In [41]:
```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import warnings
warnings.filterwarnings('ignore')
import seaborn as sns
import os
```

In [42]:
```
df=pd.read_csv("Car_sales.csv")
df
```

Out[42]:

	Manufacturer	Model	Sales_in_thousands	__year_resale_value	Vehicle_type	Price_in_thousands	Engine_s
0	Acura	Integra	16.919	16.360	Passenger	21.50	
1	Acura	TL	39.384	19.875	Passenger	28.40	
2	Acura	CL	14.114	18.225	Passenger	NaN	
3	Acura	RL	8.588	29.725	Passenger	42.00	
4	Audi	A4	20.397	22.255	Passenger	23.99	
...	...	...	...	...	...	...	
152	Volvo	V40	3.545	NaN	Passenger	24.40	
153	Volvo	S70	15.245	NaN	Passenger	27.50	
154	Volvo	V70	17.531	NaN	Passenger	28.80	
155	Volvo	C70	3.493	NaN	Passenger	45.50	
156	Volvo	S80	18.969	NaN	Passenger	36.00	

157 rows × 16 columns

In [43]:
```
table = pd.pivot_table(data=df,index=['Vehicle_type'])
table
```

Out[43]:

Vehicle_type	Curb_weight	Engine_size	Fuel_capacity	Fuel_efficiency	Horsepower	Length	Power_perf_fac
Car	3.935100	3.520000	21.895000	19.700000	186.400000	190.427500	76.9991
Passenger	3.184261	2.902586	16.592241	25.298246	185.793103	186.280172	77.0590

In [ ]:

In [ ]:

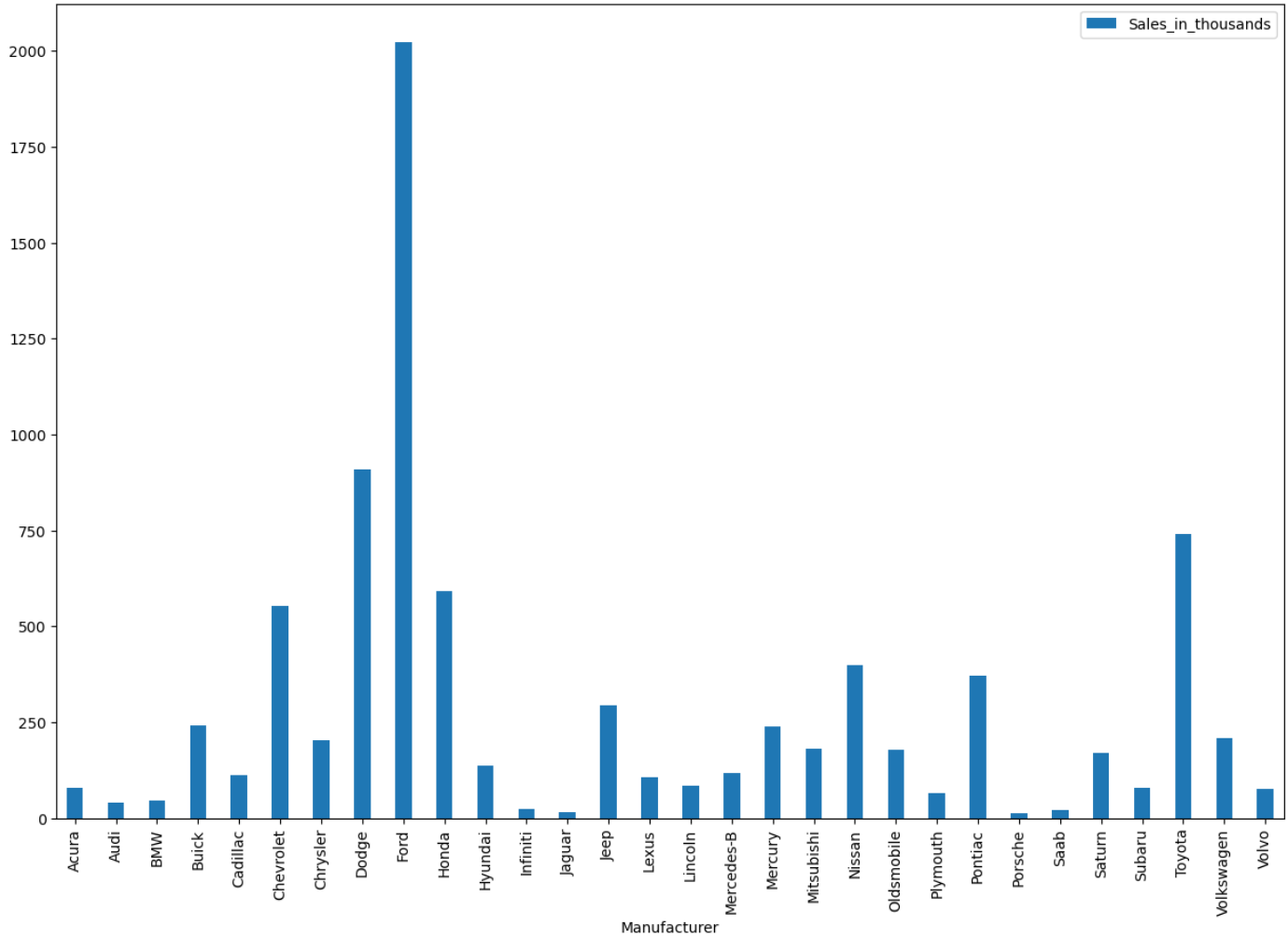
In [78]:
```
table = pd.pivot_table(df,index=['Manufacturer'],aggfunc={'Sales_in_thousands':np.sum,})
table
#table = pd.pivot_table(df,index=['Vehicle_type','Manufacturer'],aggfunc={'Sales_in_thou
#table
```

Out[78]:

Manufacturer	Sales_in_thousands
Acura	79.005
Audi	40.557
BMW	46.505
Buick	242.019
Cadillac	112.178
Chevrolet	554.365
Chrysler	201.721
Dodge	910.149
Ford	2022.635
Honda	592.674
Hyundai	137.326
Infiniti	23.713
Jaguar	15.467
Jeep	293.153
Lexus	106.843
Lincoln	85.634
Mercedes-B	117.125
Mercury	237.999
Mitsubishi	180.895
Nissan	399.635
Oldsmobile	178.989
Plymouth	64.001
Pontiac	370.534
Porsche	12.128
Saab	21.306
Saturn	168.850
Subaru	80.135
Toyota	740.205
Volkswagen	209.212
Volvo	75.740

In [86]:
```
#plt.figure(figsize=(20,10))
#fig = plt.figure(figsize=(15,10))
table.plot(kind='bar', stacked=True, width=0.4,figsize=(15,10))
```

Out[86]:
```
<Axes: xlabel='Manufacturer'>
```



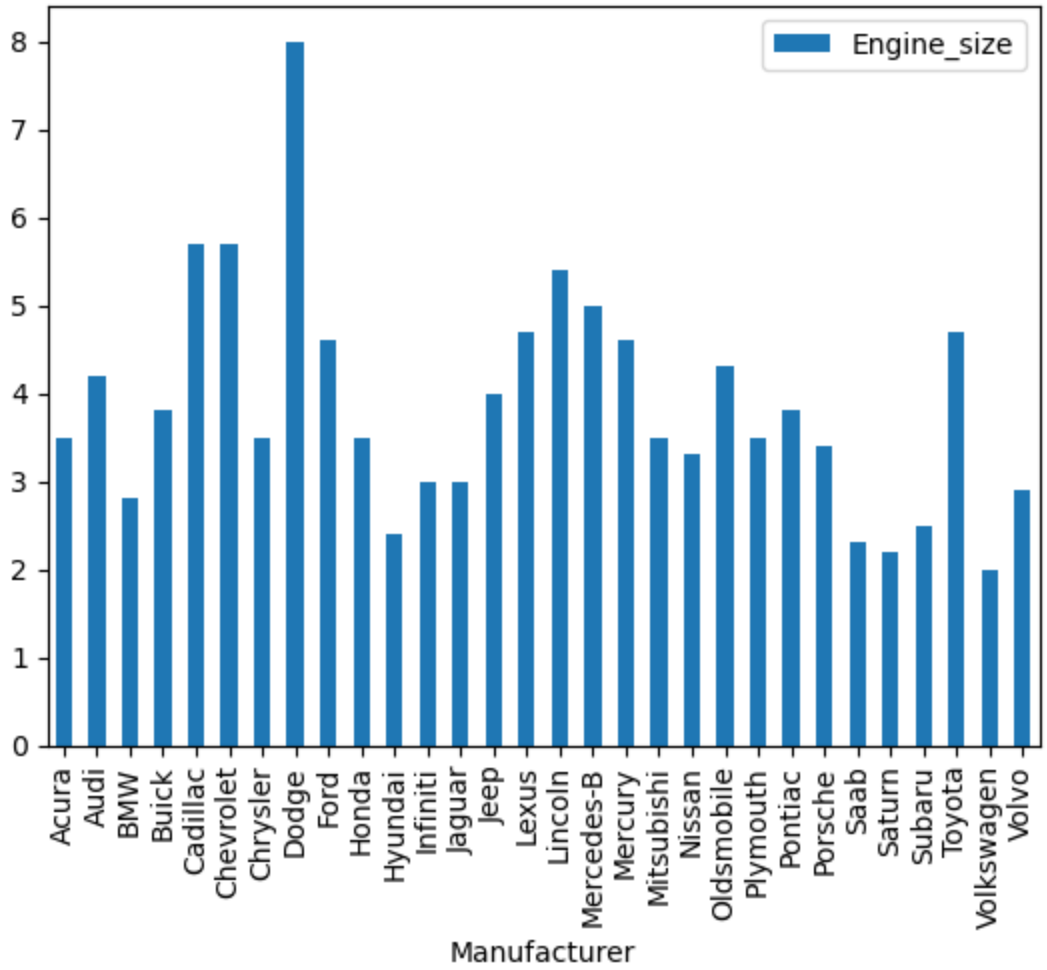
In [46]:
```
table = pd.pivot_table(df,index=['Manufacturer'],aggfunc={'Engine_size':np.max})
table
```

Out[46]:

Manufacturer	Engine_size
Acura	3.5
Audi	4.2
BMW	2.8
Buick	3.8
Cadillac	5.7
Chevrolet	5.7
Chrysler	3.5
Dodge	8.0
Ford	4.6
Honda	3.5
Hyundai	2.4
Infiniti	3.0
Jaguar	3.0
Jeep	4.0
Lexus	4.7
Lincoln	5.4
Mercedes-B	5.0
Mercury	4.6
Mitsubishi	3.5
Nissan	3.3
Oldsmobile	4.3
Plymouth	3.5
Pontiac	3.8
Porsche	3.4
Saab	2.3
Saturn	2.2
Subaru	2.5
Toyota	4.7
Volkswagen	2.0
Volvo	2.9

In [47]:
```
fig = plt.figure(figsize=(15,10))
table.plot(kind='bar', stacked=True, width=0.5)
```

Out[47]:
```
<Axes: xlabel='Manufacturer'>

<Figure size 1500x1000 with 0 Axes>
```



In [48]:
```
#table = pd.pivot_table(df,index=['Make','CO2 Emissions(g/km)'],aggfunc={'Fuel Consumpti
#table
```

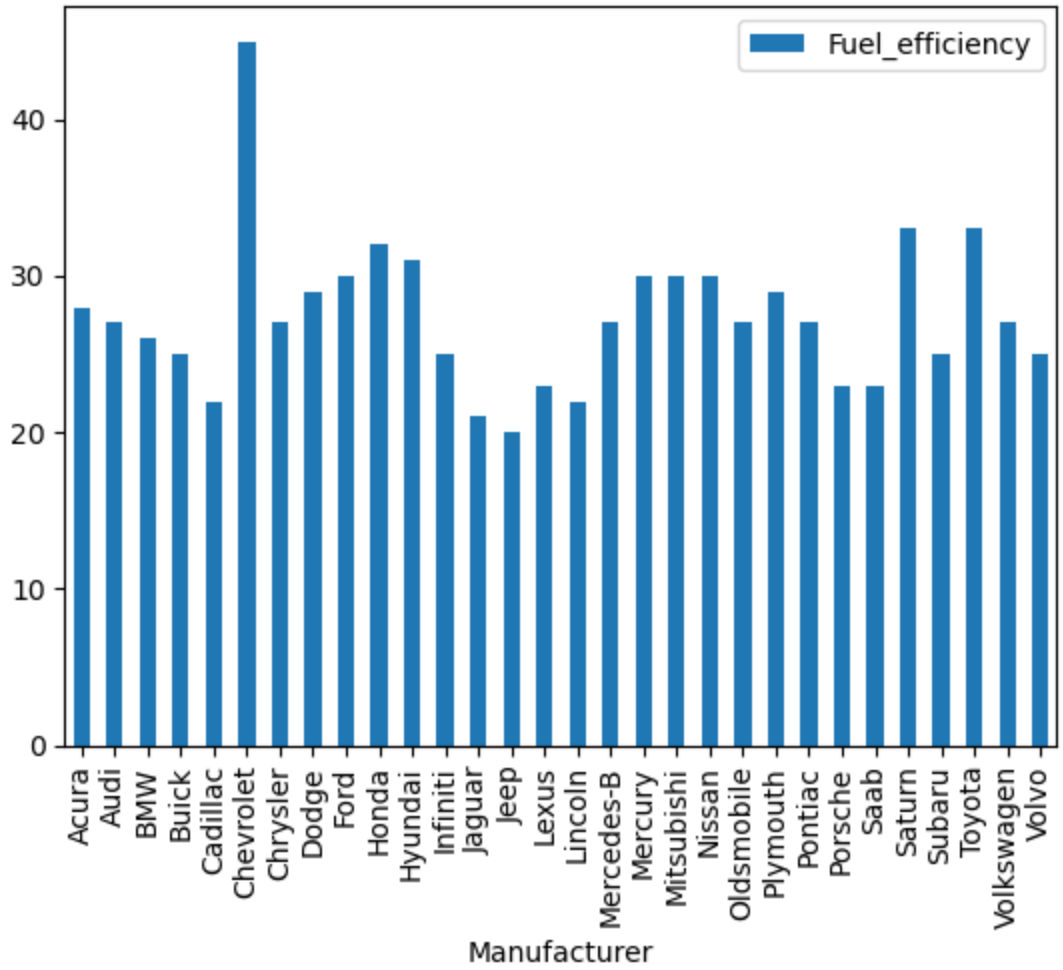
In [49]:
```
table = pd.pivot_table(df,index=['Manufacturer'],aggfunc={'Fuel_efficiency':np.max})
table
```

Out[49]:

Manufacturer	Fuel_efficiency
Acura	28.0
Audi	27.0
BMW	26.0
Buick	25.0
Cadillac	22.0
Chevrolet	45.0
Chrysler	27.0
Dodge	29.0
Ford	30.0
Honda	32.0
Hyundai	31.0
Infiniti	25.0
Jaguar	21.0
Jeep	20.0
Lexus	23.0
Lincoln	22.0
Mercedes-B	27.0
Mercury	30.0
Mitsubishi	30.0
Nissan	30.0
Oldsmobile	27.0
Plymouth	29.0
Pontiac	27.0
Porsche	23.0
Saab	23.0
Saturn	33.0
Subaru	25.0
Toyota	33.0
Volkswagen	27.0
Volvo	25.0

In [50]:
```
fig = plt.figure(figsize=(15,10))
table.plot(kind='bar', stacked=True, width=0.5)
```

Out[50]:
```
<Axes: xlabel='Manufacturer'>

<Figure size 1500x1000 with 0 Axes>
```



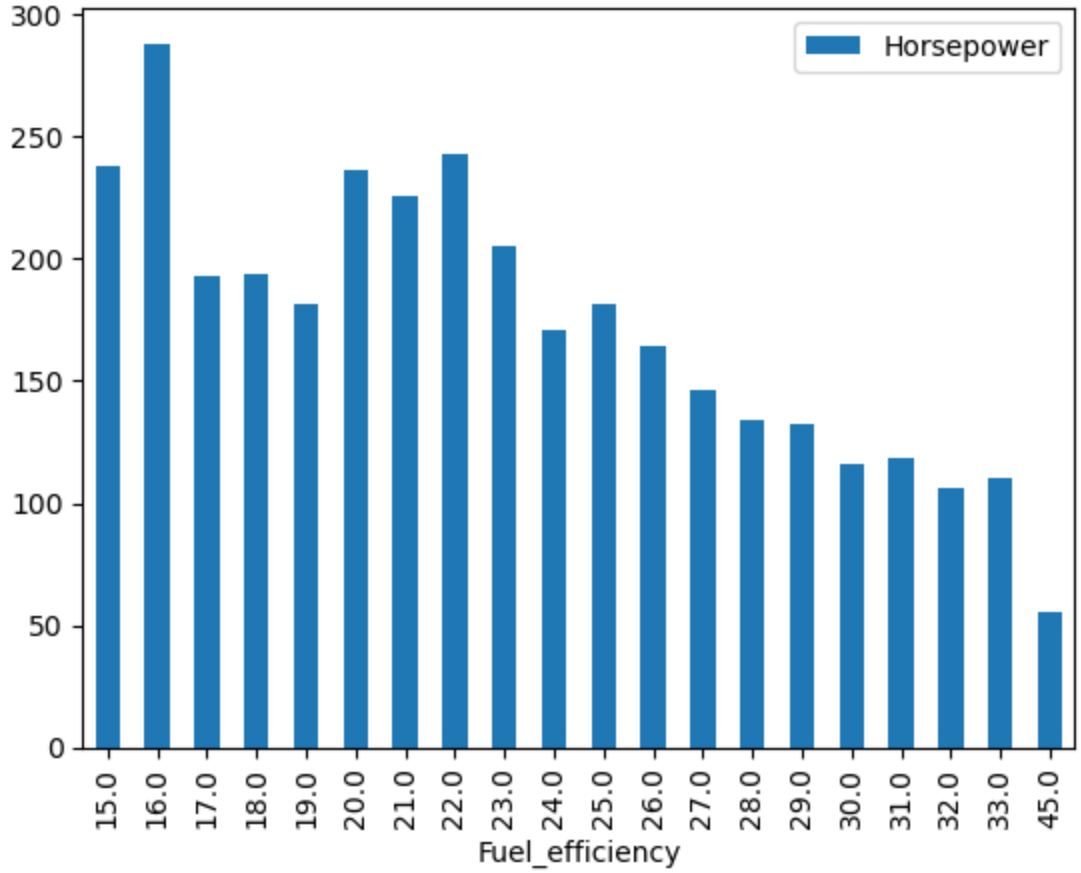
In [51]:
```
table = pd.pivot_table(df,index=['Fuel_efficiency'],values=['Horsepower'])
table
```

Out[51]:

Fuel_efficiency	Horsepower
15.0	238.000000
16.0	288.333333
17.0	193.333333
18.0	194.000000
19.0	181.666667
20.0	236.400000
21.0	226.000000
22.0	242.928571
23.0	205.571429
24.0	170.562500
25.0	181.391304
26.0	164.166667
27.0	146.400000
28.0	134.000000
29.0	132.000000
30.0	116.200000
31.0	118.666667
32.0	106.000000
33.0	110.000000
45.0	55.000000

In [52]:
```
fig = plt.figure(figsize=(15,10))
table.plot(kind='bar', stacked=True, width=0.5)
```

Out[52]:
```
<Axes: xlabel='Fuel_efficiency'>

<Figure size 1500x1000 with 0 Axes>
```



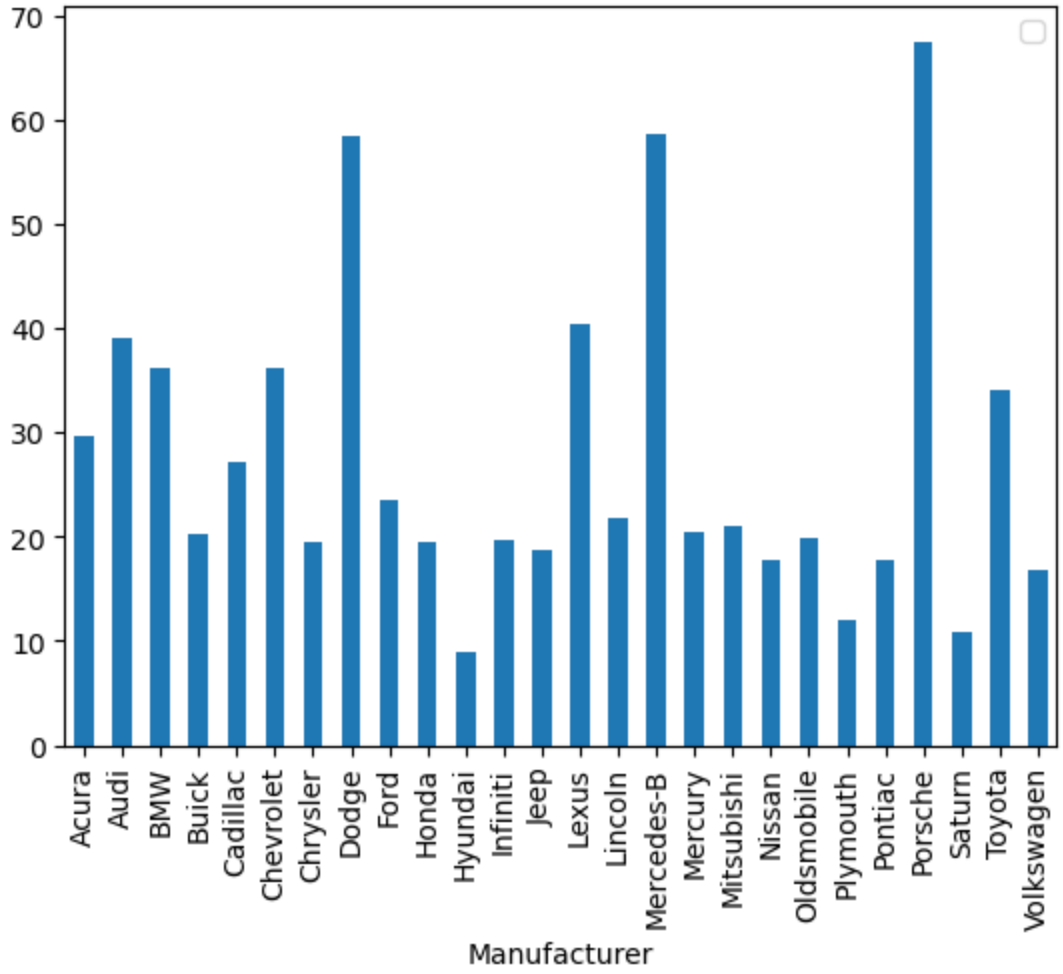
In [53]:
```
table = pd.pivot_table(df,index=['Manufacturer'],aggfunc={'__year_resale_value':np.max})
table
```

Out[53]:

Manufacturer	__year_resale_value
Acura	29.725
Audi	39.000
BMW	36.125
Buick	20.190
Cadillac	27.100
Chevrolet	36.225
Chrysler	19.540
Dodge	58.470
Ford	23.575
Honda	19.490
Hyundai	8.910
Infiniti	19.690
Jeep	18.810
Lexus	40.375
Lincoln	21.725
Mercedes-B	58.600
Mercury	20.430
Mitsubishi	20.940
Nissan	17.810
Oldsmobile	19.925
Plymouth	12.025
Pontiac	17.805
Porsche	67.550
Saturn	10.790
Toyota	34.080
Volkswagen	16.725

In [54]:
```
fig = plt.figure(figsize=(15,10))
table.plot(kind='bar')
#, stacked=True, width=0.5
```

Out[54]:
```
<Axes: xlabel='Manufacturer'>

<Figure size 1500x1000 with 0 Axes>
```



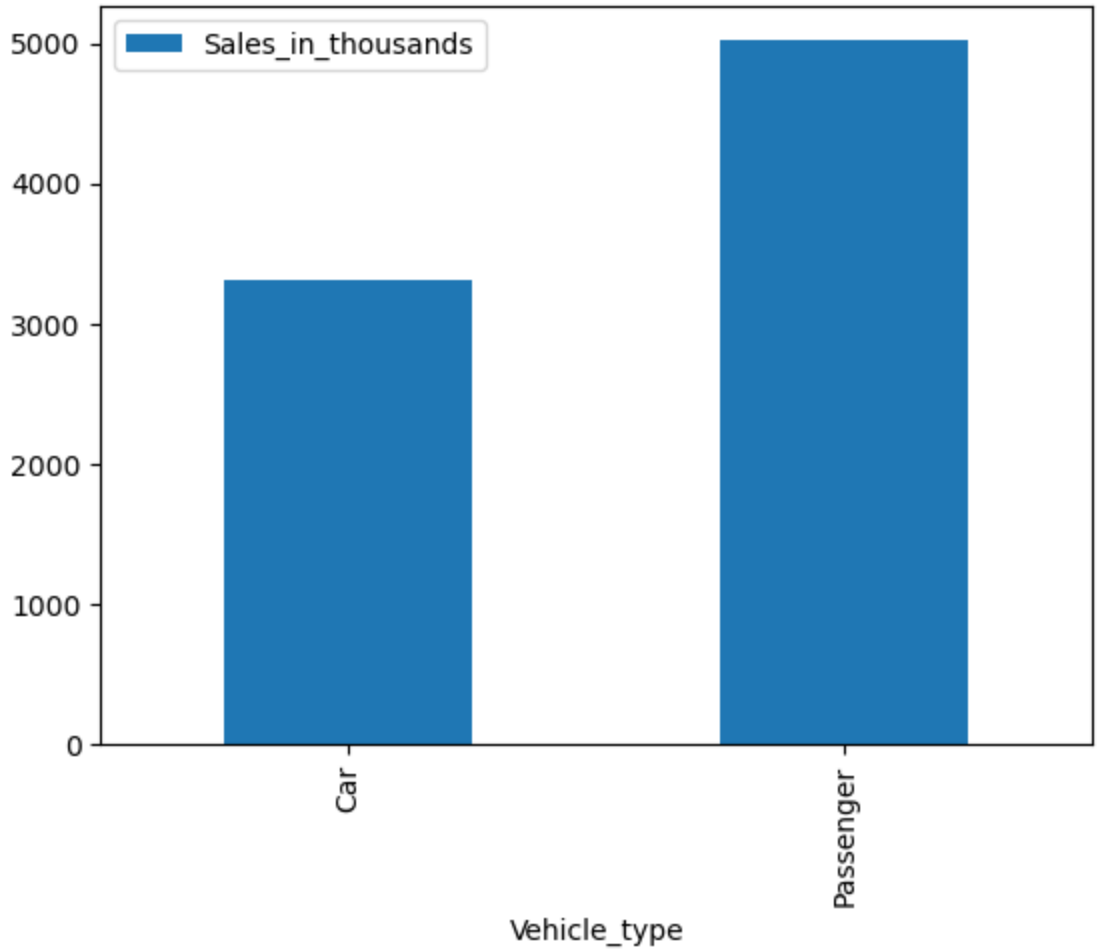
In [55]:
```
table = pd.pivot_table(df,index=['Vehicle_type'],values=['Sales_in_thousands'],aggfunc=n
table
#,columns=['Manufacturer']
```

Out[55]:

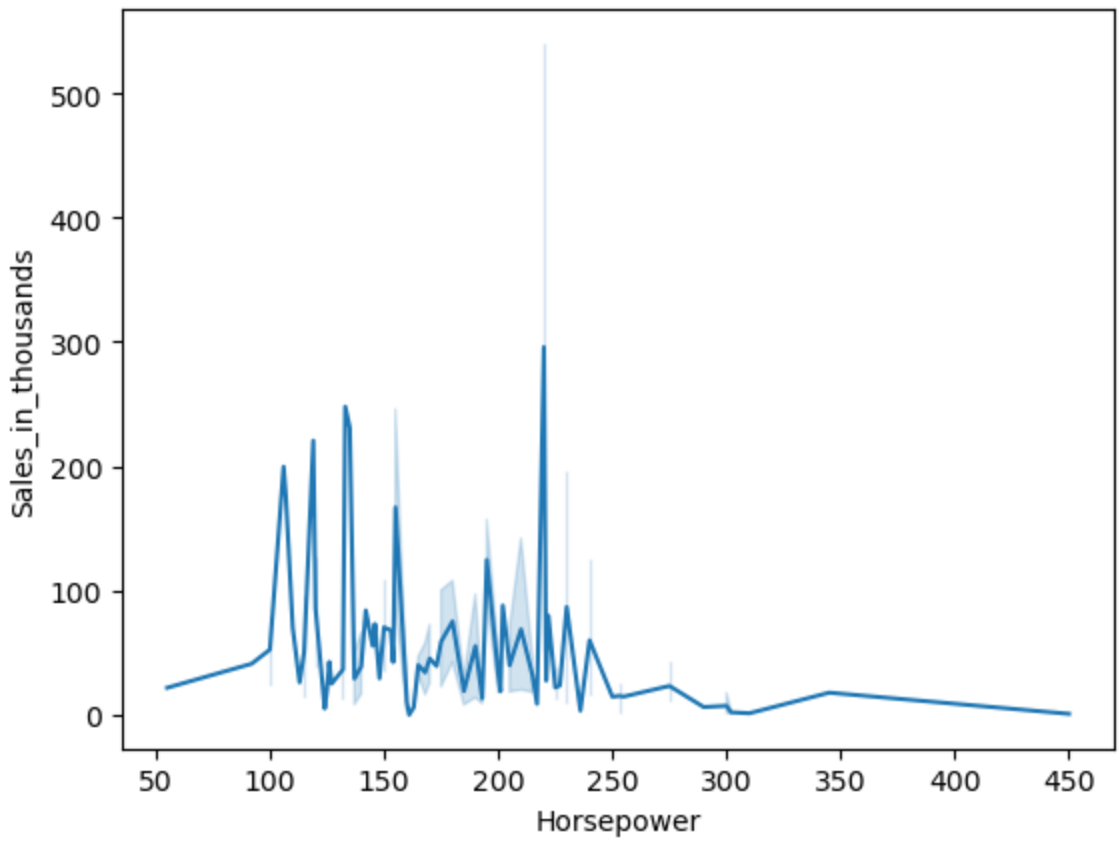
Vehicle_type	Sales_in_thousands
Car	3305.514
Passenger	5015.184

In [56]:
```
table.plot(kind='bar')
```

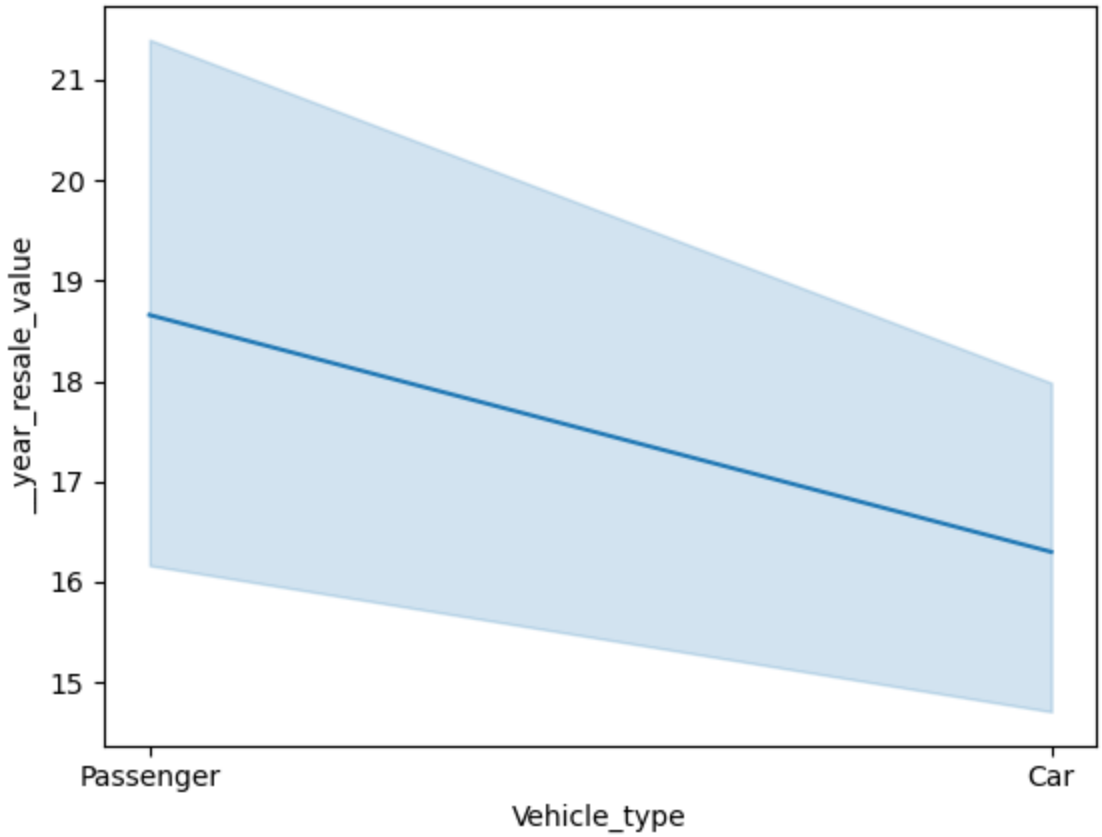
Out[56]:
```
<Axes: xlabel='Vehicle_type'>
```



In [57]:
```
sns.lineplot(x="Horsepower",y="Sales_in_thousands",data=df)
plt.show()
```



In [58]:
```
sns.lineplot(x="Vehicle_type",y="__year_resale_value",data=df)
plt.show()
```



In [59]:
```
sns.displot(df["Engine_size"],bins=[1,2,3,4])
plt.show()
```

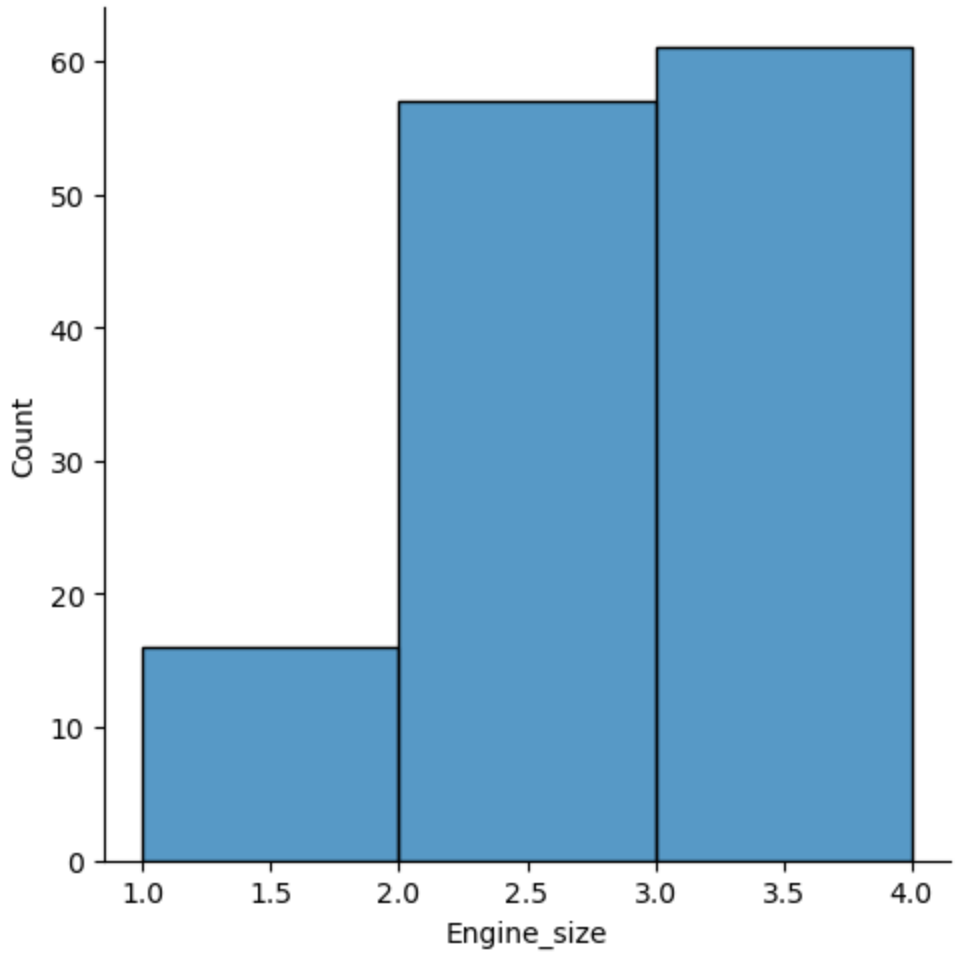
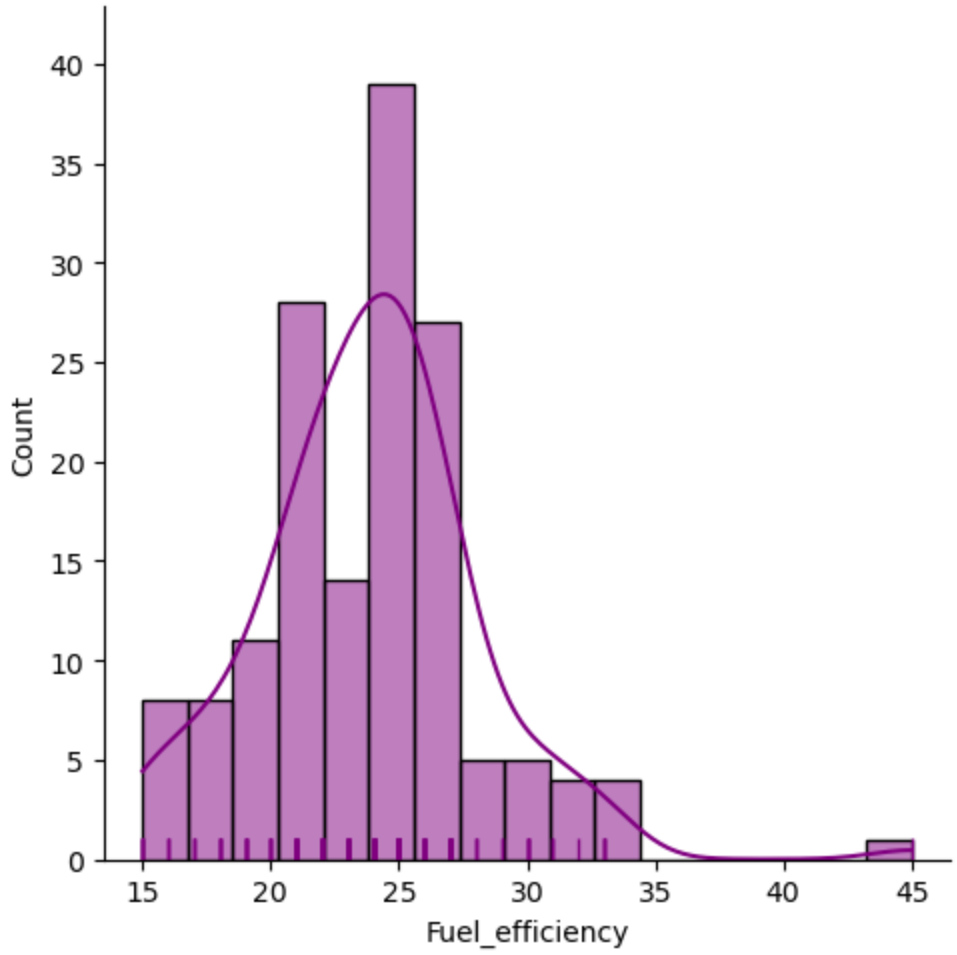


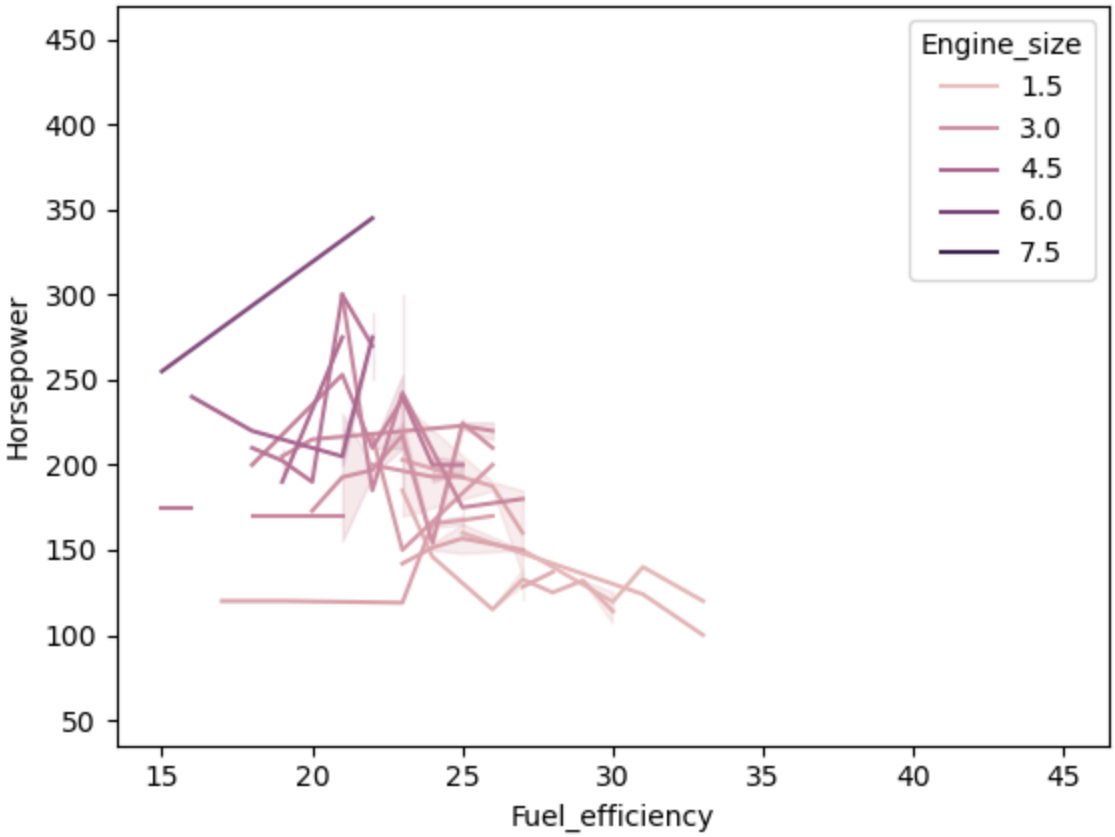
table = pd.pivot_table(df,index=['Make'],columns=['CO2 Emissions(g/km)']) table

In [60]:
```
#table = pd.pivot_table(df,index=['Make'],columns=['CO2 Emissions(g/km)'],values=['Survi
#table
```

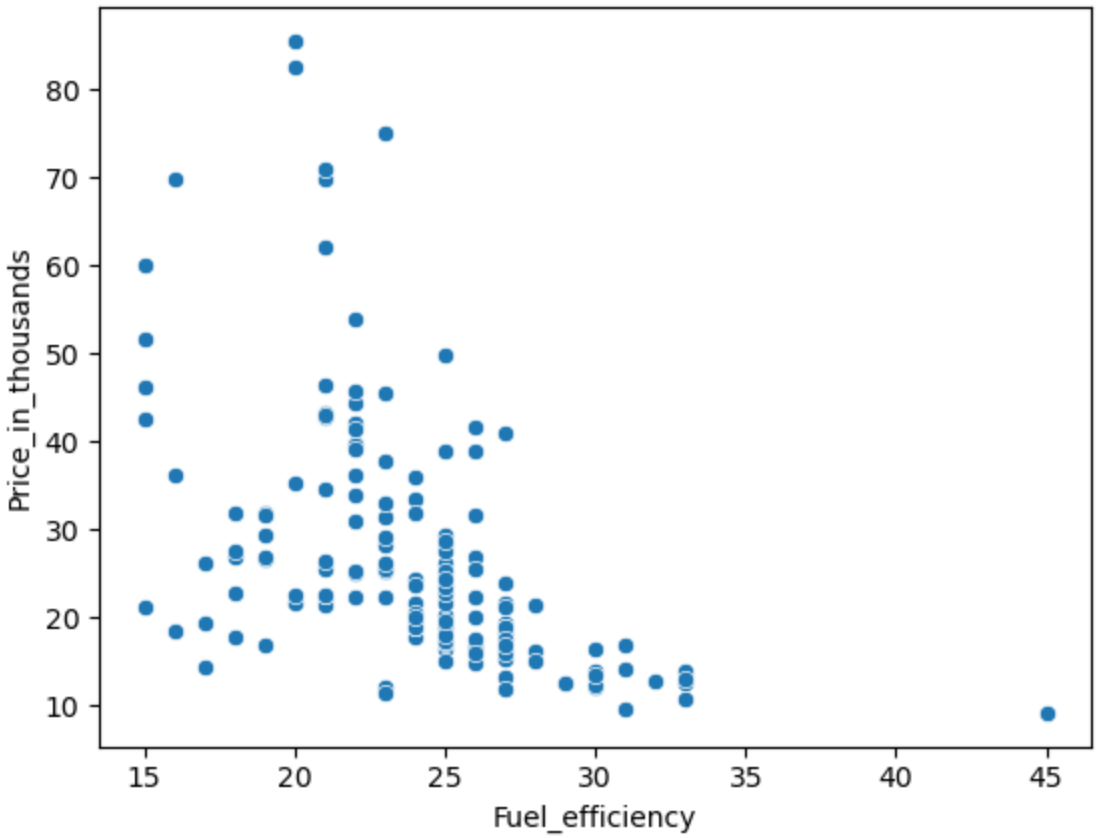
In [61]:
```
sns.displot(df["Fuel_efficiency"],kde=True,rug = True,color="purple")
plt.show()
```



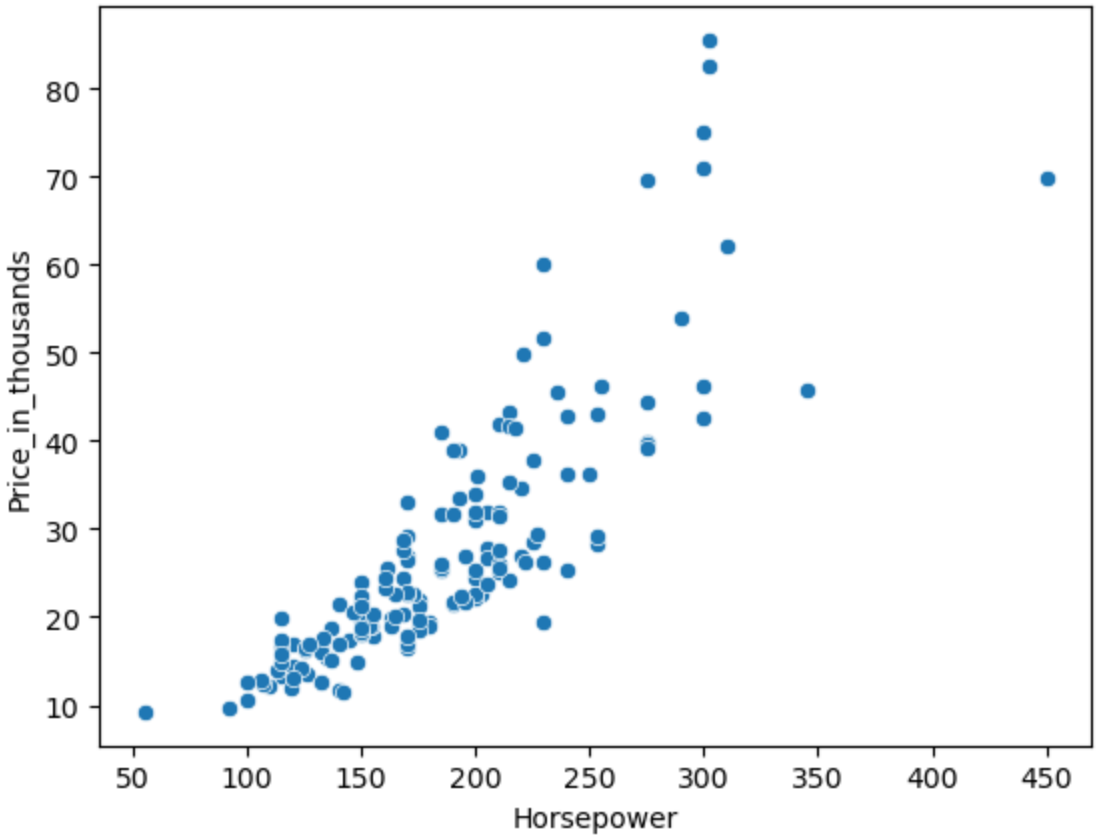
In [62]:
```
sns.lineplot(x="Fuel_efficiency",y="Horsepower",data=df,hue="Engine_size")
plt.show()
```



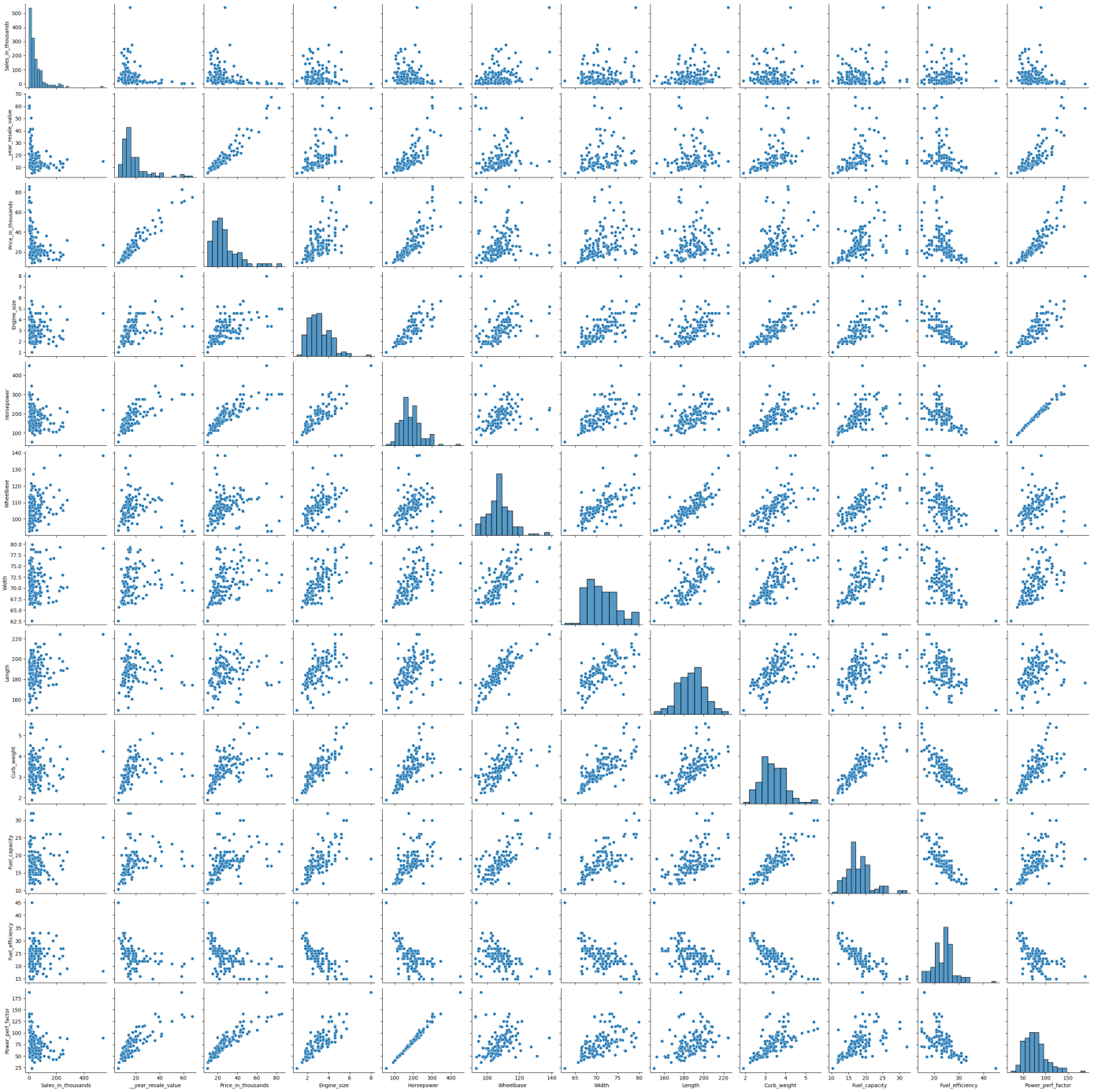
In [63]:
```
sns.scatterplot(x="Fuel_efficiency",y="Price_in_thousands",data=df)
plt.show()
```



In [64]:
```
sns.scatterplot(x="Horsepower",y="Price_in_thousands",data=df)
plt.show()
```

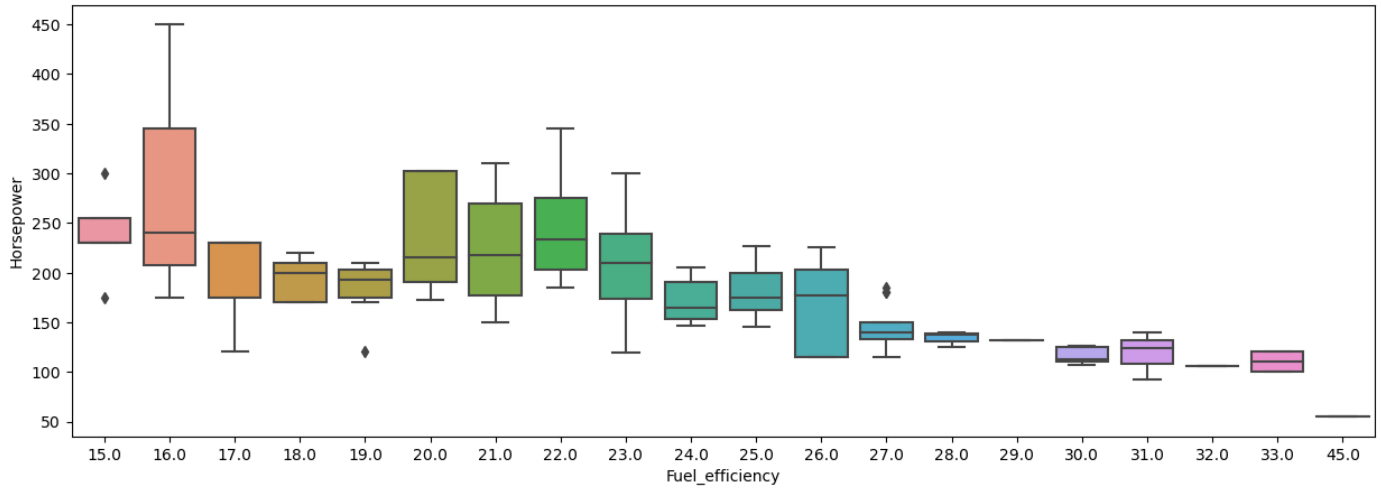


In [65]:
```
sns.pairplot(df)
plt.show()
```



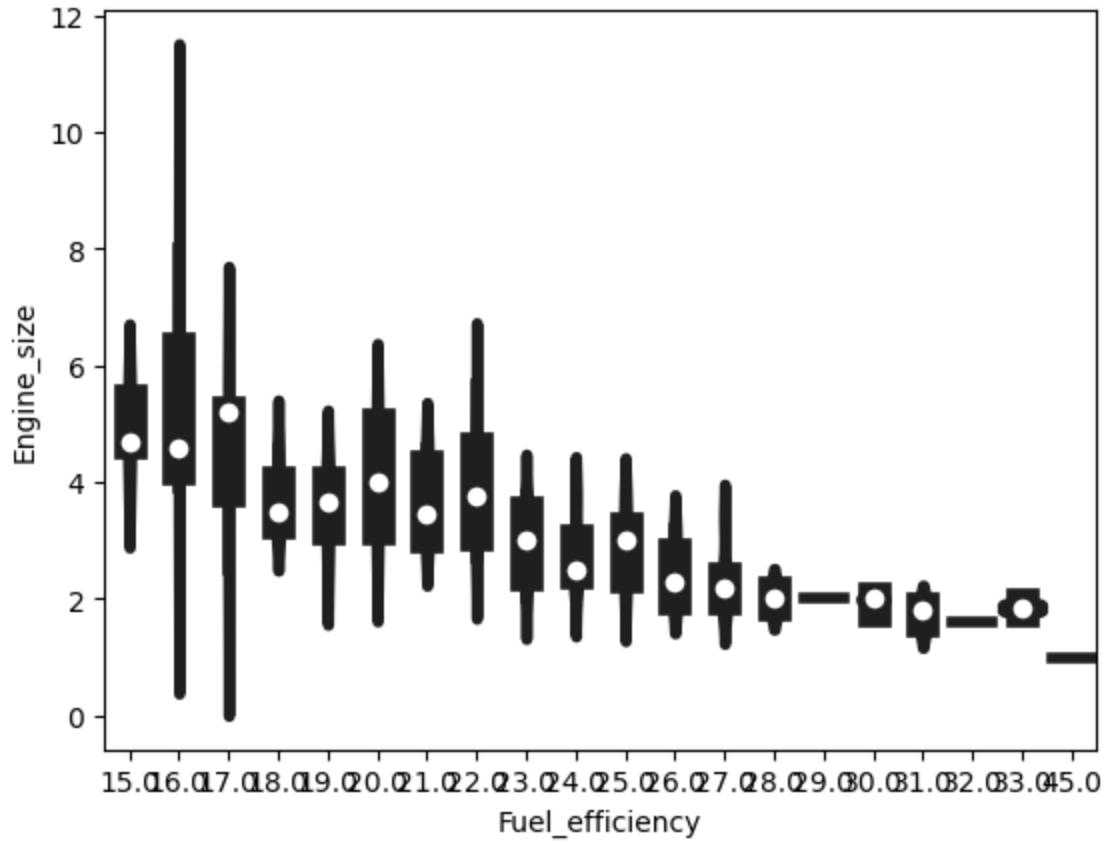
In [76]:
```
plt.figure(figsize=(15,5))

sns.boxplot(x="Fuel_efficiency",y="Horsepower",data=df,)

#plt.show()
```

Out[76]:
```
<Axes: xlabel='Fuel_efficiency', ylabel='Horsepower'>
```



In [ ]:
```
sns.pairplot(data=df, hue="class", diag_kind="kde")
```

In [69]:
```
sns.violinplot(x="Fuel_efficiency",y="Engine_size",data = df,linewidth=4,palette="BuPu_r
plt.show()
```



In [ ]:
```

```