Visualizing Renewable Energy Data Using Matplotlib ¶

Objectives:

1. Line Plot: Plotting Energy Consumption Over Several Months
2. Bar Chart: Comparing Energy Consumption by Different Renewable Energy Sources
3. Pie Chart: Showing the Share of Each Renewable Energy Source in the Total Energy Consumption
4. Scatter Plot: Analyzing the Relationship Between Energy Consumption and Carbon Emissions
5. Customization: Customizing a Bar Chart with Titles, Labels, Legends, and Adjust Styles

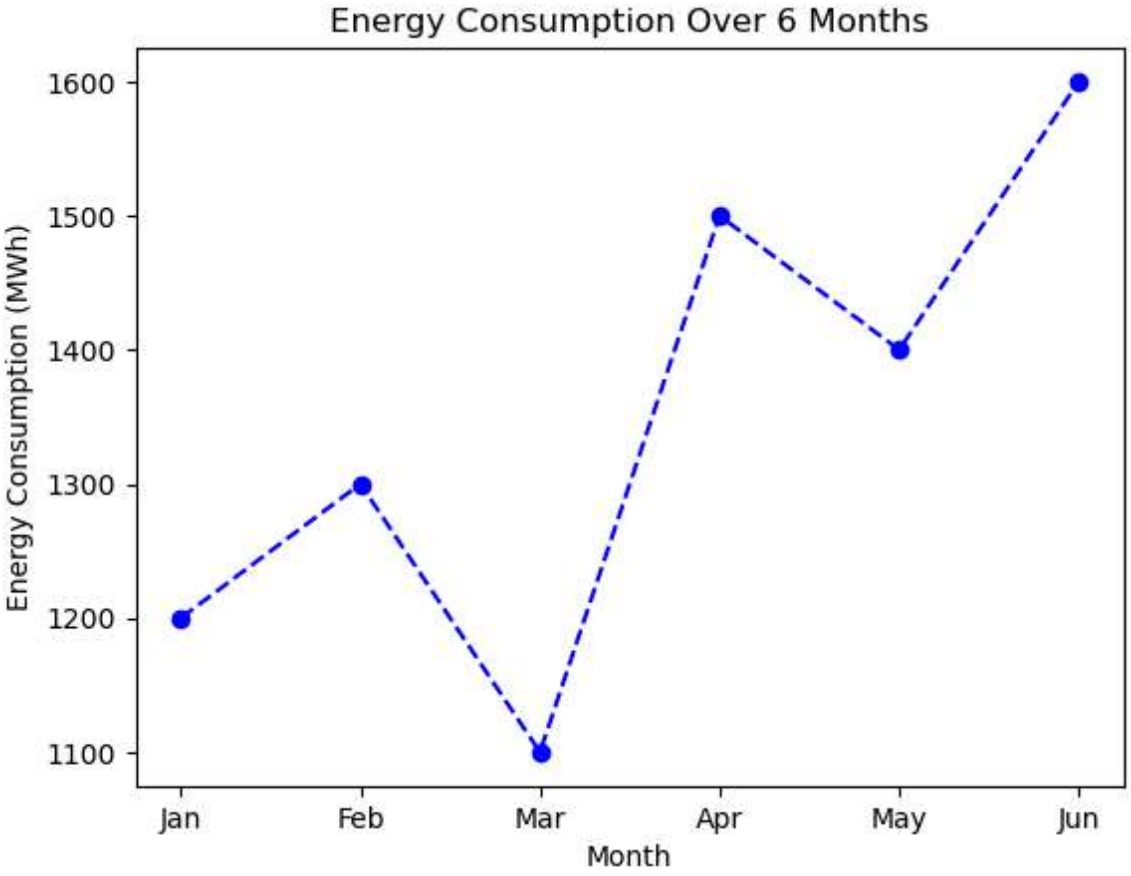
1. Line Plot: Plotting Energy Consumption Over Several Months

In [1]:
```
import matplotlib.pyplot as plt

# Sample data for energy consumption over 6 months (in MWh)
months = ['Jan', 'Feb', 'Mar', 'Apr', 'May', 'Jun']
energy_consumption = [1200, 1300, 1100, 1500, 1400, 1600]

# Create a line plot
plt.plot(months, energy_consumption, marker='o', color='b', linestyle='--')

# Add titles and labels
plt.title('Energy Consumption Over 6 Months')
plt.xlabel('Month')
plt.ylabel('Energy Consumption (MWh)')
plt.show()
```



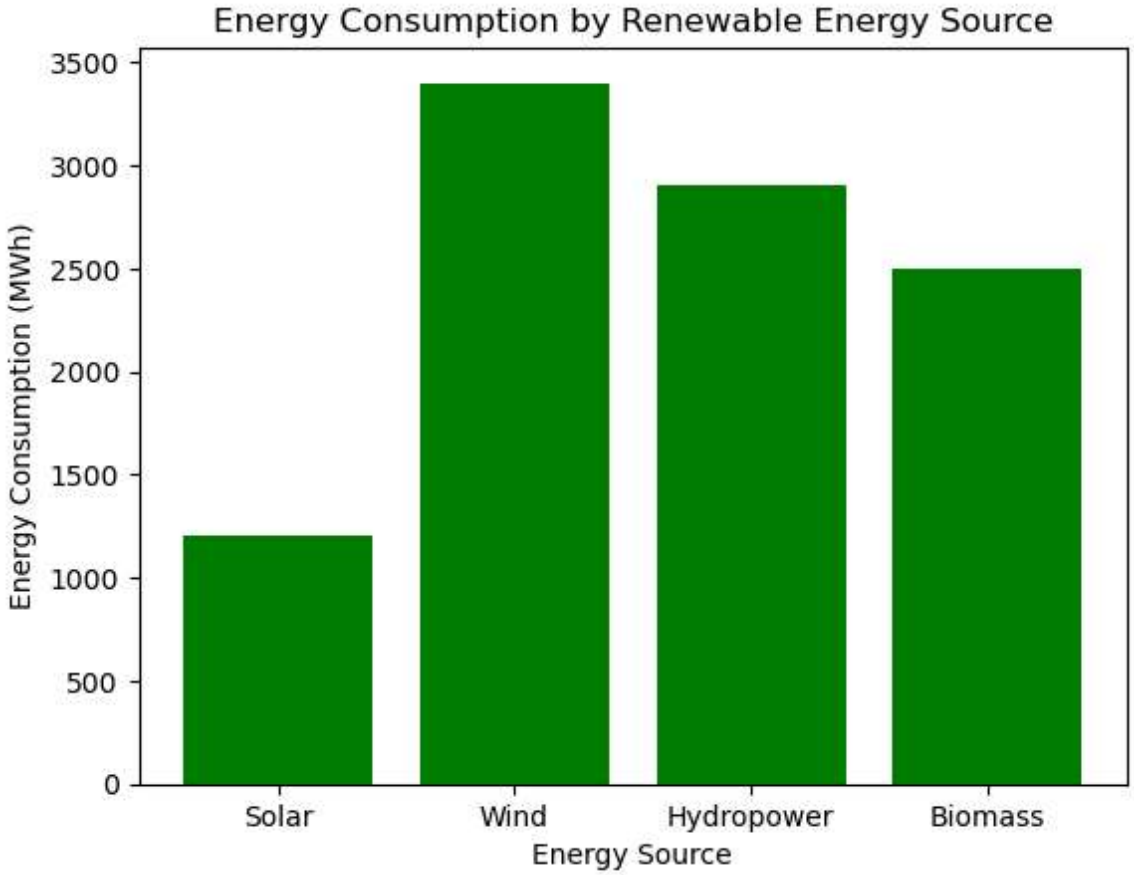
This line plot shows the trend of energy consumption over six months, helping visualize monthly fluctuations.

2. Bar Chart: Comparing Energy Consumption by Different Renewable Energy Sources

In [2]:
```
# Sample data for energy consumption by different renewable sources
energy_sources = ['Solar', 'Wind', 'Hydropower', 'Biomass']
energy_values = [1200, 3400, 2900, 2500]

# Create a bar chart
plt.bar(energy_sources, energy_values, color='green')

# Add titles and labels
plt.title('Energy Consumption by Renewable Energy Source')
plt.xlabel('Energy Source')
plt.ylabel('Energy Consumption (MWh)')
plt.show()
```

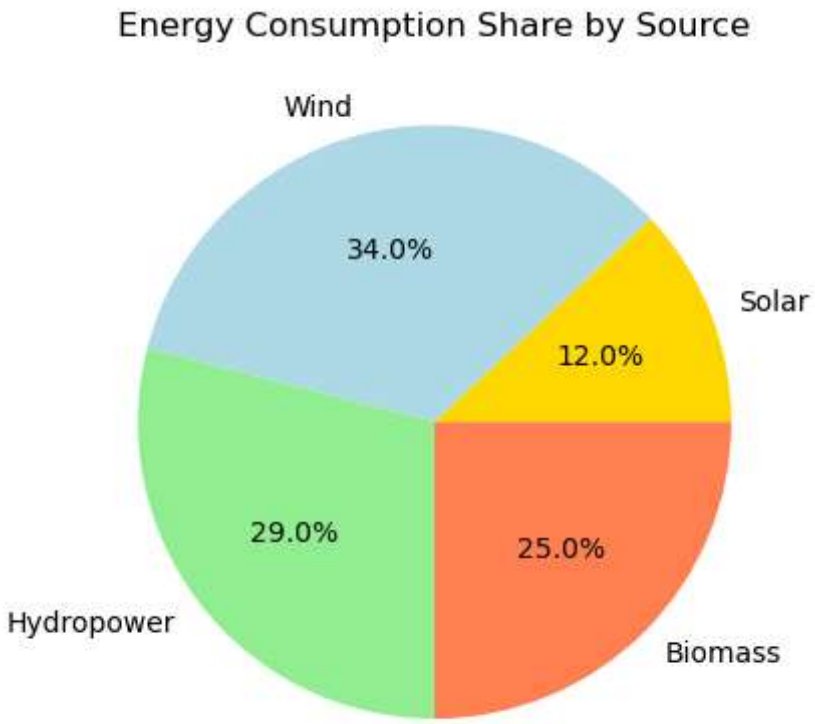


This bar chart compares energy consumption for different renewable energy sources, highlighting the contribution of each source.

3. Pie Chart: Showing the Share of Each Renewable Energy Source in the Total Energy Consumption

In [3]:
```
# Pie chart to show energy consumption distribution
plt.pie(energy_values, labels=energy_sources, autopct='%1.1f%%', colors=['gc

# Add a title
plt.title('Energy Consumption Share by Source')
plt.show()
```



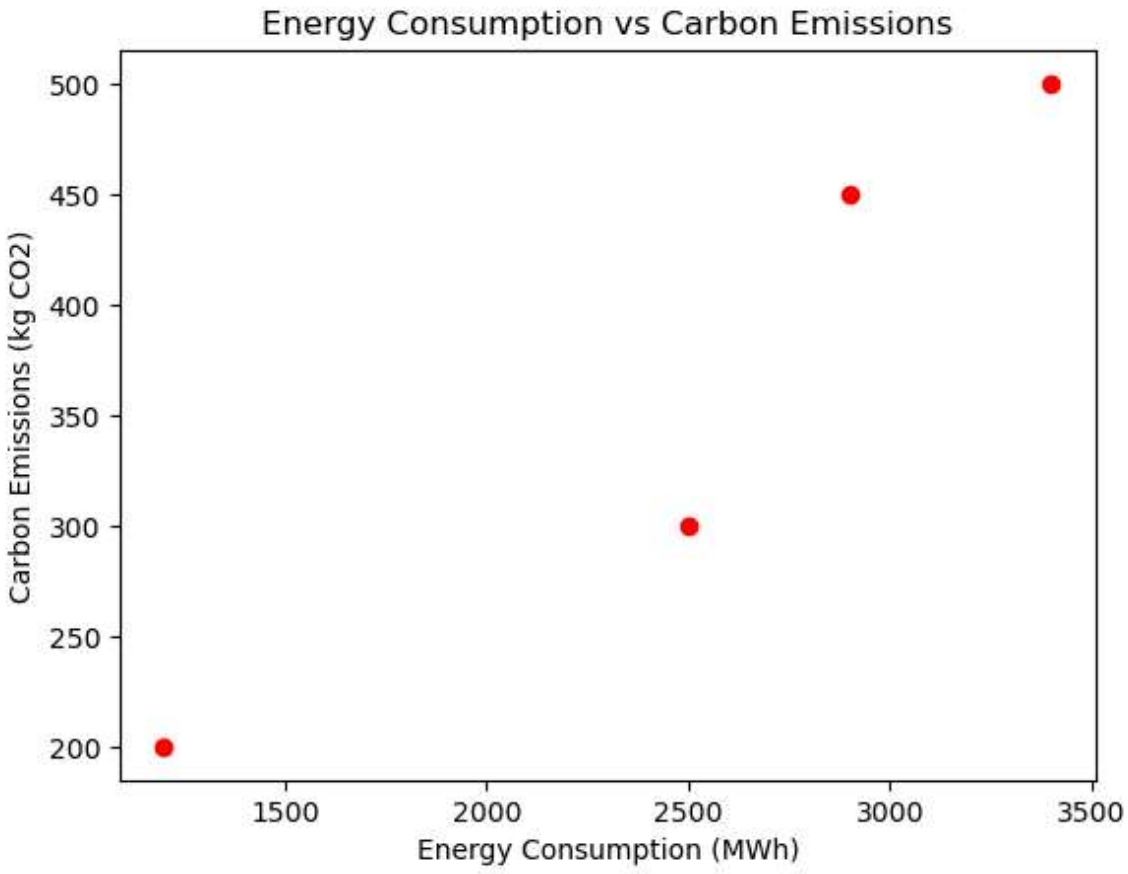
The pie chart shows the percentage share of energy consumption by each renewable energy source.

4. Scatter Plot: Analyzing the Relationship Between Energy Consumption and Carbon Emissions

In [4]:
```
# Sample data for energy consumption and carbon emissions
carbon_emissions = [200, 500, 450, 300]  # in kg CO2

# Create a scatter plot
plt.scatter(energy_values, carbon_emissions, color='red')

# Add titles and labels
plt.title('Energy Consumption vs Carbon Emissions')
plt.xlabel('Energy Consumption (MWh)')
plt.ylabel('Carbon Emissions (kg CO2)')
plt.show()
```



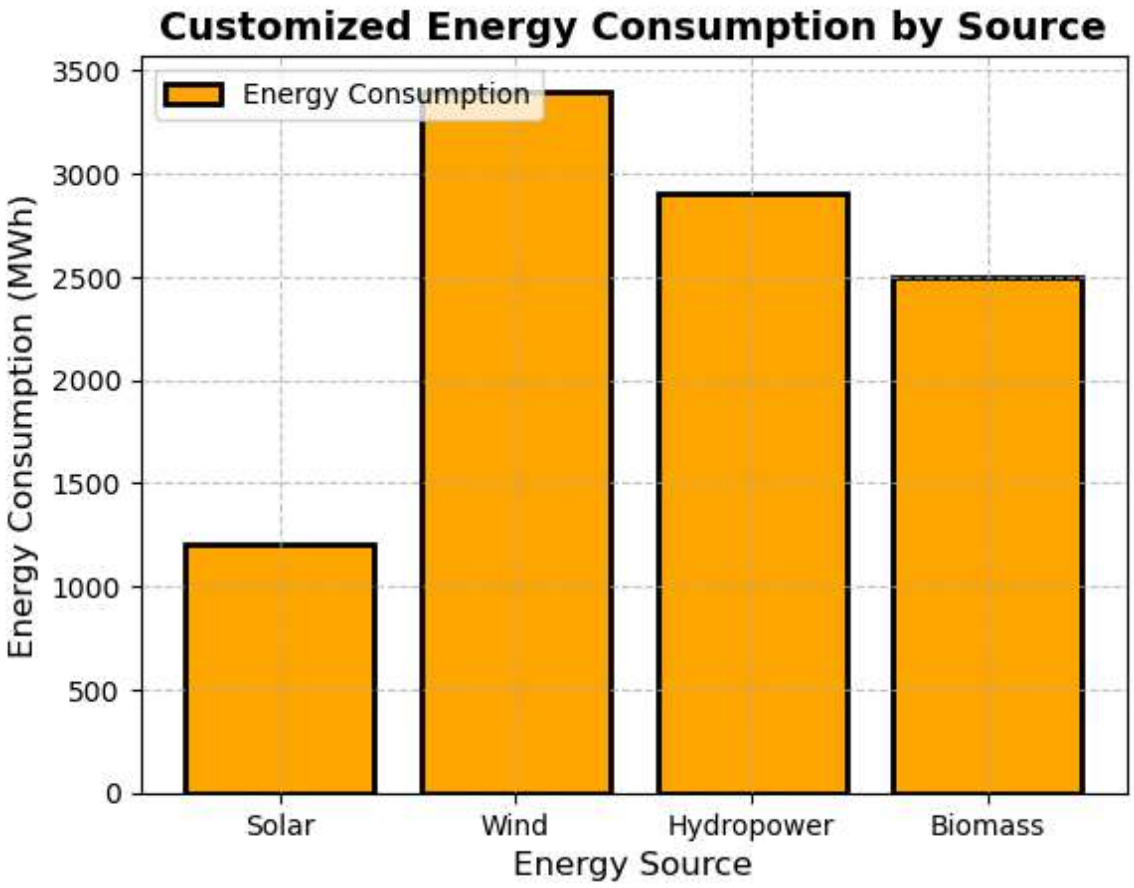
The scatter plot helps analyze the relationship between energy consumption and the corresponding carbon emissions.

5. Customization: Customizing a Bar Chart with Titles, Labels, Legends, and Adjust Styles

In [5]:
```
# Create a customized bar chart
plt.bar(energy_sources, energy_values, color='orange', edgecolor='black', li

# Add titles and labels
plt.title('Customized Energy Consumption by Source', fontsize=14, fontweight
plt.xlabel('Energy Source', fontsize=12)
plt.ylabel('Energy Consumption (MWh)', fontsize=12)

# Adding grid and customizing style
plt.grid(True, linestyle='--', alpha=0.7)
plt.legend(['Energy Consumption'], loc='upper left')
plt.show()
```



This customized bar chart demonstrates how to add titles, labels, legends, and gridlines for improved readability.

Conclusion

We have demonstrated how to visualize energy consumption data using Matplotlib. These libraries offer a wide range of plotting techniques such as line plots, bar charts, scatter plots, and more. By mastering these visualizations, we can effectively analyze and communicate insights from renewable energy datasets.