APPENDIX A

Better Climate, Better Community

WEST VANCOUVER COMMUNITY ENERGY & EMISSIONS PLAN

SUMMARY REPORT

KONSTANTIN DIMOPOULOS | THE BLUE TREES

a better climate for our prosperity, our health and nature ▪ SEPTEMBER 2016

westvancouver

WEST VANCOUVER COMMUNITY ENERGY & EMISSIONS PLAN: SUMMARY REPORT

West Vancouver's CEE Plan was prepared by a citizen working group over a 24-month planning period. This Summary Report is based on the Full Technical Report, which includes detailed modeling, comprehensive analysis, and a description of the working group planning process.

ACKNOWLEDGMENTS

Mayor and Council, residents, businesses and local and provincial stakeholders provided critical input through a series of events. The planning process was driven by a citizen working group supported by staff, external advisors and funders. The plan was inspired by Climate Action Working Group recommendations in 2010.

Community Energy & Emissions Working Group

The Council-appointed Community Energy & Emissions Plan Working Group was comprised of eight members.

Rick Amantea	Charlotte McLaughlin (Chair)	Jennie Moore
Freda Pagani	Peter Scholefield	Maciej Sobczyk
Tarah Stafford	David Van Seters	

Council Liaison

Councillor Michael Lewis was liaison to the working group and a champion of the planning process. The working group, staff, and all those involved in this project wish to acknowledge his political leadership and personal contribution to the plan.

Staff Project Team

David Hawkins (Manager of Community Planning) and Raymond Fung (Director of Engineering & Environment Services) were staff liaisons to the working group, building on initial work by Sandra Bicego (former Manager of Environment & Sustainability) and Brent Leigh (former Deputy CAO). Staff from across the organization provided strategic input, notably: Phil Bates (waste and material management, Engineering Services), Chris Bishop (Development Planning), John Calimente (Transportation & Roads), Pat Cumming (Library Services), Isabel Gordon (Director of Financial Services), Stephen Mikicich (Economic Development) and Emily Willobee (education and outreach, Engineering Services). Donna Powers and Marlis Steininger in Communications, Caroline Hyatt in Permits & Inspections, Courtney Owens and Suzanne Rowell in Engineering Services actively supported the process.

Advisors

A team of consultants headed by Boston Consulting provided strategic and analytical support. UBC's Collaborative for Advanced Landscape Architecture Planning contributed analysis and visualizations.

Boston Consulting

BLUE CEDAR VENTURES

Enerficiency Consulting

Golder Associates

Funding

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FCM Federation of Canadian Municipalities

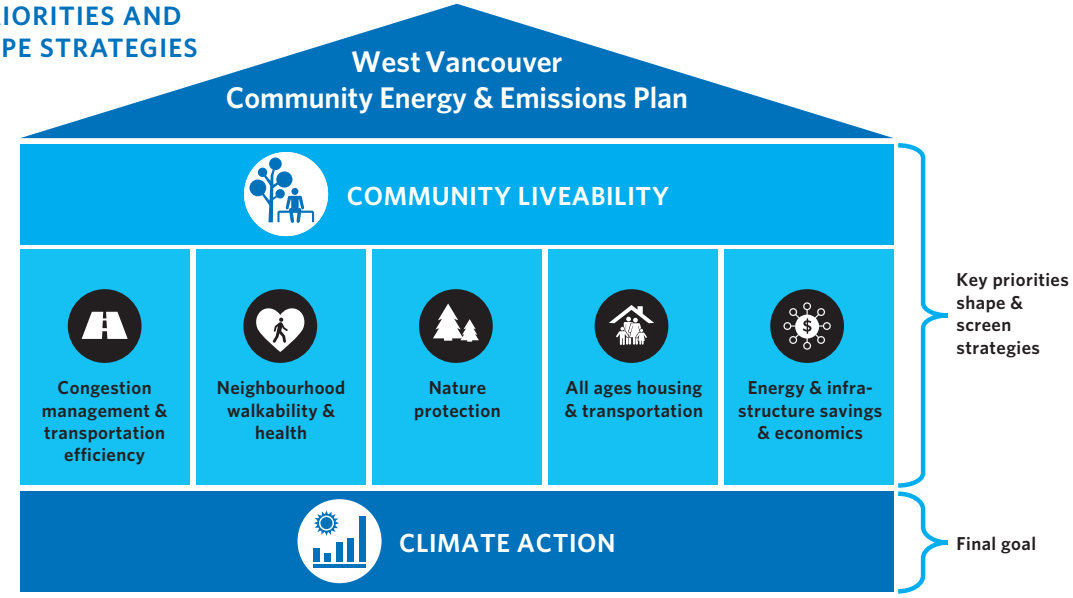
BC hydro

1. INTRODUCTION

a better climate for our prosperity, our health and nature

This Community Energy & Emissions Plan (CEE Plan) envisions a better climate for our prosperity, our health and nature. The plan is West Vancouver's latest contribution to the provincial, national and global imperative to drive deep greenhouse gas (GHG) reductions. It serves to advance mutually reinforcing priorities: public health, forest and park protection, housing options for all ages, congestion management, avoided energy and infrastructure costs, and climate action. By addressing such broad priorities synergistically, it is both a plan for a *better climate* and a *better community*.

CORE COMMUNITY PRIORITIES AND CLIMATE ACTION SHAPE STRATEGIES



2. CURRENT GHG EMISSION ACTIVITY

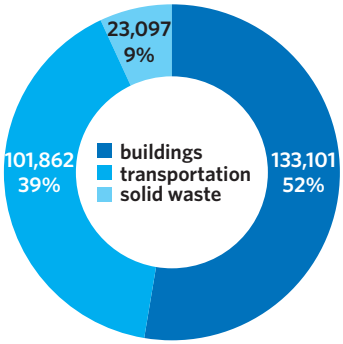
The majority of West Vancouver's current GHGs are from energy-related activity, primarily the combustion of natural gas for building energy and gasoline for transportation, generating carbon dioxide.

Roughly half of current GHGs are in Buildings. This building-dominated emission profile is unusual in BC, and is attributable to the high share of older and larger single detached homes, and smaller household sizes.

Transportation is the second largest emission sector. Like other BC communities, transportation has been the fastest growing sector over the last twenty years due to the shift towards light trucks, mini vans and SUVs, and longer driving distances. Average West Vancouver personal driving distances are similar to the region. West Vancouver has significantly less commercial vehicle traffic. The larger vehicle trend has somewhat leveled, slowing transportation GHG growth.

The smallest share of West Vancouver GHGs is from the Solid Waste sector. Waste is a non-energy emission source, resulting from anaerobic decomposition of organic waste in landfills, producing methane. West Vancouver's unparalleled leadership in recycling and curbside composting is rapidly shrinking these emissions.

The plan identifies a range of actions to achieve GHG reductions from all three emissions sectors.



WV 2010 GHG PROFILE
(tonnes CO2e)

3. STRATEGIC DIRECTIONS

The plan is built around four inter-related strategic sections. One additional section, *Cross Cutting Action,* identifies priorities that support the alignment and strengthening of climate action across all sectors. Most strategic directions require further analysis and/or engagement to occur during plan implementation.

1. NEIGHBOURHOOD & COMMUNITY PLANNING: places + spaces

Walkable village activation

A1 EXISTING VILLAGE ACTIVATION

- activate existing large and small walkable villages with modest new residential and commercial growth of a similar scale, strong public realm and infrastructure to support strong transportation choice, notably walking and cycling

A2 NEW VILLAGE INITIATION

- focus Upper Lands growth in a village near the base of Cypress Bowl Road—mixed use, strong transportation choice, notably walking and cycling, parks and plazas should define the village

A3 MICRO MARKET STABILIZATION

- support viability of existing micro markets with modest intensification, active travel and pocket plazas and pocket parks
- enable new micro market opportunities in amenable neighbourhoods with conducive regulatory and fiscal policies

Residential neighbourhood regeneration

B RESIDENTIAL NEIGHBOURHOOD REGENERATION

- create new market options for homeowners that help meet the needs of empty-nesters, solo seniors and young people and protect neighbourhood character
- sustain home-based employment opportunities in residential areas

Forest stewardship

C URBAN FOREST & TREE STEWARDSHIP

- focus growth in villages and gentle residential intensification to protect mature forests in Upper Lands
- protect and enhance trees and forests in public realms (parks and streets) and private realms (developed land and land in development).

2. HOUSING & LAND USE: bricks + mortar

Home, building renos & retros

A EMPTY-NESTER HOME RENOS & REVITALIZATIONS

- expand market options for interested home-owners wanting to down-size in their own homes and 'hoods, diversifying housing options for empty-nesters, solo seniors and young people—explore options that respect neighbourhood character such as stratified coach houses, and large lot splitting and continue to encourage secondary suites and coach houses

B1 LOW CARBON, LOW COST HOME RETROFITS

- facilitate home and pool energy retrofits in single detached homes and other small freehold and simple strata homes (e.g. duplexes, row houses)

B2 LOW CARBON, LOW COST APARTMENT RETROFITS

- facilitate energy retrofits in strata and rental apartment buildings

B3 COMMERCIAL BUILDING CARBON & COST MANAGEMENT

- facilitate energy retrofits in commercial buildings

Low carbon new homes & buildings

C MISSING MIDDLE HOUSING

- facilitate high demand, low supply "missing middle" housing options: single detached homeplex (duplex, triplex, quadplex), row/town house, and low rise—continue to encourage secondary suites, coach houses

D1 STRETCH BUILDING CODE SINGLE DETACHED HOMES & SEMI-ATTACHED ADVANCED EFFICIENCY

- facilitate higher efficiency wood frame construction in single detached and semi-attached homes: thermal, passive, low carbon heating, and comprehensive adaptable design—encourage premium performance for very large homes
- advance measures to support low carbon transportation and forest carbon storage and sequestration
- remove barriers to green building innovation

D2 STRETCH BUILDING CODE APARTMENTS & COMMERCIAL BUILDINGS

- facilitate higher efficiency new apartments/commercial buildings: thermal, passive & low carbon heating
- advance measures to support low carbon transportation, forest carbon storage and sequestration and diversion of organic and recyclable materials
- prioritize wood low/mid-rise—focus high-rise proximate to current and future transit/rapid transit stations

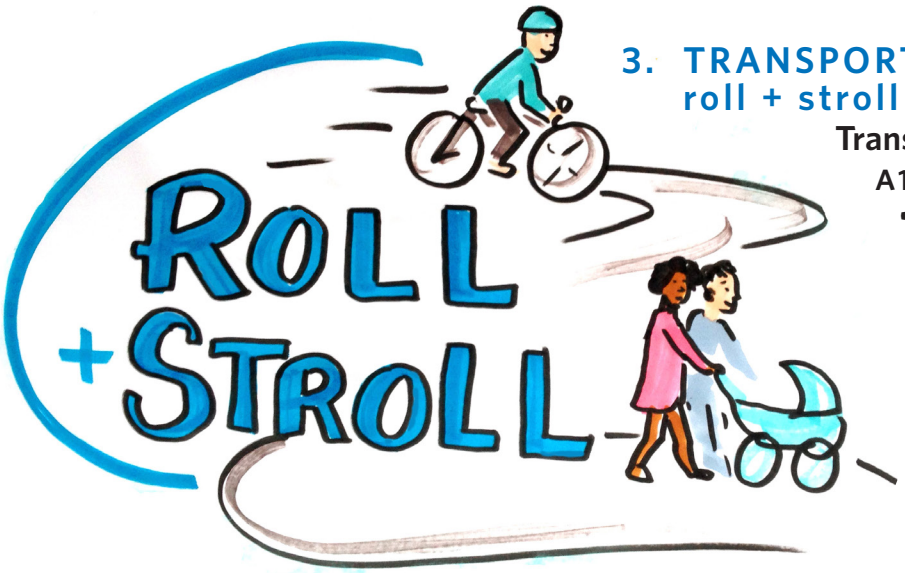
E1 DISTRICT UTILITY DEVELOPMENT

- enable distributed renewable heating systems in higher density new apartment and commercial neighbourhoods

Cross-cutting actions

F ADVANCED EFFICIENCY CAPACITY BUILDING

- strengthen capacity of District staff, builders and developers to meet and exceed BC Building Code, and advance retrofit, renovations and core community priorities.



3. TRANSPORTATION & LAND USE: roll + stroll

Transit diversification & expansion

A1 RAPID & EXPRESS TRANSIT

- attract high-quality, high-speed, high-frequency transit infrastructure and enable success with conducive land use, engineering and urban plans (Rapid Transit: Dundarave-Phibbs and enhanced Express Bus: Horseshoe Bay-Cypress Village-Park Royal-Downtown)

A2 BUS SERVICE EXTENSION

- enhance existing bus service and continue to extend into new neighbourhoods focusing on routes with higher resident, employee and student concentrations

A3 ELECTRIC PASSENGER FERRY

- facilitate electric passenger ferry service from West Vancouver to key Vancouver destinations

Complete Streets & Active Travel

B1 PEDESTRIAN INFRASTRUCTURE EXTENSION

- strengthen pedestrian infrastructure in and around walkable villages and micro markets and key destinations

B2 TRIPLE A AND DOUBLE B CYCLING INFRASTRUCTURE

- strengthen *all ages and abilities* and *better than basic* cycling infrastructure in and around and between walkable villages and micro markets and to key destinations (e.g. schools)

C COMMUNITY BIKE SHARE

- explore feasibility and impact of a community bike share, starting in the Ambleside, Dundarave, Park Royal corridor—explore collaboration with North Shore Municipalities and interaction with City of Vancouver

D SAFE ROUTES TO SCHOOLS, RECREATION & LEISURE

- expand the Safe Routes to School Program and extend it to community recreation and leisure programs and include ride sharing

Clean Cars & Smart Parking

E CAR & RIDE SHARING

- enable car sharing in walkable villages and eventually micro markets through parking allowances and collaborating with key institutional, commercial and large residential partners

F ELECTRIC VEHICLES & LOW EMISSION VEHICLES LEADERSHIP

- enable deep electric vehicle and low emission vehicle penetration through charging infrastructure policy and programs in new and existing buildings and collaboration with commercial/institutional partners

G SMART PARKING

- establish smart parking policies for on-street and off-street parking that optimize supply, constrain unnecessary car and congestion implications, and incentivize electric cars and low-emission cars.

4. SOLID WASTE & MATERIALS: trash + treasure

Smart goods & materials

A SMART GOODS & RESOURCE RECOVERY

- seek opportunities to advance community purchasing practices that reduce GHGs embedded in purchased goods and waste reduction, reuse and recycling to minimize raw resource inputs

B SUSTAINED SINGLE DETACHED LEADERSHIP

- sustain the District's single detached/semi-attached composting and recycling success

C APARTMENT & COMMERCIAL DIVERSION

- facilitate deeper composting and recycling diversion in multi-family and commercial sectors

D ZERO WASTE CONSTRUCTION & DECONSTRUCTION

- strengthen source separation in construction and deconstruction

Sharing economy

E THE SHARING COMMUNITY INITIATIVE

- facilitate shared economy activities that reduce carbon and material throughout the economy and advance community priorities.

5. CROSS CUTTING ACTION

CEE Plan resourcing

A CORPORATE-COMMUNITY CARBON NEUTRAL OFFSET FUND

- sustain the District's carbon neutral status by investing in community emission reduction projects that can be used to offset the Districts corporate carbon emissions

B COMMUNITY CLIMATE & ENERGY HUMAN RESOURCES

- seek external financing to support community energy planning HR support

C PLANNING & IMPLEMENTATION THIRD PARTY FINANCING

- secure external financing to support planning and implementation of community climate and energy priorities

Climate action mainstreaming

D CLIMATE & COMMUNITY STRATEGIC PLANNING LENS

- incorporation a strategic planning lens into key planning process to facilitate process towards deep reductions and community priorities

E CLIMATE ACTION MONITORING & CONTINUOUS IMPROVEMENT

- update the CEE Plan by 2025, renewing efforts and filling the gap between actions in this plan and its associated 50% emission reductions by 2050, and the official OCP 80% reduction target by 2050

F CEE PLAN UPDATE

- establish an ongoing process to continuously monitor, report and strengthen climate action planning and implementation

Engagement & outreach

G BUSINESS OF CLIMATE ACTION

- evaluate potential for a climate action program for local business institutions

H ULTRA-COOL NEIGHBOURHOOD PILOT

- explore viability of comprehensive cool neighbourhood pilot project that facilitates early and advanced climate action across all sectors (i.e. buildings, transportation, waste and material through rich engagement)

I SOCIAL MARKETING LEVERAGE

- integrate a social marketing dimension into major strategic directions to strengthen resonance and response

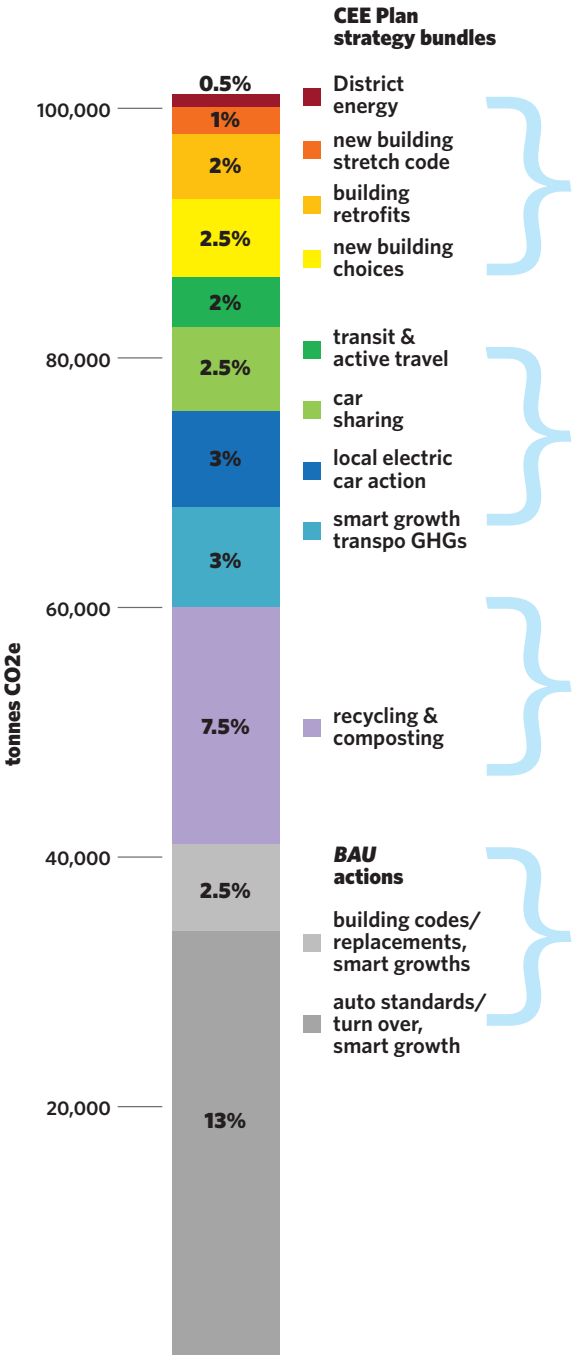
J COOL COMMUNITY LEADERS

- establish a community climate leaders award to promote and profile notable climate action by local residents and businesses.

4. GHG REDUCTIONS SUPPORTED BY THE PLAN

The plan's strategic directions support community GHG reductions of 40% below 2010 levels by 2040, which is an annual GHG reduction of 100,000 tonnes. GHGs in buildings are reduced by 6%, transportation by 10.5% and solid waste by 7.5%. *Business-As-Usual* (BAU) actions lead further reductions of 15.5%.

2040 CEE PLAN STRATEGY BUNDLE REDUCTION CONTRIBUTIONS



BUILDINGS: New District Energy systems (0.5%), building retrofits (2%), voluntarily adopting a provincial stretch code for new buildings (2%) and diversifying housing options across the District (2.5%) lead to 6% reductions cumulatively.

TRANSPORTATION: Increasing opportunities for transit and active travel (2%), supporting car share programs (2.5%), providing infrastructure for electric cars (3%) and putting people closer to services and transit (3%) lead to reductions of 10.5%.

SOLID WASTE: Deepening the District's organic diversion success reduces GHGs 7.5%.

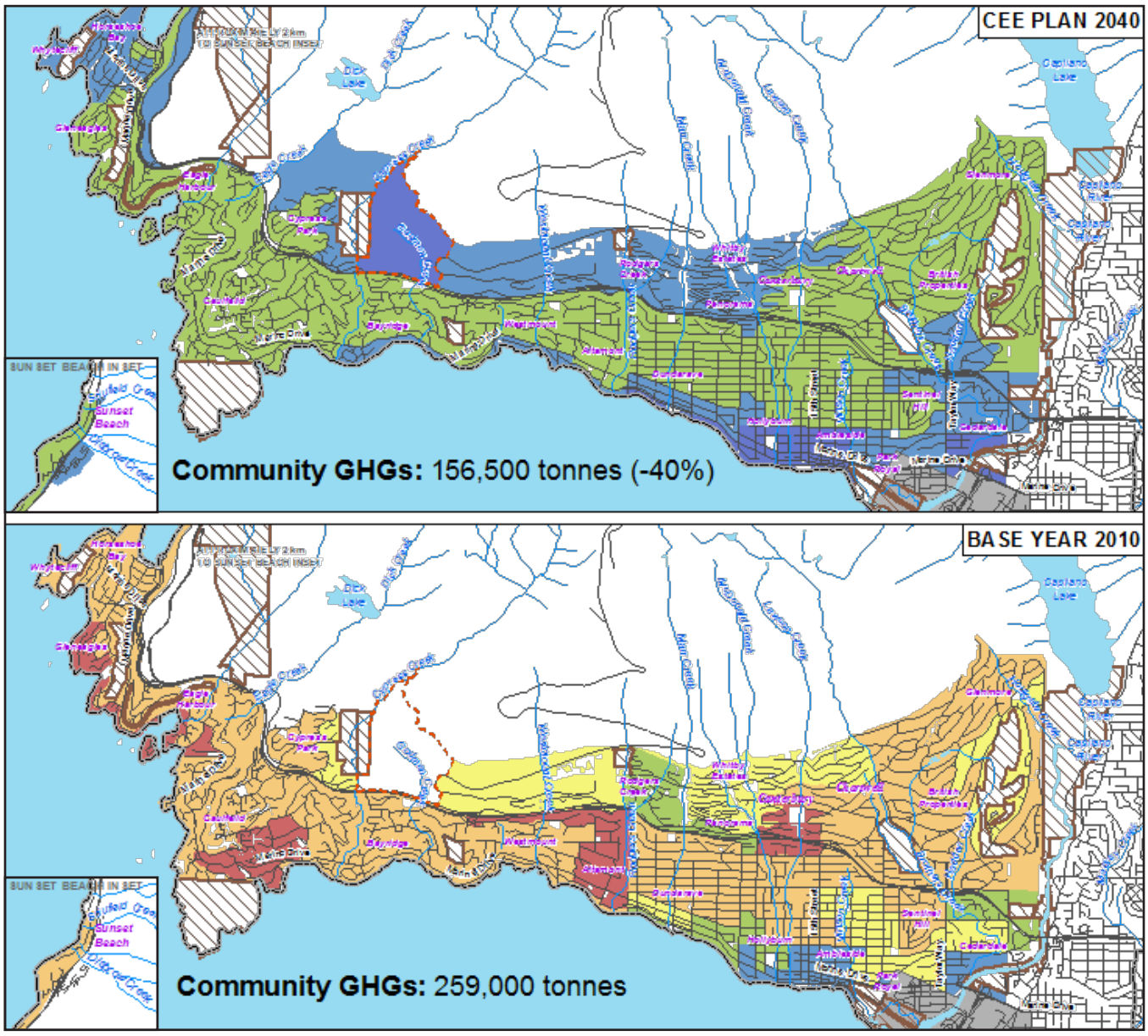
BUSINESS-AS-USUAL: BAU actions make a sizeable reduction contribution (15.5% collectively). Actions include current senior government commitments, notably improvements in vehicle efficiency, building codes, and BC Hydro grid decarbonization commitments. Local building and vehicle stock turnover realizes much of those GHG reductions, and smarter growth accrues a large share of building and transportation emission reductions.

It should be noted that land-use related actions (like the location and type of new housing) underpin the deepest reductions in both the Buildings and Transportation sectors.

This plan gets the District most of the way towards its official GHG reduction target of 80% reductions below 2007 emissions by 2050. This ambitious target continues to serve as a benchmark of the reductions necessary by all levels of government to avoid dangerous, run-away climate change. The District will identify further local actions as well as senior government efforts necessary to fill this gap in a future CEE Plan update.

MEASURING THE IMPACT OF THE PLAN: ANNUAL GHGs BY HOUSEHOLD BY NEIGHBOURHOOD CEE PLAN 2040 & BASE YEAR 2010

This map illustrates typical transportation and building GHGs per household for 2010 and 2040. Village areas have the lowest GHGs with more dwellings sharing walls, smaller floor areas and diverse travel options. GHG reduction options in residential areas include home renovations, retrofits and lot splitting that also create new housing options. Newer neighbourhoods with more energy efficient housing have lower GHGs. All neighbourhoods benefit from a shift towards electric vehicles.



LEGEND

AVERAGE YEARLY CO_2e PER HOUSEHOLD (TONNES)

- 2.2 - 4.0
- 4.1 - 8.0
- 8.1 - 12.0
- 12.1 - 16.0
- 16.1 - 20.0
- 20.1 - 25.0

FOR STRATEGIC PLANNING PURPOSES ONLY

0 1,000 2,000

1:50,000 METERS

- DISTRICT OF WEST VANCOUVER MUNICIPAL BOUNDARY
- Park Royal — NEIGHBOURHOOD NAME
- HIGHWAY
- ROAD
- WATERCOURSE
- WATERBODY
- SQUAMISH NATION TERRITORY (IR 5)
- PROPOSED CYPRESS VILLAGE CONCEPT AREA

NOTE(S)

THIS IS A COARSE PROJECTION INTENDED TO PROVIDE HIGH LEVEL PLANNING GUIDANCE VS DETAILED MANAGEMENT SUPPORT. SOME LOCATIONAL RESULTS MAY APPEAR TO BE MISLEADING IN THAT ONE PART OF A GEOGRAPHICAL AREA WILL SCORE EXCEPTIONALLY HIGH OR LOW, SKEWING THE AVERAGE FOR THAT GEOGRAPHICAL AREA. CYPRESS VILLAGE IS NOT SUFFICIENTLY PLANNED TO PERMIT ACCURATE SPATIAL ANALYSIS. HOUSEHOLDS ARE ESTIMATED TO EMIT 0-4.0 TONNES OF CO2E PER YEAR. SOURROUNDING AREAS MAY HAVE EMISSIONS APPEAR HIGHER DUE TO AVERAGING. PERSONAL EMISSIONS INCLUDE RESIDENTIAL BUILDINGS AND PERSONAL TRANSPORTATION.

REFERENCE(S)

1. ROADS, WATER FEATURES AND NAMED FEATURES OBTAINED FROM CANVEC© DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED.
2. MUNICIPAL BOUNDARIES OBTAINED BY BC MINISTRY OF FORESTS, LAND AND NATURAL RESOURCES OPERATIONS.
3. DATUM: NAD 83 PROJECTION: UTM ZONE 10

5. ADVANCING KEY COMMUNITY PRIORITIES

In addition to significant GHG reductions, the plan simultaneously advances multiple community priorities.

HOUSING DIVERSITY

+33%

Diverse mix of new town/row house, low, mid and high rise, for downsizers and young families [X]

FOREST PROTECTION

50 hectares

Avoid 50 hectares of forest loss, and 9,000 tonnes forest carbon emissions with smart growth [Y]

TRAFFIC

-30%

Reduce cars and total yearly community kilometres driven while improving access to all transportation choices [Y Z]

FREQUENT TRANSIT ACCESS

+100%

Double the share of population with access to transit operating every 15 minutes 7 a.m.–7 p.m. [X]

ALL AGES WALKING & CYCLING

20 km by 20 km by 2025

Extend sidewalks 20 km and ultra-safe bike routes 20 km by 2025 [X]

ACTIVE WALKER, HEALTHY WEIGHT RESIDENTS

+1300%

Increase share of residents in extremely walkable neighbourhoods with low obesity/overweight likelihood [X]

ENERGY SAVINGS

$2500/household/year

Reduce average household transportation and building energy spending 45% [X]

TRANSPORTATION SAVINGS

$3230/household/year

Reduce average household transportation spending 20% due to attractive transportation choices and reduced car ownership requirements [Z]

INFRASTRUCTURE SAVINGS

$500/household/year

Avoid $11.5 million annually in new infrastructure spending across the community ($500 per household) through smart growth [Y]

COMMUNITY SAVINGS & ECONOMIC DEVELOPMENT

$463.5 million

2010–2040 community savings on energy, transport & infrastructure, a high share would be respent regionally [X Y]

[X] *2040 performance relative to today* | [Y] *2040 performance relative to Business-As-Usual*

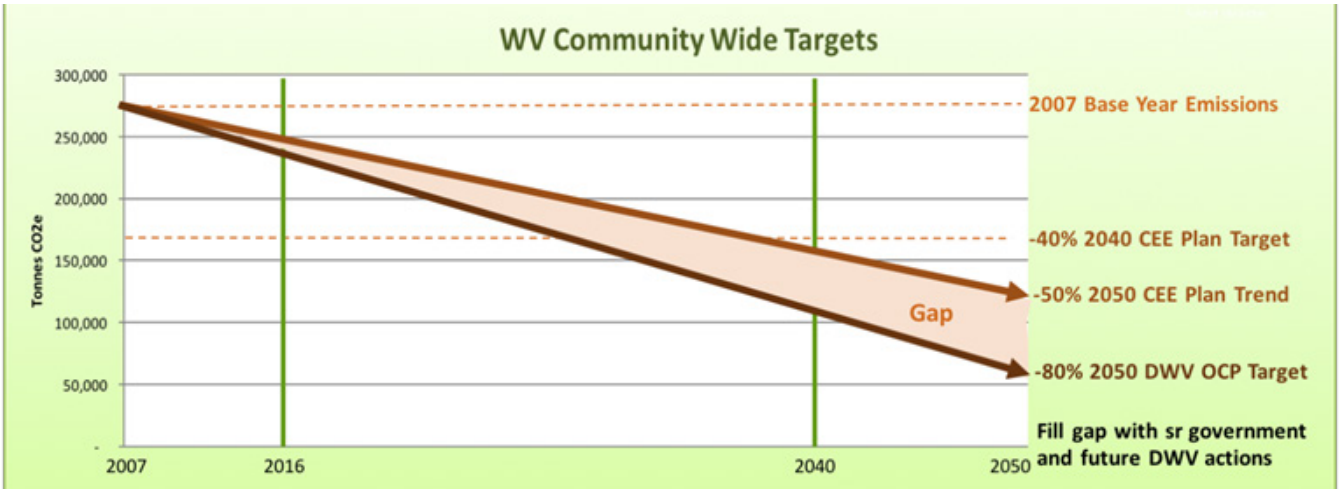
[Z] *Many households shed marginally used second cars in village areas where access to cars rises through car share which becomes extensively utilized. There is significant growth in active travel, transit and car share trips.*

6. WORKING GROUP RECOMMENDATIONS SUMMARY

This is a high level strategic plan. Achieving GHG reductions and other community benefits will require engagement with the community and integration into departments' work plans. It will involve collaboration and partnership with senior levels of government, utilities, the transit authority, other local governments, philanthropic organizations and local private, public and social sector organizations. It depends on active participation by local citizens and businesses. Many of these constituencies were consulted developing this plan. To this end, the working group recommends:

TARGETS + TIMETABLES

1. Adopt CEE Plan Community Target of 40% reductions by 2040 and demonstrate the District's commitment to climate action.
2. Confirm existing OCP long term target of 80% reductions by 2050 and create a window for additional actions governments may undertake, along with technological and socio-economic change considerations.



CONTINUOUS IMPROVEMENT

3. Establish a continuous improvement regime to monitor progress and strengthen and update policies and actions to extend potential emissions reductions towards the 80% target, including:
   - an annual climate action progress report to Council
   - a CEE Plan update by 2025
   - an investigation into the implementation and feasibility of the CEE Plan's "Big Ideas" such as energy efficiency tax shifting, home retrofit loans and levies, building scale utilities, and a carbon neutral reserve fund.
4. Work cross-departmentally to develop a strategic planning lens to help manage GHGs that can be incorporated into major district planning processes such as the annual budget and infrastructure plans.

LOCAL ACTION

5. Incorporate CEE Plan strategic directions into departmental work plans:

Planning & Development Services

a. Integrate energy and emission directions into major policy agendas, specifically:
   - Official Community Plan review
   - Built Form, Housing & Neighbourhood Character, with an emphasis on seniors and young people.

Engineering & Environment Services

b. Advance plans to implement infrastructure priorities to support active travel and public transit, taking advantage of senior government grants.

c. Extend policy and planning opportunities to advance car sharing and electric vehicles.

d. Maintain plans to increase waste diversion in the single family sector and extend as feasible this leadership to multi-family and commercial.

e. Initiate implementation planning on building energy conservation with an emphasis on residential building retrofit policy and program development and leveraging collaboration with key strategic partners, specifically:
   - negotiate with BC Hydro on human resource and implementation funding partnerships
   - engage local non-profit groups to deepen their residential retrofit program.

f. Integrate CEE Plan's cross cutting priorities into the department's long range plans.

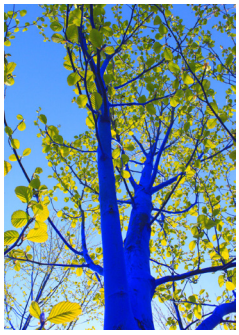
FINANCING

6. Prepare a report to Council on innovative financial tools that may be used to advance CEE Plan strategic directions and would be useful for integrating into advancing strategic directions in departmental work plans.

7. Prepare a proposal for the annual budget process that includes establishing a Climate Action Reserve Fund that can be used to sustain the District's corporate carbon neutral leadership, seeded by the annual Climate Action Revenue Incentive Program (CARIP) grant.

SENIOR GOVERNMENT ACTION

8. Write to key senior government ministers and elected officials to share the plan and underscore the need for collaboration to achieve shared goals for deep emission reductions, and to maximize co-benefits from climate action, notably:
   - All Ages Housing and Transportation
   - Public Health
   - Congestion Management
   - Prosperity.



Konstantin Dimopoulos | The Blue Trees | Vancouver Biennale 2015

"The Blue Trees" was an installation by Konstantin Dimopoulos in 14 locations around the world, including West Vancouver and Squamish First Nations Capilano Territory.

"The Blue Trees takes an urban landscape with which you are familiar and changes it for a brief period of time so that it becomes surreal, unfamiliar, even uncomfortable," Dimopoulos states. "We are creatures who like certainty and we become disconcerted when our environment changes. Yet we have altered and destroyed much of the global environment."

Dimopoulos is optimistic that his art generates discussion and inspires solutions.