

# Assessing Building Performance in terms of GHG Emission and Energy Use amid Pandemic in Ontario

### What is it?

One aspect of climate change is global warming which is a result of increasing the concentration of greenhouse gases in the atmosphere. Therefore, finding a way to assess the amount of GHG emission and EUI (energy use intensity) and decrease the rate of them is the goal of the project. As a result, the main project's objective is to suggest a prediction model of GHG emission and EUI, based on the cities and function of the buildings, which can Evaluate the rate of EUI and GHG emissions. The users in this project are occupants of various types of buildings that have been assessed.

### What is new and distinctive about your project?

For achieving the objectives of this project, the elemental factors in producing GHG emission and EUI have been evaluated and the correlation of them with GHG emission has been found and evaluated. The new aspect in this project is to compare and analyze in terms of the amount of GHG emission and EUI between buildings, based on the available data, in Covid-19 pandemic and the previous year (2018). For the prediction of the GHG emission and EUI, two types of algorithms have been selected and compared with each other in terms of performance to find the accuracy of the model.

### How it works?

A Machine Learning (ML) approach has been selected to establish thorough predicting patterns for enhancing energy performance in the building sectors. Implementation of both supervised and unsupervised algorithms to reach a more precise model for forecasting GHG emissions, EUI, and Energy Efficiency Grade which are the most significant representatives of building enactment.

### Outcomes

The results demonstrate the necessity of improving data collection, retrofit old buildings, and focusing on weighty variables such as natural gas and electricity consumption to be prepared for future similar pandemics. The city of Montreal can take advantage of these recommendation extracted from Ontario data due to more matching climate and population intensity features.



Bahar Zilaei Golara Shafaei Sharareh Salami Saman Hosseinzadeh

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