



CUSP

canadian urban
sustainability practitioners

The Energy Poverty and Equity Explorer: Technical User Guide

The [Canadian Urban Sustainability Practitioners'](#) (CUSP) Energy Poverty and Equity Explorer maps a set of indicators to help inform policy and programs concerned with home energy cost burden, efficiency and clean energy transition.

This mapping tool was developed by CUSP with design and technical support from the [Community Data Program](#) team and customized data sets ordered from and created by Statistics Canada. This tool was developed with funding from the Municipal Climate Innovation Program of the Federation of Canadian Municipalities (FCM)¹ for CUSP's Local Energy Access Programs (LEAP) project. The LEAP project is a multi-city, multi-sector initiative led by CUSP to achieve deep emissions and energy poverty reductions through equitable clean energy program design and delivery. Members of the CUSP network as well as of the Community Data Program have access to the larger data set behind this map, containing many more variables.

ABOUT CANADIAN URBAN SUSTAINABILITY PRACTITIONERS (CUSP)

Launched in the spring of 2015, the CUSP network connects sustainability practitioners from Canada's large and leading municipalities and provides added capacity to support their collective efforts and expand their reach and impact. Combined, CUSP's seventeen member cities represent a population of 18 million, or one half of the country's population and generate \$1 Trillion, or 55% of the country's GDP.

www.cuspnetwork.ca

¹ The preparation of the Energy Poverty and Equity Explorer was carried out with assistance from the Government of Canada and the Federation of Canadian Municipalities. Notwithstanding this support, any views expressed and insights developed using this tool are the personal views of the authors and users, and the Federation of Canadian Municipalities and the Government of Canada accept no responsibility for them.

This User Guide explains what the Energy Poverty and Equity Explorer can do and how to use it.

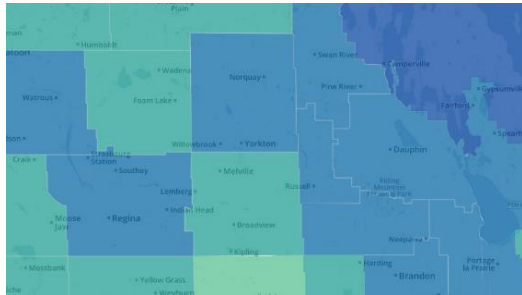
Users can navigate the Guide by clicking on Table of Contents items.

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Geographic levels, navigation and searching

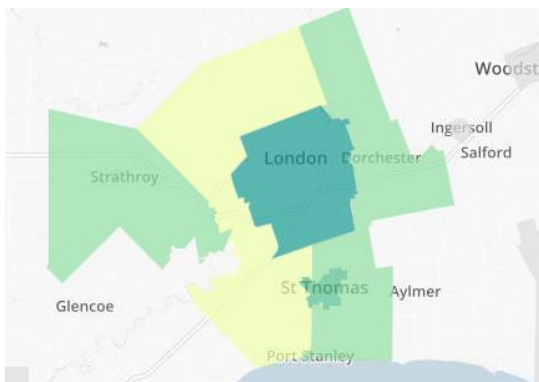
GEOGRAPHIC LEVELS USED IN THE MAP



Census Division

Represents a county or region. Some metropolitan areas like Metro Vancouver, Toronto or Ottawa are Census Divisions.

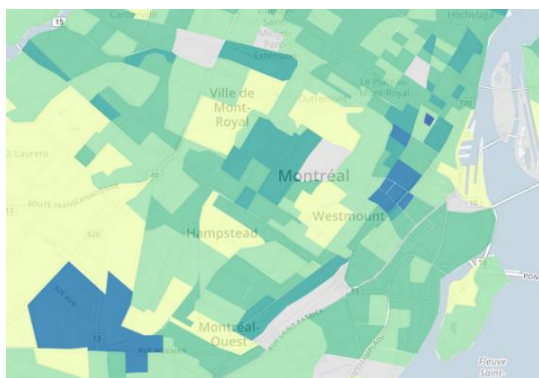
Technical Description – A group of neighbouring municipalities joined together for regional planning and managing common services, such as a County or Regional Municipality.



Census Subdivision

Most often corresponds to cities or towns.

Technical Description - A lower tier or single tier municipality or an area that is deemed to be equivalent to a municipality for statistical reporting purposes.



Census Tracts

Roughly the size of a neighbourhood in cities, but its boundaries do not correspond to local neighbourhood names and places referred to familiarly by municipalities and residents.

Technical Description - Located in and around large urban centres with an urban core population of 50,000 or more, and usually containing a population of 2,500 to 8,000 persons.

Level of disaggregation available in this tool:

As a result of how the census is reported, more data is available in urban areas with larger populations. As such, the Energy Poverty and Equity Explorer tool contains varying data by geographical level. Energy cost burden measures and other indicators are available at:

- Census Division level for all of Canada
- Census Subdivisions and Census Tracts in all major urban centres (or Census Metropolitan Areas).

SEARCH TOOL

The Search Tool allows users to find an area on the map using a street address, postal code or place name.



When searching for a street address, an incorrect postal code may be displayed in the Search bar, but the correct Census Tract will be produced.

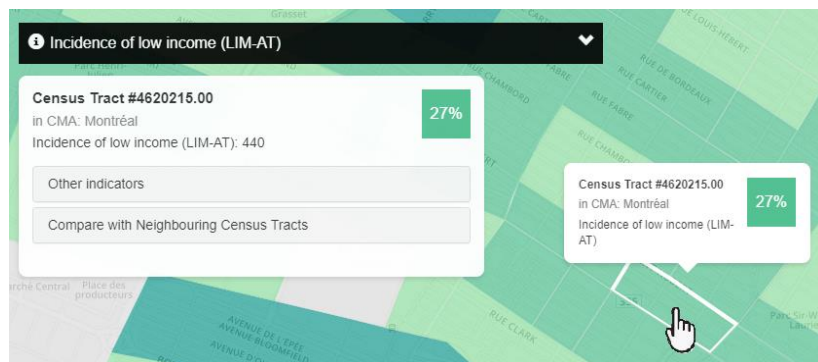
ZOOM TOOL

To navigate, users can grab the map and pan. Users can also zoom in and out of the map using the zoom tool at the bottom of the screen.

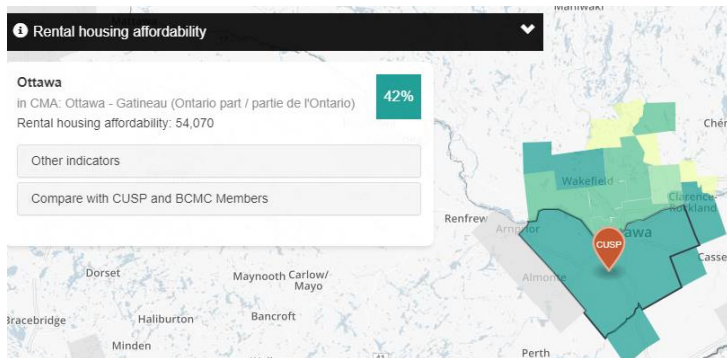


Clicking on the zoom tool bar will make the map zoom to the selected geographic level.

Clicking on the map will make the map zoom into that area and open a profile window displaying the value for the selected indicator.

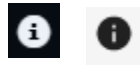


CUSP PINS



The CUSP pins indicate municipalities that are members of the CUSP network. Clicking on a CUSP pin will make the map zoom to that area and open the profile window displaying the value for the selected indicator.

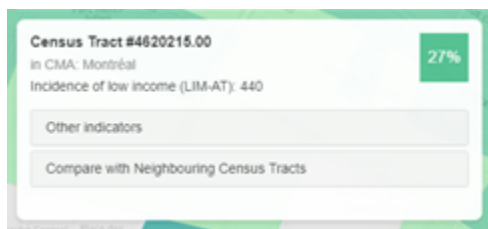
INFORMATION POP-UPS



Clicking on a circled i will bring up useful information. The tool offers information pop-ups with definitions of indicators, a [description of the geographic levels used](#) and an [explanation of the Cross-tabulation button](#).

Indicator display and selection

PROFILE WINDOW



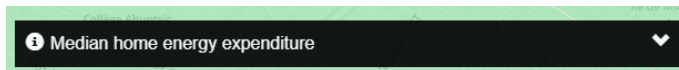
When an area is clicked, a profile window for that region opens, displaying the value of the indicator, as a proportion as well as the absolute count of persons or households being represented.

HOVERING OVER A REGION

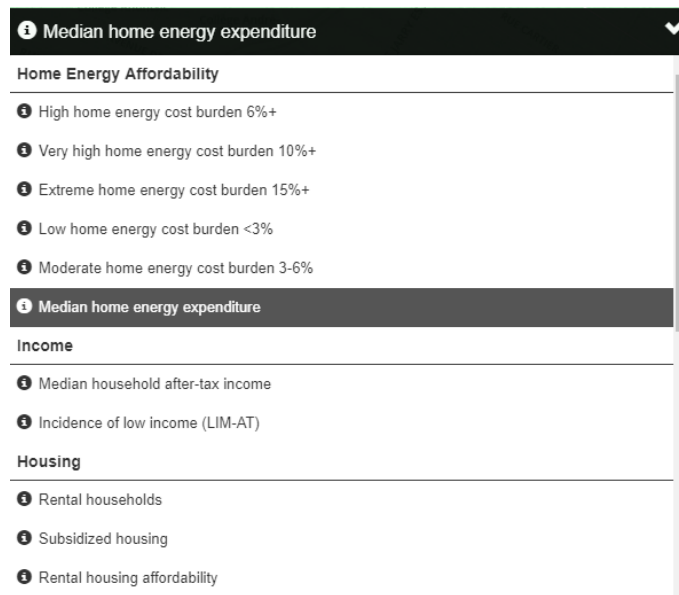
Hovering over an area will display the name of the geography, as well as the name and value of the selected indicator.



INDICATOR SELECTION DROPDOWN LIST



Users can display different indicators on the map by selecting from the dropdown list in the top left corner of the screen.



The indicators are grouped into themes.

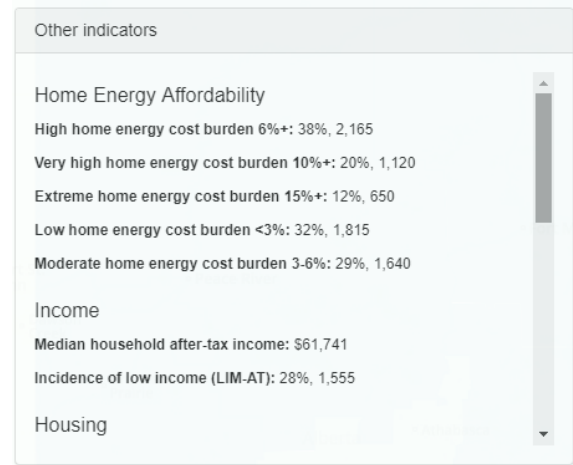
Clicking on the circled i button will bring up a description of the indicator.

COMING SOON

Household-level indicators on commuting will be added to the Energy Poverty and Equity Explorer soon. In the meantime, the percentage of commuters driving a car is provided. However, unlike the other indicators, this indicator can not be cross-tabulated by households paying 6% or more of after-tax income on home energy (see [Cross-tabulating indicators](#)).

THE 'OTHER INDICATORS' BUTTON

Clicking on "Other indicators" opens a drop-down display that provides the other indicator values and counts for the selected area.



COMPARE WITH NEIGHBOURING CENSUS TRACTS



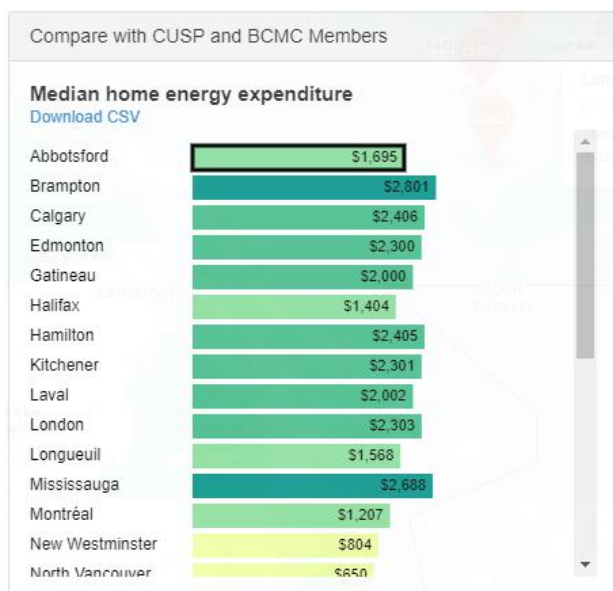
When viewing indicators at the Census Tract level, the profile window will offer the option to "Compare with Neighbouring Census Tracts". Selecting this option opens a drop-down display that charts the current indicator value against that of other census tracts in the immediate vicinity.

Hovering the mouse over the bars of the chart will highlight the selected Census Tract on the map. Clicking on a bar will select that area on the map, allowing users to view the area to which the census track number corresponds.

It is also possible to download the data that make up the chart by selecting the 'Download CSV' link.

A CSV file opened in Excel may be modified by Excel's attempt at recognizing data types and formatting them. Therefore, care should be taken when opening the CSV file in Excel in order to preserve the leading and trailing zeros in the names of Census Tracts. One way to do this in Excel is to ensure Excel is told not to detect data types by selecting Data → Get Data → From File → From Text/CSV, then selecting the file and under "Data Type Detection" checking "Do not detect data types".

COMPARE WITH CUSP AND BCMC MEMBERS



When viewing data at the Census Subdivision level, the profile window will offer the option to "Compare with CUSP and BCMC Members". Selecting this option opens a drop-down display that charts the current indicator value against that of other cities that are members of the CUSP network or the Big City Mayors Caucus (BCMC).

Clicking on a bar in the chart will select that city on the map.

It is also possible to download the data that make up the chart by selecting the 'Download CSV' link.

Cross-tabulating indicators

Most of the indicators can be cross-tabulated to select for households that are paying 6% or more of their after-tax income on home energy.

For example, when displaying the Housing Condition indicator, the map shows the proportion of all dwellings requiring major repairs for the chosen geographic area.

If the Cross-tabulated button is switched to 'on' position, the map will display the proportion of dwellings requiring major repairs for the subset of households that pay 6% or more of their after-tax income on home energy (in other words the # and % of households in 'energy poverty' AND in need of major repair).

CUSP has chosen to cross-tabulate these indicators with a 6% energy cost burden threshold. The 6% threshold represents roughly twice the median home energy cost burden in Canada, highlighting households that face disproportionate home energy costs relative to their after-tax income.



Ranking tool

The screenshot shows a web interface for a ranking tool. At the top, there is a search bar with a magnifying glass icon and the text 'Type an address', and a hamburger menu icon labeled '1'. Below this are five dropdown menus, each with a red number indicating a step: '2' for 'Indicators' (selected: 'Very high home energy cost bu...'), '3' for 'Province/Territory' (selected: 'Manitoba'), '4' for 'CMA' (selected: 'Winnipeg'), and '5' for 'CSD/CT' (selected: 'Census Subdivisions'). Below these is a 'Ranking' section with a bar chart icon labeled '6'. The ranking list shows six items with their names and percentages: 1. St. François Xavier (12.2%), 2. St. Clements (9.4%), 3. Rosser (8.1%), 4. Springfield (6.7%), 5. Winnipeg (6.3%), and 6. Ritchot (5.9%). To the right of the list, there are two red labels: '7' next to 'Rosser' and 'CUSP' next to 'Winnipeg'.

Users can open the ranking tool by clicking on the three lines in the top right corner of the screen **(1)**.

The ranking tool allows the user to rank different geographic areas within a Census Metropolitan Area (CMA) for each indicator in the map.

After selecting an indicator **(2)**, the user selects a province **(3)** and then the Census Metropolitan Area **(4)** they want to see the ranking of that indicator for.

Users can rank the Census Subdivisions or Census Tracts within a CMA **(5)**.

Census Subdivisions are identified by recognizable names of cities, whereas Census Tracts are identified by number. Users should refer to the map in order to locate Census Tracts.

The map will display the indicator selected in the ranking tool **(2)**.

The bar chart icon **(6)** can toggle the order of the rankings between ascending and descending.

Users can click on a geography in the ranked list **(7)** to centre the map on that area.

Methodology notes

The mapping tool has been made using data taken from the 2016 Census of Population.

The universe of the map comprises all households with after-tax income and with non-zero home energy costs. Households with zero after-tax income or with zero home energy costs are not included in the data to more accurately represent home energy cost burdens for those who pay these costs. For example, rental households with electricity and heating costs included in their rent are not included in the data. As a result, some values may differ from similar indicators you will find in other Census data products, such as the Census Profile.

Note that the 2016 Census does not have income and housing cost data for Reserves. In the Energy Poverty and Equity Explorer, Census Subdivisions that are Reserves display no data and the data for Census Divisions containing Reserves do not include these areas. This lack of data represents a substantial gap as research on housing condition, energy rates and access, and income levels indicate that the pervasiveness and extent of energy poverty in Indigenous communities is significant.

Technical development notes for the Energy Poverty and Equity Explorer

The technical specifications of the mapping tool include four basic components. The first component is a Map of Canada, relying on Leaflet.js along with D3.js. A second component, the Base Map, is hosted and styled on Mapbox.com, using OpenStreetMap data offering features such as roadways, water bodies and institutional facilities. Accompanying the Map of Canada and Base Map is a Geographic Boundary File, relying on Statistics Canada's cartographic boundary files for dissemination areas based on the 2016 Census. Finally, the User Interface has been built using jQuery, Bootstrap, CSS and HTML.

The map has been built using data from a custom tabulation obtained in partnership with the [Community Data Program](#). The full data tables, which are available to CUSP members and members of the [Community Data Program](#), contain the following variables:

- Selected housing characteristics, including structural type of dwelling, period of construction, housing condition, household size, housing affordability and core housing need.
- Selected household statistics, including average and median home energy spending as % of after-tax household income, average and median home energy expenditures, average household size and average and median after-tax household income.
- Home energy spending as % after-tax household income (thresholds)
- Household home energy expenditures (presence or absence)
- Low Income Status (LIM-AT)
- After-tax household income groups
- Housing tenure
- Households where no person aged 18+ has full-time/full-year employment
- Households with at least one person aged 25+ without certificate, diploma or degree
- Households with at least one person aged 18+ who is Aboriginal identity
- Households with at least one person aged 18+ who is a visible minority
- Households with at least one person aged 18+ who is a recent immigrant (period of immigration 2011 to 2016)
- Households with at least one person aged 18+ who speaks neither English nor French as the language spoken at home
- Households with at least one person aged 65+