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

In [2]:
```
df = pd.read_csv('Preprocessed data.csv', parse_dates= True, index_col = 'date_time', low_memory = False
```

In [3]:
```
df.head()
```

Out[3]:

date_time	Global_active_power	Global_reactive_power	Voltage	Global_intensity	Sub_metering_1	Sub_metering_2	Sub_meterin
2006-12-16 17:24:00	4.216	0.418	234.84	18.4	0.0	1.0	1
2006-12-16 17:25:00	5.360	0.436	233.63	23.0	0.0	1.0	1
2006-12-16 17:26:00	5.374	0.498	233.29	23.0	0.0	2.0	1
2006-12-16 17:27:00	5.388	0.502	233.74	23.0	0.0	1.0	1
2006-12-16 17:28:00	3.666	0.528	235.68	15.8	0.0	1.0	1

In [12]:
```
df_df=df.copy(deep=True)
df_df.head()
```

Out[12]:

date_time	Global_active_power	Global_reactive_power	Voltage	Global_intensity	Sub_metering_1	Sub_metering_2	Sub_meterin
2006-12-16 17:24:00	4.216	0.418	234.84	18.4	0.0	1.0	1
2006-12-16 17:25:00	5.360	0.436	233.63	23.0	0.0	1.0	1
2006-12-16 17:26:00	5.374	0.498	233.29	23.0	0.0	2.0	1
2006-12-16 17:27:00	5.388	0.502	233.74	23.0	0.0	1.0	1
2006-12-16 17:28:00	3.666	0.528	235.68	15.8	0.0	1.0	1

In [13]:
```
df_df.reset_index(inplace=True)
df_df.head()
```

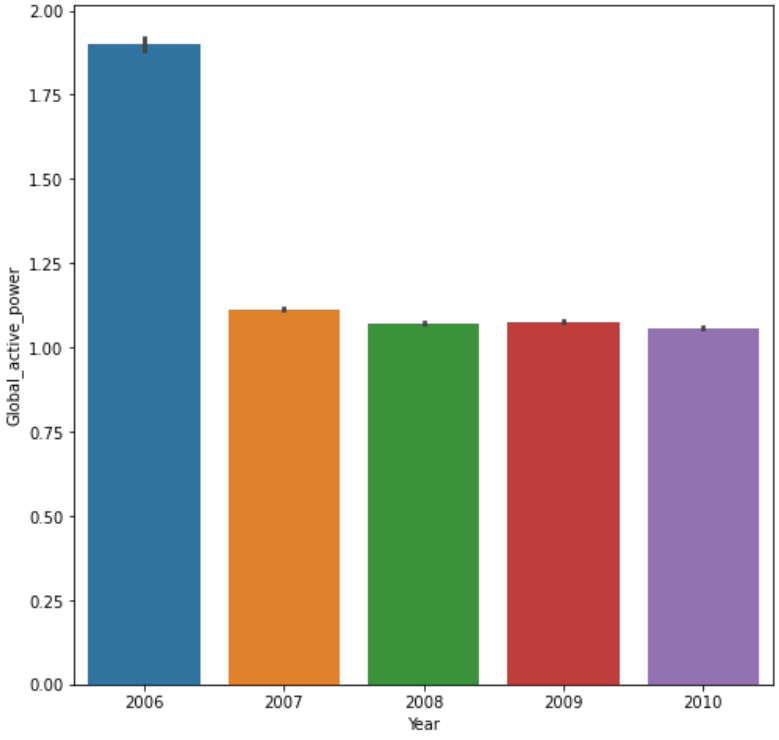
Out[13]:

	date_time	Global_active_power	Global_reactive_power	Voltage	Global_intensity	Sub_metering_1	Sub_metering_2	Sub_mete
0	2006-12-16 17:24:00	4.216	0.418	234.84	18.4	0.0	1.0	
1	2006-12-16 17:25:00	5.360	0.436	233.63	23.0	0.0	1.0	
2	2006-12-16 17:26:00	5.374	0.498	233.29	23.0	0.0	2.0	
3	2006-12-16 17:27:00	5.388	0.502	233.74	23.0	0.0	1.0	
4	2006-12-16 17:28:00	3.666	0.528	235.68	15.8	0.0	1.0	

In [14]:
```
def month(x):
    return x.month
df_df['Month']= df_df['date_time'].apply(lambda x: month(x))
def year(x):
    return x.year
df_df['Year']=df_df['date_time'].apply(lambda x: year(x))
def hour(x):
    return x.hour
df_df['Hour']= df_df['date_time'].apply(lambda x: hour(x))
```

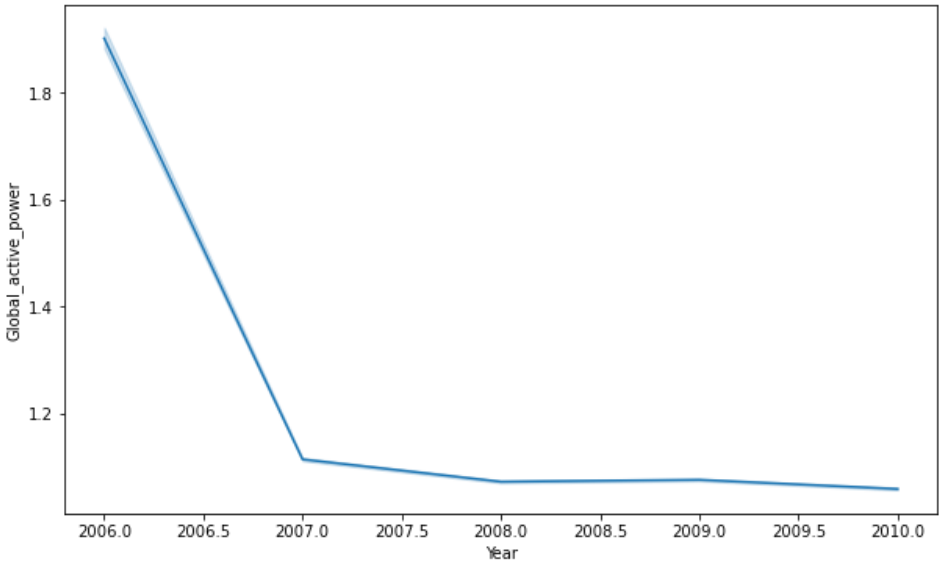
In [15]:
```
import seaborn as sns
plt.figure(figsize=(8,8))
sns.barplot(x="Year", y="Global_active_power",data=df_df)
```

Out[15]: <matplotlib.axes._subplots.AxesSubplot at 0x1ea8ab0c130>



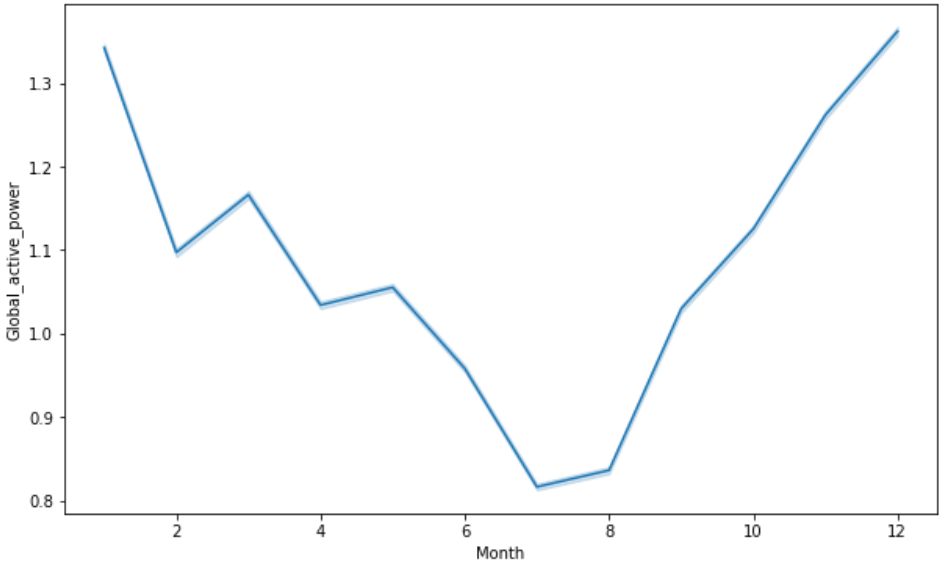
In [20]:
```
plt.figure(figsize=(10,6))
sns.lineplot(x="Year", y="Global_active_power",data=df_df)
```

Out[20]: <matplotlib.axes._subplots.AxesSubplot at 0x1ea8b16b2e0>



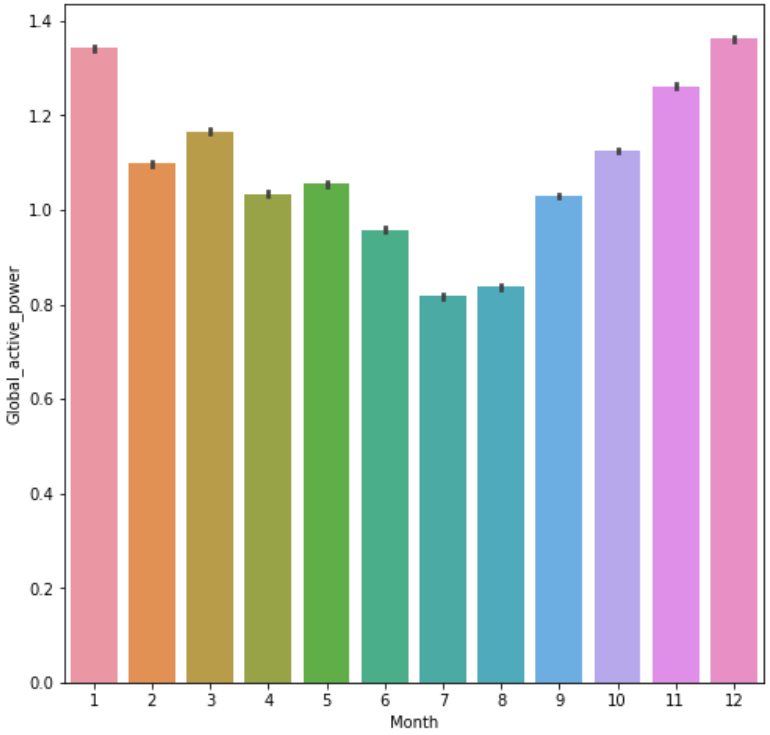
In [21]:
```
plt.figure(figsize=(10,6))
sns.lineplot(x="Month", y="Global_active_power",data=df_df)
```

Out[21]: <matplotlib.axes._subplots.AxesSubplot at 0x1ea9b107490>



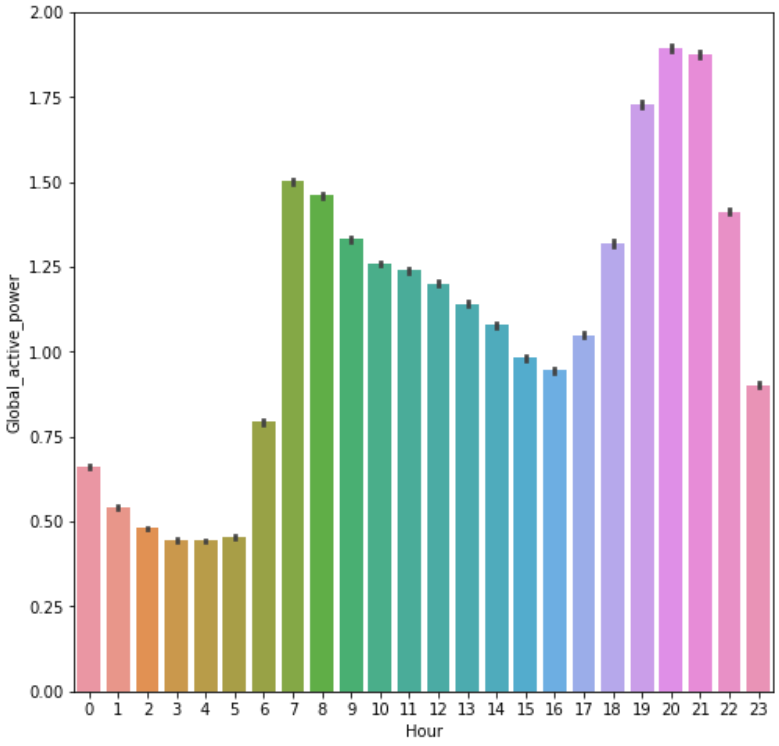
In [16]:
```
plt.figure(figsize=(8,8))
sns.barplot(x="Month", y="Global_active_power",data=df_df)
```

Out[16]:
```
<matplotlib.axes._subplots.AxesSubplot at 0x1eaaa1b9910>
```



In [17]:
```
plt.figure(figsize=(8,8))
sns.barplot(x="Hour", y="Global_active_power",data=df_df)
```

Out[17]: <matplotlib.axes._subplots.AxesSubplot at 0x1ea8aedcaf0>



In [22]:
```
plt.figure(figsize=(10,6))
sns.lineplot(x="Hour", y="Global_active_power",data=df_df)
```

Out[22]:
```
<matplotlib.axes._subplots.AxesSubplot at 0x1ea8ab05af0>
```