-sectoral initiative focused on accelerating Canada's transition to a stronger, cleaner economy.

Climate Action 100+: An investor-led initiative that engages with the largest global GHG emitters with the objective of seeking action on climate change. RBC GAM has been a signatory since 2020.

Climate Risk Management, Scenario Analysis & Disclosures

Bank of Canada and the Office of the Superintendent of Financial Institutions (OSFI): RBC is involved in a pilot project to use scenario analysis and stress testing to better understand the risks to the financial system related to a transition to a low-carbon economy.

Canadian Bankers Association (CBA): RBC works with the CBA to develop consistent and comparable approaches to conducting climate risk assessments and disclosures among our Canadian peers.

B4ICA

Banking for Impact on Climate in Agriculture (B4ICA): B4ICA aims to enable banks to more accurately account for agricultural sector GHG emissions. Convening partners include the World Business Council for Sustainable Development, UNEP FI and PCAF.

United Nations Environment Programme Finance Initiative (UNEP FI): RBC joined TCFD pilot projects (Phases I and III) to advance climate scenario analysis related to physical and transition risks, and encourage consistent and comparable approaches among our global peers.

Partnership for Carbon Accounting Financials (PCAF): RBC joined PCAF in 2021 and will be using the PCAF methodology to advance the measurement of our indirect emissions associated with lending.

Net-Zero Banking Alliance (NZBA): Joining the NZBA reinforces RBC's commitment to playing a significant role in financing the climate transition, and supporting collaborative approaches between the public and private sectors to reach the goal of net-zero emissions by 2050.

Sustainable Operations

Business Renewables Centre Canada (BRC): The BRC is a community group for buyers to learn how to source renewable energy directly from project developers. RBC is a founding member.

Inform and inspire a sustainable future

Case Study RBC Tech for Nature

We know that innovative solutions, based on technologies like blockchain, AI, machine learning and digital platforms, offer immense potential to address complex environmental challenges. That's why we launched RBC Tech for Nature – our commitment to innovation, data and technologies for our shared future. In 2021, we provided over $10 million to more than 110 universities and charities that are solving pressing environmental challenges like climate change by leveraging technology and innovation capabilities.[4] This brings our total investment through RBC Tech for Nature to date to over $27 million since 2019. Profiles of key partnerships are below:

Quebec: Aqua Forum

Restoring freshwater health through tech solutions developed by innovative young Canadians

Alberta: Energy Futures Lab

How digital innovations can help Alberta thrive in the energy transition

Manitoba: Lake Winnipeg Foundation

Citizen science and blockchain-enabled data sharing in the Lake Winnipeg watershed

Ontario: Second Harvest

Reducing food waste in Canada through an innovative app, Food Rescue

United Kingdom: World Wildlife Fund UK

WALRUS SPACE

Using satellite imagery to assess climate change and protect walrus populations

Atlantic: Coastal Action

New 3D mapping technology helps Coastal communities address sea-level rise and flood impact

USA: The Trust for Public Land

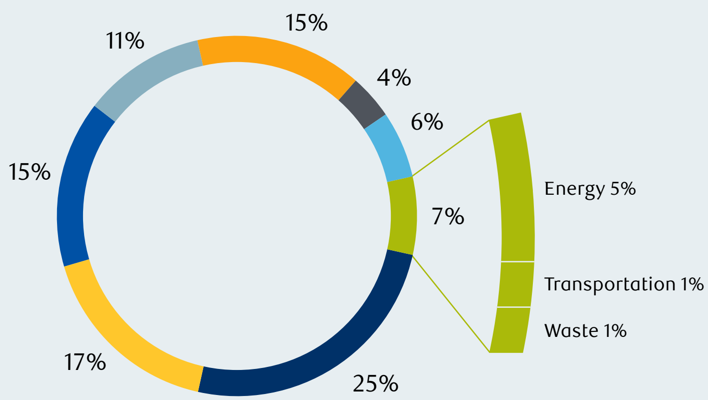
Building data to catalyze nature-based climate solutions in urban areas

Inform and inspire a sustainable future

Case Study

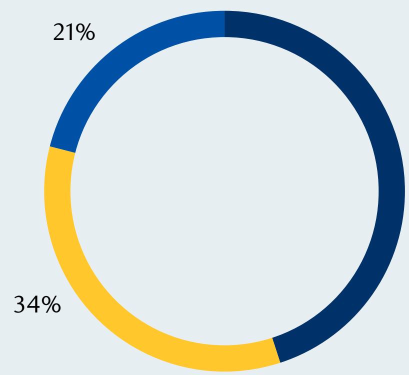
RBC Tech for Nature

Breakdown by environmental sector (%)



- Water
- Land conservation
- Education
- Biodiversity conservation
- Clean tech
- Climate adaptation
- Agriculture
- Other

Breakdown by focus area (%)



- Data[59]
- Communities of Action[60]
- Innovation Ecosystem[61]

FY 2021 At-a-glance

160+
Applications (record year)

$26+ Million
in donations requested

110+
Partners (applications funded)

$10.15 Million
in grants provided (record year)

Advance net-zero leadership in our own operations

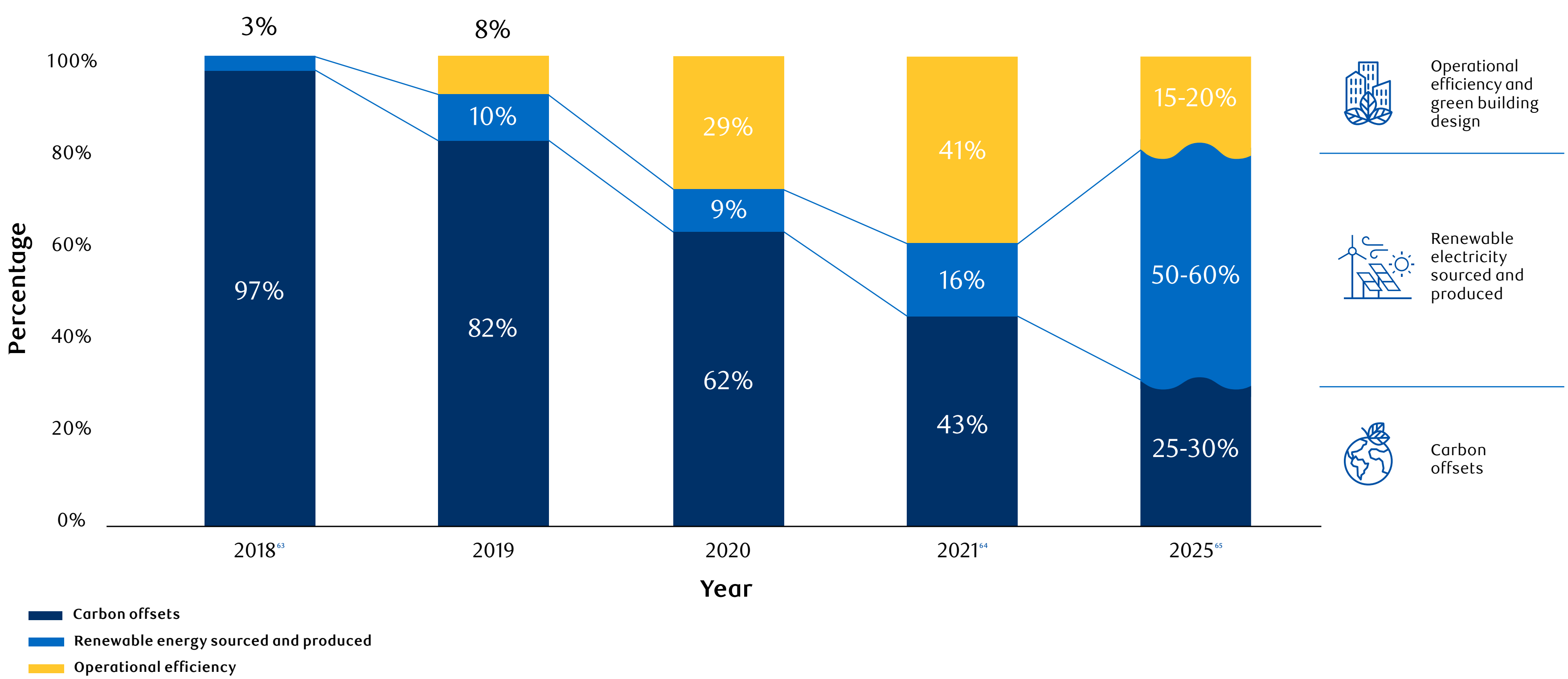
Net-zero operations

Beyond our business segments, there are opportunities in our global operations to invest in green buildings, energy efficiency and renewable energy. Reducing GHG emissions and energy use is foundational to any corporate environmental program and an expectation of any organization that is taking action on climate change. This is why, in 2017, we became carbon neutral and committed to a goal of net-zero emissions in our global operations annually. We continue to accomplish this through energy and emissions reduction programs in our property network and IT infrastructure by procuring renewable energy through a power purchase agreement (PPA) and by sourcing renewable energy credits (RECs) and high quality carbon offsets to account for emissions we cannot eliminate. Each year, we aim to be less reliant on carbon offsets.

To this end, we set two key goals in 2020 that drive our net-zero operations strategy: reduce absolute GHG emissions by 70% with a baseline year of 2018 and an increase in our sourcing of electricity from renewable and non-emitting sources to 100%, both by 2025.

We had a 94% decrease in emissions from business travel which contributed to an overall reduction of 55% in total GHG emissions in 2021 over our 2018 baseline (see Figure 12). Decreases in our absolute GHG emissions were driven by a combination of factors including lower occupancy rates in our office spaces, less business travel due to COVID-19 pandemic restrictions, our continued operational efficiency programming, our increased focus on and investment in renewable energy for our operations and the continued decarbonization of electrical grids globally.

Figure 11: Shift towards greater operational efficiency and renewable energy sourcing and production by 2025[62]



Advance net-zero leadership in our own operations

Figure 12: GHG emissions performance for Scope 1, 2, and 3 (business travel) emissions[42]

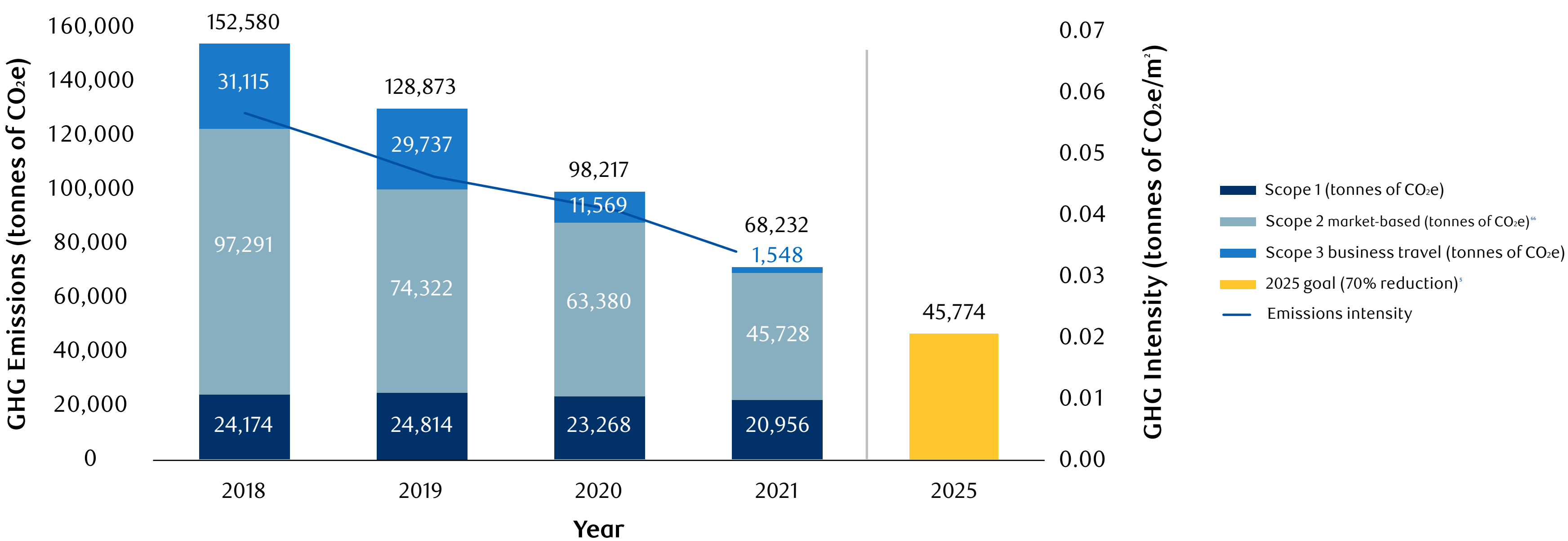
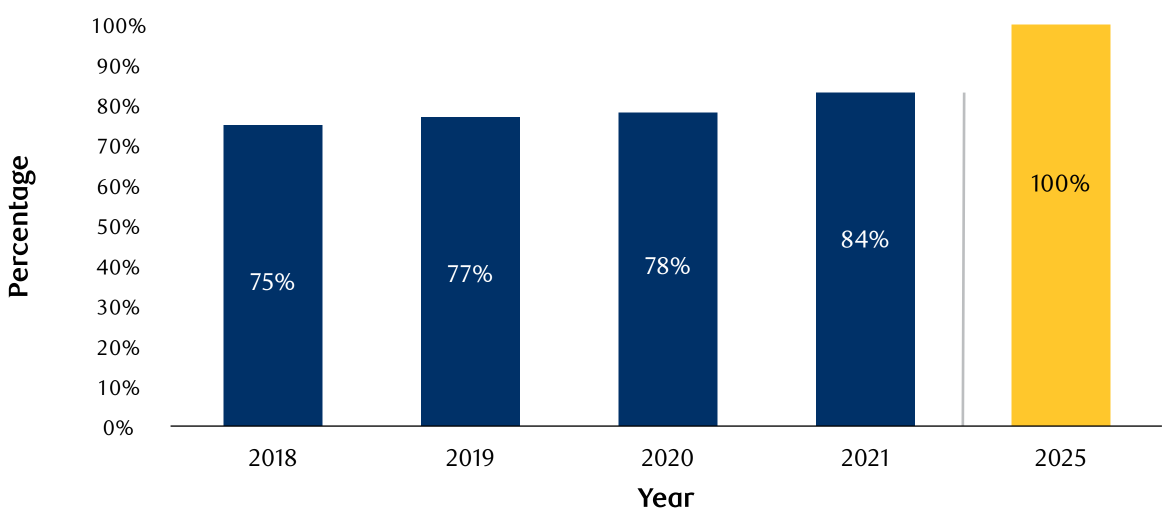


Figure 13: Percentage of electricity sourced from renewable and non-emitting sources globally



In 2021, 99% of our electricity consumption in Canada came from renewable and non-emitting sources.

Advance net-zero leadership in our own operations

Case Study //

RBC is the first Canadian bank to sign long-term renewable energy power purchase agreement in Alberta

To help achieve our GHG emission reduction target and renewable energy sourcing target, RBC entered into a long-term power purchase agreement (PPA) – a first for a Canadian financial institution – with BluEarth Renewables. The PPA directly supported the construction of two solar farms in Alberta, which created more than 300 construction jobs and injected $70 million into Alberta's economy. The solar farm provides Alberta's electricity grid with roughly 80,000 MWh of renewable energy annually, enough to power more than 6,400 homes for a year, and represents two of Canada's largest solar farms. In addition to providing renewable energy for RBC's operations, the project will contribute significant and stable long-term property tax revenue to the local economy over the life of the facility.

The PPA began commercial operation in May 2021. At that time, we began to receive renewable energy credits (RECs) from the PPA that will support reducing our emissions over the next several years. The RECs received in our 2021 fiscal year represent 12,095 tonnes of CO_2e avoided. In addition, we source RECs from renewable energy projects in Canada, including two Indigenous-owned projects.

Scenario analysis

Overview

The impacts from climate change are here now. The science is also clear that changes in our climate, and their corresponding impact on weather, will continue for decades – as will efforts to transition to a low-carbon economy. In short, climate-related risks and opportunities manifest in diverse ways and across a wide range of time scales. Scenario analysis is one way of assessing this landscape of risks and opportunities.

Over the past year, RBC has accelerated its capabilities in this area to better understand what we, our clients and our communities are facing now, what might be over the horizon and how our collective future depends on the path we take together. This section highlights three dedicated climate scenario analysis projects we completed in 2021. As summarized in Figure 14, these cover a range of scenarios for both physical and transition risk.

Figure 14: The scenarios and risk focus in our dedicated climate scenario analysis projects

	Project	1.5°C-aligned scenario	2°C-aligned scenario	Scenario aligned with 3°C or greater
Transition Risk	Bank of Canada & OSFI pilot	Immediate transition	Immediate transition and delayed transition	Business as usual (2019 policies)
Transition Risk	RBC Europe Limited: Transition Check	Delayed transition	Immediate transition	Business as usual (2015 policies)
Physical Risk	RBC Europe Limited: Flooding	RCP2.6[68]		RCP8.5[68]

Bank of Canada and OSFI transition risk pilot project

In 2021, RBC participated as one of six Canadian financial institutions (FIs) in a pilot project convened by the Bank of Canada and the Office of the Superintendent of Financial Institutions (OSFI). This project sought to explore the potential financial impact of a transition to a low-carbon economy through scenario analysis. The project's goal was to build capabilities and knowledge and to better understand the risks to the financial system from the transition. The Bank of Canada developed 30-year scenarios (three transition scenarios and one baseline, business-as-usual scenario) and a model based on a methodology developed by Oliver Wyman.[67] For participating banks, the scenario analysis focused on portions of their wholesale credit portfolios in high-emitting sectors in Canada and the U.S.

Details on the scenarios, methodology, and results are available from the Bank of Canada. Overall, the analysis indicates that delayed climate policy action has greater cumulative economic impacts compared to immediate policy action. There is variation at a regional and sector level, however. For example, Canada already has an abundance of renewable power and so is relatively well-positioned to support a low-carbon, electrified economy. In contrast, the electricity sector requires greater investment in the U.S. during the transition, because of the dominance of fossil-fuel power generation. For sectors sensitive to commodity exporting, there will be impacts from both national and global climate policies. At a client level, we were able to better understand some of the idiosyncratic factors associated with transition risk resiliency, beyond simply a client's sector or sub-sector.

Any scenario analysis can only give an indication of where and how transition risks may manifest, but is in no respect a prediction of what will happen. Assumptions and limitations are inherent in scenario analysis. It is important to note that this work did not assess the impacts of physical risk, which could be significant in the business as usual baseline scenario. Regardless, through our participation we have improved our capabilities to carry out long-term scenario analysis, which is an important tool for better understanding climate risks and opportunities.

Scenario analysis

RBC Europe Limited scenario analysis projects

In 2021, we designed and executed a comprehensive scenario analysis program for our RBC Europe Limited (RBC EL) subsidiary, as part of its climate risk management program (described in Appendix A). This included the two scenario analysis projects described below and the programs described in the appendix.

Flooding scenario analysis

Flooding is the most significant physical risk for many of our real estate clients in the U.K. and Europe. In 2021, we assessed the river (fluvial) flooding for real estate exposures in these geographies in real estate-related portions of our wholesale loan book and in our Wealth Management business. We used the methodology co-developed by Acclimitise and UNEP FI with RCP2.6 and RCP8.5 scenarios and flood maps for return periods of 1-in-100 years and 1-in-500 years (an example is shown in Figure 15).[69] Impact to market values was calibrated using historical data for country-level averages, and the outputs were converted into financial impacts using our internal credit models.

In the assessed portfolios, the methodology we used did not show significant financial impacts from river flooding, as there are few properties within the flood zones.

Transition Check

In 2021, RBC EL used a tool called Transition Check to assess the transition risk impacts to a substantial portion of its wholesale loan exposures in the energy, utilities and automotive sectors. This tool and its underlying methodology were co-developed by Oliver Wyman and UNEP FI, and we independently validated it internally as per our model risk policies.[71] The 30-year scenarios we used included both an orderly and disorderly transition.[72]

A summary of our results of relative change in expected losses is shown in Figure 16. Of the three sectors, our results showed that on average, automotive manufacturers were most sensitive to transition risk, as many of these companies were at risk of not having an adequate portfolio of electric vehicles (EVs) given the proliferation of phase-out policies for internal combustion engines.[73]

Figure 15: London, UK overlaid with a 1-in-500 year flood map (blue)[70]

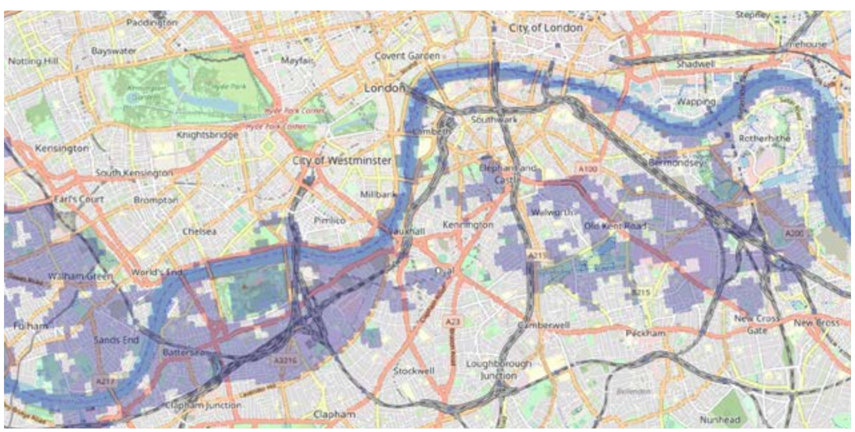


Figure 16: The change in expected losses[74] under the two transition scenarios

Sectors	Immediate 2°C			Delayed 1.5°C		
	2030	2040	2050	2030	2040	2050
Automotive	0	1	4	0	2	5
Oil & gas	0	1	1	0	1	2
Utilities	0	0	0	0	1	1

Change in expected losses relative to 2020 values

5 4 3 2 1 0

Higher losses — Same losses

Scenario analysis

Overall outcomes from RBC's scenario analysis projects

	What we've learned from scenario analysis	How we plan to advance
Physical Risk	Based on the results of our preliminary physical risk scenario project, we do not expect significant financial risks to the portfolios and geographies we assessed. However these results are preliminary and the methodology and data is still limited.	We are exploring a number of ways to build on this work to improve its granularity and better identify risk concentration, such as using more robust datasets that provide a more comprehensive, accurate and precise picture of flooding and other physical risks. We are also considering incorporating factors such as insurance coverage, property-specific damage functions, impacts to cash flow (for commercial properties) and changes in consumer sentiment (for property prices). We are starting to explore the chronic physical impacts of climate change. For example, we worked with academic researchers to publish a peer-reviewed study exploring the economic impacts on the Canadian economy from a range of climate variables beyond temperature.[75]
Transition Risk	Our projects focusing on transition risk scenario analysis have highlighted some at-risk industries in the assessed portfolios, but so far have not revealed unmanageable impacts. However, methodological assumptions and limitations could make this conclusion inaccurate.	We will continue to assess transition risk impacts and mature our approach, where possible, through updated scenarios, methodologies and data.
Strategy and Coordination	We have found that considerable resources are required for dedicated transition risk scenario analysis projects. Climate scenario analysis of this scale requires a significant investment of time and effort involving the contributions of a broad group of individuals with sector-specific expertise across the organization. Furthermore, more teams across RBC are carrying out dedicated climate scenario analysis or are incorporating climate factors into existing stress testing programs, such as market risk and operational risk (see Appendix A for examples used by RBC Europe Limited) and comprehensive regulatory stress tests.	We have launched an organization-wide Climate Scenario Analysis Working Group to coordinate resources, accelerate the advancement of the methodology and data, and develop strategic approaches. We are also seeking to expand our assessment of transition risks and physical risks across more portfolios and asset classes.
Data	In carrying out these scenario analysis projects, we faced significant data challenges. For example, physical risk assessments require geographic information for assets and for the risks being considered (e.g. flood maps). Similarly, forward-looking metrics related to clients' transition risk exposures are needed to do the type of bottom-up analysis we performed this year.	We will continue to engage with third-party data providers to augment our internal data as necessary and where appropriate. At the same time, we are working towards streamlining and enhancing our internal data resources to ensure that scenario analysis inputs and outputs can be more readily integrated into our risk management and strategic processes.

Risk Management

Climate risk approach

Climate risk is a very dynamic and rapidly evolving subject, which contributes to its complexity. Our Group Risk Management teams are working with both internal and external partners to enhance our capabilities to measure, manage and monitor climate risk and to mitigate its impacts on RBC, our clients and communities.

Graeme Hepworth,
Chief Risk Officer,
Royal Bank of Canada

The ability to manage risk is a core competency of RBC, and is supported by our risk-aware culture and risk management approach. Starting in 2018, we identified climate risk as an emerging risk to RBC and subsequently in 2020, climate risk was identified as a top and emerging risk to RBC. In 2021 we joined PCAF[41] to further our ability to measure and monitor our financed emissions risk.

As a global financial institution with a diversified business model, we actively manage a variety of risks to help protect and enable our business, and have integrated climate considerations into our qualitative risk appetite framework, risk measurement and risk policies. We regard climate risk as a transverse risk, which impacts all the other risk categories for which we have established limits, and requires us to consider how financial and non-financial factors may impact us and our clients. We continue to advance our capabilities and approach to climate risk management:

- We conduct portfolio, client and scenario analyses to assess our exposure to, and the impact of, climate-related risks.
- We participated in a climate scenario analysis pilot project with the Bank of Canada and OSFI to build our climate scenario analysis knowledge and understanding of our potential exposure to climate-related transition risks (see page 38 for summary).
- We have committed to refining our climate risk appetite and setting interim financed emission reduction targets on our path to net-zero emissions in our lending by 2050.
- We are building out climate-related scenario analysis and stress testing capabilities. As part of our annual stress testing and analysis, we incorporated components of climate risk through transition and physical risk stress factors and assessed its impact on our key portfolios.
- With the potential for climate risk to translate to increased credit risk, we have done work to identify those sectors within our wholesale portfolio that are most affected by physical and transition risk, which allows us to better monitor climate risk on an ongoing basis.

We continue to embed climate change in our approach to E&S risk management, which is articulated in our enterprise-wide and business-specific E&S risk management policies. Group Risk Management has a dedicated E&S risk management team that develops approaches to identify, assess, monitor and report on climate-related risks, as appropriate. Business segments and corporate functions are responsible for incorporating E&S risk management requirements in their operations.

Identification and assessment of climate risks

In line with the TCFD recommendations, we define climate risk as risk related to the global transition to a net-zero economy (transition risk) and risk related to the physical impacts of climate change (physical risk), which includes both chronic and acute risks. We may be exposed to climate risk including through emerging regulatory and legal requirements, disruptions to our operations and services, and the products and services we provide to our clients. Both we and our clients may also be exposed to climate risk through technological and societal change and market forces. Additionally, we and our clients may also be vulnerable to physical climate risk. Figure 17, below, provides an overview of climate-related risks and examples of possible impacts on RBC, along with other businesses, and is based on the risk categories identified in the TCFD recommendations.

Figure 17: Overview of the associated climate-related risks and examples of possible impacts

	Transition risk				Physical risk			
					Chronic[76]		Acute[76]	
Climate-related risks	Technology	Policy and Legal	Markets	Reputation	Heat Stress	Sea-Level Rise	Flooding	Wildfire
Possible impacts	R&D expenditure Costs to adopt new technology	Increased operating costs Stranded assets Litigation	Reduced demand for services Repricing of assets Changing revenue sources Changing consumer preferences	Stakeholder and client sentiment Capital availability Workforce management Brand value	Increased operating costs Damage to facilities Lack of insurability of assets		Service and supply chain interruptions Asset devaluation and write-offs	

Identification and assessment of climate risks

Climate risk reaches across RBC as transition and physical risk factors could impact other risk types unless they are appropriately managed. The chart below details some of the climate-related risks as they relate to our enterprise risk drivers.

Control & Influence	Risk type	Description as it relates to climate risk
Less	**Macroeconomic**	• Systemic risks are more likely in a disorderly transition as a result of the interconnectedness of financial systems and power supply. For example, where energy transition policies lead to energy price volatility and shortages, this may reverberate through the global economy causing systemic instability. • Increasing physical impacts could impact macroeconomic conditions. Trade tensions could rise if climate policies differ from country to country.
	Reputational/ Strategic	• Strategic risks may arise from a failure to effectively communicate our climate strategy. We need to balance the stakeholder pressure to move quickly on climate, ensuring we support clients in a manner that enables an orderly and just transition. Reputation risks may arise from those who believe we are moving too quickly on climate change, and those who believe we are moving too slowly.
	Operational/ Regulatory Compliance	• Operational risks may arise from the impact of more frequent and intense weather events on our operational resilience, including business continuity as well as the pricing of inputs such as energy, water and insurance. • Regulatory compliance risks may arise from our inability to adapt to and comply with new climate-related regulations for banks, insurers and asset managers.
More	**Transactional/ Positional**	• Credit risks may arise from factors such as changes in the company or asset valuation, uninsured or uninsurable damages, impacts on operating costs and revenue, or client business models and strategies that are (or are perceived to be) misaligned with the transition to a net-zero economy. • Market and liquidity risks may arise from factors such as the impacts of energy and commodity prices, corporate bonds, equities and certain derivatives contracts in carbon-intensive sectors. Our liquidity may be impacted if we are perceived as not addressing the impacts of climate change adequately or fast enough. • Insurance risks may arise from misevaluating climate-related health impacts on mortality and disability premiums/liabilities.

We take a "top-down" approach to risk management to identify and measure the relative sensitivity of sectors to climate-related risks. An understanding of sector sensitivity to climate-related risks provides us with a better understanding of how climate risk might affect our clients, and the appropriate measures to manage strategic and transactional/positional risks for RBC. Sector sensitivity to climate-related risks does not mean that those risks will be realized for all clients in that sector. We have made progress this year in developing our capabilities relating to transition risk in a "bottom-up" approach, considering the possible impact of transition risk on clients, taking into consideration factors such as geography, GHG emissions data and mitigation strategies. We are working to combine the sector information above with client-specific information to further our understanding of the impact of climate risk on our clients and our business.

Management of climate risks

We may be exposed to climate risk through emerging regulatory and legal requirements, disruptions to our operations and services, and the products and services we provide to our clients. We regularly review the risks that we face and reflect on those that affect our clients, considering the following:

Potential risk	Actions to mitigate risk
Emerging regulatory and legal requirements	• Climate change regulations, frameworks and guidance that apply to banks, insurers and asset managers are rapidly evolving. Several central banks and regulators have taken steps to introduce or have already introduced rules to address the financial and economic risks of climate change. As regulations and formal requirements evolve, we monitor such developments and update our risk management practices and disclosures as necessary. • For clients in RBC's Corporate Client Group and RBC Capital Markets that are in sectors categorized as high environmental risk, such as those in carbon-intensive sectors, we evaluate whether they have assessed and quantified the regulatory impacts of climate change as part of our due diligence and risk assessment process.
Disruptions to operations and client services	• We identify properties we lease or own that contain business processes and supporting applications that require enhanced facility infrastructure to mitigate site disruptions, such as those caused by extreme weather events. We classify critical environment sites based on our business risk tolerance for site-specific downtime and, among other things, site location, power supply, exposure to flooding, geological stability and other hazards. • We take steps to mitigate and adapt to climate change through our building design and our purchasing decisions. • As required, we assess the impact of climate-related events (e.g., floods, hurricanes) on our businesses and client operations.
Products and services we provide	• We maintain a diversified lending portfolio, which improves our resilience to geographic or sectoral downturns and minimizes concentrations of credit exposure. • Each business segment is responsible for identifying material climate-related risks and opportunities, which are integrated into risk management processes as necessary. • We deliver advice and solutions to our clients to support their transition to a net-zero economy and the advancement of their sustainability strategies. For example, we provide sustainable finance products such as green, social and sustainability bond underwriting, sustainability-linked bonds and loans as well as advisory services to integrate ESG factors for companies that are in the pre-initial public offering or pre-acquisition stage. In addition, our offerings include ESG-integrated investment solutions, structured products, carbon trading services, ESG research and thought leadership. • RBC Global Asset Management integrates material ESG factors into its investment approach to help mitigate risk and/or enhance long-term, risk-adjusted returns. • RBC Insurance® (through its insurance agency) sells property and casualty insurance products that are underwritten and insured by Aviva Canada Inc. As such, RBC Insurance is not directly exposed to climate-related risks associated with these products. The property and casualty insurance industry as a whole has exposure to longer term shifts in climate patterns, such as rising temperatures and hurricanes, which may indirectly impact our Insurance business results. We are working to advance our understanding of the impact of acute and longer term weather events on travel insurance and life & health insurance products sold to group/business clients.

Analysis of exposure and sensitivity to climate risk

Climate-sensitive sectors are those most impacted by the transition risks and physical risks of climate change. Figures 18 and 19 represent our exposure to carbon-related assets relative to total assets, as recommended by the TCFD, along with our lending to power generation by energy source.

We have expanded the sectors that make up carbon-related assets to include the latest recommendations from the TCFD, which has resulted in an increase in our total exposure to carbon-related assets. The new sectors that have been included are agriculture, food and forest products, transportation, and materials & buildings. The increase in overall exposure is primarily driven by the addition of the materials & buildings sector, which includes our commercial real estate and related sectors.

Sector sensitivity to climate risk does not mean that those risks will be realized for all clients in that sector. The impact at a client level will depend on factors such as geography, location of assets and mitigation strategies.

Figure 18: Credit risk exposure to carbon-related assets relative to total credit risk exposure[77]

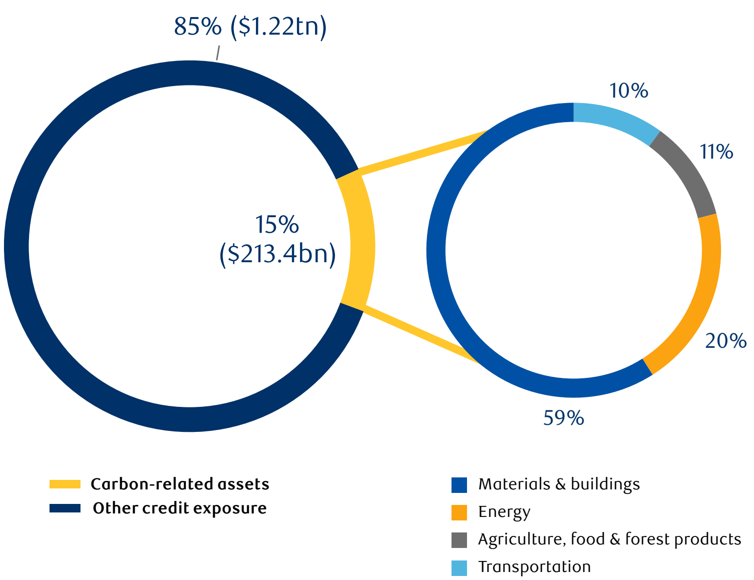
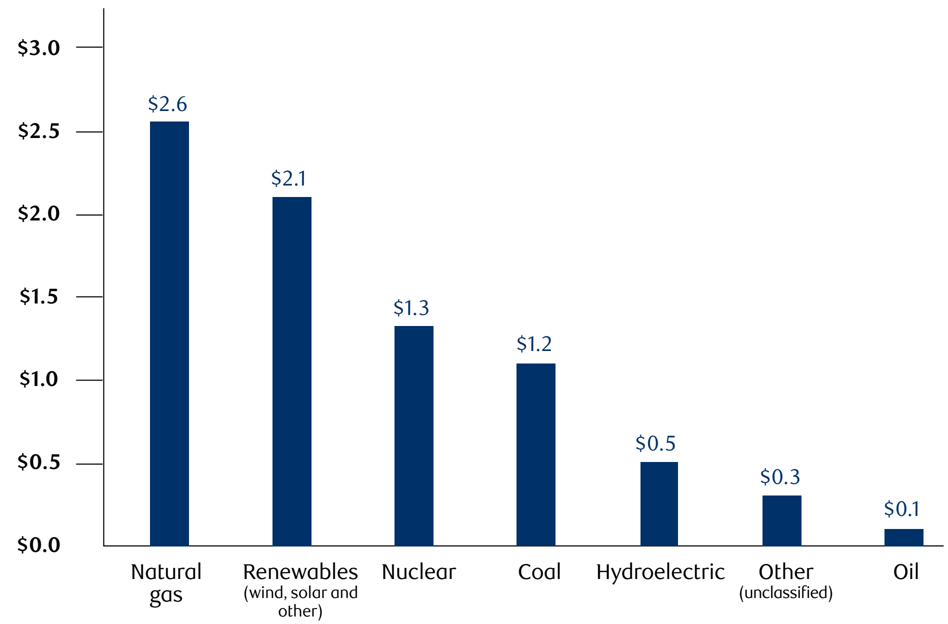


Figure 19: Lending to power generation by energy source ($ billions)[78]



Metrics & Targets

Measuring and tracking progress

We have reported annually on key environmental performance metrics since 2003. Since then, we have increasingly provided data related to GHG emissions, energy use, green buildings, products and services that support our clients in the transition to a net-zero economy, socially responsible investments and E&S risk management, among other performance indicators.

Metric	Goal	2021	2020	2019
Help clients as they transition to net-zero				
Total value of assets under management by RBC GAM that integrate material ESG factors	No goal set	$597.2 billion[79]	$518.5 billion	$467.2 billion
Total value of sustainable financing	$500 billion by 2025	$83.8 billion	$73.3 billion	$40.8 billion
Hold ourselves accountable				
Scope 3 – Initial estimates of financed emissions (tonnes of CO_2e)	We intend to disclose interim financed emission reduction targets for clients in the oil & gas, power & utilities, and automotive & transportation sectors by spring 2023.	45 million tonnes	–	–
Credit risk exposure to carbon-related assets	No goal set	15.0%[77]	4.0%	4.6%
Inform and inspire a sustainable future				
Support to universities and charities that are developing technology solutions to address climate change through RBC Tech for Nature	Up to $100 million in support by 2025	$10.15 million	$9.0 million	$7.9 million
Advance net-zero leadership in our own operations				
Total GHG emissions from operations, globally (tonnes of CO_2e)	Reduce by 70% by 2025[5]	68,232 tonnes	98,217 tonnes	128,873 tonnes
Percentage of electricity from renewable and non-emitting sources for all properties	Increase to 100% by 2025	84%	78%	77%

Appendix

Appendix A: Overview of RBC Europe Limited's management of climate risk

In 2020, the Bank of England, through the Prudential Regulation Authority (PRA), set a deadline for all financial institutions to understand the financial impacts of climate change and to embed climate risk management into their regulated entity operations by the end of calendar year 2021. The Climate Financial Risk Forum (CFRF), which was jointly established by the PRA and the Financial Conduct Authority (FCA), published a guide written by industry for industry to help firms approach and address climate-related financial risks. The CFRF guide formed the basis of RBC Europe Limited's (RBC EL) climate risk project roadmap, to adhere to the PRA deadline. This project roadmap consists of four pillars: (i) governance, (ii) risk management, (iii) scenario analysis and (iv) disclosure.

Governance

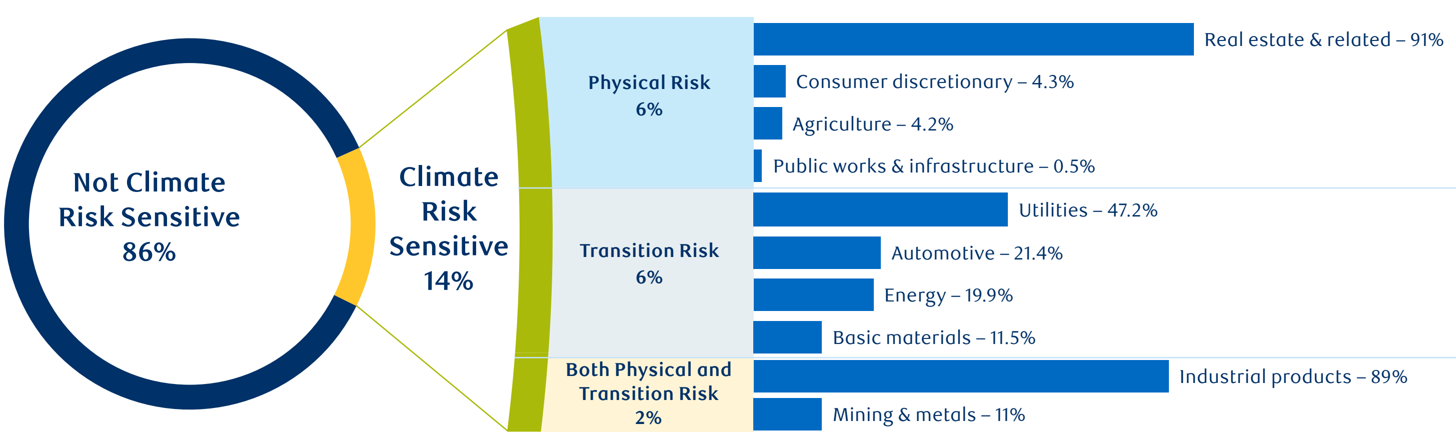
In response to the regulatory requirements, the Risk Committee of the Board of Directors of RBC EL (U.K. Risk Committee) received a presentation and training from management on issues related to climate risk, which led to the decision to add additional layers of governance at both the RBC EL Board and management levels, including:

- **U.K. Risk Committee:** RBC EL Board receives updates quarterly on climate-related developments.
- **U.K. Climate Risk Steering Committee:** Meets monthly to discuss climate-related developments and provide guidance on steering action. This committee includes executive membership from GRM and regional chief risk officers.
- **U.K. Senior Management Function (SMF):** The Chief Risk Officer, Europe is responsible for climate-related financial risk for RBC EL.
- **U.K. Risk Management Committees:** Provides monthly climate-related reporting to a number of risk management committees for RBC EL.
- **U.K. Climate Working Group:** Holds monthly meetings with heads of local risk groups, regional GRM colleagues and other functions, with a mandate to collaboratively meet the PRA's expectations to embed climate risk management and report to the SMF and U.K. Climate Risk Steering Committee.

Risk management – Risk appetite

RBC EL adopted a climate risk appetite statement metric to measure the value of credit exposure to climate-sensitive sectors of their loan and trading portfolios. This metric is monitored monthly and reported on a quarterly basis to senior management. Climate risk appetite is refreshed annually and will be enhanced to take into account advancements in our capabilities in climate risk and RBC's commitments to refining climate risk appetite and setting interim financed emission reduction targets on our path to net-zero in our lending by 2050.

Figure 20: RBC EL climate risk sensitive credit risk exposure for loan and trading portfolios (as of October 31, 2021)



Appendix A: Overview of RBC Europe Limited's management of climate risk

Risk Management – Reporting

A Climate Risk dashboard has been created for the RBC EL Board and reports quarterly on the climate risk appetite and the results of financial impacts of climate change from our scenario analysis. Example provided in Figure 22: Summary of Climate Risk Dashboard.

Financed emissions

As stated in the "Financed emissions" section (page 23), RBC joined PCAF and NZBA in 2021 and has produced initial estimates of RBC's financed emissions by asset class. As data availability and methodologies mature, we will be able to further disaggregate at the sector and entity levels to derive RBC EL's contribution to RBC's total financed emissions.

Scenario analysis

RBC EL's scenario analysis was performed by leveraging RBC's previous experiences from 2018, focusing on RBC EL's most significant climate sensitive sectoral exposures in physical risk and transition risk, and looking at short-term and long-term scenarios.

Figure 21: Summary of the scenario analysis exercises performed by RBC EL in 2021

Physical scenario analysis

RBC EL conducted a weather driven risk assessment of RBC EL's own London premises (100 Bishopsgate office and Disaster Recovery site) that concluded there is no notable impact from weather driven events. Short-term and long-term flood risk was performed on RBC EL's most significant physical risk credit exposure - Real Estate, comprising of corporate and residential properties, to assess credit metrics such as the loan-to-value ratio and expected credit loss. More details can be found in Figure 22 and on page 39. In addition, we have analysed the energy efficiency rating for the UK properties in RBC EL's real estate credit exposure, and plan to extend this analysis for properties in other countries, as and when data becomes available.

Transition scenario analysis

An operational risk greenwashing scenario analysis was undertaken through the engagement with the Debt Capital Markets (DCM) business and Legal and Compliance to assess the impact to RBC if we were to face an accusation and finding of greenwashing in connection with our green bond issuance and advisory business.[80] RBC EL's ongoing Market Risk Stress VaR monitoring considers several scenarios, including the Energy Crisis scenario. The Energy Crisis scenario addresses transition risk to a low-carbon economy incorporating hypothetical climate change themes brought about by government climate legislation, shareholder resolutions, and reduced interest in potential investors and moderate loss of confidence from existing investors. RBC EL also performed long-term transition scenario analysis on its most significant transition risk credit exposures (the Utilities, Automotive and Energy sectors) using the Transition Check methodology, developed by the UNEP FI and Oliver Wyman, for long-term transition scenario analysis. More details can be found on page 39.

The assessment results of RBC EL's scenario analysis work are reported to the RBC EL Board (see Figure 22: Summary Climate Risk Dashboard) and also formed part of RBC EL's Internal Capital Adequacy Assessment Process (ICAAP).

Appendix A: Overview of RBC Europe Limited’s management of climate risk

Figure 22: Summary of climate risk dashboard

Measure	Measure Description	Result
Risk Profile		
Risk Appetite	Value of Climate sensitive exposure	Within Appetite
UK mortgages energy efficiency	Number and exposure value of properties by energy efficiency ratings	Limited Impact
Short-term (~1-5 years)		
Greenwashing[80]	Impact assessment on a variety of possible greenwashing scenarios	Limited Impact
Energy Crisis – Market Risk Stress VaR	Value of Stress Loss	Within Appetite
Physical Risk – Flooding	Weather driven assessment on RBC Premises	Limited Impact
	Number and exposure value of properties in flood zones	Limited Impact
Long-term (~10-30 years)		
Physical Risk – Flooding	Number and exposure value of properties in flood zones	Limited Impact
Transition Risk	Value of expected loss by two referenced scenarios	Limited Impact

Disclosure

RBC EL is committed to providing annual disclosure updates on its progress toward understanding and assessing the financial impacts of climate change on its operations and balance sheet. RBC EL has done so through RBC’s TCFD Report 2021, in addition to RBC EL’s 2021 Annual Accounts, its 2021 Internal Capital Adequacy Assessment Process and its 2021 Pillar 3 disclosures.

RBC EL is monitoring emerging regulatory and legal requirements, in particular the developments of the UK Sustainability Disclosure Requirements (SDR) incorporating the UK Green Taxonomy and associated work of the International Sustainability Standards Board (ISSB).

Endnotes

1. Beginning November 1, 2021 (fiscal year 2022).
2. As defined by the UNEP FI Guidelines for Climate Target Setting for Banks. We have chosen to focus on Capital Markets clients in high-emitting sectors within our oil & gas, power & utilities, and automotive & transportation portfolios at this time because they represent a significant portion of the emissions in our overall portfolio, and client-level emissions data and transition scenarios are more readily available. As we progress along our net-zero journey, we will expand our efforts to obtain this information from other sectors and clients as part of meeting our broader commitments under the NZBA.
3. For more information, see RBC's Commitment to the Net-Zero Banking Alliance.
4. For more information, see our RBC Climate Blueprint.
5. This target is inclusive of our global operations, Scope 1, 2 and 3 (business travel) emissions, and uses a baseline of 2018.
6. The total available loan balances is defined as the aggregate loan amounts made to clients in high-emitting sectors in oil & gas, power & utilities, and automotive & transportation portfolios in our Capital Markets business.
7. This goal refers to RBC's lending activities only and is not inclusive of assets under management by RBC Wealth Management and RBC Global Asset Management (RBC GAM).
8. For more information, see RBC Tech for Nature.
9. The Financial Stability Board's Task Force on Climate-related Financial Disclosure (TCFD). For more information on recommended climate disclosures for financial institutions, see the TCFD Recommendations.
10. For more information, see our 2021 RBC ESG Performance Report.
11. For more information, see our 2021 RBC Annual Report.
12. The RBC Sustainable Finance Group integrates ESG factors into their core capital markets platform, working in collaboration with partners in Global Investment Banking, Global Markets and Corporate Banking to deliver advice and solutions to clients that also aim to have a positive impact on the world. For more information, see RBC Sustainable Finance.
13. RBC Wealth Management (WM) includes the following affiliates: RBC Dominion Securities Inc. (Member–Canadian Investor Protection Fund), RBC Direct Investing Inc. (Member–Canadian Investor Protection Fund), Royal Mutual Funds Inc., RBC Global Asset Management Inc., RBC Phillips, Hager & North Investment Counsel Inc., RBC Wealth Management Financial Services Inc., Royal Trust Corporation of Canada and The Royal Trust Company, which are separate but affiliated subsidiaries of RBC.
14. RBC Global Asset Management (RBC GAM) includes the following affiliates: BlueBay Asset Management LLP (BlueBay), RBC Global Asset Management Inc. (including Phillips, Hager & North Investment Management), RBC Global Asset Management (U.S.) Inc., RBC Global Asset Management (UK) Limited, and RBC Global Asset Management (Asia) Limited, which are separate, but affiliated subsidiaries of RBC.
15. The Paris Agreement is a legally binding international treaty on climate change. The goal of the Agreement is to limit global warming to well below 2, preferably to 1.5 degrees Celsius, compared to pre-industrial levels. It was adopted by 196 Parties at COP 21 in Paris, on 12 December 12, 2015 and entered into force on November 4, 2016.
16. For more information, see RBC's Sustainable Finance Commitment.
17. Loans extended to borrowers and projects qualifying under RBC's sustainable financing methodology. Credit extended is the total authorized amount as at October 31, 2021. Represents RBC Capital Markets and P&CB authorized loan amounts.
18. Designated green loans that align with the Loan Market Association (LMA) Green Loan Principles and designated sustainability linked loans that align with the LMA Sustainability Linked Loan Principles. Credit extended is the total authorized amount as at October 31, 2021. Represents RBC Capital Markets authorized loan amounts.
19. Designated green, social, sustainability, and sustainability-linked bonds that align with the International Capital Market Association Green, Social, & Sustainability-Linked Bond Principles, and Sustainability Bond Guidelines. Deal credit (offering size) split equally among named Bookrunners. RBC did not underwrite any Sustainability-Linked bonds in fiscal years 2020 and 2019.
20. Capital raised through Debt Capital Markets, Equity Capital Markets, Securitizations, Project Finance, and Leveraged Finance Capital Markets for issuers and projects qualifying under RBC's sustainable financing methodology. Deal credit (offering size) split equally among named Bookrunners.
21. Deal credit (total deal value) allocated in full to all advisors.
22. Deal credit (offering size) split equally among named Bookrunners.
23. Tax credit investments closed represents the total equity committed. These amounts represent investments raised through the RBC Capital Markets Tax Credit Equity Group.
24. Value of green, social (incl. pandemic), and sustainability bonds held by RBC's Treasury & Market Services.
25. Value represents green structured notes.
26. Analysis based on Bloomberg data for calendar year 2021.
27. RBC Community Investments syndicates Low Income Housing Tax Credits, Workforce/Impact Housing, Renewable Energy Tax Credits, Historic Tax Credits and State Tax Credits.
28. RBC Capital Markets trades a variety of carbon products including spot investments, forwards, futures, options and swaps. For more information, see RBC Commodities.
29. RBC InvestEase is an online investment management service that simplifies investing and adds the expertise of real advisors.
30. For more information, see RBC Select Portfolios.
31. For more information, see RBC Global Balanced Portfolio.
32. The Portfolio Advisory Group (PAG) is a team of highly specialized equity and fixed-income portfolio advisors that conduct ongoing research and analysis on a wide spectrum of investment opportunities and proactively provide ideas to RBC Dominion Securities advisors to better assist their clients.
33. Climate Action 100+ is an investor-led initiative to ensure the world's largest corporate greenhouse gas emitters take necessary action on climate change.
34. For more information, see Climate Engagement Canada.
35. For more information, see the Canadian Investor Statement on Climate Change.
36. For more information, see our Clean Energy Financing Program.
37. For more information, see the RBC Energy Saver Loan Program.
38. For more information, see RBCx.
39. For more information, see RBC's ESG Market-Linked GIC.

Endnotes

40. This transaction is RBC's second Green Bond offering, following its inaugural EUR500 million 5-year Green Bond in 2019. Importantly, it represents RBC's first issuance through its Sustainable Bond Framework which was launched in 2020 as part of the bank's commitments to advancing its sustainable finance and environmental, social and governance (ESG) leadership.
41. The Partnership for Carbon Accounting Financials (PCAF) is an industry-led partnership to facilitate transparency and enable financial institutions to assess and disclose greenhouse gas emissions of loans and investments.
42. The Greenhouse Gas Protocol (GHG Protocol) is the leading global corporate standard for measuring and managing GHG emissions. To guide companies in the task of identifying and calculating the emissions they create and contribute to across the value chain, the GHG Protocol breaks emissions down into 3 "Scopes". Direct Scope 1 emissions and indirect Scope 2 emissions (as identified by the GHG Protocol) are calculated and disclosed by RBC as part of our operational emissions. The GHG Protocol breaks down Scope 3 indirect emissions into 15 categories. RBC measures our Scope 3 emissions related to business travel (category 6) as part of our operational emission calculations. In 2021, we also began measuring and reporting our Scope 3 emissions related to loans and investments (category 15), also referred to as "financed" emissions for the first time.
43. Derived from PCAF (2020). The Global GHG Accounting and Reporting Standard for the Financial Industry. First edition, p. 40 and the PCAF North America Launch webinar (2019), slide 15.
44. As of October 31, 2021. Showcased in Megatons of carbon dioxide equivalent ($MtCO_2e$). Each of our asset classes measured covers a percentage of our total loan and investment balances. Gaps in measurement exist due to lack of data availability both internally and externally to measure financed emissions for the entirety of our lending. In total our measurement covers approximately 95% of the total loan and investment balances related to the 6 PCAF asset classes. Each of the individual asset classes have some variability in the total loan and investment balances measured and will fluctuate as we refine our inclusions and exclusions. Financed emissions are calculated based on best available score which includes a mix of PCAF data score 1 to 5 (primarily Score 5 as discussed herein) and includes scope 1 and 2 emissions. Emissions calculated using Score 5 data may be materially different from emissions calculated using Score 1 data. In addition, emissions calculated using Score 5 data have a high degree of uncertainty as to their accuracy. We continue to evaluate our approach to measuring financed emissions and will continue to refine our measurement. See "Important Notice Regarding this Report". We are working towards disclosing material methodology changes and will highlight their impact on total balances analyzed and financed emissions in future disclosures.
45. Covers 95% of business loan balances. PCAF Score 5 has been used for the majority of the business loans measurement. S&P Global Trucost data and S&P Global Capital IQ data has been used to measure for PCAF data Score 1 to 4. The PCAF methodology for business loans and unlisted equity has also been applied to project finance and commercial real estate assets with unknown use of proceeds. Unlisted equity is not currently measured as part of the business loan measurement. We expect to refine the measurement of this asset class in future disclosures as methodologies mature and data becomes available.
46. Covers 96% of Canadian residential mortgage balances. Excludes Home Equity Lines of Credit and non-Canadian mortgages, including those from City National Bank.
47. Covers 99% of motor vehicle loan balances related to automotive vehicles. Excludes loans associated with other vehicle types such as marine vehicles and recreation vehicles.
48. Covers 85% of commercial real estate mortgage balances. General purpose commercial real estate loans are currently captured within business loans.
49. Covers 89% of listed equity & corporate bonds. S&P Global Trucost data and S&P Global Capital IQ data has been used to measure this asset class for PCAF data Score 1 to 4 and PCAF Score 5 has been used for the remaining balances.
50. RMI is an independent, non-partisan, non-profit organization that decarbonizes energy systems through rapid, market-based change in the world's most critical geographies to align with a 1.5°C future and address the climate crisis. See page 32 for additional information.
51. Banking for Impact on Climate in Agriculture (B4ICA) is an initiative in partnership with the United Nations Environment Programme Finance Initiative (UNEP FI), the Partnership for Carbon Accounting Financials (PCAF) and the Environmental Defense Fund (EDF). B4ICA aims to enable banks to more accurately account for agricultural sector GHG emissions, enable consistency in methodologies and frameworks, leverage best in class data and transparency tools, and accelerate the drive towards financial farming solutions for net zero, climate-smart agricultural practices in critical commodity supply chains and regions. See page 32 for additional information.
52. The utilities sector is classified under our Business Loans asset class. This is currently being measured using PCAF Score 5 and also S&P Global Trucost data and S&P Global Capital IQ data for score 1 to 4. Due to lack of granularity within our internal Standard Industry Classification codes for power generation when using s data Score 5 we are primarily using emission factors related to fossil fuel power generation. As such, emissions related to our utility portfolio may be overestimated and will be re-classified with the appropriate sectoral emission factors in future measurement and disclosure.
53. Other includes all other RBC sector groups such as Consumer Discretionary, Industrial Products, Information Technology, Mining & Metals, Real Estate & Related and Transportation, among others.
54. RBC Economics provides RBC and its clients with timely economic forecasts and analysis. For more information, see RBC Economics.
55. RBC Economics and Thought Leadership conducted a year-long research project that mapped out six pathways for Canada to get to net-zero by 2050. For more information, see our Road to Net Zero Report.

Endnotes

56. Disruptors is an ongoing podcast series about reimagining Canada's economy in a time of unprecedented change. For more information, see RBC Disruptors.
57. ESG Stratify provides the latest in-depth insights from RBC Capital Market's Equity Research team. For more information, see RBC ESG Stratify.
58. RBC GAM provides a regular cadence of research and insights on trending ESG topics. To learn more, view our Featured Insights.
59. The RBC Tech for Nature focus area "Data" supports programs and projects at qualifying charitable organizations that work to improve the collection, organization, and availability of climate data and allow for more informed and meaningful decision-making.
60. The RBC Tech for Nature focus area "Communities of Action" supports programs and projects at qualifying charitable organizations that empower individuals to work with their communities to positively change their behavior and produce a notable change for the planet.
61. The RBC Tech for Nature focus area "Innovation Ecosystem" supports programs and projects at qualifying charitable organizations that empower entrepreneurs, ventures and charities working to build, launch, and scale game-changing solutions to solve the pressing environmental challenges of today.
62. GHG emissions reductions in thousands of tonnes.
63. There are no improvements to operational efficiency as 2018 is used as our baseline year to determine future operational efficiency.
64. RBC operational efficiency in 2021 is partially attributable to the impact of the COVID-19 pandemic, including lower occupancy rates in our office spaces due to stay-at-home requirements.
65. We continue to evaluate our target approach to achieving net-zero emissions in our operations.
66. These Scope 2 market-based emissions (tonnes of CO2e) figures are net of GHG reductions from green power purchases.
67. The methodology developed by Oliver Wyman was based on work through the United Nations Environment Programme Finance Initiative (UNEP FI). It is described in the Extending our Horizons report. A key assumption was that the balance sheets would be static over the 30 year scenario horizon.
68. RCP stands for Representative Concentration Pathway, a standard pathway of GHG concentrations used by climate scientists.
69. The methodology is described in the publicly-available Navigating a New Climate report from UNEP-FI.
70. The flood maps we used in our assessment are from Francesco et al (2021): River flood hazard maps for Europe and the Mediterranean Basin region. European Commission, Joint Research Centre (JRC).
71. See Extending our Horizons and Beyond the Horizon report from UNEP-FI. A static balance sheet assumption was used.
72. The scenarios were developed specifically for use in the Transition Check tool, but are broadly similar to the scenarios released in 2020 by the Network for Greening the Financial System. We used the scenarios which were modeled with REMIND-MAgPIE Integrated Assessment Model developed by the Potsdam Institute for Climate Impact Research. The scenarios are based on those described in the 2018 paper by Kriegler et al in Environmental Research Letters.
73. Since we ran this exercise in the first half of 2021, a number of automotive manufacturers have announced significant investments to grow their EV product lines.
74. Expected loss calculated using a Basel approach: expected loss = (probability of default) x (loss given default) x (exposure at default).
75. Stan, K., Watt, G.A. & Sanchez-Azofeifa, A. Financial stability in response to climate change in a northern temperate economy. Nat Commun 12, 7161 (2021).
76. Physical risk includes both chronic and acute risks. Chronic refers to long-term changes in climate patterns (e.g., higher temperatures, increased precipitation) and acute refers to extreme weather events (e.g., increased intensity and frequency of storms).
77. This represents our total credit risk exposure to carbon-related assets as a percentage of our total credit risk exposure. As per the TCFD's updated implementation guidelines (October 2021) carbon-related assets includes "those assets tied to the four non-financial groups identified by the Task Force", comprising borrowers within Energy (oil & gas, coal & electric utilities), Transportation (air, maritime, rail, trucking & automobiles), Materials & Buildings (metals & mining, chemicals, construction materials, capital goods, real estate management and development) and Agriculture, Food and Forest Products (beverages, agriculture, packaged food and meats, paper and forest products). In relation to electric utilities borrowers, as per the guidelines, we have excluded those whose business relates to renewables and hydro-electric power.
78. Lending represents the credit risk exposures that include on-balance sheet amount and off-balance sheet amount (undrawn and other). Power generation is a subset of our Utilities portfolio. It includes those borrowers that generate power and excludes those that are exclusively involved in transmission and distribution or non-power generation. Calculated on a client-by-client basis using the most recent publicly available information on energy source (as a % of MWh), the proportion of which is applied to our credit risk exposure to the client, as at October 31, 2021.
79. Assets managed by RBC Global Asset Management that are beneficially owned by clients, as of October 31 for each of the years presented. All RBC GAM investment teams integrate material ESG factors as part of the investment approach and follow RBC GAM's approach to responsible investment. This figure includes investments in derivatives, cash, money market instruments and funds that track an index. Due to the nature of these instruments, ESG factors are less likely to impact the value of an investment compared to investments in asset classes like equities and fixed income. Where a material ESG risk or opportunity is identified, it is considered in the investment decision. For funds where the investment manager does not exercise discretion, such as funds that track an index, there may be less opportunity to integrate ESG considerations as part of the investment process. This figure also includes externally sub-advised assets under management. The level of ESG integration is assessed during the selection process of all new external subadvisors and the ESG integration approaches of existing external sub-advisors are monitored. However, these sub-advisors do not follow RBC GAM's approach to responsible investment. For further definitions, please refer to rbcgam.com/cgri.
80. Greenwashing means accusations of false or misleading claims about the environmental benefits of a product, service or technology.

Providing feedback

This report is published for all stakeholders of Royal Bank of Canada and its subsidiaries. We welcome your questions and feedback on our approach, or suggestions for improvement, at corporatecitizenship@rbc.com.

124043 (03/2022)