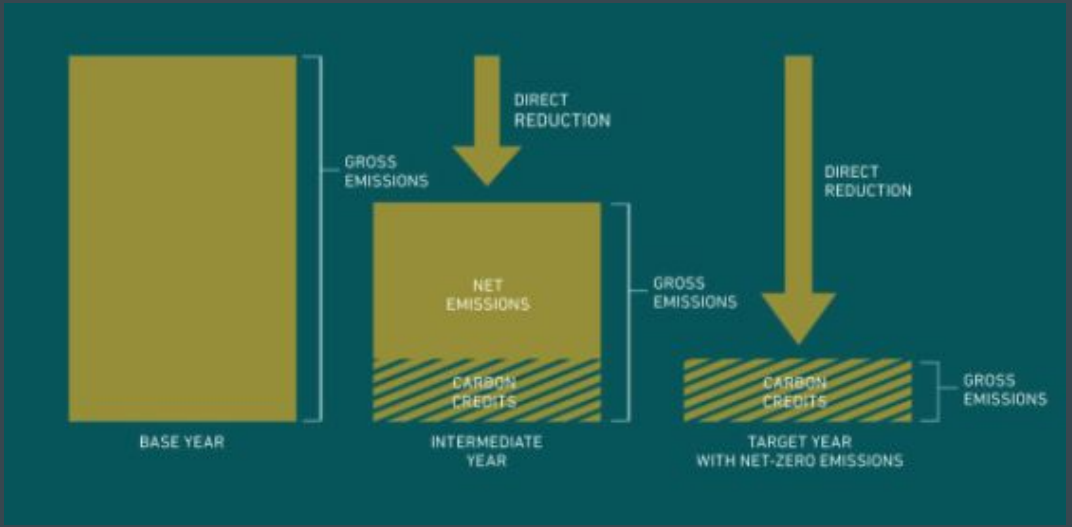
Reducing Carbon Emissions of NYC's Large Buildings

Goal: Net-Zero by 2050

"By 2050, New York City will have net-zero GHG emissions citywide." *

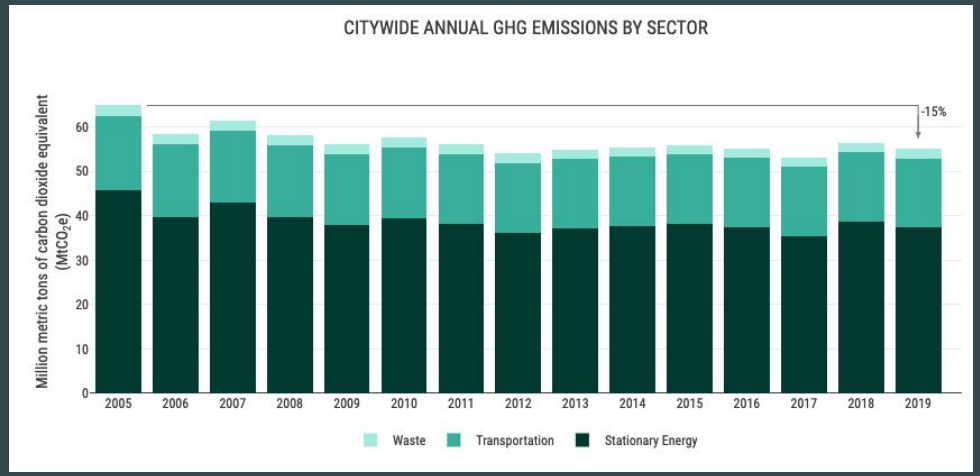
"...the City **will achieve a 50 percent reduction from City-owned buildings and operations by 2030** on the path to carbon neutral buildings."

http://onenyc.cityofnewyork.us/initiatives/achieve-carbon-neutrality-and-100-percent-clean-electricity/

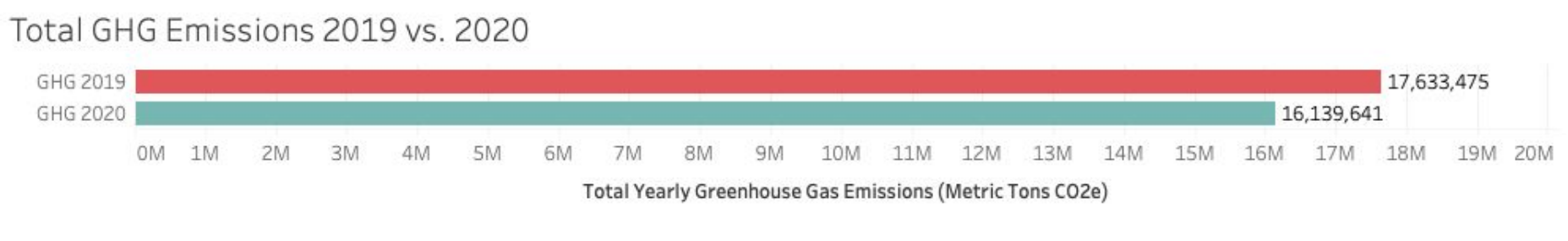


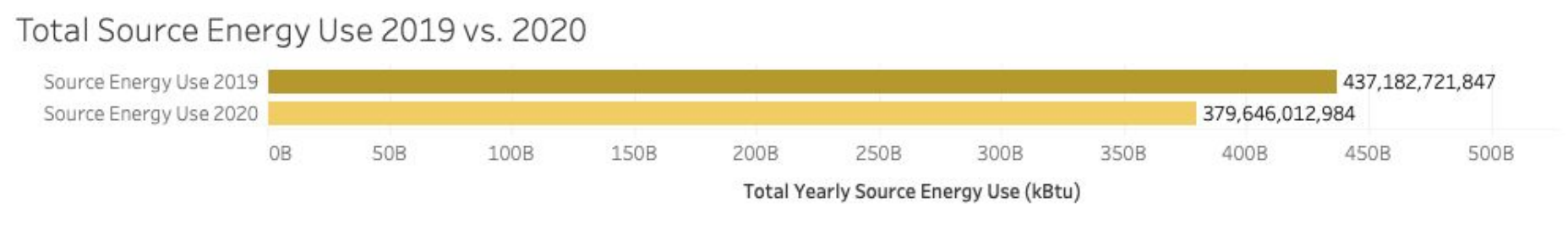
Data/Methodology

- **66-70%** of NYC's carbon emissions come from buildings
- Data Source: Energy and Water Data Disclosure (2019 and 2020)
  - Includes privately owned buildings over 25,000 sq ft and in city-owned buildings over 10,000 sq ft.



Results

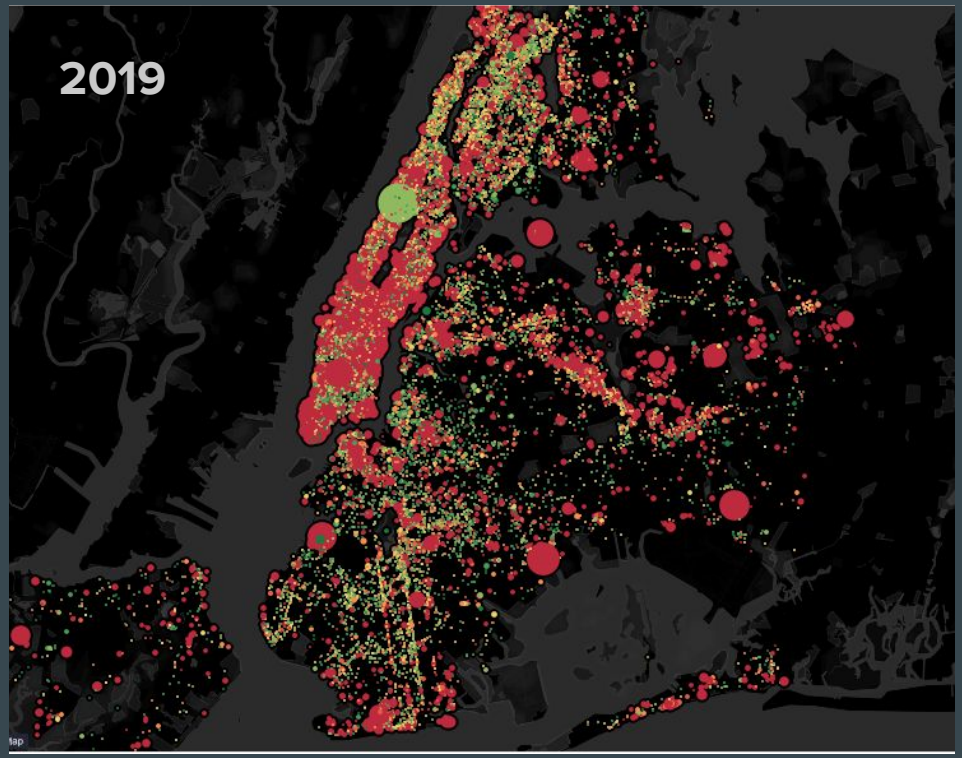


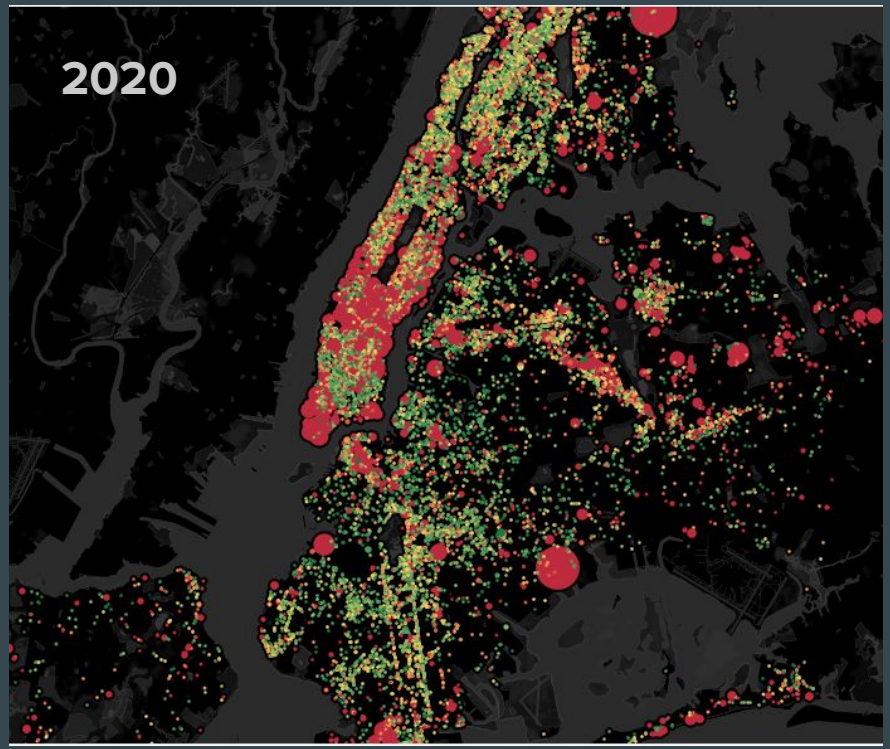


Greenhouse gas emissions and energy use decreased from 2019 to 2020

Results

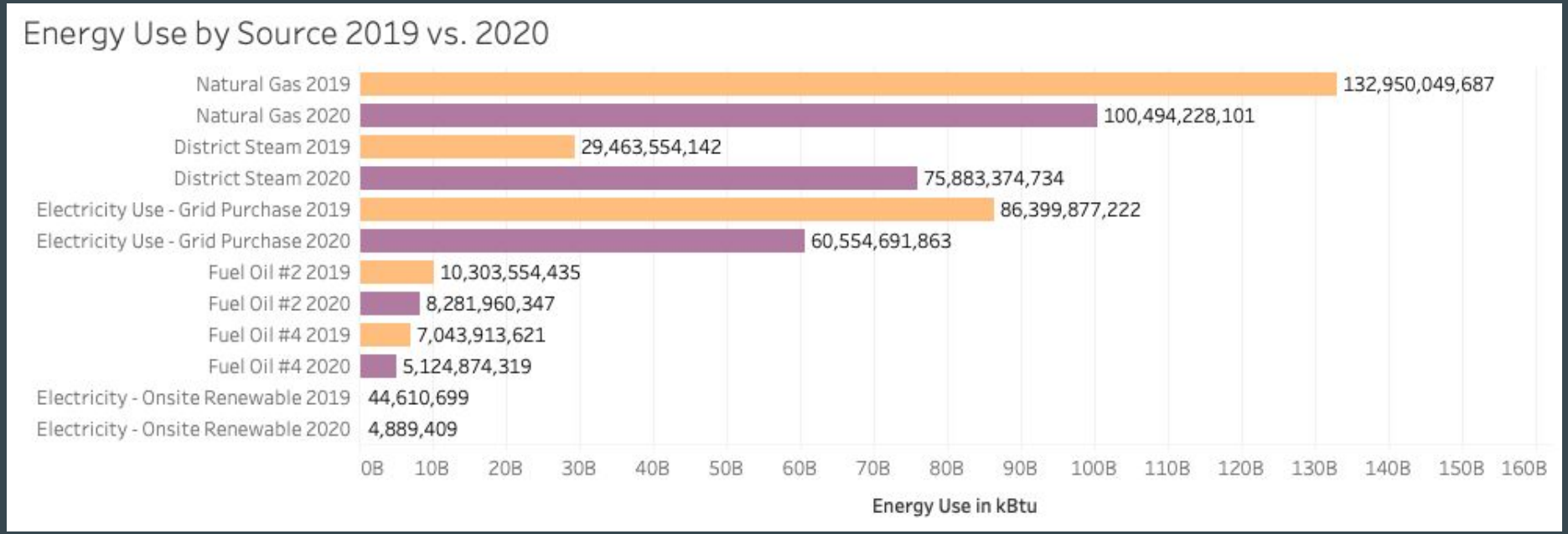
Reduced GHG emissions might be an effect of COVID





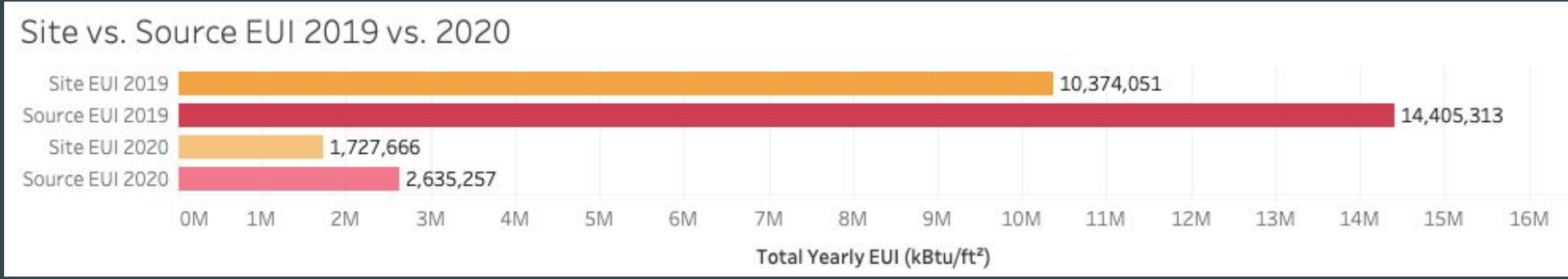
Results

- Natural gas is still the most-used energy source
- Use of steam increased; other energy sources decreased

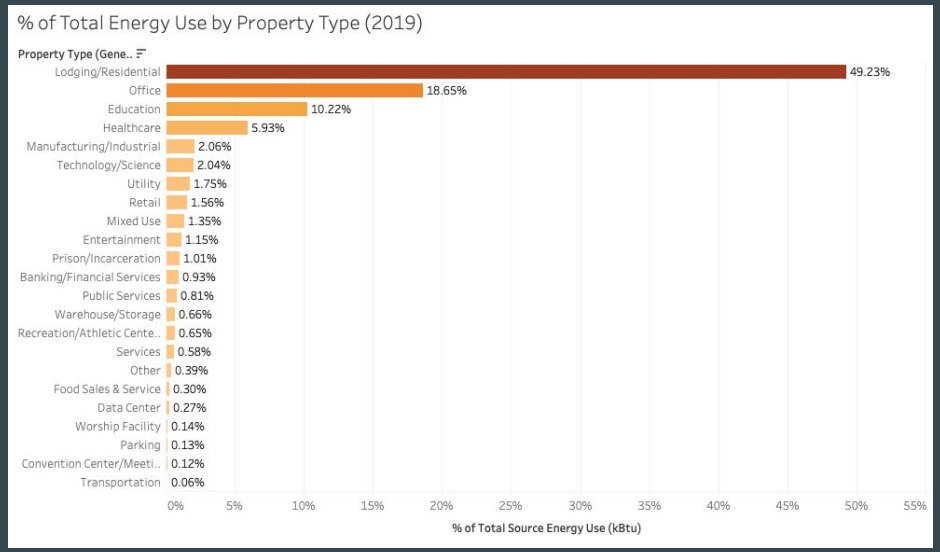


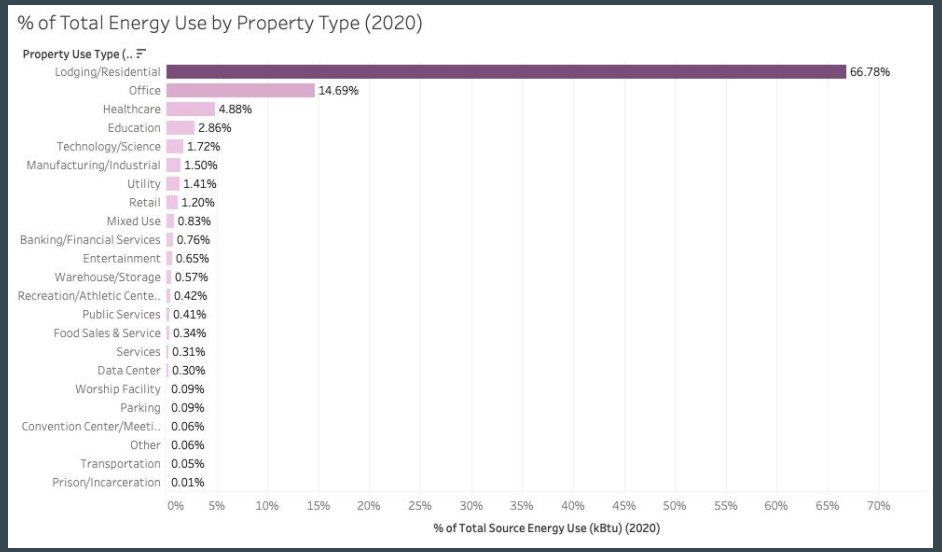
Results

Gap between **site Energy Use Intensity** and **source Energy Use Intensity**



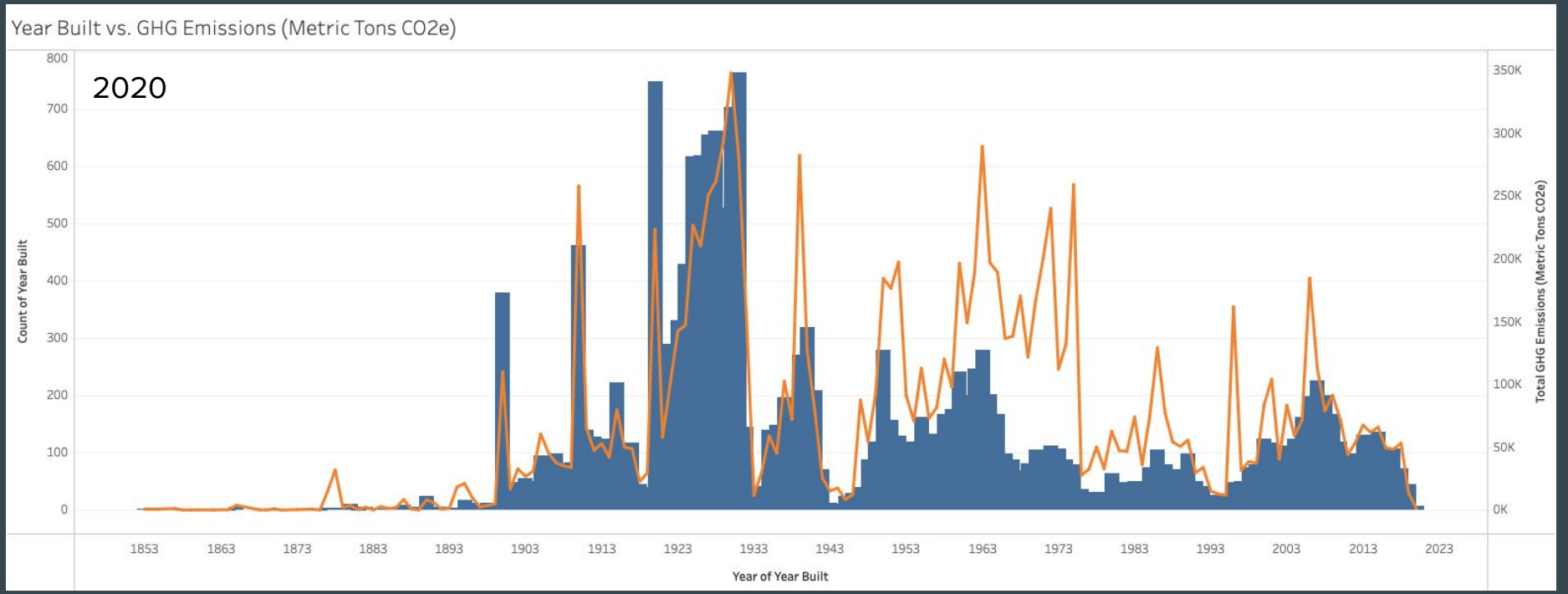
Results





Most of NYC's energy use comes from residential properties (in part bc there are so many of them)

Results



Newer buildings (after 1975) tend to produce lower levels of emissions, but not always

Conclusions

NYC has a long way to go before reaching its goal of 100% clean energy by 2040

Problem/Opportunity	Suggested Solution
Most of NYC's energy usage comes from gas	➔ reduce use of gas, increase use of electricity generated onsite from renewable sources
A lot of energy is lost from source to site	➔ increase efficiency of transport and/or create more local, onsite sources of energy
Electricity still generates emissions–what is "clean energy?"	➔ reduce overall energy consumption; update older buildings (especially residential properties)

Future Work

- How close is the city to reaching its emissions reductions goal? (privately-owned vs city-owned buildings)
- What caused increases or decreases in emissions in previous years? (time series modeling)
- What building features might be causing higher emissions? (linear regression)