CITY OF VANCOUVER

RENEWABLE CITY STRATEGY

SUMMARY

Renewable energy is energy that is naturally replenished as it is used.

ACHIEVING 100% RENEWABLE ENERGY FOR VANCOUVER

Imagine a city where jobs and businesses are diverse and economically strong; where homes and offices have clean and comfortable environments that are less expensive to heat and cool; where the transportation system is abundant and efficient, a city that supports a thriving economy while improving affordability and provides citizens the opportunity to be healthy and mobile.

Imagine a city powered only by renewable energy.

TARGETS AND SCOPES

Target 1: Derive 100% of the energy used in Vancouver from renewable sources before 2050

Target 2: Reduce greenhouse gas emissions by at least 80% below 2007 levels before 2050

Geographic Scope: The geographic scope of the Renewable City Strategy covers the area within the City limits, and any facilities owned or operated by the City of Vancouver outside those limits.

Emissions Scope: The Renewable City Strategy will track emissions in accordance with the most stringent international reporting standards (currently the Global Protocol for Community-Scale Greenhouse Gas Emission Inventories).

STRATEGIC APPROACH

1. Reduce energy use

Advance energy conservation and efficiency programs which are the most cost-effective way to a renewable energy future.

2. Increase the use of renewable energy

Switch to renewable forms of energy that are already available to us, and make improvements to our existing infrastructure to use it to its fullest potential.

3. Increase the supply of renewable energy

Increase the supply of renewable energy and build new renewable energy infrastructure.

PRIMED FOR SUCCESS

Vancouver has all the conditions needed to successfully derive 100% of its energy from renewable sources before 2050. Vancouver is building on 25 years of action and success to tackle climate change for the benefit of all who live in, work in, and visit Vancouver, and for the benefit of the world. Vancouver, a city of 605,000 people and an area of 115 sq. km, is a world leader in the development of complete, compact, and livable communities. Vancouver already has one of the lowest greenhouse gas emissions per person in the developed world. Serviced by a clean and reliable electrical system, which also powers much of the city's transit system, Vancouver is primed to capitalize on the electrification of both its buildings and its transportation system. Vancouver's brand, valued at US$31bn when measured by investment, reputation, and performance, demonstrates the economic importance of existing in harmony with nature.

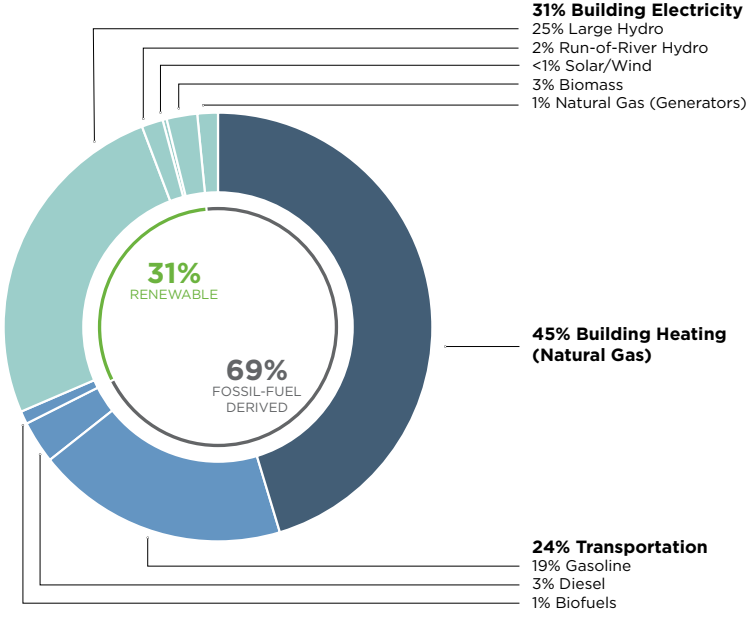
THE OPPORTUNITY

The technological and business transformation of energy efficiency, conservation, and management coupled with new renewable energy generation is set to define the economy of the future. The Renewable City Strategy positions Vancouver to increase its economic diversity for a stronger, more resilient economy. A healthy environment is essential to attracting and retaining the very best minds, establishing Vancouver as an innovation hub with high and inclusive employment, and positioning Vancouver in the vanguard of long-term economic stability and success. The City of Vancouver can be the catalyst for change through its own internal operations, as well as public pilots and demonstrations. Ensuring that the city's neighbourhoods, communities, buildings, transportation system, businesses, and individuals embrace renewable energy will mean a better, healthier quality of life for Vancouverites today and into the future.

ENERGY USE IN VANCOUVER TODAY

Vancouver's energy use is currently 31% renewable, with the fossil fuel fraction dominated by natural gas for space heat and hot water, and gasoline for personal and light-duty vehicle use. Vancouver's energy use and resulting greenhouse gas emissions, are dominated by buildings and transportation. These two sectors are the primary focus of the Renewable City Strategy.

SOURCES OF ENERGY USED IN VANCOUVER
2014



A VISION FOR VANCOUVER'S BUILDINGS IN 2050

By 2050, about 40% of Vancouver's buildings will have been replaced and built to the carbon-neutral standards set out in the Greenest City 2020 Action Plan or to zero-emission standards which will have come into effect before 2030. Of the buildings which remain there will be an even split between those built to current standards and those built to standards pre-dating 2010. The vast majority of these buildings will have undergone deep retrofits to bring their energy performance up to the standards expected of new construction, or have been connected to the one of Vancouver's renewable neighbourhood energy systems. These changes will cut city-wide building energy use by about 30% compared to 2014.

Current business-as-usual energy use with existing City and Provincial policies would likely mean an increase in city-wide electricity use by 2050 of approximately 10% over 2014, with large amounts of fossil-fuel-derived energy remaining. The Renewable City Strategy would lead to an increase in electricity use of about 20% by 2050 over 2014 levels, but would in the process eliminate Vancouver's need for fossil fuels.

Building performance improvements and the expansion of neighbourhood renewable energy systems that can provide heating and cooling will limit increases in electrical demand. There will be only minimal need for large electrical generation and transmission infrastructure investments – British Columbia's electrical grid can be capitalized upon and optimized to meet demand with only modest generation additions.

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The use of on-site power generation from solar, or air-source heat pumps and geoexchange systems for heating, will further limit the need for new electrical generation. For those buildings that cannot be brought to perform to zero-emission standards and that cannot be connected to renewable neighbourhood energy systems, biomethane will be used to meet heating needs, although this need is expected to be minimal and biomethane will play a more significant role in the transportation system as an energy-rich mobile fuel.

The incremental increase over business-as-usual of electrical demand will in part be due to the electrification of personal transportation. Since typical daily commutes are short in Vancouver, and the need for personal vehicle use will decline substantially by 2050, vehicle electrical demand will constitute only about 5% of total annual city-wide electrical demand. This demand will be met through home and work-place charging infrastructure. New smart-grid technologies will manage electrical distribution, on-site generation, and electric vehicle charging.

"Between 2010 and 2014 $31 billion was invested in Canadian renewable electricity projects" *Clean Energy Canada, 2015*

ZERO-EMISSION BUILDING PRIORITIES

B.1 New buildings to be zero-emission by 2030

B.1.1 Adopt and demonstrate zero-emission standards in new City of Vancouver building construction

B.1.2 Ensure rezoning policy leads the transition to zero-emission buildings

B.1.3 Incentivize and streamline the development of exemplary buildings

B.1.4 Establish and enforce specific greenhouse gas intensity limits for new developments

B.1.5 Develop innovative financing tools to help fund new zero-emission buildings

B.1.6 Establish partnerships to build industry capacity

B.1.7 Mandate building energy benchmarking and labelling requirements

B.2 Retrofit existing buildings to perform like new construction

B.2.1 Use the Zero-Emission New Building Strategy to reduce the need for building retrofits

B.2.2 Mandate energy efficiency improvements for existing buildings

B.2.3 Provide flexibility to achieve energy efficiency requirements through the support of on-site generation or neighbourhood energy system connection

B.2.4 Facilitate modest retrofits through structured guidance and the provision of incentives

B.2.5 Increase renewable energy use by large energy consumers

B.3 Expand existing and develop new Neighbourhood Renewable Energy Systems

B.3.1 Expand existing Neighbourhood Renewable Energy Systems

B.3.2 Enable the conversion of the downtown and hospital steam systems from natural gas to renewable energy

B.3.3 Enable the development new neighbourhood renewable energy systems for downtown and the Cambie corridor

B.3.4 Continue to enforce, and update as required, building and renewable energy supply policies that support neighbourhood renewable energy systems

B.4 Ensure grid supplied electricity is 100% renewable

B.4.1 Partner with utilities to increase the supply of renewable energy

B.4.2 Partner with utilities to implement a smart grid that meets Vancouver's energy needs


EXIT
Admissions

A VISION FOR VANCOUVER'S TRANSPORTATION SYSTEM IN 2050

Vancouver will continue its efforts to build a city that is compact and complete, allowing most people to meet their daily needs through walking, cycling, and transit. Longer journeys will be made on transit that is predominantly electrified, complemented by renewable fuels like sustainable biofuel, biomethane, or hydrogen. The number of people living and working in the city will grow significantly by 2050, and while the number of private vehicles per person could decline by as much as 15%, the total number is expected to increase by 15%. Even with this growth, the actions outlined in the Renewable City Strategy - including thoughtful land use planning and infrastructure investments that improve green transportation options - could reduce total annual vehicle kilometres travelled by 20% over 2014.

The Renewable City Strategy priorities will help transition private vehicles to using only renewable energy sources. By 2050 about 25% of Vancouver's personal vehicles would be electric using renewably generated electricity, 45% plug-in hybrids using renewable electricity and sustainable biofuels, and the remainder conventional hybrid vehicles running on sustainable biofuels. The compact nature of Vancouver means daily commutes are short enough to allow the vast majority of plug-in hybrid journeys to use only the vehicle's battery. Given the anticipated growth in both electric and plug-in hybrid vehicles, it will be critical to provide charging infrastructure at home, work, and on-the-go locations. The effect of autonomous cars on our transportation system is expected to be marked, although it is unclear if the effect will in aggregate be positive or negative.

As fewer people drive for personal trips, the proportion of transportation energy attributable to commercial vehicles will increase. Less important than the number of commercial vehicles is the distance they travel and the weight of goods they haul. Improving how goods, freight, and services are provided will be paramount, although it is as yet unclear if electrification, sustainable biofuels, biomethane, or hydrogen will dominate heavy-duty vehicle types.

RENEWABLY POWERED TRANSPORTATION PRIORITIES

T.1 Use land-use and zoning policies to develop complete compact communities and complete streets that encourage active transportation and transit

T.1.1 Foster land use as a tool to improve transportation consistent with the direction established in Transportation 2040

T.1.2 Enhance and accelerate the development of complete streets and green infrastructure

T.1.3 Enhance the pedestrian network according to the direction established in Transportation 2040

T.1.4 Enhance cycling infrastructure and encourage more bike trips according to the direction set in Transportation 2040

T.1.5 Use parking policies to support sustainable transportation choices and efficient use of our street network

T.1.6 Optimize the road network to manage congestion, improve safety, and prioritize green transportation

T.2 Improve transit services as set out in Transportation 2040

T.2.1 Extend the Millennium Line in a tunnel under Broadway

T.2.2 Improve frequency, reliability, and capacity across the transit network

T.2.3 Develop a transit supportive public realm with improved multimodal integration and comfortable waiting areas

T.2.4 Work with the transit authority and other partners to transition fossil fuel powered transit vehicles to renewable energy

T.3 Transition light-duty vehicles (cars and light trucks) to be predominantly electric, plug-in hybrid, or sustainable biofuel powered

T.3.1 Develop vehicle and fuel standards to support renewably powered vehicles

T.3.2 Develop supporting infrastructure that meets the needs of renewably powered vehicles

T.4 Develop car-sharing and regional mobility pricing to encourage rational journey choice

T.4.1 Support increased car-sharing and the uptake of renewably powered vehicles in car-sharing fleets

T.4.2 Advocate for comprehensive regional mobility pricing

T.5 Better manage commercial vehicle journeys and transition heavy-duty (commercial) vehicles to sustainable biofuels, biomethane, hydrogen, and electricity

T.5.1 Improve the delivery of commercial freight, goods, and services according the direction set in Transportation 2040

T.5.2 Work with fleet operators and contractors to transition to renewably powered vehicles

CITY SERVICES RENEWABLE ENERGY PRIORITIES

The City of Vancouver can catalyze change by being a leader in the use of renewable energy in its own operations and empowering change through the full array or services it provides; to do this:

S.1 The City will adopt a comprehensive approach to the consideration of climate change as part of its service planning

S.2 The City will adopt a comprehensive approach to pricing carbon emissions for municipal operations

S.3 The City will develop a framework to assess how City enabling tools may be used to support the transition to 100% renewable energy

S.4 The City commits to keep abreast of financing mechanisms available that enable the delivery of renewable energy technology and other green infrastructure

ECONOMIC OPPORTUNITY PRIORITIES

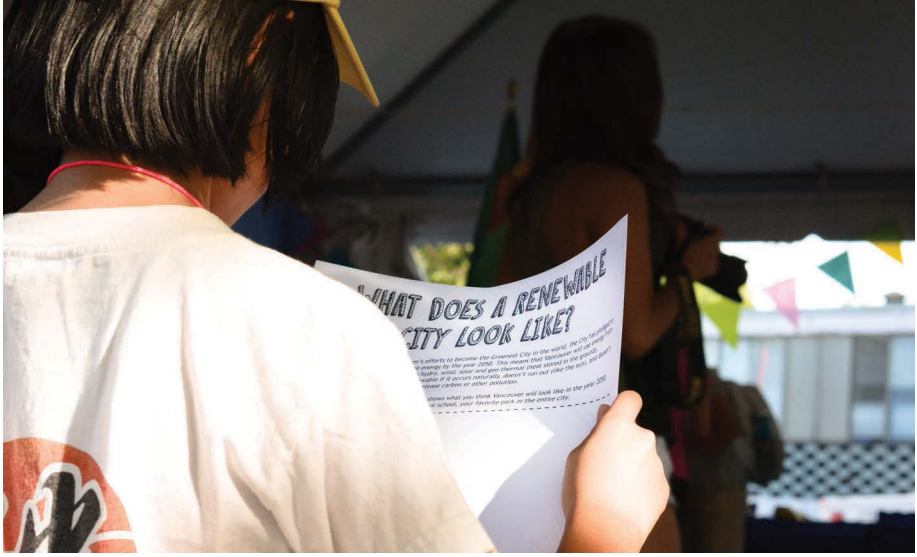
The Renewable City Strategy provides a significant economic opportunity for Vancouver. To capitalize on this, the City will:

E.1 Support innovators through business and technology research, incubation, acceleration, and demonstration

E.2 Actively work with businesses to increase the use of renewable energy

E.3 Target key events and organizations that represent clean tech and renewable energy to strengthen Vancouver's economy

E.4 Attract 'green capital' and enable more innovative financing mechanisms for clean and renewable businesses



VANCOUVER'S POTENTIAL ENERGY SYSTEM TRANSFORMATION

Implementing the Renewable City Strategy will reduce total energy use from a 2050 business-as-usual scenario by more than 50%, saving 39 million GJ of energy annually. The net impact is a reduction of one third over 2014 energy use levels, saving 21 million GJ of energy a year.

- 45% of this reduction could come from improvements in building performance, reductions in personal vehicle use through active transport, and improvements in vehicle efficiency.
- 20% of this reduction could come from the increased use of existing renewable energy sources like the expansion of neighbourhood renewable energy systems, increased transit use and the expansion of car-sharing.
- Finally, 35% of this reduction could come from the increase of renewable energy supply through new neighbourhood renewable energy systems and the use of biofuels, biomethane and hydrogen.

Vancouver's citizens and communities have a critical role to play in the success of the Renewable City Strategy.

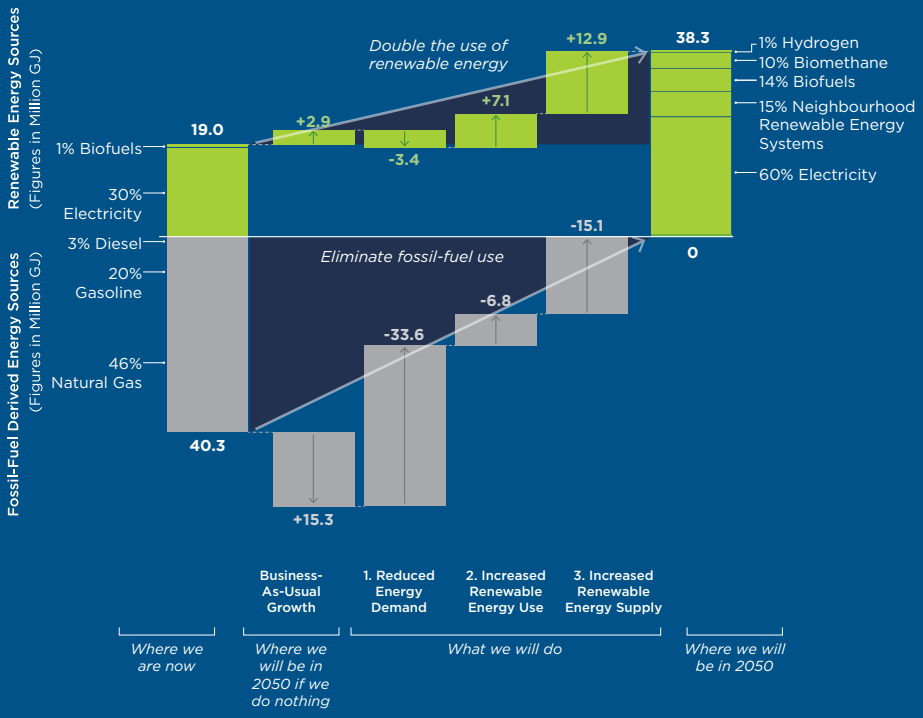
Discover how you can help build Vancouver's green and renewable future at **vancouver.ca/greennews**

HOW VANCOUVER WILL GET TO 100% RENEWABLE ENERGY BY 2050

2014
Total Energy Use
59.3 Million GJ

BUILDINGS AND TRANSPORTATION

2050
Total Energy Use
38.3 Million GJ



Due to rounding, numbers presented may not add up precisely to the totals provided.

CITY OF VANCOUVER | GREENEST CITY

For More Information:

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Outside Vancouver: 604-873-7000

Hỏi chi tiết **Obtenga Información**

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