



Bachelor Thesis / Master Thesis:

## AI-Driven Electricity Price Forecasting

The rapid global spread of renewable energy generation facilities has led to significant fluctuations in electricity prices. Nevertheless, electricity price forecasts are necessary for many applications, such as building optimization, smart energy management systems, and much more.

Predicting electricity prices for a 72-hour period with hourly resolution is challenging due to numerous factors that influence the electricity market. The aim of this work is to develop innovative approaches that use advanced machine learning techniques to generate accurate electricity price forecasts.

### Project Description:

The primary objectives of the thesis are:

1. Literature review: Review of current methods and previous work on electricity price forecasting with a focus on data-driven machine learning approaches.
2. Data collection and preprocessing: Collecting historical data, meteorological forecasts, and other relevant data. Fixing data quality issues such as missing or noisy data and performing feature engineering.
3. Developing a prediction model: Creating a robust model to forecast electricity prices for the next 72 hours using this collected data.
4. Benchmarking multiple methods: Comparing different prediction techniques, including regression models, time series forecasting, and deep learning architecture (e.g., LSTMs) to evaluate their strengths and limitations in different scenarios.
5. Documentation: Compiling the results into a well-structured final thesis.

### Key Requirements:

- Strong background in renewable energy and data science.
- Experience with machine learning and statistical modeling (proficiency in Python or a similar programming language is preferred)
- Familiarity with time series analysis and deep learning architecture is a plus.
- Interest in interdisciplinary research that spans data analytics.

**Start date:** As soon as possible

### Contact:

Lingga Aksara Putra, M.Sc.

Professorship of Regenerative Energy Systems

Schulgasse 16, 94315 Straubing, Room 0.A10

Telephone: +49 (0) 9421 187-118

E-Mail: [lingga\\_aksara.putra\[at\]tum.de](mailto:lingga_aksara.putra[at]tum.de)