DELPHI GROUP

VANCOUVER ECONOMIC COMMISSION

Vancouver's Competitiveness as a Global ESG Investment Destination

2023

This report was commissioned by the Vancouver Economic Commission (VEC), working on the unceded territory of the xʷməθkʷəy̓əm (Musqueam), Skwx̱wú7mesh (Squamish), and sə̓ilw̓ ətaʔɬ (Tsleil-Waututh) Nations.

These Nations have cared for the lands and waters of "Vancouver" since time immemorial, sustaining strong economies while thriving in balance with the natural world. Vancouver is a City of Reconciliation, and VEC—an agency of the City—commits to forming longlasting relationships of mutual respect and understanding with host First Nations and other local urban Indigenous communities.

VEC pledges to better understand the full breadth of truth and reconciliation and to work alongside local Indigenous communities to support and collaborate on building economic prosperity for all.

Disclaimer

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Executive Summary

Competition for foreign direct investment (FDI) and addressing the climate crisis are priorities for cities and regions globally. In the transition to a zero emissions economy, these two priorities come together as new opportunities emerge and benefits are realized. This report, *Vancouver's Competitiveness as a Global ESG Investment Destination* (CAGE), explores how the Vancouver Economic Commission (VEC) can assess and measure the competitiveness of Vancouver's green economy against comparable cities globally.

Impacts from the climate crisis are felt more broadly every year, and this creates an imperative for governments to align priorities and actions that were previously siloed. While a significant number of tools are held by senior levels of government, **local agencies play a key role in catalyzing FDI,** and the nature of the resulting economic activity can be shaped by the indicators used to define and evaluate prosperity.

The use of environment, social, and governance (ESG) metrics is a rapidly evolving approach for businesses and governments alike to better understand risk and to measure and report progress on sustainability. An ESG approach is used in this report as a framework with which to measure the competitiveness of local economies in the context of attracting FDI. This approach identifies metrics that can be used to understand a city's competitive advantages, in relation to both capital and operational investment attraction.

A recent addition under the City of Vancouver's Climate Emergency Action Plan (CEAP), VEC's Zero Emissions Economic Transition Action Plan (ZEETAP) is an economic strategy to support the target of halving GHG emissions by 2030. One of the specific ways ZEETAP aims to advance climate action is by working with partners to ensure that companies looking for green opportunities and an ESG-aligned ecosystem will find no greater place to invest in than Vancouver. As it seeks to implement the CEAP and ZEETAP, **Vancouver can use the identified metrics to understand competitive advantages** and areas for growth and drive the type of FDI that helps progress towards its climate targets and ultimately a zero emissions economy.

For the purposes of this report, 10 "peer group" cities were chosen based on their leadership in climate, sustainability, and green economic development: Copenhagen, Dublin, Edmonton, Montreal, Seattle, Singapore, Stockholm, Sydney, Tel Aviv and Toronto. Other global leaders outside of the peer group are highlighted in specific metrics where applicable.

Within the *Environment* metrics identified, which include theme areas of *Energy* and *Infrastructure,* Vancouver ranks #2 among peers in *Cost of Energy* from its relatively clean and affordable supply of provincially supplied hydroelectricity. It ranks lower (#56) in *Sustainable Mobility*, with Hong Kong leading globally and Singapore ranked highest (#8) among peers. *Climate Resilience* is also included as a metric (measured at the national level), with Canada ranking #14 behind global and peer group leaders from Northern Europe.

In terms of *Social* metrics used in this report, which include theme areas of *Lifestyle*, *Workforce and Talent*, and *Social Inclusion*, Vancouver is ranked among global leaders in some areas while showing mixed results in others. Vancouver's *Quality of Life* is ranked #3 in the world, as is its largest university, the University of British Columbia (UBC), in *University Reputation*. Areas where Vancouver ranked behind its peers include *Labour Force Participation Rate* (#6) and *Gender Pay Equity* (#9). An index ranking of *Cost of Living* is also included in the analysis, which ranked Vancouver near the global median at #108. This highlights the fact that **while Vancouver has a relatively high ratio of quality of life to cost of living, it remains among the most expensive cities in Canada.** Given the link between housing affordability and business success, this is an area where Vancouver must continue to focus to foster broader prosperity.

Relevant *Governance* metrics identified in this study fit within the themes of *Business Environment and Data* and *Public Sector Support*. Vancouver's performance in *Cleantech Ecosystem* puts it at #16, behind Toronto (#12) and the top performing city in its peer group, Stockholm, which ranks #3 globally. The *Ease of Doing Business* index published by the World Bank, which looks at the national level and relies on Toronto-based data, ranks Canada #23 behind global leaders Singapore, Denmark, and the United States.

The Climate Change Performance Index, a national level ranking, was used for the *Climate Change Action* metric and puts Canada well behind global and peer group leaders Denmark and Sweden. **Vancouver has a strong reputation for climate action at the local level,** building on progress made under the municipality's 2011 Greenest City Action Plan, and from the benefit of close alignment with regional and provincial level priorities on climate action. *Zero Waste* and *Circular Economy* are two related areas where Vancouver has made some progress, while still having an opportunity to further its leadership through eliminating waste and more efficient use and reuse of resources.

Some of **Vancouver's greatest competitive strengths are its low cost and low carbon electricity supply, history of climate leadership, and world-class quality of life.** The global attraction of Vancouver has created immense pressures on housing and other social supports, and it is critical that the City work together with other agencies to address these challenges in a way that aligns with its climate targets.

By leveraging the strong alignment between government priorities and corporate sustainability leadership, Vancouver can continue to support a thriving green economy and attract the type of FDI that fits within one of the greenest cities in the world.

Research Areas				Cities										
	Thematic Area	Related Metrics / Data	Measurement	Vancouver	Copenhagen	Dublin	Edmonton	Montreal	Seattle	Singapore	Stockholm	Sydney	Tel Aviv	Toronto
Environment	*Energy*	Cost of Energy	$USD per KWH	0.08	0.48	0.29	0.14	0.06	0.16	0.20	0.29	0.21	0.17	0.10
		GHG Intensity of Energy	GHG Intensity (GHGi) per kWH											
	Infrastructure	Airport Sustainability	Qualitative scale	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
		Port Sustainability	Qualitative scale	Y	Y	Y	n/a	Y	Y	Y	Y	Y	n/a	Y
		Sustainable Mobility	Index ranking of 100 cities	56	12	44	n/a	36	74	8	9	51	n/a	54
		Climate Resiliency	Index ranking of 182 countries	14	5	21	14	14	18	6	4	13	27	14
Social	*Lifestyle*	Cost of Living	Index ranking of 227 cities with the most expensive as #1	108	11	49	n/a	125	45	8	87	58	6	89
		Quality of Life	Index ranking of 230 cities	3	8	33	n/a	21	46	25	23	11	104	16
	Workforce and Talent	University Reputation	Index ranking of 700 universities	3	71	171	118	42	62	81	98	5	341	2
		Labour Force Participation	Labour force participation rate	67.4%	72.1%	64.7%	68.2%	68.1%	64.2%	67.5%	74.2%	66.7%	63.2%	65.6%
	Social Inclusion	Gender Pay Equity	Difference between median earnings of men and women (country) + Qualitative scale	16.7% + pay transparency	5% + pay transparency for public institutions	8.3% + pay transparency	16.7% + no pay transparency	16.7% + pay transparency	16.9% + pay transparency	10.8% + no pay transparency	7.4% + pay transparency	15.3% + pay transparency	24.3% + pay transparency (large companies)	16.7% + pay transparency
		Human Rights Protections	Index ranking of 165 countries	6	3	5	6	6	15	48	9	8	62	6
		Accessibility	Qualitative scale	Y	Initiatives, no formal strategy	Y	Y	Y	Initiatives, no formal strategy	Initiatives, no formal strategy	Initiatives, no formal strategy	Y	Initiatives, no formal strategy	Y
Governance	*Business Environment and Data*	Cleantech Ecosystem	Index ranking of 280 cities	16	31	17	n/a	n/a	19	30	3	22	2	12
		Ease of Doing Business	Index ranking of 190 countries	23	4	24	23	23	6	2	10	14	35	23
		Open Data	Qualitative scale	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Public Sector Support	Climate Action	Qualitative scale	Y + Y	Y* + Y	Y + Y	Y + Y	Y + Y	N + Y	N + Y	Y* + Y	Y + Environmental Strategy	N + Y	Y + Y
		Zero Waste	Qualitative scale	Y	initiatives within CE plan	initiatives, no zero-waste target	Y	Y	Y	Y	Y*	Y	initiatives, no zero-waste target	Y
		Circular Economy	Qualitative scale	initiatives, no strategy	Y	Y*	Y	initiatives, no strategy	Initiatives, no strategy	initiatives, no strategy	Y*	Y*	initiatives, no strategy	initiatives, no strategy

City Ranking / Performance

High-ranking performance — Low-ranking performance

Figure 1: CAGE Matrix and peer group of cities used for the competitive analysis.

Introduction

As the need to act on the climate crisis gains traction, it is imperative that governments at all levels conduct business in a way that aligns with their climate plans and targets. A zero emissions economic transition is underway globally, creating an opportunity for leading cities to attract FDI to leverage their assets and competitive strengths in the pursuit of a prosperous and socially just future.

Global competitiveness in the transition to a zero emissions economy is important for cities, just as it is important for business. The use of environment, social, and governance (ESG) metrics leads to a better understanding of risk in an evolving corporate landscape – where measurable impacts on people and the planet can affect the bottom line. Local agencies play a key role in connecting ideas and opportunities to catalyze FDI and general economic development. The shape of development is determined in part by which indicators and metrics are used to define and evaluate progress and prosperity.

A Note on FDI

Foreign direct investment (FDI) includes deployment of capital and operational business activity. For the purposes of this report, this translates to attracting foreign capital investment into Vancouver-based enterprises, as well as attracting foreign businesses to establish and expand operations in Vancouver.

The term 'FDI' is used throughout this report to refer to the broader suite of activities, and a distinction between capital investment and operational considerations is made where applicable.

The City of Vancouver has been making progress towards climate and environmental targets for many years, particularly over the last decade under the 2011 Greenest City Action Plan.[1,2] Recent climate and environmental leadership has taken shape through the City of Vancouver's Climate Emergency Action Plan (CEAP), a comprehensive climate action strategy approved by Council in 2020.[3] Building on the CEAP, the Vancouver Economic Commission (VEC) created the Zero Emissions Economic Transition Action Plan (ZEETAP) in 2022; it supports the City's ambition to halve greenhouse gas (GHG) emissions by 2030, while integrating four economic goals:[4]

1. Maximizing the economic opportunities of climate action
2. Minimizing the challenges and costs of taking climate action
3. Accelerating voluntary action to address climate change
4. Championing equity and justice in all aspects of climate action and economic development

One of the ways in which ZEETAP aims to advance climate action in the business community is through its international investment focus area. As outlined in the plan, VEC will work with partners, such as Invest Vancouver, Invest in Canada, and both federal and provincial trade commissioners, to ensure that companies looking for green opportunities and an ESG-aligned ecosystem will find no greater place to invest in than Vancouver. However, to make this case effectively, VEC will need data and comparables against other leading cities.

This report explores how VEC can assess and measure the competitiveness of its green economy against comparable cities globally. Delphi developed a unique approach to capture relevant ESG considerations into a manageable composite index of metrics and rankings that could be used to

compare cities. The purpose of this exercise is to identify a set of metrics that Vancouver can track now and into the future to understand competitive advantages, identify strengths and weaknesses, communicate to key audiences, and ultimately drive the type of FDI that supports progress towards achieving a zero emissions economy.

The Vancouver Context

Vancouver has a history of **environmental leadership** ranging from the founding of Greenpeace and West Coast Environmental Law in the 1970s, to significant institutions such as the David Suzuki Foundation, Farm Folk City Folk, The Land Conservancy, and Canada Green Building Council. These organizations form an important part of Vancouver's green economy ecosystem, along with leading businesses, public sector agencies, and educational institutions. Vancouver is at a mature phase of action on environmental challenges, whether plastic pollution, air quality, clean energy or green buildings. This maturity, and the collective experience that comes with it, can help to mitigate transition impacts on the economy and labour market.

Many **lifestyle factors** in Vancouver attract visitors and residents from around the world, from the surrounding landscape to leading educational institutions, to the diversity of cultures represented. A 2015 Vancouver Brand Finance report found that Vancouver is ahead of the curve compared to its competitive set, with a high performance across social and environmental metrics. Specific areas of strength for Vancouver included "a good place to live/raise a family", "a great lifestyle", "exists in harmony with its environment", and "considered to be green or eco-friendly".

Vancouver has **unique governance mechanisms** that provide a supportive program and policy landscape. For example, the Vancouver Charter is a provincial statute that grants the city additional powers such as more flexible financing mechanisms, the authority to prohibit certain businesses, and unique land use planning tools. The 2015 Vancouver Brand Finance report also highlighted Vancouver as ahead of its competitors with regards to "effective and transparent government".

Approach

The Delphi Group conducted the competitive analysis of Vancouver's performance on selected sustainability related metrics with comparable cities to achieve two objectives:

1. Identify Vancouver's performance in the green economy (and relevant ESG issue areas) in comparison to key competitor cities
2. Identify gaps and opportunities where Vancouver could focus its efforts to better attract FDI

The selection of competitive metrics began by building off an existing Competitive Analysis of the Green Economy (CAGE) framework, based on past VEC FDI-attraction work, while aligning with thematic groupings from Vancouver's ZEETAP.

In addition to aligning with CAGE and ZEETAP themes, Delphi conducted research to build a long list of possible metrics from resources including Arcadis Sustainable Cities Index, Corporate Knights Sustainable Cities Index and other leading global city indexes, as well as leaders in sustainable city research such as C40 and CDP (see Appendix A for a list of the data sources utilized in this analysis). The initial long list of metrics was compiled and refined based on the quality of their measurement, availability of reliable data, and relevance to Vancouver's business community. It is important to note that no city-level rankings specific to green FDI currently exist.

By applying the guiding principles that were established at the outset of the project, and in consultation with VEC, Delphi further scoped down the metrics and categorized within an ESG framework. This framework was selected given its saliency and priority in guiding reporting and investing metrics. Each metric was assigned a data source and type of measurement (i.e. index rating, qualitative rating or a sum of both), and data was input across each metric for Vancouver and 10 other "peer group" cities (Copenhagen, Dublin, Edmonton, Montreal, Seattle, Singapore, Stockholm, Sydney, Tel Aviv and Toronto). These cities were selected in consultation with VEC to reflect the organization's priorities in staying competitive with leaders in climate, sustainability, and green economic development both domestically and internationally.

Figure 2 outlines the overall structure of the matrix used for the competitive analysis.

Research Areas				
	Thematic Area	**Related Metrics / Data**	**Data Source**	**Measurement**
Environment	***Energy***	Cost of Energy	Statista (2022) + city-specific research	$USD per KWH
		GHG Intensity of Energy	CDP Technical Note: Accounting of Scope 2 Emissions	GHG Intensity (GHGi) per kWH
	Infrastructure	Airport Sustainability	Climate Commitment (Y/N)	Qualitative scale
		Port Sustainability	Port Sustainability Plan (Y/N)	Qualitative scale
		Sustainable Mobility	Arcadis Sustainable Cities Mobility Index (2017)	Index ranking of 100 cities
		Climate Resiliency	Notre Dame GAIN Ranking (country level)	Index ranking of 182 countries
Social	***Lifestyle***	Cost of Living	Mercer's Cost-of-Living Ranking (2022)	Index ranking of 227 cities with the most expensive as #1
		Quality of Life	Mercer's Quality of Living City Ranking (2019)	Index ranking of 230 cities
	Workforce and Talent	University Reputation	QS World University Rankings (2023)	Index ranking of 700 universities
		Labour Force Participation	OECD Labour force participation rate + city-specific data	Labour force participation rate
	Social Inclusion	Gender Pay Equity	OECD Gender Wage Gap (country) + whether city has pay transparency (Y/N)	Difference between median earnings of men and women (country) + Qualitative scale
		Human Rights Protection	Human Freedom Index (country level)	Index ranking of 165 countries
		Accessibility	City Accessibility Strategy (Y/N)	Qualitative scale
Governance	***Business Environment and Data***	Cleantech Ecosystem	GSE Report: Cleantech Edition (2022)	Index ranking of 280 cities
		Ease of Doing Business	World Bank Ease of Doing Business (country level)	Index ranking of 190 countries
		Open Data	City Open Government Data Site (Y/N)	Qualitative scale
	Public Sector Support	Climate Action	Climate emergency declared (Y/N) + City Climate Action Plan (Y/N)	Qualitative scale
		Zero Waste	City Zero Waste Plan and Target (Y/N)	Qualitative scale
		Circular Economy	City Circular Economy Plan (Y/N)	Qualitative scale

Figure 2: Overview of CAGE Matrix

Results & Matrix Analysis

Environment	*Energy*
	Infrastructure

Energy		
Metric	**Measurement**	**Top Cities**
Cost of Energy	$USD per kWh (2021) Statista (2022) + city-specific research	1. Montreal 2. **Vancouver** 3. Toronto
GHG Intensity of Energy	GHG Intensity (GHGi) per kWh CDP Technical Note: Accounting of Scope 2 Emissions	(not ranked)[5]

Findings

Vancouver performs near the top (#2) compared to peers on *Cost of Energy* for households. Given that approximately 97% of Vancouver's electricity is produced from renewable resources, Vancouver benefits from energy that is affordable as well as clean. Based on the targets set out in Vancouver's Renewable City Action Plan, the city hopes to build on its renewable energy capacity and become entirely powered by it before 2050.[6] Reaching this goal will spur on initiatives across energy efficiency, buildings and transportation powered by renewable energy, and increasing the supply of renewable energy through solar and natural gas from solid waste. Collectively, these will reduce the *GHG Intensity of Energy* production, a metric with data available for future analysis (see footnote 5).

Further, Vancouver is moving to electrify the heating and cooling of buildings through provincial incentives to switch from natural gas furnaces to electric heat pumps[7]. There is already evidence that using a heat pump to both heat and cool a home is more cost-effective for residents and businesses.

Other cities that join Vancouver in affordable energy prices include **Montreal, Seattle, and Toronto**. At $0.06 USD/kWh, Montreal supplies the most affordable energy of the cities chosen for this study. Similar to Vancouver, Montreal benefits from abundant hydropower and a mix of other renewables and is able to market this as an attractant to business investment and development.

Importance of thematic area

The cost of energy (measured as total cost of energy per kWH) is relevant to investors' bottom line (operational costs) and lower energy bills long-term. Affordability of electricity also ties into a city's cost of living, impacting talent attraction and retention.

Clean, low-cost energy can place a city at a competitive advantage as more businesses are considering both price and carbon intensity of energy sources. Carbon- or GHG-intensity (measured as GHGi per kWh) is relevant to several groups with emissions targets, particularly for emissions caused indirectly through purchased energy (scope 2 emissions).

Companies across a variety of sectors are using a shadow carbon price (SCP) for long-term planning purposes and risk mitigation should increased carbon pricing come into effect.[8] Energy sources that greatly reduce or eliminate costs associated with carbon pricing (such as hydroelectricity), emissions-based taxation, or other emissions-related impacts have a direct impact on a business' financial bottom line.

False Creek Neighbourhood Energy Utility

Using waste thermal energy captured from sewage, the False Creek Neighbourhood Energy Utility (NEU) has provided space heating and hot water to buildings in the Southeast False Creek since 2010, as well as several other buildings in nearby Vancouver neighbourhoods.

This NEU, which derives 70% of its energy supply from renewable sources, is self-funded, so it provides a return on investment to City taxpayers and offers affordable rates to customers.

Since its inception in 2010, the operation has rapidly expanded to serve over 6.4 million square feet across residential, commercial, and institutional space. GHG reductions from the NEU in 2021 were forecast to be 6,300t CO2e compared to the 2007 baseline.

More info: **False Creek Neighbourhood Energy Utility, 2022 Report**

Photo by City of Vancouver

Data gaps and opportunities

Evaluating the *Cost of Energy* across cities presented data challenges. Average residential electricity prices were used, as they provide the most straightforward and consistent comparison across cities. An assumption is that these rates represent conservative estimates for industrial and commercial energy prices, which are often subsidized by governments as an investment attraction policy.

There are also data limitations for *GHG Intensity of Energy* at the city level. Recommendations and considerations for calculating GHGi / kWh include:

- Using the International Energy Agency (IEA) Emissions Factors database, a globally well-regarded reference available for GHG emissions factors from electricity and heat generation. 9 Of note is that these emissions factors are available at the country-level, not city-level. Generally, using country-level factors from the IEA are deemed sufficient, unless jurisdiction-level emissions factors are provided.
- The CDP also offers guidance on accounting for scope 2 emissions and best resources for national and regional averages.[10]

By highlighting its renewable, clean, and reliable energy, Montreal has been able to attract foreign investors and multinational companies, such as Google, to the area. Businesses benefit from the lowest and most stable electricity rate in North America and energy considered to be over 99% renewable.

More info: [Montreal International]

Photo from Wikimedia Commons

It is important to note that regions need to use the same method of emissions accounting to make accurate comparisons (e.g. market-based vs. location-based methods). Unfortunately, data provided through the CDP, National Inventory Reports (NIRs) or the EU Association of Issuing Bodies (AIB) does not necessarily follow the same reporting frameworks, though in many cases it can be aligned depending on intended use. For this exercise, using location-based accounting for regional emissions factors is recommended, as there are too many issues of comparability across jurisdictions for market-based accounting to serve as an accurate comparison. Additionally, there is no established market-based accounting clearance system that can effectively quantify the residual mix grid factors in Canada. Also, it will take some time to pull data from multiple sources and ensure they are aligned. This challenge could present an opportunity for global cities to coordinate and advocate for location-based, region-specific data sets measuring GHG emissions factors.

Infrastructure		
Metric	**Measurement**	**Top Cities**
Sustainable Mobility	Index ranking Arcadis Sustainable Cities Mobility Index (2017)	1. Hong Kong 8. Singapore 9. Stockholm **56. Vancouver**
Climate Resiliency	Index ranking ND-GAIN Country Index (2020)	1. Norway (Oslo) 4. Sweden (Stockholm) 5. Denmark (Copenhagen) **14. Canada (Vancouver)**
Airport Sustainability	Index ranking Sustainability Ranking of Airports (SRA) Index (2016) + Qualitative scale	1. Amsterdam Airport Schiphol (AMS) 2. Frankfurt Airport (FRA) 3. Munich International Airport (MUC) - **Vancouver International Airport (YVR)** not included in index[11]
Port Sustainability	Qualitative scale	(not ranked)[12]

Findings

Vancouver did not rank high in the *Sustainable Mobility* metric. While the city has a dense downtown core that could score well on its own for sustainable mobility, the geography and layout of the rest of the city and surrounding region present connection challenges. Implementation of the TransLink 2050 strategy, including the Fast and Reliable Transit Network, will improve sustainable mobility options for the city and region.[13] Leading cities that did perform well on sustainable mobility include **Hong Kong**, **Singapore,** and **Stockholm**. A high share of Hong Kong's population take public transportation, made easier through a well-connected and efficient metro network and connection to 3G internet through all tunnels and stations.[14] Meanwhile Stockholm connects residents and tourists through an accessible, unified public transit network of buses, commuter trains, trams, ferry lines, and an underground subway system adorned with art.

The *Climate Resiliency* metric was evaluated using the Notre Dame Global Adaptation Initiative's (ND-GAIN) Country Index. The index is comprised of 36 indicators relating to vulnerability and nine measuring readiness. In terms of infrastructure, Canadian cities, including Vancouver, have a lower climate vulnerability and higher readiness score compared to most countries (ranking 14th overall). Areas where Canada is more vulnerable to pressures from climate change include agriculture capacity, projected change of annual water runoff, and projected changes in flood hazards. Canada performs best under readiness metrics related to governance, including political stability, control of corruption, regulatory quality, and rule of law (all of which support effective disaster recovery efforts).[15] Other northern, coastal cities of comparable size to Vancouver that have a low climate vulnerability and high readiness scores were **Oslo** and **Helsinki**. Singapore and Stockholm also perform well in the *Climate Resiliency* metric.

While Vancouver was not selected for the Sustainability Ranking of Airports (SRA) Index used to evaluate *Airport Sustainability,* Vancouver International Airport (YVR) does have a climate commitment (as did all other cities studied). Vancouver has one of the more ambitious climate-related targets, with a goal of achieving net-zero carbon emissions by 2030. YVR expects to invest $135 million towards net-zero commitments over the next decade.[16] The top-ranking airport in the index, **Amsterdam** Airport Schiphol (AMS), aims to be circular and energy-positive by 2050 and has 15 strategic measures (including electric vehicles and thermal storage) to achieve this ambition. Other city airports with notable targets include **Sydney** (net-zero airport operations by 2030) and **Stockholm** (net-zero Swedish domestic air transport by 2030).

Vancouver also appears to be a leader for *Port Sustainability.* With a vision of becoming the world's most sustainable port, the Port of Vancouver has a goal of phasing out all port-related emissions by 2050. The Port of Vancouver has a number of initiatives that incentivize and support shipping companies, partners, tenants, and employees to reduce emissions and other environmental impacts.[17] Also vying for the title of becoming the most sustainable port in the world is **Copenhagen** Malmö Port (CMP). CMP sees itself as a facilitator and catalyst for more sustainable, innovative solutions and has developed formal partnerships to develop more sustainable multimodal logistics services.[18]

Singapore's Leadership in Sustainable Mobility

Continuing to rank as a top sustainable city, Singapore is injecting significant investment to further improve its mobility and connectivity to serve a population that is expected to grow by six million people by 2030. The government is enhancing its bus system to increase ridership by public transport from 66% to 75%.

The city is also a perfect size to test driverless vehicles, which the government is backing through a deal signed with two self-driving tech companies for truck fleets on public roads.

The city is also leaning heavily on big data to understand commuter flow and optimize planning based on insights.

More info: Arcadis Sustainable Cities Mobility Index

Photo by bortnikau/iStock

Importance of thematic area

Resilient and reliable infrastructure is important to investors for several reasons, including business continuity, reliability with customers and suppliers, and a lower risk profile for insurance providers. A city that provides sustainable mobility and low emission transportation options can have an impact on scope 3 emissions (employee travel, goods movement, local supplier manufacturing, etc.).

Metrics under this thematic area included sustainability planning and performance of major travel hubs (airports, ports) as well as urban mobility. Resilient infrastructure and subnational adaptation strategies were also considered, to account for a city's susceptibility and ability to prepare for climate change impacts and natural disasters.

Data gaps and opportunities

The *Airport Sustainability* metric was measured using a basic qualitative scale, which is subject to interpretation. The proposed scale evaluates whether an airport has a climate statement and plan in place, and whether there is evidence of action and progress towards objectives. As a more robust alternative, methodology for benchmarking airports based on a sustainability ranking index was identified, developed by researchers at Delft University of Technology and The Scientific and Technological Research Council of Turkey[19]. The study surveyed nine of the busiest global airports across five dimensions (airport services and quality, energy consumption and generation, CO_2 emissions and mitigation planning, environmental management and biodiversity, and atmosphere and low emission transport) and 25 indicators. Replicating the methodology and locating data with the selected cities for this report may be a worthwhile exercise for evaluating and ranking global airports in the future.

The *Port Sustainability* metric was also measured using a qualitative scale. In addition to the subjective nature of ranking, not every city identified to include in the study has a major commercial port to evaluate (e.g. Edmonton, Tel Aviv). While cities may not be directly comparable on this metric, it highlights the opportunity for goods movement partnerships between Vancouver and other large land-locked centres in North America.

The Arcadis Sustainable Cities Mobility Index[20] used to evaluate *Sustainable Mobility* also presents limitations. The index produces a composite score comprised of 23 indicators selected by Arcadis' subject matter experts. Three indicators (traffic fatalities, metric tons of CO_2 per capita multiplied by CO_2 from transport, and bicycle ownership) do not draw exclusively from city-level data. Two cities in this study (Edmonton and Tel Aviv) are not included in the index rankings and could therefore not be compared.

The ND-GAIN Country Index also presents limitations as it evaluates vulnerability to climate change, amongst other global challenges, with readiness to improve resilience at the national level. Location-specific threats at the city-level (e.g. rising sea levels) aren't necessarily captured when generalizing the impacts of climate change across a country as vast and geographically diverse as Canada.

Social	*Lifestyle*
	Workforce and Talent
	Social Inclusion

Lifestyle		
Metric	**Measurement**	**Top Cities**
Cost of Living	Index ranking Mercer's Cost of Living ranking (2022)	227. Ankara (lowest cost of living) 125. Montreal **108. Vancouver**
Quality of Life	Index ranking Mercer's Quality of Living ranking (2019)	1. Vienna **3. Vancouver** 8. Copenhagen

Findings

Vancouver has a lower *Cost of Living* relative to the cities included as the focus of this study, many of which are considered unaffordable on a global scale. The cost of living in Vancouver is slightly more reasonable in comparison to the other cities, given the high quality of life that is available to residents (i.e. access to green space, sustainable transportation, low air pollution). Independent quality of life rankings found Vancouver near the top overall (#3), behind **Vienna** (#1) and **Zurich** (#2), both of which have a higher cost of living than Vancouver (Vienna ranked #21 for cost of living, and Zurich #2).

The index used to evaluate cost of living (Mercer's Cost of Living Ranking) focuses on costs and draws on prices from over 200 items across 10 categories: housing, utilities, domestic supplies, personal care, recreation and entertainment, transportation, food, home services, clothing and footwear, and alcohol and tobacco.

While Vancouver offers a slightly more reasonable cost of living overall and high quality of life compared to the peer cities in this study, it is important to note it remains in the top five least affordable cities in Canada, especially when it comes to housing. Given that housing prices were spotlighted as one of the greatest determinants of business success in a recent survey conducted by the Chartered Professional Accountants of BC (CPABC)[21], this is an area that Vancouver can focus on to maintain or improve quality of living.

Other cities selected as part of this exercise that offer a high *Quality of Life* include **Copenhagen (#8), Sydney (#11)** and **Toronto (#16).** Notably, Toronto is also ranked as having a slightly higher cost of living than Vancouver (#89 vs. #108), which is largely due to similar affordable housing challenges.

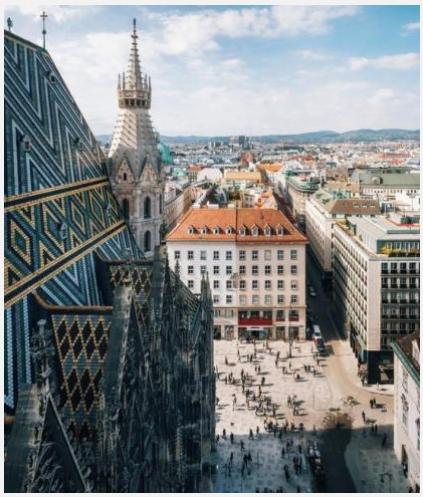
Importance of thematic area

Quality of life and cost of living are important factors for attracting and retaining talent to a city. Quality of life as defined by the World Health Organization refers to "an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns".[22] Common indicators related to quality of life, such as the environment, employment, recreation, social belonging, safety, security, and freedom, can be influenced and enhanced by a city. These same factors may also be relevant to foreign investors and business operators who are looking to live or have a footprint in the city where they're investing.

Data gaps and opportunities

As previously noted, Vancouver's ranking of #108 in Mercer's 2022 Cost of Living Ranking[23] does not equate to the city being affordable for most residents.

Independent quality of life rankings, such as Mercer's Quality of Living City Ranking[24], which was used in this study, contain qualitative and subjective components. These indexes may not consider factors that employers consider important, such as whether residents settle down and stay in the city long term. It is also important to note that not all cities in the peer group (e.g. Edmonton) are included in these global rankings. Affordability ranking methodologies are also often disputed; in the context of attracting investment and business, the exchange rate between country of origin and Canada may constitute a compelling case for relocation, or a compelling case against it.



Vienna's leadership in public housing is a key factor in being ranked 1st in the Global Livability Index three of the past five years. Today 60% of residents live in co-ops, government-owned or subsidised housing built during an ambitious public housing program in the wake of the First World War. This public-sector intervention in the housing market has helped Vienna maintain a relatively high quality of life to cost of living ratio.

More info: City Monitor

Photo by bortnikau/iStock

Workforce and Talent		
Metric	**Measurement**	**Top Cities**
University Reputation	Index ranking QS World Rankings: Sustainability (2023)	1. University of California, Berkeley (Berkely) 2. University of Toronto (Toronto) **3. University of British Columbia (Vancouver)**
Labour Force Participation	Labour force participation rate (2022) OECD Labour force participation rate + city-specific data	1. Stockholm 2. Copenhagen 3. Edmonton **6. Vancouver**

Findings

Vancouver's largest university, the University of British Columbia (UBC), ranks high (#3) amongst global universities for *University Reputation*. Of the criteria used to develop the ranking, UBC scored highest (out of 100) on Employer Reputation (95.4), International Research Network (97.9), and Academic Reputation (98).[25] One other Vancouver-based institution that made the list was Simon Fraser University, placing #250 on Environmental Impact.

Highlights of UBC's program and initiatives that also lend to its notable rank include:

- Campus as a Living Lab
- Sustainability Education Grants
- Sustainability Scholars Program
- Climate Emergency Task Force

A potential limitation for employers is the high proportion of international students that attend UBC (27% of the student population). This may present a challenge for businesses looking to hire summer interns or recent graduates if they do not meet the legal requirements to work in Canada or the means and network to remain in the city. Other notable cities with major universities that performed well include **Toronto** (#2), **Sydney** (#5), **Edinburgh** (#4), and **Tokyo** (#7).

Vancouver's *Labour Force Participation* rate of 67.4% is on par with its peers, especially within Canada. **Stockholm** and **Copenhagen** have slightly higher rates, which could be attributed to related policies and workforce protections. These high participation rates could also mean competing for talent is

more challenging and upward pressure is placed on wages. Tel Aviv and Seattle have slightly lower labour force participation rates than Vancouver.

Importance of thematic area

Access to local talent is relevant to investors and businesses looking for employees who are already familiar with the city and regional context and may not require additional costs or incentives to relocate.

Cities with universities and colleges that rank high on sustainability programs and leadership can more easily attract summer interns, co-op students, and recent graduates who are knowledgeable in the latest practices. The QS World University Sustainability Rankings used in this study focus on indicators that cover environmental and social impact measures.

Labour force participation rates were also taken into account and can be indicative of an adaptable workforce that is able to navigate the transition to a zero-emissions economy.[26] Green policies have been linked to economic growth and job creation and can create revenue streams to fund further workforce enhancements, such as training or labour taxes. Under the Greenest City Action Plan, green and local food jobs in Vancouver grew by 87% between 2010 and 2020, equating to 15,885 net-new jobs.[27]

Foreign capital can boost labour force participation rates through the creation of new jobs and the training, facilities, and associated infrastructure that come with them. Often the decision for foreign investors to choose a particular location is driven by incentives offered by local governments and economic institutions. Historically, these incentives have largely focused on cost-savings measures, including tax breaks, lower wages, lax environmental standards, or lower labour standards. Vancouver may want to coordinate with provincial and federal regulators to keep pace with neighbouring jurisdictions (e.g. Seattle) on environmental and labour regulations to ensure foreign capital isn't driven away. That being said, FDI may seek out jurisdictions with more sustainable and ambitious policies if they align with a company's values, its commitment to the

Stockholm's high labour force participation rate can be attributed in part to its commitment of achieving gender equality and policies that support workers with children who wish to remain in the workforce. Parents are entitled to 480 days of paid parental leave, with fathers accounting for 30% of all paid parental leave. Children 12-months and older have the right to a spot in daycare and the care itself is considered affordable for Swedish parents.

More info: Sweden.se

Photo by Vilseskogen/Flickr

Data gaps and opportunities

Global university rankings, such as the QS World University Ranking[28] used for this study, are methodologically challenged. These rankings have drawn criticism for irrelevant indicators (e.g. Nobel Prize winners as proxy for quality education), reliance on self-reporting metrics, and diversion of funds to help institutions better their position[29].

The labour force participation rates used (labour force divided by the total working-age population) also present limitations. For one, they reflect the overall labour force participation across all sectors rather than focusing on particular "green" talent areas and skills that businesses may be looking for. Also, labour force participation rates on their own don't account for additional nuances of *who* is not participating in the labour force and *why*.

Social Inclusion		
Metric	**Measurement**	**Top Cities**
Gender Pay Equity	Difference between median earnings of men and women (country) + Qualitative scale (2022)	1. Copenhagen 2. Stockholm 3. Dublin **9. Vancouver**
Human Rights Protections	Index Ranking Human Freedom Index ranking (2021)	1. Switzerland 3. Denmark (Copenhagen) 5. Ireland (Dublin) **6. Canada (Vancouver)**
Accessibility	Qualitative scale	(not ranked)[30]

Findings

Vancouver has room for improvement against its leading peers when it comes to *Gender Pay Equity*. British Columbia just passed pay transparency legislation that will enter into force in November of 2023; while this legislation will not immediately shift performance in this area, progress is more likely and can be amplified over time.[31] Both Montreal and Toronto have pay transparency legislation in place. Relative to Vancouver's wage gap result of 16.7%, **Denmark (Copenhagen), Sweden (Stockholm),** and **Ireland (Dublin**) have a gender wage gap of 5%, 7.4 % and 8.3% respectively. Each of these cities also provides pay transparency.

Vancouver ranks well on *Human Rights Protections,* with Canada ranking #6 in the Human Freedom Index. Areas where Canada, and Vancouver by extension, is particularly strong include security and safety (e.g. lower homicide rates, conflicts, and acts of terrorism), freedom of movement, freedom of expression, freedom of assembly, freedom in relationships (e.g. same-sex relationships, laws around divorce, inheritance rights), and factors that relate to "sound money", such as the standard deviation of inflation and freedom to own foreign currency. **Denmark** (**Copenhagen**) placed just ahead of Canada in the #3 spot. Denmark also performed well in the categories listed above yet received higher scores related to economic freedoms, such as its legal system and property rights, freedom to trade internationally, and credit market regulations. **Ireland** (**Dublin)** placed just ahead of Canada in the #5 position, doing slightly better on metrics related to the freedom to trade internationally (e.g. tariffs, movement of capital and people) and less civil society repression.

As the Assembly of First Nations, the Canadian House of Commons, and the BC Office of the Human Rights Commissioner have all noted, police discrimination and violence against Indigenous and other people of colour continue to create disproportionate harm for members of these communities both across Canada and in Vancouver.[32,33,34] Like many of the cities Vancouver is compared against, this asymmetry of human rights protections and violations remains an enduring facet of colonialism and systemic racism in these societies. Vancouver is not unique in facing these challenges, and indeed every city ranked here has some variation of these challenges, but beneath the overarching and positive national ranking, tremendous work remains to achieve genuine equity across all communities in how human rights are upheld in the ranked cities.

Vancouver can be considered a leading city on planning for *Accessibility.* The city's Accessibility Strategy was adopted in July 2022 and is designed to "support the full participation of persons with disabilities by establishing and maintaining inclusive services, programs, and infrastructure, and by identifying, removing, and preventing barriers."[35] Key focus areas to make the city more accessible focus on the built environment and public spaces, transportation, housing, information/communication, employment, governance and services, capacity and collaboration, and advocacy working with other orders of government. **Dublin**, **Montreal, Edmonton, Montreal, Sydney,** and **Toronto** also have well-developed accessibility action plans.

Importance of thematic area

The ability for an investor to fully tap into the talent potential of a city depends in large part on whether everyone in the population has a fair and accessible chance to participate. It is important for cities that wish to attract and retain top talent to have the necessary infrastructure, policies, and programs in place to support integration, and re-integration, into the workforce.

The *Gender Pay Equity* metric (measured as the difference between median earnings of men and women) is important to a city, both for attracting female, non-binary, and gender fluid talent as well as the longer-term implications and stresses lower wages can have on local social services and programs.[36]

Human Rights Protections are also important for citizens to feel at ease being their authentic selves without fear of punishment or violence. Factors relating to personal, economic, and human freedoms all contribute to the overall social concept of "freedom" that recognizes the dignity of individuals and is absent of coercive constraint. For talent attraction and retention, personal safety ranks high when workers are deciding where to live.[37]

Promoting Health and Well-Being through Social Inclusion in Toronto

In partnership with Wellesley Institute, Toronto Public Health led a two-phase exploration project to identify how to further promote social inclusion. The study identified the range of social inclusion intervention programs and organizations that have been implemented across the city and engaged with leaders and founders of the interventions to better understand challenges, enablers, and how to build on their progress.

The consultation process uncovered several themes that will help guide the city's planning and funding of future programs, including commitment to evaluation, secure funding, and population specific program design.

More info: City of Toronto

Photo by Sandro Schuh/Unsplash

Human rights in BC also operate in the context of Indigenous Rights and Title, and, most recently, by Canada, BC, and Vancouver's ratification and implementation of the UN Declaration on the Rights of Indigenous Peoples (UNDRIP). This adds an additional layer of governmental accountability for the protection of Rights and Title holders and is a unique consideration in comparison to some of the other cities ranked on this list.

The *Accessibility* of buildings, transportation, city services, and accommodations to support remote work are also key to unlocking the full potential of a city's workforce. Worldwide, the disability community comprises over 15% of the global population.[38] In Vancouver, over 5% of residents have some form of mobility restriction or physical disability.[39] It is important that these people are not barred from entering the workforce should they wish to contribute.

Data gaps and opportunities

Gender pay gaps are typically calculated and reported at the national level, and only some countries, including Canada, have started to disaggregate data to measure and report on other intersectional factors, such as race. This makes comparability across cities more challenging with inconsistent data collection and parameters for who is considered a visible minority varying across different regions of the world. In Canada, university-educated, Canadian-born members of a visible racial minority earn 87.4 cents for every dollar their Caucasian counterparts make[40]. Additionally, racialized women earn just 59 cents for every dollar a non-racialized man earns.[41] Amongst Canadian-born women working across commercial firms (large, medium, small) and the non-commercial sector, Chinese, Korean/Japanese, and South Asian women have average weekly earnings among the highest within sectors compared to White women. Latin American, Southeast Asian and Black women have average weekly earnings that are generally the lowest across sectors.[42] Researchers, as well as the BC Government and BC Office of the Human Rights Commissioner, have all recognized the ongoing data gaps in wage statistics and other areas related to Indigenous peoples.[43][44] For example, Indigenous peoples living on-reserve are not subject to the national Labour Force Survey, which underpins most wage (and wage-gap) data. These ongoing gaps represent a substantial data gap and very likely underrepresent discrimination and pay disparities within Canada. British Columbia has developed new plans, and a provincial act, to address this, but implementation is only now beginning. Future comparisons will hopefully include this more granular data.[45] Statistics Canada's plans to replicate the study with 2021 census data is a hopeful sign that more transparency and nuance will be brought to addressing wage gap issues.

Assessing the comprehensiveness, impact, and progress of a city's accessibility plan on a qualitative scale has limitations – both from the limited perspectives and potential biases of the evaluators as well as the variability across cities for what is considered "accessible". While there are best practices to meet the needs of many different users, such as Universal Design principles (defined as "*the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design*"[46]), they do not guarantee that spaces or services are accessible to all. It is also difficult to ascertain from a city's public accessibility plan whether these and other best practice principles have been incorporated unless explicitly stated.

The Human Freedom Index[47] used in this study is calculated at the national level, which means any of the Canadian cities in the study have an identical score. The index is comprised of 82 indicators covering the areas of rule of law, relationships, security and safety, size of government, movement, legal system and property rights, religion, sound money, association, assembly, and civil society, freedom to trade internationally, expression and information, and regulation. Of note, the Human Freedom Index is co-published by the Cato Institute (a public policy think tank founded on libertarian principles) and the Fraser Institute.

Governance	*Business Environment and Data*
	Public Sector Support

Business Environment and Data

Metric	Measurement	Top Cities
Cleantech Ecosystem	Index ranking Global Startup Ecosystem Report: Cleantech Edition (2022)	1. Silicon Valley 2. Tel Aviv 3. Stockholm **16. Vancouver**
Ease of Doing Business	Index ranking World Bank Ease of Doing Business (2019)	1. Singapore 2. Denmark (Copenhagen) 3. United States (Seattle) **23. Canada (Vancouver)**
Open Data	Qualitative scale City Open Government Data Site (Y/N)	(not ranked)[48]

Findings

Vancouver's *Cleantech Ecosystem* is on par with many of its global peers, placing #16 in Startup Genome's top 35 cleantech ecosystems. According to the cleantech ecosystem evaluation criteria, Vancouver ranked high on knowledge, with room for improvement across funding, startup experience, talent, and focus. Vancouver has become known for attracting talent and capital across a variety of cleantech solutions, from carbon capture to ocean robotics. Support and programming through Innovate BC helps startups scale and stay in the province. **Tel Aviv** was edged out by Silicon Valley for the top position in cleantech ecosystems. **Stockholm** followed closely behind in the #3 position.

When it comes to *Ease of Doing Business*, factors considered important by the World Bank are mainly related to the regulatory environment at the national level. Canada is one of the best countries (#3) for starting a business and protecting minority investors (#7). Areas where Canada is seen as weaker include trading across borders (time and costs), enforcing contracts (time and costs to resolve a commercial dispute), dealing with construction permits, and getting electricity (namely the number of procedures and time to set up a permanent connection, which would be less relevant to investors or business owners who are not interested in new construction).[49] While Canada ranks lower than its

global peers, Vancouver offers programs and incentives that still make it an attractive location for investors and business owners. The province of BC has a number of targeted tax credits and incentives for businesses[50] and offers support for female entrepreneurs[51] and entrepreneurs with disabilities[52]. Vancouver also offers resources for immigrant entrepreneurs[53], specially funded Business Improvement Areas (BIAs)[54], and facilitates connections between investors and climate solutions[55]. Among the top ranked countries for ease of doing business are **Denmark** (**Copenhagen** - #4), the **United States** (**Seattle** - #6), **Singapore** (#2) and **Sweden** (**Stockholm** - #10). Denmark performed well on metrics relating to trading across borders, dealing with construction permits, and paying taxes. Businesses looking to establish themselves in a U.S. city such as Seattle can expect greater ease of accessing credit and resolving insolvency. Singapore is seen as a place that is easy to start a business, enforce contracts, and protect minority investors. For investors and business owners in Sweden, Stockholm is one of the easier cities to register property and hook up to electricity.[56]

For *Open Data*, Vancouver has a user-friendly open data portal with 184 datasets. The catalogue includes useful information for investors and business owners (such as business licenses, storefronts inventory, and Business improvement areas) as well as sustainability-related data sets and dashboards (such as designated floodplains and the status of climate change targets). The portal has a channel to report issues of data accuracy, availability, or accessibility. All other cities included in this study had open data government sites.

Tel Aviv is a city described as punching above its weight when it comes to Cleantech innovation. The city boasts the world's highest ratios of start-ups per residents (1:154) and has long focused on developing efficient solutions to local challenges in agriculture, waste management, clean energy, and water treatment. Companies who develop Intellectual Property in the country can benefit from reduced corporate, dividend, and capital gain taxes. The city also runs a unique program that brings together municipal employees and companies together over 3-months to create innovative, funded solutions to improve resident services.

More info: Startup Genome & Innovation Tel Aviv Yafo Model (ITAY)

Photo by Gilad Avidan/Wikimedia Commons

Importance of thematic area

The strength of a city's cleantech ecosystem is important as it gives a sense of how competitive and connected the cleantech space is, both of which are factors that can fuel innovation. The health and global reputation of a city's cleantech ecosystem can also indicate whether there is adequate investment dollars and support for new businesses.

Beyond the availability of investment capital for new businesses, it is important for cities to provide supports and tools that streamline the bureaucracy involved in establishing and growing a new enterprise. Using the national rankings provided by the World Bank, the *Ease of Doing Business* metric was used to assess how Vancouver fares in encouraging business creation and development.

Open data access is important as it supports government transparency and public oversight. Business owners and investors benefit from open data to better understand market trends and local demand or assess their own environmental performance.

Data gaps and opportunities

The *Global Startup Ecosystem Report: Cleantech Edition*[57] used for this study is limited to 35 global cities. Edmonton and Montreal, included in the core cities for comparison, were not captured in the study and therefore not assigned a ranking. While the ranking included quantitative data from over three million companies and 280+ ecosystems, surveys (10,000+) and interviews with experts (100+) are subject to selection bias.

It is important to note that the World Bank's *Ease of Doing Business* rankings[58] is a national level ranking, which relies on Toronto-based data for the evaluation of criteria. Further qualitative analysis in this area or a future subnational study by the World Bank could provide Vancouver-specific insights.

Data availability was also a metric included in this theme; however, all cities provide some level of access to open government data. For future work, it would be helpful to identify 3-4 key aspects of open data that would be specifically useful to investors.

Public Sector Support		
Metric	**Measurement**	**Top Cities**
Climate Action	Qualitative scale Climate emergency declared (Y/N) + City Climate Action Plan (Y/N)	(not ranked)[59]
Zero Waste	Qualitative scale	(not ranked)[60]
Circular Economy	Qualitative scale	(not ranked)[61]

Findings

Vancouver is a leader amongst cities on *Climate Action.* It was one of the first cities in the world to declare a Climate Emergency calling for urgent action to limit global warming to 1.5˚C.[62] The City of Vancouver created a Climate Emergency Action Plan (CEAP) that focuses on action areas where it has jurisdiction, such as land-use planning, transportation, building, infrastructure, and natural systems.[63] Other cities that have declared a climate emergency and have a city climate action plan in place include **Dublin, Edmonton, Montreal,** and **Toronto**. Denmark (Copenhagen) and Sweden (Stockholm) have also declared a climate emergency as part of the EU.

A shadow over Vancouver's climate ambition is Canada's perceived performance on the world stage. In comparison to international leaders such as Denmark (Copenhagen), there is a gap for Canadian cities to close according to the Climate Change Performance Index, which ranks climate performance at a national level. This is largely due to continued oil and gas production nationwide and the need for a stronger emissions reduction plan at the federal level. For BC and Vancouver specifically, the nearby construction and expansion of new fossil fuel infrastructure and associated emissions, such as the Trans Mountain Pipeline, threaten to cancel out progress in other areas.

Vancouver also has a *Zero Waste* strategic plan with a vision of becoming a zero-waste community by 2040.[64] The strategy includes several areas that align and bolster elements of the Climate Emergency Action Plan, including the ability to avoid landfill disposal and the GHG emissions associated with incinerators. Other cities with zero-waste plans and targets include **Montreal** and **Sydney** (both with zero-waste targets of 2030).

Where Vancouver falls short against some of its peers is not having a formal *Circular Economy* strategy. The city does have several initiatives and resources for businesses to incorporate circular practices into their operations[65] but no formal plan or support from government to bring these activities under a cohesive strategy. Inspiration can be drawn from **Copenhagen**'s circular economy plan, which includes a variety of measures to improve circularity – from reusing construction materials from the city's properties to making waste sorting easier and more intuitive for residents.[66] The city of **Edmonton,** with support from the Recycling Council of Alberta, has created a Circular Cities Roadmap that aligns with the city's four strategic goals of 1) healthy city, 2) urban places, 3) regional prosperity, and 4) climate resilience.[67]

Importance of thematic area

City *Climate Action* rankings indicate whether cities are implementing forward-thinking and actionable climate plans and policies that are conducive to green economy business development. In addition to the climate action ranking, a city-level metric is also included to show whether a city has declared a climate emergency to further reinforce the imperative for solutions that align with green economy innovation.

Zero Waste and *Circular Economy* are qualitative metrics that indicate how leading cities are applying zero waste and circular economy strategies to reach targets as part of their shift toward low carbon economies. Benefits of becoming a zero waste or circular economy community include conserving scare resources, extending local landfill use, and creating social and economic opportunities.

Data gaps and opportunities

Databases listing and ranking city-wide zero-waste and circular economy plans do not currently exist. The existence of these plans were confirmed from web searches done on a city-by-city basis and carried the risk that elements or updates were missed, particularly for plans published in a language other than English. There is an opportunity gap for a publicly available list or repository of global cities' circular economy and zero-waste plans.

While noting that VEC does have some circular economy-related programs and supports available,[68] there is an opportunity for Vancouver to further its leadership in this area by developing a circular economy strategy and working with other levels of government to collect and report metrics to measure the strategy's progress. This will also send a clear signal to businesses and investors to establish and grow their circular economy services and technologies in Vancouver.

Copenhagen leads on circular economy initiatives with a formal CE strategy and ambitious target to have 70% of waste recycled by 2024. Copenhagen also leads on climate change ambition with a goal of becoming the world's first carbon neutral capital by 2025. The city benefits from Denmark's leadership in progressive climate policies, which include the adoption of a corporate carbon tax (beginning in 2025) for companies subject to the EU Emissions Trading System (ETS). Proceeds from the carbon tax will be used to phase out fossil fuels and accelerate the green transition.

More info: C40 Cities

Photo by Jorge Franganillo/Flickr

Conclusions & Opportunities

Vancouver's environmental performance is strengthened by relatively low cost and low carbon electricity, which is complemented by new policies requiring buildings to switch away from fossil fuel energy sources. This is increasingly important as more and more businesses are paying attention to the full scope of emissions associated with their assets and factoring climate risk into their long-term investment decisions.

There is room for improvement in Vancouver's infrastructure, while still having recent progress to build on. The main port and airport both have stated net-zero goals, and a major public transit upgrade is underway (the Broadway Subway Project), which is scheduled to be completed in 2026. Additional progress on climate resilience can be expected in the coming years with Canada's launch of its *National Adaptation Strategy* in November 2022.

While cost of living (and specifically the lack of affordable housing) is an ongoing priority, this study shows that Vancouver fares well against other cities when factoring quality of life metrics into the overall equation. In addition to UBC ranked #3 globally in university rankings, a 2015 Brand Finance report showed that the education space (primary and secondary systems) is one of Vancouver's strengths.

Vancouver has shown leadership in climate action across many sectors and has become a hub for green building activity in North America. Exciting synergies emerge when combining buildings sector climate targets with circular economy supports, creating FDI opportunities in zero carbon and modular building solutions that can also address housing supply challenges.

Vancouver's position as a clean technology centre is growing with many strong underlying supports in the innovation ecosystem. While there is relatively strong alignment between the City and other levels of government, it is important that agencies continue to work together to streamline the bureaucracy that can be a hurdle for FDI.

One specific opportunity for governments to work together is catalyzing opportunities for Vancouver-based firms to sell their products and services domestically. A recent report from Invest Vancouver highlighted regional and provincial strengths, such as the collection of engineering talent in the hydrogen sector and growing hubs for digital media and entertainment, all of which have the potential to drive FDI.[69]

Of all the metrics evaluated in this study, **Vancouver's greatest competitive strengths are its low cost of energy, relatively high quality of life to cost of living ratio, and a group of leading post-secondary institutions that includes a university ranked #3 in the world**. None of the metrics evaluated present an existential threat to Vancouver's competitiveness today, but areas that could be focused on to improve future performance include sustainable mobility, labour force participation rate, gender pay equity, and ease of doing business.

Partnership Opportunities

In recent years, Vancouver has experienced relatively good alignment with regional, provincial, and federal green economy-related priorities (e.g. sustainable mobility, zero waste/circular economy, climate mitigation and adaptation). This situation creates economic conditions that allow for green growth and investment while remaining competitive in a more traditional sense.[70] Below are examples of strategic priorities and programs that can help Vancouver's economy transition to zero emissions in unison with other agencies and levels of government.

Destination Vancouver's Tourism 2030 report outlines future scenarios for the tourism sector and specifically a growth in business travel, pointing to catalysts like the tech sector and growth in commercial office space. These growth scenarios can be realized by supporting green building and sustainable tourism policies and programs.[71] Additionally, a theme in Metro Vancouver's Destination Development Strategy is focused on business responsibility, sustainability, and resilience; this includes specific actions related to measuring progress towards sustainability goals, green infrastructure, business resiliency planning, accessibility, and social inclusion.[72]

With Vancouver the economic centre of Western Canada, it is important that the City continues to leverage provincial and federal programs and supports to the extent possible. Provincial level supports include InnovateBC and BC Tech programs, such as the HyperGlobal export accelerator. The Province also has an initiative to establish a *BC ESG Centre of Excellence*,[73] and has reported on its own ESG performance.[74]

In terms of alignment with federal action, Global Affairs Canada's Sustainable Development Strategy 2020-2023[75] includes targets related to clean growth and clean technology exports. Strategies to boost both export performance and FDI can go hand-in-hand,[76] and Canada has identified advantages in areas such as mining, chemical recycling, value-added wood products, and other circular economy exports.[77] Other federal government supports include PacificCan's strategic priorities of Cluster Growth and Inclusiveness,[78] and ISED's Strategic Innovation Fund Business Innovation and Growth stream.[79]

Because many of these indicators are influenced by policies and actions at senior levels of government, there is value in continuing to work with other leading cities across Canada (and supporting organizations such as C40 and CUSP) to advocate for more urgent provincial and federal action in response to the climate crisis. By leveraging these partnership opportunities, Vancouver can continue to support a thriving green economy and attract the type of FDI that fits within one of the greenest cities in the world.

Appendix A | Index & Indicator Scan

Source / Vancouver Ranking	Indicator	Relevant to study? (yes/maybe/no)
CK Sustainable Cities Index - #8		
CK Sustainable Cities Index	Scope 1 GHG emissions	N
CK Sustainable Cities Index	Consumption-based emissions	N
CK Sustainable Cities Index	Air quality	M
CK Sustainable Cities Index	Open public space	N
CK Sustainable Cities Index	Water access	M
CK Sustainable Cities Index	Water consumption	N
CK Sustainable Cities Index	Vehicle dependency	M
CK Sustainable Cities Index	Road infrastructure efficiency	N
CK Sustainable Cities Index	Sustainable transport	M
CK Sustainable Cities Index	Solid waste generated	N
CK Sustainable Cities Index	Climate change resilience	Y
CK Sustainable Cities Index	Sustainable policies	Y
Arcadis Sustainable Cities Index - #17		
Arcadis Sustainable Cities Index	Planet - Air pollution	N
Arcadis Sustainable Cities Index	Planet - Bicycle infrastructure	M
Arcadis Sustainable Cities Index	Planet - Energy consumption & renewable energy share	Y
Arcadis Sustainable Cities Index	Planet - Enviro exposure	N
Arcadis Sustainable Cities Index	Planet - Green spaces	N
Arcadis Sustainable Cities Index	Planet - GHGs	N
Arcadis Sustainable Cities Index	Planet - Public policy	Y
Arcadis Sustainable Cities Index	Planet - Sustainable transport incentives	M
Arcadis Sustainable Cities Index	Planet - Waste management	M
Arcadis Sustainable Cities Index	People - Quality of public transport infrastructure	M
Arcadis Sustainable Cities Index	People - Cost of broadband	M
Arcadis Sustainable Cities Index	People - Crime (homicide + theft rates)	M
Arcadis Sustainable Cities Index	People - Education	N
Arcadis Sustainable Cities Index	People - Health	N
Arcadis Sustainable Cities Index	People - Income inequality	M
Arcadis Sustainable Cities Index	People - Wifi avail. Work life balance	M
Arcadis Sustainable Cities Index	Profit - Access to reliable electricity	M
Arcadis Sustainable Cities Index	Profit - Affordability	M
Arcadis Sustainable Cities Index	Profit - Connectivity	M
Arcadis Sustainable Cities Index	Profit - Ease of doing business	Y
Arcadis Sustainable Cities Index	Profit - Economic development	M
Arcadis Sustainable Cities Index	Profit - Employment	M
Arcadis Sustainable Cities Index	Profit - Green finance	Y
Arcadis Sustainable Cities Index	Profit - Job quality and commercial transport infrastructure	M

Global Liveability Index - #5

Global Liveability Index	Stability	M
Global Liveability Index	Healthcare	N
Global Liveability Index	Culture and Environment	M
Global Liveability Index	Education	N
Global Liveability Index	Infrastructure	M

Prosperity and Inclusion in Cities Seal and Awards Index (2019) - #No Rank

PICSA	GDP per capita	N
PICSA	Quality of life	Y
PICSA	Personal safety score	M
PICSA	Population w/ tertiary education	M
PICSA	ICT access	M
PICSA	Affordability (ratio of average monthly net salary over rent)	M
PICSA	Environmental quality	M
PICSA	Physician density	N

IESE Cities in Motion - #55

IESE Cities in Motion	Human capital	M
IESE Cities in Motion	Social cohesion	M
IESE Cities in Motion	Economy	M
IESE Cities in Motion	Governance	M
IESE Cities in Motion	Environment	M
IESE Cities in Motion	Mobility and transportation	Y
IESE Cities in Motion	Urban planning	M
IESE Cities in Motion	International profile	M

GSE Report: Cleantech Edition - #16

GSE Report: Cleantech Edition	Performance	M
GSE Report: Cleantech Edition	Funding	Y
GSE Report: Cleantech Edition	Startup Experience	M
GSE Report: Cleantech Edition	Knowledge	M
GSE Report: Cleantech Edition	Talent	Y
GSE Report: Cleantech Edition	Focus	M

GSE Report: Blue Economy Edition - #14

GSE Report: Blue Economy Edition	Performance	M
GSE Report: Blue Economy Edition	Funding	Y
GSE Report: Blue Economy Edition	Startup Experience	M
GSE Report: Blue Economy Edition	Knowledge	M
GSE Report: Blue Economy Edition	Talent	Y
GSE Report: Blue Economy Edition	Focus	M
GSE Report: Blue Economy Edition	Legacy	M

Kearney Global Cities Index - #No rank

Kearney Global Cities Index	Business activity - Fortune 500	N

Kearney Global Cities Index	Business activity - Top global services firms	N
Kearney Global Cities Index	Business activity - Capital markets	M
Kearney Global Cities Index	Business activity - Air freight	M
Kearney Global Cities Index	Business activity - Sea freight	M
Kearney Global Cities Index	Business activity - ICCA conferences	N
Kearney Global Cities Index	Business activity - Unicorn companies	M
Kearney Global Cities Index	Human capital - Foreign-born population	M
Kearney Global Cities Index	Human capital - Top universities	M
Kearney Global Cities Index	Human capital - pop. w/ tertiary degree	M
Kearney Global Cities Index	Human capital - International student population	M
Kearney Global Cities Index	Human capital - # of international schools	N
Kearney Global Cities Index	Human capital - Medical universities	N
Kearney Global Cities Index	Information exchange - Access to TV news	N
Kearney Global Cities Index	Information exchange - News agency bureaus	N
Kearney Global Cities Index	Information exchange - Broadband subscribers	N
Kearney Global Cities Index	Information exchange - Freedom of expression	N
Kearney Global Cities Index	Information exchange - Online presence	N
Kearney Global Cities Index	Cultural experience - Museums	M
Kearney Global Cities Index	Cultural experience - Visual &performing arts	M
Kearney Global Cities Index	Cultural experience - Sporting events	M
Kearney Global Cities Index	Cultural experience - International travelers	N
Kearney Global Cities Index	Cultural experience - Culinary offerings	N
Kearney Global Cities Index	Cultural experience - Sister cities	N
Kearney Global Cities Index	Political engagement - Embassies & consulates	N
Kearney Global Cities Index	Political engagement - Think tanks	M
Kearney Global Cities Index	Political engagement - International organizations	N
Kearney Global Cities Index	Political engagement - Political conferences	N
Kearney Global Cities Index	Political engagement - Local institutions w/ global reach	N

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