Data Article

HUE: The hourly usage of energy dataset for buildings in British Columbia

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1. Data

Consumption history data, simulated solar data, and weather data is stored in simple comma-separated-value (CSV) files. The summary data is stored in a fixed-length format to make it easy to read. There are a total of 27 files in this dataset. Table 1 describes the files within the dataset. Data frequency for all files is hourly (in local Pacific timezone). Data was downloaded from BC Hydro’s customer web portal by each customer who then donated the data for research. Weather data was downloaded from the nearest Environment Canada [5] weather station. Simulated solar data was generated by a tool provided by the US Department of Energy [4].

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2. Experimental design, materials, and methods

Data was obtained through donation by BCHydro customers. Each customer logged into BCHydro’s customer web porthole and requested an export of historical hourly consumption data. The porthole only allows customers to download a maximum of three years worth of data. Only BCHydro customers were asked to donate to keep the data quality consistent. Customers were solicited through by emailing a pamphlet out to a network of family, friends, and work colleagues. The pamphlet is attached as supplementary material to the paper.

Table 2 describes the data columns found in each file of the dataset. Each house has some additional characteristic data that was collected about it (see the All_Residential.txt file) and each characteristic is described there, as well in Table 3. Note that there is no characteristic data for House 7.

Residential House 1 is the same house used in the AMPds dataset [1,2] which has 2-years of per-minute data including appliance-level consumption data; and is House 1 in the RAE dataset [3] with approximately 60-days of 1Hz including appliance-level consumption data. Residential House 2 is House 2 in the RAE dataset [3] with approximately one-year of 1Hz including appliance-level consumption data.

Table 1
Filename descriptions.

| Filename             | Description                                                                 |
|----------------------|-----------------------------------------------------------------------------|
| All_Residential.txt  | Summary data for each house in listed in a table by house ID.               |
| Holidays.csv         | Indicated what days are statutory holidays etc.                             |
| Residential_<#>.csv  | Hourly consumption history for each house where <#> is the ID of each house.|
| Solar.csv            | One year’s worth of hourly simulated solar production data generated from the PVWatts online tool [4]. DC System Size was set to 4 kW with an Invert Efficiency of 96%. |
| Weather_<ID>.csv     | Hourly weather station data where <ID> is the three-letter weather station ID listed in the summary data table. |
Table 2
Data column descriptions.

| Column   | Description                                                                 |
|----------|-----------------------------------------------------------------------------|
| ac_output| Solar AC energy produced in kilo-Watt-hours (kWh) after DC conversion.       |
| date     | Date of the recording in YYYY-MM-DD.                                       |
| day      | Day of the week; e.g., Monday.                                             |
| dc_output| Solar DC energy produced in kilo-Watt-hours (kWh).                          |
| dst      | Day light savings time indicator (−1 or +1 for hour adjustment).            |
| energy_kWh| Energy consumed in kilo-Watt-hours (kWh).                                   |
| holiday  | Textual name of the holiday (indicates a working day off).                   |
| hour     | Hour of the recording from 01 to 24.                                        |
| humidity | Outside humidity in percentage (%).                                         |
| pressure | Atmospheric pressure in kilopascals (kPa).                                  |
| temperature| Outside ambient temperature in degrees Celsius (°C).                       |
| weather  | A textual description the type of weather; e.g., Mostly Cloudy.             |
| weekend  | Boolean value to indicate weekend.                                          |

Table 3
House characteristics descriptions.

| Column     | Description                                                                                           |
|------------|-------------------------------------------------------------------------------------------------------|
| House      | The house ID number.                                                                                 |
| FirstReading| The first reading date in the house's data file.                                                   |
| LastReading| The last reading date in the house's data file. At the end of each year, some house files will be updated with new data. |
| Cover      | The data coverage. The percent of non-missing readings. A value of 1.000 is 100%.                     |
| HouseType  | character: multi-level houses build before 1940
bungalow: single-level (w/basement) houses built in the 1940s and 1950s
special: two-level houses built between 1965 and 1989
modern: two-/three-level houses build in the 1990s and afterwards
duplex: two houses that share a common wall, can be side-by-side or front-back
triplex: three houses that share common walls: top unit, front unit, and back unit
townhouse: row houses that share one or two common walls
apartment: high-rise or low-rise living units
laneway: small homes built in the backyard of the main house which open onto the back lane |
| Facing     | What direction the house is facing. This often has an impact on house cooling during the summer. East and West facing houses get hotter faster. |
| Region     | The 3-letter code of the house's regional weather station.
YVR - Vancouver and Lower Mainland area
WYJ - Victoria and surrounding area |
| RU's       | Rentals Units. The number of rental suites in the house. More rental suites means higher consumption. |
| EV's       | Electric Vehicles. If there is an EV, what is the size of the battery (in kWh).                     |
| SN         | Special Notes associated to that house which are listed within the file.                             |
| HVAC       | A description of the HVAC systems which also has an impact on power consumption. One or a combination of:
FAGF - forced air gas furnace
HP - heat pump (incl. a/c)
PFE - gas fireplace
FPG - electric fireplace
IFRHG - in-floor radiant heating (gas boiler)
NAC - no a/c
FAC - fixed a/c unit
PAC - portable a/c unit
BHE - baseboard heater (electric)
IFRHE - in-floor radiant heating (electric)
WRHR - water radiant heat (cast iron radiators) |

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**Transparency document**

Transparency document associated with this article can be found in the online version at [https://doi.org/10.1016/j.dib.2019.103744](https://doi.org/10.1016/j.dib.2019.103744).

**Appendix A. Supplementary data**

Supplementary data to this article can be found online at [https://doi.org/10.1016/j.dib.2019.103744](https://doi.org/10.1016/j.dib.2019.103744).

**References**

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