

ADREE – ADVANCED DATA RELIABILITY ANALYSIS FOR EUROPEAN ENERGY SYSTEMS

ARTELYS

The study of energy systems involves a considerable amount of data intensive tasks, requiring an increasing need for detailed temporal and spatial granularities. European data exchange platforms, such as the Transparency Platform powered by the ENTSO-E, are a key component in giving access to a wide range of power system data to all actors of the energy system. In addition to facilitating data exchange between actors, those transparency platforms work for the creation of efficient, liquid and competitive wholesale markets. It thus levels the playing field between small and large actors. Intensive data exchanges are meant to increase through various new and innovative data services between actors of the European energy system such as TSOs, DSOs, aggregators, suppliers, consumers, etc... For instance, in France, with the ambition to engage more strongly consumers as a proactive actor on electricity markets, Enedis has designed and deployed the Linky smart meter, enabling consumers to monitor their electricity usage and Enedis to gather a large amount of consumption data at a very detailed level which can then be made available to conduct relevant analysis on electricity consumption. Such an extensive database is unprecedented and can then be aggregated at many different levels to be exchanged with other stakeholders.

However, frequent reviews of the Transparency Platform, for instance commissioned by the European Commission¹ or under the initiative of European researchers² and frequent users of the platform, have hinted at various shortcomings and problems in terms of data quality. The ADREE tool addresses these issues and proposes an innovative solution to leverage the progress of AI into a transparent and easy-to-use web application.

The ADREE tool has the ambition to significantly improve the accuracy and the quality of the exchanged data between TSO-DSO-consumers, by providing:

- An **efficient** and **robust** solution to get an overview of the quality of the “raw” exchanged data, for many different data sources, leveraging state-of-the art machine learning techniques;
- An “**easy-to-use**” solution to conduct data analysis;
- A **quick** solution to **fix and clean** the “raw” data based on the provided quality diagnoses.

The overall concept and approach are twofold:

- To implement **state-of-the art** algorithms for **data quality diagnosis** and **data sanitization**, powered by Machine Learning and Artificial Intelligence.
- To embed these algorithms inside an **innovative and user-friendly web application** composed of:
 - o A **workflow engine** to power data pipelines and provide a set of functionalities to follow the treatments (progress, logs, gantt, etc);
 - o A **web frontend** to easily access results and KPIs

¹ https://ec.europa.eu/energy/sites/ener/files/documents/review_of_the_entso_e_plattform.pdf

² *The ENTSO-E Transparency Platform – A review of Europe’s most ambitious electricity data platform*, Lion Hirth, Jonathan Mühlentfordt, Marisa Bulkeley



The ADREE project ambitions to deliver a tool that will provide more transparency and trustworthiness to energy systems studies.

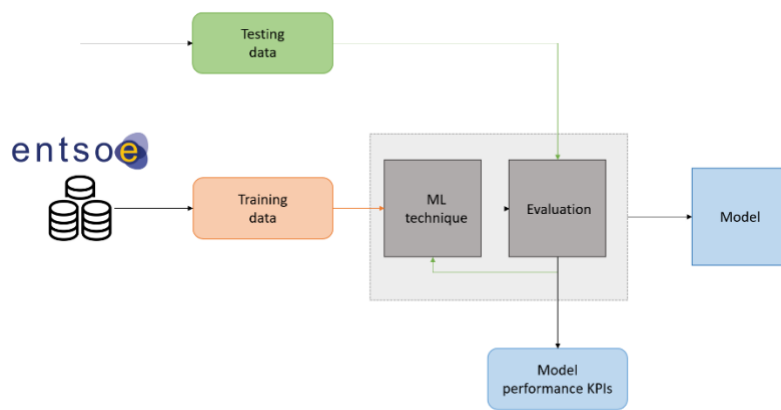


Figure 1 – Model training workflow scheme

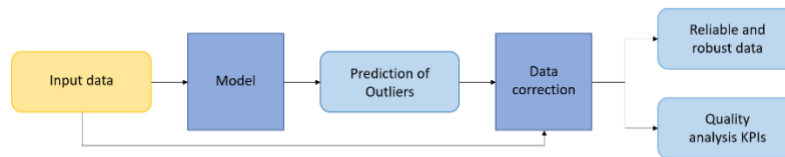


Figure 2 -Model application workflow