

# Problem Statement

Does the current TSO in Spain accurately predict electricity prices? Can we improve the predictions with the provided data? I will use multiple linear regression to improve upon the existing electricity predictions.



Hide code

In [1]:

```
import pandas as pd
import numpy as np
import seaborn as sns
import scipy
import matplotlib.pyplot as plt
from sklearn.model_selection import train_test_split
from sklearn.tree import DecisionTreeRegressor
from sklearn.linear_model import LinearRegression
from sklearn.model_selection import train_test_split
from sklearn.model_selection import ShuffleSplit
from sklearn.model_selection import cross_val_score
from sklearn.metrics import mean_absolute_error
from math import sqrt
```



```
from sklearn.metrics import mean_squared_error
from openpyxl import load_workbook
```



Show hidden code

## Data Overview

The TSO predictions consistently underestimate the electricity prices, with 89% of the predictions being an underestimate, and a median underestimate of €7.41/MWh. What's interesting, is the profile shape of the actual and predicted prices are very similar, the only difference being that the TSO estimates were shifted down to the left.



Hide code

In [3]:

```
# sns.set_color_codes(palette='deep')
sns.color_palette()
blue= '#30b4c9'
red= '#f25c5c'
green= '#69b64f'
yellow= '#f6ab53'
purple = '#ad85d2'
```

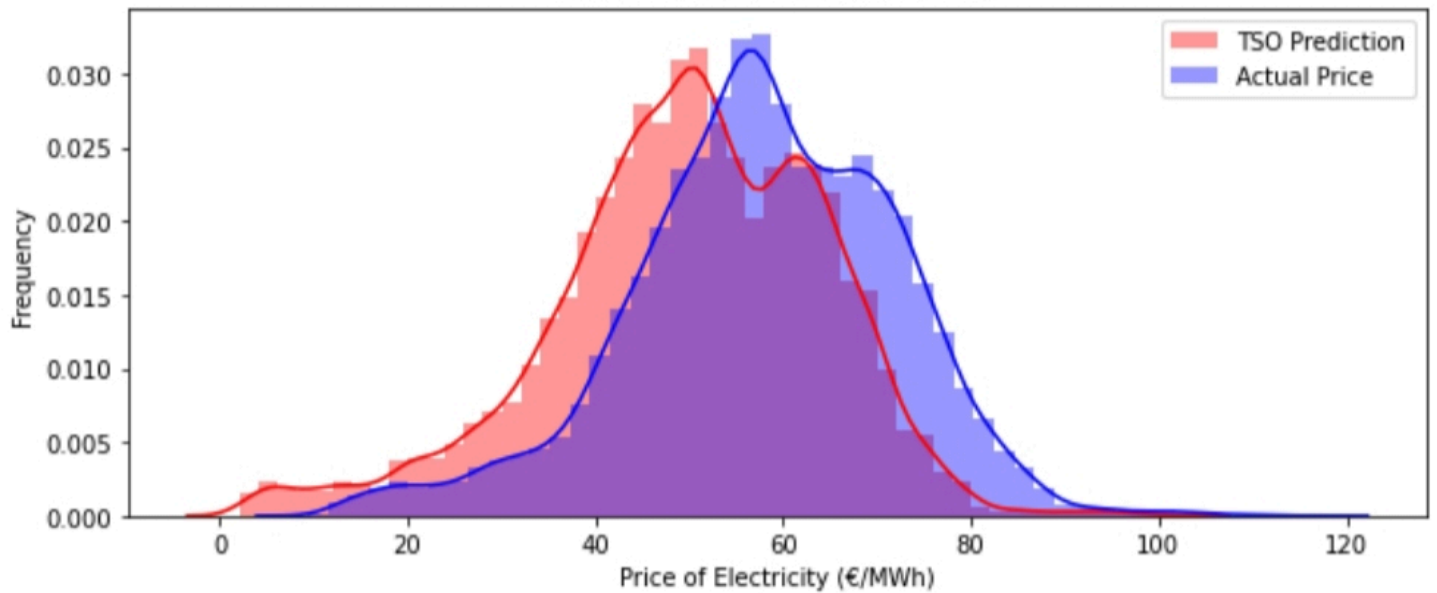
```
plt.figure(figsize=(10,4))
gr = sns.distplot(df['price day ahead'], bins=50, label='TSO Prediction',color='r')
gr = sns.distplot(df['price actual'], bins=50, label='Actual Price',color='b')
```

```
gr.set(xlabel="Price of Electricity (€/MW h)", ylabel="Frequency")
gr.set_title('Spain Electricity Price Comparison\nActual Price vs. TSO Prediction')
plt.legend()
plt.show()
```

```
p_diff = df['price actual'] - df['price day ahead']
```

```
plt.figure(figsize=(10,4))
gr = sns.distplot(p_diff, bins=50, label='Actual Price minus TSO Prediction',color='r')
gr.set(xlabel="Price of Electricity (€/MW h)", ylabel="Frequency")
gr.set_title('Spain Electricity Price\nDifference Between Actual Price and TSO Prediction')
plt.legend()
plt.show()
```

Spain Electricity Price Comparison  
Actual Price vs. TSO Prediction



Spain Electricity Price  
Difference Between Actual Price and TSO Prediction

