

3pjhdhxxj

March 15, 2025

```
[1]: import pandas as pd
import numpy as np
import seaborn as sns
import matplotlib.pyplot as plt

import warnings
warnings.simplefilter('ignore')
```

```
[2]: df = pd.read_csv('/content/Energy.csv')
```

Predict the Energy Star Score

```
[3]: pd.set_option('display.max_columns',None)
df.head()
```

```
[3]:   Order  Property Id      Property Name \
0      1      13286      201/205
1      2      28400      NYP Columbia (West Campus)
2      3      4778226      MSCHoNY North
3      4      4778267      Herbert Irving Pavilion & Millstein Hospital
4      5      4778288      Neuro Institute
```

```
   Parent Property Id      Parent Property Name BBL - 10 digits \
0      13286      201/205      1013160001
1      28400      NYP Columbia (West Campus)      1021380040
2      28400      NYP Columbia (West Campus)      1021380030
3      28400      NYP Columbia (West Campus)      1021390001
4      28400      NYP Columbia (West Campus)      1021390085
```

```
   NYC Borough, Block and Lot (BBL) self-reported \
0      1013160001
1      1-02138-0040
2      1-02138-0030
3      1-02139-0001
4      1-02139-0085
```

```
   NYC Building Identification Number (BIN) \
0      1037549
```

1 1084198; 1084387;1084385; 1084386; 1084388; 10...
2 1063380
3 1087281; 1076746
4 1063403

	Address 1 (self-reported)	Address 2	Postal Code \
0	201/205 East 42nd st.	Not Available	10017
1	622 168th Street	Not Available	10032
2	3975 Broadway	Not Available	10032
3	161 Fort Washington Ave	177 Fort Washington Ave	10032
4	710 West 168th Street	Not Available	10032

	Street Number	Street Name	Borough	DOF	Gross Floor Area \
0	675	3 AVENUE	Manhattan		289356.0
1	180	FT WASHINGTON AVENUE	Manhattan		3693539.0
2	3975	BROADWAY	Manhattan		152765.0
3	161	FT WASHINGTON AVENUE	Manhattan		891040.0
4	193	FT WASHINGTON AVENUE	Manhattan		211400.0

Primary Property Type - Self Selected \

0 Office

1 Hospital (General Medical & Surgical)

2 Hospital (General Medical & Surgical)

3 Hospital (General Medical & Surgical)

4 Hospital (General Medical & Surgical)

List of All Property Use Types at Property \

0 Office

1 Hospital (General Medical & Surgical)

2 Hospital (General Medical & Surgical)

3 Hospital (General Medical & Surgical)

4 Hospital (General Medical & Surgical)

Largest Property Use Type \

0 Office

1 Hospital (General Medical & Surgical)

2 Hospital (General Medical & Surgical)

3 Hospital (General Medical & Surgical)

4 Hospital (General Medical & Surgical)

Largest Property Use Type - Gross Floor Area (ft²) \

0 293447

1 3889181

2 231342

3 1305748

4 179694

2nd Largest Property Use Type \	
0	Not Available
1	Not Available
2	Not Available
3	Not Available
4	Not Available

2nd Largest Property Use - Gross Floor Area (ft ²) \	
0	Not Available
1	Not Available
2	Not Available
3	Not Available
4	Not Available

3rd Largest Property Use Type \	
0	Not Available
1	Not Available
2	Not Available
3	Not Available
4	Not Available

3rd Largest Property Use Type - Gross Floor Area (ft ²) Year Built \		
0	Not Available	1963
1	Not Available	1969
2	Not Available	1924
3	Not Available	1971
4	Not Available	1932

Number of Buildings - Self-reported Occupancy Metered Areas (Energy) \			
0	2	100	Whole Building
1	12	100	Whole Building
2	1	100	Not Available
3	1	100	Not Available
4	1	100	Not Available

Metered Areas (Water) ENERGY STAR Score Site EUI (kBtu/ft ²) \			
0	Not Available	Not Available	305.6
1	Whole Building	55	229.8
2	Not Available	Not Available	Not Available
3	Not Available	Not Available	Not Available
4	Not Available	Not Available	Not Available

Weather Normalized Site EUI (kBtu/ft ²) \	
0	303.1
1	228.8
2	Not Available
3	Not Available

4 Not Available

	Weather Normalized Site Electricity Intensity (kWh/ft ²) \
0	37.8
1	24.8
2	Not Available
3	Not Available
4	Not Available

	Weather Normalized Site Natural Gas Intensity (therms/ft ²) \
0	Not Available
1	2.4
2	Not Available
3	Not Available
4	Not Available

	Weather Normalized Source EUI (kBtu/ft ²)	Fuel Oil #1 Use (kBtu) \
0	614.2	Not Available
1	401.1	Not Available
2	Not Available	Not Available
3	Not Available	Not Available
4	Not Available	Not Available

	Fuel Oil #2 Use (kBtu)	Fuel Oil #4 Use (kBtu)	Fuel Oil #5 & 6 Use (kBtu) \
0	Not Available	Not Available	Not Available
1	1.96248472E7	Not Available	Not Available
2	Not Available	Not Available	Not Available
3	Not Available	Not Available	Not Available
4	Not Available	Not Available	Not Available

	Diesel #2 Use (kBtu)	District Steam Use (kBtu)	Natural Gas Use (kBtu) \
0	Not Available	5.15506751E7	Not Available
1	Not Available	-3.914148026E8	933073441
2	Not Available	Not Available	Not Available
3	Not Available	Not Available	Not Available
4	Not Available	Not Available	Not Available

	Weather Normalized Site Natural Gas Use (therms) \
0	Not Available
1	9330734.4
2	Not Available
3	Not Available
4	Not Available

	Electricity Use - Grid Purchase (kBtu) \
0	38139374.2
1	332365924

2	Not Available
3	Not Available
4	Not Available

Weather Normalized Site Electricity (kWh) \	
0	1.10827705E7
1	9.62613121E7
2	Not Available
3	Not Available
4	Not Available

Total GHG Emissions (Metric Tons CO2e) \	
0	6962.2
1	55870.4
2	0
3	0
4	0

Direct GHG Emissions (Metric Tons CO2e) \	
0	0
1	51016.4
2	0
3	0
4	0

Indirect GHG Emissions (Metric Tons CO2e) \	
0	6962.2
1	4854.1
2	0
3	0
4	0

Property GFA - Self-Reported (ft ²) Water Use (All Water Sources) (kgal) \		
0	762051	Not Available
1	3889181	Not Available
2	231342	Not Available
3	1305748	Not Available
4	179694	Not Available

Water Intensity (All Water Sources) (gal/ft ²) Source EUI (kBtu/ft ²) \		
0	Not Available	619.4
1	Not Available	404.3
2	Not Available	Not Available
3	Not Available	Not Available
4	Not Available	Not Available

Release Date	Water Required?	DOF Benchmarking Submission Status	\
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0	05/01/2017 05:32:03 PM	No	In Compliance
1	04/27/2017 11:23:27 AM	No	In Compliance
2	04/27/2017 11:23:27 AM	No	In Compliance
3	04/27/2017 11:23:27 AM	No	In Compliance
4	04/27/2017 11:23:27 AM	No	In Compliance

	Latitude	Longitude	Community Board	Council District	Census Tract \
0	40.750791	-73.973963	6.0	4.0	88.0
1	40.841402	-73.942568	12.0	10.0	251.0
2	40.840427	-73.940249	12.0	10.0	251.0
3	40.840746	-73.942854	12.0	10.0	255.0
4	40.841559	-73.942528	12.0	10.0	255.0

	NTA
0	Turtle Bay-East Midtown
1	Washington Heights South
2	Washington Heights South
3	Washington Heights South
4	Washington Heights South

```
[4]: df.shape
```

```
[4]: (11746, 60)
```

```
[5]: df.isnull().sum().sort_values(ascending=False)
```

```
[5]: NTA                2263
Longitude            2263
Census Tract         2263
Council District     2263
Community Board      2263
Latitude             2263
Street Number        124
Street Name          122
Water Required?      118
Borough              118
DOF Gross Floor Area 118
DOF Benchmarking Submission Status 30
BBL - 10 digits      11
Fuel Oil #2 Use (kBtu) 0
Weather Normalized Site Electricity (kWh) 0
Fuel Oil #4 Use (kBtu) 0
Fuel Oil #5 & 6 Use (kBtu) 0
Diesel #2 Use (kBtu) 0
District Steam Use (kBtu) 0
Natural Gas Use (kBtu) 0
Weather Normalized Site Natural Gas Use (therms) 0
```

Electricity Use - Grid Purchase (kBtu)	0
Water Intensity (All Water Sources) (gal/ft ²)	0
Total GHG Emissions (Metric Tons CO ₂ e)	0
Direct GHG Emissions (Metric Tons CO ₂ e)	0
Indirect GHG Emissions (Metric Tons CO ₂ e)	0
Property GFA - Self-Reported (ft ²)	0
Water Use (All Water Sources) (kgal)	0
Weather Normalized Source EUI (kBtu/ft ²)	0
Source EUI (kBtu/ft ²)	0
Release Date	0
Fuel Oil #1 Use (kBtu)	0
Order	0
Weather Normalized Site Natural Gas Intensity (therms/ft ²)	0
Largest Property Use Type - Gross Floor Area (ft ²)	0
Property Name	0
Parent Property Id	0
Parent Property Name	0
NYC Borough, Block and Lot (BBL) self-reported	0
NYC Building Identification Number (BIN)	0
Address 1 (self-reported)	0
Address 2	0
Postal Code	0
Primary Property Type - Self Selected	0
List of All Property Use Types at Property	0
Largest Property Use Type	0
2nd Largest Property Use Type	0
Weather Normalized Site Electricity Intensity (kWh/ft ²)	0
2nd Largest Property Use - Gross Floor Area (ft ²)	0
3rd Largest Property Use Type	0
3rd Largest Property Use Type - Gross Floor Area (ft ²)	0
Year Built	0
Number of Buildings - Self-reported	0
Occupancy	0
Metered Areas (Energy)	0
Metered Areas (Water)	0
ENERGY STAR Score	0
Site EUI (kBtu/ft ²)	0
Property Id	0
Weather Normalized Site EUI (kBtu/ft ²)	0
dtype: int64	

```
[6]: # dropping irrelevant columns to me
df.drop(['Order', 'Property Id', 'Property Name', 'Parent Property Id', 'BBL - 10_
↳ digits', 'NYC Borough, Block and Lot (BBL) self-reported', 'NYC Building_
↳ Identification Number (BIN)', 'Street Number', 'Street_
↳ Name', 'NTA'], axis=1, inplace=True)
```

```
[7]: #same
df.drop(['Address 2', 'Postal Code'], axis=1, inplace=True)
```

```
[8]: df.replace({'Not Available': np.nan}, inplace=True)
```

```
[9]: df.isnull().sum().sort_values(ascending=False)
```

```
[9]: Fuel Oil #1 Use (kBtu) 11737
Diesel #2 Use (kBtu) 11730
Fuel Oil #5 & 6 Use (kBtu) 11152
District Steam Use (kBtu) 10810
Fuel Oil #4 Use (kBtu) 10425
3rd Largest Property Use Type - Gross Floor Area (ft²) 10262
3rd Largest Property Use Type 10262
Fuel Oil #2 Use (kBtu) 9165
2nd Largest Property Use - Gross Floor Area (ft²) 8005
2nd Largest Property Use Type 8005
Metered Areas (Water) 4609
Water Use (All Water Sources) (kgal) 3984
Water Intensity (All Water Sources) (gal/ft²) 3984
Latitude 2263
Longitude 2263
Community Board 2263
Council District 2263
Census Tract 2263
ENERGY STAR Score 2104
Weather Normalized Site Natural Gas Intensity (therms/ft²) 1963
Weather Normalized Site Natural Gas Use (therms) 1962
Weather Normalized Site EUI (kBtu/ft²) 1465
Weather Normalized Source EUI (kBtu/ft²) 1465
Natural Gas Use (kBtu) 1442
Weather Normalized Site Electricity Intensity (kWh/ft²) 787
Weather Normalized Site Electricity (kWh) 786
Electricity Use - Grid Purchase (kBtu) 244
Site EUI (kBtu/ft²) 163
Source EUI (kBtu/ft²) 163
Borough 118
DOF Gross Floor Area 118
Water Required? 118
Direct GHG Emissions (Metric Tons CO2e) 83
Total GHG Emissions (Metric Tons CO2e) 74
Indirect GHG Emissions (Metric Tons CO2e) 65
Metered Areas (Energy) 57
DOF Benchmarking Submission Status 30
Largest Property Use Type - Gross Floor Area (ft²) 2
Largest Property Use Type 2
Year Built 0
```


Property GFA - Self-Reported (ft ²)	0
Number of Buildings - Self-reported	0
Release Date	0
Occupancy	0
List of All Property Use Types at Property	0
Primary Property Type - Self Selected	0
Address 1 (self-reported)	0
Parent Property Name	0
dtype: int64	

```
[10]: df.isnull().mean().sort_values(ascending=False)
```

Fuel Oil #1 Use (kBtu)	0.999234
Diesel #2 Use (kBtu)	0.998638
Fuel Oil #5 & 6 Use (kBtu)	0.949430
District Steam Use (kBtu)	0.920313
Fuel Oil #4 Use (kBtu)	0.887536
3rd Largest Property Use Type - Gross Floor Area (ft ²)	0.873659
3rd Largest Property Use Type	0.873659
Fuel Oil #2 Use (kBtu)	0.780266
2nd Largest Property Use - Gross Floor Area (ft ²)	0.681509
2nd Largest Property Use Type	0.681509
Metered Areas (Water)	0.392389
Water Use (All Water Sources) (kgal)	0.339179
Water Intensity (All Water Sources) (gal/ft ²)	0.339179
Latitude	0.192661
Longitude	0.192661
Community Board	0.192661
Council District	0.192661
Census Tract	0.192661
ENERGY STAR Score	0.179125
Weather Normalized Site Natural Gas Intensity (therms/ft ²)	0.167121
Weather Normalized Site Natural Gas Use (therms)	0.167036
Weather Normalized Site EUI (kBtu/ft ²)	0.124723
Weather Normalized Source EUI (kBtu/ft ²)	0.124723
Natural Gas Use (kBtu)	0.122765
Weather Normalized Site Electricity Intensity (kWh/ft ²)	0.067002
Weather Normalized Site Electricity (kWh)	0.066916
Electricity Use - Grid Purchase (kBtu)	0.020773
Site EUI (kBtu/ft ²)	0.013877
Source EUI (kBtu/ft ²)	0.013877
Borough	0.010046
DOF Gross Floor Area	0.010046
Water Required?	0.010046
Direct GHG Emissions (Metric Tons CO2e)	0.007066
Total GHG Emissions (Metric Tons CO2e)	0.006300
Indirect GHG Emissions (Metric Tons CO2e)	0.005534

Metered Areas (Energy)	0.004853
DOF Benchmarking Submission Status	0.002554
Largest Property Use Type - Gross Floor Area (ft ²)	0.000170
Largest Property Use Type	0.000170
Year Built	0.000000
Property GFA - Self-Reported (ft ²)	0.000000
Number of Buildings - Self-reported	0.000000
Release Date	0.000000
Occupancy	0.000000
List of All Property Use Types at Property	0.000000
Primary Property Type - Self Selected	0.000000
Address 1 (self-reported)	0.000000
Parent Property Name	0.000000

dtype: float64

```
[11]: #dropping columns with over 50% missing values
```

```
drop_cols = []

for col in df.columns:
    if df[col].isnull().mean() > 0.5:
        drop_cols.append(col)
```

```
[12]: drop_cols
```

```
[12]: ['2nd Largest Property Use Type',
       '2nd Largest Property Use - Gross Floor Area (ft²)',
       '3rd Largest Property Use Type',
       '3rd Largest Property Use Type - Gross Floor Area (ft²)',
       'Fuel Oil #1 Use (kBtu)',
       'Fuel Oil #2 Use (kBtu)',
       'Fuel Oil #4 Use (kBtu)',
       'Fuel Oil #5 & 6 Use (kBtu)',
       'Diesel #2 Use (kBtu)',
       'District Steam Use (kBtu)']
```

```
[13]: df = df.drop(columns = drop_cols)
```

```
[14]: df.head()
```

```
[14]:      Parent Property Name Address 1 (self-reported)  Borough \
0      201/205 201/205 East 42nd st. Manhattan
1  NYP Columbia (West Campus)      622 168th Street Manhattan
2  NYP Columbia (West Campus)      3975 Broadway Manhattan
3  NYP Columbia (West Campus)  161 Fort Washington Ave Manhattan
4  NYP Columbia (West Campus)   710 West 168th Street Manhattan

      DOF Gross Floor Area Primary Property Type - Self Selected \
```

0	289356.0	Office
1	3693539.0	Hospital (General Medical & Surgical)
2	152765.0	Hospital (General Medical & Surgical)
3	891040.0	Hospital (General Medical & Surgical)
4	211400.0	Hospital (General Medical & Surgical)

List of All Property Use Types at Property \

0	Office
1	Hospital (General Medical & Surgical)
2	Hospital (General Medical & Surgical)
3	Hospital (General Medical & Surgical)
4	Hospital (General Medical & Surgical)

Largest Property Use Type \

0	Office
1	Hospital (General Medical & Surgical)
2	Hospital (General Medical & Surgical)
3	Hospital (General Medical & Surgical)
4	Hospital (General Medical & Surgical)

Largest Property Use Type - Gross Floor Area (ft²) Year Built \

0	293447	1963
1	3889181	1969
2	231342	1924
3	1305748	1971
4	179694	1932

Number of Buildings - Self-reported Occupancy Metered Areas (Energy) \

0	2	100	Whole Building
1	12	100	Whole Building
2	1	100	NaN
3	1	100	NaN
4	1	100	NaN

Metered Areas (Water) ENERGY STAR Score Site EUI (kBtu/ft²) \

0	NaN	NaN	305.6
1	Whole Building	55	229.8
2	NaN	NaN	NaN
3	NaN	NaN	NaN
4	NaN	NaN	NaN

Weather Normalized Site EUI (kBtu/ft²) \

0	303.1
1	228.8
2	NaN
3	NaN
4	NaN

	Weather Normalized Site Electricity Intensity (kWh/ft ²) \
0	37.8
1	24.8
2	NaN
3	NaN
4	NaN

	Weather Normalized Site Natural Gas Intensity (therms/ft ²) \
0	NaN
1	2.4
2	NaN
3	NaN
4	NaN

	Weather Normalized Source EUI (kBtu/ft ²)	Natural Gas Use (kBtu) \
0	614.2	NaN
1	401.1	933073441
2	NaN	NaN
3	NaN	NaN
4	NaN	NaN

	Weather Normalized Site Natural Gas Use (therms) \
0	NaN
1	9330734.4
2	NaN
3	NaN
4	NaN

	Electricity Use - Grid Purchase (kBtu) \
0	38139374.2
1	332365924
2	NaN
3	NaN
4	NaN

	Weather Normalized Site Electricity (kWh) \
0	1.10827705E7
1	9.62613121E7
2	NaN
3	NaN
4	NaN

	Total GHG Emissions (Metric Tons CO2e) \
0	6962.2
1	55870.4
2	0

3	0
4	0

Direct GHG Emissions (Metric Tons CO2e) \	
0	0
1	51016.4
2	0
3	0
4	0

Indirect GHG Emissions (Metric Tons CO2e) \	
0	6962.2
1	4854.1
2	0
3	0
4	0

Property GFA - Self-Reported (ft ²) Water Use (All Water Sources) (kgal) \		
0	762051	NaN
1	3889181	NaN
2	231342	NaN
3	1305748	NaN
4	179694	NaN

Water Intensity (All Water Sources) (gal/ft ²) Source EUI (kBtu/ft ²) \		
0	NaN	619.4
1	NaN	404.3
2	NaN	NaN
3	NaN	NaN
4	NaN	NaN

Release Date Water Required? DOF Benchmarking Submission Status \			
0	05/01/2017 05:32:03 PM	No	In Compliance
1	04/27/2017 11:23:27 AM	No	In Compliance
2	04/27/2017 11:23:27 AM	No	In Compliance
3	04/27/2017 11:23:27 AM	No	In Compliance
4	04/27/2017 11:23:27 AM	No	In Compliance

	Latitude	Longitude	Community Board	Council District	Census Tract
0	40.750791	-73.973963	6.0	4.0	88.0
1	40.841402	-73.942568	12.0	10.0	251.0
2	40.840427	-73.940249	12.0	10.0	251.0
3	40.840746	-73.942854	12.0	10.0	255.0
4	40.841559	-73.942528	12.0	10.0	255.0

```
[15]: df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
```

```
RangeIndex: 11746 entries, 0 to 11745
```

```
Data columns (total 38 columns):
```

#	Column	Non-Null Count
	Dtype	
---	-----	-----
0	Parent Property Name	11746 non-null
	object	
1	Address 1 (self-reported)	11746 non-null
	object	
2	Borough	11628 non-null
	object	
3	DOF Gross Floor Area	11628 non-null
	float64	
4	Primary Property Type - Self Selected	11746 non-null
	object	
5	List of All Property Use Types at Property	11746 non-null
	object	
6	Largest Property Use Type	11744 non-null
	object	
7	Largest Property Use Type - Gross Floor Area (ft ²)	11744 non-null
	object	
8	Year Built	11746 non-null
	int64	
9	Number of Buildings - Self-reported	11746 non-null
	int64	
10	Occupancy	11746 non-null
	int64	
11	Metered Areas (Energy)	11689 non-null
	object	
12	Metered Areas (Water)	7137 non-null
	object	
13	ENERGY STAR Score	9642 non-null
	object	
14	Site EUI (kBtu/ft ²)	11583 non-null
	object	
15	Weather Normalized Site EUI (kBtu/ft ²)	10281 non-null
	object	
16	Weather Normalized Site Electricity Intensity (kWh/ft ²)	10959 non-null
	object	
17	Weather Normalized Site Natural Gas Intensity (therms/ft ²)	9783 non-null
	object	
18	Weather Normalized Source EUI (kBtu/ft ²)	10281 non-null
	object	
19	Natural Gas Use (kBtu)	10304 non-null
	object	
20	Weather Normalized Site Natural Gas Use (therms)	9784 non-null

```

object
  21 Electricity Use - Grid Purchase (kBtu) 11502 non-null
object
  22 Weather Normalized Site Electricity (kWh) 10960 non-null
object
  23 Total GHG Emissions (Metric Tons CO2e) 11672 non-null
object
  24 Direct GHG Emissions (Metric Tons CO2e) 11663 non-null
object
  25 Indirect GHG Emissions (Metric Tons CO2e) 11681 non-null
object
  26 Property GFA - Self-Reported (ft2) 11746 non-null
int64
  27 Water Use (All Water Sources) (kgal) 7762 non-null
object
  28 Water Intensity (All Water Sources) (gal/ft2) 7762 non-null
object
  29 Source EUI (kBtu/ft2) 11583 non-null
object
  30 Release Date 11746 non-null
object
  31 Water Required? 11628 non-null
object
  32 DOF Benchmarking Submission Status 11716 non-null
object
  33 Latitude 9483 non-null
float64
  34 Longitude 9483 non-null
float64
  35 Community Board 9483 non-null
float64
  36 Council District 9483 non-null
float64
  37 Census Tract 9483 non-null
float64
dtypes: float64(6), int64(4), object(28)
memory usage: 3.4+ MB

```

```

[16]: # giving columns the right dtype
for col in list(df.columns):
    if ('ft2' in col or 'kBtu' in col or 'Metric Tons CO2e' in col or 'kWh' in
        col or 'therms' in col or 'gal' in col or 'Score' in col):
        df[col] = df[col].astype(float)

```

```

[17]: for col in df.columns:
        print(col)
        print(df[col].unique())

```

```
print('*'*75)
```

Parent Property Name

```
['201/205' 'NYP Columbia (West Campus)' 'NYP Cornell (East Campus)'  
'North Shore Towers' 'Cadman Towers'  
'STATEN ISLAND UNIVERSITY HOSPITAL Seaview' 'Barnard College'  
'720-730 Ft. Washington Owners Corp.' 'Park 76th Street Inc.'  
'560 Riverside Drive' 'Meyer Hall' 'MCKINLEY'  
'Metro North - 420-440 East 102 St.' 'Benjamin: 86-02 208 St (Parent)'  
'Benjamin: 206-10 86 Rd (Parent)' 'Benjamin: 209-30 86 Drive (Parent)'  
'Benjamin: 209-31 86 Drive (Parent)' 'Columbia University (morningside)'  
'Columbia University Medical Center' 'Pace University NYC Campus'  
'Memorial Sloan Kettering Cancer Center 1'  
'New York University: Washington Square' 'New York Eye & Ear Infirmary'  
'435 W 119 and 434 W 120' 'College of Mt St Vincent' '1 hoyt st'  
'601 W 112 and 600 W 113' '430 W 119 ET AL' 'Manhattan Campus'  
'CubeSmart - 900 Atlantic Avenue, Brooklyn' 'Jacobs Academic Building'  
'Bay Plaza Community Center, LLC'  
'Amalgamated Warbasse Houses-Block 7250'  
'Amalgamated Warbasse Houses-Block 7253' 'SHEEPSHEAD BAY 9 CAMPUS'  
'Jamaica Hospital Medical Center Campus' 'DUNBAR OWNER LLC'  
'3091 - KINGS PLAZA SHOPPING CENTER' 'Third Housing Company Inc.'  
'First Housing Company Inc.' 'Second Housing Company Inc' 'Carol Gardens'  
'Fourth Housing Company Inc.' 'Fifth Housing Company Inc'  
'Harry Silver Housing' 'WEST BRIGHTON I/WEST BRIGHTON II CAMPUS'  
'Fieldston School Building' 'Mall 1-Bay Plaza, LLC'  
'Jalen: 134-30 Franklin Ave (Parent)' 'AAR: 147-35 38th Ave (Parent)'  
'92nd Street Y (Parent)' 'Beech Hills Corp 1 Site 6'  
'Beech Hills Corp 1 Site 1' 'Beech Hills Corp 2 Site 2'  
'Beech Hills Corp 2 Site 3' 'Beech Hills Corp 3 Site 4'  
'The Morgan Library & Museum' 'Beech Hills Corp 3 Site 5'  
'Deepdale Corp 1 Cluster C' 'Deepdale Corp 1 Cluster D'  
'Deepdale Corp 2 Cluster E' 'Deepdale Corp 2 Cluster F'  
'Deepdale Corp 3 Cluster J' '404 Lafayette Street'  
'Chelsea Gardens Apartments' 'Mason Avenue Holdings Corp'  
'Deepdale Corp 3 Cluster G' 'Deepdale Corp 3 Cluster H'  
'Deepdale Corp 4 Cluster L' 'Deepdale Corp 4 Cluster M'  
'Main Campus - Super Block' '105 E 106th & 104 E 107th' '310-320 W 86 St'  
'Tower Gardens (ww) - Compliance'  
'620-640 West 239th Street (WW) - Compliance'  
'Franklin Plaza (WW) - Compliance' 'Original Campus'  
'Chase Metrotech Campus (3&4)' '1-50/76-00 Dayton Towers'  
'Riverbend (WW)' 'Esplanade Gardens (WW) - Compliance'  
'Boulevard Tenants Corp.'  
'Community Management: 3465/3461 Amboy Road (Parent)'  
'Pratt Industries Staten Island'  
'Carriage: Fort Greene Partnership Homes' 'LINDSAY PARK HGS CORP' 'test'
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'63 and 67 Wall Street' 'West Farms Square' 'zysman gottesman'
 'zysman gottesman, zysman gottesman'
 'H-047 Warbasse House: Amalgamated Warbasse Houses, Inc.- Whole Campus'
 'LL84 DGH, MET, CMP/140-146' 'Monte Excelsior- 245-10-20-30'
 'NYLS-New York Law School' 'Union Theological' 'Mount Sinai West'
 'Mount Sinai Beth Israel Hospital' 'Highmount Associates I & II'
 'Remedder Houses LL84' 'Bronxworks, Inc.' 'Parent Property'
 'Not Applicable: Standalone Property']

 Address 1 (self-reported)
 ['201/205 East 42nd st.' '622 168th Street' '3975 Broadway' ...
 '267 6th Street' '27 Prospect Park West' '420 Clinton Ave\t']

 Borough
 ['Manhattan' 'Queens' nan 'Brooklyn' 'Staten Island' 'Bronx']

 DOF Gross Floor Area
 [289356. 3693539. 152765. ... 70645. 93500. 57824.]

 Primary Property Type - Self Selected
 ['Office' 'Hospital (General Medical & Surgical)' 'Mixed Use Property'
 'Multifamily Housing' 'Other' 'Medical Office' 'College/University'
 'Residence Hall/Dormitory' 'Worship Facility'
 'Urgent Care/Clinic/Other Outpatient' 'Laboratory' 'Library'
 'Social/Meeting Hall' 'Senior Care Community' 'Self-Storage Facility'
 'Strip Mall' 'Retail Store' 'Bank Branch' 'Movie Theater' 'Enclosed Mall'
 'K-12 School' 'Parking' 'Other - Recreation' 'Other - Education'
 'Other - Specialty Hospital' 'Financial Office'
 'Manufacturing/Industrial Plant' 'Performing Arts'
 'Other - Lodging/Residential' 'Hotel' 'Data Center'
 'Non-Refrigerated Warehouse' 'Other - Entertainment/Public Assembly'
 'Restaurant' 'Distribution Center' 'Fitness Center/Health Club/Gym'
 'Ambulatory Surgical Center' 'Museum' 'Automobile Dealership'
 'Residential Care Facility' 'Outpatient Rehabilitation/Physical Therapy'
 'Other - Mall' 'Pre-school/Daycare' 'Supermarket/Grocery Store'
 'Mailing Center/Post Office' 'Other - Public Services'
 'Other - Technology/Science' 'Courthouse' 'Wholesale Club/Supercenter'
 'Refrigerated Warehouse' 'Other - Services' 'Adult Education'
 'Repair Services (Vehicle, Shoe, Locksmith, etc.)' 'Ice/Curling Rink'
 'Food Service']

 List of All Property Use Types at Property
 ['Office' 'Hospital (General Medical & Surgical)' 'Other'
 'Financial Office, Medical Office, Multifamily Housing, Non-Refrigerated
 Warehouse, Office, Other, Other - Entertainment/Public Assembly, Other - Public
 Services, Other - Recreation, Other - Services, Parking, Restaurant, Retail
 Store, Social/Meeting Hall, Supermarket/Grocery Store, Swimming Pool'
 'Multifamily Housing, Other, Parking']

'Multifamily Housing, Parking, Retail Store' 'Medical Office'
 'College/University, Residence Hall/Dormitory' 'Multifamily Housing'
 'Residence Hall/Dormitory' 'College/University' 'Worship Facility'
 'Office, Other' 'Office, Other, Residence Hall/Dormitory'
 'Office, Residence Hall/Dormitory'
 'Medical Office, Office, Other, Urgent Care/Clinic/Other Outpatient'
 'Medical Office, Office, Other' 'Other, Parking'
 'Other, Other - Entertainment/Public Assembly'
 'Multifamily Housing, Parking' 'Library' 'Social/Meeting Hall'
 'Medical Office, Multifamily Housing'
 'Hospital (General Medical & Surgical), Other'
 'College/University, Office'
 'College/University, Office, Residence Hall/Dormitory'
 'Office, Residence Hall/Dormitory, Retail Store' 'Senior Care Community'
 'Self-Storage Facility' 'Medical Office, Parking, Strip Mall'
 'Retail Store' 'Bank Branch' 'Movie Theater' 'Multifamily Housing, Other'
 'Enclosed Mall' 'K-12 School, Parking, Swimming Pool'
 'Enclosed Mall, Parking' 'Parking' 'Other - Recreation'
 'Other - Education' 'Other - Specialty Hospital'
 'Data Center, Medical Office, Office, Other, Other - Specialty Hospital,
 Outpatient Rehabilitation/Physical Therapy, Restaurant'
 'K-12 School, Medical Office, Office, Other - Entertainment/Public Assembly'
 'Medical Office, Office' 'K-12 School' 'Financial Office, Parking'
 'Data Center, Financial Office, Office, Parking, Restaurant, Retail Store'
 'Data Center, Financial Office, Parking'
 'Manufacturing/Industrial Plant, Parking'
 'Manufacturing/Industrial Plant' 'Multifamily Housing, Office'
 'Office, Performing Arts' 'Performing Arts'
 'Office, Other - Restaurant/Bar, Performing Arts'
 'K-12 School, Office, Other - Entertainment/Public Assembly, Residence
 Hall/Dormitory'
 'Other - Lodging/Residential' 'Data Center, Office, Parking'
 'Office, Pre-school/Daycare' 'Office, Parking' 'Office, Retail Store'
 'Convenience Store without Gas Station, Office'
 'K-12 School, Office, Swimming Pool'
 'Multifamily Housing, Supermarket/Grocery Store'
 'Convenience Store without Gas Station, K-12 School, Multifamily Housing,
 Office, Other, Parking, Retail Store'
 'Multifamily Housing, Retail Store'
 'Data Center, Office, Other - Restaurant/Bar, Retail Store'
 'Financial Office, Medical Office, Office, Other, Other - Recreation,
 Restaurant'
 'Multifamily Housing, Office, Other - Recreation, Parking'
 'Multifamily Housing, Senior Care Community, Swimming Pool'
 'Data Center, Financial Office, Other'
 'Medical Office, Multifamily Housing, Parking'
 'Multifamily Housing, Office, Parking, Retail Store'
 'Multifamily Housing, Office, Retail Store'

'Fast Food Restaurant, Hotel, Other - Entertainment/Public Assembly, Restaurant, Retail Store'

'Hotel'

'Multifamily Housing, Other - Entertainment/Public Assembly, Parking, Supermarket/Grocery Store'

'Bank Branch, Office' 'Financial Office, Multifamily Housing'

'Financial Office, Office, Other'

'Convenience Store without Gas Station, Medical Office, Office, Other'

'Multifamily Housing, Other, Restaurant' 'Financial Office, Office'

'Data Center, Financial Office, Office, Parking'

'K-12 School, Office, Retail Store' 'Parking, Restaurant'

'Multifamily Housing, Repair Services (Vehicle, Shoe, Locksmith, etc.), Restaurant'

'Office, Parking, Retail Store'

'Bank Branch, Fast Food Restaurant, Multifamily Housing, Other - Entertainment/Public Assembly'

'Bank Branch, Data Center, Office'

'Bank Branch, Multifamily Housing, Parking, Supermarket/Grocery Store'

'Hotel, Multifamily Housing, Office, Retail Store'

'Office, Other, Parking, Restaurant, Self-Storage Facility'

'Data Center, Financial Office, Office, Other - Restaurant/Bar'

'Multifamily Housing, Other - Public Services'

'Food Service, Hotel, Multifamily Housing, Other'

'Multifamily Housing, Other - Restaurant/Bar'

'Financial Office, Office, Other, Other - Recreation, Retail Store'

'Bank Branch, Convenience Store without Gas Station, Office, Other - Restaurant/Bar, Personal Services (Health/Beauty, Dry Cleaning, etc.), Restaurant'

'Data Center, Office' 'Multifamily Housing, Office, Other, Retail Store'

'Data Center, Office, Retail Store'

'Medical Office, Office, Retail Store'

'Financial Office, Office, Other, Outpatient Rehabilitation/Physical Therapy'

'Food Service, Multifamily Housing, Other'

'Financial Office, Multifamily Housing, Retail Store'

'Data Center, Medical Office, Office, Other, Other - Entertainment/Public Assembly, Restaurant'

'Office, Supermarket/Grocery Store'

'Office, Other, Restaurant, Retail Store' 'Office, Other, Retail Store'

'Fast Food Restaurant, Food Service, Office, Parking, Retail Store'

'Office, Other - Entertainment/Public Assembly'

'Data Center, Financial Office, Office, Parking, Retail Store'

'K-12 School, Medical Office, Office'

'Data Center, Non-Refrigerated Warehouse, Office'

'Museum, Office, Pre-school/Daycare'

'College/University, Office, Parking' 'Financial Office'

'Data Center, Office, Other, Other - Education, Other - Entertainment/Public Assembly'

'Multifamily Housing, Other - Mall'

'Bank Branch, Multifamily Housing, Retail Store'
 'Hotel, Multifamily Housing, Other'
 'Multifamily Housing, Other - Mall, Parking'
 'Enclosed Mall, Financial Office, Multifamily Housing, Parking,
 Supermarket/Grocery Store'
 'Multifamily Housing, Restaurant'
 'Bank Branch, Office, Other, Other - Entertainment/Public Assembly'
 'Multifamily Housing, Other, Retail Store, Self-Storage Facility,
 Social/Meeting Hall'
 'Medical Office, Multifamily Housing, Office, Parking'
 'Other, Residence Hall/Dormitory, Restaurant'
 'Multifamily Housing, Parking, Swimming Pool'
 'Multifamily Housing, Other, Swimming Pool'
 'Bank Branch, Multifamily Housing, Other, Other - Recreation, Restaurant'
 'Bank Branch, Multifamily Housing'
 'Multifamily Housing, Office, Other - Mall' 'Non-Refrigerated Warehouse'
 'Food Service, Hotel' 'Multifamily Housing, Office, Other'
 'Food Service, Office'
 'Medical Office, Multifamily Housing, Other, Parking, Retail Store'
 'K-12 School, Multifamily Housing, Other - Services, Parking'
 'Multifamily Housing, Other, Retail Store' 'Data Center, Office, Other'
 'Office, Other, Other - Entertainment/Public Assembly, Retail Store'
 'Medical Office, Office, Other, Retail Store'
 'Multifamily Housing, Office, Other, Parking, Retail Store'
 'Multifamily Housing, Other, Parking, Retail Store, Social/Meeting Hall'
 'Office, Personal Services (Health/Beauty, Dry Cleaning, etc.)'
 'College/University, Office, Repair Services (Vehicle, Shoe, Locksmith, etc.),
 Restaurant'
 'Hotel, Other' 'Multifamily Housing, Other, Parking, Retail Store'
 'Non-Refrigerated Warehouse, Office, Retail Store'
 'Fitness Center/Health Club/Gym, Office, Retail Store'
 'K-12 School, Multifamily Housing, Office'
 'Multifamily Housing, Retail Store, Supermarket/Grocery Store'
 'Non-Refrigerated Warehouse, Parking'
 'Multifamily Housing, Other - Services, Restaurant, Retail Store'
 'Other - Entertainment/Public Assembly'
 'Multifamily Housing, Swimming Pool'
 'Food Service, Multifamily Housing, Other, Retail Store'
 'Residence Hall/Dormitory, Retail Store'
 'Residence Hall/Dormitory, Restaurant, Retail Store'
 'Multifamily Housing, Office, Other - Entertainment/Public Assembly, Retail
 Store'
 'Office, Restaurant, Retail Store'
 'Bank Branch, Multifamily Housing, Office'
 'Retail Store, Self-Storage Facility'
 'Financial Office, Multifamily Housing, Other, Parking'
 'Office, Other - Recreation'
 'Multifamily Housing, Office, Restaurant, Retail Store'

'Restaurant, Retail Store' 'Office, Other - Utility, Retail Store'
 'Multifamily Housing, Other, Other - Services'
 'Automobile Dealership, Office' 'Hotel, Retail Store, Swimming Pool'
 'Medical Office, Multifamily Housing, Retail Store'
 'Office, Other, Retail Store, Supermarket/Grocery Store'
 'Office, Other - Restaurant/Bar'
 'Multifamily Housing, Non-Refrigerated Warehouse, Office, Restaurant, Retail Store'
 'Hotel, Office, Restaurant, Retail Store'
 'Fast Food Restaurant, Multifamily Housing, Retail Store'
 'Laboratory, Office, Other, Other - Restaurant/Bar, Personal Services (Health/Beauty, Dry Cleaning, etc.)'
 'Bank Branch, Movie Theater, Office, Other, Other - Restaurant/Bar'
 'Bank Branch, Convenience Store without Gas Station, Food Sales, Multifamily Housing, Other - Services, Retail Store'
 'College/University, Office, Retail Store' 'Fast Food Restaurant, Office'
 'Medical Office, Multifamily Housing, Office, Retail Store'
 'Medical Office, Multifamily Housing, Other' 'Office, Other, Restaurant'
 'Manufacturing/Industrial Plant, Medical Office, Office, Residence Hall/Dormitory'
 'College/University, Other'
 'Bank Branch, Food Sales, Multifamily Housing, Parking'
 'Multifamily Housing, Office, Other, Restaurant, Retail Store, Supermarket/Grocery Store'
 'Food Sales, Multifamily Housing, Other, Other - Mall, Restaurant, Urgent Care/Clinic/Other Outpatient'
 'Medical Office, Multifamily Housing, Other, Restaurant'
 'Bank Branch, Office, Retail Store' 'College/University, Office, Other'
 'Medical Office, Multifamily Housing, Office, Parking, Retail Store'
 'Multifamily Housing, Other - Education, Parking, Retail Store'
 'Other - Recreation, Residence Hall/Dormitory, Supermarket/Grocery Store'
 'Financial Office, Multifamily Housing, Other, Retail Store, Supermarket/Grocery Store'
 'Food Sales, Multifamily Housing, Other, Other - Mall, Other - Services, Urgent Care/Clinic/Other Outpatient'
 'Medical Office, Multifamily Housing, Office'
 'Financial Office, Medical Office, Multifamily Housing, Retail Store, Supermarket/Grocery Store'
 'Multifamily Housing, Parking, Supermarket/Grocery Store'
 'Medical Office, Multifamily Housing, Restaurant, Retail Store'
 'Adult Education, Office, Other' 'Office, Self-Storage Facility'
 'Food Sales, Food Service, Office'
 'Non-Refrigerated Warehouse, Office, Other, Retail Store'
 'Financial Office, Fitness Center/Health Club/Gym, Office, Other - Restaurant/Bar'
 'Food Service, Multifamily Housing, Other, Restaurant, Retail Store'
 'K-12 School, Worship Facility' 'Distribution Center, Parking'
 'Office, Other - Services, Retail Store'

'Data Center, Office, Restaurant, Retail Store'
 'Financial Office, Office, Restaurant, Retail Store'
 'Data Center, Food Service, Office, Parking' 'Distribution Center'
 'Office, Restaurant'
 'Medical Office, Multifamily Housing, Other, Retail Store'
 'Office, Residence Hall/Dormitory, Worship Facility'
 'Urgent Care/Clinic/Other Outpatient'
 'Medical Office, Multifamily Housing, Other, Parking'
 'Financial Office, Multifamily Housing, Non-Refrigerated Warehouse, Other,
 Restaurant'
 'Multifamily Housing, Parking, Restaurant'
 'College/University, Multifamily Housing, Other, Other - Entertainment/Public
 Assembly, Other - Recreation, Social/Meeting Hall, Worship Facility'
 'Non-Refrigerated Warehouse, Office, Other, Restaurant'
 'Hotel, Restaurant, Retail Store' 'Non-Refrigerated Warehouse, Office'
 'Office, Other, Self-Storage Facility'
 'Office, Parking, Self-Storage Facility'
 'Office, Other - Entertainment/Public Assembly, Parking'
 'Parking, Retail Store' 'Other, Self-Storage Facility'
 'Multifamily Housing, Other, Other - Entertainment/Public Assembly, Retail
 Store'
 'Multifamily Housing, Other - Education, Parking'
 'Multifamily Housing, Office, Other, Other - Mall, Other - Recreation, Parking'
 'Library, Multifamily Housing, Parking, Retail Store'
 'Office, Restaurant, Urgent Care/Clinic/Other Outpatient'
 'Medical Office, Office, Other, Parking, Supermarket/Grocery Store'
 'Data Center, Medical Office, Office, Other - Restaurant/Bar, Parking, Retail
 Store'
 'Multifamily Housing, Other - Public Services, Retail Store'
 'Office, Restaurant, Supermarket/Grocery Store'
 'Hotel, Office, Other, Residence Hall/Dormitory, Restaurant'
 'Multifamily Housing, Non-Refrigerated Warehouse'
 'Convenience Store without Gas Station, Medical Office, Office, Other -
 Restaurant/Bar'
 'Office, Other, Supermarket/Grocery Store'
 'Fitness Center/Health Club/Gym, Office'
 'Food Sales, Multifamily Housing, Retail Store'
 'Other - Entertainment/Public Assembly, Residence Hall/Dormitory'
 'Office, Other, Other - Services, Retail Store'
 'Office, Other - Recreation, Social/Meeting Hall'
 'Office, Other - Education, Restaurant'
 'Multifamily Housing, Office, Restaurant'
 'Fast Food Restaurant, Office, Other, Parking, Restaurant, Retail Store'
 'Other - Mall, Parking' 'Hotel, Retail Store'
 'Office, Outpatient Rehabilitation/Physical Therapy, Vocational School'
 'Office, Other, Other - Education, Retail Store' 'Other, Retail Store'
 'Bank Branch, Office, Other, Restaurant'
 'Office, Retail Store, Self-Storage Facility'

'Non-Refrigerated Warehouse, Office, Other'
 'Office, Other, Other - Restaurant/Bar'
 'Data Center, Non-Refrigerated Warehouse, Retail Store'
 'Office, Other - Education, Retail Store'
 'Multifamily Housing, Office, Parking' 'Adult Education, Office'
 'Bank Branch, Multifamily Housing, Parking, Retail Store'
 'Courthouse, Office, Other, Retail Store'
 'Multifamily Housing, Pre-school/Daycare'
 'Fast Food Restaurant, Multifamily Housing, Office, Other - Services,
 Restaurant'
 'Manufacturing/Industrial Plant, Office, Retail Store'
 'Financial Office, Medical Office, Office'
 'Multifamily Housing, Other - Lodging/Residential, Retail Store'
 'Office, Residence Hall/Dormitory, Restaurant'
 'Office, Other - Entertainment/Public Assembly, Residence Hall/Dormitory'
 'Bank Branch, Multifamily Housing, Other'
 'Hotel, Multifamily Housing, Other, Parking, Restaurant'
 'Bank Branch, Fast Food Restaurant, Office, Other'
 'Fast Food Restaurant, Office, Retail Store'
 'Fast Food Restaurant, Office, Restaurant, Retail Store'
 'Office, Social/Meeting Hall'
 'Fitness Center/Health Club/Gym, Office, Other'
 'Financial Office, Office, Restaurant' 'Bank Branch, Parking, Restaurant'
 'Convenience Store without Gas Station, Food Sales, Mailing Center/Post Office,
 Office, Restaurant'
 'Bank Branch, Fast Food Restaurant, Office' 'Hotel, Multifamily Housing'
 'Medical Office, Multifamily Housing, Office, Other, Parking'
 'Medical Office, Office, Other - Mall, Restaurant' 'K-12 School, Office'
 'K-12 School, Office, Other - Education, Retail Store'
 'Multifamily Housing, Other, Other - Education' 'Bar/Nightclub, Office'
 'Library, Office'
 'Office, Personal Services (Health/Beauty, Dry Cleaning, etc.), Retail Store'
 'Multifamily Housing, Other, Parking, Restaurant, Retail Store'
 'Financial Office, Office, Retail Store'
 'Bar/Nightclub, Office, Other - Restaurant/Bar'
 'Financial Office, Multifamily Housing, Parking'
 'Distribution Center, Non-Refrigerated Warehouse, Office, Retail Store'
 'Multifamily Housing, Other, Parking, Restaurant'
 'Office, Other - Entertainment/Public Assembly, Restaurant, Retail Store'
 'Hotel, Multifamily Housing, Retail Store'
 'Multifamily Housing, Other, Parking, Retail Store, Supermarket/Grocery Store'
 'Multifamily Housing, Other - Restaurant/Bar, Retail Store'
 'Non-Refrigerated Warehouse, Retail Store' 'Food Service, Office, Other'
 'Bank Branch, Multifamily Housing, Office, Retail Store'
 'Other - Restaurant/Bar, Parking'
 'Multifamily Housing, Office, Other, Retail Store, Supermarket/Grocery Store'
 'Fast Food Restaurant, Food Service, Office, Other - Recreation'
 'Data Center, Financial Office, Office, Restaurant, Retail Store'

'Financial Office, Multifamily Housing, Other'
 'Financial Office, Office, Personal Services (Health/Beauty, Dry Cleaning, etc.)'
 'Fast Food Restaurant, Financial Office, Office'
 'Fast Food Restaurant, Non-Refrigerated Warehouse, Office'
 'Fitness Center/Health Club/Gym, Medical Office, Office'
 'Bank Branch, Office, Other, Parking, Restaurant, Retail Store'
 'Office, Other - Mall'
 'Adult Education, Financial Office, Office, Other - Restaurant/Bar'
 'College/University, Data Center, Library, Office'
 'Multifamily Housing, Outpatient Rehabilitation/Physical Therapy'
 'Hotel, Office, Other - Restaurant/Bar, Social/Meeting Hall'
 'Fast Food Restaurant, Financial Office, Office, Retail Store'
 'Convenience Store without Gas Station, Hotel' 'Museum, Office'
 'Bank Branch, Fast Food Restaurant, Office, Other, Parking'
 'Fast Food Restaurant, Office, Other - Restaurant/Bar'
 'Multifamily Housing, Office, Other - Entertainment/Public Assembly, Parking, Retail Store, Swimming Pool'
 'Financial Office, Medical Office, Office, Restaurant'
 'Multifamily Housing, Urgent Care/Clinic/Other Outpatient'
 'Financial Office, Residence Hall/Dormitory'
 'Medical Office, Multifamily Housing, Restaurant'
 'College/University, Financial Office, Office, Other, Other - Entertainment/Public Assembly, Other - Restaurant/Bar, Retail Store, Self-Storage Facility'
 'Food Sales, Multifamily Housing, Other - Mall, Other - Recreation'
 'Bank Branch, Office, Other'
 'Multifamily Housing, Office, Other, Parking'
 'Multifamily Housing, Restaurant, Retail Store'
 'Mailing Center/Post Office, Multifamily Housing'
 'Hotel, Office, Parking, Residence Hall/Dormitory, Worship Facility'
 'Fast Food Restaurant, Office, Other - Recreation'
 'Multifamily Housing, Other - Services, Retail Store, Supermarket/Grocery Store'
 'Financial Office, Medical Office, Multifamily Housing'
 'Medical Office, Multifamily Housing, Parking, Retail Store'
 'Hotel, Other - Entertainment/Public Assembly'
 'Ambulatory Surgical Center'
 'Multifamily Housing, Parking, Retail Store, Supermarket/Grocery Store'
 'Food Sales, Medical Office, Multifamily Housing, Other, Other - Mall, Other - Services'
 'Medical Office, Office, Other - Education'
 'Bank Branch, Multifamily Housing, Restaurant'
 'Multifamily Housing, Other, Parking, Urgent Care/Clinic/Other Outpatient'
 'Financial Office, Fitness Center/Health Club/Gym, Office'
 'Data Center, Financial Office, Office, Other, Retail Store'
 'Office, Other, Other - Entertainment/Public Assembly, Restaurant'
 'Financial Office, Office, Parking, Retail Store' 'Hotel, Swimming Pool'

'Financial Office, Food Service, Office, Other, Retail Store'
 'Data Center, Fast Food Restaurant, Office, Parking, Restaurant'
 'Data Center, Fast Food Restaurant, Office, Other, Restaurant, Retail Store'
 'Financial Office, Food Service, Office, Parking, Restaurant, Retail Store'
 'Data Center, Financial Office, Office, Other, Parking, Retail Store'
 'Hotel, Parking' 'Data Center, Office, Parking, Retail Store'
 'Office, Other, Social/Meeting Hall'
 'Medical Office, Multifamily Housing, Office, Parking, Restaurant'
 'Fast Food Restaurant, Office, Restaurant' 'Hotel, Restaurant'
 'Food Service, Office, Outpatient Rehabilitation/Physical Therapy'
 'Hotel, Multifamily Housing, Parking, Retail Store'
 'Data Center, Food Service, Office, Other, Social/Meeting Hall'
 'Financial Office, Food Sales, Office, Other, Parking, Retail Store'
 'Financial Office, Non-Refrigerated Warehouse, Office, Restaurant, Retail Store'
 'Food Service, Multifamily Housing, Retail Store'
 'Food Sales, Office, Other, Retail Store, Vocational School'
 'Data Center, Office, Other, Other - Recreation'
 'Hotel, Office, Other, Parking, Retail Store, Swimming Pool'
 'Hotel, Parking, Restaurant'
 'Other - Entertainment/Public Assembly, Restaurant, Retail Store'
 'Office, Parking, Performing Arts'
 'Multifamily Housing, Parking, Restaurant, Retail Store'
 'Bank Branch, Office, Other - Entertainment/Public Assembly, Outpatient Rehabilitation/Physical Therapy, Parking'
 'Hotel, Other - Entertainment/Public Assembly, Retail Store'
 'Multifamily Housing, Retail Store, Self-Storage Facility'
 'Hotel, Other - Lodging/Residential, Restaurant'
 'Office, Parking, Restaurant' 'Museum'
 'K-12 School, Residence Hall/Dormitory'
 'Multifamily Housing, Other - Public Services, Parking'
 'Fast Food Restaurant, Office, Residence Hall/Dormitory, Restaurant, Social/Meeting Hall'
 'Multifamily Housing, Other, Parking, Restaurant, Supermarket/Grocery Store'
 'Food Sales, Multifamily Housing, Other, Other - Mall, Other - Services, Parking'
 'Data Center, Hotel, Office, Parking, Residence Hall/Dormitory, Retail Store, Supermarket/Grocery Store'
 'Multifamily Housing, Other - Entertainment/Public Assembly, Retail Store'
 'Hotel, Multifamily Housing, Other, Other - Entertainment/Public Assembly, Other - Mall, Parking, Restaurant, Supermarket/Grocery Store'
 'Bank Branch, Food Sales, Food Service, Multifamily Housing, Office, Parking, Restaurant, Retail Store, Supermarket/Grocery Store'
 'Medical Office, Multifamily Housing, Office, Other, Retail Store'
 'Office, Other, Retail Store, Urgent Care/Clinic/Other Outpatient'
 'Food Service, Multifamily Housing, Office, Other'
 'Distribution Center, Office'
 'Food Service, Multifamily Housing, Office, Other, Parking, Restaurant, Retail

Store, Supermarket/Grocery Store'

'Fast Food Restaurant, Hotel, Parking'

'Multifamily Housing, Other - Recreation, Parking, Restaurant, Retail Store'

'Automobile Dealership' 'Office, Urgent Care/Clinic/Other Outpatient'

'Bowling Alley, Fitness Center/Health Club/Gym, Multifamily Housing, Parking, Personal Services (Health/Beauty, Dry Cleaning, etc.), Restaurant, Swimming Pool'

'Enclosed Mall, Fitness Center/Health Club/Gym, Multifamily Housing, Parking, Supermarket/Grocery Store, Swimming Pool'

'Multifamily Housing, Social/Meeting Hall'

'Non-Refrigerated Warehouse, Office, Parking'

'Multifamily Housing, Parking, Retail Store, Swimming Pool'

'Fast Food Restaurant, Office, Other, Restaurant'

'Financial Office, Multifamily Housing, Other, Parking, Retail Store'

'Fast Food Restaurant, Hotel, Restaurant, Retail Store'

'Hotel, Office, Other, Swimming Pool'

'Multifamily Housing, Other - Recreation'

'Food Sales, Multifamily Housing, Office, Other - Services, Parking, Worship Facility'

'Financial Office, Office, Parking, Restaurant'

'Hotel, Non-Refrigerated Warehouse, Other, Supermarket/Grocery Store'

'Multifamily Housing, Other - Recreation, Retail Store'

'Multifamily Housing, Parking, Personal Services (Health/Beauty, Dry Cleaning, etc.), Retail Store'

'Multifamily Housing, Personal Services (Health/Beauty, Dry Cleaning, etc.), Restaurant, Retail Store'

'Bank Branch, Multifamily Housing, Retail Store, Supermarket/Grocery Store'

'Medical Office, Multifamily Housing, Other - Recreation'

'Financial Office, K-12 School, Medical Office, Multifamily Housing, Office, Other, Parking, Retail Store'

'Social/Meeting Hall, Swimming Pool'

'Hotel, Other, Restaurant, Supermarket/Grocery Store'

'Bank Branch, Food Sales, Food Service, Medical Office, Multifamily Housing, Parking'

'Food Sales, Multifamily Housing, Parking, Pre-school/Daycare, Retail Store, Worship Facility'

'Multifamily Housing, Other, Outpatient Rehabilitation/Physical Therapy'

'K-12 School, Multifamily Housing, Other - Entertainment/Public Assembly'

'Fast Food Restaurant, Multifamily Housing, Restaurant, Retail Store'

'Financial Office, Medical Office, Multifamily Housing, Other, Parking, Retail Store'

'Bank Branch, Food Service, Medical Office, Multifamily Housing, Other, Parking, Personal Services (Health/Beauty, Dry Cleaning, etc.)'

'Food Sales, Multifamily Housing, Office, Other, Retail Store'

'Multifamily Housing, Other - Services, Restaurant, Retail Store, Supermarket/Grocery Store'

'Data Center, Office, Parking, Restaurant' 'Office, Worship Facility'

'Financial Office, Office, Other, Parking'

'College/University, Mailing Center/Post Office, Office'
 'Data Center, Financial Office'
 'Convenience Store without Gas Station, Fitness Center/Health Club/Gym, Office, Restaurant'
 'Fast Food Restaurant, Mailing Center/Post Office, Office'
 'Fast Food Restaurant, Office, Other, Retail Store'
 'Office, Other - Entertainment/Public Assembly, Other - Recreation, Restaurant, Retail Store'
 'Bank Branch, Convenience Store without Gas Station, Fast Food Restaurant, Financial Office, Medical Office, Office, Restaurant'
 'Bank Branch, Fast Food Restaurant, Office, Other, Parking, Repair Services (Vehicle, Shoe, Locksmith, etc.), Retail Store'
 'Hotel, Office, Other, Restaurant'
 'Medical Office, Multifamily Housing, Parking, Restaurant'
 'Bank Branch, Financial Office, Office, Restaurant, Retail Store'
 'Financial Office, Office, Other, Parking, Retail Store'
 'Medical Office, Other'
 'Bar/Nightclub, Fast Food Restaurant, Financial Office, Office, Retail Store'
 'Bank Branch, Fast Food Restaurant, Financial Office, Office, Restaurant'
 'Bank Branch, Fast Food Restaurant, Office, Retail Store'
 'Fitness Center/Health Club/Gym, Office, Restaurant, Retail Store'
 'Fast Food Restaurant, Office, Other, Other - Restaurant/Bar, Restaurant, Retail Store'
 'Fitness Center/Health Club/Gym, Food Service, Office'
 'K-12 School, Office, Parking, Restaurant'
 'Food Service, Medical Office, Office, Other'
 'Bank Branch, Data Center, Financial Office'
 'Data Center, Food Service, Office, Other, Retail Store'
 'Data Center, Financial Office, Office, Other - Recreation, Restaurant'
 'Office, Outpatient Rehabilitation/Physical Therapy, Personal Services (Health/Beauty, Dry Cleaning, etc.)'
 'Multifamily Housing, Other, Parking, Restaurant, Social/Meeting Hall'
 'Financial Office, Office, Restaurant, Self-Storage Facility'
 'Bank Branch, Medical Office, Office'
 'Office, Other - Entertainment/Public Assembly, Retail Store'
 'Hotel, Office, Other - Services, Other - Utility, Restaurant, Self-Storage Facility, Social/Meeting Hall'
 'Bank Branch, Data Center, Financial Office, Movie Theater, Office, Retail Store'
 'Office, Parking, Social/Meeting Hall'
 'Financial Office, Medical Office, Office, Other'
 'Data Center, Food Service, Office'
 'Fast Food Restaurant, Library, Office, Parking, Retail Store'
 'Financial Office, Food Service, Office, Restaurant'
 'Hotel, Office, Retail Store'
 'Convenience Store without Gas Station, Financial Office, Office, Restaurant'
 'Fitness Center/Health Club/Gym, Pre-school/Daycare, Restaurant, Social/Meeting Hall, Swimming Pool, Worship Facility'

'Food Sales, Food Service, Library, Office'
 'Fast Food Restaurant, Multifamily Housing'
 'Food Sales, Hotel, Retail Store'
 'Financial Office, Office, Other, Parking, Restaurant'
 'Fitness Center/Health Club/Gym, Office, Other, Parking, Retail Store'
 'Data Center, Financial Office, Office, Retail Store'
 'Bank Branch, Data Center, Office, Retail Store'
 'Multifamily Housing, Office, Personal Services (Health/Beauty, Dry Cleaning, etc.), Retail Store'
 'Financial Office, Medical Office, Office, Retail Store'
 'Multifamily Housing, Other, Urgent Care/Clinic/Other Outpatient'
 'Fast Food Restaurant, Library, Medical Office, Office, Parking'
 'Bank Branch, Data Center, Fast Food Restaurant, Multifamily Housing, Office, Restaurant, Retail Store, Wholesale Club/Supercenter'
 'Financial Office, Fitness Center/Health Club/Gym, Non-Refrigerated Warehouse, Office, Other, Restaurant, Self-Storage Facility'
 'Bank Branch, Office, Retail Store, Self-Storage Facility'
 'Office, Retail Store, Supermarket/Grocery Store' 'Food Sales, Office'
 'Hotel, K-12 School, Office, Other - Entertainment/Public Assembly, Swimming Pool'
 'Data Center, Office, Other, Parking'
 'K-12 School, Multifamily Housing, Other'
 'Financial Office, Office, Other, Retail Store'
 'Bank Branch, Multifamily Housing, Parking'
 'Multifamily Housing, Office, Other - Recreation, Retail Store'
 'Multifamily Housing, Other - Education, Retail Store' 'Hotel, Office'
 'K-12 School, Office, Other, Worship Facility'
 'Convenience Store without Gas Station, Multifamily Housing, Other'
 'K-12 School, Multifamily Housing'
 'Library, Multifamily Housing, Other, Retail Store, Worship Facility'
 'Medical Office, Multifamily Housing, Parking, Urgent Care/Clinic/Other Outpatient'
 'Library, Museum'
 'Multifamily Housing, Other, Outpatient Rehabilitation/Physical Therapy, Parking'
 'Multifamily Housing, Other, Other - Recreation'
 'Multifamily Housing, Retail Store, Urgent Care/Clinic/Other Outpatient'
 'Financial Office, Medical Office, Multifamily Housing, Parking, Retail Store'
 'Financial Office, Multifamily Housing, Parking, Retail Store'
 'Multifamily Housing, Other - Services, Parking, Retail Store'
 'Multifamily Housing, Office, Other, Parking, Restaurant'
 'Financial Office, Multifamily Housing, Other, Outpatient Rehabilitation/Physical Therapy'
 'Financial Office, Multifamily Housing, Office, Retail Store'
 'Multifamily Housing, Other, Outpatient Rehabilitation/Physical Therapy, Retail Store, Supermarket/Grocery Store'
 'College/University, Multifamily Housing'
 'Office, Outpatient Rehabilitation/Physical Therapy'

'Medical Office, Multifamily Housing, Office, Retail Store, Supermarket/Grocery Store'
 'Data Center, Other'
 'Multifamily Housing, Other, Other - Recreation, Other - Services, Restaurant'
 'Other - Entertainment/Public Assembly, Self-Storage Facility'
 'Medical Office, Parking' 'Laboratory'
 'Multifamily Housing, Office, Parking, Restaurant, Retail Store'
 'Financial Office, Multifamily Housing, Other - Education, Outpatient Rehabilitation/Physical Therapy, Retail Store, Supermarket/Grocery Store'
 'Medical Office, Multifamily Housing, Other, Parking, Swimming Pool'
 'Data Center, Hotel, Library, Medical Office, Non-Refrigerated Warehouse, Office, Other, Residence Hall/Dormitory, Restaurant'
 'Financial Office, Multifamily Housing, Office, Other - Services, Outpatient Rehabilitation/Physical Therapy, Supermarket/Grocery Store'
 'Non-Refrigerated Warehouse, Other - Entertainment/Public Assembly, Retail Store'
 'Hospital (General Medical & Surgical), Multifamily Housing, Parking'
 'Hospital (General Medical & Surgical), Multifamily Housing'
 'Food Sales, Medical Office, Multifamily Housing, Other, Retail Store'
 'Multifamily Housing, Parking, Urgent Care/Clinic/Other Outpatient'
 'Multifamily Housing, Office, Parking, Supermarket/Grocery Store'
 'Multifamily Housing, Other - Entertainment/Public Assembly, Retail Store, Swimming Pool'
 'Residential Care Facility'
 'Food Sales, Food Service, Multifamily Housing, Other, Other - Mall, Other - Services'
 'Fitness Center/Health Club/Gym, Multifamily Housing, Retail Store'
 'Multifamily Housing, Other, Parking, Swimming Pool'
 'Medical Office, Multifamily Housing, Parking, Supermarket/Grocery Store'
 'Multifamily Housing, Office, Retail Store, Swimming Pool'
 'Multifamily Housing, Other, Other - Mall, Other - Services, Urgent Care/Clinic/Other Outpatient'
 'Financial Office, Multifamily Housing, Office, Parking, Supermarket/Grocery Store'
 'Food Sales, Multifamily Housing, Other, Parking'
 'Hotel, K-12 School, Office'
 'Residence Hall/Dormitory, Supermarket/Grocery Store'
 'Financial Office, Multifamily Housing, Other, Other - Recreation, Restaurant'
 'Bank Branch, K-12 School, Multifamily Housing, Retail Store, Supermarket/Grocery Store'
 'Outpatient Rehabilitation/Physical Therapy, Parking'
 'Outpatient Rehabilitation/Physical Therapy'
 'K-12 School, Multifamily Housing, Office, Supermarket/Grocery Store'
 'Multifamily Housing, Personal Services (Health/Beauty, Dry Cleaning, etc.), Retail Store, Urgent Care/Clinic/Other Outpatient'
 'Ambulatory Surgical Center, Multifamily Housing, Other - Recreation, Parking, Restaurant'
 'K-12 School, Multifamily Housing, Parking'

'Fast Food Restaurant, Multifamily Housing, Other, Retail Store'
 'K-12 School, Multifamily Housing, Other, Supermarket/Grocery Store'
 'Bank Branch, Office, Parking, Retail Store'
 'K-12 School, Multifamily Housing, Office, Parking'
 'Other - Education, Worship Facility'
 'College/University, Urgent Care/Clinic/Other Outpatient'
 'Multifamily Housing, Other - Entertainment/Public Assembly'
 'Multifamily Housing, Office, Supermarket/Grocery Store'
 'Multifamily Housing, Office, Other, Other - Entertainment/Public Assembly,
 Worship Facility'
 'Laboratory, Medical Office, Multifamily Housing'
 'Bank Branch, K-12 School, Multifamily Housing, Parking, Restaurant, Retail
 Store'
 'K-12 School, Multifamily Housing, Retail Store'
 'Food Sales, K-12 School, Multifamily Housing, Other, Retail Store'
 'Other, Residence Hall/Dormitory'
 'Multifamily Housing, Parking, Pre-school/Daycare'
 'Bank Branch, Multifamily Housing, Parking, Retail Store, Supermarket/Grocery
 Store'
 'Multifamily Housing, Worship Facility'
 'Food Sales, Multifamily Housing, Office, Other'
 'Fast Food Restaurant, Financial Office, Multifamily Housing, Other'
 'Fast Food Restaurant, Hotel, Retail Store'
 'Fast Food Restaurant, Fitness Center/Health Club/Gym, Office, Retail Store'
 'K-12 School, Multifamily Housing, Other, Restaurant'
 'Multifamily Housing, Other - Services'
 'Multifamily Housing, Other - Recreation, Retail Store, Supermarket/Grocery
 Store'
 'Other - Mall' 'College/University, Multifamily Housing, Office, Parking'
 'Multifamily Housing, Other, Restaurant, Retail Store, Supermarket/Grocery
 Store'
 'Multifamily Housing, Other - Recreation, Parking, Restaurant'
 'Financial Office, Medical Office, Multifamily Housing, Office, Parking, Retail
 Store'
 'K-12 School, Non-Refrigerated Warehouse, Supermarket/Grocery Store'
 'Convenience Store without Gas Station, Multifamily Housing, Restaurant'
 'Fast Food Restaurant, Medical Office, Multifamily Housing, Other'
 'Multifamily Housing, Other, Restaurant, Supermarket/Grocery Store'
 'Multifamily Housing, Retail Store, Supermarket/Grocery Store, Worship
 Facility'
 'Convenience Store without Gas Station, Multifamily Housing, Personal Services
 (Health/Beauty, Dry Cleaning, etc.)'
 'Convenience Store without Gas Station, Multifamily Housing, Personal Services
 (Health/Beauty, Dry Cleaning, etc.), Restaurant'
 'Medical Office, Office, Urgent Care/Clinic/Other Outpatient'
 'Multifamily Housing, Other, Residence Hall/Dormitory'
 'Food Sales, Medical Office, Multifamily Housing, Office, Retail Store'
 'Fast Food Restaurant, Medical Office, Multifamily Housing, Office, Other -

Services, Retail Store'
 'Food Service, Multifamily Housing'
 'Multifamily Housing, Other, Retail Store, Supermarket/Grocery Store'
 'Convenience Store without Gas Station, Multifamily Housing, Outpatient
 Rehabilitation/Physical Therapy, Personal Services (Health/Beauty, Dry Cleaning,
 etc.), Restaurant'
 'Multifamily Housing, Other - Public Services, Personal Services
 (Health/Beauty, Dry Cleaning, etc.), Restaurant, Retail Store'
 'Medical Office, Multifamily Housing, Other, Restaurant, Retail Store'
 'Convenience Store without Gas Station, Multifamily Housing, Other, Other -
 Services, Retail Store'
 'Multifamily Housing, Other, Supermarket/Grocery Store'
 'Multifamily Housing, Office, Other, Restaurant, Supermarket/Grocery Store'
 'Multifamily Housing, Restaurant, Retail Store, Supermarket/Grocery Store'
 'Convenience Store without Gas Station, Multifamily Housing, Other, Retail
 Store'
 'Multifamily Housing, Office, Other - Restaurant/Bar'
 'Financial Office, Multifamily Housing, Personal Services (Health/Beauty, Dry
 Cleaning, etc.), Restaurant'
 'Convenience Store without Gas Station, Medical Office, Multifamily Housing,
 Personal Services (Health/Beauty, Dry Cleaning, etc.)'
 'Strip Mall'
 'Multifamily Housing, Office, Other - Services, Restaurant, Retail Store,
 Supermarket/Grocery Store'
 'Fast Food Restaurant, Multifamily Housing, Other, Restaurant, Retail Store'
 'Multifamily Housing, Other, Other - Restaurant/Bar, Personal Services
 (Health/Beauty, Dry Cleaning, etc.)'
 'Multifamily Housing, Office, Restaurant, Retail Store, Supermarket/Grocery
 Store'
 'College/University, Medical Office, Office, Other, Retail Store, Self-Storage
 Facility'
 'K-12 School, Multifamily Housing, Worship Facility' 'Pre-school/Daycare'
 'Supermarket/Grocery Store' 'Office, Other, Parking'
 'Fast Food Restaurant, Medical Office, Retail Store, Supermarket/Grocery Store'
 'Manufacturing/Industrial Plant, Non-Refrigerated Warehouse, Office, Other'
 'Bank Branch, Office, Parking' 'Other - Mall, Restaurant, Retail Store'
 'K-12 School, Parking, Residence Hall/Dormitory'
 'Mailing Center/Post Office' 'Food Sales, Multifamily Housing, Other'
 'Multifamily Housing, Parking, Personal Services (Health/Beauty, Dry Cleaning,
 etc.)'
 'Distribution Center, Non-Refrigerated Warehouse, Office, Other - Services'
 'Distribution Center, Office, Parking'
 'Convenience Store without Gas Station, Multifamily Housing, Office'
 'Office, Refrigerated Warehouse' 'Non-Refrigerated Warehouse, Other'
 'Distribution Center, Refrigerated Warehouse'
 'Non-Refrigerated Warehouse, Office, Refrigerated Warehouse'
 'Multifamily Housing, Office, Other, Other - Entertainment/Public Assembly'
 'Multifamily Housing, Office, Other, Other - Entertainment/Public Assembly,

Parking'

'Multifamily Housing, Office, Other, Supermarket/Grocery Store'

'Fast Food Restaurant, Multifamily Housing, Other - Services, Supermarket/Grocery Store'

'Multifamily Housing, Other - Services, Supermarket/Grocery Store'

'Multifamily Housing, Office, Retail Store, Supermarket/Grocery Store'

'Convenience Store without Gas Station, Multifamily Housing'

'Multifamily Housing, Other, Personal Services (Health/Beauty, Dry Cleaning, etc.), Restaurant'

'Multifamily Housing, Other, Worship Facility'

'Convenience Store without Gas Station, Multifamily Housing, Other, Parking, Personal Services (Health/Beauty, Dry Cleaning, etc.), Supermarket/Grocery Store'

'Medical Office, Retail Store, Supermarket/Grocery Store'

'K-12 School, Medical Office, Multifamily Housing'

'Food Sales, Multifamily Housing'

'Medical Office, Multifamily Housing, Office, Other, Other - Entertainment/Public Assembly'

'K-12 School, Medical Office, Office, Other, Retail Store'

'College/University, Retail Store'

'Multifamily Housing, Other, Retail Store, Supermarket/Grocery Store, Urgent Care/Clinic/Other Outpatient'

'Parking, Senior Care Community'

'Food Sales, Multifamily Housing, Other, Other - Services'

'Medical Office, Multifamily Housing, Supermarket/Grocery Store'

'Non-Refrigerated Warehouse, Supermarket/Grocery Store'

'Other - Entertainment/Public Assembly, Parking'

'Restaurant, Retail Store, Supermarket/Grocery Store'

'K-12 School, Medical Office'

'Financial Office, Medical Office, Multifamily Housing, Retail Store'

'Parking, Self-Storage Facility'

'Multifamily Housing, Other, Outpatient Rehabilitation/Physical Therapy, Repair Services (Vehicle, Shoe, Locksmith, etc.), Retail Store'

'Medical Office, Parking, Retail Store'

'Parking, Residential Care Facility'

'K-12 School, Other - Lodging/Residential'

'Medical Office, Office, Other, Retail Store, Supermarket/Grocery Store'

'Multifamily Housing, Parking, Self-Storage Facility'

'Medical Office, Multifamily Housing, Parking, Self-Storage Facility'

'Medical Office, Multifamily Housing, Other - Services, Supermarket/Grocery Store'

'Multifamily Housing, Other - Education, Parking, Pre-school/Daycare, Retail Store'

'Other - Technology/Science' 'Courthouse, Office'

'Fitness Center/Health Club/Gym, Residence Hall/Dormitory, Retail Store'

'Data Center, K-12 School, Medical Office, Office, Other, Other - Entertainment/Public Assembly, Parking, Retail Store'

'Convenience Store without Gas Station, Multifamily Housing, Parking'

'Office, Other - Recreation, Retail Store'
 'Other - Entertainment/Public Assembly, Retail Store'
 'Medical Office, Multifamily Housing, Office, Other, Restaurant, Retail Store'
 'Financial Office, Non-Refrigerated Warehouse, Retail Store,
 Supermarket/Grocery Store'
 'Wholesale Club/Supercenter'
 'Convenience Store without Gas Station, Medical Office, Multifamily Housing,
 Parking, Pre-school/Daycare'
 'Data Center, Non-Refrigerated Warehouse, Office, Other'
 'Manufacturing/Industrial Plant, Other'
 'Distribution Center, Non-Refrigerated Warehouse, Office'
 'Multifamily Housing, Senior Care Community'
 'Hospital (General Medical & Surgical), Other - Specialty Hospital'
 'Multifamily Housing, Parking, Social/Meeting Hall'
 'Medical Office, Multifamily Housing, Parking, Social/Meeting Hall'
 'Office, Other - Entertainment/Public Assembly, Residence Hall/Dormitory,
 Swimming Pool'
 'Office, Other, Other - Recreation, Worship Facility'
 'Convenience Store without Gas Station, Food Sales, Multifamily Housing, Other,
 Restaurant'
 'Other - Services'
 'Other, Other - Public Services, Wholesale Club/Supercenter'
 'Convenience Store without Gas Station, Multifamily Housing, Pre-
 school/Daycare'
 'Medical Office, Multifamily Housing, Parking, Restaurant, Supermarket/Grocery
 Store'
 'Distribution Center, Non-Refrigerated Warehouse, Office, Other, Refrigerated
 Warehouse'
 'Multifamily Housing, Office, Pre-school/Daycare'
 'Medical Office, Multifamily Housing, Self-Storage Facility, Social/Meeting
 Hall'
 'Multifamily Housing, Other, Retail Store, Swimming Pool'
 'Bank Branch, Fitness Center/Health Club/Gym, Multifamily Housing, Parking,
 Retail Store'
 'Multifamily Housing, Non-Refrigerated Warehouse, Office'
 'Distribution Center, Parking, Refrigerated Warehouse'
 'Food Sales, Multifamily Housing, Office' 'Refrigerated Warehouse'
 'Parking, Refrigerated Warehouse' 'Parking, Supermarket/Grocery Store'
 'Multifamily Housing, Office, Other, Outpatient Rehabilitation/Physical
 Therapy'
 'Office, Restaurant, Retail Store, Supermarket/Grocery Store'
 'Adult Education' 'Distribution Center, Non-Refrigerated Warehouse'
 'Manufacturing/Industrial Plant, Office'
 'Distribution Center, Office, Refrigerated Warehouse, Self-Storage Facility'
 'Medical Office, Multifamily Housing, Other, Other - Services,
 Supermarket/Grocery Store'
 'Food Sales, Multifamily Housing, Other - Technology/Science, Other - Utility,
 Personal Services (Health/Beauty, Dry Cleaning, etc.), Retail Store'

'Medical Office, Multifamily Housing, Other - Services, Retail Store'
 'Medical Office, Multifamily Housing, Office, Other, Supermarket/Grocery Store'
 'Hospital (General Medical & Surgical), Parking' 'K-12 School, Parking'
 'Medical Office, Multifamily Housing, Other - Recreation, Retail Store'
 'K-12 School, Swimming Pool'
 'Food Service, Multifamily Housing, Parking, Pre-school/Daycare, Retail Store'
 'Medical Office, Multifamily Housing, Retail Store, Supermarket/Grocery Store'
 'Other - Public Services' 'Retail Store, Strip Mall'
 'Other, Parking, Retail Store'
 'Parking, Retail Store, Wholesale Club/Supercenter'
 'Food Service, K-12 School, Office, Other, Other - Education, Other -
 Recreation, Swimming Pool'
 'Non-Refrigerated Warehouse, Office, Parking, Repair Services (Vehicle, Shoe,
 Locksmith, etc.)'
 'Medical Office, Non-Refrigerated Warehouse, Office'
 'Office, Other - Entertainment/Public Assembly, Worship Facility'
 'Distribution Center, Other'
 'Financial Office, Library, Office, Restaurant'
 'Distribution Center, Manufacturing/Industrial Plant, Office'
 'Other, Other - Mall, Restaurant, Supermarket/Grocery Store'
 'Automobile Dealership, Retail Store'
 'Medical Office, Multifamily Housing, Non-Refrigerated Warehouse,
 Supermarket/Grocery Store'
 'Other, Parking, Supermarket/Grocery Store'
 'Repair Services (Vehicle, Shoe, Locksmith, etc.)'
 'Manufacturing/Industrial Plant, Multifamily Housing'
 'Office, Other, Refrigerated Warehouse, Retail Store'
 'Fire Station, Office' 'Office, Other, Parking, Retail Store'
 'Distribution Center, Non-Refrigerated Warehouse, Other'
 'Multifamily Housing, Parking, Retail Store, Self-Storage Facility'
 'Mailing Center/Post Office, Office, Other, Parking'
 'Non-Refrigerated Warehouse, Self-Storage Facility'
 'Multifamily Housing, Other, Parking, Worship Facility'
 'Medical Office, Office, Other - Restaurant/Bar, Parking'
 'Non-Refrigerated Warehouse, Office, Other - Services'
 'Other, Restaurant, Retail Store, Supermarket/Grocery Store'
 'Financial Office, Office, Parking, Retail Store, Supermarket/Grocery Store,
 Urgent Care/Clinic/Other Outpatient'
 'Medical Office, Multifamily Housing, Other - Services'
 'Automobile Dealership, Multifamily Housing, Other'
 'Multifamily Housing, Other - Education' 'Library, Multifamily Housing'
 'Other - Mall, Parking, Restaurant, Supermarket/Grocery Store'
 'Office, Other - Services'
 'Medical Office, Multifamily Housing, Office, Other - Services, Parking'
 'Medical Office, Multifamily Housing, Office, Other'
 'Medical Office, Office, Parking'
 'Energy/Power Station, Parking, Retail Store'
 'Non-Refrigerated Warehouse, Parking, Refrigerated Warehouse'

'Non-Refrigerated Warehouse, Office, Other, Parking, Repair Services (Vehicle, Shoe, Locksmith, etc.)'

'Non-Refrigerated Warehouse, Refrigerated Warehouse'

'Courthouse, Office, Parking'

'Distribution Center, Non-Refrigerated Warehouse, Office, Other'

'Medical Office, Multifamily Housing, Office, Other - Services'

'Office, Other, Parking, Restaurant, Retail Store'

'Financial Office, Medical Office, Office, Other, Retail Store'

'Fast Food Restaurant, Multifamily Housing, Office, Other - Services, Restaurant, Retail Store, Supermarket/Grocery Store'

'Medical Office, Office, Self-Storage Facility'

'Distribution Center, Non-Refrigerated Warehouse, Refrigerated Warehouse'

'Parking, Urgent Care/Clinic/Other Outpatient' 'Food Service'

'Financial Office, Office, Retail Store, Supermarket/Grocery Store'

'Bank Branch, Fast Food Restaurant, Office, Other, Other - Entertainment/Public Assembly, Other - Mall, Other - Recreation, Restaurant, Retail Store, Supermarket/Grocery Store'

'Financial Office, Food Service, Other, Retail Store, Supermarket/Grocery Store'

'Hotel, Multifamily Housing, Other - Mall, Other - Recreation, Parking'

'Office, Other, Other - Mall, Parking, Restaurant'

'Multifamily Housing, Other - Recreation, Parking'

'Fast Food Restaurant, Medical Office, Multifamily Housing, Other, Restaurant, Supermarket/Grocery Store'

'Financial Office, Medical Office, Office, Parking, Retail Store'

'Bank Branch, Other, Parking, Retail Store, Supermarket/Grocery Store'

'K-12 School, Medical Office, Multifamily Housing, Office, Other'

'Office, Other - Services, Parking'

'Parking, Repair Services (Vehicle, Shoe, Locksmith, etc.)'

'Bank Branch, Food Service, Office, Other, Other - Public Services, Other - Recreation, Other - Services, Parking, Restaurant, Retail Store, Supermarket/Grocery Store'

'Bank Branch, Office, Other, Other - Entertainment/Public Assembly, Other - Mall, Outpatient Rehabilitation/Physical Therapy, Parking, Restaurant, Retail Store'

'College/University, K-12 School, Multifamily Housing, Residence Hall/Dormitory'

'Bank Branch, Medical Office, Office, Other, Restaurant, Retail Store, Supermarket/Grocery Store'

'Bank Branch, Restaurant, Retail Store'

'Pre-school/Daycare, Repair Services (Vehicle, Shoe, Locksmith, etc.)'

'Movie Theater, Restaurant, Retail Store'

'Mailing Center/Post Office, Multifamily Housing, Parking'

'College/University, Office, Residence Hall/Dormitory, Worship Facility'

'Fast Food Restaurant, Supermarket/Grocery Store'

'Non-Refrigerated Warehouse, Parking, Retail Store'

'Distribution Center, Office, Other'

'Multifamily Housing, Office, Other - Entertainment/Public Assembly, Swimming

Pool'

'Medical Office, Office, Other, Other - Education'

'Convenience Store without Gas Station, Financial Office, Medical Office, Office, Other, Other - Services, Restaurant, Retail Store, Supermarket/Grocery Store'

'Hotel, Parking, Swimming Pool'

'Medical Office, Non-Refrigerated Warehouse, Office, Residence Hall/Dormitory'

'Financial Office, Food Service, Non-Refrigerated Warehouse, Office, Other, Other - Recreation, Parking'

'Multifamily Housing, Office, Parking, Swimming Pool'

'College/University, Library, Office, Other - Education, Other - Recreation, Residence Hall/Dormitory'

'Convenience Store without Gas Station, Office, Parking, Strip Mall, Supermarket/Grocery Store'

'Data Center, Non-Refrigerated Warehouse, Office, Parking'

'Office, Outpatient Rehabilitation/Physical Therapy, Parking'

'Financial Office, Other - Mall, Parking, Supermarket/Grocery Store'

'Fast Food Restaurant, Financial Office, Medical Office, Other, Restaurant, Strip Mall, Supermarket/Grocery Store, Urgent Care/Clinic/Other Outpatient'

'Fast Food Restaurant, Office, Other, Other - Entertainment/Public Assembly, Parking'

'K-12 School, Office, Other - Entertainment/Public Assembly, Swimming Pool'

'Bank Branch, Fast Food Restaurant, Food Sales, Other - Education, Personal Services (Health/Beauty, Dry Cleaning, etc.), Restaurant, Retail Store, Supermarket/Grocery Store'

'Distribution Center, Non-Refrigerated Warehouse, Office, Supermarket/Grocery Store']

Largest Property Use Type

['Office' 'Hospital (General Medical & Surgical)' 'Other'

'Multifamily Housing' 'Medical Office' 'College/University'

'Residence Hall/Dormitory' 'Worship Facility' nan

'Urgent Care/Clinic/Other Outpatient' 'Library' 'Social/Meeting Hall'

'Senior Care Community' 'Self-Storage Facility' 'Strip Mall'

'Retail Store' 'Bank Branch' 'Movie Theater' 'Enclosed Mall'

'K-12 School' 'Parking' 'Other - Recreation' 'Other - Education'

'Other - Specialty Hospital' 'Financial Office'

'Manufacturing/Industrial Plant' 'Performing Arts'

'Other - Lodging/Residential' 'Hotel' 'Data Center'

'Non-Refrigerated Warehouse' 'Other - Entertainment/Public Assembly'

'Restaurant' 'Distribution Center' 'Other - Mall'

'Ambulatory Surgical Center' 'Museum' 'Automobile Dealership'

'Laboratory' 'Residential Care Facility'

'Outpatient Rehabilitation/Physical Therapy' 'Pre-school/Daycare'

'Supermarket/Grocery Store' 'Mailing Center/Post Office'

'Other - Technology/Science' 'Courthouse' 'Wholesale Club/Supercenter'

'Other - Services' 'Other - Public Services' 'Refrigerated Warehouse'

'Adult Education' 'Repair Services (Vehicle, Shoe, Locksmith, etc.)'

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'Food Service' 'Convenience Store without Gas Station']
*****
Largest Property Use Type - Gross Floor Area (ft2)
[ 293447. 3889181. 231342. ... 74177. 103328. 60715.]
*****
Year Built
[1963 1969 1924 1971 1932 1974 1903 1950 1907 1939 1911 1964 1962 1973
 1952 1897 1996 1906 1898 1908 1999 1934 1925 1935 1961 1910 1980 1977
 1988 1987 1927 1930 2010 1909 1920 1914 2004 1998 1995 1929 1928 1976
 1970 1905 1940 2009 2003 2006 1833 1966 1981 1959 1960 1992 1896 1972
 2001 2012 1986 1951 1895 1894 1893 1891 1901 2011 1848 1956 1967 1915
 2000 2013 2007 1965 1978 1990 1953 1955 1968 1954 2014 1900 1994 1947
 1887 2005 1888 1957 1975 1991 1984 2008 1949 1921 1985 1931 1882 1958
 1902 1997 1989 1983 1916 1917 1904 1913 1982 1926 1836 1827 2002 1922
 1912 1600 1936 1918 1883 1890 1845 1865 1933 1979 1938 1923 2016 1886
 1874 1880 1860 1885 1919 1941 1873 1857 1942 1899 1850 1937 1945 1875
 1867 1870 1877 1892 1993 1948 2015 1889 1946 1943 1853 1944 1841 1881
 1868 1649 2019]
*****
Number of Buildings - Self-reported
[ 2 12 1 4 7 0 6 8 56 77 3 5 17 14 19 18 10 35
 21 9 11 30 15 24 22 29 16 32 60 48 49 45 52 91 140 126
 161 131 107 37 25 68 83 98 13 155 62 33 28]
*****
Occupancy
[100 60 95 10 90 80 0 75 65 50 40 70 85 25 30 5 55 45
 20]
*****
Metered Areas (Energy)
['Whole Building' nan 'Another configuration' 'Common areas only'
 'Common Area Cooling, Tenant Plug Load/Electricity, Tenant Cooling, Common Area
 Plug Load/Electricity'
 'Tenant Plug Load/Electricity, Common Area Cooling, Tenant Cooling, Common Area
 Plug Load/Electricity'
 'Tenant Cooling, Common Area Hot Water, Common Area Heating, Common Area Plug
 Load/Electricity'
 'Tenant areas only']
*****
Metered Areas (Water)
[nan 'Whole Building' 'Combination of common and tenant areas'
 'Another configuration' 'Tenant areas only' 'Common areas only'
 'Tenant areas (all energy loads)']
*****
ENERGY STAR Score
[ nan 55. 93. 1. 80. 72. 67. 100. 40. 99. 12. 88. 89. 86.
 73. 71. 74. 19. 84. 78. 81. 6. 77. 3. 59. 23. 61. 58.
 85. 66. 45. 2. 51. 17. 34. 22. 43. 13. 96. 98. 36. 69.
 68. 65. 26. 95. 49. 39. 29. 14. 15. 16. 53. 94. 8. 33.

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32. 91. 25. 24. 11. 21. 30. 42. 41. 79. 97. 35. 90. 28.
 37. 31. 4. 75. 64. 9. 92. 62. 38. 76. 20. 54. 87. 70.
 46. 56. 63. 48. 10. 60. 82. 44. 83. 52. 18. 7. 5. 27.
 57. 47. 50.]

Site EUI (kBtu/ft²)

[305.6 229.8 nan ... 217.3 400.3 166.7]

Weather Normalized Site EUI (kBtu/ft²)

[303.1 228.8 nan ... 144.8 223.4 166.5]

Weather Normalized Site Electricity Intensity (kWh/ft²)

[3.7800e+01 2.4800e+01 nan 8.3000e+00 3.1990e+02 7.5000e+00
 5.8000e+00 3.2200e+01 8.7000e+00 3.5000e+00 4.0000e+00 2.6000e+00
 6.1000e+00 6.8000e+00 4.8000e+00 0.0000e+00 7.9000e+00 1.0700e+01
 7.4000e+00 4.9000e+00 1.2400e+01 5.7000e+00 1.6200e+01 4.5000e+00
 7.0000e-01 1.2000e+00 8.6000e+00 1.0000e+01 2.1500e+01 2.0500e+01
 1.7930e+02 2.0000e-01 2.4000e+01 5.1800e+01 6.3900e+01 5.8000e+01
 5.1400e+01 1.8200e+01 4.5500e+01 6.9000e+00 8.2000e+00 6.7000e+00
 9.8000e+00 1.1200e+01 7.0000e+00 1.3500e+01 3.8900e+01 2.8000e+01
 5.7000e+01 6.4800e+01 1.0000e+00 2.0000e+00 4.2000e+00 3.8000e+00
 4.6000e+00 4.4000e+01 7.1000e+00 1.5500e+01 2.9000e+00 1.6400e+01
 1.0200e+01 3.3000e+00 1.4000e+00 5.0000e-01 2.2100e+01 2.9200e+01
 4.0300e+01 1.1000e+00 1.1800e+01 9.9000e+00 1.4000e+01 1.5900e+01
 6.0000e-01 2.1000e+00 9.0000e-01 8.0000e-01 1.6800e+01 2.1400e+01
 1.2100e+02 2.8500e+01 4.5200e+01 1.8100e+01 2.3800e+01 2.1600e+01
 2.9400e+01 1.0900e+01 5.0500e+01 4.7000e+00 3.9000e+00 3.2000e+00
 4.1000e+00 5.1000e+00 7.7000e+00 7.6000e+00 7.2000e+00 1.2700e+01
 1.2500e+01 1.2800e+01 7.8000e+00 9.0000e+00 9.1000e+00 2.8100e+01
 3.0000e+00 1.5800e+01 5.0200e+01 5.9000e+00 5.4000e+00 6.5000e+00
 6.3000e+00 2.3500e+01 6.0000e+00 6.2000e+00 2.4000e+00 7.3000e+00
 1.4800e+01 8.5000e+00 5.0000e+00 3.5000e+01 1.0600e+01 2.7900e+01
 5.5000e+00 5.6000e+00 3.6000e+00 1.9000e+00 1.4700e+01 5.2000e+00
 9.4000e+00 4.4000e+00 3.1000e+00 1.8300e+01 3.3800e+01 5.3000e+00
 4.1200e+01 2.7400e+01 2.2000e+00 2.1900e+01 8.9000e+00 3.0000e-01
 1.3000e+00 1.5000e+00 9.3000e+00 1.0500e+01 2.7000e+00 1.1600e+01
 1.8700e+01 4.1100e+01 4.3000e+00 2.3000e+00 1.3000e+01 1.2600e+01
 3.1200e+01 4.8500e+01 1.3900e+01 3.0200e+01 7.7800e+01 9.7000e+00
 1.0000e-01 1.4500e+01 1.6100e+01 1.3100e+01 1.4200e+01 1.4900e+01
 2.5800e+01 9.6000e+00 1.1700e+01 1.8000e+01 1.0400e+01 1.1000e+01
 1.7300e+01 1.9200e+01 2.1700e+01 8.0000e+00 1.1400e+01 2.3600e+01
 1.1300e+01 6.6000e+00 1.0800e+01 1.3700e+01 1.5200e+01 1.7900e+01
 2.1300e+01 1.2100e+01 1.7100e+01 1.8900e+01 5.6000e+01 1.4100e+01
 1.7800e+01 8.1000e+00 2.6700e+01 1.0300e+01 1.3600e+01 3.9000e+01
 5.0300e+01 1.1100e+01 1.9900e+01 1.2300e+01 8.4000e+00 1.3400e+01
 1.5400e+01 1.5700e+01 2.6400e+01 1.9600e+01 1.2200e+01 2.5200e+01
 1.1900e+01 1.8500e+01 1.4600e+01 1.0100e+01 2.0200e+01 1.6300e+01
 1.4300e+01 1.7700e+01 1.5300e+01 3.4800e+01 1.7500e+01 1.2000e+01]

| | | | | | |
|------------|------------|------------|------------|------------|------------|
| 2.1200e+01 | 2.4500e+01 | 3.2700e+01 | 1.7000e+01 | 8.8000e+00 | 2.0400e+01 |
| 1.3300e+01 | 2.3000e+01 | 6.4000e+00 | 1.9400e+01 | 2.2000e+01 | 9.2000e+00 |
| 1.6600e+01 | 8.6300e+01 | 1.1500e+01 | 3.4000e+00 | 3.6300e+01 | 2.9900e+01 |
| 2.4900e+01 | 1.6900e+01 | 1.8800e+01 | 2.9600e+01 | 1.3800e+01 | 6.4300e+01 |
| 2.4300e+01 | 1.7200e+01 | 1.6500e+01 | 9.5000e+00 | 2.6300e+01 | 4.0600e+01 |
| 1.3200e+01 | 2.0800e+01 | 1.6700e+01 | 1.7600e+01 | 1.7000e+00 | 2.6000e+01 |
| 1.4400e+01 | 3.0800e+01 | 3.8000e+01 | 5.9500e+01 | 2.5100e+01 | 3.3700e+01 |
| 1.5000e+01 | 1.9300e+01 | 2.0100e+01 | 1.5600e+01 | 2.7800e+01 | 1.7400e+01 |
| 1.2900e+01 | 2.7300e+01 | 2.6600e+01 | 2.8700e+01 | 3.8200e+01 | 4.0100e+01 |
| 1.5100e+01 | 1.9000e+01 | 2.3100e+01 | 3.7000e+00 | 2.1000e+01 | 1.9100e+01 |
| 3.8400e+01 | 1.8000e+00 | 2.0000e+01 | 1.9700e+01 | 1.9800e+01 | 4.9600e+01 |
| 2.6500e+01 | 1.6000e+01 | 1.8400e+01 | 3.6400e+01 | 2.8400e+01 | 4.2700e+01 |
| 6.4900e+01 | 2.2300e+01 | 2.1800e+01 | 3.2400e+01 | 5.9800e+01 | 2.8000e+00 |
| 3.0900e+01 | 2.7500e+01 | 3.1100e+01 | 3.1300e+01 | 1.6000e+00 | 3.5400e+01 |
| 2.7100e+01 | 2.2900e+01 | 3.0000e+01 | 2.5300e+01 | 4.0000e-01 | 6.3500e+01 |
| 4.3300e+01 | 8.2300e+01 | 2.3300e+01 | 5.2600e+01 | 2.3400e+01 | 2.0600e+01 |
| 2.2700e+01 | 2.0300e+01 | 2.4100e+01 | 3.4100e+01 | 3.3300e+01 | 1.4600e+02 |
| 2.1100e+01 | 2.5600e+01 | 4.6700e+01 | 2.2400e+01 | 2.4400e+01 | 2.8300e+01 |
| 2.4200e+01 | 4.6800e+01 | 3.1000e+01 | 2.8600e+01 | 5.5800e+01 | 1.9500e+01 |
| 6.6500e+01 | 4.4500e+01 | 4.0749e+03 | 2.7600e+01 | 3.3600e+01 | 2.2600e+01 |
| 3.4400e+01 | 3.9200e+01 | 2.7200e+01 | 6.0100e+01 | 9.7900e+01 | 3.0600e+01 |
| 2.3900e+01 | 3.2500e+01 | 3.9300e+01 | 2.5700e+01 | 3.8100e+01 | 2.8900e+01 |
| 2.3700e+01 | 2.7000e+01 | 2.2500e+01 | 3.1400e+01 | 2.5400e+01 | 3.0400e+01 |
| 2.9100e+01 | 6.6400e+01 | 2.5900e+01 | 1.8600e+01 | 3.7700e+01 | 3.9400e+01 |
| 2.2800e+01 | 2.9700e+01 | 5.7800e+01 | 3.6100e+01 | 2.0700e+01 | 2.5500e+01 |
| 3.4200e+01 | 4.0800e+01 | 3.7500e+01 | 2.5000e+00 | 4.5000e+01 | 9.5900e+01 |
| 3.6600e+01 | 4.5900e+01 | 2.8750e+02 | 3.5200e+01 | 4.5400e+01 | 3.0700e+01 |
| 2.6200e+01 | 2.2200e+01 | 3.0100e+01 | 4.3600e+01 | 3.9100e+01 | 5.1000e+01 |
| 3.1900e+01 | 4.0000e+01 | 3.2100e+01 | 2.9300e+01 | 2.7700e+01 | 2.6100e+01 |
| 2.3200e+01 | 1.2070e+02 | 2.0900e+01 | 4.3000e+01 | 3.1800e+01 | 4.1600e+01 |
| 3.4700e+01 | 4.4700e+01 | 4.6640e+02 | 6.7600e+01 | 4.9100e+01 | 4.2000e+01 |
| 6.1800e+01 | 4.2100e+01 | 6.2594e+03 | 3.5904e+03 | 6.2020e+03 | 5.3400e+01 |
| 6.7800e+01 | 7.4500e+02 | 6.3000e+01 | 4.1900e+01 | 4.7400e+01 | 6.8100e+01 |
| 5.4700e+01 | 4.1300e+01 | 5.6810e+02 | 3.6700e+01 | 4.2400e+01 | 2.8800e+01 |
| 4.2300e+01 | 3.4600e+01 | 7.7900e+01 | 5.3044e+03 | 1.5330e+02 | 4.7500e+01 |
| 4.1700e+01 | 3.2800e+01 | 2.5000e+01 | 3.2900e+01 | 3.8800e+01 | 5.0600e+01 |
| 4.3686e+03 | 4.8157e+03 | 1.6220e+02 | 5.0700e+01 | 4.9900e+01 | 5.6700e+01 |
| 4.7800e+01 | 4.0700e+01 | 3.0300e+01 | | | |

Weather Normalized Site Natural Gas Intensity (therms/ft²)

| | | | | | | |
|---|------------|------------|------------|------------|------------|------------|
| [| nan | 2.4000e+00 | 4.8000e+00 | 1.4397e+03 | 0.0000e+00 | 3.0000e+00 |
| | 2.2000e+00 | 9.0000e-01 | 5.0000e-01 | 1.2000e+00 | 2.0000e-01 | 3.0000e-01 |
| | 1.0000e-01 | 3.7700e+01 | 2.1000e+00 | 1.9000e+00 | 3.3000e+00 | 4.0000e-01 |
| | 9.4300e+01 | 1.7000e+00 | 8.0000e-01 | 1.1000e+00 | 1.5000e+00 | 1.0000e+00 |
| | 7.0000e-01 | 1.6000e+00 | 5.7000e+00 | 1.4000e+00 | 1.8000e+00 | 1.3000e+00 |
| | 6.0000e-01 | 2.0000e+00 | 4.2000e+00 | 7.2000e+00 | 4.4000e+00 | 8.4000e+00 |
| | 3.7000e+00 | 8.7000e+00 | 3.2000e+00 | 3.4000e+00 | 1.3100e+02 | 2.8000e+00 |
| | 2.5000e+00 | 1.0400e+01 | 2.7000e+00 | 6.4000e+00 | 4.6000e+00 | 3.1000e+00 |

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8.4900e+01 4.0000e+00 1.1700e+02 9.3930e+03 9.0560e+02 9.1160e+02
6.7640e+02 5.1000e+00 9.8000e+00 2.3000e+00 6.3000e+00 5.3000e+00
3.8000e+00 5.5000e+00 4.3000e+00 5.2000e+00 1.0300e+01 2.9000e+00]
*****
Weather Normalized Source EUI (kBtu/ft2)
[614.2 401.1 nan ... 34.9 22.9 442.4]
*****
Natural Gas Use (kBtu)
[ nan 9.33073441e+08 1.43225088e+09 ... 1.76162980e+06
3.69349980e+06 7.52849980e+06]
*****
Weather Normalized Site Natural Gas Use (therms)
[ nan 9330734.4 14322508.8 ... 18131. 40162.6 82151.4]
*****
Electricity Use - Grid Purchase (kBtu)
[3.81393742e+07 3.32365924e+08 nan ... 2.81885470e+06
5.56759900e+05 7.70105400e+05]
*****
Weather Normalized Site Electricity (kWh)
[11082770.5 96261312.1 nan ... 796837.2 155319.3 218287.2]
*****
Total GHG Emissions (Metric Tons CO2e)
[ 6962.2 55870.4 0. ... 677.9 244.2 674.6]
*****
Direct GHG Emissions (Metric Tons CO2e)
[ 0. 51016.4 77564.1 ... 677.9 93.6 196.2]
*****
Indirect GHG Emissions (Metric Tons CO2e)
[6962.2 4854.1 0. ... 437.1 447.2 71.5]
*****
Property GFA - Self-Reported (ft2)
[ 762051. 3889181. 231342. ... 101291. 103328. 60715.]
*****
Water Use (All Water Sources) (kgal)
[ nan 107151.5 19261.1 ... 2989.6 5122.8 1687.6]
*****
Water Intensity (All Water Sources) (gal/ft2)
[ nan 3.913000e+01 9.630569e+04 ... 9.546000e+01 3.112000e+01
2.780000e+01]
*****
Source EUI (kBtu/ft2)
[619.4 404.3 nan ... 22.9 446.2 334.5]
*****
Release Date
['05/01/2017 05:32:03 PM' '04/27/2017 11:23:27 AM'
'04/28/2017 07:44:37 AM' ... '04/04/2017 09:30:18 AM'
'03/23/2017 02:43:00 PM' '03/23/2017 02:51:02 PM']
*****

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Water Required?
['No' 'Yes' nan]
*****
DOF Benchmarking Submission Status
['In Compliance' nan]
*****
Latitude
[40.750791 40.841402 40.840427 ... 40.692602 40.670728 40.685549]
*****
Longitude
[-73.973963 -73.942568 -73.940249 ... -73.993231 -73.971752 -73.96831 ]
*****
Community Board
[ 6. 12.  8. 13. nan  2.  9.  3. 11.  1.  7. 10. 18.  4. 14.  5. 15. 16.
 17. 56.]
*****
Council District
[ 4. 10.  5. 23. nan 33. 50.  7.  1. 16.  8.  2. 11. 35. 12. 47.  9. 46.
 41. 49.  3.  6. 18. 32. 51. 34. 17. 15. 42. 14. 13. 39. 38. 40. 36. 37.
 45. 44. 43. 48. 26. 19. 30. 29. 31.]
*****
Census Tract
[8.80000e+01 2.51000e+02 2.55000e+02 1.16000e+02 1.24000e+02 1.55101e+05
 nan 5.02000e+02 7.00000e+01 2.81000e+02 1.30000e+02 2.11000e+02
 5.70000e+01 1.33000e+02 1.62000e+02 1.99000e+02 2.01010e+04 2.03000e+02
 2.05000e+02 1.50100e+03 1.18000e+02 5.50100e+03 6.50000e+01 5.90000e+01
 4.00000e+01 3.09000e+02 3.19000e+02 3.70000e+01 2.07010e+04 1.89000e+02
 1.10000e+01 4.62010e+04 3.54000e+02 3.56010e+04 2.34000e+02 6.98000e+02
 8.80000e+02 1.33010e+04 3.35000e+02 1.58010e+04 9.10000e+01 3.03010e+04
 1.72000e+02 1.71000e+02 5.00100e+03 4.80000e+01 8.20000e+01 3.07010e+04
 1.70000e+02 1.93000e+02 1.97000e+02 9.42030e+04 2.10000e+02 2.36000e+02
 1.46060e+04 2.91020e+04 1.79000e+02 5.11000e+02 5.05000e+02 4.91000e+02
 3.74020e+04 3.74010e+04 4.20000e+01 3.61000e+02 2.69000e+02 1.49000e+02
 3.30000e+01 1.45000e+02 1.15600e+03 2.15020e+04 9.00000e+00 1.30000e+01
 3.17040e+04 3.17030e+04 4.30000e+01 7.00000e+00 1.50200e+03 2.10000e+01
 2.50000e+01 2.90000e+01 2.70000e+01 3.90000e+01 3.10000e+01 4.10000e+01
 4.50000e+01 4.70000e+01 2.02000e+02 6.00000e+00 8.00000e+00 1.60000e+01
 1.40100e+03 1.00100e+03 1.20000e+01 1.80000e+01 1.40200e+03 2.20100e+03
 2.60200e+03 2.80000e+01 2.20200e+03 3.00200e+03 3.20000e+01 3.00100e+03
 3.60100e+03 3.40000e+01 3.60200e+03 3.80000e+01 4.90000e+01 5.50200e+03
 6.70000e+01 6.30000e+01 6.10000e+01 1.50020e+04 1.13000e+02 7.30000e+01
 7.10000e+01 6.90000e+01 7.70000e+01 7.90000e+01 7.50000e+01 9.90000e+01
 1.17000e+02 8.30000e+01 8.90000e+01 9.30000e+01 1.03000e+02 1.11000e+02
 1.15000e+02 9.70000e+01 8.10000e+01 8.70000e+01 9.50000e+01 1.01000e+02
 1.09000e+02 1.50000e+01 5.40000e+01 5.80000e+01 7.60000e+01 8.40000e+01
 5.60000e+01 5.20000e+01 7.40000e+01 5.00000e+01 6.80000e+01 7.20000e+01
 8.00000e+01 6.40000e+01 6.60000e+01 7.80000e+01 6.20000e+01 8.60100e+03
 4.40000e+01 1.19000e+02 1.25000e+02 1.31000e+02 1.37000e+02 1.21000e+02

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| | | | | | |
|-------------|-------------|-------------|-------------|-------------|-------------|
| 1.27000e+02 | 1.39000e+02 | 1.29000e+02 | 1.35000e+02 | 1.53000e+02 | 1.57000e+02 |
| 1.61000e+02 | 1.65000e+02 | 1.47000e+02 | 1.51000e+02 | 1.55000e+02 | 1.59000e+02 |
| 1.63000e+02 | 1.67000e+02 | 1.69000e+02 | 1.73000e+02 | 1.77000e+02 | 1.81000e+02 |
| 1.75000e+02 | 1.83000e+02 | 9.60000e+01 | 1.04000e+02 | 1.12010e+04 | 9.40000e+01 |
| 9.20000e+01 | 1.02000e+02 | 1.12020e+04 | 1.00000e+02 | 1.12030e+04 | 9.00000e+01 |
| 9.80000e+01 | 1.08000e+02 | 8.60300e+03 | 1.06010e+04 | 2.38010e+04 | 1.14010e+04 |
| 1.22000e+02 | 1.42000e+02 | 1.14020e+04 | 1.20000e+02 | 1.28000e+02 | 1.40000e+02 |
| 1.10000e+02 | 1.26000e+02 | 1.34000e+02 | 1.06020e+04 | 1.32000e+02 | 1.00200e+03 |
| 1.50010e+04 | 1.60010e+04 | 1.48010e+04 | 1.48020e+04 | 1.38000e+02 | 1.46010e+04 |
| 1.46020e+04 | 1.54000e+02 | 1.56010e+04 | 1.36000e+02 | 1.44010e+04 | 1.44020e+04 |
| 1.52000e+02 | 1.86000e+02 | 1.90000e+02 | 1.60020e+04 | 1.68000e+02 | 1.74010e+04 |
| 1.74020e+04 | 1.84000e+02 | 1.58020e+04 | 1.82000e+02 | 1.56020e+04 | 1.64000e+02 |
| 1.80000e+02 | 1.78000e+02 | 2.00000e+02 | 2.08000e+02 | 2.12000e+02 | 2.14000e+02 |
| 1.98000e+02 | 2.06000e+02 | 1.96000e+02 | 2.42000e+02 | 1.88000e+02 | 1.94000e+02 |
| 2.16000e+02 | 2.18000e+02 | 1.85000e+02 | 1.97020e+04 | 2.01020e+04 | 1.97010e+04 |
| 1.87000e+02 | 1.91000e+02 | 1.95000e+02 | 2.22000e+02 | 2.24000e+02 | 2.28000e+02 |
| 2.20000e+02 | 2.26000e+02 | 2.57000e+02 | 2.09010e+04 | 2.13030e+04 | 2.15000e+02 |
| 2.21020e+04 | 2.19000e+02 | 2.23010e+04 | 2.23020e+04 | 2.30000e+02 | 2.32000e+02 |
| 2.59000e+02 | 2.35020e+04 | 2.27000e+02 | 2.31000e+02 | 2.35010e+04 | 2.25000e+02 |
| 2.29000e+02 | 2.33000e+02 | 2.37000e+02 | 2.39000e+02 | 2.43010e+04 | 2.45000e+02 |
| 2.49000e+02 | 2.41000e+02 | 2.53000e+02 | 2.61000e+02 | 2.47000e+02 | 2.63000e+02 |
| 2.67000e+02 | 2.77000e+02 | 2.71000e+02 | 2.79000e+02 | 2.83000e+02 | 2.85000e+02 |
| 2.87000e+02 | 2.65000e+02 | 2.75000e+02 | 2.73000e+02 | 2.99000e+02 | 2.91000e+02 |
| 2.93000e+02 | 3.03000e+02 | 2.95000e+02 | 3.07000e+02 | 2.97000e+02 | 1.90000e+01 |
| 5.10000e+01 | 1.41000e+02 | 1.43000e+02 | 1.77010e+04 | 1.83020e+04 | 1.79010e+04 |
| 1.81010e+04 | 1.81020e+04 | 5.90200e+03 | 1.83010e+04 | 2.21010e+04 | 2.01000e+02 |
| 2.70200e+03 | 3.50000e+01 | 8.50000e+01 | 1.29010e+04 | 1.27010e+04 | 1.21020e+04 |
| 1.15020e+04 | 2.29020e+04 | 2.29010e+04 | 2.33020e+04 | 2.33010e+04 | 3.81000e+02 |
| 2.27010e+04 | 2.27030e+04 | 1.79020e+04 | 2.23000e+02 | 2.09000e+02 | 2.27020e+04 |
| 2.17000e+02 | 2.43000e+02 | 2.13020e+04 | 2.13010e+04 | 2.05010e+04 | 2.05020e+04 |
| 2.15010e+04 | 2.45010e+04 | 5.30000e+01 | 1.77020e+04 | 3.95000e+02 | 1.47010e+04 |
| 1.47020e+04 | 3.69010e+04 | 3.69020e+04 | 3.65020e+04 | 1.23000e+02 | 3.59000e+02 |
| 3.99020e+04 | 3.83020e+04 | 3.87000e+02 | 3.85000e+02 | 3.75040e+04 | 3.73000e+02 |
| 3.89000e+02 | 3.91000e+02 | 3.71000e+02 | 3.93000e+02 | 3.65010e+04 | 3.63000e+02 |
| 3.79000e+02 | 3.83010e+04 | 2.37020e+04 | 3.99010e+04 | 2.37040e+04 | 2.37030e+04 |
| 4.01000e+02 | 2.45020e+04 | 4.09000e+02 | 2.67010e+04 | 2.67020e+04 | 4.11000e+02 |
| 3.97000e+02 | 4.25000e+02 | 4.07020e+04 | 4.15000e+02 | 4.05020e+04 | 4.05010e+04 |
| 4.13000e+02 | 4.03020e+04 | 4.03040e+04 | 4.03030e+04 | 4.07010e+04 | 4.21000e+02 |
| 4.19000e+02 | 4.31000e+02 | 4.23000e+02 | 4.29010e+04 | 4.29020e+04 | 4.35000e+02 |
| 4.49010e+04 | 4.49020e+04 | 4.51010e+04 | 4.51020e+04 | 8.60000e+01 | 4.60000e+01 |
| 5.00200e+03 | 4.00100e+03 | 2.16010e+04 | 6.00000e+01 | 2.16020e+04 | 2.10010e+04 |
| 2.10020e+04 | 2.04000e+02 | 2.40000e+02 | 2.38000e+02 | 2.56000e+02 | 2.54000e+02 |
| 2.50000e+02 | 2.66010e+04 | 2.66020e+04 | 2.88000e+02 | 2.96000e+02 | 2.84000e+02 |
| 3.00000e+02 | 2.24040e+04 | 2.24010e+04 | 2.46000e+02 | 2.24030e+04 | 2.48000e+02 |
| 3.32010e+04 | 3.30000e+02 | 3.28000e+02 | 3.24000e+02 | 3.26000e+02 | 3.18000e+02 |
| 3.14000e+02 | 3.10000e+02 | 3.32020e+04 | 3.40000e+02 | 3.60000e+02 | 3.36000e+02 |
| 3.38000e+02 | 3.76000e+02 | 3.74000e+02 | 3.72000e+02 | 3.78000e+02 | 3.92000e+02 |
| 3.94000e+02 | 3.80000e+02 | 3.82000e+02 | 3.86000e+02 | 4.62020e+04 | 3.56000e+02 |

| | | | | | |
|-------------|-------------|-------------|-------------|-------------|-------------|
| 4.08000e+02 | 4.20000e+02 | 3.96000e+02 | 4.22000e+02 | 4.24000e+02 | 4.60000e+02 |
| 4.34000e+02 | 4.30000e+02 | 4.18000e+02 | 4.44000e+02 | 4.14000e+02 | 4.42000e+02 |
| 3.02000e+02 | 2.64000e+02 | 2.74020e+04 | 1.58000e+02 | 1.60000e+02 | 5.16000e+02 |
| 4.56000e+02 | 2.89000e+02 | 2.93010e+04 | 2.93020e+04 | 3.01000e+02 | 3.45000e+02 |
| 3.51000e+02 | 3.43000e+02 | 3.37000e+02 | 3.23000e+02 | 2.30000e+01 | 1.00000e+00 |
| 5.01000e+02 | 2.00000e+00 | 2.20000e+01 | 3.05000e+02 | 2.07000e+02 | 2.13000e+02 |
| 3.27000e+02 | 3.13000e+02 | 3.11000e+02 | 2.21000e+02 | 3.15000e+02 | 3.17010e+04 |
| 3.41000e+02 | 3.17020e+04 | 3.39000e+02 | 3.25000e+02 | 3.33000e+02 | 3.21000e+02 |
| 3.31000e+02 | 3.29000e+02 | 7.98010e+04 | 8.04000e+02 | 8.06000e+02 | 3.47000e+02 |
| 3.53000e+02 | 3.57000e+02 | 3.49000e+02 | 3.55000e+02 | 8.76000e+02 | 1.23700e+03 |
| 2.59010e+04 | 5.43000e+02 | 5.55000e+02 | 2.35000e+02 | 1.85010e+04 | 5.49000e+02 |
| 5.47000e+02 | 5.25000e+02 | 5.45000e+02 | 5.29000e+02 | 5.33000e+02 | 5.37000e+02 |
| 5.31000e+02 | 5.35000e+02 | 5.07000e+02 | 5.57000e+02 | 5.17000e+02 | 5.19000e+02 |
| 5.53000e+02 | 5.13000e+02 | 5.51000e+02 | 5.23000e+02 | 5.63000e+02 | 5.79000e+02 |
| 5.65000e+02 | 5.75000e+02 | 5.89000e+02 | 5.15000e+02 | 4.49000e+02 | 4.77000e+02 |
| 4.81000e+02 | 4.53000e+02 | 4.85000e+02 | 4.93000e+02 | 4.47000e+02 | 4.45000e+02 |
| 4.43000e+02 | 4.41000e+02 | 3.99000e+02 | 4.39000e+02 | 4.37000e+02 | 4.03000e+02 |
| 4.05000e+02 | 9.00000e+02 | 9.24000e+02 | 9.16000e+02 | 1.13400e+03 | 9.18000e+02 |
| 9.20000e+02 | 8.96000e+02 | 9.22000e+02 | 1.09800e+03 | 1.19800e+03 | 9.08000e+02 |
| 1.14400e+03 | 1.12600e+03 | 1.14202e+05 | 1.17000e+03 | 1.15200e+03 | 1.16200e+03 |
| 1.12400e+03 | 1.17602e+05 | 1.17800e+03 | 1.20000e+03 | 1.20800e+03 | 1.11600e+03 |
| 1.10400e+03 | 1.10600e+03 | 1.22000e+03 | 1.07800e+03 | 1.05804e+05 | 1.07000e+03 |
| 8.82000e+02 | 8.84000e+02 | 8.78000e+02 | 8.92000e+02 | 8.86000e+02 | 8.90000e+02 |
| 8.88000e+02 | 8.62000e+02 | 9.38000e+02 | 9.28000e+02 | 9.46000e+02 | 8.40000e+02 |
| 9.32000e+02 | 8.74010e+04 | 8.10000e+02 | 8.08000e+02 | 8.18000e+02 | 8.72000e+02 |
| 8.16000e+02 | 8.60000e+02 | 8.56000e+02 | 8.54000e+02 | 8.30000e+02 | 8.32000e+02 |
| 7.82000e+02 | 7.88000e+02 | 7.86000e+02 | 7.98020e+04 | 7.96010e+04 | 8.02000e+02 |
| 5.08040e+04 | 5.08030e+04 | 8.22000e+02 | 7.96020e+04 | 8.20000e+02 | 5.06000e+02 |
| 5.08010e+04 | 5.12000e+02 | 5.10020e+04 | 7.94000e+02 | 8.24000e+02 | 1.52200e+03 |
| 5.10010e+04 | 7.92000e+02 | 5.14000e+02 | 5.26000e+02 | 5.20000e+02 | 5.16020e+04 |
| 8.26000e+02 | 8.28000e+02 | 5.18000e+02 | 5.16010e+04 | 7.90000e+02 | 7.64000e+02 |
| 7.66000e+02 | 7.72000e+02 | 7.70000e+02 | 5.02020e+04 | 5.00000e+02 | 5.04000e+02 |
| 4.98000e+02 | 4.96000e+02 | 4.88000e+02 | 4.94000e+02 | 4.92000e+02 | 4.90000e+02 |
| 4.84000e+02 | 4.82000e+02 | 4.80000e+02 | 4.76000e+02 | 4.74000e+02 | 4.64000e+02 |
| 4.72000e+02 | 4.48000e+02 | 2.52000e+02 | 2.58000e+02 | 1.12000e+02 | 1.14000e+02 |
| 1.92000e+02 | 1.28010e+04 | 3.00000e+01 | 3.60000e+01 | 5.20100e+03 | 5.20200e+03 |
| 5.60100e+03 | 5.60200e+03 | 2.68000e+02 | 2.72000e+02 | 4.28000e+02 | 2.70000e+02 |
| 2.78000e+02 | 2.90000e+02 | 2.92000e+02 | 2.82000e+02 | 1.76000e+02 | 2.86000e+02 |
| 2.94000e+02 | 4.58000e+02 | 4.52000e+02 | 4.36000e+02 | 4.32000e+02 | 4.40000e+02 |
| 4.38000e+02 | 4.26000e+02 | 4.12000e+02 | 4.14010e+04 | 4.14020e+04 | 4.16000e+02 |
| 5.28000e+02 | 5.30000e+02 | 5.32000e+02 | 7.62000e+02 | 5.34000e+02 | 7.60000e+02 |
| 7.68000e+02 | 5.38000e+02 | 5.42000e+02 | 5.44000e+02 | 5.46000e+02 | 5.48000e+02 |
| 6.42000e+02 | 5.54000e+02 | 5.52000e+02 | 5.50000e+02 | 5.56000e+02 | 5.58000e+02 |
| 5.60000e+02 | 5.64000e+02 | 3.04000e+02 | 3.08000e+02 | 3.48000e+02 | 3.42000e+02 |
| 3.52000e+02 | 4.10000e+02 | 3.88000e+02 | 3.90000e+02 | 3.66000e+02 | 3.70000e+02 |
| 3.50000e+02 | 3.56020e+04 | 5.66000e+02 | 5.82000e+02 | 5.80000e+02 | 5.78000e+02 |
| 5.76000e+02 | 5.70000e+02 | 5.84000e+02 | 5.86000e+02 | 5.92000e+02 | 5.94010e+04 |
| 5.94020e+04 | 5.88000e+02 | 5.96000e+02 | 6.26000e+02 | 6.06000e+02 | 6.00000e+02 |

```

5.98000e+02 7.74000e+02 7.84000e+02 7.02020e+04 7.76000e+02 7.50000e+02
7.40000e+02 7.42000e+02 7.48000e+02 7.44000e+02 7.38000e+02 7.58000e+02
7.46000e+02 7.56000e+02 7.26000e+02 7.24000e+02 7.20000e+02 7.28000e+02
7.32000e+02 7.36000e+02 9.60000e+02 9.44010e+04 9.62000e+02 9.74000e+02
9.88000e+02 1.01800e+03 1.02800e+03 6.96010e+04 6.96020e+04 7.00000e+02
3.64000e+02 3.62000e+02 3.60010e+04 3.60020e+04 6.10030e+04 6.10040e+04
6.10020e+04 6.12000e+02 6.20000e+02 6.16000e+02 6.08000e+02 6.22000e+02
6.32000e+02 6.28000e+02 1.48300e+03 7.23000e+02 7.37000e+02 7.69010e+04
5.39000e+02 9.07000e+02 1.07201e+05 1.03202e+05 1.01002e+05 1.01001e+05
9.98010e+04 9.98020e+04 9.72040e+04 9.64000e+02 9.42020e+04 9.42010e+04
9.34020e+04 3.00000e+00 1.87020e+04 3.19020e+04 3.19010e+04 2.91040e+04
3.03020e+04 2.91030e+04 2.77020e+04 9.60100e+03 1.28040e+04 1.28060e+04
1.32010e+04 1.46070e+04 1.46040e+04 2.08010e+04]

```

```
[18]: df.describe()
```

```

[18]:      DOF Gross Floor Area \
count      1.162800e+04
mean       1.732695e+05
std        3.367055e+05
min        5.002800e+04
25%        6.524000e+04
50%        9.313850e+04
75%        1.596140e+05
max        1.354011e+07

```

```

      Largest Property Use Type - Gross Floor Area (ft²)   Year Built \
count      1.174400e+04   11746.000000
mean       1.605524e+05   1948.738379
std        3.095746e+05    30.576386
min        5.400000e+01   1600.000000
25%        6.520100e+04   1927.000000
50%        9.132400e+04   1941.000000
75%        1.532550e+05   1966.000000
max        1.421712e+07   2019.000000

```

```

      Number of Buildings - Self-reported   Occupancy   ENERGY STAR Score \
count      11746.000000   11746.000000   9642.000000
mean        1.289971    98.762557    59.854594
std         4.017484    7.501603    29.993586
min         0.000000    0.000000    1.000000
25%         1.000000   100.000000    37.000000
50%         1.000000   100.000000    65.000000
75%         1.000000   100.000000    85.000000
max        161.000000   100.000000   100.000000

```

| | Site EUI (kBtu/ft ²) | Weather Normalized Site EUI (kBtu/ft ²) \ |
|-------|----------------------------------|---|
| count | 11583.000000 | 10281.000000 |
| mean | 280.071484 | 309.747466 |
| std | 8607.178877 | 9784.731207 |
| min | 0.000000 | 0.000000 |
| 25% | 61.800000 | 65.100000 |
| 50% | 78.500000 | 82.500000 |
| 75% | 97.600000 | 102.500000 |
| max | 869265.000000 | 939329.000000 |

| | Weather Normalized Site Electricity Intensity (kWh/ft ²) \ |
|-------|--|
| count | 10959.000000 |
| mean | 11.072643 |
| std | 127.733868 |
| min | 0.000000 |
| 25% | 3.800000 |
| 50% | 5.300000 |
| 75% | 9.200000 |
| max | 6259.400000 |

| | Weather Normalized Site Natural Gas Intensity (therms/ft ²) \ |
|-------|---|
| count | 9783.000000 |
| mean | 1.901441 |
| std | 97.204587 |
| min | 0.000000 |
| 25% | 0.100000 |
| 50% | 0.500000 |
| 75% | 0.700000 |
| max | 9393.000000 |

| | Weather Normalized Source EUI (kBtu/ft ²) | Natural Gas Use (kBtu) \ |
|-------|---|--------------------------|
| count | 10281.000000 | 1.030400e+04 |
| mean | 417.915709 | 5.048545e+07 |
| std | 10530.524339 | 3.914719e+09 |
| min | 0.000000 | 0.000000e+00 |
| 25% | 103.500000 | 1.098251e+06 |
| 50% | 129.400000 | 4.103962e+06 |
| 75% | 167.200000 | 6.855070e+06 |
| max | 986366.000000 | 3.942852e+11 |

| | Weather Normalized Site Natural Gas Use (therms) \ |
|-------|--|
| count | 9.784000e+03 |
| mean | 5.364578e+05 |
| std | 4.022606e+07 |
| min | 0.000000e+00 |
| 25% | 1.176952e+04 |
| 50% | 4.445525e+04 |

| | |
|-----|--------------|
| 75% | 7.348107e+04 |
| max | 3.942852e+09 |

| | |
|-------|--|
| | Electricity Use - Grid Purchase (kBtu) \ |
| count | 1.150200e+04 |
| mean | 5.965472e+06 |
| std | 3.154430e+07 |
| min | 0.000000e+00 |
| 25% | 1.043673e+06 |
| 50% | 1.855196e+06 |
| 75% | 4.370302e+06 |
| max | 1.691763e+09 |

| | |
|-------|---|
| | Weather Normalized Site Electricity (kWh) \ |
| count | 1.096000e+04 |
| mean | 1.768752e+06 |
| std | 9.389154e+06 |
| min | 0.000000e+00 |
| 25% | 3.019975e+05 |
| 50% | 5.416312e+05 |
| 75% | 1.284677e+06 |
| max | 4.958273e+08 |

| | |
|-------|--|
| | Total GHG Emissions (Metric Tons CO2e) \ |
| count | 1.167200e+04 |
| mean | 4.553657e+03 |
| std | 2.041639e+05 |
| min | 0.000000e+00 |
| 25% | 3.287000e+02 |
| 50% | 5.002500e+02 |
| 75% | 9.084250e+02 |
| max | 2.094340e+07 |

| | |
|-------|---|
| | Direct GHG Emissions (Metric Tons CO2e) \ |
| count | 1.166300e+04 |
| mean | 2.477937e+03 |
| std | 1.954498e+05 |
| min | 0.000000e+00 |
| 25% | 1.474500e+02 |
| 50% | 2.726000e+02 |
| 75% | 4.475000e+02 |
| max | 2.094340e+07 |

| | |
|-------|---|
| | Indirect GHG Emissions (Metric Tons CO2e) \ |
| count | 1.168100e+04 |
| mean | 2.076339e+03 |
| std | 5.931295e+04 |

| | |
|-----|---------------|
| min | -2.313430e+04 |
| 25% | 9.480000e+01 |
| 50% | 1.718000e+02 |
| 75% | 4.249000e+02 |
| max | 4.764375e+06 |

| Property GFA - Self-Reported (ft ²) \ | |
|---|--------------|
| count | 1.174600e+04 |
| mean | 1.673739e+05 |
| std | 3.189238e+05 |
| min | 0.000000e+00 |
| 25% | 6.699400e+04 |
| 50% | 9.408000e+04 |
| 75% | 1.584140e+05 |
| max | 1.421712e+07 |

| Water Use (All Water Sources) (kgal) \ | |
|--|--------------|
| count | 7.762000e+03 |
| mean | 1.591798e+04 |
| std | 1.529524e+05 |
| min | 0.000000e+00 |
| 25% | 2.595400e+03 |
| 50% | 4.692500e+03 |
| 75% | 8.031875e+03 |
| max | 6.594604e+06 |

| Water Intensity (All Water Sources) (gal/ft ²) Source EUI (kBtu/ft ²) \ | | |
|---|--------------|---------------|
| count | 7762.000000 | 11583.000000 |
| mean | 136.172432 | 385.908029 |
| std | 1730.726938 | 9312.736225 |
| min | 0.000000 | 0.000000 |
| 25% | 27.150000 | 99.400000 |
| 50% | 45.095000 | 124.900000 |
| 75% | 70.805000 | 162.750000 |
| max | 96305.690000 | 912801.100000 |

| Latitude Longitude Community Board Council District \ | | | | |
|---|-------------|-------------|-------------|-------------|
| count | 9483.000000 | 9483.000000 | 9483.000000 | 9483.000000 |
| mean | 40.754379 | -73.957057 | 7.140673 | 15.771275 |
| std | 0.080120 | 0.046337 | 3.954129 | 15.674375 |
| min | 40.516065 | -74.243582 | 1.000000 | 1.000000 |
| 25% | 40.707226 | -73.984662 | 4.000000 | 4.000000 |
| 50% | 40.759130 | -73.962810 | 7.000000 | 9.000000 |
| 75% | 40.817623 | -73.932443 | 9.000000 | 33.000000 |
| max | 40.912869 | -73.715543 | 56.000000 | 51.000000 |

Census Tract

```

count    9483.000000
mean     4977.596647
std      13520.422990
min       1.000000
25%      100.000000
50%      201.000000
75%      531.500000
max     155101.000000

```

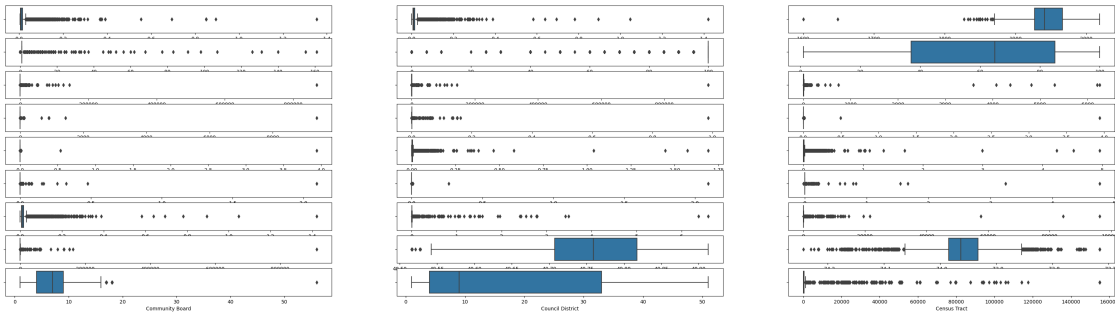
```
[19]: #some very very high maxes compared to the mean
```

```
[20]: cat_cols = df.select_dtypes('object')
      num_cols = df.select_dtypes('number')
```

```
[21]: #checking outliers
a = len(df.columns)
b = 3
c = 1

fig = plt.figure(figsize=(40,45))

for col in num_cols:
    plt.subplot(a,b,c)
    plt.xlabel(col)
    sns.boxplot(x=df[col])
    c=c+1
```



```
[22]: from collections import Counter
def detection(df,features):
    outlier_indices=[]

    for c in features:
        #1st quartile
        Q1 = df[c].quantile(0.25)
```



```

    #3rd quartile
    Q3 = df[c].quantile(0.75)

    #IQR calculation
    IQR = Q3 - Q1
    lower_range = df[c].quantile(0.25) - 1.5* IQR
    upper_range = df[c].quantile(0.75) + 1.5* IQR

    #Outlier detection                                #Outlier indexes
    outlier_list_col=df[ (df[c] < lower_range) | (df[c] > upper_range) ].
↪index

    #Store indexes
    outlier_indices.extend(outlier_list_col)

    outlier_indices=Counter(outlier_indices)
    # number of outliers

    #we are taking indexes

    return outlier_indices

```

[23]: num_cols

```

[23]:      DOF Gross Floor Area \
0          289356.0
1          3693539.0
2          152765.0
3          891040.0
4          211400.0
...          ...
11741         70645.0
11742         93500.0
11743             NaN
11744         57824.0
11745         60720.0

```

```

      Largest Property Use Type - Gross Floor Area (ft²)  Year Built \
0          293447.0          1963
1          3889181.0          1969
2          231342.0          1924
3          1305748.0          1971
4          179694.0          1932
...          ...          ...
11741         74177.0          1928
11742         93500.0          1926
11743        103328.0          1913

```

| | | |
|-------|---------|------|
| 11744 | 60715.0 | 1928 |
| 11745 | 63756.0 | 1930 |

| | Number of Buildings - Self-reported | Occupancy | ENERGY STAR Score \ |
|-------|-------------------------------------|-----------|---------------------|
| 0 | 2 | 100 | NaN |
| 1 | 12 | 100 | 55.0 |
| 2 | 1 | 100 | NaN |
| 3 | 1 | 100 | NaN |
| 4 | 1 | 100 | NaN |
| ... | ... | ... | ... |
| 11741 | 1 | 100 | 98.0 |
| 11742 | 1 | 100 | 16.0 |
| 11743 | 1 | 95 | 83.0 |
| 11744 | 1 | 100 | 92.0 |
| 11745 | 1 | 100 | 19.0 |

| | Site EUI (kBtu/ft ²) | Weather Normalized Site EUI (kBtu/ft ²) \ |
|-------|----------------------------------|---|
| 0 | 305.6 | 303.1 |
| 1 | 229.8 | 228.8 |
| 2 | NaN | NaN |
| 3 | NaN | NaN |
| 4 | NaN | NaN |
| ... | ... | ... |
| 11741 | 81.4 | 87.0 |
| 11742 | 109.3 | 117.7 |
| 11743 | 44.3 | 43.9 |
| 11744 | 70.0 | 74.9 |
| 11745 | 130.2 | 140.5 |

| | Weather Normalized Site Electricity Intensity (kWh/ft ²) \ |
|-------|--|
| 0 | 37.8 |
| 1 | 24.8 |
| 2 | NaN |
| 3 | NaN |
| 4 | NaN |
| ... | ... |
| 11741 | 3.3 |
| 11742 | 5.3 |
| 11743 | 7.7 |
| 11744 | 2.6 |
| 11745 | 3.4 |

| | Weather Normalized Site Natural Gas Intensity (therms/ft ²) \ |
|---|---|
| 0 | NaN |
| 1 | 2.4 |
| 2 | NaN |
| 3 | NaN |

| | |
|-------|-----|
| 4 | NaN |
| ... | ... |
| 11741 | 0.8 |
| 11742 | 0.9 |
| 11743 | 0.2 |
| 11744 | 0.7 |
| 11745 | 1.3 |

| | Weather Normalized Source EUI (kBtu/ft ²) | Natural Gas Use (kBtu) \ |
|-------|---|--------------------------|
| 0 | 614.2 | NaN |
| 1 | 401.1 | 933073441.0 |
| 2 | NaN | NaN |
| 3 | NaN | NaN |
| 4 | NaN | NaN |
| ... | ... | ... |
| 11741 | 114.9 | 5179599.9 |
| 11742 | 160.8 | 8616799.8 |
| 11743 | 101.0 | 1761629.8 |
| 11744 | 96.9 | 3693499.8 |
| 11745 | 172.0 | 7528499.8 |

| | Weather Normalized Site Natural Gas Use (therms) \ |
|-------|--|
| 0 | NaN |
| 1 | 9330734.4 |
| 2 | NaN |
| 3 | NaN |
| 4 | NaN |
| ... | ... |
| 11741 | 56168.9 |
| 11742 | 95350.0 |
| 11743 | 18131.0 |
| 11744 | 40162.6 |
| 11745 | 82151.4 |

| | Electricity Use - Grid Purchase (kBtu) \ |
|-------|--|
| 0 | 38139374.2 |
| 1 | 332365924.0 |
| 2 | NaN |
| 3 | NaN |
| 4 | NaN |
| ... | ... |
| 11741 | 857323.0 |
| 11742 | 1885508.7 |
| 11743 | 2818854.7 |
| 11744 | 556759.9 |
| 11745 | 770105.4 |

| | Weather Normalized Site Electricity (kWh) \ |
|-------|---|
| 0 | 11082770.5 |
| 1 | 96261312.1 |
| 2 | NaN |
| 3 | NaN |
| 4 | NaN |
| ... | ... |
| 11741 | 245251.1 |
| 11742 | 532672.7 |
| 11743 | 796837.2 |
| 11744 | 155319.3 |
| 11745 | 218287.2 |

| | Total GHG Emissions (Metric Tons CO2e) \ |
|-------|--|
| 0 | 6962.2 |
| 1 | 55870.4 |
| 2 | 0.0 |
| 3 | 0.0 |
| 4 | 0.0 |
| ... | ... |
| 11741 | 354.7 |
| 11742 | 674.6 |
| 11743 | 355.2 |
| 11744 | 247.8 |
| 11745 | 471.3 |

| | Direct GHG Emissions (Metric Tons CO2e) \ |
|-------|---|
| 0 | 0.0 |
| 1 | 51016.4 |
| 2 | 0.0 |
| 3 | 0.0 |
| 4 | 0.0 |
| ... | ... |
| 11741 | 275.1 |
| 11742 | 499.7 |
| 11743 | 93.6 |
| 11744 | 196.2 |
| 11745 | 399.9 |

| | Indirect GHG Emissions (Metric Tons CO2e) \ |
|-------|---|
| 0 | 6962.2 |
| 1 | 4854.1 |
| 2 | 0.0 |
| 3 | 0.0 |
| 4 | 0.0 |
| ... | ... |
| 11741 | 79.6 |

| | |
|-------|-------|
| 11742 | 175.0 |
| 11743 | 261.6 |
| 11744 | 51.7 |
| 11745 | 71.5 |

| | Property GFA - Self-Reported (ft ²) \ |
|-------|---|
| 0 | 762051.0 |
| 1 | 3889181.0 |
| 2 | 231342.0 |
| 3 | 1305748.0 |
| 4 | 179694.0 |
| ... | ... |
| 11741 | 74177.0 |
| 11742 | 101291.0 |
| 11743 | 103328.0 |
| 11744 | 60715.0 |
| 11745 | 63756.0 |

| | Water Use (All Water Sources) (kgal) \ |
|-------|--|
| 0 | NaN |
| 1 | NaN |
| 2 | NaN |
| 3 | NaN |
| 4 | NaN |
| ... | ... |
| 11741 | 2308.5 |
| 11742 | 4216.8 |
| 11743 | NaN |
| 11744 | 1687.6 |
| 11745 | NaN |

| | Water Intensity (All Water Sources) (gal/ft ²) | Source EUI (kBtu/ft ²) \ |
|-------|--|--------------------------------------|
| 0 | NaN | 619.4 |
| 1 | NaN | 404.3 |
| 2 | NaN | NaN |
| 3 | NaN | NaN |
| 4 | NaN | NaN |
| ... | ... | ... |
| 11741 | 31.12 | 109.6 |
| 11742 | 41.63 | 153.4 |
| 11743 | NaN | 103.6 |
| 11744 | 27.80 | 92.7 |
| 11745 | NaN | 161.9 |

| | Latitude | Longitude | Community Board | Council District | Census Tract |
|---|-----------|------------|-----------------|------------------|--------------|
| 0 | 40.750791 | -73.973963 | 6.0 | 4.0 | 88.0 |
| 1 | 40.841402 | -73.942568 | 12.0 | 10.0 | 251.0 |

| | | | | | |
|-------|-----------|------------|------|------|-------|
| 2 | 40.840427 | -73.940249 | 12.0 | 10.0 | 251.0 |
| 3 | 40.840746 | -73.942854 | 12.0 | 10.0 | 255.0 |
| 4 | 40.841559 | -73.942528 | 12.0 | 10.0 | 255.0 |
| ... | ... | ... | ... | ... | ... |
| 11741 | 40.696420 | -73.992495 | 2.0 | 33.0 | 502.0 |
| 11742 | 40.692602 | -73.993231 | 2.0 | 33.0 | 7.0 |
| 11743 | NaN | NaN | NaN | NaN | NaN |
| 11744 | 40.670728 | -73.971752 | 6.0 | 39.0 | 165.0 |
| 11745 | 40.685549 | -73.968310 | 2.0 | 35.0 | 199.0 |

[11746 rows x 27 columns]

```
[24]: num_cols_list = list(num_cols)
```

```
[25]: num_cols_list
```

```
[25]: ['DOF Gross Floor Area',
       'Largest Property Use Type - Gross Floor Area (ft²)',
       'Year Built',
       'Number of Buildings - Self-reported',
       'Occupancy',
       'ENERGY STAR Score',
       'Site EUI (kBtu/ft²)',
       'Weather Normalized Site EUI (kBtu/ft²)',
       'Weather Normalized Site Electricity Intensity (kWh/ft²)',
       'Weather Normalized Site Natural Gas Intensity (therms/ft²)',
       'Weather Normalized Source EUI (kBtu/ft²)',
       'Natural Gas Use (kBtu)',
       'Weather Normalized Site Natural Gas Use (therms)',
       'Electricity Use - Grid Purchase (kBtu)',
       'Weather Normalized Site Electricity (kWh)',
       'Total GHG Emissions (Metric Tons CO2e)',
       'Direct GHG Emissions (Metric Tons CO2e)',
       'Indirect GHG Emissions (Metric Tons CO2e)',
       'Property GFA - Self-Reported (ft²)',
       'Water Use (All Water Sources) (kgal)',
       'Water Intensity (All Water Sources) (gal/ft²)',
       'Source EUI (kBtu/ft²)',
       'Latitude',
       'Longitude',
       'Community Board',
       'Council District',
       'Census Tract']
```

```
[26]: outliers = detection(df,num_cols_list)
```

```
[27]: df.loc[outliers]
```

[27]:

| | Parent Property Name | Address 1 (self-reported) \ |
|-------|-------------------------------------|------------------------------|
| 1 | NYP Columbia (West Campus) | 622 168th Street |
| 3 | NYP Columbia (West Campus) | 161 Fort Washington Ave |
| 5 | NYP Cornell (East Campus) | 525 East 68th Street |
| 7 | North Shore Towers | 270-10 Grand Central Parkway |
| 8 | North Shore Towers | 272-86 Grand Central Parkway |
| ... | ... | ... |
| 9541 | Not Applicable: Standalone Property | 1150 Brighton Beach Avenue |
| 9542 | Not Applicable: Standalone Property | 200 Brighton 15th st. |
| 9544 | Not Applicable: Standalone Property | 200 Corbin Place |
| 11736 | Not Applicable: Standalone Property | 1955 Grand Concourse |
| 11737 | Not Applicable: Standalone Property | 1480 Popham Ave |

| | Borough | DOF Gross Floor Area | Primary Property Type - Self Selected \ |
|-------|-----------|----------------------|---|
| 1 | Manhattan | 3693539.0 | Hospital (General Medical & Surgical) |
| 3 | Manhattan | 891040.0 | Hospital (General Medical & Surgical) |
| 5 | Manhattan | 2230742.0 | Hospital (General Medical & Surgical) |
| 7 | Queens | 3750565.0 | Multifamily Housing |
| 8 | Queens | 3750565.0 | Other |
| ... | ... | ... | ... |
| 9541 | Brooklyn | 162957.0 | Multifamily Housing |
| 9542 | Brooklyn | 96600.0 | Multifamily Housing |
| 9544 | Brooklyn | 146834.0 | Multifamily Housing |
| 11736 | Bronx | 59800.0 | Multifamily Housing |
| 11737 | Bronx | 60480.0 | Multifamily Housing |

| | List of All Property Use Types at Property \ |
|-------|---|
| 1 | Hospital (General Medical & Surgical) |
| 3 | Hospital (General Medical & Surgical) |
| 5 | Hospital (General Medical & Surgical) |
| 7 | Financial Office, Medical Office, Multifamily ... |
| 8 | Other |
| ... | ... |
| 9541 | Multifamily Housing |
| 9542 | Multifamily Housing, Parking |
| 9544 | Multifamily Housing |
| 11736 | Multifamily Housing |
| 11737 | Multifamily Housing |

| | Largest Property Use Type \ |
|------|---------------------------------------|
| 1 | Hospital (General Medical & Surgical) |
| 3 | Hospital (General Medical & Surgical) |
| 5 | Hospital (General Medical & Surgical) |
| 7 | Multifamily Housing |
| 8 | Other |
| ... | ... |
| 9541 | Multifamily Housing |

| | |
|-------|---------------------|
| 9542 | Multifamily Housing |
| 9544 | Multifamily Housing |
| 11736 | Multifamily Housing |
| 11737 | Multifamily Housing |

| | Largest Property Use Type - Gross Floor Area (ft ²) | Year Built \ |
|-------|---|--------------|
| 1 | 3889181.0 | 1969 |
| 3 | 1305748.0 | 1971 |
| 5 | 2971874.0 | 1932 |
| 7 | 2400000.0 | 1974 |
| 8 | 200.0 | 1974 |
| ... | ... | ... |
| 9541 | 167846.0 | 1935 |
| 9542 | 96600.0 | 1951 |
| 9544 | 151239.0 | 1961 |
| 11736 | 67350.0 | 1930 |
| 11737 | 72372.0 | 1940 |

| | Number of Buildings - Self-reported | Occupancy Metered | Areas (Energy) \ |
|-------|-------------------------------------|-------------------|------------------|
| 1 | 12 | 100 | Whole Building |
| 3 | 1 | 100 | NaN |
| 5 | 12 | 100 | Whole Building |
| 7 | 4 | 100 | Whole Building |
| 8 | 1 | 100 | Whole Building |
| ... | ... | ... | ... |
| 9541 | 1 | 100 | Whole Building |
| 9542 | 1 | 100 | Whole Building |
| 9544 | 1 | 100 | Whole Building |
| 11736 | 1 | 100 | Whole Building |
| 11737 | 1 | 100 | Whole Building |

| | Metered Areas (Water) | ENERGY STAR Score \ |
|-------|--|---------------------|
| 1 | Whole Building | 55.0 |
| 3 | NaN | NaN |
| 5 | Whole Building | 55.0 |
| 7 | Combination of common and tenant areas | NaN |
| 8 | NaN | NaN |
| ... | ... | ... |
| 9541 | NaN | 75.0 |
| 9542 | NaN | NaN |
| 9544 | NaN | 90.0 |
| 11736 | NaN | 83.0 |
| 11737 | NaN | 83.0 |

| | Site EUI (kBtu/ft ²) | Weather Normalized Site EUI (kBtu/ft ²) \ |
|---|----------------------------------|---|
| 1 | 229.8 | 228.8 |
| 3 | NaN | NaN |

| | | |
|-------|----------|----------|
| 5 | 359.9 | 359.0 |
| 7 | 143974.4 | 143976.0 |
| 8 | 1138.3 | 1091.5 |
| ... | ... | ... |
| 9541 | 76.3 | 80.8 |
| 9542 | NaN | NaN |
| 9544 | 58.7 | 61.8 |
| 11736 | 102.0 | 106.5 |
| 11737 | 95.0 | 101.4 |

Weather Normalized Site Electricity Intensity (kWh/ft²) \

| | |
|-------|-------|
| 1 | 24.8 |
| 3 | NaN |
| 5 | 8.3 |
| 7 | NaN |
| 8 | 319.9 |
| ... | ... |
| 9541 | 3.4 |
| 9542 | NaN |
| 9544 | 3.1 |
| 11736 | 4.6 |
| 11737 | 5.0 |

Weather Normalized Site Natural Gas Intensity (therms/ft²) \

| | |
|-------|--------|
| 1 | 2.4 |
| 3 | NaN |
| 5 | 4.8 |
| 7 | 1439.7 |
| 8 | NaN |
| ... | ... |
| 9541 | 0.7 |
| 9542 | NaN |
| 9544 | 0.5 |
| 11736 | 0.9 |
| 11737 | 0.8 |

| | Weather Normalized Source EUI (kBtu/ft ²) | Natural Gas Use (kBtu) \ |
|-------|---|--------------------------|
| 1 | 401.1 | 9.330734e+08 |
| 3 | NaN | NaN |
| 5 | 411.5 | 1.432251e+09 |
| 7 | 151174.5 | 3.942852e+11 |
| 8 | 3427.3 | NaN |
| ... | ... | ... |
| 9541 | 109.2 | 1.075506e+07 |
| 9542 | NaN | NaN |
| 9544 | 87.2 | 7.233821e+06 |
| 11736 | 144.2 | 5.511800e+06 |

| | | |
|-------|-------|--------------|
| 11737 | 142.2 | 5.593400e+06 |
|-------|-------|--------------|

| | | |
|-------|--|--|
| | Weather Normalized Site Natural Gas Use (therms) \ | |
| 1 | 9.330734e+06 | |
| 3 | NaN | |
| 5 | 1.432251e+07 | |
| 7 | 3.942852e+09 | |
| 8 | NaN | |
| ... | ... | |
| 9541 | 1.159262e+05 | |
| 9542 | NaN | |
| 9544 | 7.738320e+04 | |
| 11736 | 5.843670e+04 | |
| 11737 | 6.097370e+04 | |

| | | |
|-------|--|--|
| | Electricity Use - Grid Purchase (kBtu) \ | |
| 1 | 332365924.0 | |
| 3 | NaN | |
| 5 | 86335350.5 | |
| 7 | NaN | |
| 8 | 227658.1 | |
| ... | ... | |
| 9541 | 2058312.0 | |
| 9542 | NaN | |
| 9544 | 1645082.2 | |
| 11736 | 1081157.0 | |
| 11737 | 1284867.1 | |

| | | |
|-------|---|--|
| | Weather Normalized Site Electricity (kWh) \ | |
| 1 | 96261312.1 | |
| 3 | NaN | |
| 5 | 24550859.4 | |
| 7 | NaN | |
| 8 | 63979.9 | |
| ... | ... | |
| 9541 | 574828.4 | |
| 9542 | NaN | |
| 9544 | 472185.0 | |
| 11736 | 307746.1 | |
| 11737 | 363247.5 | |

| | | |
|---|--|--|
| | Total GHG Emissions (Metric Tons CO2e) \ | |
| 1 | 55870.4 | |
| 3 | 0.0 | |
| 5 | 54429.8 | |
| 7 | 20943400.0 | |
| 8 | 21.1 | |

| | |
|-------|-------|
| ... | ... |
| 9541 | 762.3 |
| 9542 | NaN |
| 9544 | 536.9 |
| 11736 | 413.7 |
| 11737 | 416.3 |

| | |
|-------|---|
| | Direct GHG Emissions (Metric Tons CO2e) \ |
| 1 | 51016.4 |
| 3 | 0.0 |
| 5 | 77564.1 |
| 7 | 20943400.0 |
| 8 | 0.0 |
| ... | ... |
| 9541 | 571.3 |
| 9542 | NaN |
| 9544 | 384.2 |
| 11736 | 313.3 |
| 11737 | 297.1 |

| | |
|-------|---|
| | Indirect GHG Emissions (Metric Tons CO2e) \ |
| 1 | 4854.1 |
| 3 | 0.0 |
| 5 | -23134.3 |
| 7 | 0.0 |
| 8 | 21.1 |
| ... | ... |
| 9541 | 191.0 |
| 9542 | NaN |
| 9544 | 152.7 |
| 11736 | 100.3 |
| 11737 | 119.2 |

| | |
|-------|---|
| | Property GFA - Self-Reported (ft ²) \ |
| 1 | 3889181.0 |
| 3 | 1305748.0 |
| 5 | 2971874.0 |
| 7 | 2738875.0 |
| 8 | 200.0 |
| ... | ... |
| 9541 | 167846.0 |
| 9542 | 96600.0 |
| 9544 | 151239.0 |
| 11736 | 67350.0 |
| 11737 | 72372.0 |

| | |
|--|--|
| | Water Use (All Water Sources) (kgal) \ |
|--|--|

| | |
|-------|----------|
| 1 | NaN |
| 3 | NaN |
| 5 | NaN |
| 7 | 107151.5 |
| 8 | 19261.1 |
| ... | ... |
| 9541 | 9547.7 |
| 9542 | NaN |
| 9544 | 6651.0 |
| 11736 | 8862.0 |
| 11737 | 7215.4 |

| | Water Intensity (All Water Sources) (gal/ft ²) | Source EUI (kBtu/ft ²) \ |
|-------|--|--------------------------------------|
| 1 | NaN | 404.3 |
| 3 | NaN | NaN |
| 5 | NaN | 414.2 |
| 7 | 39.13 | 151172.9 |
| 8 | 96305.69 | 3574.2 |
| ... | ... | ... |
| 9541 | 56.88 | 105.8 |
| 9542 | NaN | NaN |
| 9544 | 43.98 | 84.4 |
| 11736 | 131.58 | 140.5 |
| 11737 | 99.70 | 136.9 |

| | Release Date | Water Required? \ |
|-------|------------------------|-------------------|
| 1 | 04/27/2017 11:23:27 AM | No |
| 3 | 04/27/2017 11:23:27 AM | No |
| 5 | 04/27/2017 11:23:27 AM | No |
| 7 | 04/28/2017 07:44:37 AM | Yes |
| 8 | 04/28/2017 07:44:37 AM | Yes |
| ... | ... | ... |
| 9541 | 04/25/2017 02:36:18 PM | Yes |
| 9542 | 05/01/2017 07:43:09 PM | Yes |
| 9544 | 04/25/2017 02:36:18 PM | Yes |
| 11736 | 04/26/2017 04:59:11 PM | Yes |
| 11737 | 04/26/2017 04:59:11 PM | No |

| | DOF Benchmarking Submission Status | Latitude | Longitude \ |
|------|------------------------------------|-----------|-------------|
| 1 | In Compliance | 40.841402 | -73.942568 |
| 3 | In Compliance | 40.840746 | -73.942854 |
| 5 | In Compliance | 40.761395 | -73.957726 |
| 7 | In Compliance | 40.757859 | -73.715543 |
| 8 | In Compliance | 40.757859 | -73.715543 |
| ... | ... | ... | ... |
| 9541 | In Compliance | 40.577631 | -73.955718 |
| 9542 | In Compliance | 40.576289 | -73.955064 |

| | | | |
|-------|---------------|-----------|------------|
| 9544 | In Compliance | 40.577241 | -73.953962 |
| 11736 | NaN | 40.850655 | -73.905048 |
| 11737 | NaN | 40.847884 | -73.921891 |

| | Community Board | Council District | Census Tract |
|-------|-----------------|------------------|--------------|
| 1 | 12.0 | 10.0 | 251.0 |
| 3 | 12.0 | 10.0 | 255.0 |
| 5 | 8.0 | 5.0 | 116.0 |
| 7 | 13.0 | 23.0 | 155101.0 |
| 8 | 13.0 | 23.0 | 155101.0 |
| ... | ... | ... | ... |
| 9541 | 13.0 | 48.0 | 61002.0 |
| 9542 | 13.0 | 48.0 | 61002.0 |
| 9544 | 13.0 | 48.0 | 61002.0 |
| 11736 | 5.0 | 14.0 | 23501.0 |
| 11737 | 5.0 | 14.0 | 20501.0 |

[5454 rows x 38 columns]

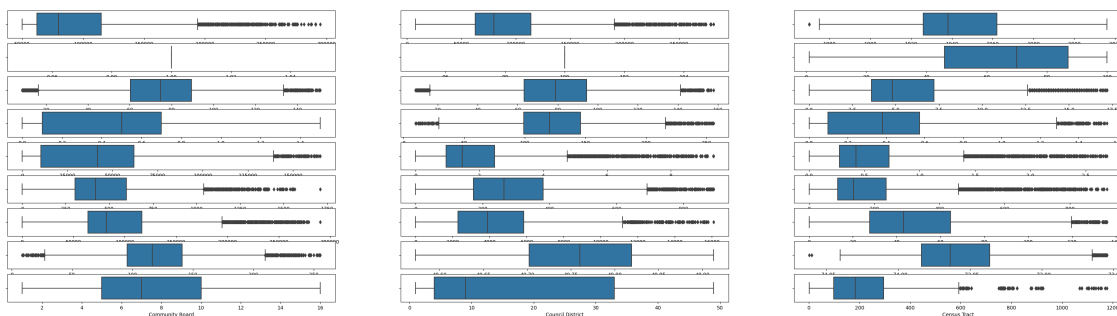
```
[28]: data = df.drop(outliers,axis=0).reset_index(drop = True)
```

```
[29]: a = len(df.columns)
b = 3
c = 1

fig = plt.figure(figsize=(40,45))

for col in num_cols:
    plt.subplot(a,b,c)
    plt.xlabel(col)
    sns.boxplot(x=data[col])
    c=c+1

#better but still a lot
```



```
[30]: data.describe()
```

```
[30]:      DOF Gross Floor Area \
```

```
count      6268.000000
mean       95331.876516
std        44649.962793
min        50028.000000
25%        62099.000000
50%        79910.000000
75%       114994.000000
max       294821.000000
```

```
      Largest Property Use Type - Gross Floor Area (ft2)  Year Built \
count      6291.000000      6292.000000
mean      94263.622095      1946.043388
std      43442.699988        29.548785
min       8000.000000      1870.000000
25%      62625.000000      1926.000000
50%      80000.000000      1938.000000
75%     113891.000000      1962.000000
max     281941.000000      2016.000000
```

```
      Number of Buildings - Self-reported  Occupancy  ENERGY STAR Score \
count      6292.0      6292.0      5261.000000
mean         1.0      100.0      64.421973
std          0.0         0.0      27.241580
min          1.0      100.0         1.000000
25%          1.0      100.0      46.000000
50%          1.0      100.0      70.000000
75%          1.0      100.0      87.000000
max          1.0      100.0     100.000000
```

```
      Site EUI (kBtu/ft2)  Weather Normalized Site EUI (kBtu/ft2) \
count      6232.000000      5515.000000
mean        73.989265        77.812947
std        25.660435        26.955478
min         8.600000         9.000000
25%        60.175000        63.100000
50%        74.700000        78.800000
75%        89.525000        94.500000
max       151.000000       157.900000
```

```
      Weather Normalized Site Electricity Intensity (kWh/ft2) \
count      5904.000000
mean         5.829590
std         3.263483
min         0.000000
```

| | |
|-----|-----------|
| 25% | 3.600000 |
| 50% | 4.800000 |
| 75% | 7.200000 |
| max | 17.200000 |

| Weather Normalized Site Natural Gas Intensity (therms/ft ²) \ | |
|---|-------------|
| count | 5416.000000 |
| mean | 0.454838 |
| std | 0.319306 |
| min | 0.000000 |
| 25% | 0.100000 |
| 50% | 0.500000 |
| 75% | 0.700000 |
| max | 1.500000 |

| Weather Normalized Source EUI (kBtu/ft ²) Natural Gas Use (kBtu) \ | | |
|--|-------------|--------------|
| count | 5515.000000 | 5.705000e+03 |
| mean | 123.159347 | 3.960240e+06 |
| std | 39.850901 | 3.182682e+06 |
| min | 9.800000 | 0.000000e+00 |
| 25% | 99.100000 | 9.755530e+05 |
| 50% | 120.600000 | 3.825439e+06 |
| 75% | 146.000000 | 5.738981e+06 |
| max | 256.000000 | 1.547865e+07 |

| Weather Normalized Site Natural Gas Use (therms) \ | |
|--|---------------|
| count | 5416.000000 |
| mean | 42825.709287 |
| std | 34267.090684 |
| min | 0.000000 |
| 25% | 10320.900000 |
| 50% | 41703.300000 |
| 75% | 61930.525000 |
| max | 165081.800000 |

| Electricity Use - Grid Purchase (kBtu) \ | |
|--|--------------|
| count | 6.219000e+03 |
| mean | 1.989576e+06 |
| std | 1.566178e+06 |
| min | 0.000000e+00 |
| 25% | 9.514696e+05 |
| 50% | 1.464586e+06 |
| 75% | 2.474833e+06 |
| max | 9.345752e+06 |

| Weather Normalized Site Electricity (kWh) \ | |
|---|--------------|
| count | 5.904000e+03 |

| | |
|------|--------------|
| mean | 5.778506e+05 |
| std | 4.550941e+05 |
| min | 0.000000e+00 |
| 25% | 2.736860e+05 |
| 50% | 4.236845e+05 |
| 75% | 7.231212e+05 |
| max | 2.691784e+06 |

| | |
|--|-------------|
| Total GHG Emissions (Metric Tons CO2e) \ | |
| count | 6261.000000 |
| mean | 475.221498 |
| std | 252.769061 |
| min | 0.000000 |
| 25% | 302.600000 |
| 50% | 420.000000 |
| 75% | 598.000000 |
| max | 1711.000000 |

| | |
|---|-------------|
| Direct GHG Emissions (Metric Tons CO2e) \ | |
| count | 6254.000000 |
| mean | 284.930972 |
| std | 178.919736 |
| min | 0.000000 |
| 25% | 172.625000 |
| 50% | 263.350000 |
| 75% | 380.350000 |
| max | 890.100000 |

| | |
|---|-------------|
| Indirect GHG Emissions (Metric Tons CO2e) \ | |
| count | 6262.000000 |
| mean | 190.685883 |
| std | 157.579845 |
| min | 0.000000 |
| 25% | 87.900000 |
| 50% | 136.250000 |
| 75% | 236.300000 |
| max | 914.400000 |

| | |
|---|---------------|
| Property GFA - Self-Reported (ft ²) \ | |
| count | 6292.000000 |
| mean | 96860.123331 |
| std | 44255.291152 |
| min | 120.000000 |
| 25% | 64166.250000 |
| 50% | 82107.500000 |
| 75% | 116466.250000 |
| max | 290421.000000 |

| | Water Use (All Water Sources) (kgal) \ |
|-------|--|
| count | 4336.000000 |
| mean | 4326.334640 |
| std | 2880.103915 |
| min | 0.000000 |
| 25% | 2289.500000 |
| 50% | 3869.650000 |
| 75% | 5848.700000 |
| max | 16104.100000 |

| | Water Intensity (All Water Sources) (gal/ft ²) | Source EUI (kBtu/ft ²) \ |
|-------|--|--------------------------------------|
| count | 4336.000000 | 6232.000000 |
| mean | 47.552671 | 119.266030 |
| std | 28.972380 | 39.431424 |
| min | 0.000000 | 8.700000 |
| 25% | 27.717500 | 95.500000 |
| 50% | 43.120000 | 116.500000 |
| 75% | 64.642500 | 141.200000 |
| max | 136.030000 | 255.400000 |

| | Latitude | Longitude | Community Board | Council District \ |
|-------|-------------|-------------|-----------------|--------------------|
| count | 4885.000000 | 4885.000000 | 4885.000000 | 4885.000000 |
| mean | 40.755013 | -73.957259 | 7.334903 | 16.186489 |
| std | 0.080331 | 0.036394 | 3.779825 | 15.682984 |
| min | 40.572759 | -74.062256 | 1.000000 | 1.000000 |
| 25% | 40.702245 | -73.984023 | 5.000000 | 4.000000 |
| 50% | 40.759937 | -73.963826 | 7.000000 | 9.000000 |
| 75% | 40.818992 | -73.936260 | 10.000000 | 33.000000 |
| max | 40.912869 | -73.854455 | 16.000000 | 49.000000 |

| | Census Tract |
|-------|--------------|
| count | 4885.000000 |
| mean | 233.255271 |
| std | 183.412281 |
| min | 1.000000 |
| 25% | 98.000000 |
| 50% | 183.000000 |
| 75% | 296.000000 |
| max | 1178.000000 |

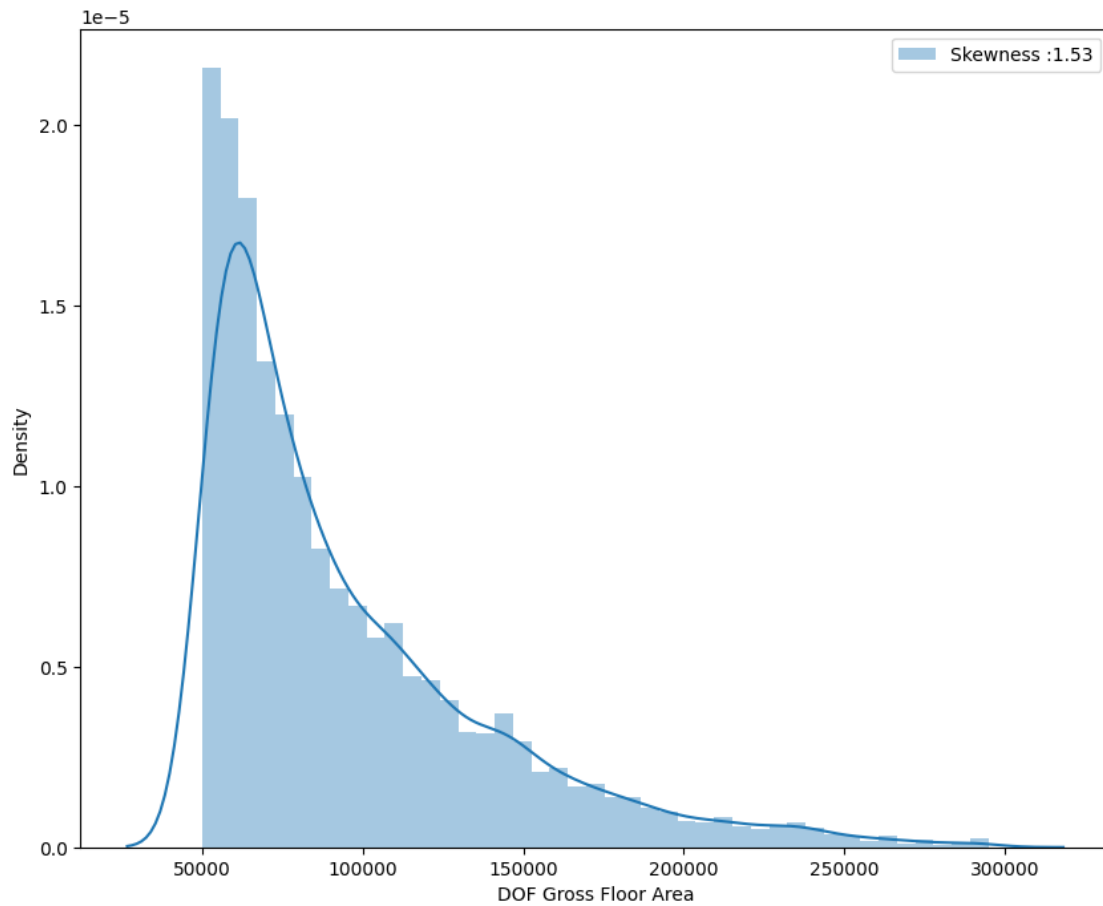
```
[31]: df.shape
```

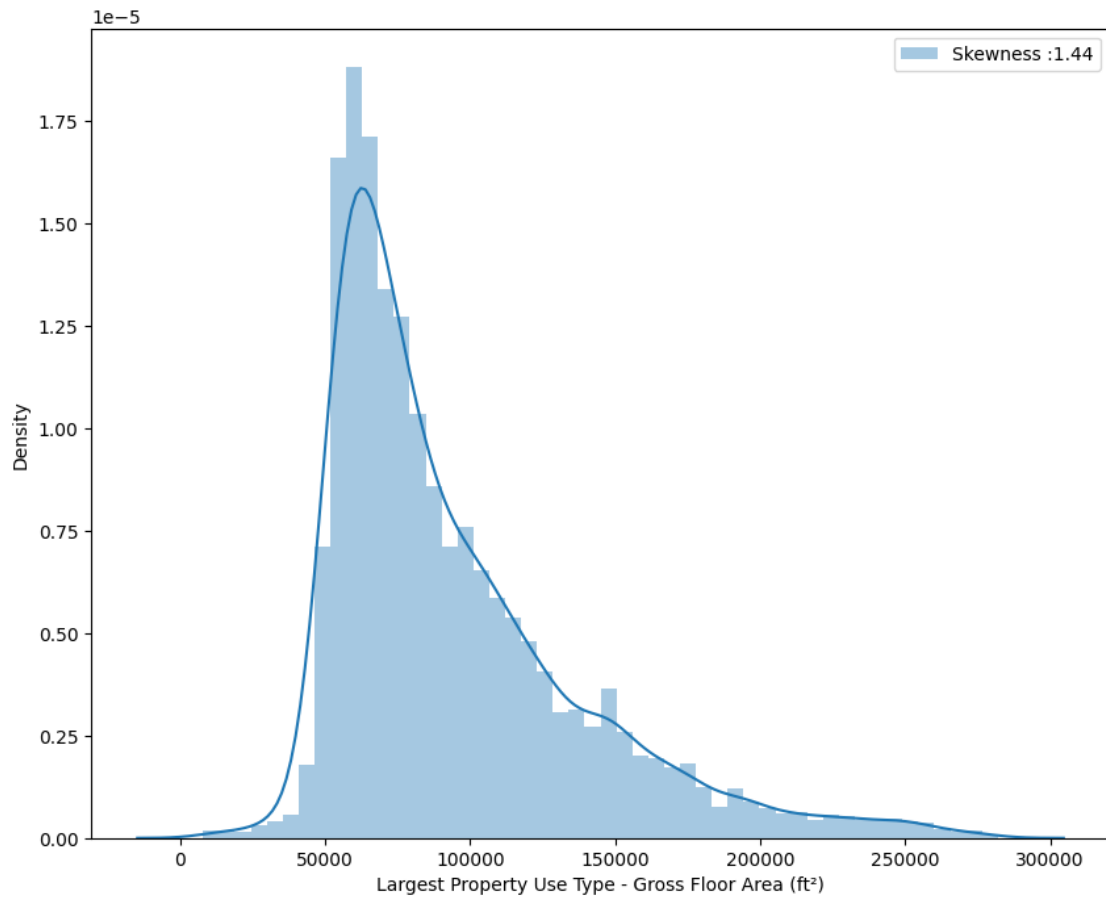
```
[31]: (11746, 38)
```

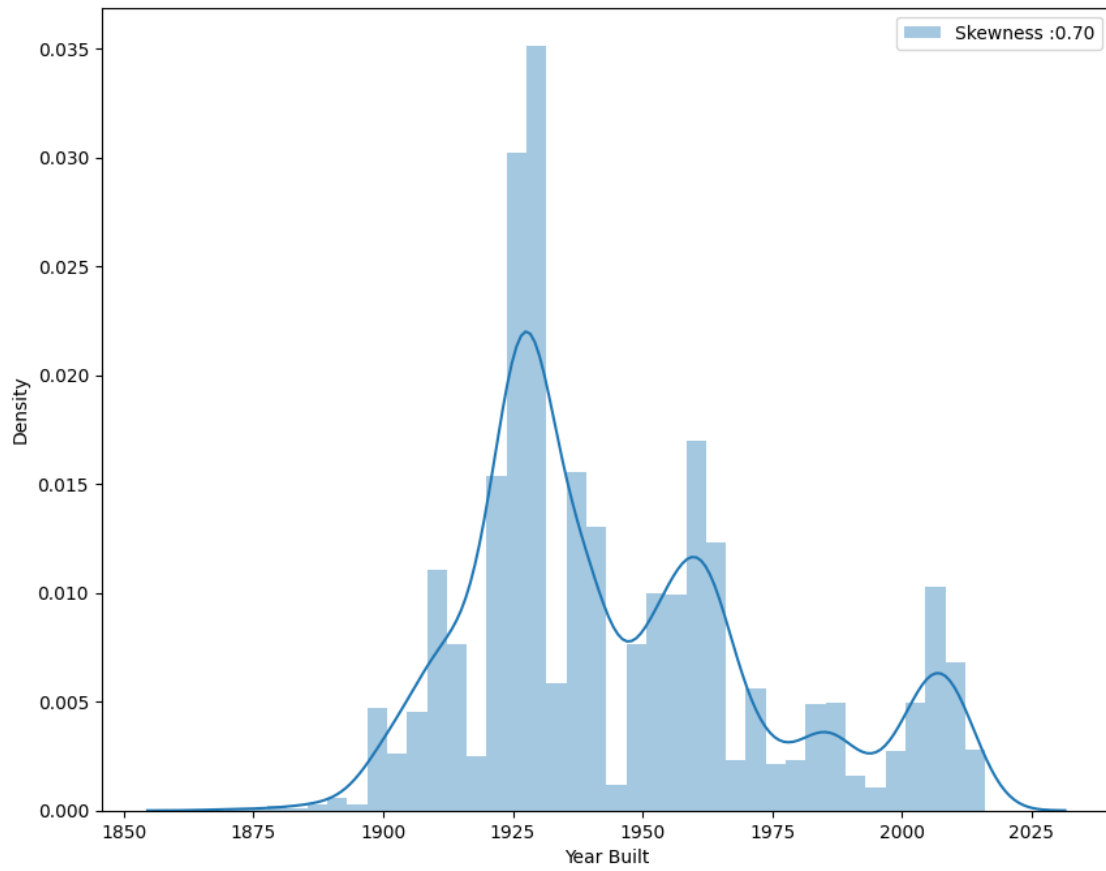
```
[32]: data.shape
```

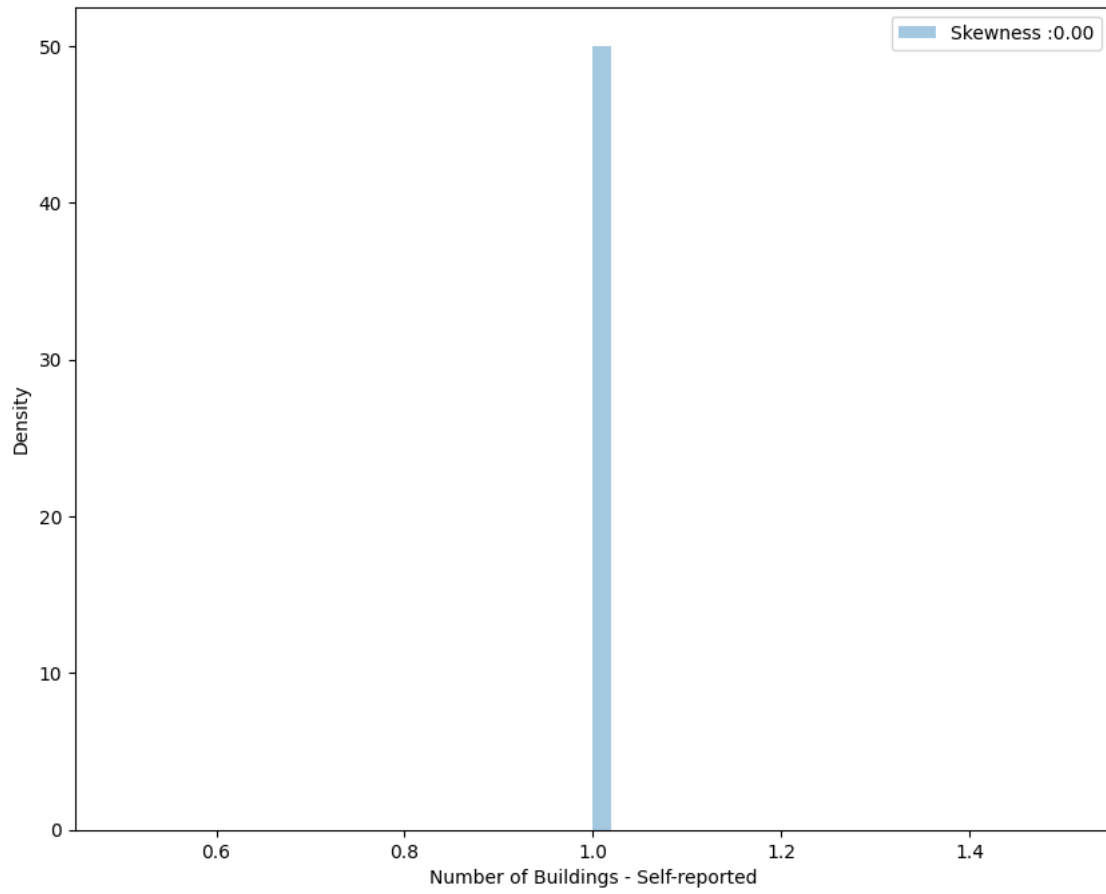
[32]: (6292, 38)

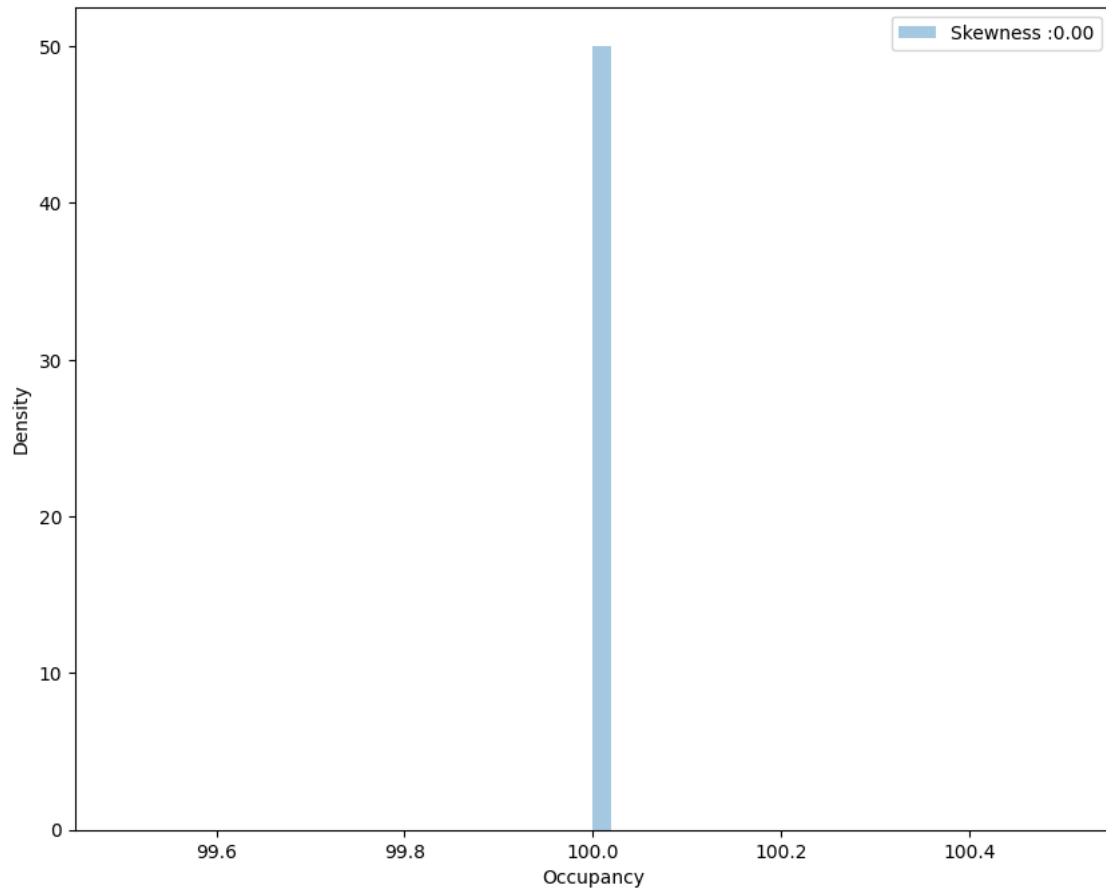
```
[33]: for col in num_cols:
plt.figure(figsize=(10,8))
plt.xlabel(col)
sns.distplot(x=data[col],label='Skewness :%.2f'%(data[col].skew()))
plt.legend()
plt.show()
```

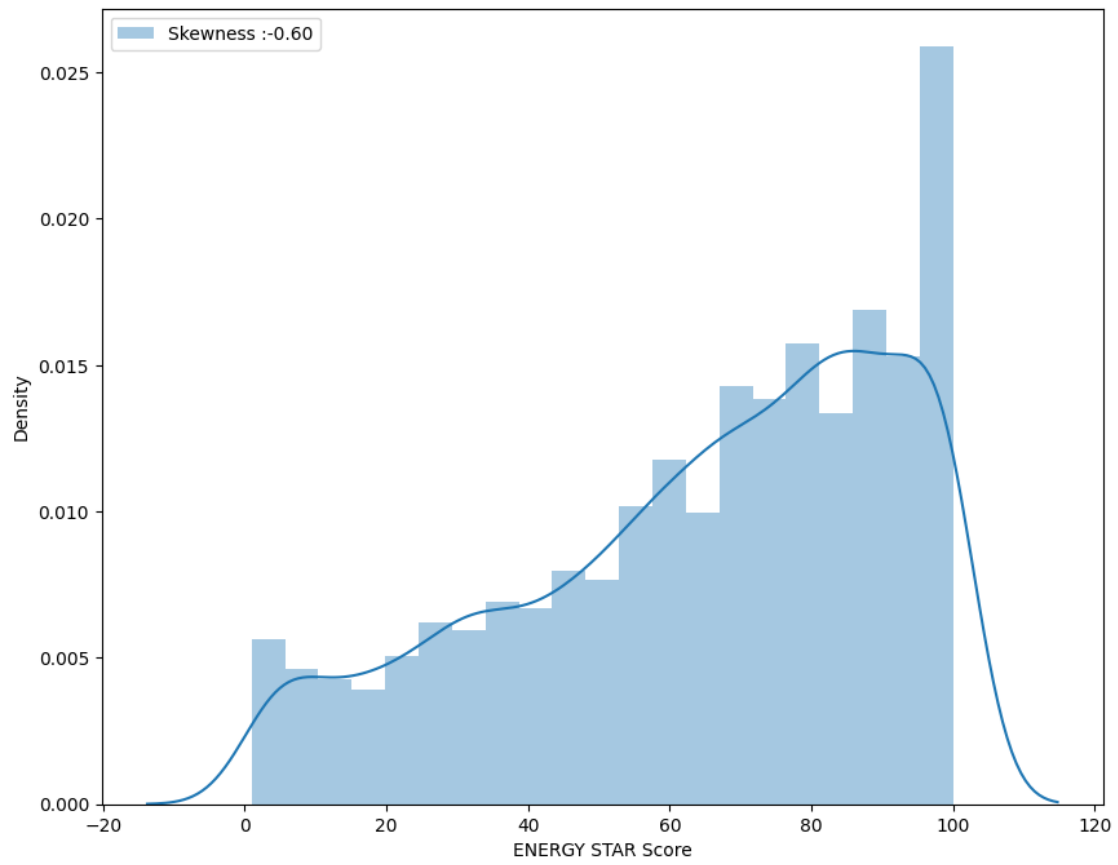


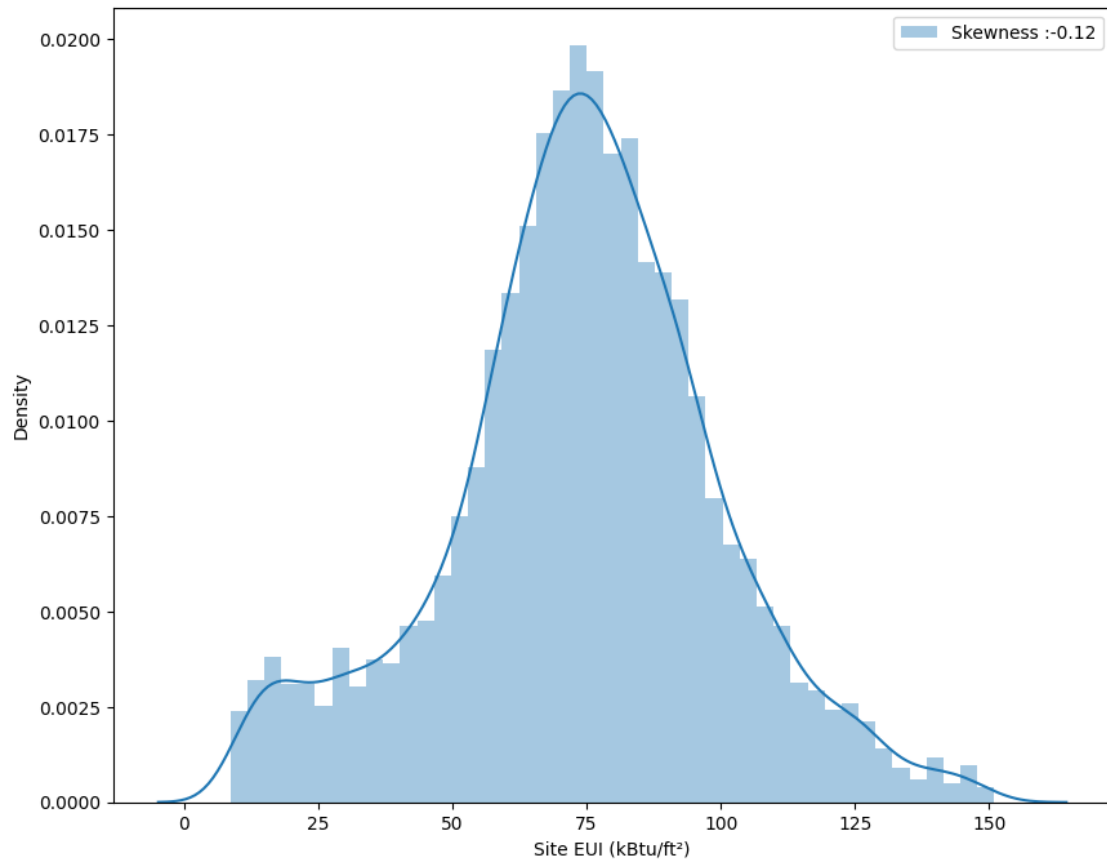


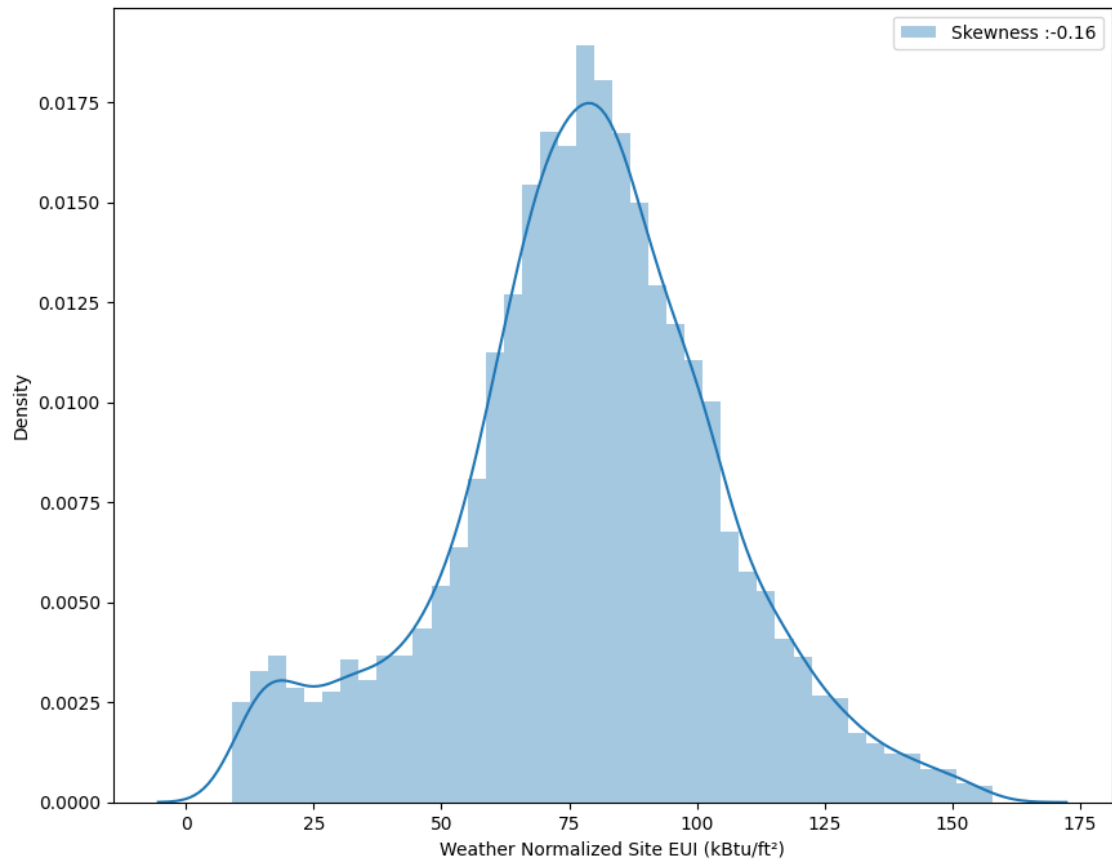


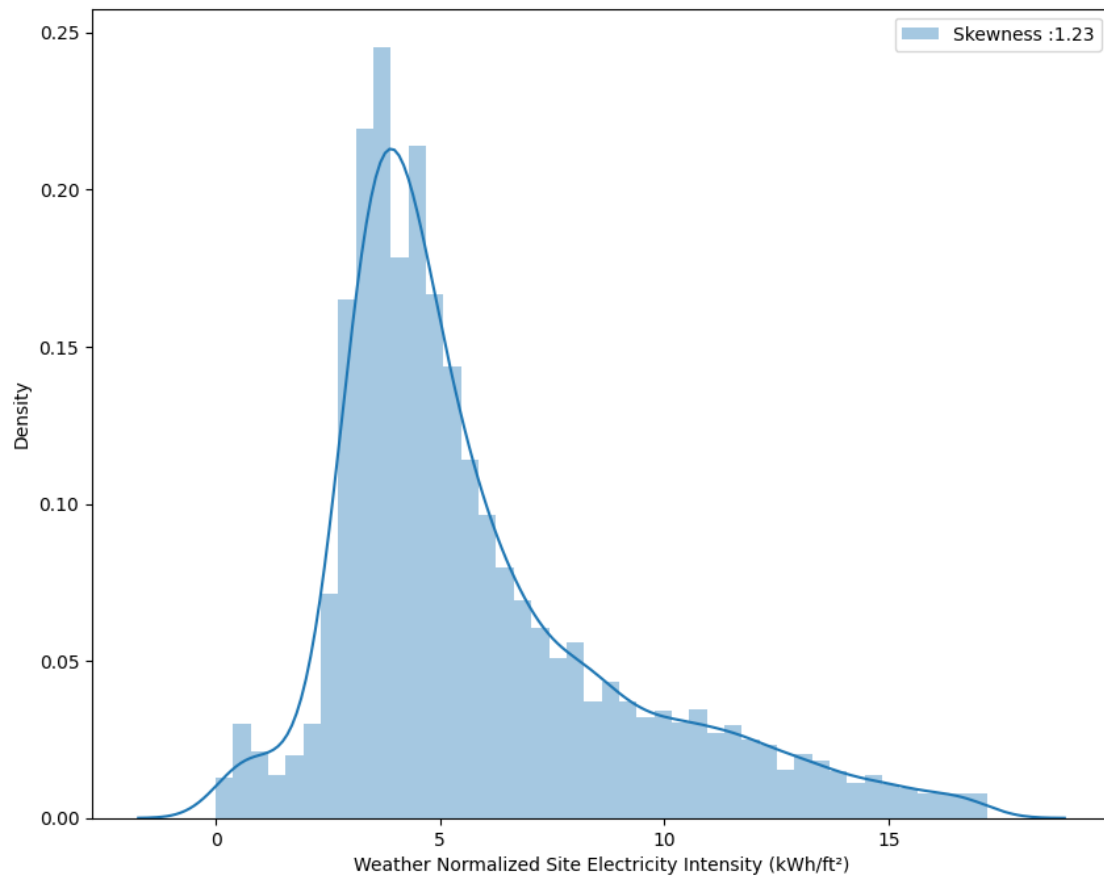


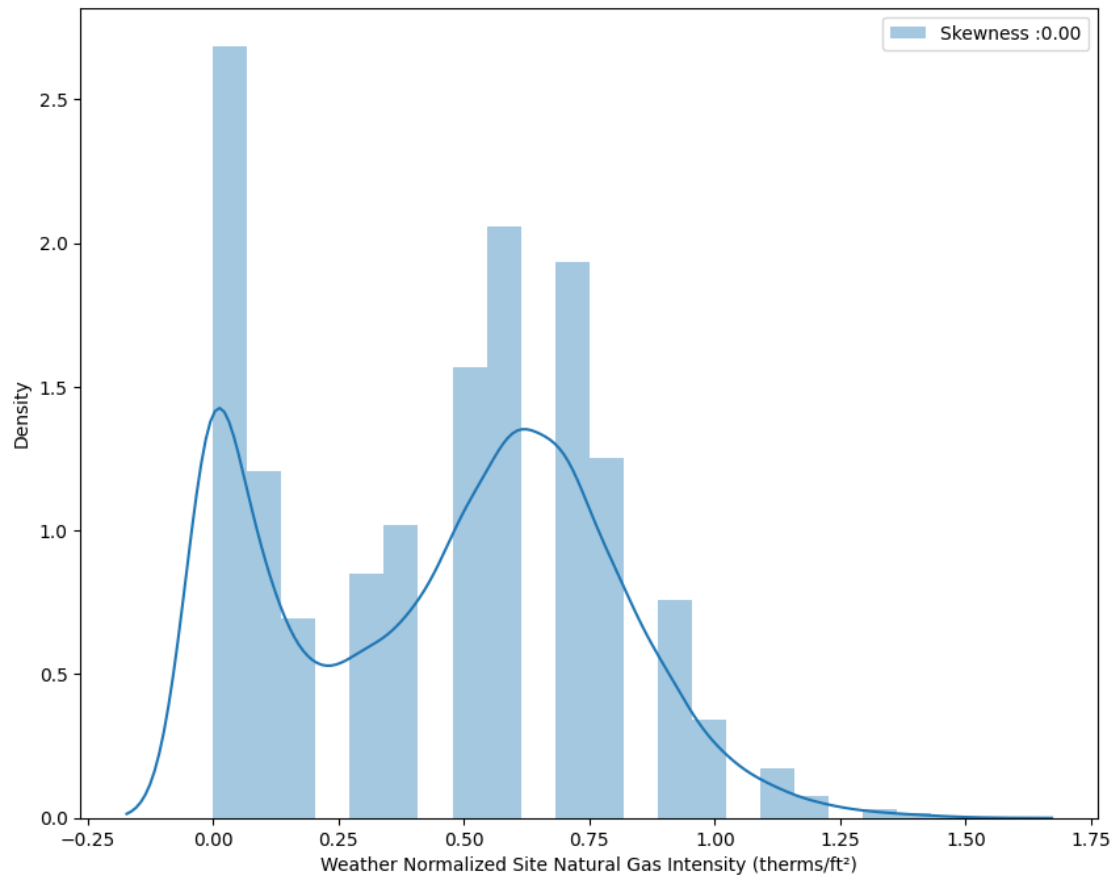


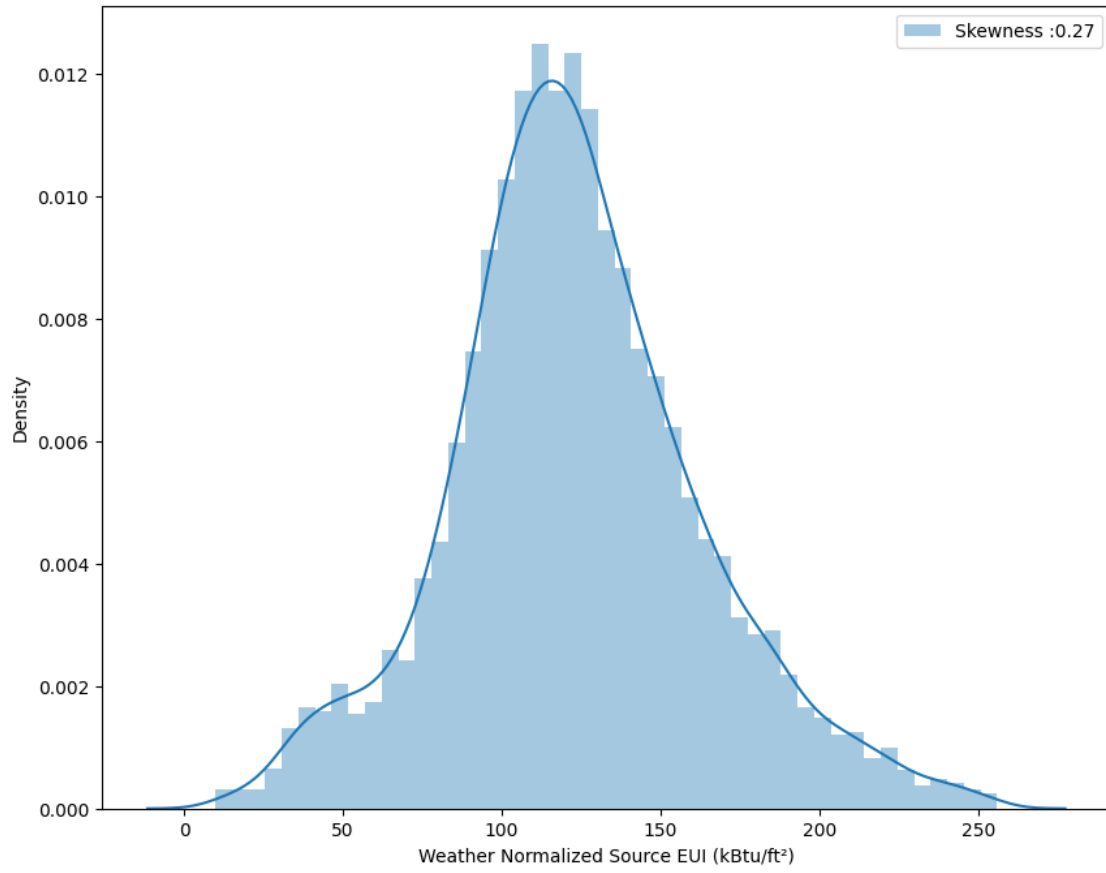


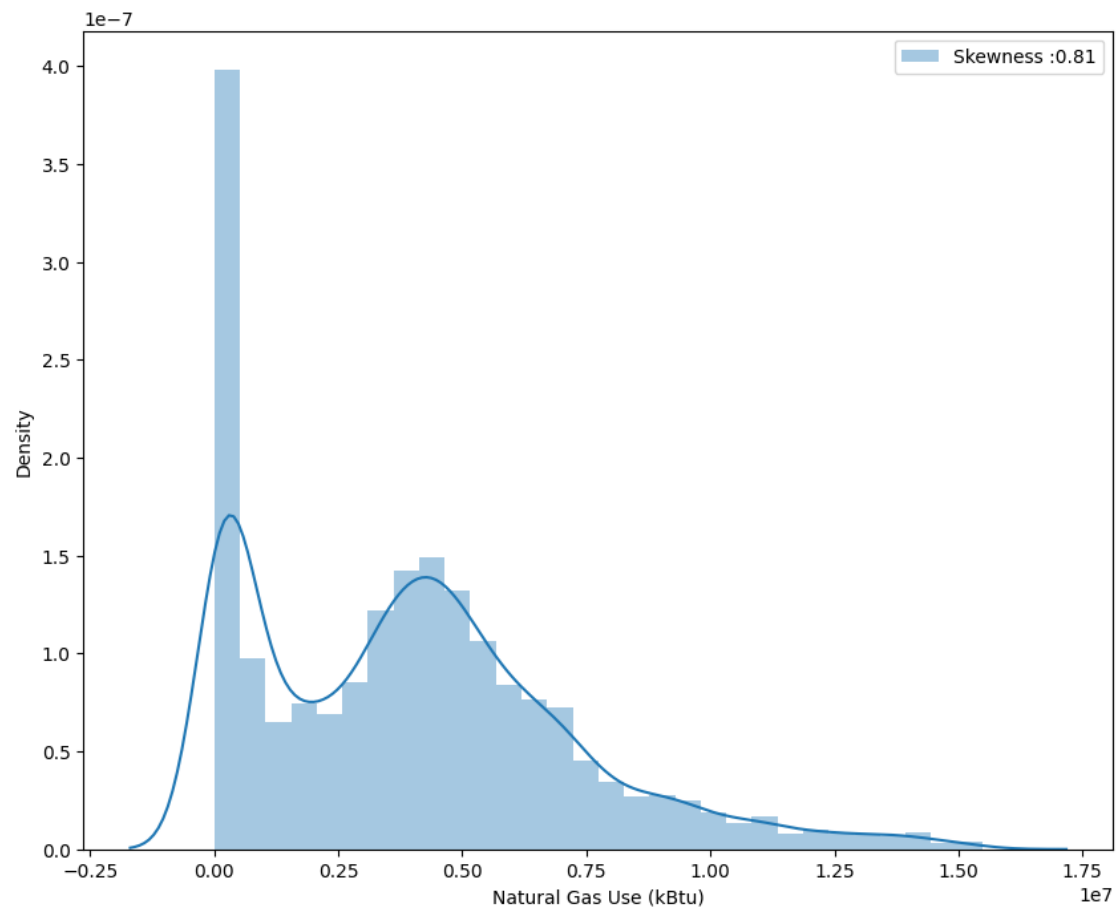


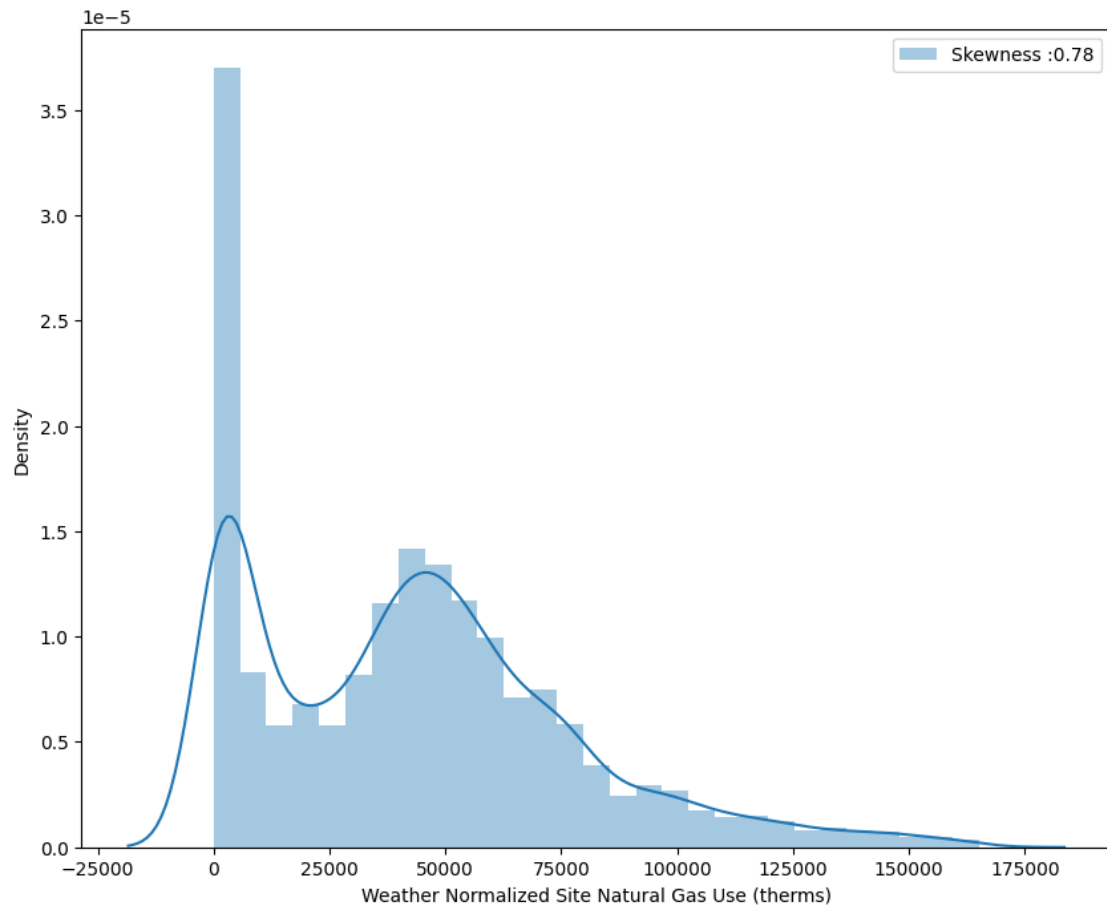


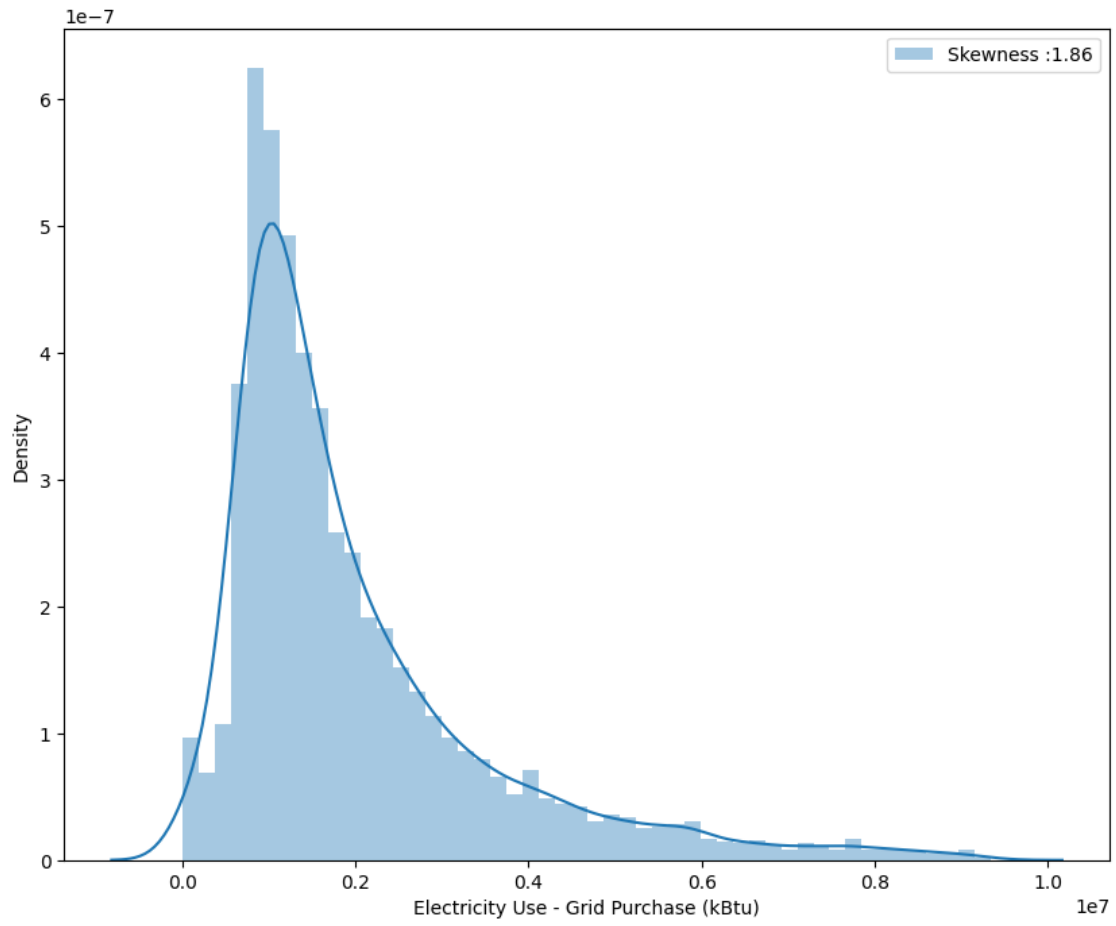


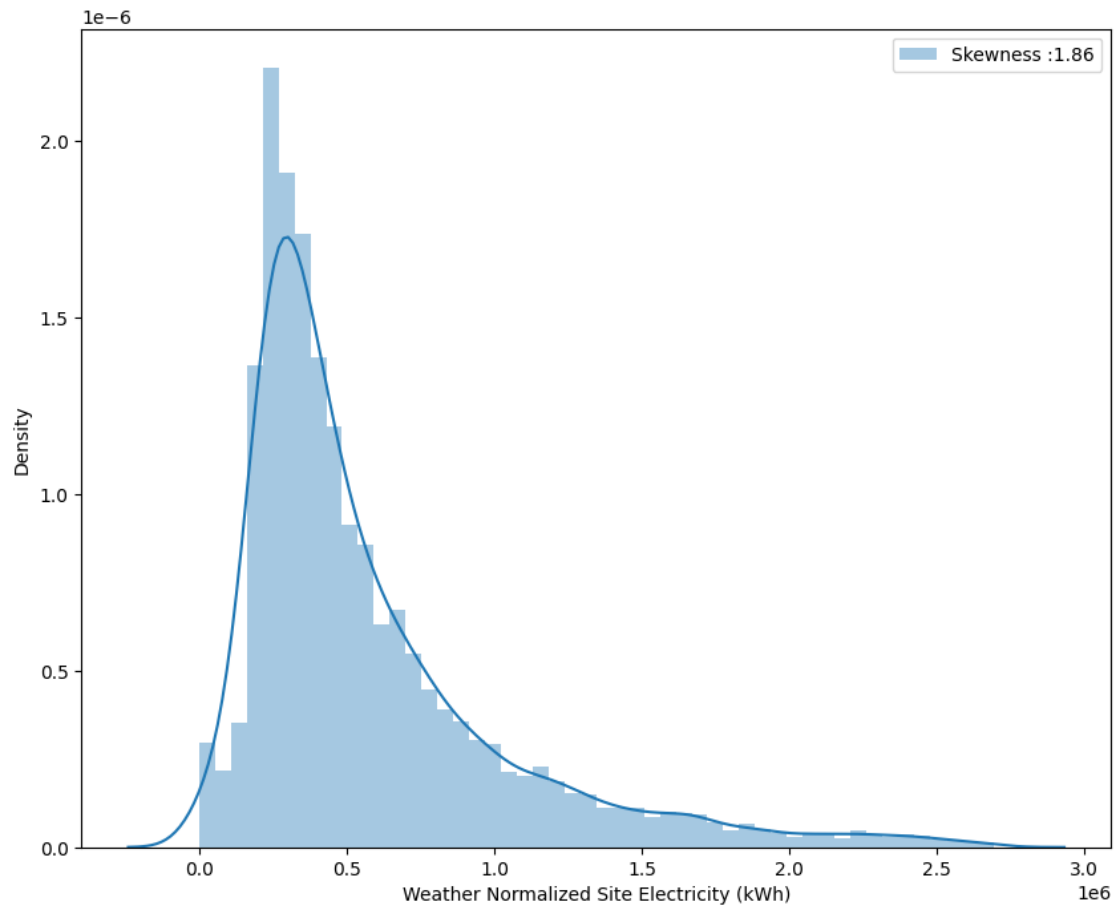


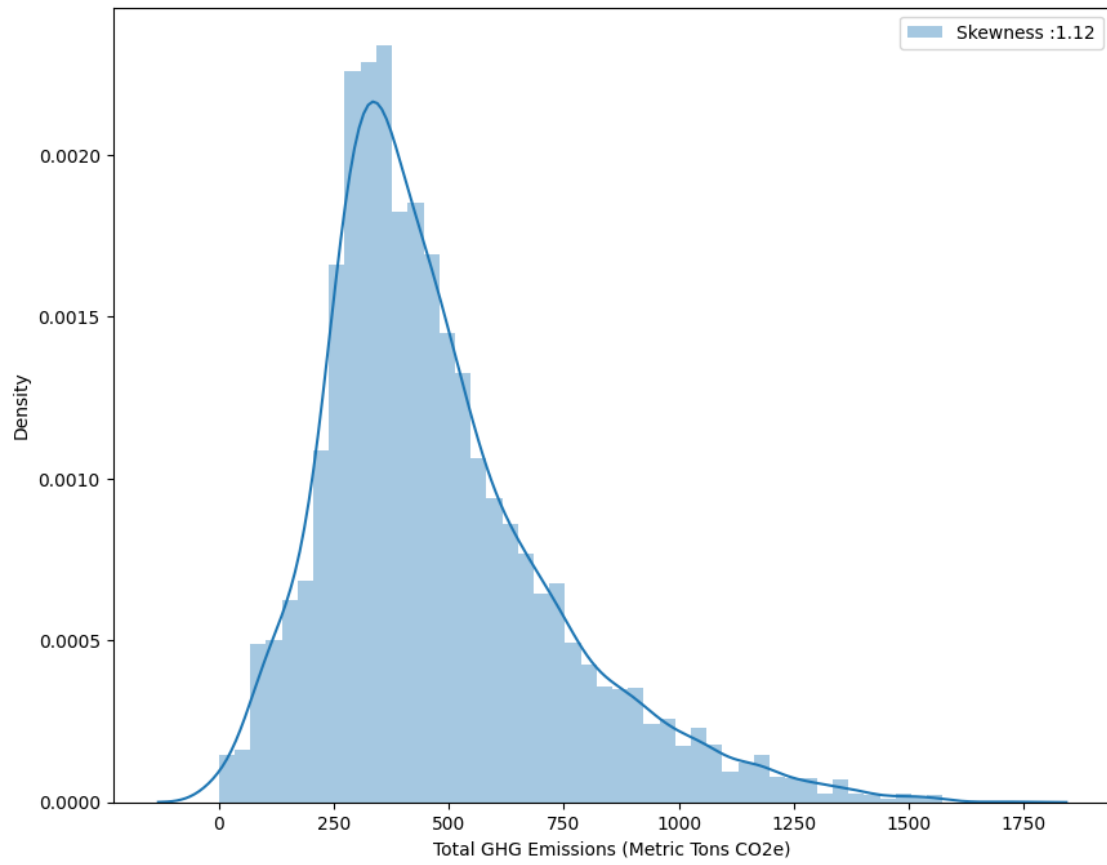


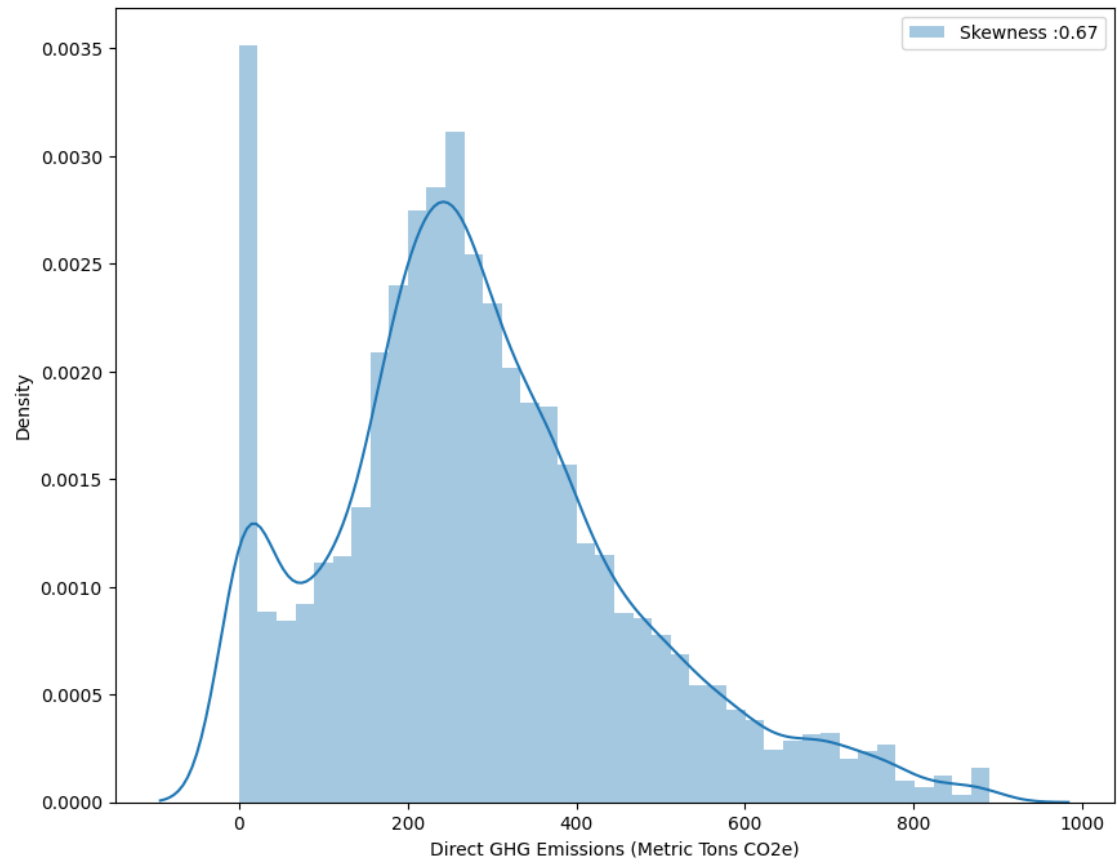


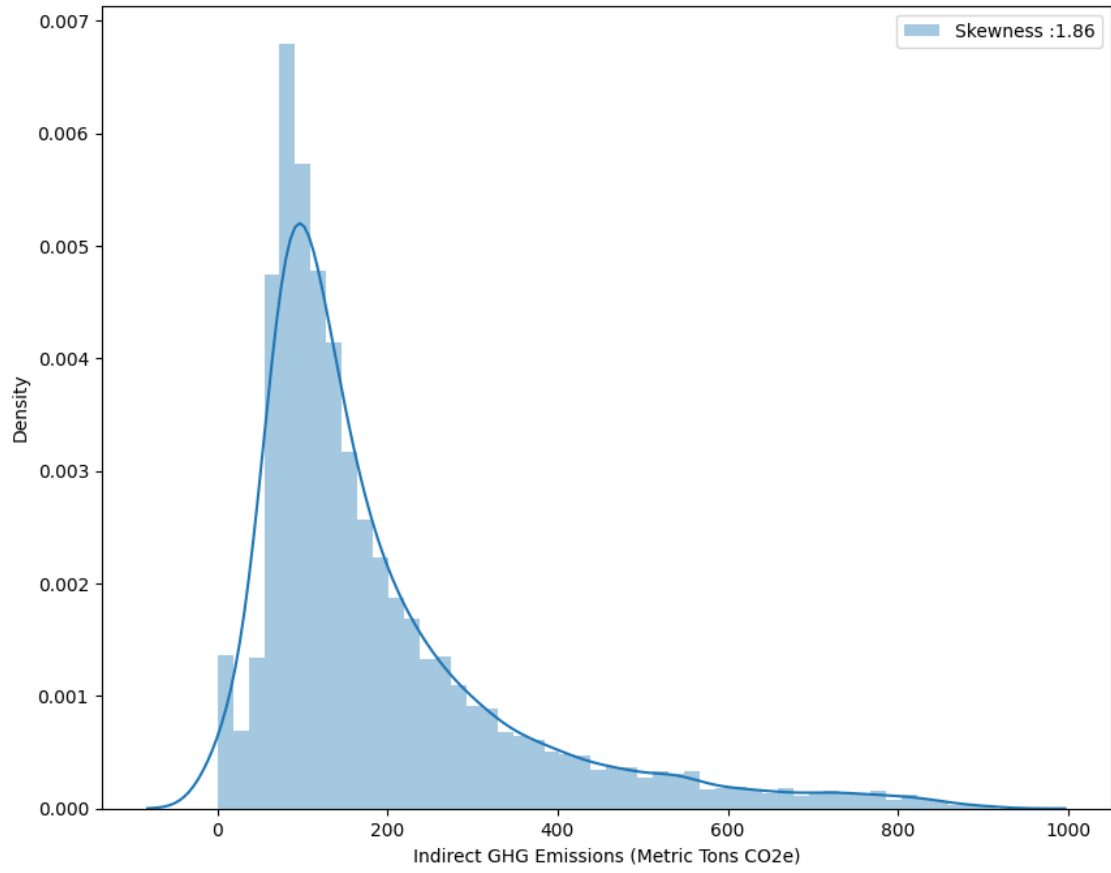


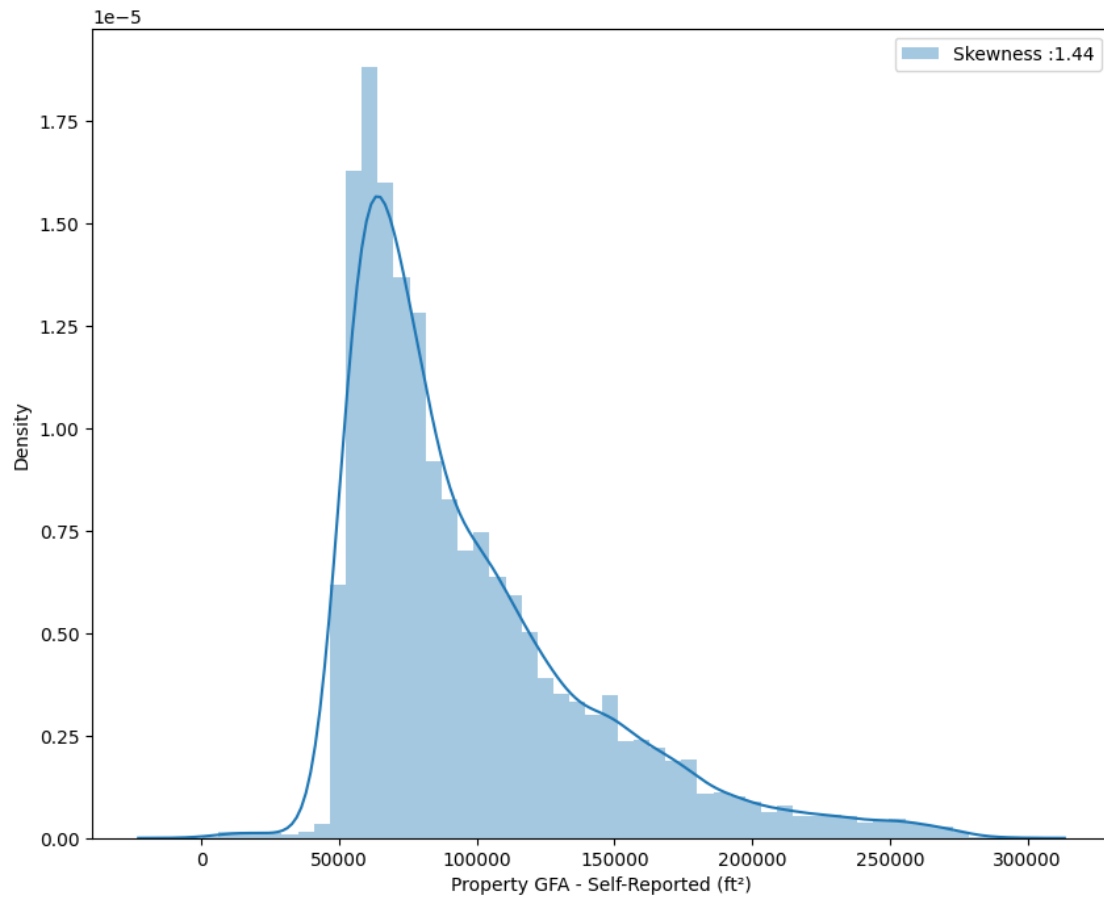


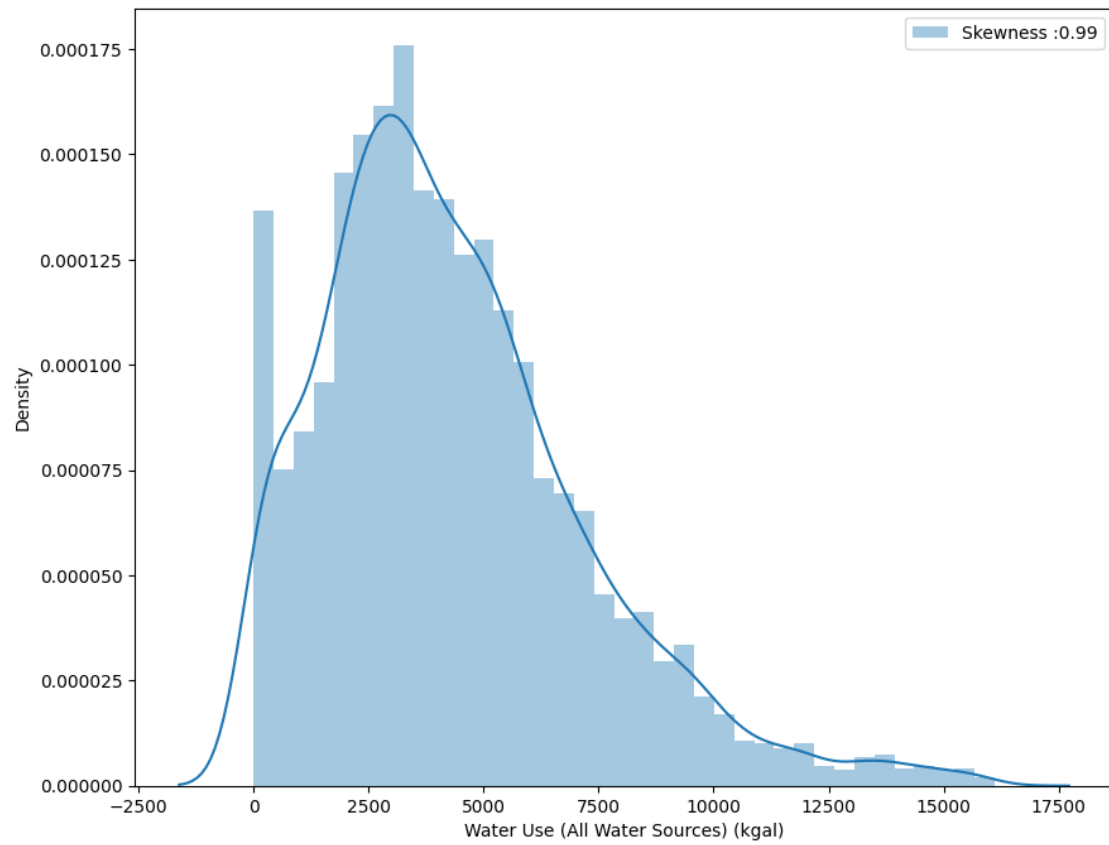


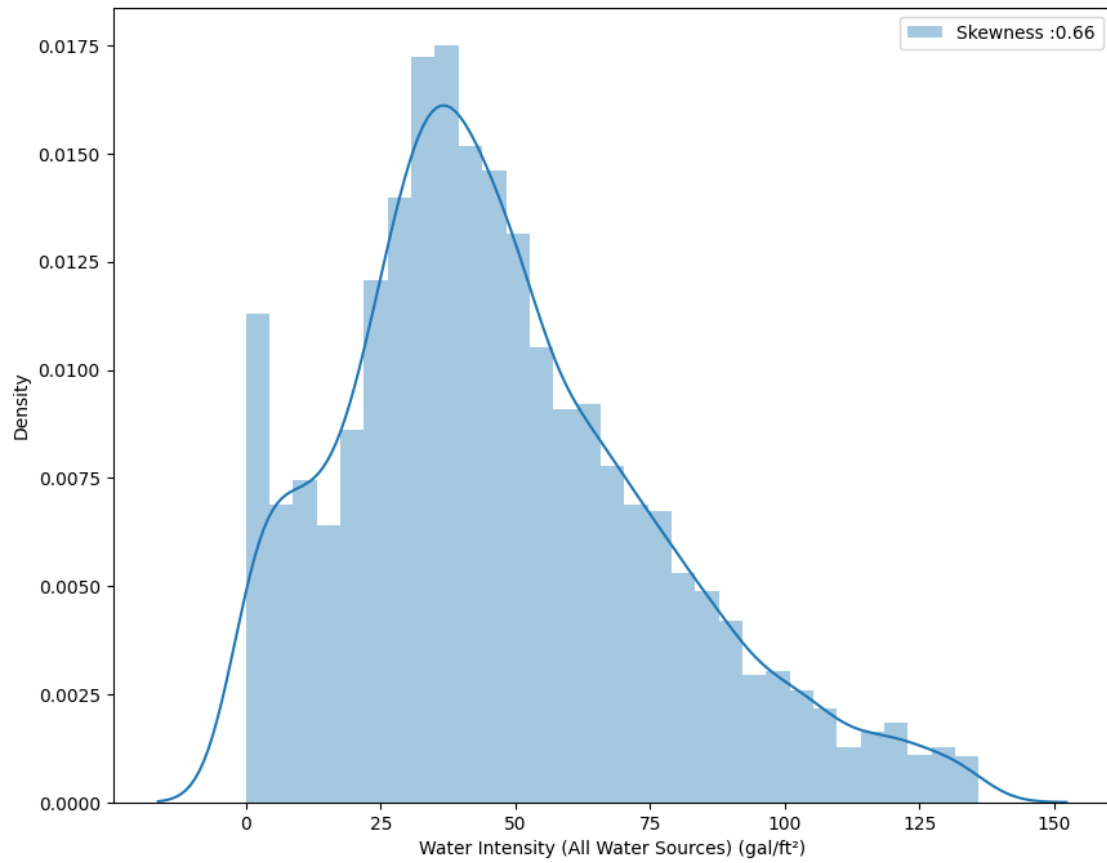


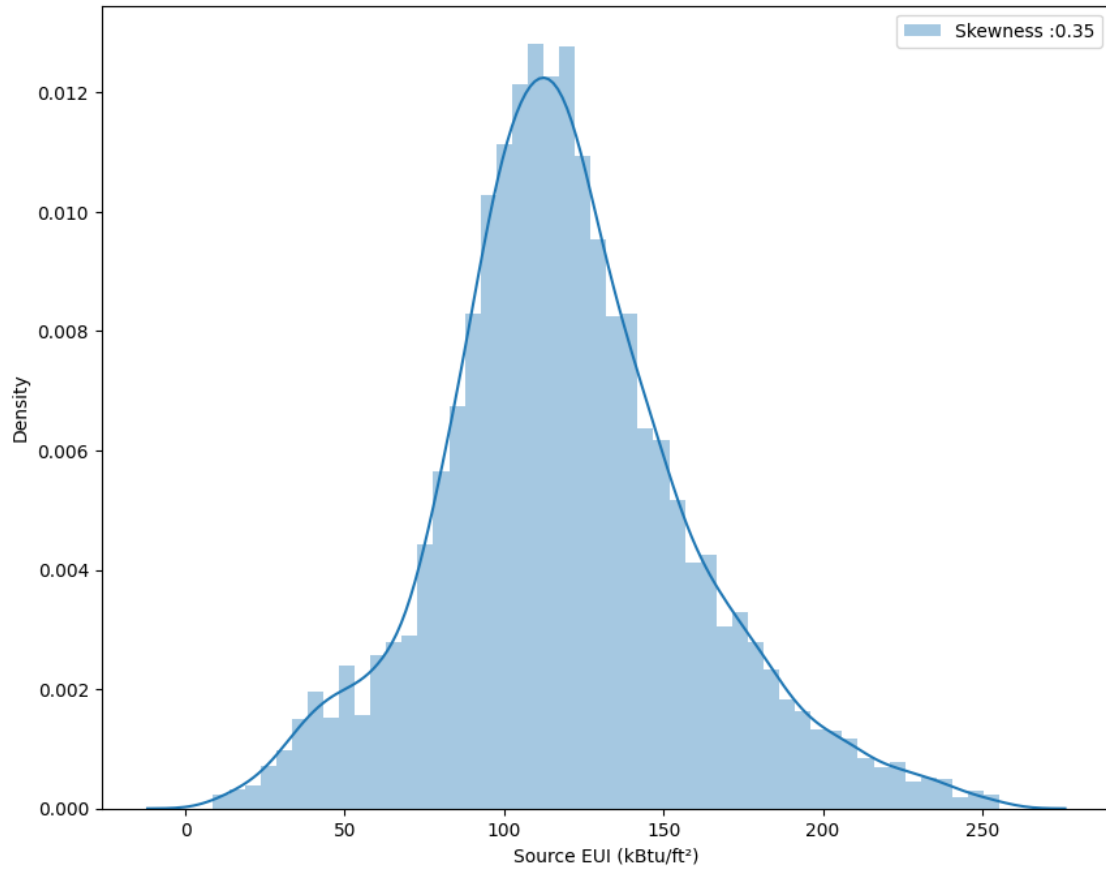


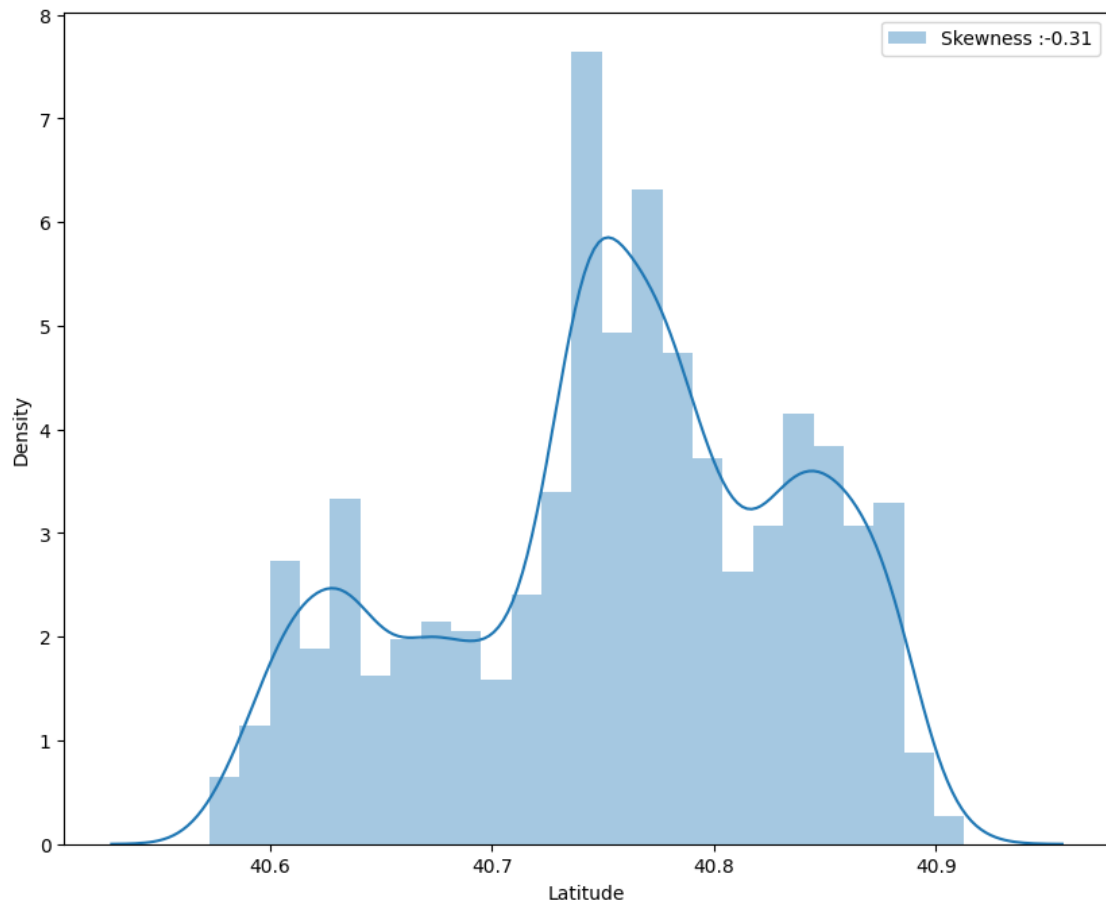


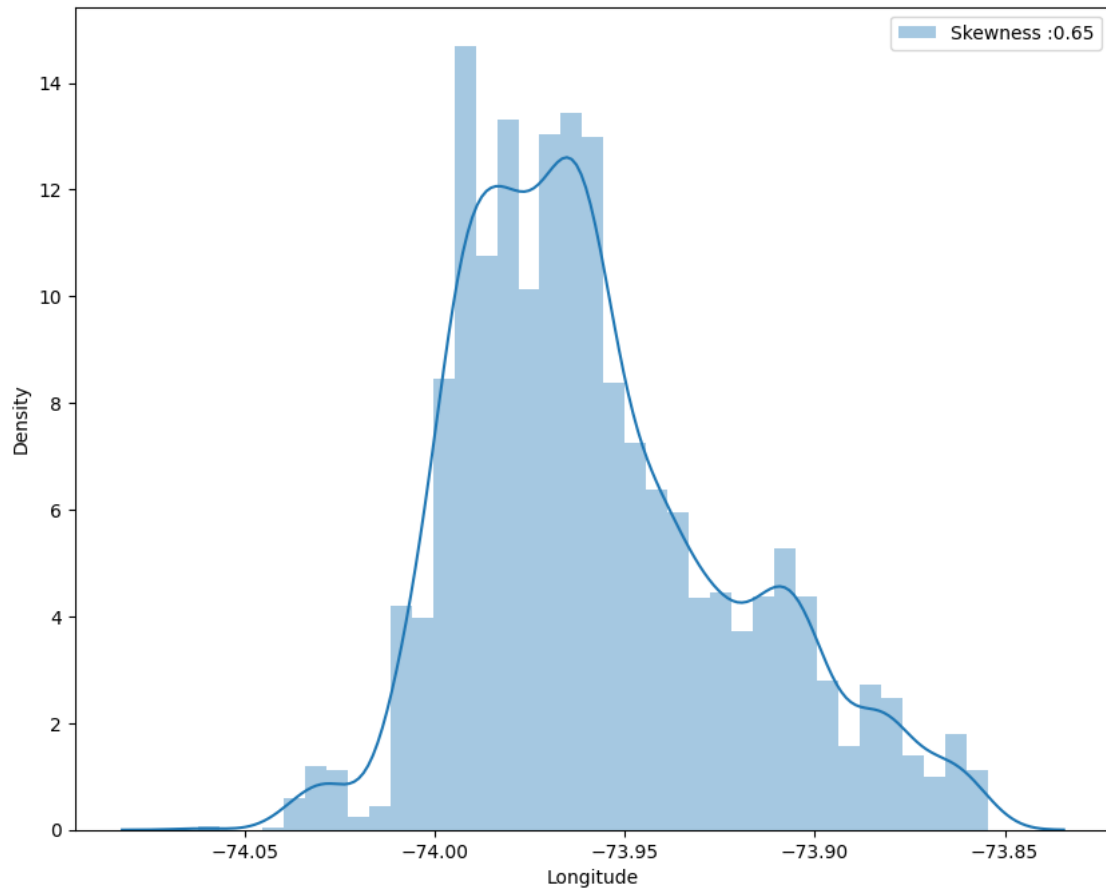


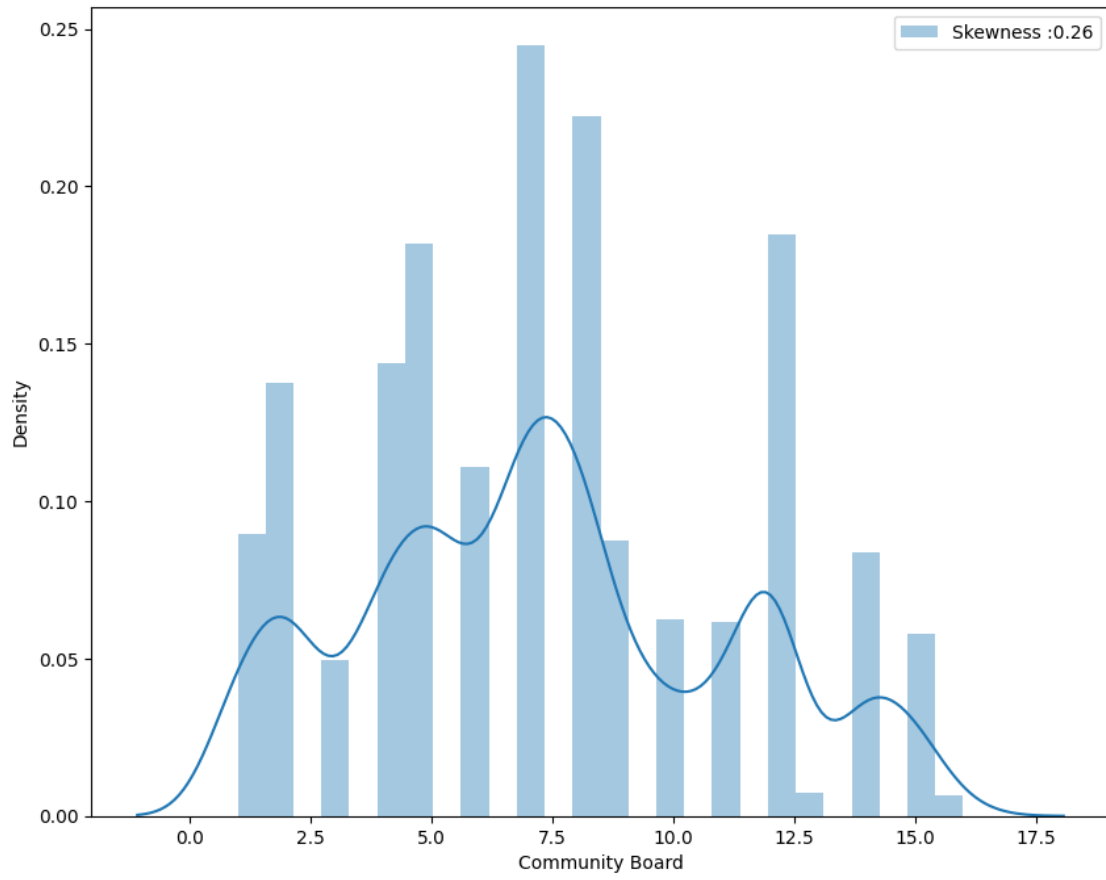


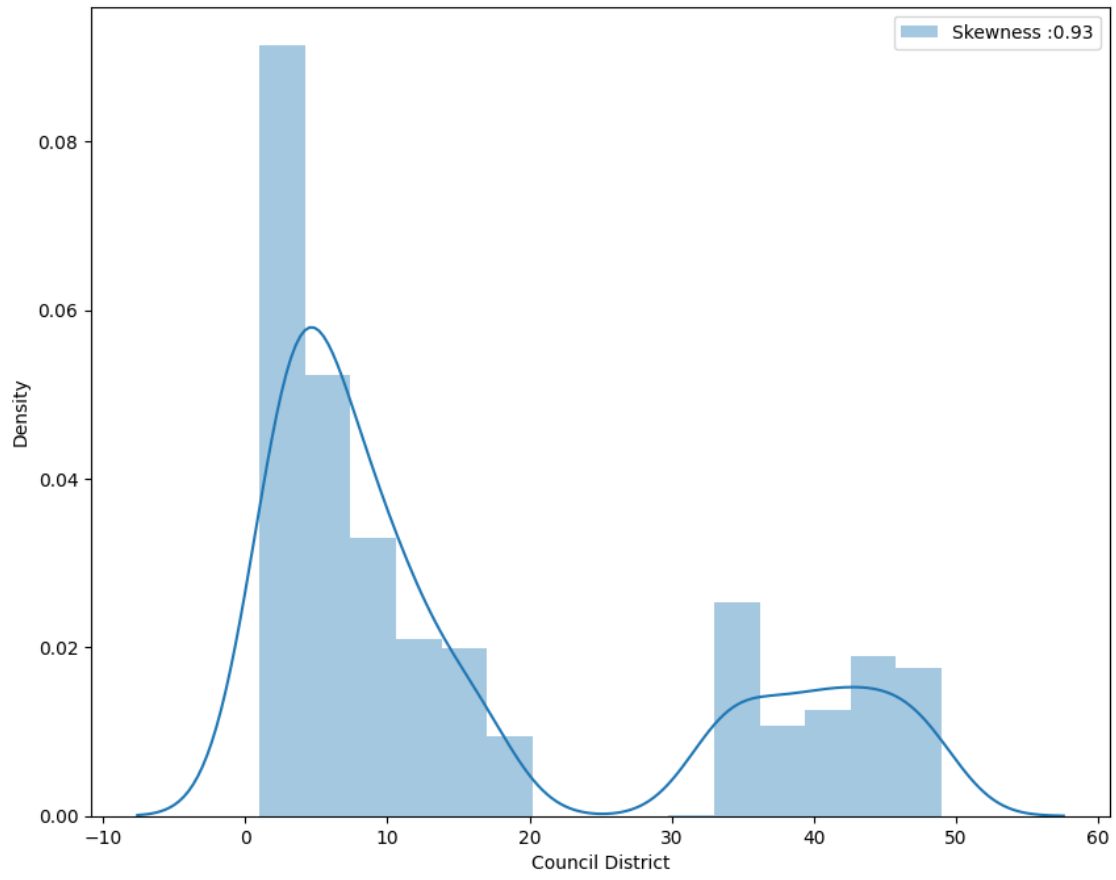


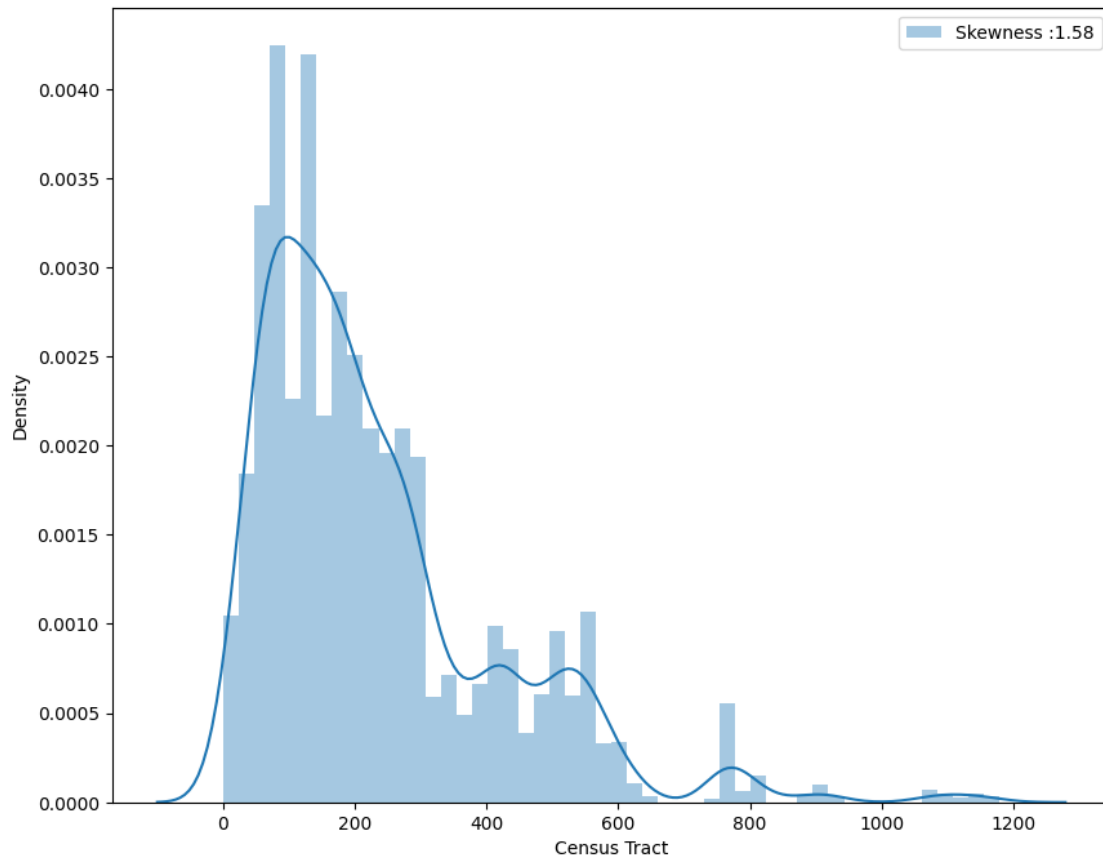












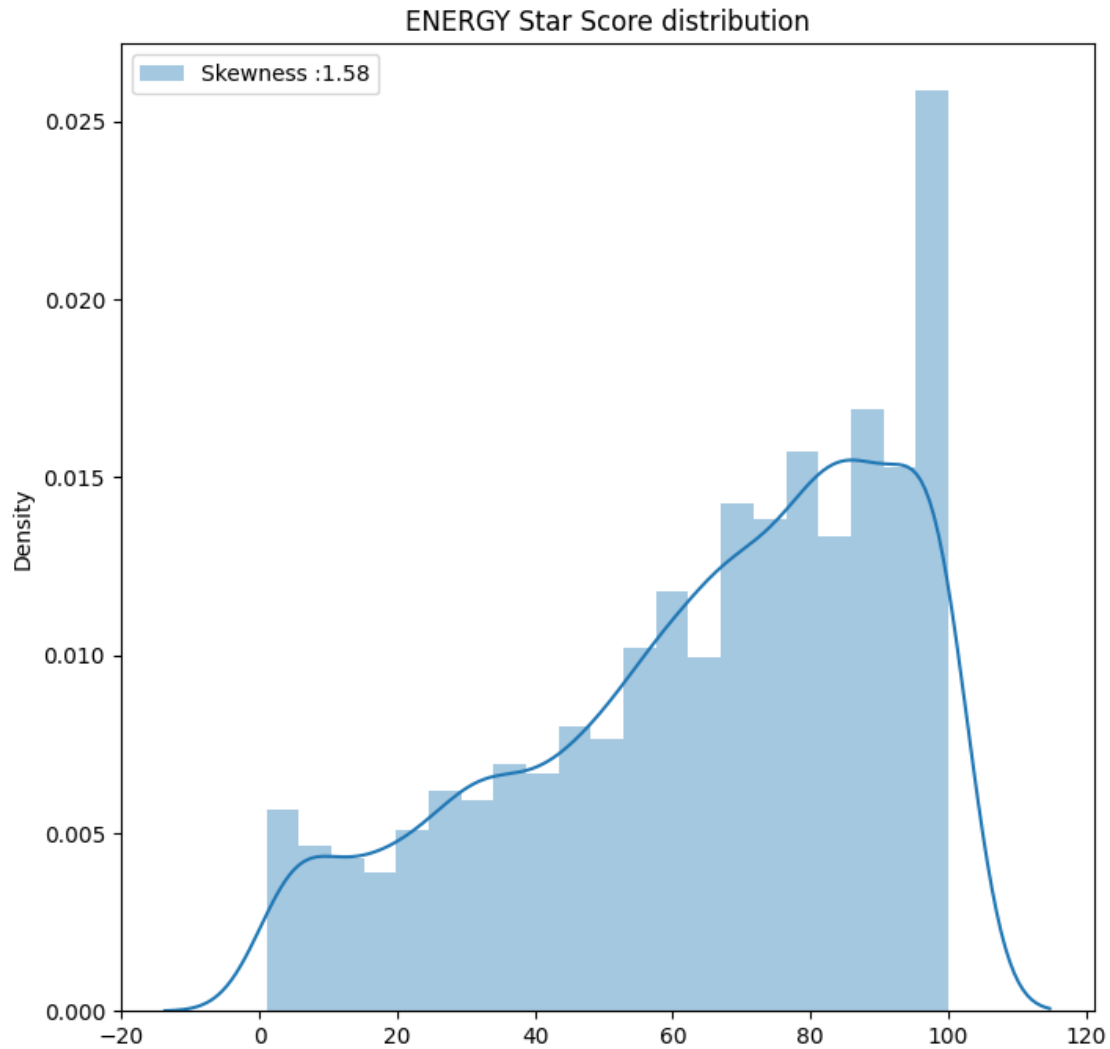
```
[34]: #few variables positively skewed
```

```
[84]: df.skew().sort_values(ascending=False)
```

```
[84]: Direct GHG Emissions (Metric Tons CO2e)      105.690836
      Natural Gas Use (kBtu)                      99.343099
      Weather Normalized Site Natural Gas Use (therms) 96.477511
      Total GHG Emissions (Metric Tons CO2e)      94.155755
      Weather Normalized Site Natural Gas Intensity (therms/ft²) 92.735657
      Site EUI (kBtu/ft²)                        90.254339
      Weather Normalized Site EUI (kBtu/ft²)      87.051948
      Source EUI (kBtu/ft²)                      83.404776
      Weather Normalized Source EUI (kBtu/ft²)    81.533225
      Indirect GHG Emissions (Metric Tons CO2e)   62.397525
      Water Intensity (All Water Sources) (gal/ft²) 42.780992
      Weather Normalized Site Electricity Intensity (kWh/ft²) 41.032173
      Electricity Use - Grid Purchase (kBtu)      37.120637
      Weather Normalized Site Electricity (kWh)    36.384749
      Water Use (All Water Sources) (kgal)        27.709851
      Number of Buildings - Self-reported        26.436335
```

| | |
|---|------------|
| Largest Property Use Type - Gross Floor Area (ft ²) | 18.806924 |
| Property GFA - Self-Reported (ft ²) | 17.515530 |
| DOF Gross Floor Area | 15.679543 |
| Census Tract | 4.120781 |
| Council District | 1.003232 |
| Community Board | 0.638174 |
| Year Built | 0.226411 |
| Longitude | -0.042609 |
| Latitude | -0.353541 |
| ENERGY STAR Score | -0.451861 |
| Occupancy | -10.009619 |
| dtype: float64 | |

```
[35]: plt.figure(figsize=(8,8))
sns.distplot(x=data['ENERGY STAR Score'],label='Skewness :%.2f'%(data[col].
↪skew()))
plt.title('ENERGY Star Score distribution')
plt.legend()
plt.show()
```



```
[ ]: #skewed negatively most buildings have a good (over 60) ESS
```

```
[36]: most_types = data['Primary Property Type - Self Selected'].value_counts().
      ↪sort_values(ascending=False)[:10].index
      most_types
```

```
[36]: Index(['Multifamily Housing', 'Office', 'Non-Refrigerated Warehouse', 'Other',
      'Residence Hall/Dormitory', 'K-12 School', 'Self-Storage Facility',
      'Hotel', 'Distribution Center', 'College/University'],
      dtype='object')
```

```
[37]: df_most_types = data[data['Primary Property Type - Self Selected'].
      ↪isin(most_types)]
      df_most_types
```

[37]:

| | Parent Property Name | Address 1 (self-reported) | \ |
|------|-------------------------------------|-----------------------------|---|
| 2 | 720-730 Ft. Washington Owners Corp. | 720-730 Ft. Washington Ave. | |
| 3 | Park 76th Street Inc. | 830 Park Avenue | |
| 4 | Park 76th Street Inc. | 840 Park Avenue | |
| 5 | Columbia University (morningside) | 420 W 116th St | |
| 6 | Columbia University (morningside) | 508 West 114th Street | |
| ... | ... | ... | |
| 6287 | Not Applicable: Standalone Property | 161 Henry Street | |
| 6288 | Not Applicable: Standalone Property | 24 Monroe Place | |
| 6289 | Not Applicable: Standalone Property | 150 Joralemon Street | |
| 6290 | Not Applicable: Standalone Property | 27 Prospect Park West | |
| 6291 | Not Applicable: Standalone Property | 420 Clinton Ave\ | t |

| | Borough | DOF | Gross Floor Area | Primary Property Type - Self Selected | \ |
|------|-----------|-----|------------------|---------------------------------------|---|
| 2 | Manhattan | | 102150.0 | Multifamily Housing | |
| 3 | Manhattan | | 151666.0 | Multifamily Housing | |
| 4 | Manhattan | | 64827.0 | Multifamily Housing | |
| 5 | NaN | | NaN | Office | |
| 6 | NaN | | NaN | Residence Hall/Dormitory | |
| ... | ... | | ... | ... | |
| 6287 | Brooklyn | | 51110.0 | Multifamily Housing | |
| 6288 | Brooklyn | | 70645.0 | Multifamily Housing | |
| 6289 | Brooklyn | | 93500.0 | Multifamily Housing | |
| 6290 | Brooklyn | | 57824.0 | Multifamily Housing | |
| 6291 | Brooklyn | | 60720.0 | Multifamily Housing | |

| | List of All Property Use Types at Property | Largest Property Use Type | \ |
|------|--|---------------------------|---|
| 2 | Multifamily Housing | Multifamily Housing | |
| 3 | Multifamily Housing | Multifamily Housing | |
| 4 | Multifamily Housing | Multifamily Housing | |
| 5 | Office | Office | |
| 6 | Residence Hall/Dormitory | Residence Hall/Dormitory | |
| ... | ... | ... | |
| 6287 | Multifamily Housing | Multifamily Housing | |
| 6288 | Multifamily Housing | Multifamily Housing | |
| 6289 | Multifamily Housing, Other | Multifamily Housing | |
| 6290 | Multifamily Housing | Multifamily Housing | |
| 6291 | Multifamily Housing | Multifamily Housing | |

| | Largest Property Use Type - Gross Floor Area (ft ²) | Year Built | \ |
|------|---|------------|---|
| 2 | 116744.0 | 1939 | |
| 3 | 130629.0 | 1911 | |
| 4 | 54913.0 | 1911 | |
| 5 | 50000.0 | 1906 | |
| 6 | 48608.0 | 1898 | |
| ... | ... | ... | |
| 6287 | 53665.0 | 1906 | |

| | | |
|------|---------|------|
| 6288 | 74177.0 | 1928 |
| 6289 | 93500.0 | 1926 |
| 6290 | 60715.0 | 1928 |
| 6291 | 63756.0 | 1930 |

| | Number of Buildings - Self-reported | Occupancy | Metered Areas (Energy) \ |
|------|-------------------------------------|-----------|--------------------------|
| 2 | 1 | 100 | Whole Building |
| 3 | 1 | 100 | Another configuration |
| 4 | 1 | 100 | Another configuration |
| 5 | 1 | 100 | Whole Building |
| 6 | 1 | 100 | Whole Building |
| ... | ... | ... | ... |
| 6287 | 1 | 100 | Whole Building |
| 6288 | 1 | 100 | Whole Building |
| 6289 | 1 | 100 | Whole Building |
| 6290 | 1 | 100 | Whole Building |
| 6291 | 1 | 100 | Whole Building |

| | Metered Areas (Water) | ENERGY STAR Score | Site EUI (kBtu/ft ²) \ |
|------|-----------------------|-------------------|------------------------------------|
| 2 | NaN | 80.0 | 77.1 |
| 3 | NaN | 100.0 | 23.7 |
| 4 | NaN | 100.0 | 17.9 |
| 5 | NaN | NaN | NaN |
| 6 | NaN | 99.0 | 16.0 |
| ... | ... | ... | ... |
| 6287 | Whole Building | 86.0 | 75.0 |
| 6288 | Whole Building | 98.0 | 81.4 |
| 6289 | NaN | 16.0 | 109.3 |
| 6290 | Whole Building | 92.0 | 70.0 |
| 6291 | NaN | 19.0 | 130.2 |

| | Weather Normalized Site EUI (kBtu/ft ²) \ |
|------|---|
| 2 | 82.7 |
| 3 | 23.4 |
| 4 | 17.4 |
| 5 | NaN |
| 6 | 16.0 |
| ... | ... |
| 6287 | 79.9 |
| 6288 | 87.0 |
| 6289 | 117.7 |
| 6290 | 74.9 |
| 6291 | 140.5 |

| | Weather Normalized Site Electricity Intensity (kWh/ft ²) \ |
|---|--|
| 2 | 2.6 |
| 3 | 6.8 |

| | |
|------|-----|
| 4 | 4.8 |
| 5 | NaN |
| 6 | 4.5 |
| ... | ... |
| 6287 | 4.1 |
| 6288 | 3.3 |
| 6289 | 5.3 |
| 6290 | 2.6 |
| 6291 | 3.4 |

| | Weather Normalized Site Natural Gas Intensity (therms/ft ²) \ |
|------|---|
| 2 | 0.0 |
| 3 | NaN |
| 4 | 0.0 |
| 5 | NaN |
| 6 | 0.0 |
| ... | ... |
| 6287 | 0.7 |
| 6288 | 0.8 |
| 6289 | 0.9 |
| 6290 | 0.7 |
| 6291 | 1.3 |

| | Weather Normalized Source EUI (kBtu/ft ²) | Natural Gas Use (kBtu) \ |
|------|---|--------------------------|
| 2 | 102.8 | 326760.6 |
| 3 | 73.3 | NaN |
| 4 | 52.3 | 59412.9 |
| 5 | NaN | NaN |
| 6 | 49.1 | 27900.0 |
| ... | ... | ... |
| 6287 | 112.9 | 3260900.1 |
| 6288 | 114.9 | 5179599.9 |
| 6289 | 160.8 | 8616799.8 |
| 6290 | 96.9 | 3693499.8 |
| 6291 | 172.0 | 7528499.8 |

| | Weather Normalized Site Natural Gas Use (therms) \ |
|------|--|
| 2 | 3301.9 |
| 3 | NaN |
| 4 | 601.0 |
| 5 | NaN |
| 6 | 279.0 |
| ... | ... |
| 6287 | 35428.7 |
| 6288 | 56168.9 |
| 6289 | 95350.0 |
| 6290 | 40162.6 |

| | |
|------|---------|
| 6291 | 82151.4 |
|------|---------|

| | |
|------|--|
| | Electricity Use - Grid Purchase (kBtu) \ |
| 2 | 1081789.4 |
| 3 | 3090622.7 |
| 4 | 923332.2 |
| 5 | NaN |
| 6 | 750367.0 |
| ... | ... |
| 6287 | 765468.5 |
| 6288 | 857323.0 |
| 6289 | 1885508.7 |
| 6290 | 556759.9 |
| 6291 | 770105.4 |

| | |
|------|---|
| | Weather Normalized Site Electricity (kWh) \ |
| 2 | 308074.6 |
| 3 | 894049.0 |
| 4 | 262377.2 |
| 5 | NaN |
| 6 | 219920.0 |
| ... | ... |
| 6287 | 218353.1 |
| 6288 | 245251.1 |
| 6289 | 532672.7 |
| 6290 | 155319.3 |
| 6291 | 218287.2 |

| | |
|------|--|
| | Total GHG Emissions (Metric Tons CO2e) \ |
| 2 | 689.0 |
| 3 | 286.8 |
| 4 | 88.8 |
| 5 | 0.0 |
| 6 | 71.1 |
| ... | ... |
| 6287 | 244.2 |
| 6288 | 354.7 |
| 6289 | 674.6 |
| 6290 | 247.8 |
| 6291 | 471.3 |

| | |
|---|---|
| | Direct GHG Emissions (Metric Tons CO2e) \ |
| 2 | 588.6 |
| 3 | 0.0 |
| 4 | 3.2 |
| 5 | 0.0 |
| 6 | 1.5 |

| | |
|------|-------|
| ... | ... |
| 6287 | 173.2 |
| 6288 | 275.1 |
| 6289 | 499.7 |
| 6290 | 196.2 |
| 6291 | 399.9 |

| | |
|------|---|
| | Indirect GHG Emissions (Metric Tons CO2e) \ |
| 2 | 100.4 |
| 3 | 286.8 |
| 4 | 85.7 |
| 5 | 0.0 |
| 6 | 69.6 |
| ... | ... |
| 6287 | 71.0 |
| 6288 | 79.6 |
| 6289 | 175.0 |
| 6290 | 51.7 |
| 6291 | 71.5 |

| | |
|------|---|
| | Property GFA - Self-Reported (ft ²) \ |
| 2 | 116744.0 |
| 3 | 130629.0 |
| 4 | 54913.0 |
| 5 | 50000.0 |
| 6 | 48608.0 |
| ... | ... |
| 6287 | 53665.0 |
| 6288 | 74177.0 |
| 6289 | 101291.0 |
| 6290 | 60715.0 |
| 6291 | 63756.0 |

| | |
|------|--|
| | Water Use (All Water Sources) (kgal) \ |
| 2 | NaN |
| 3 | NaN |
| 4 | 231.9 |
| 5 | NaN |
| 6 | NaN |
| ... | ... |
| 6287 | 5122.8 |
| 6288 | 2308.5 |
| 6289 | 4216.8 |
| 6290 | 1687.6 |
| 6291 | NaN |

| | | |
|--|--|--------------------------------------|
| | Water Intensity (All Water Sources) (gal/ft ²) | Source EUI (kBtu/ft ²) \ |
|--|--|--------------------------------------|

| | | |
|------|-------|-------|
| 2 | NaN | 97.7 |
| 3 | NaN | 74.3 |
| 4 | 4.22 | 53.9 |
| 5 | NaN | NaN |
| 6 | NaN | 49.1 |
| ... | ... | ... |
| 6287 | 95.46 | 108.6 |
| 6288 | 31.12 | 109.6 |
| 6289 | 41.63 | 153.4 |
| 6290 | 27.80 | 92.7 |
| 6291 | NaN | 161.9 |

| | Release Date | Water Required? | \ |
|------|------------------------|-----------------|---|
| 2 | 05/01/2017 10:09:31 PM | Yes | |
| 3 | 05/01/2017 10:09:31 PM | NaN | |
| 4 | 05/01/2017 10:09:31 PM | Yes | |
| 5 | 04/24/2017 06:52:20 PM | NaN | |
| 6 | 04/24/2017 06:52:20 PM | NaN | |
| ... | ... | ... | |
| 6287 | 04/26/2017 11:20:06 AM | NaN | |
| 6288 | 04/26/2017 11:20:06 AM | NaN | |
| 6289 | 04/26/2017 11:20:06 AM | NaN | |
| 6290 | 04/26/2017 11:20:06 AM | NaN | |
| 6291 | 04/27/2017 06:37:53 AM | Yes | |

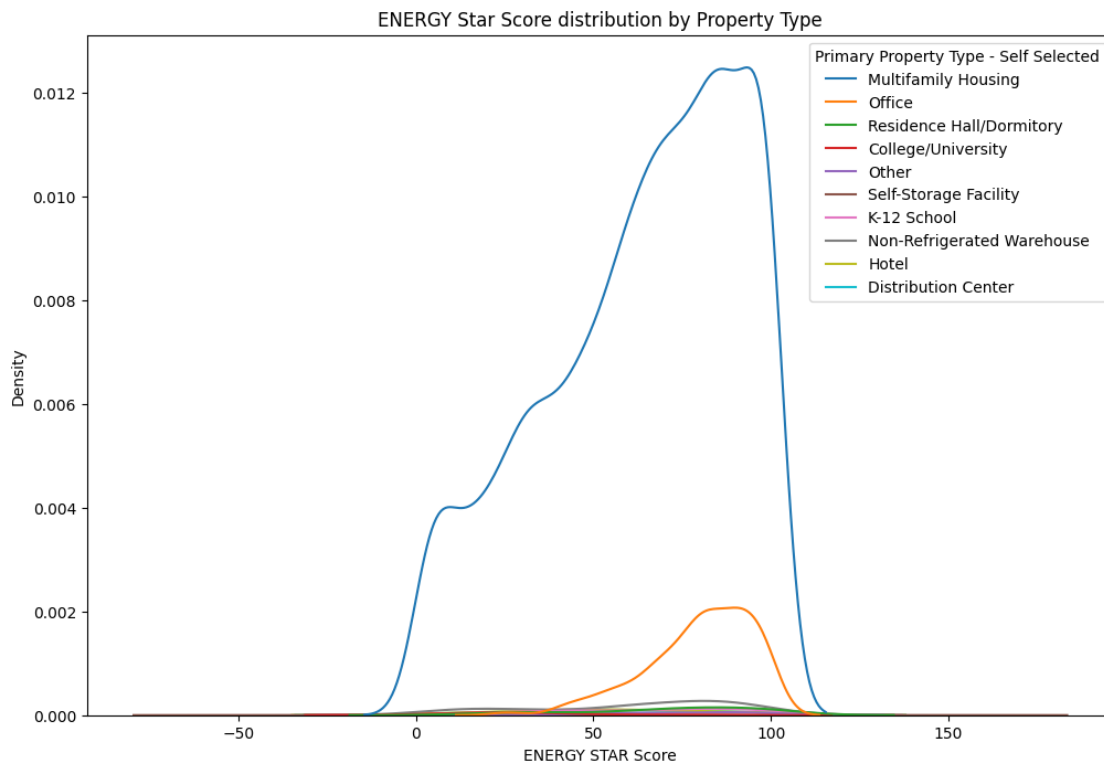
| | DOF Benchmarking Submission Status | Latitude | Longitude | \ |
|------|------------------------------------|-----------|------------|---|
| 2 | In Compliance | 40.858256 | -73.934734 | |
| 3 | In Compliance | 40.773465 | -73.962116 | |
| 4 | In Compliance | 40.773843 | -73.961838 | |
| 5 | In Compliance | NaN | NaN | |
| 6 | In Compliance | NaN | NaN | |
| ... | ... | ... | ... | |
| 6287 | NaN | 40.695759 | -73.993826 | |
| 6288 | NaN | 40.696420 | -73.992495 | |
| 6289 | NaN | 40.692602 | -73.993231 | |
| 6290 | NaN | 40.670728 | -73.971752 | |
| 6291 | NaN | 40.685549 | -73.968310 | |

| | Community Board | Council District | Census Tract |
|------|-----------------|------------------|--------------|
| 2 | 12.0 | 10.0 | 281.0 |
| 3 | 8.0 | 4.0 | 130.0 |
| 4 | 8.0 | 4.0 | 130.0 |
| 5 | NaN | NaN | NaN |
| 6 | NaN | NaN | NaN |
| ... | ... | ... | ... |
| 6287 | 2.0 | 33.0 | 502.0 |
| 6288 | 2.0 | 33.0 | 502.0 |

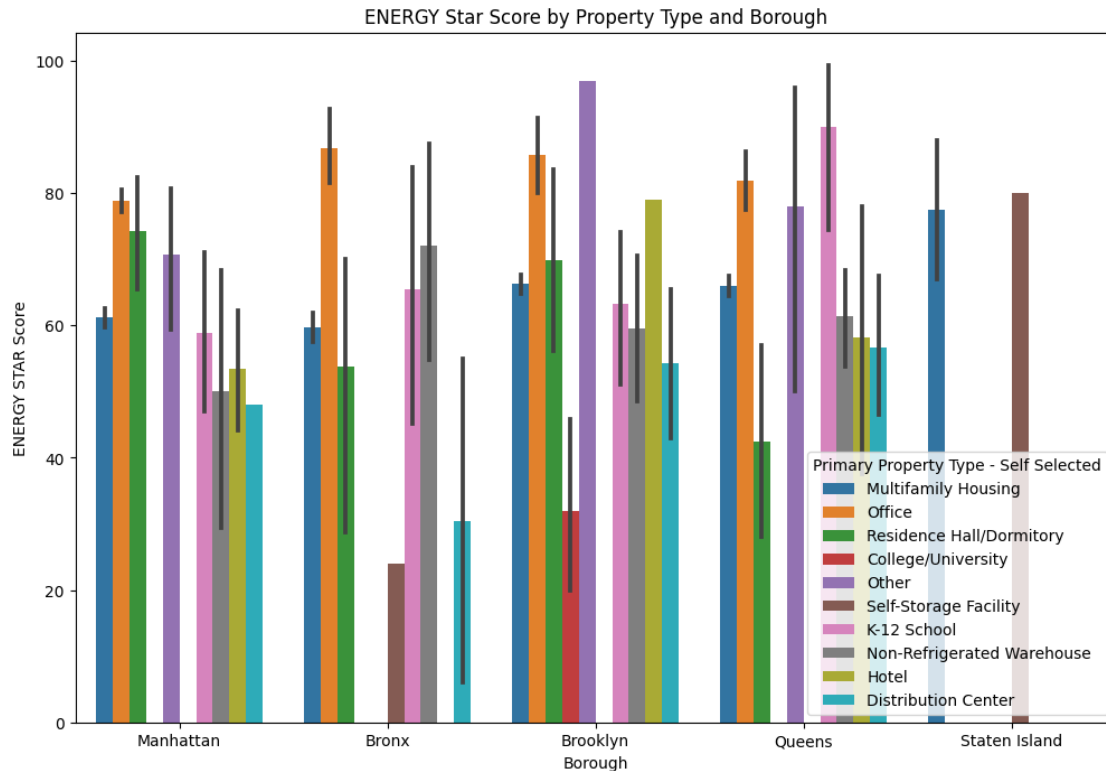
| | | | |
|------|-----|------|-------|
| 6289 | 2.0 | 33.0 | 7.0 |
| 6290 | 6.0 | 39.0 | 165.0 |
| 6291 | 2.0 | 35.0 | 199.0 |

[6113 rows x 38 columns]

```
[38]: plt.figure(figsize=(12,8))
sns.kdeplot(x=data['ENERGY STAR Score'],hue=df_most_types['Primary Property Type - Self Selected'])
plt.title('ENERGY Star Score distribution by Property Type')
plt.show()
```



```
[39]: plt.figure(figsize=(12,8))
sns.barplot(y=data['ENERGY STAR Score'],x=df_most_types['Borough'],hue=df_most_types['Primary Property Type - Self Selected'])
plt.title('ENERGY Star Score by Property Type and Borough')
plt.show()
```



```
[40]: plt.figure(figsize = (35,30))
grid = plt.GridSpec(4, 4, wspace =0.3, hspace = 0.8)

g1 = plt.subplot(grid[:, 0])
g2 = plt.subplot(grid[:2, 1:3])
g3 = plt.subplot(grid[2:, 1:3])
g4 = plt.subplot(grid[:, 3])

g1.set_title('Site EUI by Property Type', fontsize=15)
g2.set_title('ESS by Property Type', fontsize=15)
g3.set_title('Source EUI by Property Type', fontsize=15)
g4.set_title('Total GHG Emission by Property Type', fontsize=15)

sns.barplot(y=data['Weather Normalized Site EUI (kBtu/
↪ft²)'],x=df_most_types['Primary Property Type - Self Selected'],ax=g1)

sns.barplot(y=data['ENERGY STAR Score'],x=df_most_types['Primary Property Type_
↪ Self Selected'],ax=g2)

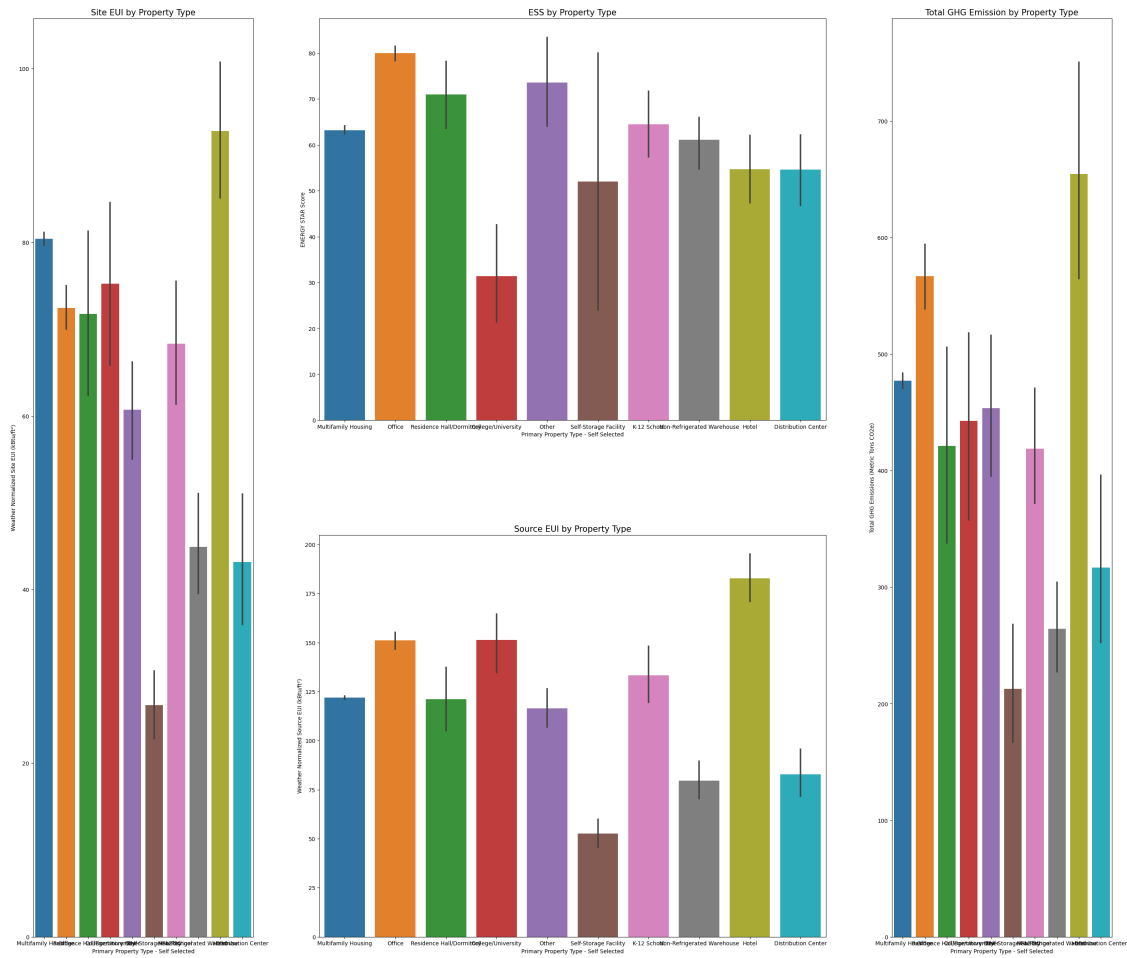
sns.barplot(y=data['Weather Normalized Source EUI (kBtu/
↪ft²)'],x=df_most_types['Primary Property Type - Self Selected'],ax=g3)
```

```

sns.barplot(y=data['Total GHG Emissions (Metric Tons_
↪CO2e)'],x=df_most_types['Primary Property Type - Self Selected'],ax=g4)

plt.show()

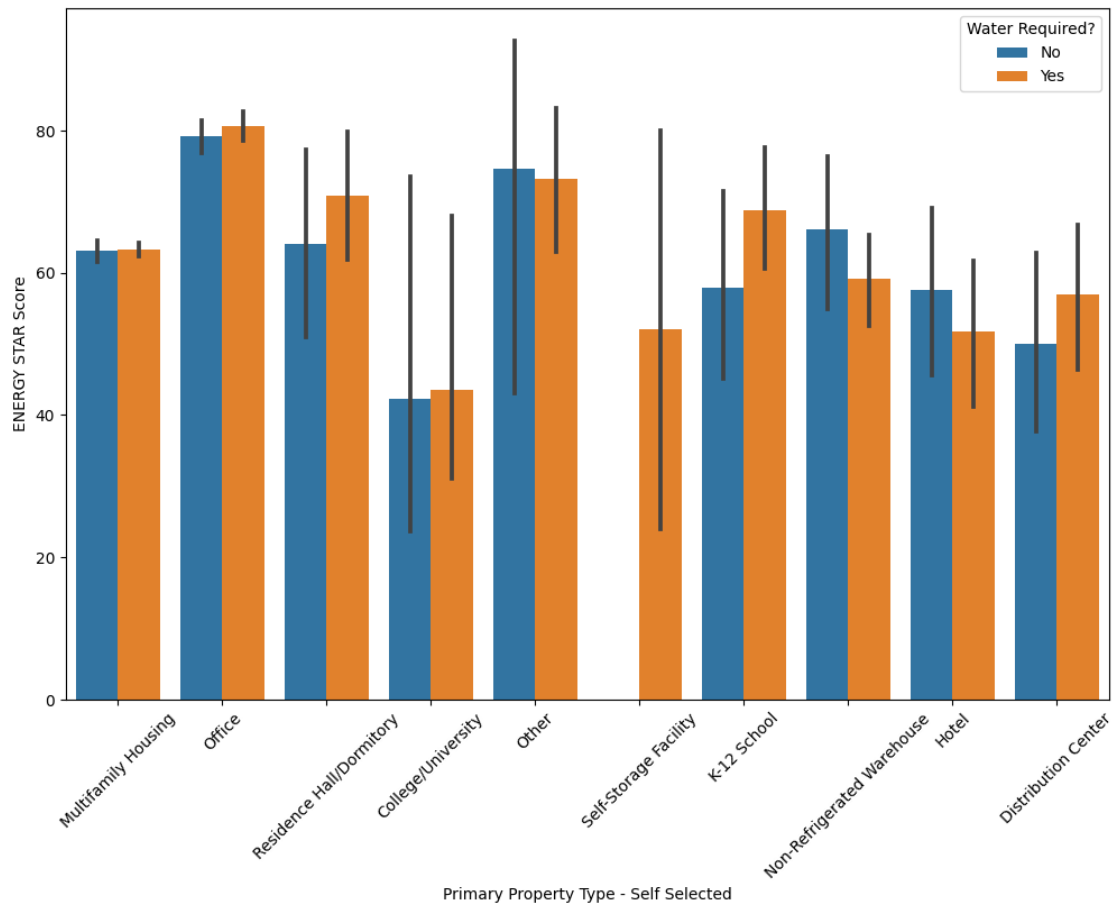
```



```

[41]: plt.figure(figsize=(12,8))
sns.barplot(y=data['ENERGY STAR Score'],x=df_most_types['Primary Property Type_
↪ Self Selected'],hue=data['Water Required?'])
plt.xticks(rotation=45)
plt.show()

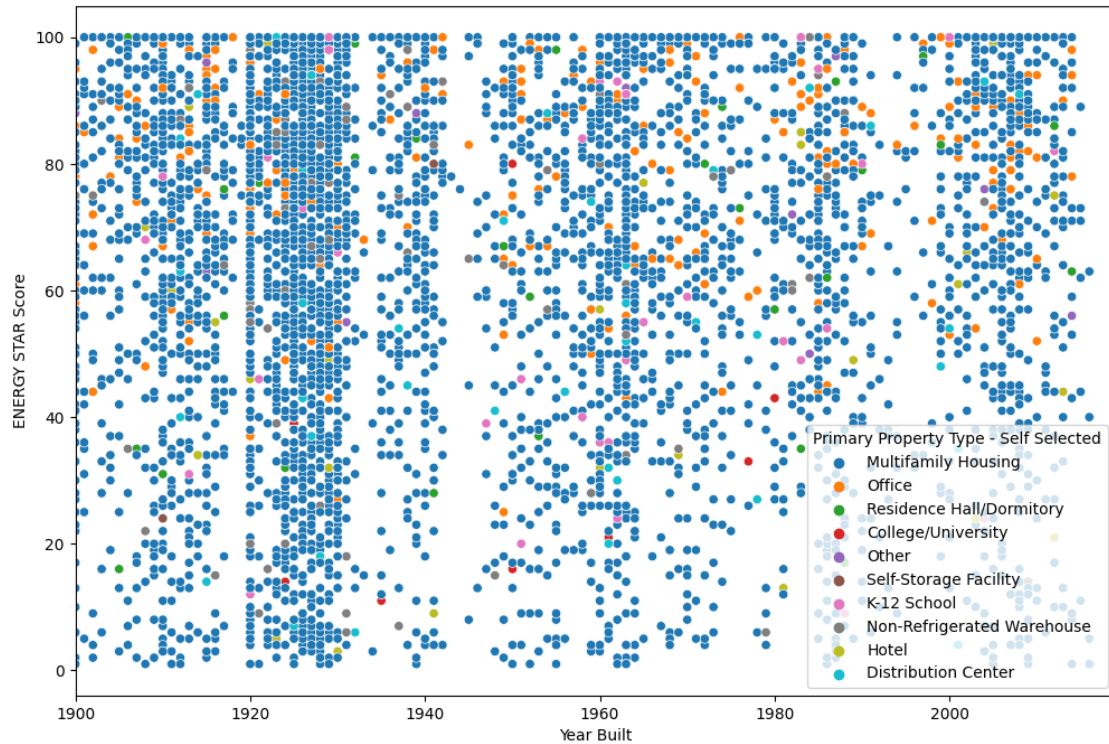
```



```
[42]: data['Year Built'].describe()
```

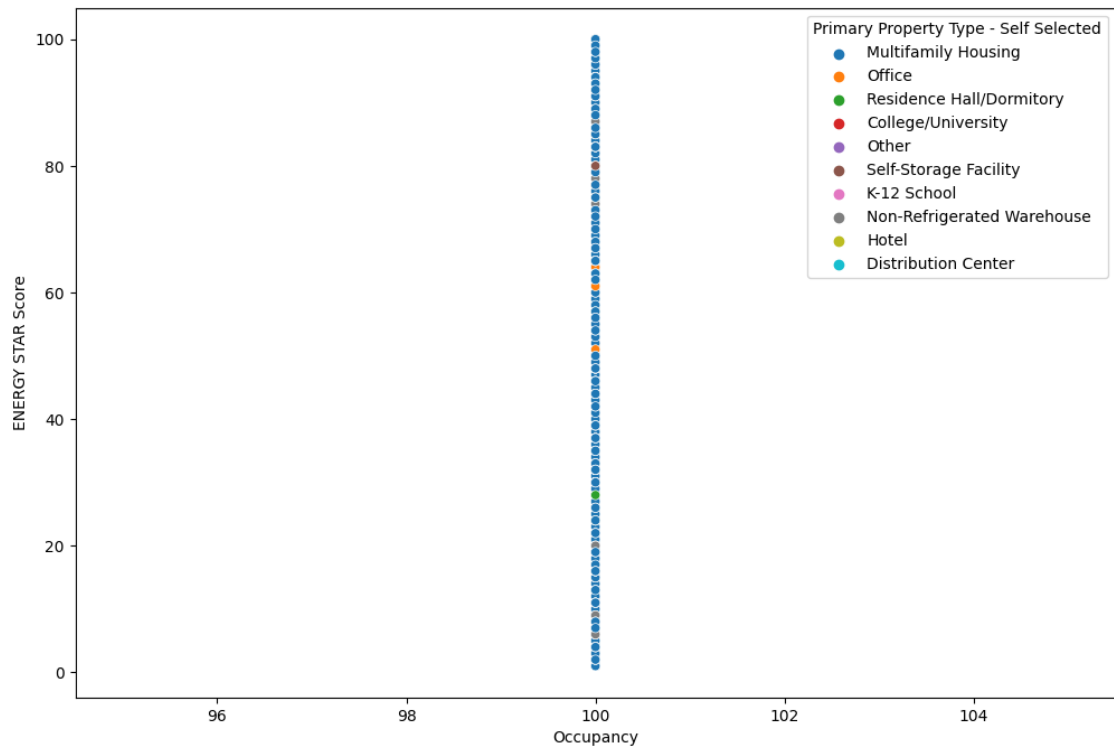
```
[42]: count    6292.000000
      mean     1946.043388
      std       29.548785
      min     1870.000000
      25%     1926.000000
      50%     1938.000000
      75%     1962.000000
      max     2016.000000
      Name: Year Built, dtype: float64
```

```
[43]: plt.figure(figsize=(12,8))
      sns.scatterplot(y=data['ENERGY STAR Score'],hue=df_most_types['Primary Property_
      ↪Type - Self Selected'],x=df['Year Built'])
      plt.xlim([1900,2019])
      plt.show()
```

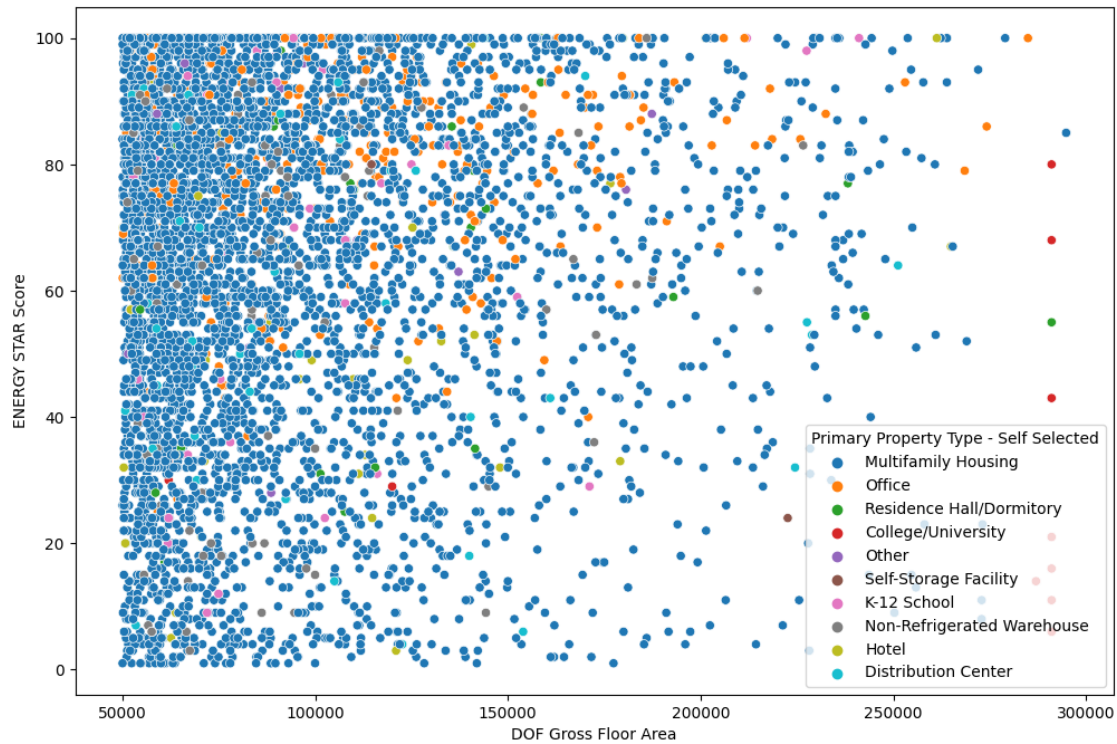
```
[ ]: #year built probably not high corr with ESS
```

```
[44]: plt.figure(figsize=(12,8))
sns.scatterplot(y=data['ENERGY STAR Score'],hue=df_most_types['Primary Property_
↪Type - Self Selected'],x=data['Occupancy'])
plt.show()
```



```
[ ]: #occupancy not high corr with ESS
```

```
[45]: plt.figure(figsize=(12,8))
sns.scatterplot(y=data['ENERGY STAR Score'],hue=df_most_types['Primary Property Type - Self Selected'],x=data['DOF Gross Floor Area'])
plt.show()
```



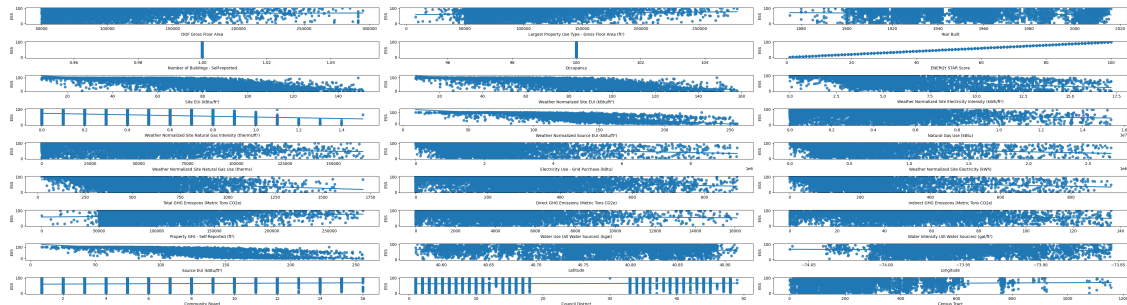
```
[ ]: #DOF gross Floor area probably not high corr with ESS
```

```
[46]: a = len(df.columns)
      b = 3
      c = 1

      fig = plt.figure(figsize=(40,45))

      for col in num_cols:
          plt.subplot(a,b,c)
          plt.xlabel(col)
          sns.regplot(x=data[col],y=data['ENERGY STAR Score'])
          plt.ylabel('ESS')
          c=c+1

      plt.tight_layout()
      plt.show()
```



```
[47]: ## grande utilisation d'une source d'énergie entraine baisse de l'ESS
      ## grande volume de Gas Emission entraine baisse de l'ESS
      # weather normalized site Gas use and Intensity
      # weather normalized site Electric use and Intensity
      # weather normalized site / source EUI = Energy use intensity
```

```
[48]: data.describe()
```

```
[48]:      DOF Gross Floor Area  \
count      6268.000000
mean      95331.876516
std       44649.962793
min       50028.000000
25%       62099.000000
50%       79910.000000
75%       114994.000000
max       294821.000000

      Largest Property Use Type - Gross Floor Area (ft²)  Year Built  \
count      6291.000000      6292.000000
mean      94263.622095      1946.043388
std       43442.699988        29.548785
min       8000.000000      1870.000000
25%       62625.000000      1926.000000
50%       80000.000000      1938.000000
75%       113891.000000     1962.000000
max       281941.000000     2016.000000

      Number of Buildings - Self-reported  Occupancy  ENERGY STAR Score  \
count      6292.0      6292.0      5261.000000
mean         1.0      100.0        64.421973
std         0.0         0.0        27.241580
min         1.0      100.0         1.000000
25%         1.0      100.0        46.000000
50%         1.0      100.0        70.000000
```

| | | | |
|-----|-----|-------|------------|
| 75% | 1.0 | 100.0 | 87.000000 |
| max | 1.0 | 100.0 | 100.000000 |

| | | |
|-------|----------------------------------|---|
| | Site EUI (kBtu/ft ²) | Weather Normalized Site EUI (kBtu/ft ²) \ |
| count | 6232.000000 | 5515.000000 |
| mean | 73.989265 | 77.812947 |
| std | 25.660435 | 26.955478 |
| min | 8.600000 | 9.000000 |
| 25% | 60.175000 | 63.100000 |
| 50% | 74.700000 | 78.800000 |
| 75% | 89.525000 | 94.500000 |
| max | 151.000000 | 157.900000 |

| | |
|-------|--|
| | Weather Normalized Site Electricity Intensity (kWh/ft ²) \ |
| count | 5904.000000 |
| mean | 5.829590 |
| std | 3.263483 |
| min | 0.000000 |
| 25% | 3.600000 |
| 50% | 4.800000 |
| 75% | 7.200000 |
| max | 17.200000 |

| | |
|-------|---|
| | Weather Normalized Site Natural Gas Intensity (therms/ft ²) \ |
| count | 5416.000000 |
| mean | 0.454838 |
| std | 0.319306 |
| min | 0.000000 |
| 25% | 0.100000 |
| 50% | 0.500000 |
| 75% | 0.700000 |
| max | 1.500000 |

| | | |
|-------|---|--------------------------|
| | Weather Normalized Source EUI (kBtu/ft ²) | Natural Gas Use (kBtu) \ |
| count | 5515.000000 | 5.705000e+03 |
| mean | 123.159347 | 3.960240e+06 |
| std | 39.850901 | 3.182682e+06 |
| min | 9.800000 | 0.000000e+00 |
| 25% | 99.100000 | 9.755530e+05 |
| 50% | 120.600000 | 3.825439e+06 |
| 75% | 146.000000 | 5.738981e+06 |
| max | 256.000000 | 1.547865e+07 |

| | |
|-------|--|
| | Weather Normalized Site Natural Gas Use (therms) \ |
| count | 5416.000000 |
| mean | 42825.709287 |
| std | 34267.090684 |

| | |
|-----|---------------|
| min | 0.000000 |
| 25% | 10320.900000 |
| 50% | 41703.300000 |
| 75% | 61930.525000 |
| max | 165081.800000 |

| | |
|-------|--|
| | Electricity Use - Grid Purchase (kBtu) \ |
| count | 6.219000e+03 |
| mean | 1.989576e+06 |
| std | 1.566178e+06 |
| min | 0.000000e+00 |
| 25% | 9.514696e+05 |
| 50% | 1.464586e+06 |
| 75% | 2.474833e+06 |
| max | 9.345752e+06 |

| | |
|-------|---|
| | Weather Normalized Site Electricity (kWh) \ |
| count | 5.904000e+03 |
| mean | 5.778506e+05 |
| std | 4.550941e+05 |
| min | 0.000000e+00 |
| 25% | 2.736860e+05 |
| 50% | 4.236845e+05 |
| 75% | 7.231212e+05 |
| max | 2.691784e+06 |

| | |
|-------|--|
| | Total GHG Emissions (Metric Tons CO2e) \ |
| count | 6261.000000 |
| mean | 475.221498 |
| std | 252.769061 |
| min | 0.000000 |
| 25% | 302.600000 |
| 50% | 420.000000 |
| 75% | 598.000000 |
| max | 1711.000000 |

| | |
|-------|---|
| | Direct GHG Emissions (Metric Tons CO2e) \ |
| count | 6254.000000 |
| mean | 284.930972 |
| std | 178.919736 |
| min | 0.000000 |
| 25% | 172.625000 |
| 50% | 263.350000 |
| 75% | 380.350000 |
| max | 890.100000 |

| | |
|--|---|
| | Indirect GHG Emissions (Metric Tons CO2e) \ |
|--|---|

| | |
|-------|-------------|
| count | 6262.000000 |
| mean | 190.685883 |
| std | 157.579845 |
| min | 0.000000 |
| 25% | 87.900000 |
| 50% | 136.250000 |
| 75% | 236.300000 |
| max | 914.400000 |

| | |
|-------|---|
| | Property GFA - Self-Reported (ft ²) \ |
| count | 6292.000000 |
| mean | 96860.123331 |
| std | 44255.291152 |
| min | 120.000000 |
| 25% | 64166.250000 |
| 50% | 82107.500000 |
| 75% | 116466.250000 |
| max | 290421.000000 |

| | |
|-------|--|
| | Water Use (All Water Sources) (kgal) \ |
| count | 4336.000000 |
| mean | 4326.334640 |
| std | 2880.103915 |
| min | 0.000000 |
| 25% | 2289.500000 |
| 50% | 3869.650000 |
| 75% | 5848.700000 |
| max | 16104.100000 |

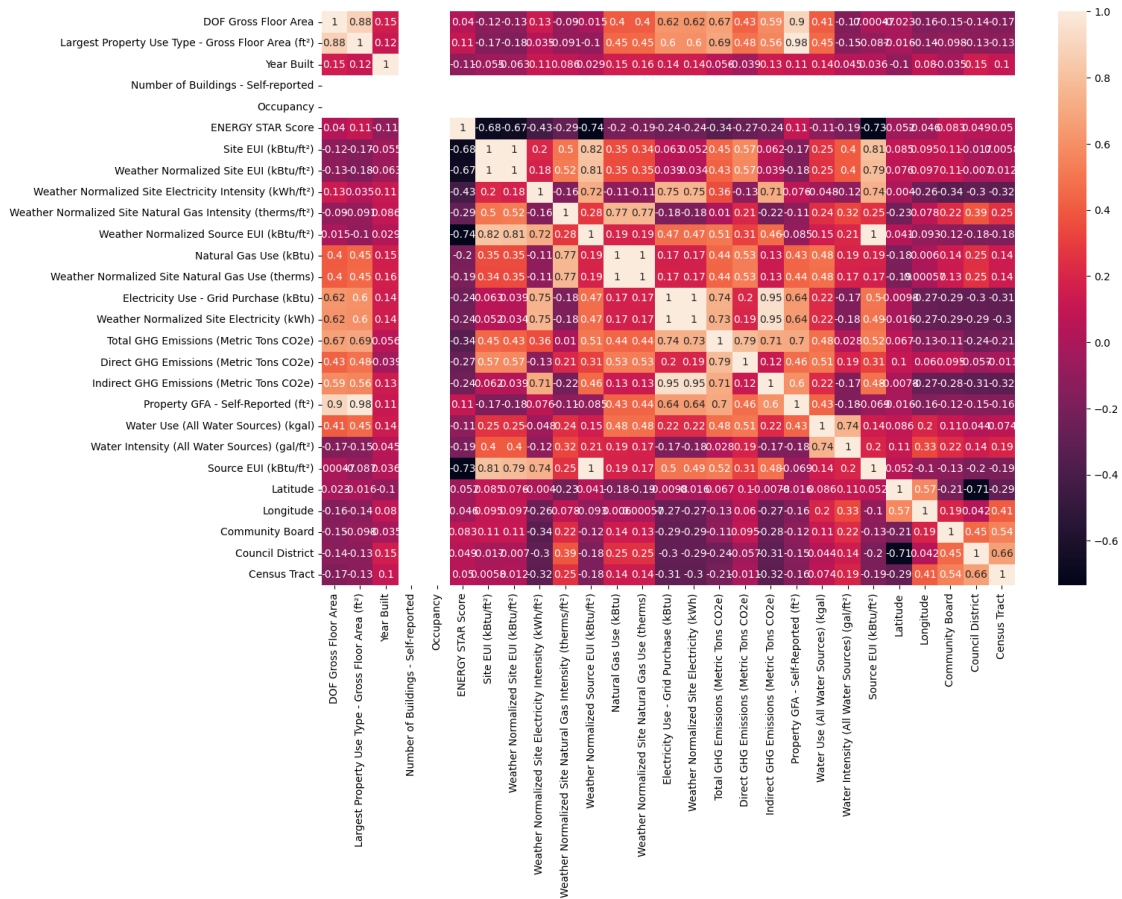
| | | |
|-------|--|--------------------------------------|
| | Water Intensity (All Water Sources) (gal/ft ²) | Source EUI (kBtu/ft ²) \ |
| count | 4336.000000 | 6232.000000 |
| mean | 47.552671 | 119.266030 |
| std | 28.972380 | 39.431424 |
| min | 0.000000 | 8.700000 |
| 25% | 27.717500 | 95.500000 |
| 50% | 43.120000 | 116.500000 |
| 75% | 64.642500 | 141.200000 |
| max | 136.030000 | 255.400000 |

| | | | | |
|-------|-------------|-------------|-----------------|--------------------|
| | Latitude | Longitude | Community Board | Council District \ |
| count | 4885.000000 | 4885.000000 | 4885.000000 | 4885.000000 |
| mean | 40.755013 | -73.957259 | 7.334903 | 16.186489 |
| std | 0.080331 | 0.036394 | 3.779825 | 15.682984 |
| min | 40.572759 | -74.062256 | 1.000000 | 1.000000 |
| 25% | 40.702245 | -73.984023 | 5.000000 | 4.000000 |
| 50% | 40.759937 | -73.963826 | 7.000000 | 9.000000 |
| 75% | 40.818992 | -73.936260 | 10.000000 | 33.000000 |

max 40.912869 -73.854455 16.000000 49.000000

Census Tract
count 4885.000000
mean 233.255271
std 183.412281
min 1.000000
25% 98.000000
50% 183.000000
75% 296.000000
max 1178.000000

```
[49]: plt.figure(figsize=(15,10))  
sns.heatmap(data.corr(),annot=True)  
plt.show()
```

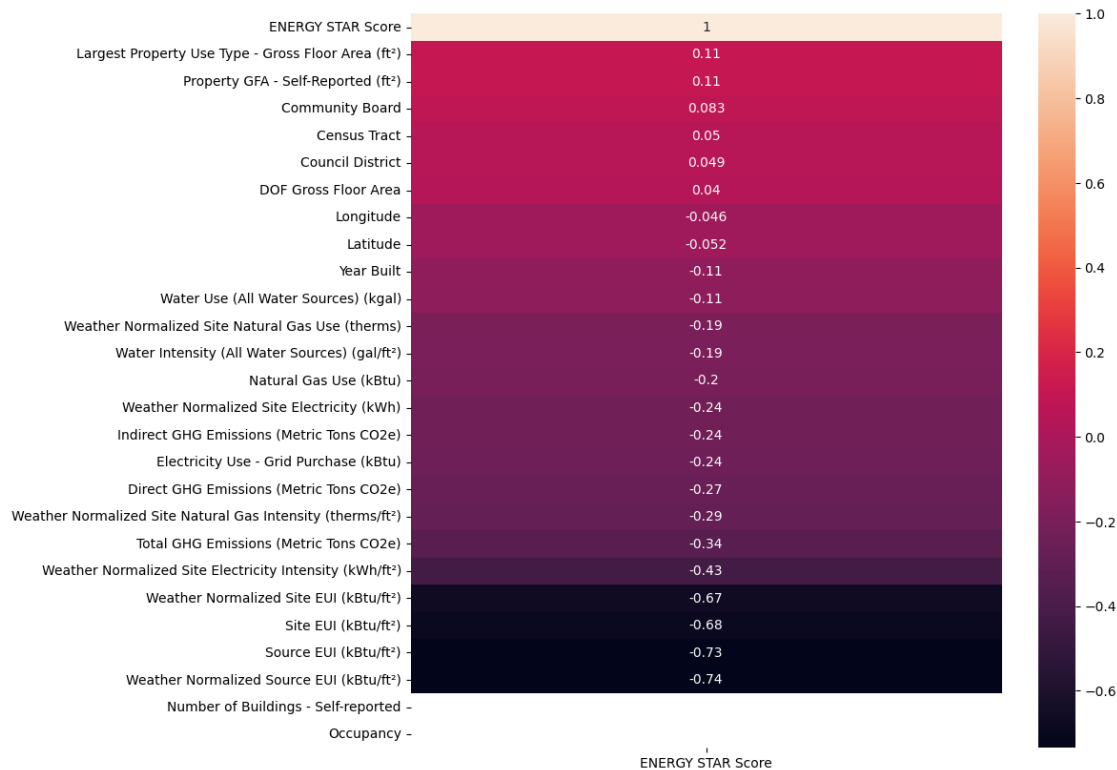


```
[50]: # a lot of high correlations between variables suspects multicollinearity  
# high correlation between variable and its weather normalized version
```



```
# high correlation between variable and its independent ones (ex: Total GHG Emission and Direct and Indirect GHG Emission)
```

```
[51]: #confirms regplot ESS very negatively influenced by Weather Normalized Site and Source EUI
plt.figure(figsize=(10,10))
sns.heatmap(data.corr()[['ENERGY STAR Score']].
            sort_values(ascending=False,by='ENERGY STAR Score'),annot=True)
plt.show()
```



```
[52]: data.isnull().mean().sort_values(ascending=False)
```

```
[52]: Metered Areas (Water) 0.389860
Water Intensity (All Water Sources) (gal/ft²) 0.310871
Water Use (All Water Sources) (kgal) 0.310871
Census Tract 0.223617
Council District 0.223617
Community Board 0.223617
Longitude 0.223617
Latitude 0.223617
ENERGY STAR Score 0.163859
Weather Normalized Site Natural Gas Use (therms) 0.139224
```

| | |
|---|----------|
| Weather Normalized Site Natural Gas Intensity (therms/ft ²) | 0.139224 |
| Weather Normalized Source EUI (kBtu/ft ²) | 0.123490 |
| Weather Normalized Site EUI (kBtu/ft ²) | 0.123490 |
| Natural Gas Use (kBtu) | 0.093293 |
| Weather Normalized Site Electricity (kWh) | 0.061666 |
| Weather Normalized Site Electricity Intensity (kWh/ft ²) | 0.061666 |
| Electricity Use - Grid Purchase (kBtu) | 0.011602 |
| Source EUI (kBtu/ft ²) | 0.009536 |
| Site EUI (kBtu/ft ²) | 0.009536 |
| Water Required? | 0.006516 |
| Direct GHG Emissions (Metric Tons CO ₂ e) | 0.006039 |
| Total GHG Emissions (Metric Tons CO ₂ e) | 0.004927 |
| Indirect GHG Emissions (Metric Tons CO ₂ e) | 0.004768 |
| DOF Gross Floor Area | 0.003814 |
| Borough | 0.003814 |
| Metered Areas (Energy) | 0.003338 |
| DOF Benchmarking Submission Status | 0.001271 |
| Largest Property Use Type - Gross Floor Area (ft ²) | 0.000159 |
| Largest Property Use Type | 0.000159 |
| Primary Property Type - Self Selected | 0.000000 |
| List of All Property Use Types at Property | 0.000000 |
| Property GFA - Self-Reported (ft ²) | 0.000000 |
| Release Date | 0.000000 |
| Year Built | 0.000000 |
| Address 1 (self-reported) | 0.000000 |
| Number of Buildings - Self-reported | 0.000000 |
| Occupancy | 0.000000 |
| Parent Property Name | 0.000000 |
| dtype: float64 | |

```
[53]: #handle Nan
num_cols_data = data.select_dtypes('number')
for col in num_cols_data:
    data[col] = data[col].fillna(df[col].median())
```

```
[54]: data.dropna(inplace=True)
```

```
[55]: data.isnull().mean().sort_values(ascending=False)
```

| | |
|--|-----|
| [55]: Parent Property Name | 0.0 |
| Water Intensity (All Water Sources) (gal/ft ²) | 0.0 |
| Electricity Use - Grid Purchase (kBtu) | 0.0 |
| Weather Normalized Site Electricity (kWh) | 0.0 |
| Total GHG Emissions (Metric Tons CO ₂ e) | 0.0 |
| Direct GHG Emissions (Metric Tons CO ₂ e) | 0.0 |
| Indirect GHG Emissions (Metric Tons CO ₂ e) | 0.0 |
| Property GFA - Self-Reported (ft ²) | 0.0 |

| | |
|---|-----|
| Water Use (All Water Sources) (kgal) | 0.0 |
| Source EUI (kBtu/ft ²) | 0.0 |
| Address 1 (self-reported) | 0.0 |
| Release Date | 0.0 |
| Water Required? | 0.0 |
| DOF Benchmarking Submission Status | 0.0 |
| Latitude | 0.0 |
| Longitude | 0.0 |
| Community Board | 0.0 |
| Council District | 0.0 |
| Weather Normalized Site Natural Gas Use (therms) | 0.0 |
| Natural Gas Use (kBtu) | 0.0 |
| Weather Normalized Source EUI (kBtu/ft ²) | 0.0 |
| Weather Normalized Site Natural Gas Intensity (therms/ft ²) | 0.0 |
| Borough | 0.0 |
| DOF Gross Floor Area | 0.0 |
| Primary Property Type - Self Selected | 0.0 |
| List of All Property Use Types at Property | 0.0 |
| Largest Property Use Type | 0.0 |
| Largest Property Use Type - Gross Floor Area (ft ²) | 0.0 |
| Year Built | 0.0 |
| Number of Buildings - Self-reported | 0.0 |
| Occupancy | 0.0 |
| Metered Areas (Energy) | 0.0 |
| Metered Areas (Water) | 0.0 |
| ENERGY STAR Score | 0.0 |
| Site EUI (kBtu/ft ²) | 0.0 |
| Weather Normalized Site EUI (kBtu/ft ²) | 0.0 |
| Weather Normalized Site Electricity Intensity (kWh/ft ²) | 0.0 |
| Census Tract | 0.0 |
| dtype: float64 | |

```
[56]: data.drop(['Parent Property Name', 'Address 1 (self-reported)', 'Release_
↳ Date'], axis=1, inplace=True)
```

```
[57]: #encode
cat_cols_data = data.select_dtypes('object')

from sklearn.preprocessing import LabelEncoder

le = LabelEncoder()

for col in cat_cols_data:
    data[col] = le.fit_transform(data[col])
```

```
[58]: data.head()
```

[58]:

| | Borough | DOF Gross Floor Area | Primary Property Type - Self Selected | \ |
|----|---------|----------------------|---------------------------------------|----|
| 16 | 2 | 55056.0 | | 22 |
| 18 | 2 | 84442.0 | | 11 |
| 21 | 2 | 122500.0 | | 2 |
| 22 | 2 | 141811.0 | | 2 |
| 24 | 2 | 100628.0 | | 2 |

| | List of All Property Use Types at Property | Largest Property Use Type | \ |
|----|--|---------------------------|----|
| 16 | | 267 | 22 |
| 18 | | 237 | 10 |
| 21 | | 13 | 2 |
| 22 | | 13 | 2 |
| 24 | | 13 | 2 |

| | Largest Property Use Type - Gross Floor Area (ft ²) | Year Built | \ |
|----|---|------------|---|
| 16 | 57903.0 | 1932 | |
| 18 | 52850.0 | 1970 | |
| 21 | 61310.0 | 1895 | |
| 22 | 168566.0 | 2001 | |
| 24 | 128679.0 | 1894 | |

| | Number of Buildings - Self-reported | Occupancy | Metered Areas (Energy) | \ |
|----|-------------------------------------|-----------|------------------------|---|
| 16 | 1 | 100 | | 2 |
| 18 | 1 | 100 | | 2 |
| 21 | 1 | 100 | | 0 |
| 22 | 1 | 100 | | 2 |
| 24 | 1 | 100 | | 2 |

| | Metered Areas (Water) | ENERGY STAR Score | Site EUI (kBtu/ft ²) | \ |
|----|-----------------------|-------------------|----------------------------------|---|
| 16 | 3 | 100.0 | 11.4 | |
| 18 | 3 | 81.0 | 85.6 | |
| 21 | 3 | 65.0 | 52.9 | |
| 22 | 3 | 65.0 | 10.1 | |
| 24 | 3 | 65.0 | 29.9 | |

| | Weather Normalized Site EUI (kBtu/ft ²) | \ |
|----|---|---|
| 16 | 11.4 | |
| 18 | 89.8 | |
| 21 | 52.9 | |
| 22 | 10.1 | |
| 24 | 29.9 | |

| | Weather Normalized Site Electricity Intensity (kWh/ft ²) | \ |
|----|--|---|
| 16 | 0.0 | |
| 18 | 9.8 | |
| 21 | 15.5 | |
| 22 | 2.9 | |

| | |
|----|-----|
| 24 | 8.7 |
|----|-----|

| | |
|----|---|
| | Weather Normalized Site Natural Gas Intensity (therms/ft ²) \ |
| 16 | 0.1 |
| 18 | 0.0 |
| 21 | 0.5 |
| 22 | 0.0 |
| 24 | 0.5 |

| | | |
|----|---|--------------------------|
| | Weather Normalized Source EUI (kBtu/ft ²) | Natural Gas Use (kBtu) \ |
| 16 | 11.9 | 657600.00 |
| 18 | 161.7 | 49786.00 |
| 21 | 166.2 | 4103962.15 |
| 22 | 31.2 | 53900.00 |
| 24 | 93.7 | 4103962.15 |

| | |
|----|--|
| | Weather Normalized Site Natural Gas Use (therms) \ |
| 16 | 6576.00 |
| 18 | 523.10 |
| 21 | 44455.25 |
| 22 | 539.00 |
| 24 | 44455.25 |

| | |
|----|--|
| | Electricity Use - Grid Purchase (kBtu) \ |
| 16 | 0.0 |
| 18 | 2898517.5 |
| 21 | 3245494.5 |
| 22 | 1656867.2 |
| 24 | 3841365.6 |

| | |
|----|---|
| | Weather Normalized Site Electricity (kWh) \ |
| 16 | 0.0 |
| 18 | 825719.4 |
| 21 | 951199.9 |
| 22 | 485599.9 |
| 24 | 1125839.7 |

| | |
|----|---|
| | Total GHG Emissions (Metric Tons CO ₂ e) \ |
| 16 | 34.9 |
| 18 | 589.9 |
| 21 | 301.2 |
| 22 | 156.6 |
| 24 | 356.5 |

| | |
|----|--|
| | Direct GHG Emissions (Metric Tons CO ₂ e) \ |
| 16 | 34.9 |
| 18 | 320.9 |

| | |
|----|-----|
| 21 | 0.0 |
| 22 | 2.9 |
| 24 | 0.0 |

| | Indirect GHG Emissions (Metric Tons CO2e) \ |
|----|---|
| 16 | 0.0 |
| 18 | 269.0 |
| 21 | 301.2 |
| 22 | 153.8 |
| 24 | 356.5 |

| | Property GFA - Self-Reported (ft ²) | Water Use (All Water Sources) (kgal) \ |
|----|---|--|
| 16 | 57903.0 | 4692.5 |
| 18 | 84508.0 | 1753.4 |
| 21 | 61310.0 | 4692.5 |
| 22 | 168566.0 | 2032.1 |
| 24 | 128679.0 | 462.9 |

| | Water Intensity (All Water Sources) (gal/ft ²) | Source EUI (kBtu/ft ²) \ |
|----|--|--------------------------------------|
| 16 | 45.095 | 11.9 |
| 18 | 20.750 | 159.6 |
| 21 | 45.095 | 166.2 |
| 22 | 12.050 | 31.2 |
| 24 | 3.600 | 93.7 |

| | Water Required? | DOF Benchmarking Submission Status | Latitude | Longitude \ |
|----|-----------------|------------------------------------|-----------|-------------|
| 16 | 1 | 0 | 40.809120 | -73.965599 |
| 18 | 0 | 0 | 40.845958 | -73.942539 |
| 21 | 0 | 0 | 40.730625 | -73.998784 |
| 22 | 1 | 0 | 40.729912 | -73.999044 |
| 24 | 1 | 0 | 40.729456 | -73.994667 |

| | Community Board | Council District | Census Tract |
|----|-----------------|------------------|--------------|
| 16 | 9.0 | 7.0 | 205.0 |
| 18 | 12.0 | 10.0 | 255.0 |
| 21 | 2.0 | 1.0 | 65.0 |
| 22 | 2.0 | 1.0 | 65.0 |
| 24 | 2.0 | 1.0 | 59.0 |

```
[59]: data.skew().sort_values(ascending=False)
```

```
[59]: Largest Property Use Type          4.759829
      Primary Property Type - Self Selected 4.262693
      Weather Normalized Site Electricity (kWh) 2.010265
      Electricity Use - Grid Purchase (kBtu) 1.931994
      Indirect GHG Emissions (Metric Tons CO2e) 1.927956
      Census Tract 1.845189
```

| | |
|---|------------|
| DOF Gross Floor Area | 1.511024 |
| Property GFA - Self-Reported (ft ²) | 1.454483 |
| Largest Property Use Type - Gross Floor Area (ft ²) | 1.452128 |
| Weather Normalized Site Electricity Intensity (kWh/ft ²) | 1.397960 |
| Council District | 1.316536 |
| Total GHG Emissions (Metric Tons CO2e) | 1.202070 |
| Water Use (All Water Sources) (kgal) | 1.003798 |
| Natural Gas Use (kBtu) | 0.812891 |
| Longitude | 0.808892 |
| Water Intensity (All Water Sources) (gal/ft ²) | 0.798567 |
| Weather Normalized Site Natural Gas Use (therms) | 0.785247 |
| Year Built | 0.768635 |
| Direct GHG Emissions (Metric Tons CO2e) | 0.733740 |
| List of All Property Use Types at Property | 0.458268 |
| Source EUI (kBtu/ft ²) | 0.407180 |
| Community Board | 0.347060 |
| Weather Normalized Source EUI (kBtu/ft ²) | 0.290645 |
| Number of Buildings - Self-reported | 0.000000 |
| DOF Benchmarking Submission Status | 0.000000 |
| Occupancy | 0.000000 |
| Weather Normalized Site Natural Gas Intensity (therms/ft ²) | -0.050972 |
| Site EUI (kBtu/ft ²) | -0.105231 |
| Weather Normalized Site EUI (kBtu/ft ²) | -0.217228 |
| Latitude | -0.397498 |
| Borough | -0.400242 |
| ENERGY STAR Score | -0.703535 |
| Water Required? | -0.718251 |
| Metered Areas (Water) | -23.087210 |
| Metered Areas (Energy) | -49.729535 |
| dtype: float64 | |

```
[60]: skewed_cols_data = []

for col in data.columns:
    if data[col].skew() > 4 or data[col].skew() < -10 :
        skewed_cols_data.append(col)

skewed_cols_data
```

```
[60]: ['Largest Property Use Type',
       'Metered Areas (Energy)',
       'Metered Areas (Water)']
```

```
[61]: for col in skewed_cols_data:
        data[col] = np.log1p(data[col])
```

```
[62]: data.skew().sort_values(ascending=False)
```

```
[62]: Primary Property Type - Self Selected          4.262693
      Weather Normalized Site Electricity (kWh)      2.010265
      Electricity Use - Grid Purchase (kBtu)         1.931994
      Indirect GHG Emissions (Metric Tons CO2e)      1.927956
      Census Tract                                   1.845189
      DOF Gross Floor Area                           1.511024
      Property GFA - Self-Reported (ft²)             1.454483
      Largest Property Use Type - Gross Floor Area (ft²) 1.452128
      Weather Normalized Site Electricity Intensity (kWh/ft²) 1.397960
      Council District                               1.316536
      Largest Property Use Type                     1.208956
      Total GHG Emissions (Metric Tons CO2e)        1.202070
      Water Use (All Water Sources) (kgal)           1.003798
      Natural Gas Use (kBtu)                         0.812891
      Longitude                                       0.808892
      Water Intensity (All Water Sources) (gal/ft²)  0.798567
      Weather Normalized Site Natural Gas Use (therms) 0.785247
      Year Built                                     0.768635
      Direct GHG Emissions (Metric Tons CO2e)        0.733740
      List of All Property Use Types at Property      0.458268
      Source EUI (kBtu/ft²)                         0.407180
      Community Board                               0.347060
      Weather Normalized Source EUI (kBtu/ft²)       0.290645
      Number of Buildings - Self-reported            0.000000
      DOF Benchmarking Submission Status             0.000000
      Occupancy                                      0.000000
      Weather Normalized Site Natural Gas Intensity (therms/ft²) -0.050972
      Site EUI (kBtu/ft²)                          -0.105231
      Weather Normalized Site EUI (kBtu/ft²)        -0.217228
      Latitude                                       -0.397498
      Borough                                       -0.400242
      ENERGY STAR Score                         -0.703535
      Water Required?                             -0.718251
      Metered Areas (Water)                       -27.178552
      Metered Areas (Energy)                     -53.576814
      dtype: float64
```

```
[ ]: #not better
```

```
[63]: data.head()
```

```
[63]:   Borough  DOF Gross Floor Area  Primary Property Type - Self Selected \
      16      2          55056.0          22
      18      2          84442.0          11
      21      2         122500.0           2
      22      2         141811.0           2
      24      2         100628.0           2
```


| | List of All Property Use Types at Property | Largest Property Use Type | \ |
|----|--|---------------------------|---|
| 16 | 267 | 3.135494 | |
| 18 | 237 | 2.397895 | |
| 21 | 13 | 1.098612 | |
| 22 | 13 | 1.098612 | |
| 24 | 13 | 1.098612 | |

| | Largest Property Use Type - Gross Floor Area (ft ²) | Year Built | \ |
|----|---|------------|---|
| 16 | 57903.0 | 1932 | |
| 18 | 52850.0 | 1970 | |
| 21 | 61310.0 | 1895 | |
| 22 | 168566.0 | 2001 | |
| 24 | 128679.0 | 1894 | |

| | Number of Buildings - Self-reported | Occupancy | Metered Areas (Energy) | \ |
|----|-------------------------------------|-----------|------------------------|---|
| 16 | 1 | 100 | 1.098612 | |
| 18 | 1 | 100 | 1.098612 | |
| 21 | 1 | 100 | 0.000000 | |
| 22 | 1 | 100 | 1.098612 | |
| 24 | 1 | 100 | 1.098612 | |

| | Metered Areas (Water) | ENERGY STAR Score | Site EUI (kBtu/ft ²) | \ |
|----|-----------------------|-------------------|----------------------------------|---|
| 16 | 1.386294 | 100.0 | 11.4 | |
| 18 | 1.386294 | 81.0 | 85.6 | |
| 21 | 1.386294 | 65.0 | 52.9 | |
| 22 | 1.386294 | 65.0 | 10.1 | |
| 24 | 1.386294 | 65.0 | 29.9 | |

| | Weather Normalized Site EUI (kBtu/ft ²) | \ |
|----|---|---|
| 16 | 11.4 | |
| 18 | 89.8 | |
| 21 | 52.9 | |
| 22 | 10.1 | |
| 24 | 29.9 | |

| | Weather Normalized Site Electricity Intensity (kWh/ft ²) | \ |
|----|--|---|
| 16 | 0.0 | |
| 18 | 9.8 | |
| 21 | 15.5 | |
| 22 | 2.9 | |
| 24 | 8.7 | |

| | Weather Normalized Site Natural Gas Intensity (therms/ft ²) | \ |
|----|---|---|
| 16 | 0.1 | |
| 18 | 0.0 | |
| 21 | 0.5 | |

| | |
|----|-----|
| 22 | 0.0 |
| 24 | 0.5 |

| | Weather Normalized Source EUI (kBtu/ft ²) | Natural Gas Use (kBtu) \ |
|----|---|--------------------------|
| 16 | 11.9 | 657600.00 |
| 18 | 161.7 | 49786.00 |
| 21 | 166.2 | 4103962.15 |
| 22 | 31.2 | 53900.00 |
| 24 | 93.7 | 4103962.15 |

| | Weather Normalized Site Natural Gas Use (therms) \ |
|----|--|
| 16 | 6576.00 |
| 18 | 523.10 |
| 21 | 44455.25 |
| 22 | 539.00 |
| 24 | 44455.25 |

| | Electricity Use - Grid Purchase (kBtu) \ |
|----|--|
| 16 | 0.0 |
| 18 | 2898517.5 |
| 21 | 3245494.5 |
| 22 | 1656867.2 |
| 24 | 3841365.6 |

| | Weather Normalized Site Electricity (kWh) \ |
|----|---|
| 16 | 0.0 |
| 18 | 825719.4 |
| 21 | 951199.9 |
| 22 | 485599.9 |
| 24 | 1125839.7 |

| | Total GHG Emissions (Metric Tons CO ₂ e) \ |
|----|---|
| 16 | 34.9 |
| 18 | 589.9 |
| 21 | 301.2 |
| 22 | 156.6 |
| 24 | 356.5 |

| | Direct GHG Emissions (Metric Tons CO ₂ e) \ |
|----|--|
| 16 | 34.9 |
| 18 | 320.9 |
| 21 | 0.0 |
| 22 | 2.9 |
| 24 | 0.0 |

| | Indirect GHG Emissions (Metric Tons CO ₂ e) \ |
|----|--|
| 16 | 0.0 |

| | |
|----|-------|
| 18 | 269.0 |
| 21 | 301.2 |
| 22 | 153.8 |
| 24 | 356.5 |

| | Property GFA - Self-Reported (ft ²) | Water Use (All Water Sources) (kgal) \ |
|----|---|--|
| 16 | 57903.0 | 4692.5 |
| 18 | 84508.0 | 1753.4 |
| 21 | 61310.0 | 4692.5 |
| 22 | 168566.0 | 2032.1 |
| 24 | 128679.0 | 462.9 |

| | Water Intensity (All Water Sources) (gal/ft ²) | Source EUI (kBtu/ft ²) \ |
|----|--|--------------------------------------|
| 16 | 45.095 | 11.9 |
| 18 | 20.750 | 159.6 |
| 21 | 45.095 | 166.2 |
| 22 | 12.050 | 31.2 |
| 24 | 3.600 | 93.7 |

| | Water Required? | DOF Benchmarking Submission Status | Latitude | Longitude \ |
|----|-----------------|------------------------------------|-----------|-------------|
| 16 | 1 | 0 | 40.809120 | -73.965599 |
| 18 | 0 | 0 | 40.845958 | -73.942539 |
| 21 | 0 | 0 | 40.730625 | -73.998784 |
| 22 | 1 | 0 | 40.729912 | -73.999044 |
| 24 | 1 | 0 | 40.729456 | -73.994667 |

| | Community Board | Council District | Census Tract |
|----|-----------------|------------------|--------------|
| 16 | 9.0 | 7.0 | 205.0 |
| 18 | 12.0 | 10.0 | 255.0 |
| 21 | 2.0 | 1.0 | 65.0 |
| 22 | 2.0 | 1.0 | 65.0 |
| 24 | 2.0 | 1.0 | 59.0 |

```
[65]: data.isnull().sum()
```

```
[65]: Borough                                0
      DOF Gross Floor Area                    0
      Primary Property Type - Self Selected    0
      List of All Property Use Types at Property 0
      Largest Property Use Type                 0
      Largest Property Use Type - Gross Floor Area (ft²) 0
      Year Built                               0
      Number of Buildings - Self-reported       0
      Occupancy                                0
      Metered Areas (Energy)                    0
      Metered Areas (Water)                     0
      ENERGY STAR Score                       0
```

| | |
|---|---|
| Site EUI (kBtu/ft ²) | 0 |
| Weather Normalized Site EUI (kBtu/ft ²) | 0 |
| Weather Normalized Site Electricity Intensity (kWh/ft ²) | 0 |
| Weather Normalized Site Natural Gas Intensity (therms/ft ²) | 0 |
| Weather Normalized Source EUI (kBtu/ft ²) | 0 |
| Natural Gas Use (kBtu) | 0 |
| Weather Normalized Site Natural Gas Use (therms) | 0 |
| Electricity Use - Grid Purchase (kBtu) | 0 |
| Weather Normalized Site Electricity (kWh) | 0 |
| Total GHG Emissions (Metric Tons CO ₂ e) | 0 |
| Direct GHG Emissions (Metric Tons CO ₂ e) | 0 |
| Indirect GHG Emissions (Metric Tons CO ₂ e) | 0 |
| Property GFA - Self-Reported (ft ²) | 0 |
| Water Use (All Water Sources) (kgal) | 0 |
| Water Intensity (All Water Sources) (gal/ft ²) | 0 |
| Source EUI (kBtu/ft ²) | 0 |
| Water Required? | 0 |
| DOF Benchmarking Submission Status | 0 |
| Latitude | 0 |
| Longitude | 0 |
| Community Board | 0 |
| Council District | 0 |
| Census Tract | 0 |
| dtype: int64 | |

```
[66]: data.dropna(inplace=True)
```

```
[67]: X = data.drop('ENERGY STAR Score',axis=1)
y = data['ENERGY STAR Score']

from statsmodels.stats import diagnostic

import statsmodels.api as sm

X = sm.add_constant(X)
model = sm.OLS(y, X).fit()
#predictions = model.predict(x_test)

print_model = model.summary()
print(print_model)
```

OLS Regression Results

```
=====
Dep. Variable:          ENERGY STAR Score    R-squared:                0.473
Model:                  OLS                   Adj. R-squared:           0.469
Method:                 Least Squares         F-statistic:              109.6
Date:                  Sun, 09 Apr 2023        Prob (F-statistic):       0.00
```

Time: 21:41:57 Log-Likelihood: -16365.
 No. Observations: 3818 AIC: 3.279e+04
 Df Residuals: 3786 BIC: 3.299e+04
 Df Model: 31
 Covariance Type: nonrobust

| | | | | coef | std err |
|---|-------|-----------|-----------|------------|----------|
| t | P> t | [0.025 | 0.975] | | |
| ----- | | | | | |
| Borough | | | | -0.5502 | 0.508 |
| -1.082 | 0.279 | -1.547 | 0.447 | | |
| DOF Gross Floor Area | | | | -7.523e-05 | 1.96e-05 |
| -3.847 | 0.000 | -0.000 | -3.69e-05 | | |
| Primary Property Type - Self Selected | | | | -1.5749 | 0.291 |
| -5.417 | 0.000 | -2.145 | -1.005 | | |
| List of All Property Use Types at Property | | | | 0.0424 | 0.009 |
| 4.899 | 0.000 | 0.025 | 0.059 | | |
| Largest Property Use Type | | | | 16.9908 | 3.806 |
| 4.464 | 0.000 | 9.529 | 24.453 | | |
| Largest Property Use Type - Gross Floor Area (ft ²) | | | | 2.625e-07 | 3.66e-05 |
| 0.007 | 0.994 | -7.15e-05 | 7.2e-05 | | |
| Year Built | | | | -0.0675 | 0.011 |
| -6.235 | 0.000 | -0.089 | -0.046 | | |
| Number of Buildings - Self-reported | | | | -0.3263 | 0.181 |
| -1.803 | 0.072 | -0.681 | 0.029 | | |
| Occupancy | | | | -32.6345 | 18.105 |
| -1.803 | 0.072 | -68.131 | 2.862 | | |
| Metered Areas (Energy) | | | | -19.8073 | 15.307 |
| -1.294 | 0.196 | -49.818 | 10.203 | | |
| Metered Areas (Water) | | | | -1.7241 | 8.225 |
| -0.210 | 0.834 | -17.850 | 14.402 | | |
| Site EUI (kBtu/ft ²) | | | | -0.5898 | 0.105 |
| -5.625 | 0.000 | -0.795 | -0.384 | | |
| Weather Normalized Site EUI (kBtu/ft ²) | | | | -0.0407 | 0.067 |
| -0.605 | 0.545 | -0.172 | 0.091 | | |
| Weather Normalized Site Electricity Intensity (kWh/ft ²) | | | | -2.0160 | 0.638 |
| -3.159 | 0.002 | -3.267 | -0.765 | | |
| Weather Normalized Site Natural Gas Intensity (therms/ft ²) | | | | 4.0153 | 2.599 |
| 1.545 | 0.122 | -1.081 | 9.111 | | |
| Weather Normalized Source EUI (kBtu/ft ²) | | | | 0.0669 | 0.052 |
| 1.292 | 0.196 | -0.035 | 0.168 | | |
| Natural Gas Use (kBtu) | | | | 2.793e-07 | 4.6e-07 |
| 0.607 | 0.544 | -6.23e-07 | 1.18e-06 | | |
| Weather Normalized Site Natural Gas Use (therms) | | | | -7.355e-05 | 4.87e-05 |
| -1.511 | 0.131 | -0.000 | 2.19e-05 | | |
| Electricity Use - Grid Purchase (kBtu) | | | | -1.355e-06 | 1.76e-06 |

| | | | | | |
|--|-------|-----------|-------------------|-----------|----------|
| -0.772 | 0.440 | -4.8e-06 | 2.09e-06 | | |
| Weather Normalized Site Electricity (kWh) | | | | 3.173e-06 | 5.44e-06 |
| 0.583 | 0.560 | -7.49e-06 | 1.38e-05 | | |
| Total GHG Emissions (Metric Tons CO2e) | | | | 0.0137 | 0.024 |
| 0.569 | 0.570 | -0.033 | 0.061 | | |
| Direct GHG Emissions (Metric Tons CO2e) | | | | 0.0022 | 0.024 |
| 0.092 | 0.927 | -0.044 | 0.049 | | |
| Indirect GHG Emissions (Metric Tons CO2e) | | | | 0.0041 | 0.025 |
| 0.168 | 0.867 | -0.044 | 0.052 | | |
| Property GFA - Self-Reported (ft ²) | | | | 2.708e-05 | 4.4e-05 |
| 0.615 | 0.539 | -5.92e-05 | 0.000 | | |
| Water Use (All Water Sources) (kgal) | | | | 0.0003 | 0.000 |
| 0.977 | 0.329 | -0.000 | 0.001 | | |
| Water Intensity (All Water Sources) (gal/ft ²) | | | | 0.0186 | 0.026 |
| 0.728 | 0.467 | -0.032 | 0.069 | | |
| Source EUI (kBtu/ft ²) | | | | -0.0761 | 0.080 |
| -0.955 | 0.340 | -0.232 | 0.080 | | |
| Water Required? | | | | -0.7417 | 0.612 |
| -1.213 | 0.225 | -1.941 | 0.457 | | |
| DOF Benchmarking Submission Status | | | | 8.526e-16 | 5.45e-15 |
| 0.156 | 0.876 | -9.83e-15 | 1.15e-14 | | |
| Latitude | | | | -7.3028 | 11.439 |
| -0.638 | 0.523 | -29.730 | 15.125 | | |
| Longitude | | | | -51.4661 | 19.786 |
| -2.601 | 0.009 | -90.259 | -12.674 | | |
| Community Board | | | | 0.6490 | 0.116 |
| 5.590 | 0.000 | 0.421 | 0.877 | | |
| Council District | | | | -0.1663 | 0.061 |
| -2.718 | 0.007 | -0.286 | -0.046 | | |
| Census Tract | | | | 0.0012 | 0.003 |
| 0.371 | 0.711 | -0.005 | 0.007 | | |
| ===== | | | | | |
| Omnibus: | | 129.291 | Durbin-Watson: | 1.880 | |
| Prob(Omnibus): | | 0.000 | Jarque-Bera (JB): | 142.553 | |
| Skew: | | -0.453 | Prob(JB): | 1.11e-31 | |
| Kurtosis: | | 3.274 | Cond. No. | 1.33e+16 | |
| ===== | | | | | |

Notes:

[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.

[2] The smallest eigenvalue is 5.93e-16. This might indicate that there are strong multicollinearity problems or that the design matrix is singular.

[68]: *#pour les variables avec une p-value <0.05 on rejette H0: hypothèse de non*
↪significativité au seuil 5%

```
#pour les variables avec une p-value >0.05 on ne rejette pas H0: hypothèse de
↳non significativité 5%
data_signi = data.drop(['Borough','Largest Property Use Type - Gross Floor Area_
↳(ft²)','Metered Areas (Energy)','Metered Areas (Water)','Weather Normalized_
↳Site EUI (kBtu/ft²)','Weather Normalized Site Natural Gas Intensity (therms/
↳ft²)','Weather Normalized Source EUI (kBtu/ft²)','Natural Gas Use_
↳(kBtu)','Weather Normalized Site Natural Gas Use (therms)','Electricity Use_
↳- Grid Purchase (kBtu)','Weather Normalized Site Electricity (kWh)','Total_
↳GHG Emissions (Metric Tons CO2e)','Direct GHG Emissions (Metric Tons_
↳CO2e)','Indirect GHG Emissions (Metric Tons CO2e)','Property GFA -_
↳Self-Reported (ft²)','Water Use (All Water Sources) (kgal)','Water Intensity_
↳(All Water Sources) (gal/ft²)','Source EUI (kBtu/ft²)','Water Required?
↳','DOF Benchmarking Submission Status','Latitude','Census Tract'],axis=1)
```

```
[69]: X = data_signi.drop('ENERGY STAR Score',axis=1)
y = data_signi['ENERGY STAR Score']
X = sm.add_constant(X)

model = sm.OLS(y, X).fit()
#predictions = model.predict(x_test)

print_model = model.summary()
print(print_model)
```

OLS Regression Results

```
=====
Dep. Variable:          ENERGY STAR Score    R-squared:                0.464
Model:                  OLS                   Adj. R-squared:           0.463
Method:                 Least Squares         F-statistic:             330.1
Date:                  Sun, 09 Apr 2023       Prob (F-statistic):       0.00
Time:                  21:41:57               Log-Likelihood:          -16396.
No. Observations:      3818                   AIC:                    3.281e+04
Df Residuals:          3807                   BIC:                    3.288e+04
Df Model:               10
Covariance Type:       nonrobust
=====
=====
```

| | | | | coef | std err |
|--|-------|-----------|----------|-----------|----------|
| t | P> t | [0.025 | 0.975] | | |
| ----- | | | | | |
| DOF Gross Floor Area | | | | 4.936e-06 | 7.04e-06 |
| 0.702 | 0.483 | -8.86e-06 | 1.87e-05 | | |
| Primary Property Type - Self Selected | | | | -1.6365 | 0.288 |
| -5.686 | 0.000 | -2.201 | -1.072 | | |
| List of All Property Use Types at Property | | | | 0.0406 | 0.009 |
| 4.713 | 0.000 | 0.024 | 0.057 | | |

| | | | | | |
|--|-------|---------|-------------------|----------|----------|
| Largest Property Use Type | | | | 17.3830 | 3.754 |
| 4.631 | 0.000 | 10.023 | 24.743 | | |
| Year Built | | | | -0.0780 | 0.010 |
| -7.514 | 0.000 | -0.098 | -0.058 | | |
| Number of Buildings - Self-reported | | | | -0.2962 | 0.071 |
| -4.172 | 0.000 | -0.435 | -0.157 | | |
| Occupancy | | | | -29.6241 | 7.100 |
| -4.172 | 0.000 | -43.544 | -15.704 | | |
| Site EUI (kBtu/ft ²) | | | | -0.5575 | 0.012 |
| -45.474 | 0.000 | -0.582 | -0.533 | | |
| Weather Normalized Site Electricity Intensity (kWh/ft ²) | | | | -1.9537 | 0.105 |
| -18.544 | 0.000 | -2.160 | -1.747 | | |
| Longitude | | | | -43.2584 | 9.565 |
| -4.523 | 0.000 | -62.011 | -24.506 | | |
| Community Board | | | | 0.6401 | 0.103 |
| 6.213 | 0.000 | 0.438 | 0.842 | | |
| Council District | | | | -0.1167 | 0.024 |
| -4.909 | 0.000 | -0.163 | -0.070 | | |
| ===== | | | | | |
| Omnibus: | | 144.332 | Durbin-Watson: | | 1.866 |
| Prob(Omnibus): | | 0.000 | Jarque-Bera (JB): | | 160.696 |
| Skew: | | -0.483 | Prob(JB): | | 1.27e-35 |
| Kurtosis: | | 3.275 | Cond. No. | | 9.50e+19 |
| ===== | | | | | |

Notes:

[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.

[2] The smallest eigenvalue is 4.48e-27. This might indicate that there are strong multicollinearity problems or that the design matrix is singular.

```
[70]: # pour DOF Gross Floor Area p-value >0.05 on ne rejette pas H0: hypothèse de
      ↪ non significativité 5%
data_signi_2 = data_signi.drop('DOF Gross Floor Area',axis=1)
```

```
[71]: X = data_signi_2.drop('ENERGY STAR Score',axis=1)
      y = data_signi_2['ENERGY STAR Score']
      X = sm.add_constant(X)

      model = sm.OLS(y, X).fit()
      #predictions = model.predict(x_test)

      print_model = model.summary()
      print(print_model)
```

OLS Regression Results

```
=====
Dep. Variable:          ENERGY STAR Score    R-squared:                0.464
```



```

Model:                      OLS      Adj. R-squared:      0.463
Method:                     Least Squares  F-statistic:      366.7
Date:                       Sun, 09 Apr 2023  Prob (F-statistic):      0.00
Time:                       21:41:57    Log-Likelihood:      -16396.
No. Observations:          3818      AIC:      3.281e+04
Df Residuals:              3808      BIC:      3.287e+04
Df Model:                   9
Covariance Type:           nonrobust

```

| ===== | | | | |
|--|---------|-------------------|----------|---------|
| ===== | | | | |
| | | | coef | std err |
| t | P> t | [0.025 | 0.975] | |
| ----- | | | | |
| ----- | | | | |
| Primary Property Type - Self Selected | | | -1.6416 | 0.288 |
| -5.706 | 0.000 | -2.206 | -1.078 | |
| List of All Property Use Types at Property | | | 0.0406 | 0.009 |
| 4.714 | 0.000 | 0.024 | 0.058 | |
| Largest Property Use Type | | | 17.4095 | 3.753 |
| 4.638 | 0.000 | 10.051 | 24.768 | |
| Year Built | | | -0.0769 | 0.010 |
| -7.495 | 0.000 | -0.097 | -0.057 | |
| Number of Buildings - Self-reported | | | -0.3029 | 0.070 |
| -4.306 | 0.000 | -0.441 | -0.165 | |
| Occupancy | | | -30.2940 | 7.035 |
| -4.306 | 0.000 | -44.087 | -16.502 | |
| Site EUI (kBtu/ft ²) | | | -0.5585 | 0.012 |
| -45.893 | 0.000 | -0.582 | -0.535 | |
| Weather Normalized Site Electricity Intensity (kWh/ft ²) | | | -1.9476 | 0.105 |
| -18.551 | 0.000 | -2.153 | -1.742 | |
| Longitude | | | -44.1428 | 9.480 |
| -4.656 | 0.000 | -62.730 | -25.556 | |
| Community Board | | | 0.6387 | 0.103 |
| 6.201 | 0.000 | 0.437 | 0.841 | |
| Council District | | | -0.1186 | 0.024 |
| -5.020 | 0.000 | -0.165 | -0.072 | |
| ===== | | | | |
| Omnibus: | 145.268 | Durbin-Watson: | 1.865 | |
| Prob(Omnibus): | 0.000 | Jarque-Bera (JB): | 161.867 | |
| Skew: | -0.485 | Prob(JB): | 7.10e-36 | |
| Kurtosis: | 3.277 | Cond. No. | 1.62e+17 | |
| ===== | | | | |

Notes:

[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.

[2] The smallest eigenvalue is 5.55e-25. This might indicate that there are strong multicollinearity problems or that the design matrix is singular.

```
[72]: #R2 = 46% pouvoir explicatif tres moyen
      #DW preseques égale à 2, assez proche pour considérer une absence_
      ↪ d'autocorrelation des erreurs
      #Prob(JB) < 0.05 on rejette H0 hypothèse de distribution normale des erreurs
```

```
[85]: import statsmodels.stats.api as sms
      from statsmodels.compat import lzip

      name = ["Lagrange multiplier statistic", "p-value", "f-value", "f p-value"]
      test = sms.het_breuschpagan(model.resid, model.model.exog)
      lzip(name, test)
```

```
[85]: [('Lagrange multiplier statistic', 362.3514981776715),
      ('p-value', 9.510470801183295e-72),
      ('f-value', 44.36647561980916),
      ('f p-value', 2.4425135443624113e-76)]
```

```
[ ]: # p-value < 0,05 on rejette H0: hypothese d'homoscedasticité
```

```
[74]: import statsmodels.api as sm

def vif_cal(input_data, dependent_col):
    vif_df = pd.DataFrame( columns = ['Var', 'Vif'])
    x_vars=input_data.drop([dependent_col], axis=1)
    xvar_names=x_vars.columns
    for i in range(0,xvar_names.shape[0]):
        y=x_vars[xvar_names[i]]
        x=x_vars[xvar_names.drop(xvar_names[i])]
        rsq=sm.OLS(y,x).fit().rsquared
        vif=round(1/(1-rsq),2)
        vif_df.loc[i] = [xvar_names[i], vif]
    return vif_df.sort_values(by = 'Vif', axis=0, ascending=False,
    ↪ inplace=False)
```

```
[75]: vif_cal(input_data=data_signi_2, dependent_col='ENERGY STAR Score')
```

```
[75]:
```

| | Var | Vif |
|----|---|------|
| 2 | Largest Property Use Type | 7.48 |
| 0 | Primary Property Type - Self Selected | 6.81 |
| 1 | List of All Property Use Types at Property | 1.77 |
| 9 | Community Board | 1.44 |
| 10 | Council District | 1.36 |
| 7 | Weather Normalized Site Electricity Intensity ... | 1.30 |
| 6 | Site EUI (kBtu/ft ²) | 1.12 |
| 8 | Longitude | 1.12 |

| | | |
|---|-------------------------------------|------|
| 3 | Year Built | 1.07 |
| 4 | Number of Buildings - Self-reported | 0.00 |
| 5 | Occupancy | 0.00 |

```
[76]: #Largest Property Use Type and Primary Property Type - Self Selected vif>5,
      ↪signe de multicollinéarité
      #use a model robust to it
```

```
[77]: from sklearn.model_selection import train_test_split
      from sklearn.linear_model import Ridge

      X = data_signi_2.drop('ENERGY STAR Score',axis=1)
      y = data_signi_2['ENERGY STAR Score']

      X_train, X_test, y_train, y_test = train_test_split(X,y,test_size=0.3)
```

```
[78]: from sklearn.metrics import r2_score, mean_absolute_error
      y_pred_guess = np.median(y_train)
      def mae(y_true, y_pred):
          return np.mean(abs(y_true - y_pred_guess))
      mae(y_test, y_pred_guess)
```

```
[78]: 17.589877835951135
```

```
[80]: from sklearn.linear_model import Ridge
      from sklearn.tree import DecisionTreeRegressor
      from sklearn.ensemble import RandomForestRegressor
      from sklearn.neighbors import KNeighborsRegressor

      from sklearn.metrics import r2_score
      from sklearn.metrics import mean_absolute_error

      rr = Ridge()
      knn = KNeighborsRegressor()
      dt = DecisionTreeRegressor()
      rf = RandomForestRegressor()

      regressors = [('K Nearest Neighbours', knn),('Decision Tree', dt), ('Random
      ↪Forest', rf),('Ridge Regression', rr)]
```

```
[81]: for regressor_name, regressor in regressors:

      regressor.fit(X_train, y_train)

      y_pred = regressor.predict(X_test)
      accuracy = round(r2_score(y_test,y_pred),3)*100
      '{:s} : {:.0f} %'.format(regressor_name, accuracy)
```

```
print('{:s} : {:.0f} %'.format(regressor_name, accuracy))
```

K Nearest Neighbours : 48 %

Decision Tree : 39 %

Random Forest : 64 %

```
[82]: from sklearn.model_selection import cross_val_score
      for regressor_name, regressor in regressors:

          regressor.fit(X_train, y_train)

          y_pred = regressor.predict(X_test)
          accuracy = cross_val_score(regressor, X_train, y_train, cv=10,
          ↪scoring='neg_mean_absolute_error')
          accuracy = accuracy.mean()
          print('{:s} : {:.3f}'.format(regressor_name, accuracy))
```

K Nearest Neighbours : -12.817

Decision Tree : -13.404

Random Forest : -10.742

```
[82]: #random forest meilleur modele car meilleur pouvoir explicatif et mae la plus
      ↪faible : un écart d'environ 10 entre l'ESS predit par le modele et sa vrai
      ↪valeur
```