



Ottawa Korean Church

One Planet Living® leadership review
January 2025



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Report overview

Report overview

Project name:

Ottawa Korean Church, Ottawa, Canada

Project type:

Real estate

Developer:

Windmill Developments

Description:

Ottawa Korean Church is located in Ottawa's West Centretown neighbourhood. In partnership with Ottawa Korean Community Church, Windmill will redevelop and densify the site, retaining the historic church façade along Arlington Avenue and Bell Street, with three- and six-storey apartments behind. Closer to the Queensway Highway, the project provides a 24-storey residential tower block. In total, the project will deliver 296 homes, a mixture of studios, one, two and three-bedroom apartments.

Ottawa Korean Church is part of the One Planet Living Real Estate Fund portfolio.

Reviewer:

Nicole Lazarus

Sign-off and quality review:

Sue Riddlestone

Date of review:

January 2025



Leadership status:



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Global
Leader 2025

Bioregional and One Planet Living

Bioregional and One Planet Living

About Bioregional

Bioregional is a registered charity, and purpose-led sustainability consultancy. It has worked in over 20 countries on sustainable development, working with local communities, cities, and companies.

Bioregional devised the One Planet Living framework in 2003 supported by WWF, based on our experiences creating the multi-award-winning BedZED in South London (pictured below), the UK's first large-scale sustainable community. One Planet Living has guided the development of real estate across the world, shaping exemplar communities that enable sustainable living.



About One Planet Living

One Planet Living is a vision of a world where everyone can live happily and healthily within the limits of our planet's resources while leaving sufficient space for nature to thrive.

We need to achieve this vision because if everyone lived like the average north American, we would need nearly five planets to support us. The measure of this is called 'ecological footprinting'. Meanwhile, many lack what they need for a good life, and wildlife is being pushed out to make room for our demands. Ecologists have calculated that we need to leave half the Earth for the rest of nature.

The One Planet Living framework consists of 10 principles which cover the activities that drive resource consumption, and the elements that form the basis of a good life for everyone. The principles are used to identify the needs in a local area, to relate these to the planetary bottom-line, and then to structure responses to those needs. One Planet Living is freely available through an open licence, and has been used on over \$30billion of real estate development globally.



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A framework
by Bioregional

| | |
|--|----------------------------|
| | Health and happiness |
| | Equity and local economy |
| | Culture and community |
| | Land and nature |
| | Sustainable water |
| | Local and sustainable food |
| | Travel and transport |
| | Materials and products |
| | Zero waste |
| | Zero carbon energy |

What is a One Planet Living leadership review?

What is a One Planet Living leadership review?

A review is when you open your One Planet Living action plan to scrutiny from a suitable qualified expert from Bioregional (or one appointed by Bioregional).

It will include:

- Reviewing the action plan as a whole and providing advice and suggestions on how it might be improved
- Evaluating it against several criteria including impact, systems change, ambition and delivery
- Assessing the action plan against the One Planet Living goals and guidance and local industry best practice.
- You can then discuss whether your action plan could be a candidate for leadership recognition.



About this leadership review

About this leadership review

This document reviews the Ottawa Korean Church One Planet Living Action Plan (OPAP) along with supplementary documents including:

- Drawings and landscape plans
- Energy Modelling Report
- Windmill Impact Standard - Project Tracker
- Windmill's emerging strategy for Community Benefits, One Planet Lifestyles and post-occupancy monitoring
- Windmill's Design and Contractor Guidelines
- Windmill's One Planet Living Carbon Specification
- Ottawa Korean Church Landscape Design Brief

Windmill has established a One Planet Living (OPL) Lifestyles Working Group to identify a strategy to provide post-occupancy support for all developments in the OPL Fund portfolio, including Ottawa Korean Church. The work of this group is underway with a strategy already presented in February 2024. The strategy includes:

- the use of a website or resident portal to provide information for all incoming residents, including resources to facilitate sustainable behaviour
- plans for incorporating OPL approaches into the governance arrangements of each scheme where possible, i.e., through the future Condo Board
- incentives such as introductory subscriptions to sustainable food providers, mobility providers, and / or public transport passes
- plans for post-occupancy monitoring and resident surveys
- an eco-concierge service to support active engagement with residents.

For the purposes of this review, details of the OPL Lifestyle package are listed as opportunities for future editions of the OPAP.

Review summary and highlights

Review summary

Ottawa Korean Church provides high quality urban densification in the right place with excellent transit links. The ambitions in the action plan are comprehensive, with robust KPIs across all 10 principles.

As part of the One Planet Living Fund portfolio, Ottawa Korean Church continues the process of making aspirational One Planet Living a standard and consistent way of delivering communities.

Design stage and construction stage measures are well addressed in the documents provided. The upcoming OPL Lifestyles and Community Benefit support packages will also be important.

The outcome of this review is to recognise Ottawa Korean Church as a One Planet Living Global Leader 2025.



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Project highlights

1. Ottawa Korean Church is in an excellent location, contributing to high density urban renewal, with excellent transit and active travel provision.
 2. Ottawa Korean Church is designed to achieve LEED Platinum and is aligned with the Ottawa High Performance Design Standard Tier 2. It will be net-zero carbon with no combustion on site, excellent building fabric, geothermal energy supply and excellent water efficiency measures.
 3. This redevelopment project helps to secure the long-term financial viability of the Ottawa Korean Community Church, allowing them to build a new, modern facility suited to their growing congregation.
 4. Ottawa Korean Church will offer residents great quality of life features including thermal comfort, exposed wood surfaces and use of high-quality outdoor roof and balcony spaces.
 5. Windmill are seeking funding to provide at least 10% affordable homes.
 6. Despite the high density, Ottawa Korean Church will provide 30% nature friendly landscaping space, with best practice in native planting, bird-safe design, and non-toxic pest control.
 7. An Ottawa Korean Church Community Benefits Plan is currently being developed. It includes a flexible hiring system to benefit equity seeking groups and social purpose enterprises. It will also include apprenticeship opportunities for equity-seeking groups. The project is targeting 20% of construction jobs being filled from equity-seeking groups.
7. Windmill are considering a rental model for this development and this would mean a long-term ongoing presence at Ottawa Korean Church. Post-occupancy engagement and performance tracking would then become possible. Windmill is addressing these whole life considerations at a group-wide level, with an intention to develop:
 - a. One Planet Lifestyles package,
 - b. A post-occupancy monitoring plan and resident survey monitoring for energy and water, travel habits and possibly greenhouse gas (GHG) savings due to more plant-based diets. The length of this engagement is under consideration, and may differ between rental and condo, where the opportunities for monitoring may be limited to one year.

When these measures are in place, and if post-occupancy monitoring can be extended beyond one year, this will demonstrate exemplary post-occupancy commitment for schemes of this scale.

Suggestions

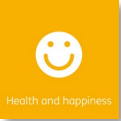




1. All of the post-occupancy opportunities that the rental model opens up should be reviewed if this new business model is adopted.
2. Due to climate change, all locations are expected to face an increase in extreme weather events, from thermal extremes to storms and flooding events. It is not clear from the information provided that Ottawa Korean Church has been designed and modelled using weather data from these extreme but increasingly likely forecasts. There is an opportunity for this during detailed design.
3. Details of how the small quantity of residual carbon emissions will be offset to fully achieve the net-zero carbon ambition. This could be through a local photovoltaic (PV) or retrofit project, perhaps enhancing the Community Benefits package e.g., PV panels on a local school or social housing scheme.
4. Resident surveys should include questions on travel modes to understand how effective the measures have been and ideally to assess modal share.
5. There is an opportunity for Windmill and its appointed contractor to identify health and wellbeing measures for construction staff beyond good indoor air quality.

Action plan summary

Action plan summary

Bioregional uses a simple red/amber/green traffic-light approach to indicate how well the action plan addresses the One Planet Living principle and their goals. More detailed comments and recommendations are in the ‘detailed review’ section.






- 5 Well addressed
- 4 Well addressed but additional suggestions provided
- 3 Partly addressed but additional content needed
- 2 Not adequately addressed
- 1 Not addressed

| | Comment | RAG rating |
|--|--|---|
|  | Well-structured resident surveys for at least one year comparing health and wellbeing indicators with local baselines. Active travel provision is excellent. Thermal comfort, healthy materials, and exposed timber surfaces. Use of private and shared outdoor spaces. | 5 |
|  | The project is exploring CMHC financing to provide some 10% affordable housing units. The project is also considering a rental model due to market conditions. The action plan targets 20% of construction jobs being filled by members of equity-seeking groups. The full Ottawa Korean Church Community Benefits Plan is currently under development. | 4 |
|  | Redevelopment of the existing church will help finance construction of a new church, suitable for their growing congregation. Meanwhile the existing church façade will be retained and restored. Indigenous art that also celebrates cycling culture has been commissioned. Plans are being developed to actively engage with residents to nurture a culture of sustainability. | 5 |
|  | Despite the high density design, the landscape strategy uses the streetscape and the roof top amenity space to transform a lifeless, tarmac-covered site into a creative rich haven for both people and nature. Packed with native hardy, drought-tolerant plant species, micro-habitats providing food for pollinators and birds. | 5 |
|  | Excellent water efficient specification with zero mains water for irrigation. There is an intention to monitor site-wide water use and to feedback to residents. Stormwater runoff to be reduced by half. Water quality will be protected through removal of suspended solids from run-off leaving the site. Stormwater runoff will be reduced by half but it is not clear if future extreme rainfall events have been considered. | 4 |

Action plan summary

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| | Comment | RAG rating |
|--|---|------------|
|  | Residents will be provided with information materials to promote plant-based diets, and to reduce emissions associated with high-carbon diets. The action plan aims to track reductions in meat and dairy consumption using post-occupancy surveys, targeting a 25% reduction. Space will be designed in for box scheme deliveries and segregated organic waste collection. | 4 |
|  | Excellent location for minimising car dependency, with convenient access to bus, light rail, active travel, and all service needs. Car parking <0.5 spaces per dwelling with ample EV charging. Walkscore.com gives ratings of 79 for walkability, a cycling score of 91 and transit score of 70. | 5 |
|  | Ottawa Korean Church will be of concrete construction, targeting upfront embodied carbon of <420kgCO ₂ /m ² and exploring prefabrication options and lower emission concrete. Specifications include local sourcing, responsible extraction and environmental product declarations. The specification requires no added urea formaldehyde. The OPL Lifestyle package will encourage low impact resident consumption habits. | 5 |
|  | Targeting >90% construction and demolition waste diversion. Design includes space for communal recycling and bulky waste item collection areas, special collection areas e.g., batteries, and waste segregation in each dwelling. Windmill is currently developing a methodology for monitoring resident waste., targeting a 25% reduction against local baseline. | 5 |
|  | Good building fabric specification with Thermal Energy Demand Intensity modelled at 33kWh/m ² .and Energy Use Intensity at 105kWh/m ² . Space heating and cooling utilise ground source heat pumps. Waste heat will be recovered to meet domestic hot water demands. Windmill envisages post-occupancy energy monitoring for at least one year. Clean grid electricity results in a small residual GHG intensity of 3.2kgCO ₂ /m ² , to be offset in line with Canada Green Building Council (CaGBC) standards. | 5 |

Overall leadership qualities

Overall leadership qualities

| | Highlights | Opportunities |
|-----------------------|---|---|
| Scope | <p>The action plan addresses, or has work in progress to address, all 10 principles. It considers all the direct impacts and opportunities associated with delivering the development and most indirect impacts.</p> <p>The plan targets design, construction, operation and, where possible, future resident behaviour, and even marketing/sales processes.</p> <p>The action plan contains an excellent context analysis which sets the scene for all of the proposed strategies.</p> | <p>The project is considering a rental model for this development which presents many exciting opportunities for maintaining the OPL approach after residents move in.</p> <p>A long-term rental operator has the opportunity to maintain a relationship with the condo board and to pro-actively monitor and track the success of the scheme against the ambitions of the One Planet Living Action Plan. This will provide precious learning to inform:</p> <ul style="list-style-type: none"> • Ongoing management strategies • Feedback to residents • Future One Planet Living Fund schemes • And dissemination to the wider industry. <p>All of the opportunities that the rental model opens up should be reviewed if this new business model is adopted.</p> |
| Transformation | <p>As part of the OPL Fund portfolio, Ottawa Korean Church continues to deliver industry leadership in many ways. It has an impressive approach to standardising high performance One Planet Living solutions, delivering some of the first zero-carbon, LEED Platinum-certified multi-family developments in Eastern Canada.</p> | <p>The upcoming OPL Lifestyle package has the exciting potential to show innovative leadership in post-occupancy follow up, especially if the project adopts a rental model in partnership with a long-term operator.</p> |

Overall leadership qualities

| | Highlights | Opportunities |
|----------------|---|---------------|
| Ambition | The outcomes are comprehensive, and their level of ambition aligns with the goals in the OPL framework. The outcomes are particularly well crafted for the context, with topic areas to illuminate the intentions of the outcomes. Each outcome is accompanied by at least one indicator with ambitious targets set. Ottawa Korean Church is designed to meet LEED Platinum and is aligned with the Ottawa High Performance Design Standard Tier 2. | |
| Implementation | Windmill and their team have a proven track record of delivering exemplary projects. The ambitious targets are matched with realistic design specifications and strategies for delivery. | |

Detailed review



Outcomes:

- Residents are among the most physically active in Canada
- Residents are among the happiest in Canada
- Indoor and outdoor spaces are healthy, welcoming and comfortable

| Topic | Highlights | Opportunities |
|--|--|--|
| Physical health Happiness and wellbeing | <p>Post-occupancy resident surveys will ask standardised questions on self-reported health and happiness. The project aspires to score much better than the Ottawa baseline.</p> <p>The project provides excellent active travel provisions (See Travel and transport below).</p> <p>The resident survey will ask about residents’ physical activity and aspires to a 20% improvement on the Ottawa baseline of 150 minutes-per-week.</p> <p>The project will make use of biophilic design principles as a requirement in the design guidelines.</p> <p>The project specifies 95% low volatile organic compound (VOC) building products.</p> <p>To maintain thermal comfort, the buildings are designed to remain below 26°C in summer conditions. Passive features that will help achieve this include excellent building fabric standards, a window to wall ratio of <30%, and thermally efficient glazing. Active cooling will then be provided from the ground source heat pump system.</p> | <p>Identify more health and well-being measures for construction staff when contractors are appointed.</p> |

Continued overleaf

| Topic | Highlights | Opportunities |
|--|--|---------------|
| Physical health | For resiliency, a refuge area is provided. Daylight modelling ensures good lighting levels and anti glare measures are used. | |
| Happiness and wellbeing (continued) | All dwellings will have good views and many will have private outdoor balconies or terraces. And all residents will have access to a shared rooftop terrace. In order to protect the health and wellbeing of construction workers, dust management, good ventilation and low emitting materials will ensure good construction stage indoor air quality. | |



Equity and
local economy

Outcomes:

- Affordable and accessible options are available to all
- Economic development opportunities are available to equity-seeking groups
- Residents and contractors engage in environmentally and socially responsible procurement practices

| Topic | Highlights | Opportunities |
|---------------------------------------|---|--|
| Diversity and equality of opportunity | <p>This redevelopment project helps to secure the long-term financial viability of the Ottawa Korean Church. It will allow them to build a new facility to meet their needs.</p> <p>Ottawa Korean Church will include at least 15% accessible homes to meet the Ontario Building Code.</p> <p>An Ottawa Korean Church Community Benefits Plan is currently being developed. It includes a flexible hiring system to benefit equity seeking groups and social purpose enterprises. It will also include apprenticeship opportunities for equity-seeking groups. The project is targeting 20% of construction jobs being filled from equity-seeking groups.</p> | <p>The team is currently exploring opportunities to deliver some or all of the homes through Canada Mortgage and Housing Corporation (CMHC) affordable housing fund. If this programme is deemed viable, then the project will be able to have at least 10% affordable homes. The project is also considering a rental model due to market conditions.</p> <p>The Community Benefits Plan currently being developed will identify what equity-seeking groups will be targeted for social hiring.</p> |
| Vibrant local economy | <p>Post-occupancy resident surveys will ask questions on how many residents regularly shop locally, targeting >75%, a better score than the Ottawa baseline of 66%.</p> | <p>The OPL lifestyle package can promote local sustainable businesses and service providers to residents.</p> |
| Fair international trade | | <p>The OPL lifestyle package can potentially address this.</p> |



Culture and
community

Outcomes:

- There is a culture of sustainability that is rooted in indigenous traditional knowledge and wisdom
- The design embodies indigenous oral history to reveal its local narratives
- All residents feel a sense of belonging, regardless of physical ability, ethnic identity, age or economic means

| Topic | Highlights | Opportunities |
|--|---|---|
| Sense of place and belonging | <p>The project has commissioned an indigenous designed “thunderbird” bike parking rack, symbolizing power, protection and strength and a vibrant mural will tell the story of the thunderbird’s significance to the Ojibwe Peoples.</p> <p>The project includes thoughtfully designed shared amenity spaces both indoors and on roof terraces. The 7th floor amenity space will include a green roof community garden with a barbeque, outdoor sink, and benches arranged in a welcoming geometric pattern.</p> | |
| Local culture and heritage | <p>The sale and redevelopment of the existing Korean Church property will contribute to the construction of a new church, addressing the needs of their growing congregation and nurturing that cultural community. Meanwhile the existing church façade will be retained and restored.</p> | <p>A Ottawa Korean Church Community Benefits Plan is currently being developed.</p> |
| Active citizenship and sustainability culture | <p>Provide educational materials to residents to explain the projects’ sustainable features and local history. Actively engage with residents through an Eco-Concierge program to nurture a culture of sustainability that values environmental and social advocacy, participation and volunteerism.</p> | |



Land and nature

Outcomes:

- The natural cycles and resource flows of the local ecosystems are respected and regenerated
- Connections to the surrounding natural beauty and landscape create a love of nature

| Topic | Highlights | Opportunities |
|---|---|--|
| Positive contribution to local biodiversity Enhance ecosystem services | <p>The site is currently buildings and car park. Apart from two small trees, there is currently no greenspace or biodiversity value.</p> <p>The landscape architect has shared an excellent and creative biodiversity strategy that makes maximum use of the new planting opportunities along the street and in the roof garden amenity.</p> <p>It uses native plants to offer seasonal interest and provide pollinator food and habitat. Plants vary in bloom times, colour, and height, and are drought tolerant and hardy.</p> <p>The building specification incorporates lots of best practice details such as green roofs, bird-safe design, dark sky compliance, heat island reductions and non-toxic pest control.</p> <p>The streetscape will be enhanced with trees, plants and vine-covered privacy screens are used.</p> | |
| Engage people in the value of nature | <p>Every dwelling will have unobstructed, quality views outdoors.</p> <p>Ottawa Korean Church is within walking distance of an excellent selection of natural areas including the Ottawa River, Dominion Arboretum and Fletcher Wildlife Garden.</p> | <p>Elements of biophilic design are specified in the design brief but will not be finalised until detailed design is complete.</p> |



Outcomes:

- The residents use less potable water
- Groundwater and surface water are protected

| Topic | Highlights | Opportunities |
|----------------------------|---|---|
| Water efficiency | <p>Water efficiency measures are excellent, with low flow/flush fixtures and fittings. The project is targeting 98 litres per person per day mains water consumption, less than half the local baseline.</p> <p>Outdoor water needs will be minimised through native and adapted planting and minimal turf grass. No potable water will be used for irrigation.</p> <p>Water meters and sub-meters will provide an opportunity to track water consumption and to feedback to residents.</p> | <p>The upcoming OPL Lifestyle pack could provide information on water saving behaviours and steps residents can take to prevent water pollution.</p> |
| Surface water management | <p>Rainwater will be retained and stored in an underground cistern, for use in irrigation. This reduces stormwater runoff by half and reduces the flood risks for the site and the surrounding neighbourhood.</p> <p>The project follows Ottawa’s Wet Weather Flow Management Guidelines to reduce the quantity and improve the quality of stormwater runoff.</p> <p>Water quality will be protected through long-term removal of total suspended solids from run-off leaving the site.</p> | <p>Given the flood risks along the Ottawa river, it is not clear to what degree the Wet Weather Flow Management Guidelines address future climate scenarios and future extreme rainfall events.</p> |
| Runoff during construction | <p>An Erosion and Sedimentation Control plan is specified.</p> | |



Outcomes:

- Residents and visitors have access to affordable, healthy, local food
- The carbon footprint associated with food is minimised
- Community spirit is fostered through food

| Topic | Highlights | Opportunities |
|---|--|--|
| Fresh, local, seasonal, healthy produce Diets high in vegetable protein Promote sustainable, humane farming Eliminate food waste | <p>The upcoming OPL Lifestyle package will provide education materials to promote plant-based diet, and reduce emissions associated with high-carbon diets.</p> <p>There is an intention to track any reduction in meat and dairy consumption using post-occupancy surveys and targeting a 25% reduction.</p> <p>A municipal segregated organic waste collection service will be provided.</p> | <p>The project will consult with incoming residents to identify the most appropriate sustainable food initiative. This might include facilitating Community Supported Agriculture (CSA) pickups, a local organic box scheme or a community garden.</p> <p>The upcoming OPL Lifestyle package has the opportunity to address sustainable food choices, reducing food waste and provide ideas for food-based community activities.</p> |



Travel and transport

Outcomes:

- Low-carbon transportation options are the primary means of transport for residents
- Parking infrastructure is adaptable and flexible for future re-use and growth

| Topic | Highlights | Opportunities |
|--|--|--|
| Reduce car dependence and the need to travel Promote walking and cycling Promote car-sharing and public transport | <p>Ottawa Korean Church is just a 12-minute walk from the Corso Italia light rail transit (LRT) station and just a 5-minute walk from multiple, well-served bus stops.</p> <p>The site is situated in an area of quiet streets, very walkable and cycle-friendly. It has a walkscore rating of 79 (very walkable), a cycling score of 91 (biker's paradise) and a transit score of 70 (excellent transit).</p> <p>The project is within walking distance of several culturally significant neighbourhoods with restaurants, cafes, bars, grocery stores, schools and everyday amenities.</p> <p>Natural amenities include numerous parks, recreation centre's, Dow's Lake and Ottawa River front.</p> <p>The buildings will have ample well-designed secure cycle parking, at least 1 per dwelling, and e-bike chargers. Space will be provided for other micro-mobility devices such as scooters.</p> | <p>Resident surveys should include questions on travel modes to understand how effective the measures have been and ideally to assess modal share.</p> <p>The upcoming OPL Lifestyle pack can provide information and incentivise residents on active and low carbon travel choices.</p> |

Continued overleaf

| Topic | Highlights | Opportunities |
|---|---|--|
| Promote low/zero carbon vehicles | <p>Parking provision <0.5 spaces per dwelling. 100% of parking spaces will be EV ready, with 25% fitted with level 2 chargers.</p> <p>The project is also considering transit subsidies for residents and a car share programme.</p> <p>Contractors will have a voluntary requirement to reduce and track transport-related emissions.</p> | |
| Raise awareness of the impacts of, and promote alternatives to, air travel | | <p>The upcoming OPL Lifestyle package can share information on the impacts of flying and provide resources so residents can consider alternatives.</p> |



Outcomes:

- Embodied carbon is reduced
- Building materials are culturally appropriate and provide healthy indoor environment for all occupants
- Materials for building construction and operations are selected to minimise their lifecycle impact

| Topic | Highlights | Opportunities |
|---|--|--|
| Reduce consumption of materials and products | Durability of building components is maximised through good practice moisture control. | The upcoming OPL lifestyles package can highlight the impacts of material consumption habits and promote alternatives. |
| Choose materials and products with minimum impact | <p>The project is exploring lower emission concrete and use of bio-based materials. Its LEED-based design specification targets include:</p> <ul style="list-style-type: none">• embodied carbon of <420kgCO₂/m²,• local material where possible,• 25% responsible extraction criteria,• 25 products with environmental product declarations• 100% of timber products to be non-tropical, reused, reclaimed, FSC certified or USGBC-approved equivalent | The project team intend to include a survey question on whether residents purchase sustainable products, targeting 75%. This will raise awareness. |
| Nontoxic materials and products | The design specifies zero added urea formaldehyde. | |

Continued overleaf



Outcomes:

- Residents generate less waste
- The construction process generates less waste
- A sharing culture is developed and supported by residents

| Topic | Highlights | Opportunities |
|--|--|--|
| <div>Reduce wasteful consumption</div> <div>Upcycling, reuse and recycling</div> <div>Zero waste to landfill</div> | <p>The outcomes are good, covering both construction and occupation phase. They include the sharing culture and a topic area for circular economy.</p> <p>Targeting >90% construction and demolition waste diversion, with a construction and demolition waste management plan.</p> <p>Targeting a 25% reduction in residential waste against the local baseline, aiming for <255kg/person/year. Actions to achieve this target include:</p> <ul style="list-style-type: none">• good waste segregation facilities in each dwelling,• designing communal recycling facilities, bulky waste collection areas and space for a compactor unit,• additional storage and collection arrangements for batteries, mercury-containing lamps or electronic waste. | <p>The action plan doesn't currently mention encouraging a culture of upcycling and reuse, avoiding wasteful consumption. This is an opportunity for the upcoming OPL Lifestyles package.</p> <p>Windmill could establish a partnership with a local organisation to collect items for donation, as on other projects.</p> |



Outcomes:

- There are zero operational greenhouse gas emissions
- Renewable energy is generated on-site
- Building occupants enjoy superior indoor thermal comfort year-round

| Topic | Highlights | Opportunities |
|---|---|--|
| Energy efficient buildings 100% renewable energy | <p>The project is targeting zero carbon and will be combustion free in operation.</p> <p>The project targets LEED Platinum and aligns with the Ottawa High Performance Design Standard Tier 2. As such, measures include air tightness testing, tracking of energy and water consumption, a commissioning plan, smart metering and future climate resiliency planning.</p> <p>The project is targeting a 45% energy demand reduction compared with the baseline.</p> <p>Limits have been set on Global Warming Potential (GWP) and Ozone Depletion Potential (ODP).</p> <p>The project will use geothermal energy via ground source heat pumps for space heating, cooling and for domestic hot water.</p> <p>The design includes electric backup for domestic hot water and 95% efficiency backup boiler.</p> | <p>Passive measures to minimise cooling needs, such as external shading have not been used.</p> <p>It is not clear if weather data from future climate scenarios has been used in the modelling for thermal comfort. Future heat waves or cold spells could result in higher energy demands than predicted and opportunities for more passive measures to prevent this may have been missed.</p> <p>The specific method for offsetting the residual carbon emissions is yet to be specified.</p> |

Continued overleaf

| Topic | Highlights | Opportunities |
|---|---|---------------|
| Energy efficient buildings 100% renewable energy <i>(continued)</i> | <p>Performance modelling indicates:</p> <ul style="list-style-type: none"> • Thermal Energy Demand Intensity target 33kWh/m²/yr • Total Energy Use Intensity target 105kWh/m²/yr • Greenhouse Gas Intensity target 3.2kgCO₂/m²/yr • Heat pump coefficients of performance 3.2 (heat) and 4.1 (cooling). <p>This electrical demand will be supplied by Ottawa Hydro, generated almost entirely from hydro, nuclear and renewables with gas used for peak loads. Its carbon intensity is very low at ~35gCO₂/kWh and will result in a GHG intensity of just 3.1kgCO₂/m².</p> <p>These residual carbon emissions will be offset in compliance with the CaGBC and OPL Zero Carbon Standards.</p> | |

Images courtesy of Windmill Developments

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