Ontario

Accessory Dwelling Unit 1

The results presented on this page are based on a prototypical design which targets NBC 2020 - Tier 3 energy performance, and have assumed a project location and orientation for energy modelling and material specifications for embodied carbon modelling. Results will vary based on final location, mechanical systems, envelope assemblies, and material selections. See page 2 for definitions and more information on modelling assumptions.

Location & Climate Zone

Toronto, ON 5

Floor Area

Gross (m2)	59
Conditioned (m2)	49

Building Breakdown

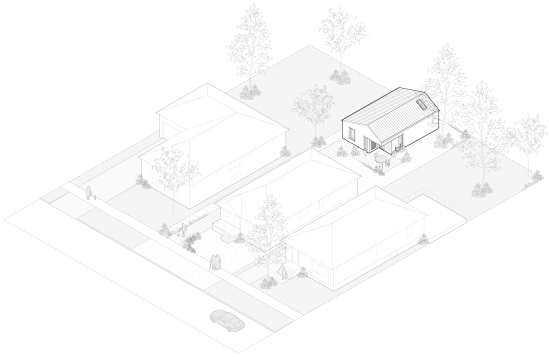
1 Storey, 1 Unit

HVAC System

Main	Natural Gas Fired Furnace
Supplementary	n/a

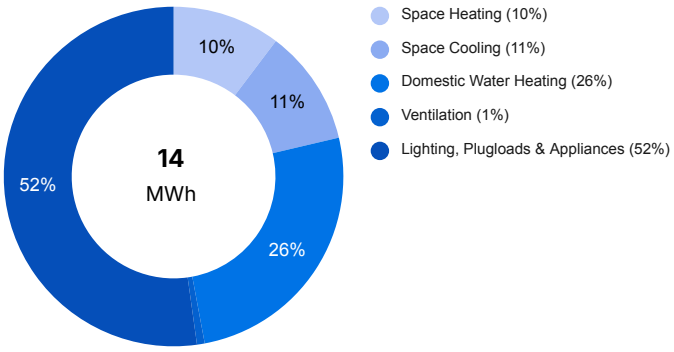
Thermal Performance (Nominal)

		Metric	Imperial
Roof	RSI/R-value	6.0	34
Floor	RSI/R-value	1.8	10
Wall	RSI/R-value	6.0	34
Door	RSI/R-value	0.9	5
Window	U-value	2.0	0.35



An aerial view of the building on its site, showing its surrounding and context. Models assume east facing to street.

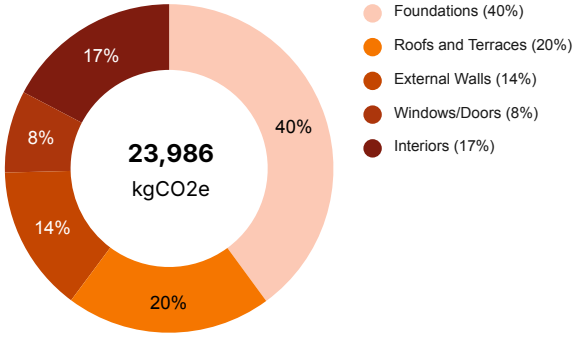
Operational Energy



Total Energy (MWh/year)	14
Energy from Electricity (MWh/year)	12
Energy from Natural Gas (MWh/year)	1

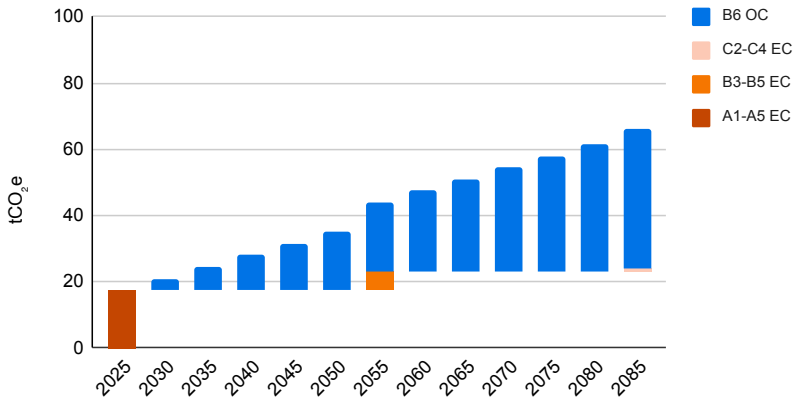
Embodied Carbon

A1-A5, B4-B5, C2-C4



Total EC Emissions ($kgCO_2e$)	23,986
EC/ GFA ($kgCO_2e/m^2$)	410
Biogenic Carbon ($kgCO_2e$)	8,456

Whole Life Carbon (WLC)



WLC over 60 years

Cumulative Carbon Emissions (tCO2e)	66

B6 Operational Carbon (OC) **64%**

OC Emissions per Annum (tCO_2e/year)	1
Cumulative OC Emissions (tCO_2e)	42

Embodied Carbon (EC) **36%**

A1-A5 EC Emissions (tCO_2e)	18
B4-B5 EC Emissions (tCO_2e)	5
C2-C4 EC Emissions (tCO_2e)	1
Cumulative EC Emissions (tCO_2e)	24

Definitions & Assumptions

Building Information

Location & Climate Zone
The specific location (city/town and province/territory) and climate zone assumed for the purposes of energy modelling and material transport distances.

Floor Area
Floor area accounted for in embodied carbon assessment (gross floor area). Energy modelling uses modelled floor area, heated floor area, or conditioned floor area, which is defined in code per applicable energy code compliance path.

Thermal Performance
A material or assembly's ability to resist heat flow, impacting energy efficiency and occupant comfort in buildings. Average nominal thermal performance metrics for roof, wall, floor, soffit, and door assemblies are given in metric ($m^2 \cdot k/W$) and imperial ($ft^2 \cdot °F \cdot h/BTU$) units. Window U-values are also provided in metric ($W/m^2 \cdot k$) and imperial ($BTU/(h \cdot ft^2 \cdot °F)$. These may differ slightly from values shown in detailed architectural drawings.

HVAC System
Heating, Ventilation, and Air Conditioning are mechanical systems that regulate indoor temperature, humidity, and air quality to maintain thermal comfort and efficiency in buildings. It includes components for heating (e.g., furnaces, boilers, heat pumps), cooling (e.g., air conditioners, heat pumps), ventilation (e.g., fans, air exchangers), and air filtration.

Operational Energy

Energy modelling targets Tier 3 energy performance as defined in NBC 2020 Section 9.36, with an assumed airtightness of 2.5 ACH (NBC 9.36.5.10). Envelope performance values align with typical assemblies, and mechanical systems reflect the base specifications in the prototypical mechanical drawings. Results presented are based on a prototypical design with representative assumptions for location, climate zone, orientation, occupancy, service loads, mechanical systems, and building assemblies. Refer to the HOT2000 Energy Model Template File provided as part of the design package for full modelling inputs.

Total Energy
Total Energy refers to the total amount of energy consumption over one year, measured in megawatt-hours (MWh). One MWh represents one megawatt of power sustained for one hour.

Energy from Electricity
Energy from Electricity refers to the total amount of electricity consumption over one year, measured in megawatt-hours (MWh). One MWh represents one megawatt of power sustained for one hour.

Energy Natural Gas
Energy from Natural Gas refers to the total amount of natural gas consumption over one year, measured in megawatt-hours (MWh). One MWh represents one megawatt of power sustained for one hour.

Operational Carbon (OC)
B6 OC
B6 Operational Carbon (OC) refers to the quantity of greenhouse gas emissions associated with the energy consumption of the building, measured in tonnes of carbon dioxide equivalent (tCO_2e). The operational carbon emissions have been calculated based on 2025 emissions factors for natural gas and grid electricity generation for each region, available on the Government of Canada website. OC Emissions per Annum (tCO_2e/year) refers to operational carbon emissions per year, whereas the Cumulative OC Emissions (tCO_2e) refers to the total carbon emissions over the building's lifetime (assumed to be 60 years).

Embodied Carbon (EC)

Embodied carbon modelling follows National Research Council guidance on life cycle assessment. Results are based on assemblies in the architectural drawings, using industry-average emissions factors, regional assumptions for transport and end-of-life, and material lifespans from Environmental Product Declarations and Carbon Leadership Forum data. Assemblies modelled are based on assumptions for regionally typical materials, inclusive of the following selections:
Roofing: Steel | Cladding: Wood, Steel | Rigid Insulation: XPS | Semi-Rigid Insulation: Mineral Wool | Batt Insulation: Fibreglass

Total EC Emissions
Embodied Carbon (EC) Emissions refer to the material emissions associated with all reported stages of the carbon life cycle, and includes material components of structure, building envelope, and interiors and finishes. These are reported in both $kgCO_2e$ and tCO_2e (to convert: divide the $kgCO_2e$ value by 1000 to arrive at tCO_2e).

EC/ GFA
Embodied Carbon Intensity Per Square Metre ($kgCO_2e/m^2$) is total embodied carbon emissions divided by the gross floor area of a building. Emissions per square metre of GFA allows for comparing buildings of different sizes.en

Biogenic Carbon
Biogenic Carbon is the carbon that is sequestered and stored in biological materials, such as trees, plants, or soil. Carbon accumulates in plants through the process of photosynthesis, and becomes sequestered when that plant is felled. It is reported in $kgCO_2e$.

Embodied Carbon Stages
A1-A5 EC
B3-B5 EC
C1-C4 EC
A1-A5 EC refers to the embodied carbon emissions associated with the extraction, manufacture and transport of building materials and construction phases before the building, landscape, or infrastructure begins to be used. **B3-B5 EC** refers to the embodied carbon emissions associated with the repair, replacement, and refubishment of building materials. This includes any recurring emissions from multiple replacement cycles across the building's lifetime. **C1-C4 EC** refers to the embodied carbon emissions associated with the building's end of life, including deconstruction, demolition, transportation, waste processing, and disposal.

Whole Life Carbon
Whole Life Carbon (WLC) refers to the total carbon emissions associated with a building, infrastructure, or product over its entire lifecycle. This includes emissions from material extraction, manufacturing, construction, operation, maintenance, and end-of-life disposal or recycling, and equates to the sum of cumulative OC and cumulative EC. This excludes embodied carbon emissions associated with Mechanical, Electrical, Plumbing (MEP) systems and projected refrigerant leakage.

The results in this report were prepared by Ha/f Climate Design, with support from Acorn Sustainability Consulting and CarbonWise.