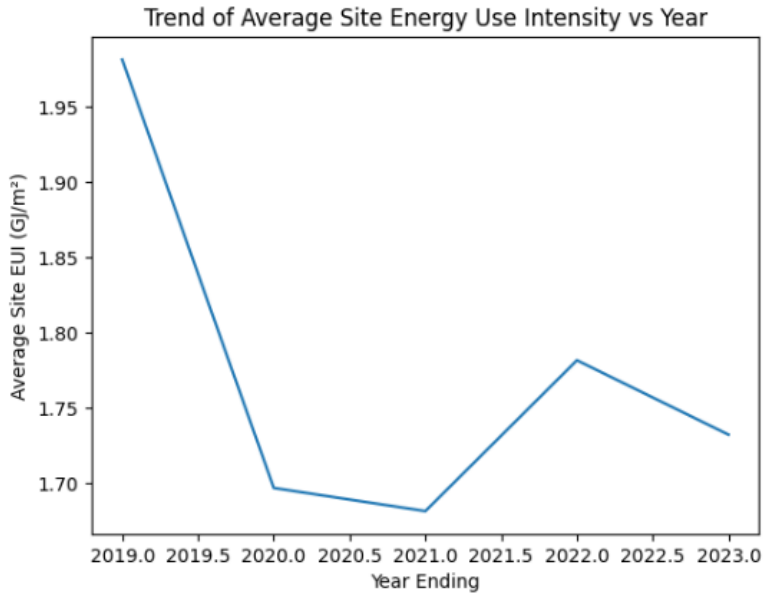
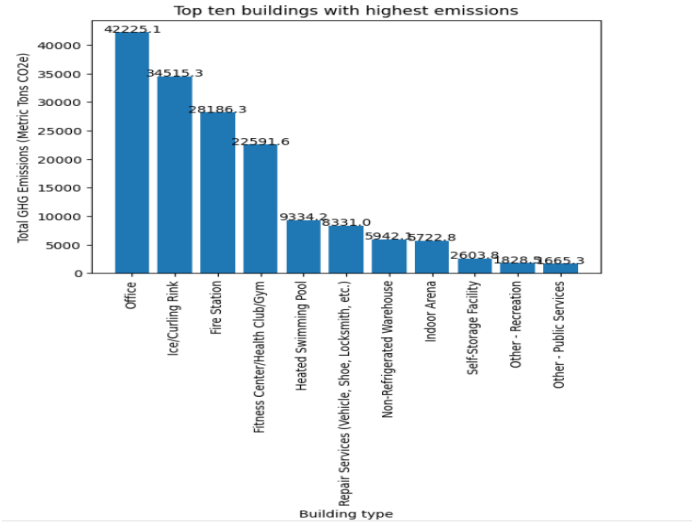
Key Trends in Energy Consumption and Efficiency

The analysis revealed a notable decreasing trend in the average Site Energy Use Intensity (EUI) over the years, suggesting an overall improvement in building energy efficiency. This trend is likely driven by a combination of factors such as the adoption of energy-efficient technologies and increased awareness of energy conservation practices. A significant drop in Site EUI was observed between 2020 and 2021, possibly due to reduced building occupancy and activity during the COVID-19 pandemic and lockdown period.



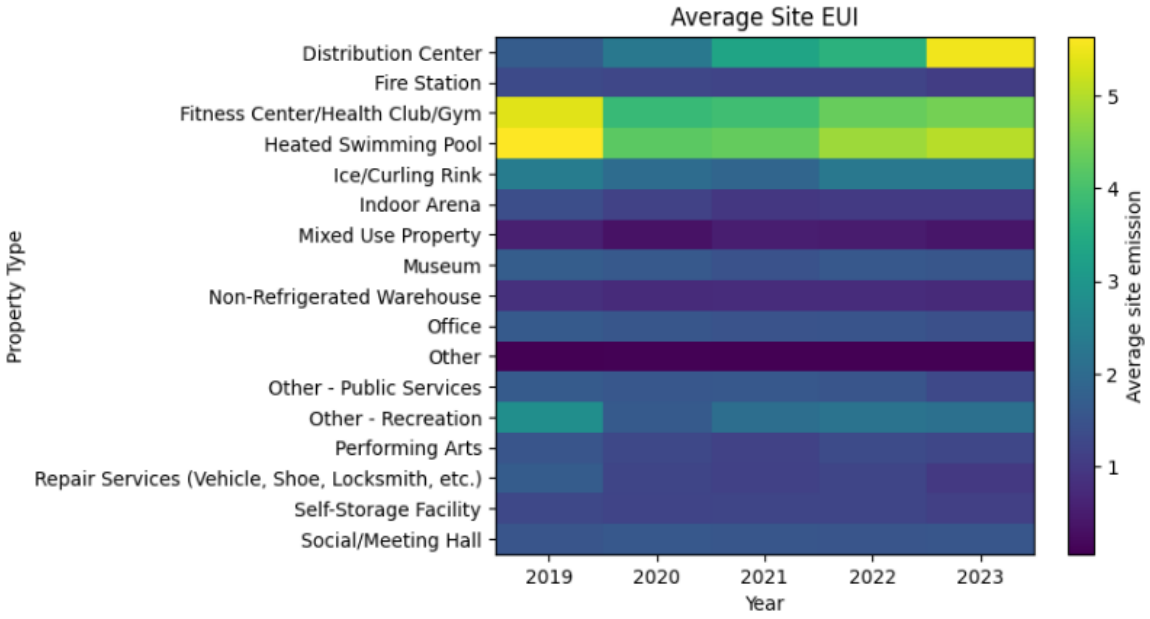
Seasonal and Property Type Variations

The dataset did not contain information on seasonal variations in energy consumption as it was recorded on a yearly basis as plotted above. The analysis of different property types showed variations in both energy consumption and greennhouse gas (GHG) emissions. Buildings like office buildings and hotels, tend to have higher energy consumption and GHG emissions compared to smaller or less occupied buildings like recreational facilities. This variation is likely due to factors such as building size, occupancy levels, and the types of energy-consuming systems in place. A hypothesis test was also conducted between these 2 buildings and emissions generated were significantly different.



Recommendations for Improving Energy Efficiency and Reducing Emissions

1. Study the building which give out the highest and least emissions. See if there are any differences in the machines/appliances being used.
2. It will be difficult to implement strict measures where a large number of people occupy a building, as these building require more energy and give out more emissions as well. Introducing smart appliances may help i.e motion sensing lights, air conditioning.
3. It is also necessary to study the average site EUI vs the property type over a year, to get a better understanding of the trends in the emissions.



Conclusion

By implementing these recommendations, Alberta can have greater energy efficiency and reduced carbon footprint. Continuous monitoring of energy performance data will be essential to ensure the effectiveness of these strategies. The insights gained from this analysis can guide developers to build more energy efficient houses and improve the overall effect the building has on the environment.