

CLIMATE CHANGE

CLIMATE CHANGE PROGRAM

CPPIB seeks to be a leader among asset owners and managers in understanding the investment risks and opportunities presented by climate change. This aligns with our legislative mandate, recognizing we must act in the best interests of current and future beneficiaries. Investments and assets must be properly priced to reflect risks and offer sufficiently attractive potential returns. This is important for a sophisticated investor with a long investment time horizon.

We apply insight and expertise and monitor developments as we construct our long-term portfolio, rather than setting targets or timelines that could compel us to sell or buy assets at a suboptimal time. This helps protect our holdings against risks, ranging from potential losses to overpaying for investments during the global energy transition.

Launched in 2018, CPPIB's Climate Change Program is a cross-departmental, multi-year initiative designed to help us achieve that objective. The Program has six work streams, described in detail on the following page.

The Program, which incorporates elements of change management, collaboration and knowledge sharing, is designed

to provide CPPIB with a differentiated understanding of the impact of climate change on our business. Goals include enhanced capital allocation, deeper investment acumen related to climate change and strengthened external communications and transparency – which is critical to fostering and promoting stakeholder confidence.

The Program builds on CPPIB's years of work on this issue. Climate change has been a focus of our engagement activities with companies for more than a decade.

CPPIB's Climate Change Steering Committee (CCSC) includes both the Chief Financial and Risk Officer and Chief Investment Strategist as well as senior representatives from the following departments: Active Equities, Public Affairs and Communications, Real Assets and the Office of the CEO. This committee, chaired by the Global Head of Active Equities, oversees CPPIB's Climate Change Program Management Office and Climate Change Management Committee, which in turn guide and support the Program's climate-related work streams.

To facilitate this work, CPPIB leverages vendors and external partners with the goal of obtaining best-in-class data and expertise.

Climate Change Steering Committee: From left: Deborah Orida, Neil Beaumont, Geoffrey Rubin, Heather Tobin, Ed Cass, Michel Leduc.



CPPIB CLIMATE CHANGE WORK STREAMS

TOTAL FUND EXPOSURE – APPETITE AND PORTFOLIO DESIGN

Work stream 1 led by: Total Portfolio Management

This work stream takes a top-down approach with the goal of, eventually, directly factoring risks and opportunities into CPPIB's investment strategy and total portfolio design. It works to understand potential climate change and energy transition pathways for various countries, as well as the resulting economic and market impacts. The work stream is also working to develop energy scenarios and reference cases to guide portfolio allocation decisions.

TOTAL FUND EXPOSURE – RISK MEASUREMENT AND SCENARIO ANALYSIS

Work stream 2 led by: Finance, Analytics & Risk

This work stream's main objective is to identify, assess and monitor climate change risks using several approaches, with the goal of ensuring the resilience of the CPP Fund. The work stream is also responsible for compiling CPPIB's carbon footprint metrics and ensuring the process is aligned with emerging best practices (see pages 23-24).

SECURITY SELECTION

Work stream 3 led by: Active Equities and Real Assets

The Security Selection work stream takes a bottom-up approach to assessing climate change risks and opportunities. Enhancing the review process for our most material individual investments, the work stream designed a framework that allows investment teams and approval committees to identify and act on key climate change issues for these fundamentally driven decisions across geographies and sectors.

DATA AND INFORMATION

Work stream 4 led by: Technology and Data

This work stream provides enterprise data, technology and information capabilities in support of CPPIB's Climate Change Program.

FUND-WIDE LEARNING AND KNOWLEDGE SHARING

Work stream 5 led by: Human Resources, Public Affairs and Communications

This work stream increases CPPIB's internal awareness and understanding of climate change risks and opportunities through both learning programs and awareness building, often through enterprise-wide communications. This group will help our global investment professionals enhance their understanding of climate change and make better-informed decisions.

EXTERNAL COMMUNICATIONS

Work stream 6 led by: Public Affairs and Communications

This work stream applies a comprehensive communications strategy to strengthen external awareness of CPPIB's climate change work. This includes expanded disclosure through our Sustainable Investing and Annual Reports and ensuring alignment with the Financial Stability Board's Task Force on Climate-related Financial Disclosures.

Climate Change Management Committee: From left: Amy Flikerski, Samantha Hill, Steven Richards, Jacqueline Cosgrove, Caroline Rogers, Diane Oliveira, Jeffrey Hodgson, Maria Montero, Ben Lambert, Rocky Ieraci. Absent: Martin Healey, Kathy Rohacek, Bill Mackenzie, Dureka Carrasquillo.





Deborah Orida, our Senior Managing Director & Global Head of Active Equities, was named executive sponsor of CPPIB's organization-wide Climate Change Program in April 2019.

What is CPPIB's approach to climate change and why have we chosen this?

CPPIB's approach is to understand both the risks and opportunities from a financial point of view. And the reason we do that is to be consistent with our mandate: to maximize returns without undue risk of loss for the benefit of 20 million Canadians. That means we need to think about these emerging risks and opportunities and ensure that they are fully incorporated into our material investment decisions.

What is CPPIB's Climate Change Program and how is it different than what was done before?

The Climate Change Program is a cross-functional effort that involves people from Total Portfolio Management (TPM), Finance, Analytics & Risk (FAR), our investment departments, Human Resources, Technology & Data, and Public Affairs and Communications. It's a cross-divisional, cross-departmental effort because our strategy on climate change affects all of CPPIB – and we need to work together to make sure we're identifying all the risks and opportunities that could impact investment decisions.

The new Program has three design work streams. The first is a top-down effort led by TPM focusing on portfolio design; and how climate change and energy transition scenarios are going to impact our target exposures in different countries. Second, we have a portfolio risk assessment and scenario analysis work stream led by our folks in FAR.

Finally, a bottom-up security selection work stream led by two investment teams – Active Equities and Real Assets – focuses on incorporating the impacts of climate change in our material investment decisions.

All this work may sound a bit theoretical. You might ask, 'How is it affecting our day-to-day investment decisions?'

One way this work is really starting to come through is in the climate change security selection framework we launched in April. Investment teams must now include descriptions of relevant climate change-related risks and

opportunities that impact investment decisions in their screening memos and final investment recommendations.

We know CPPIB aims to allocate more to emerging markets – up to a third of the Fund by 2025. How do climate change considerations fit with that strategy?

The launch of our climate change security selection framework means we now incorporate assessments of climate change-related risk into our material investment decisions. And this applies to our work in emerging markets.

As we think about investment prospects in these markets, the risks and opportunities presented by climate change will be key considerations.

We have already made investments that I believe are excellent examples of the integration of climate change considerations into our emerging markets strategy – including our growing portfolio of renewable energy assets in Brazil and India. And on the public market side we have our investments in the theme of vehicle electrification in China.

Any change will generate a genuine opportunity set, and climate change is just one example of that.

Why is it important for CPPIB to be a leader among asset owners in understanding the risks and opportunities of climate change?

Climate change is a long-term risk and opportunity set that's very consistent with CPPIB's long-term horizon. Being a leader in these areas is key to fulfilling our responsibility to make the best and most well-informed investment decisions possible for 20 million Canadians.

My own assessment is that CPPIB is an industry leader in this regard, particularly because we are so focused on approaching the challenge from a financial perspective. We look at how to incorporate the risks and opportunities in order to make the best investment decisions.

It is a real, disciplined approach and consistent with the fulfillment of our mandate.

CPIB'S INTEGRATED SUSTAINABLE INVESTING FRAMEWORK

BOARD OF DIRECTORS

- Approves overall risk framework, including integration of ESG factors
- Approves Policy on *Responsible Investing* and *Proxy Voting Principles and Guidelines*

CEO

- Sets tone and overall risk culture
- Promotes active ownership approach and our stewardship activities

SUSTAINABLE INVESTING COMMITTEE

- Chair of Committee provides updates to CEO on key issues
- Receives updates and approves sustainable investing policies, guidelines, and strategies

SUSTAINABILITY VIRTUAL TEAM

- Comprised of professionals from all investment teams
- Shares insights on ESG topics, including best practices and lessons learned, so that we can accelerate our firm-wide understanding of key ESG issues

SUSTAINABLE INVESTING GROUP

- Comprised of professionals with diverse backgrounds and expertise in ESG matters
- Supports CPIB's role as an active and engaged owner
- Champions ESG integration across the organization into investment decision-making

INVESTMENT DEPARTMENTS AND CORPORATE FUNCTIONS

- Integrate relevant ESG considerations into investment decision-making and asset management
- Help inform proxy voting decisions and engagement with companies
- Senior management oversees operational, regulatory and legal, and strategic risks.

LEGEND

- Receives updates and provides approval
- Operation lead & champion
- Operations and working groups

- Receives updates on sustainable investing activities and Climate Change Program
- Approves Integrated Risk Framework, including integration of ESG and reputational factors

Climate Change Program

CLIMATE CHANGE STEERING COMMITTEE

- Includes both the Chief Financial and Risk Officer and the Chief Investment Strategist as well as senior representatives from Public Affairs and Communications, Real Assets, and the Office of the CEO
- Chaired by Global Head of Active Equities, who is Senior Management Team sponsor of the Climate Change Program
- Approves overall program execution strategy and sponsors change management across the organization

CLIMATE CHANGE PROGRAM MANAGEMENT OFFICE

- Includes representatives from Active Equities and Finance, Analytics and Risk
- Ensures collaboration across the organization
- Leads critical project and process management, implementation and coordination capabilities

CLIMATE CHANGE MANAGEMENT COMMITTEE

- Meets monthly and oversees climate change risk integration across the organization
- Comprised of management from across investment departments and core services

WORK STREAMS

- Total fund exposure-appetite and portfolio design
- Total fund exposure-risk measurement & scenario analysis
- Security selection
- Data and information
- Fund-wide learning and knowledge sharing
- External communications

ENERGY & RESOURCES

The Energy & Resources (E&R) group pursues investments in traditional energy production, transport and storage, as well as mining. It prioritizes evaluation and monitoring of ESG factors, working with portfolio companies to ensure implementation of best practices.

This year E&R launched an Innovation, Technology and Services (ITS) strategy, with a mandate to seek early stage investments aligned with our broader sub-sector strategies and energy transition. The E&R group saw the industry is undergoing significant change from new, earlier-stage technology companies that are both creating and improving existing processes and technologies. This creates opportunities for innovative technology companies to become a large and critical segment of the E&R investing landscape.

Over the past six months the team has focused on four key areas experiencing significant change and technological innovation. These are:

- water and waste;
- materials and fuels;
- electricity (transmission, distribution, storage); and
- E&R processes and services (new innovative companies, technologies and services that are improving processes).

In October 2018, CPPIB formed a partnership with the Creative Destruction Lab (CDL) to better connect with emerging technologies in the artificial intelligence and energy sectors. CDL is a seed-stage program, founded by Professor Ajay Agrawal at the University of Toronto's Rotman School of Management. It connects deep-science ventures with serial entrepreneurs, angel investors and venture capitalists to build massively scalable companies. Within CDL's Energy Stream, our ITS team is currently engaged in the inaugural mentoring program run out of the University of Calgary.

ChargePoint

This year, E&R worked with Thematic Investing to complete an investment in ChargePoint Inc, which designs, builds, and supports a comprehensive suite of electric vehicle charger technologies for a range of customer segments including home, commercial and fleet. Headquartered in California, the company is committed to deploying 2.5 million charging spots globally by 2025. Our investment in ChargePoint will provide exposure to an increasingly important transportation technology and help enhance our insights into the latest advances in electric vehicles and energy transition.



Photo courtesy of ChargePoint

AN INTERVIEW WITH ETIENNE MIDDLETON



Capitalizing on Innovation

Etienne is a Senior Principal in the Energy & Resources (E&R) group, leading its Innovation, Technology and Services strategy. He joined CPPIB in 2009 and previously helped the organization develop a world-class infrastructure program.

CPPIB recognizes the need to understand the long-term global shift to lower-carbon energy sources. How does this projected energy transition influence the work of the E&R group?

Everything our team does is underpinned by the approach of what this energy transition means when we look at long-term investments. The global energy value chain is undergoing substantial change and is being impacted by earlier-stage technology companies that are improving existing processes.

That's led to the development of our Innovation, Technology and Services (ITS) strategy, which sees to it that we're not just aware of the changes but actually investing in some of them. Some of these companies have potential to scale and become large investments.

We also see energy demand moving to broader electrification. Looking at Heating Ventilation Air Conditioning (HVAC), and particularly heating, we're seeing more electrification. The other obvious case is the electrification of the automobile. That shift is significant because charging Electric Vehicles (EVs) puts a substantial load on homes, in some cases doubling the load. Existing infrastructure in most cities is not set up to handle that.

What areas show the most potential for future investments under our Innovation, Technology and Services strategy?

The ITS strategy focuses on companies that are improving and disrupting both existing energy and resource sectors. It currently focuses on four key areas: water and waste, materials and fuels (including carbon), electricity (generation, transmission, distribution, efficiencies and storage), and oil and gas processes and services (new innovative companies and technologies that are improving existing processes).

We're looking for opportunities across industries that are starting to bring new technologies to bear.

There's a lot to be done for oil and gas processes, where you can apply technologies to improve productivity and efficiency, and green the footprint. With commodity prices remaining low, you have to look for efficiencies in order to be competitive.

Plus, we're looking at electricity more broadly. There's a new generation of technologies that impact transmission, distribution deficiencies and storage across the chain.

We're also talking to companies that are exploring ways to sequester or use carbon better. For example, early stage technology is creating carbon nanofibers that can be coupled with other technology that is pulling carbon out of the atmosphere. Those fibres can be used for many applications such as aerospace and medical.

What have you found most interesting about the sector since launching this investment strategy?

We're seeing innovation being applied to very large, global challenges. Carbon capture, use and storage has emerged as a very big theme requiring massive investment that can help meet carbon reduction goals.

We've come to appreciate that CPPIB is very well-positioned to deliver these investments, given our scale, our long-term focus and the capabilities we've built across investment teams.

How do our investments in companies like ChargePoint dovetail with this larger strategy?

With the investment in ChargePoint, we were able to leverage expertise from across the firm, making the investment with our teammates in Thematic Investing who are focused on the shifting usage of automobiles. We were also able to tap into our portfolio companies, to understand their perspectives.

Working with teams across CPPIB and our portfolio companies to identify and unlock new, applicable technologies is a core part of our strategy. The global scale of our investments ensures we have relevant touchpoints for new technologies.

More broadly, ChargePoint dovetails with the thesis around energy transition, given the potential magnitude of the shift in fueling automobiles, moving from fossil fuels to electrification. Our broader strategy hangs on this paradigm shift of changing energy supply and energy demand. ChargePoint gives us one early window into how quickly this shift is coming and allows us to apply that knowledge across our investing activities.

POWER & RENEWABLES

The Power & Renewables (P&R) group's mandate is to take advantage of opportunities created by the global energy market's transition, as well as overall global growth in demand for power – particularly for low-carbon energy alternatives. Electricity is now the fastest-growing form of energy consumption worldwide and renewables are becoming a prominent part of the energy mix as deployment costs fall and green technologies increasingly become mainstream.

The group was created to help access attractive investments in the sector, since the industry's dynamics align closely with our competitive advantages – notably our scale, flexibility and long-term horizon. P&R focuses on strategic opportunities and the ability to apply long-term investment horizons, with latitude to explore promising, less mature development and greenfield investments.

Over the past year, P&R focused on establishing and deepening strong relationships with strategic investors in renewables – with the expectation that this will create additional investment opportunities. These include the continued success of its partnership with Brazil's Votorantim Energia, which provides access to a scaled, growing and attractive Brazilian power market.

P&R also made significant progress setting up a European-focused offshore wind joint venture that was a key component of its acquisition of a minority interest in certain Enbridge renewable assets. And, it spent the year strengthening asset management capabilities, specifically through the build-out of Cordelio Power, an entity created upon the acquisition of NextEra Energy Partners' Ontario assets in 2018. This included hiring a full asset management team with the skill to drive best practices across P&R's portfolio. There is a significant benefit to this type of common asset-management platform, both in providing efficiency and driving long-term value within the portfolio.

P&R believes CPPIB's comparative advantages are well-suited to help us build a diversified renewable energy portfolio that can deliver the best risk-adjusted returns available. CPPIB's scale provides access to the largest opportunities. Our long-term horizon makes us an attractive equity partner and preferred source of capital for top-tier management teams. Finally, our total portfolio approach and certainty of assets allow us to access a broad range of investment risk profiles, including meaningful exposure in emerging markets and disruptive technologies. P&R collaborates with colleagues in other investment programs, including Infrastructure, Relationship Investments, Active Fundamental Equities and Energy & Resources.

INTERVIEW WITH MARTIN LAGUERRE AND BILL ROGERS

Investing in Renewables

Bill and Martin are Senior Principals in the Power & Renewables group. Each has more than a decade of experience in the renewable energy sector and serve on the boards of CPPIB portfolio companies. Since joining CPPIB in 2016, Martin has played a leading role in our investment strategy for renewable energy and pursues investments on a global basis. Bill joined CPPIB in 2019 to help grow our global renewable energy portfolio, particularly in Europe.



MARTIN:

Please describe the current state of the renewable energy market. What are the trends?

We are seeing three key trends. One is that renewable energy markets continue to grow globally and have reached a point where they are attracting a different cost of capital. Renewables are being adopted widely, so we're seeing opportunities to invest in both developed and emerging economies.

The second is that the sector continues to be very competitive to buy good projects and quality companies. It attracts capital and really has gone from a market that was heavily subsidized to one that is very much competitive and at parity with conventional energy sources.

Third, pricing is becoming transparent, which means developers will bid on projects at auctions. It's attracting the large utilities, which see attractive risk-adjusted returns.

Where are investment opportunities for CPPIB likely to be found?

Again, there are three primary areas. One is buying businesses rather than just buying assets. We're spending more time forming strategic partnerships so we can scale and grow efficiently.

When you buy a business, management can invest in R&D projects at an earlier stage. These R&D projects can in time result in very high returns. That complements some of the lower-yielding, more stable assets.

The second focuses on emerging markets, where demand is driven mostly by new load growth as opposed to load substitution. Compared with developed markets, where coal is going down and renewables are picking up as replacement, emerging markets are growing 5% to 7% per annum because of demographic changes like the growing middle class.

Thirdly, we'll be going after large, complex transactions where we're one of only a few players that can act, and where we have the flexibility to think differently. A lot of investors will sell after five years. Having a total-return focus differentiates us – it's very flexible capital that allows us to look at special situations.

CPPIB is known for its very long time horizon. How is the renewable energy space likely to evolve over the coming decade, and what's in store for the Power & Renewables team?

We describe it as having a barbell strategy – we want large-scale exposure in terms of operating assets, and then combine that with development, R&D and greenfield, which is a different type of risk profile. It combines into a portfolio that we feel is very balanced and prudent.

Over time, you're going to see more technology mixing in to power and renewables. And that could be in the home, in the car, in an industrial business or at the utility.

You're going to see artificial intelligence creating the ability to load shift and load balance the grid. The power grid goes all the way to the people consuming electricity, so we'll be looking at how energy efficiency comes into play. Emerging technologies will enable some of the efficiencies utility customers are looking for. So, from our investment perspective, Power & Renewables will have a much broader definition. And, of course, climate change will continue to play a major role in supporting the shift to greater use of renewable energy.



BILL:

How would you characterize the renewable power market in Europe today? What are its major drivers or influencers?

The market today is active and reaching a new level of stability. From a low point of investment in 2017, it is now stabilizing at about US\$80 billion to US\$100 billion in investments a year.

There are two main drivers. The first is long-term regulatory goals – a European-wide 2030 target for reducing greenhouse gas emissions, and the U.K. recently setting a goal to be carbon neutral by 2050. That creates a long-term framework that supports building of new renewables.

The other driver is the increasing competitiveness of renewable technologies against conventional energy sources such as coal and gas. Solar costs have dropped over 90% since 2010 and, similarly, the cost of wind energy generated has dropped by more than 50% over the same period.

In Southern Europe, you can now make an attractive return from building solar plants without any subsidy, and the same is true for wind in parts of Northern Europe.

How is Europe different from other major renewable energy markets? Which parts of it are likely to offer the best opportunities for CPPIB's Power & Renewables team?

Europe is arguably the most mature renewable energy market in the world, having pioneered many of the technologies and business models that are driving the energy transition. It is home to many of the world's leading suppliers and project developers, who are attractive potential partners for CPPIB.

One area to highlight is offshore wind. The latest turbines can generate energy at an increasingly competitive cost, thereby unlocking a global market worth up to US\$500 billion over the next 10 to 15 years.

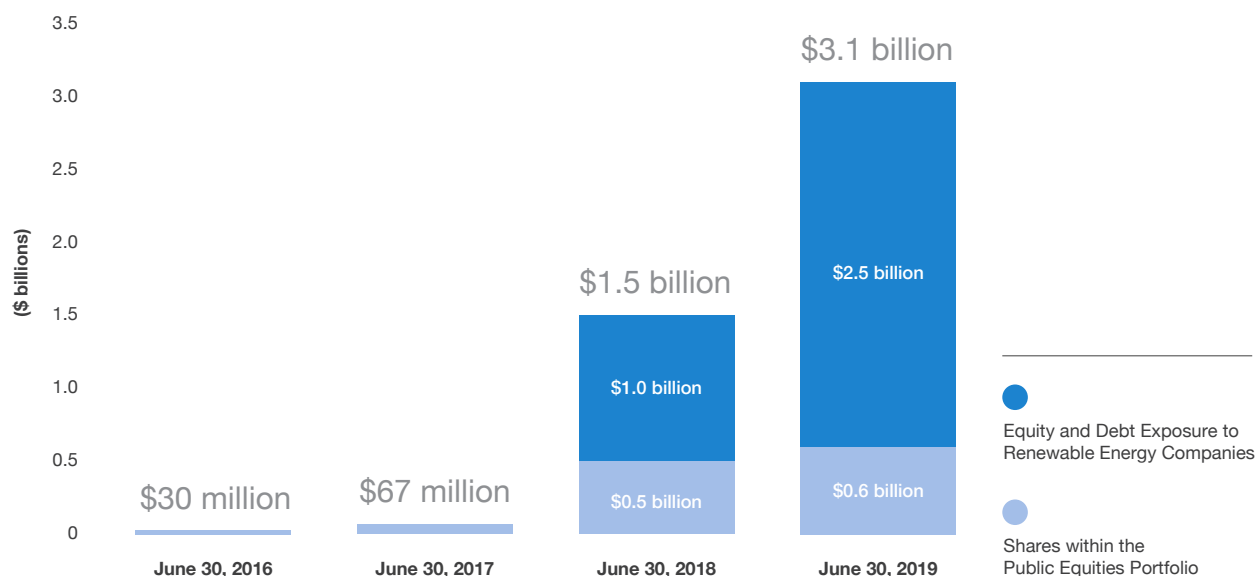
To help us access this market, we recently set up Maple Power, a 50/50 partnership with Enbridge. This will enable us to partner with leading European utilities to develop, construct and own offshore wind farms. Our initial investments are in Germany and France, with plans to expand to other parts of Europe.

CPPIB'S EXPANDING PORTFOLIO OF RENEWABLE ENERGY

CPPIB's investment in renewables is aligned with our mandate, and belief that this sector can provide attractive risk-adjusted returns when transactions are done in a thoughtful, prudent manner. Below are major transactions in this space

- In December 2017, CPPIB signed agreements with Brazil's Votorantim Energia to form a joint venture, acquiring two operational wind parks located in northeastern Brazil through an initial contribution of \$272 million in equity.
- In January 2018, CPPIB announced plans to acquire a 6.3% stake in ReNew Power, a leading Indian renewable energy developer and operator with clean energy capacity diversified across wind, utility-scale solar and rooftop solar power-producing assets. CPPIB's initial investment of US\$144 million was followed by an additional US\$247 million in March 2018. In June 2019, CPPIB participated, alongside other shareholders, in a rights Issue by ReNew Power for an additional US\$100 million, bringing our total investment to US\$491 million.
- In April 2018, CPPIB signed an agreement to acquire a portfolio of six Canadian operating wind and solar power projects from NextEra Energy Partners for \$741 million. The business now operates as Cordelio Power.
- In May 2018, CPPIB signed agreements with Enbridge Inc. to acquire 49% of Enbridge's interests in select North American onshore renewable power assets, as well as 49% of Enbridge's interests in two German offshore wind projects. CPPIB's total commitment was about \$2.25 billion. The assets included 14 long-term, fully contracted operating wind and solar assets in four Canadian markets and two operating wind and solar assets in the United States
- In October 2018, CPPIB expanded its existing joint venture with Votorantim Energia through the acquisition of the State of São Paulo's stake in the Brazilian hydro generation company Companhia Energética de São Paulo (CESP) for BRL \$1.7 billion (\$600 million). This acquisition added more than 1.5 gigawatts of gross capacity to the joint venture, in addition to the prior 564 megawatts of wind capacity.

CPPIB's equity and debt exposure to renewable energy companies



GROWING OUR PORTFOLIO OF GREEN BUILDINGS

CPPIB's real estate team is focused on acquiring assets with high sustainability metrics that align with our long-term investment goals. The level of green certification is one of the most important metrics we use to assess asset quality. The Leadership in Energy and Environmental Design (LEED) certification program and Green Building Councils across the globe encourage sustainable building and development practices through standards and performance criteria.

Like CPPIB, our partners in real estate acquisition and management take LEED or equivalent ratings into account when building and operating their property portfolios. CPPIB also looks for opportunities to enhance the performance of existing buildings through upgrades and redevelopment.

Today, our 25-country portfolio has a total of 295 green certified buildings. This includes 101 LEED-certified buildings, with 12 earning the LEED Platinum (highest level) certification, and 47 earning LEED Gold certification.

SELECT LEED PLATINUM BUILDINGS IN THE REAL ESTATE PORTFOLIO



AMLI BUCKHEAD

Partner: AMLI **Location:** Atlanta, U.S.
Sector: Multifamily **CPPIB Interest:** 45%



GLP MISATO III

Partner: GLP **Location:** Misato, Japan
Sector: Industrial **CPPIB Interest:** 50%



MNP TOWER

Partner: Oxford Properties
Location: Vancouver, Canada
Sector: Office
CPPIB Interest: 50%



CENTENNIAL PLACE

Partner: Oxford Properties
Location: Calgary, Canada
Sector: Office
CPPIB Interest: 50%



RBC WATERPARK PLACE

Partner: Oxford Properties
Location: Toronto, Canada
Sector: Office
CPPIB Interest: 50%



CPPIB MARKS ANOTHER FIRST WITH EURO-DENOMINATED GREEN BOND

In 2018, CPPIB became the first pension fund manager to issue a green bond. It set another landmark in January 2019 with the first sale of a euro-denominated green bond issued by a pension fund manager, a €1 billion 10-year fixed-rate note.

Since their introduction in 2007, green bonds have become a mainstream way for companies, governments and other organizations to raise funds for projects with environmental benefits. Green bonds provide CPPIB with additional funding as we pursue acquisitions of strong, long-term investments eligible under our Green Bond Framework. The Framework has been evaluated by the Center for International Climate Research (CICERO), a leader in providing second opinions on the qualification of debt for Green Bond status.

CPPIB's cross-departmental Green Bond Committee includes representatives from Sustainable Investing, Capital Markets and Factor Investing, Power & Renewables, Legal, and Public Affairs and Communications. The committee met in July of 2018, and January and July of 2019. The committee determines which projects are eligible for green bond proceeds in the following categories.

RENEWABLE ENERGY (WIND AND SOLAR)

- Acquisition, operation, maintenance and upgrades of wind and solar energy projects
- Efficiency improvements of wind and solar energy projects

SUSTAINABLE WATER AND WASTEWATER MANAGEMENT

- Acquisition, operation and upgrades of projects that improve efficiency of water distribution and water recycling services
- Investments in tail water recovery systems, which collect run-off water from fields that is then recycled for agricultural production

GREEN BUILDINGS (LEED PLATINUM CERTIFIED)

- Direct investments in buildings certified as LEED Platinum over the 24-month lookback period and during the life of the bond

GREEN BOND REGISTER

The Green Bond Committee also oversees the Green Bond Register. It documents the value of green bond issuance and which assets proceeds have been allocated to. Below is the registry as of June 30, 2019. Further details on CPPIB's renewable energy assets can be found on page 11.

NAME RENEWABLE ENERGY	CURRENCY
Cordelio Power	CAD
Votorantim Energia's Piaul I & Ventos III	BRL
Enbridge	CAD
Enbridge	EUR
Enbridge	USD
ReNew Power	USD
GREEN BUILDINGS	
Centennial Place, Alberta	CAD
Eau Claire Tower, Alberta	CAD
Richmond Adelaide Centre- 111 Richmond, Ontario	CAD
TOTAL ASSETS	3,033,821,458
CAD	1,500,000,000.00
EUR	1,000,000,000.00
TOTAL BONDS	2,988,100,000

HIGHLIGHTS FY2019

**\$3
BILLION**
RAISED

2
GREEN BONDS
(CAD AND EUR)

4
RENEWABLE ENERGY
PROJECTS

**4.08
MILLION**
METRIC TONS OF CO₂
AVOIDED GHG EMISSIONS
PER YEAR FROM
RENEWABLE ENERGY
PROJECTS¹

3
LEED PLATINUM CERTIFIED
BUILDINGS

**6.17
MILLION**
MEGAWATT HOURS
(MWH) OF RENEWABLE
ENERGY GENERATION
CONTRIBUTED ANNUALLY

EQUIVALENT CO₂
EMISSIONS FROM
ELECTRICITY USED BY
712,327
HOMES FOR ONE YEAR¹

EQUIVALENT TO GHG
EMISSIONS FROM
867,253
PASSENGER CARS DRIVEN
IN ONE YEAR¹

¹ Data is derived using the following website:
<https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>
based on CPPIB's investment in renewable energy projects only

ESTIMATED IMPACT OF OPERATIONAL RENEWABLE ENERGY PROJECTS

Investment	Location	Date of Initial Investment	Description	Technology	CPPIB Ownership	Gross Capacity (MW)	Prorata Capacity (MW)
Cordelio Power ¹	Canada	April 2018	Portfolio of six Canadian operating wind and solar power projects	Solar	100%	396	396
				Wind			
Enbridge ¹	Canada/ United States	May 2018	North American onshore renewable power assets	Solar	49%	1,300	637
	Germany		Two German offshore wind projects	Wind		Under Development	Under Development
Votorantim Energia ¹	Brazil	December 2017	Two operational wind parks located in Northeastern Brazil	Wind	50%	565	283
ReNew Power ²	India	March 2018	Leading Indian renewable energy developer and operator with clean energy capacity diversified across wind, utility-scale solar and rooftop solar	Solar	18%	3,100	558
				Wind		1,600	288
TOTAL						6,961	2,162

1 Assets operational as of June 2018-May 2019

2 Assets operational as of March 2018-March 2019

ESTIMATED GREEN BUILDING IMPACT

INVESTMENT	LOCATION	DESCRIPTION	CPPIB OWNERSHIP	PRO RATA ENERGY (MJ) SAVINGS	PRO RATA GHG SAVINGS	CERTIFICATION
Centennial Place	Canada	1,470,000 sf Multipurpose Commercial Space	50%	8%	11%	LEED EB PLATINUM
Eau Claire Tower	Canada	829,990 sf Multipurpose Commercial Space	50%	6%	15.5%	LEED CS PLATINUM
Richmond Adelaide Centre – 111 Richmond	Canada	258,129 sf Multipurpose Commercial Space	50%	15%	10%	LEED EB PLATINUM

The Model National Energy Code for Buildings 1997 is the baseline for a typical year upon which actuals were compared to calculate efficiency improvements.



CLIMATE CHANGE

Why We Engage

Climate change can present material financial risks and opportunities for companies and impact long-term investment values. The global transition to lower-carbon energy sources will have far-reaching implications for investors and companies across sectors and geographies. We believe companies should have a transparent and robust approach to assessing the challenges posed by climate change, so investors can make informed decisions.

What We Seek

- > Enhanced practices related to governance, strategy, risk management, performance metrics, and targets and opportunities
- > Improved disclosure on potential exposure to near-term and long-term climate change-related risks and subsequent impact on company strategy and profitability

Engagement

For more than a decade, we have worked with our portfolio companies on climate change-related issues, including understanding their levels of greenhouse gas (GHG) emissions, improving their climate change-related disclosure and advancing best practices related to climate change.

Climate change is one of the most significant physical, social, technological and economic challenges of our time. Scientists overwhelmingly believe it is critical to limit global warming to less than two degrees Celsius (2°C) above pre-industrial levels to prevent irreversible damage. Rising temperatures and sea levels create physical and transition risks, such as water scarcity, threats to biodiversity, extreme weather, and policy and market risks.

CPPIB's efforts to understand these implications and take commensurate action have accelerated and will remain a priority in coming years, building on our extensive engagement experience. Our enterprise-wide approach integrates climate change considerations into our risk framework and across relevant investment activities to build and protect long-term investment value (see pages 1-3 for details on our Climate Change Program).

We have taken a leading role in encouraging companies to improve climate change disclosure and practices. We have also helped develop global standards for how they do this through our participation on the Financial Stability Board's Task Force on Climate-related Financial Disclosures (see pages 20-22 for more information).

CPPIB's commitment to determining material financial impact means we have a responsibility to press companies to be transparent about challenges posed by climate change. We believe our interactions with portfolio companies, often in collaboration with other investors, will help us better understand climate change-related risks and opportunities, take them into consideration and respond accordingly to build long-term value.

DIRECT ENGAGEMENTS

We continue to lead and participate in collaborative engagements alongside other Canadian and global investors. These collaborative engagements press large GHG emitters in oil and gas, utilities and other sectors to improve disclosure

related to GHG emissions, strategies and performance. We find it encouraging that more and more companies are providing enhanced disclosure about climate change-related matters and the potential long-term impacts to their businesses. We will continue pressing for additional enhanced disclosure to better enable investors to assess the risks and opportunities presented by climate change.

HERMES EOS ENGAGEMENTS

In addition to direct engagement by our Sustainable Investing group, CPPIB also works with Hermes EOS. Hermes EOS' work focuses on sectors most exposed to climate change, including oil & gas, mining and materials, industrial and capital goods, utilities, automotive, technology and financial services, as well as supply chain considerations in the retail and consumer goods sectors. It engages with companies and contributes to the work of other global organizations on climate change, including the Task Force on Climate-related Financial Disclosures (see pages 20-22).

What types of climate change-related risks and opportunities should investors consider?

According to the Financial Stability Board's Task Force on Climate-related Financial Disclosures, climate change-related risks can be broadly classified into two categories: transition risks (regulatory, technological, market-based demand and/or reputational risks that could result from the shift towards a lower-carbon economy) and physical risks – those direct event-driven (acute) or longer-term (chronic, potentially resulting in food and water scarcity) risks associated with climate change. Climate change-related opportunities can be classified according to resource efficiency, energy source, products and services, the development of new markets and asset resilience. ESG factors, including health impacts and human rights-related matters.

CDP CLIMATE CHANGE PROGRAM

We support the Climate Change Information Request by the CDP (formerly the Carbon Disclosure Project). Each year, it seeks increased disclosure and management of climate change risks on behalf of investors from over 6,900 global companies. Its most recent Climate Change Report found over half of companies reporting identified climate-related risks as having potentially material financial or strategic impact on their businesses.

In 2018, a member of our Sustainable Investing group attended CDP's energy company and investor roundtable, which included discussions about the CDP Climate Change Information Request and potential ways to improve it. The roundtable also discussed the Financial Stability Board's Task Force on Climate-related Financial Disclosures recommendations (see pages 20-22) and climate-related scenario analysis. Investors also gave companies details about how climate-related information is considered when making investment decisions.

Working with companies to reduce methane emissions

Methane, the main constituent of natural gas, is a colourless, odourless, flammable greenhouse gas (GHG). It enters the atmosphere in many ways, from decomposing biological material to leaks in natural gas pipelines. While in the atmosphere, methane traps much more heat than the equivalent amount of carbon dioxide (CO₂), although it dissipates more quickly. Data from the Intergovernmental Panel on Climate Change (IPCC) shows methane is 84 times more potent than CO₂ over a 20-year time frame and is responsible for a quarter of the global warming we are experiencing today.

Managing methane is particularly important because of the role played by natural gas in the global energy transition. Many power generators are migrating from coal to natural gas as part of their transition to renewable energy sources. Since 2017, CPPIB has been active on the Advisory Committee of the United Nations-supported Principles for Responsible Investment (PRI) collaborative engagement on methane risks in the oil and gas and utilities sectors. The focus of the engagement is to encourage companies to reduce methane emissions, improve management of methane emissions and enhance disclosure.

We have chosen to lead a number of the more than 30 engagements alongside 35 other global investors. Since the launch of this initiative, targeted companies have shown stronger awareness and action on methane management.

PROXY VOTING

Over the reporting period, CPPIB supported 19 climate change-related shareholder resolutions. Several of these sought deeper disclosure on five areas related to climate change risk and opportunity management: (i) ongoing operational emissions management, including on methane, (ii) asset portfolio resilience, (iii) low carbon energy research, (iv) public policy intervention and (v) climate change risks in supply chain (see the pie chart below).

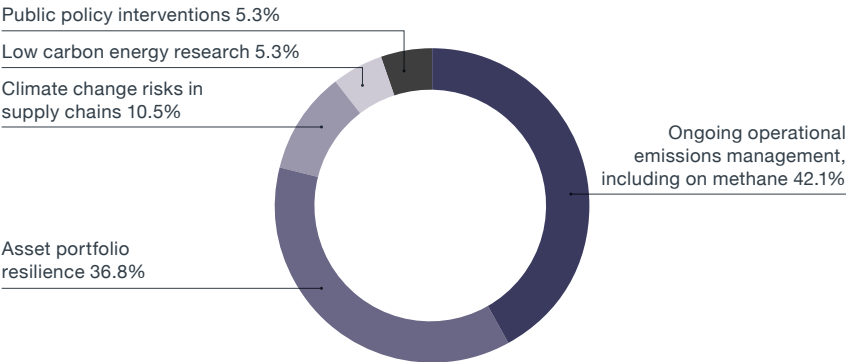
CPPIB has been supporting shareholder proposals that encourage companies to improve disclosure of climate change-related risks and opportunities for over a decade.

CPPIB supports proposals that enable stakeholders to better understand a company's exposure to climate change-related risks and opportunities. Shareholder support for these climate change-related resolutions can be seen in the bar chart to the right for a select number of companies.

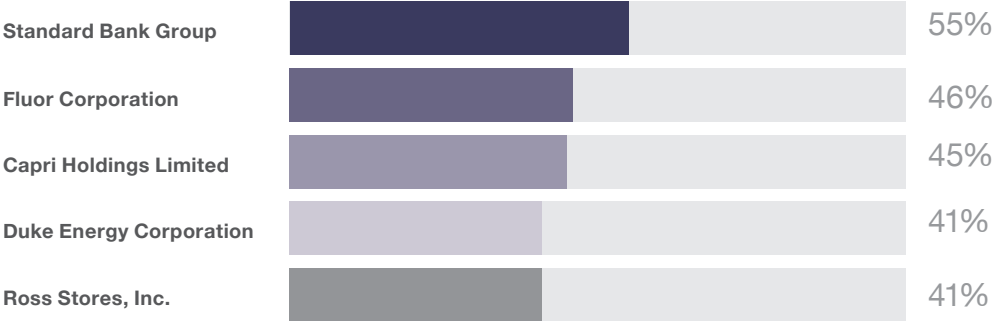
We continue to see strong levels of support for climate change-related shareholder resolutions across different sectors, which is reflective of the wide range of organizations that are exposed to climate-related risks. The support is encouraging, and we hope it will continue motivating companies to improve their disclosures and management of relevant climate change related risks and opportunities.

CLIMATE CHANGE-RELATED SHAREHOLDER PROPOSALS THAT CPPIB SUPPORTED IN 2019

SHAREHOLDER PROPOSALS BY TYPE



SELECT CLIMATE CHANGE-RELATED RESOLUTIONS THAT RECEIVED HIGH LEVELS OF SHAREHOLDER SUPPORT



2019 REPORT ON ACTIVITIES

Task Force on Climate-related Financial Disclosures

The Financial Stability Board (FSB) is an international body created in the wake of the 2008 financial crisis to monitor financial system stability. The FSB established the Task Force on Climate-related Financial Disclosures (Task Force) in 2015 to develop voluntary recommendations for more efficient and effective climate-related financial disclosures to promote more informed investment, credit and insurance underwriting decisions.

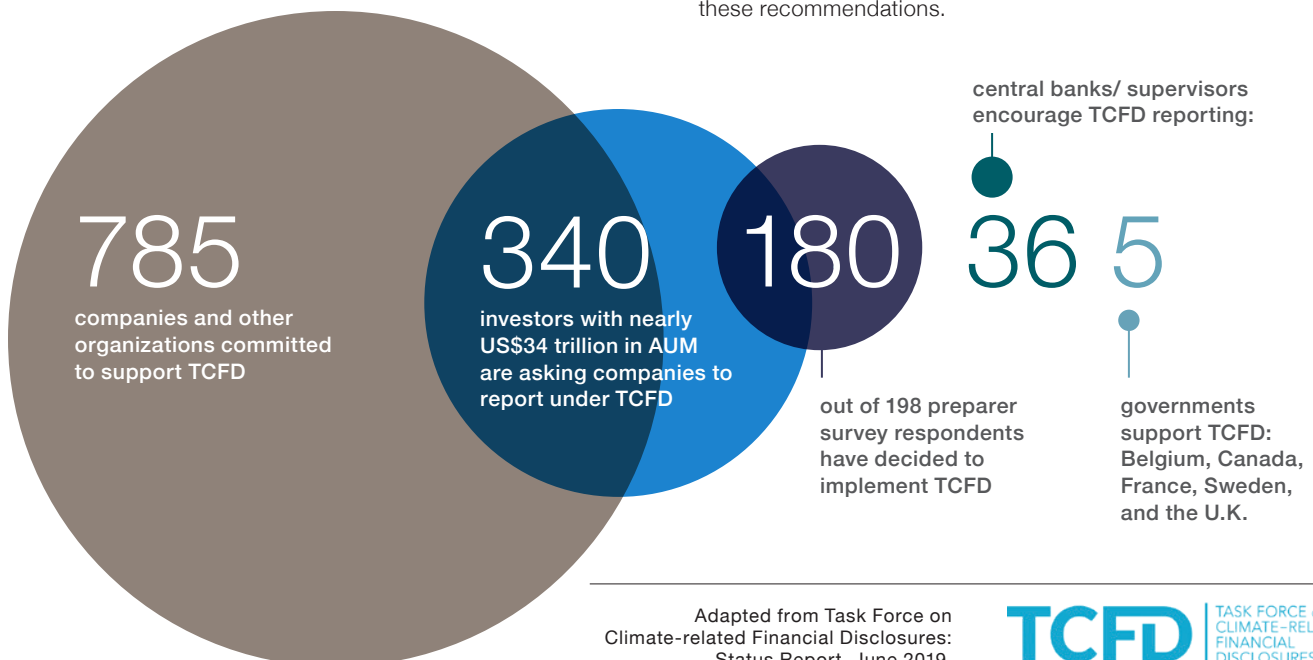
The FSB believes more effective climate change disclosures will help reduce financial stability risks by avoiding an abrupt repricing of asset values as the impacts of climate change become clearer. We agree, and this belief is reflected in our long-standing climate-related engagement work with companies.

The Task Force, chaired by Michael Bloomberg, includes capital providers, insurers, large global companies from a range of

financial and non-financial sectors, accounting and consulting firms and credit rating agencies. Stephanie Leaist, former Head of Sustainable Investing and an advisor to CPPIB, is a member of the Task Force and is continuing our efforts to actively contribute by bringing an investor perspective. CPPIB is one of only two global pension fund managers represented on the Task Force.

The Task Force's 2017 recommendations have had a growing impact on the global financial system's approach to and understanding of climate change, acting as a catalyst for transparency and action. As of June 2019, more than 785 companies and other organizations have pledged their support. More than 340 investors with nearly US\$34 trillion in assets under management are asking companies to report under the Task Force's recommendations. According to the Task Force's most recent Status Report, disclosure of climate-related financial information has increased since 2016. However, they note it is still insufficient for investors and suggest mainstreaming climate-related issues will require the involvement of multiple functions including sustainability, risk management, finance and executive management.

The Task Force's recommendations are structured around four pillars: governance, strategy, risk management, and metrics and targets. They provide a framework intended to help investors and others in the financial community better understand and assess climate-related risks and opportunities. CPPIB is committed to full adoption of these recommendations by the end of fiscal 2021. In 2019 CPPIB began including climate-related disclosures in our annual report in line with the Task Force recommendations. In the following pages, we provide an overview of steps we are taking to implement these recommendations.



Adapted from Task Force on
Climate-related Financial Disclosures:
Status Report, June 2019.

TCFD TASK FORCE ON
CLIMATE-RELATED
FINANCIAL
DISCLOSURES

IMPLEMENTATION OF THE TASK FORCE'S RECOMMENDATIONS

GOVERNANCE

Disclose the organization's governance around climate-related risks and opportunities.

The Board oversees CPPIB's enterprise-wide efforts to understand and manage climate-related risks and opportunities. It receives an annual update about our Climate Change Program's progress, as well as updates about broad trends and specific investment-related developments via ongoing risk reporting.

Our CEO sets Management's overall tone and approach for governance and integrated risk management. Our Chief Financial and Risk Officer (CFRO) has explicit accountability to recommend to the board the risk appetite and limits of the fund across all dimensions of risk consistent with the Integrated Risk Framework having specific regard CPPIB's unique mandate.

Our CFRO and Chief Investment Strategist, along with senior representatives from Active Equities, Public Affairs and Communications, Real Assets and the Office of the CEO, comprise CPPIB's Climate Change Steering Committee. Our Global Head of Active Equities recently took over from the CFRO as Chair of this committee and sponsors our firm-wide Climate Change Program. That committee oversees the work of CPPIB's Program Management Office and Climate Change Management Committee. Together, the Program Management Office and Climate Change Management Committee guide and support climate-related work streams.

STRATEGY

Disclose, where material, the actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy and financial planning.

Specifically addressing climate change in our investment activities puts us in a better position to make more informed decisions over the long term. Portions of our portfolio – including airlines; fossil fuel, steel and cement producers; and many other companies – are exposed to climate change-transition risks, including policy, legal, technology and market risk. Some assets may also be vulnerable to physical risks, like natural disasters. Simultaneously, new investment opportunities in sectors such as renewable power and resource efficiency will continue to emerge. To help address risks and opportunities, CPPIB has established a Climate Change Program with six work streams (see pages 1-3).

In late 2017, CPPIB created a stand-alone Power & Renewables group to better position the Fund to invest in climate change-related opportunities. Since then, the P&R group has been making significant investments in renewable energy projects. The combined value of these assets is now more than \$2.47 billion. This was done with the goal of helping diversify the portfolio as the world transitions to a lower-carbon energy supply.

In June 2018, CPPIB became the world's first pension fund manager to issue a green bond, and then followed up with the issuance of our first euro-denominated green bond in January 2019 (see pages 13-15 for more details). What's more, CPPIB's Energy & Resources (E&R) group launched an Innovation, Technology and Services strategy to capitalize on opportunities created by the global energy transition, such as networks to charge electric vehicles (see page 6 for details). E&R also carefully considers the transition when investing in traditional energy. Our Thematic Investing team is also preparing to launch a new climate change investment strategy.

The TCFD has said organizations should describe climate-related scenarios used to inform strategy and financial planning. For details on CPPIB's scenario analysis work, see page 25.

RISK MANAGEMENT

Disclose how the organization identifies, assesses and manages climate-related risks.

Climate change is a key risk in CPPIB's Integrated Risk Framework. The Climate Change Steering Committee is guiding CPPIB's multi-year effort to identify, assess and manage climate-related risks and opportunities at both the organizational and investment group levels (see the inside front cover).

One way we do this is by engaging with companies to improve their climate change-related disclosures. Over time, we have pressed large greenhouse gas emitters in oil and gas, utilities and other sectors for improved disclosure on this issue. And, for over a decade, CPPIB has used its voting power to support shareholder proposals that encourage companies to improve disclosure of climate change-related risks (see page 19 for details on CPPIB's support for climate change-related shareholder resolutions during this reporting period).

We believe our support of the recommendations of the Task Force on Climate-related Financial Disclosures will result in better disclosure of climate change risks. This, in turn, should help asset owners, including CPPIB, better assess these risks and make sounder investment decisions. We have a heightened interest in ESG factors broadly and climate change factors specifically. We have this interest because the risks associated with these factors tend to have material impacts on value over longer horizons. As such, we continue to push for enhanced disclosures so that we can make appropriate risk-adjusted investment decisions fully aligned with our mandate.

Additionally, as a sophisticated long-term investor, CPPIB has a structured approach for the due diligence and monitoring of environmental, social and governance (ESG) risks, including climate-related ones, in our direct investments (see page 20 of the full report for details).

The significant continuing work CPPIB is undertaking helps address climate change risk at the total portfolio level and advances our understanding of potential implications for our existing and future investments.

CPPIB is continuing efforts to develop and refine methodologies for stress testing and scenario analysis. For example, we are in the process of identifying and monitoring climate-related factors that may have an impact on CPPIB's investment portfolio and implementing controls to reduce the risk. Our assessments consider various time horizons and will allow us to quantify the potential financial impact and assess compliance with CPPIB's Risk Appetite Statements, which are an integral part of our Integrated Risk Framework. For details on CPPIB's scenario analysis work, see page 25.

METRICS AND TARGETS

Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities, where such information is material.

CPPIB published the first carbon footprint of its public equities portfolio last year. This included metrics on total carbon emissions and carbon intensity. This year, we provide a more comprehensive metric that includes both our public and private investments (see pages 23-24). We consider key performance indicators for GHG emissions, water consumption and energy efficiency in our individual investments.

Carbon Footprint & Scenario Analysis

CARBON FOOTPRINT

The recommendations of the Task Force are widely recognized as the global standard for climate change disclosure. Building on our support of and commitment to the Task Force, CPPIB introduced the carbon footprint of our public equities portfolio in the 2018 Report on Sustainable Investing. In this year's Report, we are disclosing the carbon footprint of our broader portfolio, including private holdings.

This disclosure represents part of our work (see pages 21-22) to align with the Task Force recommendations and develop a better understanding of our exposure to climate change-related risks.

CPPIB's Risk Group (Risk) developed an in-house methodology to estimate the metrics below. The numbers reflect our carbon metrics as of June 30, 2019 and show metric tonnes of carbon dioxide equivalent (CO₂e)¹. The formulas are consistent with Task Force recommendations.

The Task Force has said there are challenges and limitations with carbon footprinting metrics and noted these should not necessarily be interpreted as risk metrics. At the same time, they have said they expect the release of this data to prompt important advancements. We agree with this position. We continue to research what are the most relevant indicators of climate change risk for the portfolio. Our research to date suggests an understanding of the energy transition is particularly important, recognizing physical impacts will play a key role in certain geographies.

CPPIB PORTFOLIO CARBON FOOTPRINT METRICS

METRIC ²	LONG-TERM CAPITAL OWNERSHIP	EQUITY OWNERSHIP	DESCRIPTION
Total Carbon Emissions (million tonnes of CO ₂ e)	25.7	43.1	The absolute GHG emissions associated with a portfolio. This figure would typically rise as assets under management grow.
Carbon Footprint (tonnes of CO ₂ e/\$ million invested)	64	107	Total carbon emissions for a portfolio normalized by the market value of the portfolio.
Carbon Intensity (tonnes of CO ₂ e/\$ million revenue)	226	267	Volume of carbon emissions per million dollars revenue (carbon efficiency of a portfolio).
Weighted Average Carbon Intensity (tonnes of CO ₂ e/\$ million revenue)	195	195	Portfolio's exposure to carbon-intensive companies ³ .

1 Based on the most recent annual emission information available at June 30, 2019 and allocated based on CPPIB's June 30, 2019 holdings. Exchange rates applied are those as at the year-ends of the reported emissions and revenue data, and as at June 30, 2019 for market capitalizations and long-term debt of holdings. The following asset classes were excluded from the portfolio carbon footprint assessment: Government Bonds, Cash and Money Market Instruments, Non-Equity Derivatives.

2 Issuers' Scope 1 and 2 GHG emissions are allocated to our portfolio based on both equity ownership approach and long-term capital ownership approach, and the data is normalized based on the total in-scope portfolio value. Under the equity ownership approach, if an investor for example owns 5 percent of a company's total market capitalization, they own the same percentage of the company's emissions. Under the long-term capital ownership approach, if an investor for example owns 5 percent of the sum of a company's total market capitalization and its long-term debt, they own the same percentage of the company's emissions.

3 For this metric, Scope 1 and Scope 2 GHG emissions are allocated based on portfolio weights (the current value of the investment relative to the current portfolio value).

OUR METHODOLOGY

For our carbon disclosure, we use Scope 1 and 2 GHG emissions. Scope 1 refers to direct GHG emissions from an organization's owned and controlled sources. Scope 2 refers to indirect emissions from the generation of purchased energy. We have opted to use these types of emissions because the dataset for Scope 1 and 2 emissions is currently the most complete and robust available.

We have used emissions data provided by S&P Trucost Ltd. (Trucost¹), a division of S&P Global that provides investment grade carbon and environmental data to investors, companies and governments. While this data is the best we currently have available, it has limitations due to the use of differing GHG calculation methodologies by companies, incomplete reporting by some companies and the resulting use of partial company data to extrapolate or estimate historic emissions based on sector emissions performance.

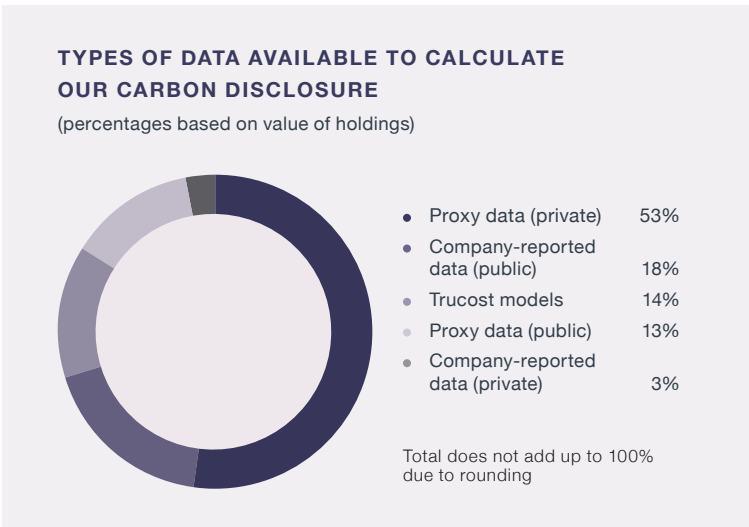
The carbon footprint metrics estimation follows a waterfall methodology using different estimation sources in order of priority based on data availability. The priority setting is based on the principle of using as much directly disclosed data as possible, prioritizing more sophisticated estimation method and balancing cost vs. benefit:

- 1. GHG emissions data that is disclosed by the public portfolio company and provided to CPPIB either by a credible source such as Trucost or by the portfolio company;
- 2. GHG emissions data that is estimated by a credible source such as Trucost or by CPPIB using specific comparable operating facilities similar to those of the issuers;
- 3. GHG emissions data that is estimated by CPPIB using a public proxy. The public proxy is established based on the average emission of the sector and country.

The data we have presented, while the best available, is subject to inherent uncertainties and these uncertainties may be material.

We also recognize the assumptions made in applying the methodologies noted had a material impact on the resulting metrics. These include the use of a point-in-time approach to reporting on our portfolio, which may not fully reflect our holdings throughout the year, and the selection of the exchange rate when making calculations. There is, as yet, no authoritative guidance or emerging standard of disclosure in relation to these assumptions. As a result, the comparability of the data presented here for our portfolio to the carbon data disclosed for other portfolios is significantly reduced.

The chart below shows the different types of data available for our calculations (percentages based on value of holdings).



1 Trucost, its affiliates, and their third-party data providers and licensors (collectively "Trucost Parties") do not guarantee the accuracy or completeness of the Information. Trucost Parties are not responsible for any errors or omissions, regardless of the cause, for the results obtained from the use of the Information. The Trucost parties make no warranties or representations, and, to the maximum extent permitted by law, each Trucost party hereby expressly disclaims all implied warranties, including warranties or merchantability and fitness for a particular purpose. Without limiting any of the foregoing and to the maximum extent permitted by law, in no event shall any of the Trucost parties have any liability regarding any of the information for direct, indirect, special, punitive, consequential (including lost profits) or any other damages even if notified of the possibility of such damages. The foregoing shall not exclude or limit any liability that may not by applicable law be excluded or limited.

SCENARIO ANALYSIS

One of the Task Force's recommended disclosures focuses on the resilience of an organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario. The Task Force recommends the disclosure of how the organization's strategies might change to address potential climate-related risks and opportunities. It believes that scenario analysis is important for improving the disclosure of decision-useful, climate-related financial information.

Scenario analysis, which has been a key element of CPPIB's Integrated Risk Framework, is used to make forward-looking assessment of risks and opportunities. Scenarios are descriptions of potential future pathways. They can be either quantitative or qualitative, or a combination of both.

To better understand the risks posed by climate change, CPPIB is developing a climate-related scenario analysis framework both internally through a cross-functional approach involving experts in risk management and investments, as well as externally through investors' collaboration platforms and consultation. (For more on CPPIB's Climate Change work streams, see page 2).

The Total Portfolio Management (TPM) department is working to assess risks and opportunities related to climate change and the energy transition using internally-determined scenarios and signposts, with particular focus on the impact on unconditional long-term returns and asset allocation.

The Risk Group (Risk) is identifying and monitoring causes or factors that affect the likelihood, timing or impact of climate change risk scenarios or events, potential investment and non-investment impacts to CPPIB and controls that can be implemented to monitor and/or reduce the risk to CPPIB's portfolio over various time horizons.

Risk recently commissioned an external service provider to support our assessment of the potential financial impact to our portfolio under different global warming pathways. The external provider used global warming pathways to project how much the world average temperature will increase compared to

pre-industrial levels. The global warming pathways assessed include an orderly transition to a 1.5°C warmer world, a disorderly transition to a 1.5°C warmer world, an orderly transition to a 2°C warmer world, a gradual transition to a 4°C warmer world, and a transition into 4°C warmer world with significant extreme weather events.

This work is in the early stages of development and the results cannot be deemed conclusive. However, CPPIB believes it is important to be an early adopter to gain a better understanding of the climate change risks to and opportunities for our portfolio.

SIGNPOSTS

TPM has developed an initial framework for using key indicators, or "signposts", to monitor the energy transition and climate change. These signposts use recent trends in data to help inform our view on the likelihood of potential scenarios for overall energy demand, the shifting mix between traditional and renewable energy sources, and the physical effects of climate change, which we can summarize in terms of an overall warming signal.

We have split these signposts into a set of categories, with four covering key elements of the energy transition and one monitoring physical indicators. The graphic on page 26 shows some preliminary results as to which level of warming each category is currently pointing. The insights provided will help the organization to better gauge the potential physical and transition risk impacts of climate change on both the global economy and our portfolio. The goal is to ensure CPPIB fulfills its mandate to maximize return without undue risk of loss by fully understanding climate change risks and opportunities.

We continue to evolve our thinking around signposts. Moving forward, we aim to expand the number of variables and make ongoing refinements to our mapping from signpost indicators to potential warming paths and scenarios. For example, we plan to expand our Physical Effects signposts so that we can better use them to warn us if we are under- or over-estimating the physical risk damages associated with climate change, or if we have reached an Earth system tipping point that is amplifying human impacts.

CLIMATE CHANGE SIGNPOSTS

Demand is an important predictor of energy consumption, with demand being driven by growth in both population and income (measured by GDP per capita). Tracking demographic and economic growth, as well as the energy intensity of that growth, provides important information about the current path of aggregate energy use.

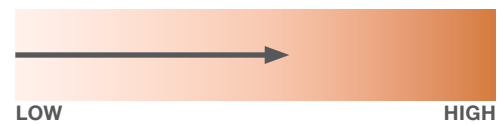
Technology is an important determinant of growth in renewable generation and is a key economic driver of the energy transition and the path of emissions. Innovation has driven rapid declines in renewable energy and electric vehicle costs, dramatically improving their competitiveness compared with higher-carbon technologies. Tracking technology costs and penetration rates provides an important insight into the evolution of the energy system and future emissions. Technology is also an important precondition of policy as improvements in the quality and affordability of renewable technology reduce the cost of action for policy makers.

Policy both shapes and is shaped by demand and technology factors, and can help drive the overall path of warming. Carbon pricing is a key element of climate policy, and its adoption around the world helps us track current policy trends. More broadly, the Nationally Determined Contributions (NDCs) are the foundation of the Paris Agreement on Climate Change and embody efforts by each signatory country to reduce national emissions. However, the NDCs are not legally binding and some countries are making better progress than others. Policy impacts both investment in new infrastructure and the rate of retirement of the existing stock of fossil fuel infrastructure.

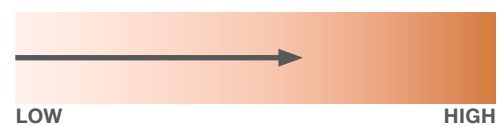
Our **Market** signpost tracks what is happening in real time and gives us a sense of how energy markets are currently evolving. Current trends in energy production help us track where energy and emissions are moving over the near-term, while investment in different energy sources gives a clear line of sight into future generation capacity and the emissions associated with it.

The **Physical Effects** signpost is designed to track the ongoing evolution of earth systems due to human activities, which is reflected in part through headline indicators like anthropogenic emissions and overall temperature change. This can help gauge both the trend and potential physical impacts of climate change. The Earth system also contains numerous sub-cycles that can temporarily mute or magnify overall warming trends. These cycles can make tracking these indicators important for the potential evolution of policy, as “pauses” in global warming such as were observed in the early 2000s can reduce public support for policy change (and vice versa).

DEMAND



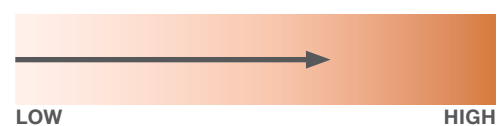
TECHNOLOGY



POLICY



MARKET



PHYSICAL EFFECTS

