Spain Electricity Price Prediction

Springboard

Overview

- Problem Statement
- Key beneficiaries
- Reference Data and Analysis
- Key Features
- ML Model and Recommendations

Problem Statement

-Predict the price of electricity

-What factors affect the price?

-What is the price trajectory?

Who might this help?

Data and Analysis Reference

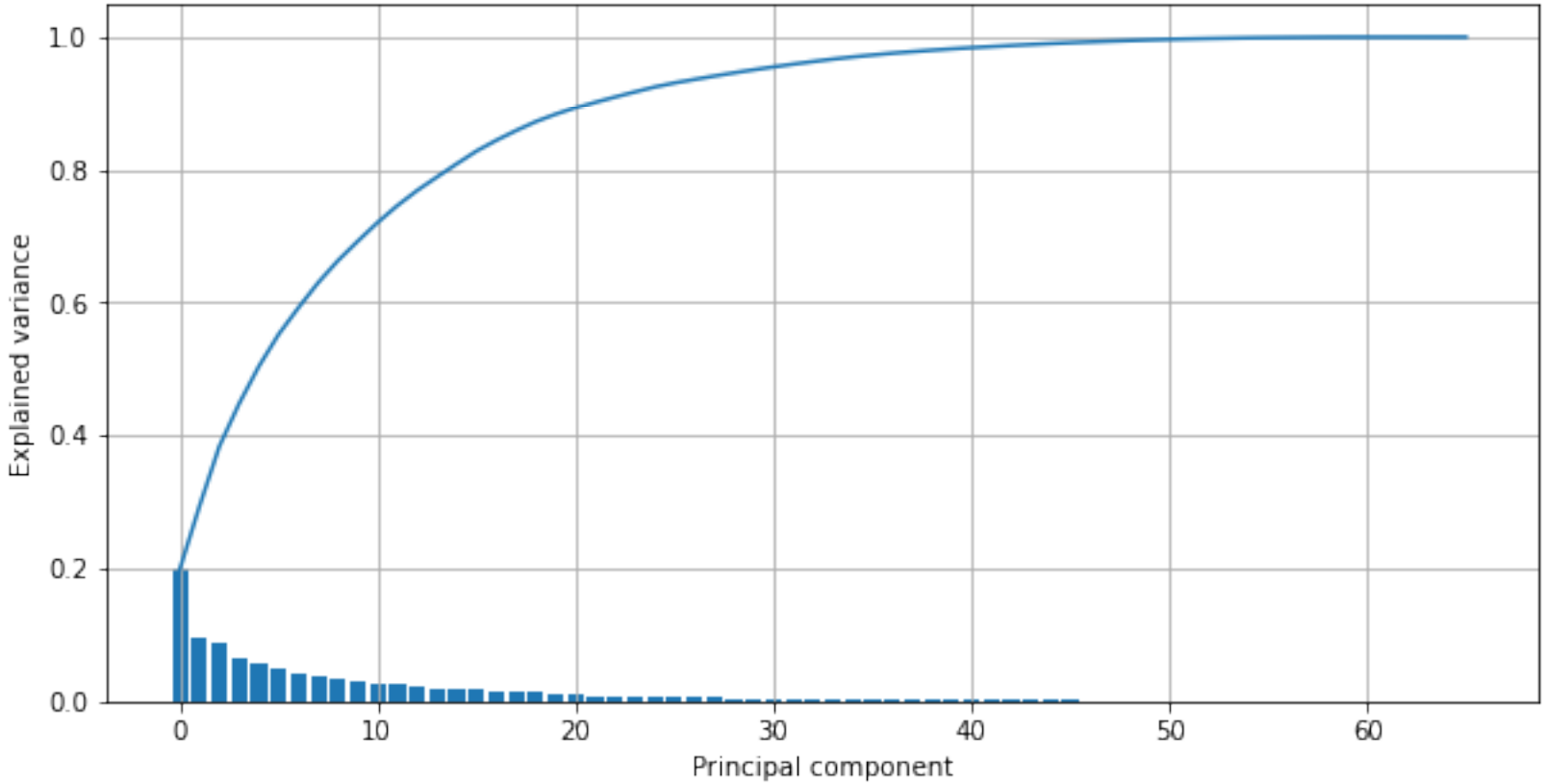
Hourly energy demand and weather data from Spain- Kaggle

-Hourly Energy Data

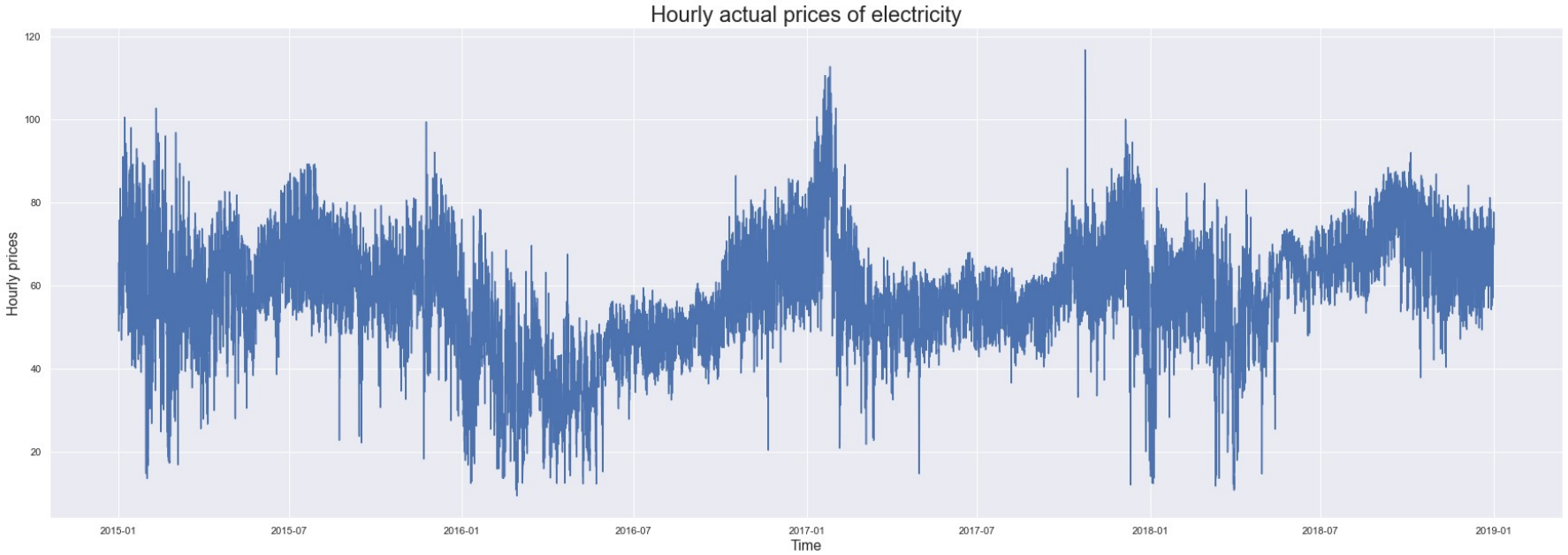
-Hourly Weather data

Key Features

- **Generation**
- **Load demand**
- **Weather data- pressure, temperature,**

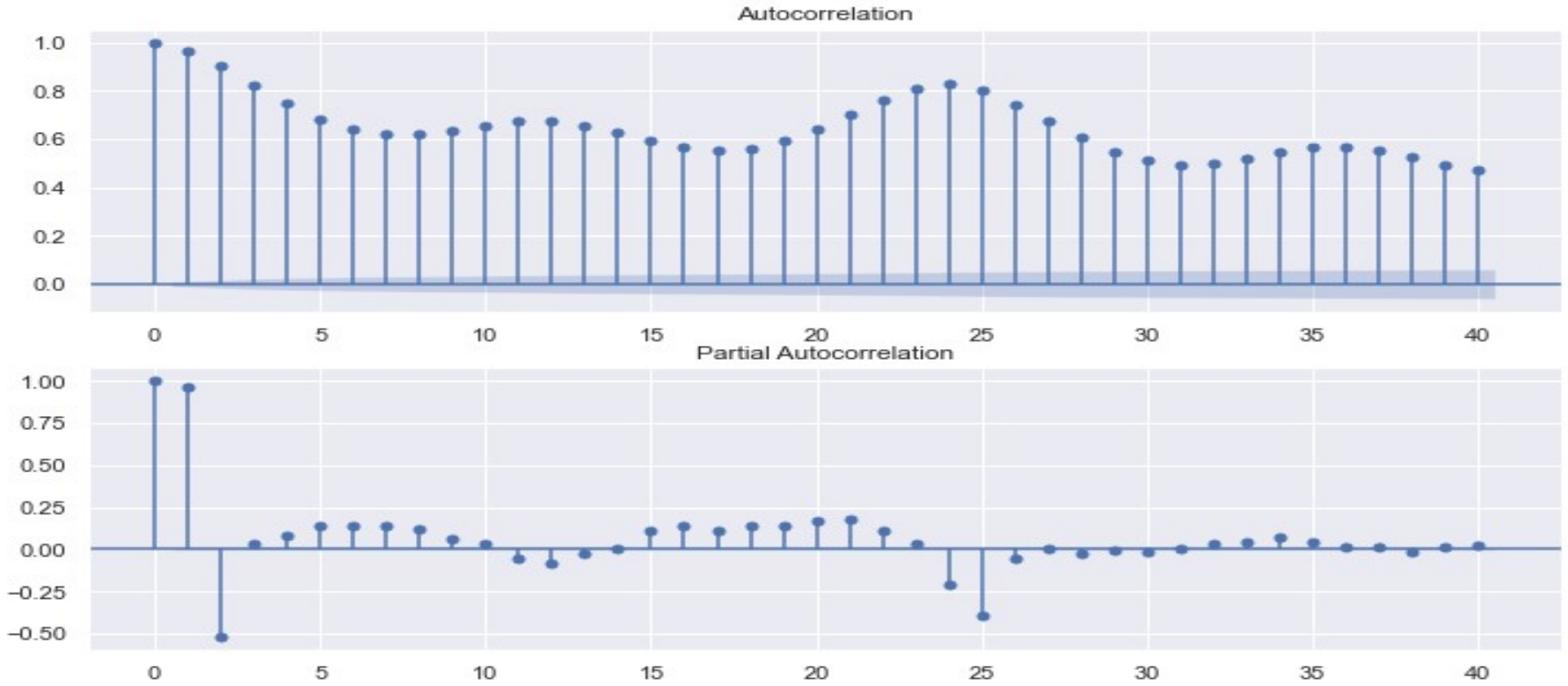


Hourly price trend



Auto-correlation plots

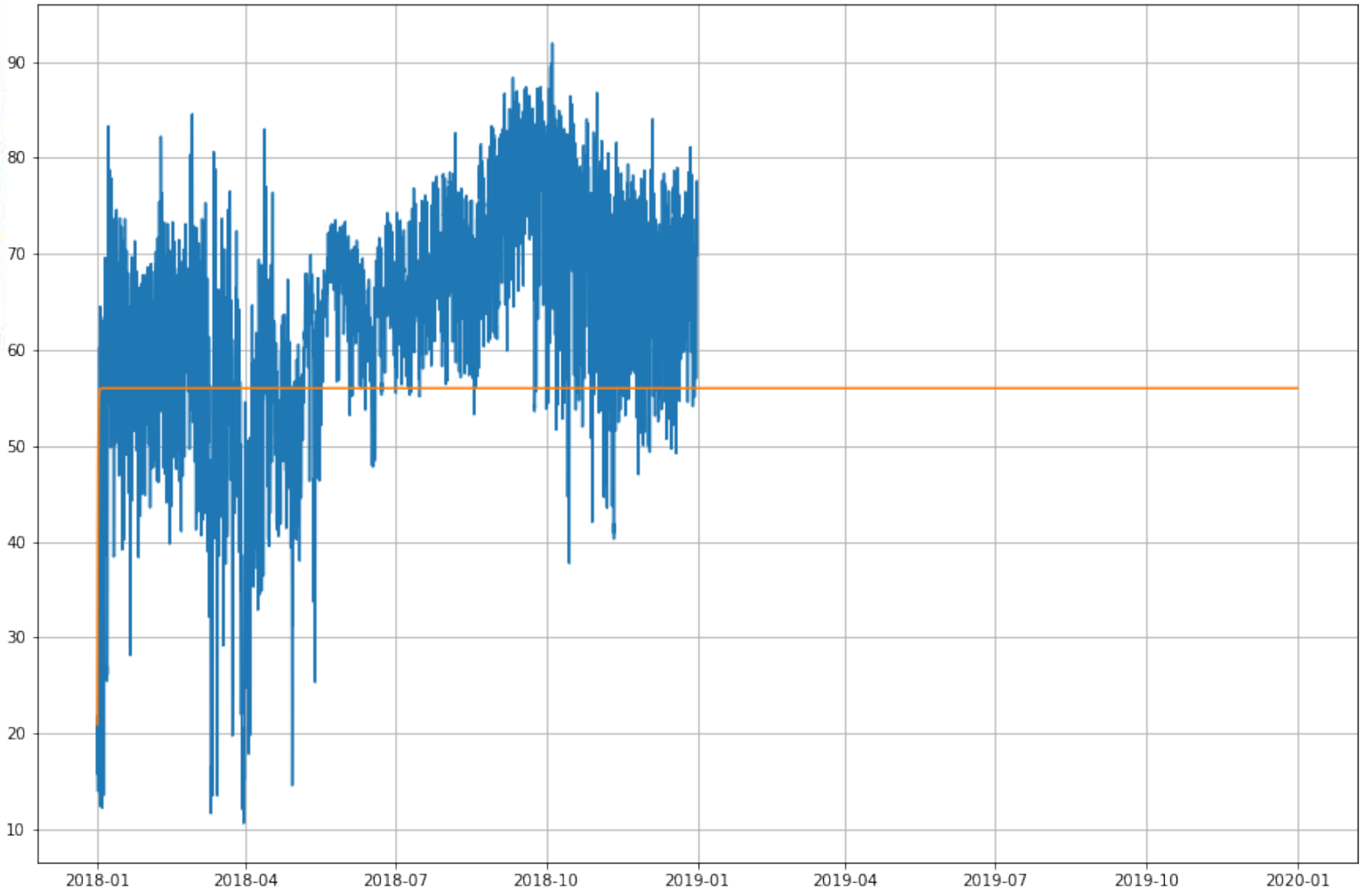
- Dependency on previous time lags



Price seasonality

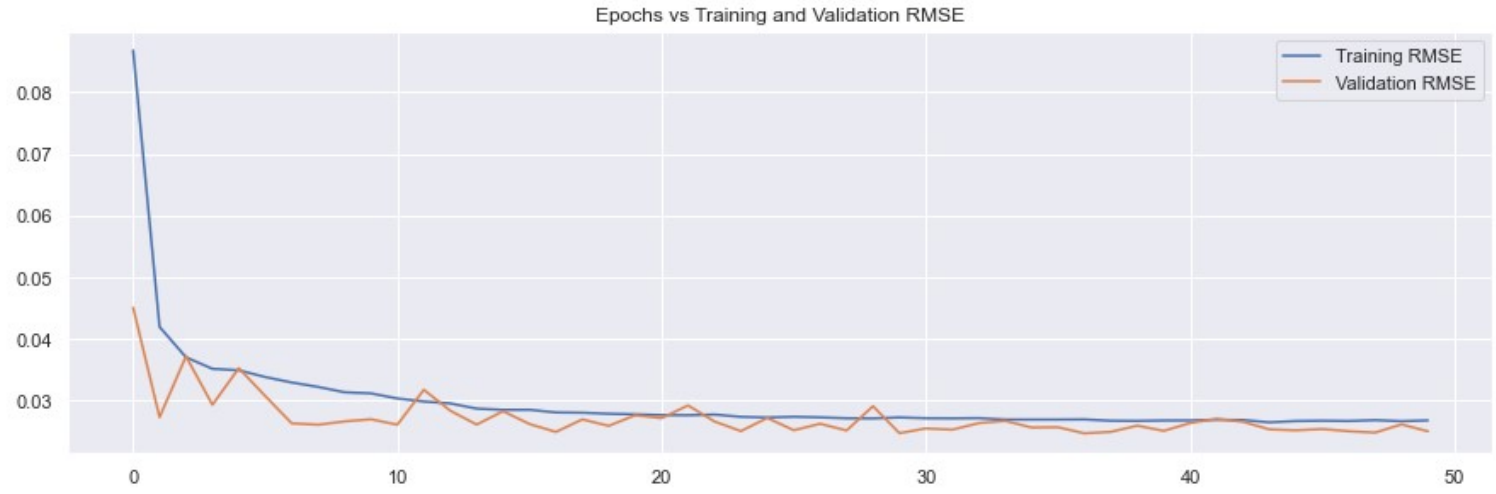
- Actual Price vs One year Lagged price

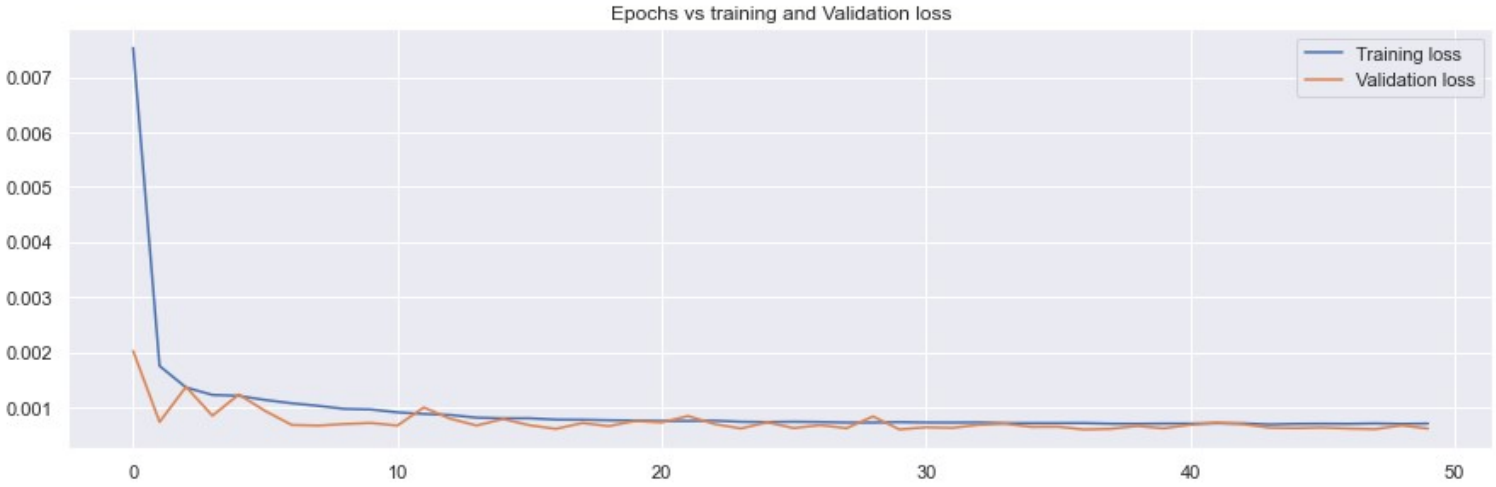
AR Model – Price Prediction

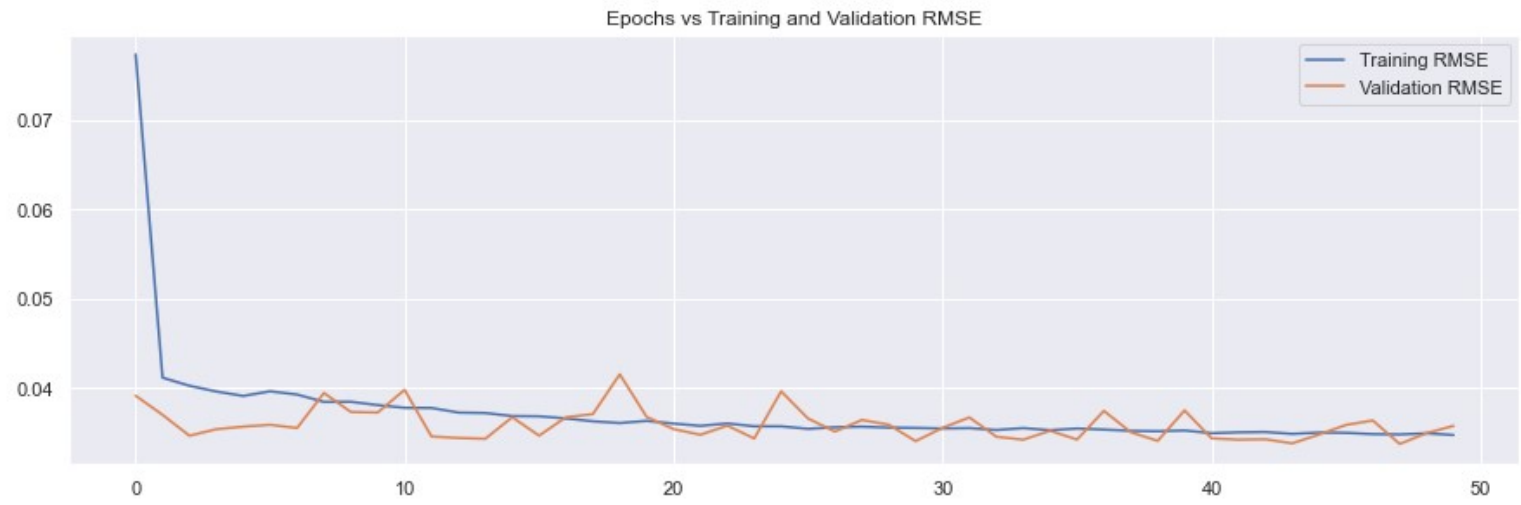


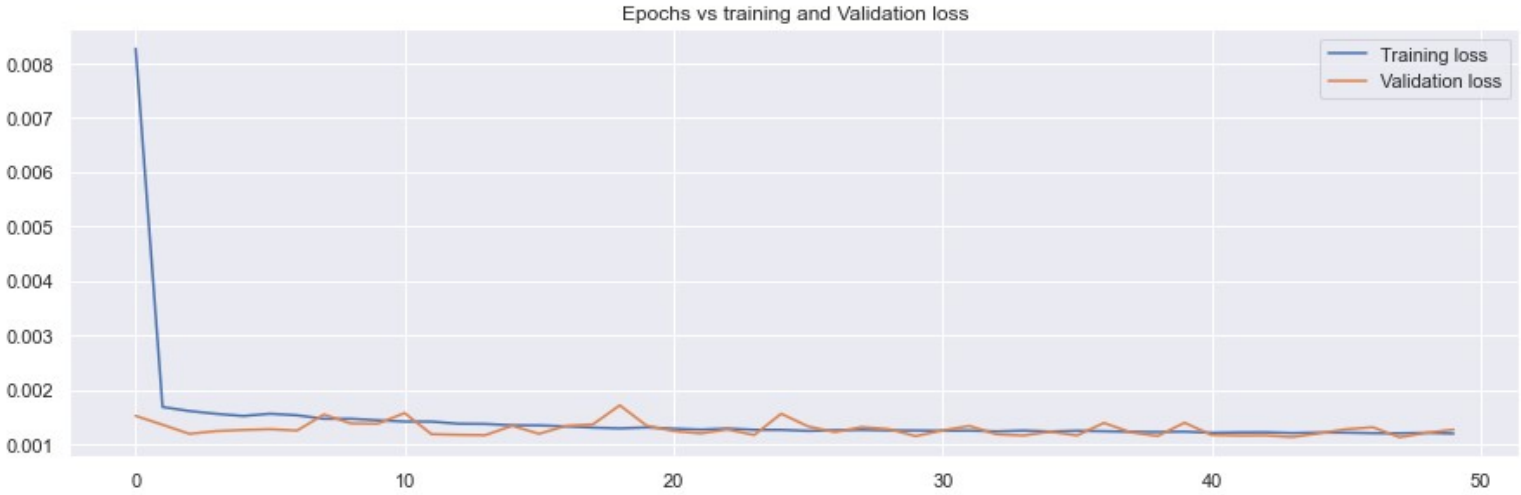
Deep Learning

- **LSTM – Univariate**
- **Previous Time Steps = 12**









Deep Learning

- **LSTM – Multivariate**
- **15 PCA components – Generation, load, weather**
- **Previous Time Steps = 1**

Model Comparison

Model	Metric - RMSE
AR Model (2, 0 , 0)	2.66 Euro / MWh
LSTM Univariate	2.68 Euro / MWh
LSTM Multivariate	3.69 Euro / MWh

Conclusions

- Best Model – AR Model p = 2
- Key Metric – RMSE
- Further Research :

  - Increase number of time steps to 24 for Univariate and Multivariate analysis.

Acknowledgements and References

- Kenneth Gill Pascal-Springboard mentor

- Kaggle EDA Analysis
- Multivariate Time Series Analysis
- LSTM - Time Series Analysis

THANK YOU!!