Decision making is at the core of any organization, and highly dynamic operational decisions require accurate short-term forecasts. This is particularly relevant in extremely volatile electricity markets, where the price can increase tenfold in a matter of hours or even minutes. However, decisions may require tailored forecasts that focus on different levels of detail and granularity. For instance, models for quarter-hourly or hourly products (or contracts) can use different information sets than those for average daily prices. Likewise, models for individual zones can differ from those for countries or regions. As a consequence, these forecasts may not align and can lead to suboptimal decisions. To cope with this, the forecasts from each temporal and/or spatial level of the hierarchy should be reconciled to be coherent.

The **Temporal Hierarchies for electricity pRIce ForecasTing (THRIFT)** project aims to ❶ develop a novel forecasting framework for temporal hierarchies tailored to day-ahead electricity markets, which ❷ uses state-of-the-art econometric and machine learning techniques, and produces point forecasts and ❸ predictive distributions to support electricity trading in national or ❹ cross-national power markets. In an era of large language models and energy-consuming computing centers, THRIFTy techniques that rationally use available resources may be particularly valuable. This is where temporal hierarchies, that can be constructed for any time series by means of non-overlapping temporal aggregation, may come in handy and replace (or at least complement) computation-heavy machine learning models.

The project will contribute primarily to Decision Sciences by supporting more efficient decision-making. However, due to its interdisciplinary nature, it will also contribute to (i) Computational Sciences by advancing knowledge in data analytics, especially statistical and deep learning for hierarchically aggregated data; (ii) Econometrics by developing novel hierarchical forecasting and reconciliation schemes for point and probabilistic setups; and (iii) Finance by assessing hierarchical forecasts in terms of not only statistical error metrics but also profits from trading strategies involving battery storage. The latter may provide incentives to invest in batteries and could reduce the risk of blackouts, like the one experienced in Spain and Portugal in April 2025.