



Collaborative forecasting and data markets



Research challenges

Any forecaster and forecast user may benefit from having improved forecasts thanks to the use of additional data sources - however, these are often owned by different agents who are not willing to share their data. Data sharing can however be incentivised if (i) organising learning and forecasting tasks in a distributed and federated fashion, (ii) providing privacy-preserving guarantees, and (iii) monetizing data sharing and collaborative analytics. New revenue streams for those who collect and/or own data are then obtained. We foresee that data markets will complement energy markets in a new future.

Main outcomes

In WP4, DTU, INESC and ICL partners demonstrated that it is possible to design distributed learning and alternative data market mechanisms that allow to generate optimal forecast quality and value from distributed data sources, possibly with privacy-preservation guarantees, while yielding new business models and revenue streams in connection with (renewable) energy forecasting.

Innovative framework for data-sharing

Distributed learning and forecasting with privacy guarantees

Privacy-preserving distributed learning allows to use distributed data from various agents without compromising their private information, while yielding non-negligible forecast improvements (up to 10%).

Online distributed learning with limited information exchange

Smart4RES distributed learning approaches outperform existing ones while closing the gap between online and distributed optimization of RES forecasting. Although agents do not have to actively share their private data, forecast accuracy is improved.

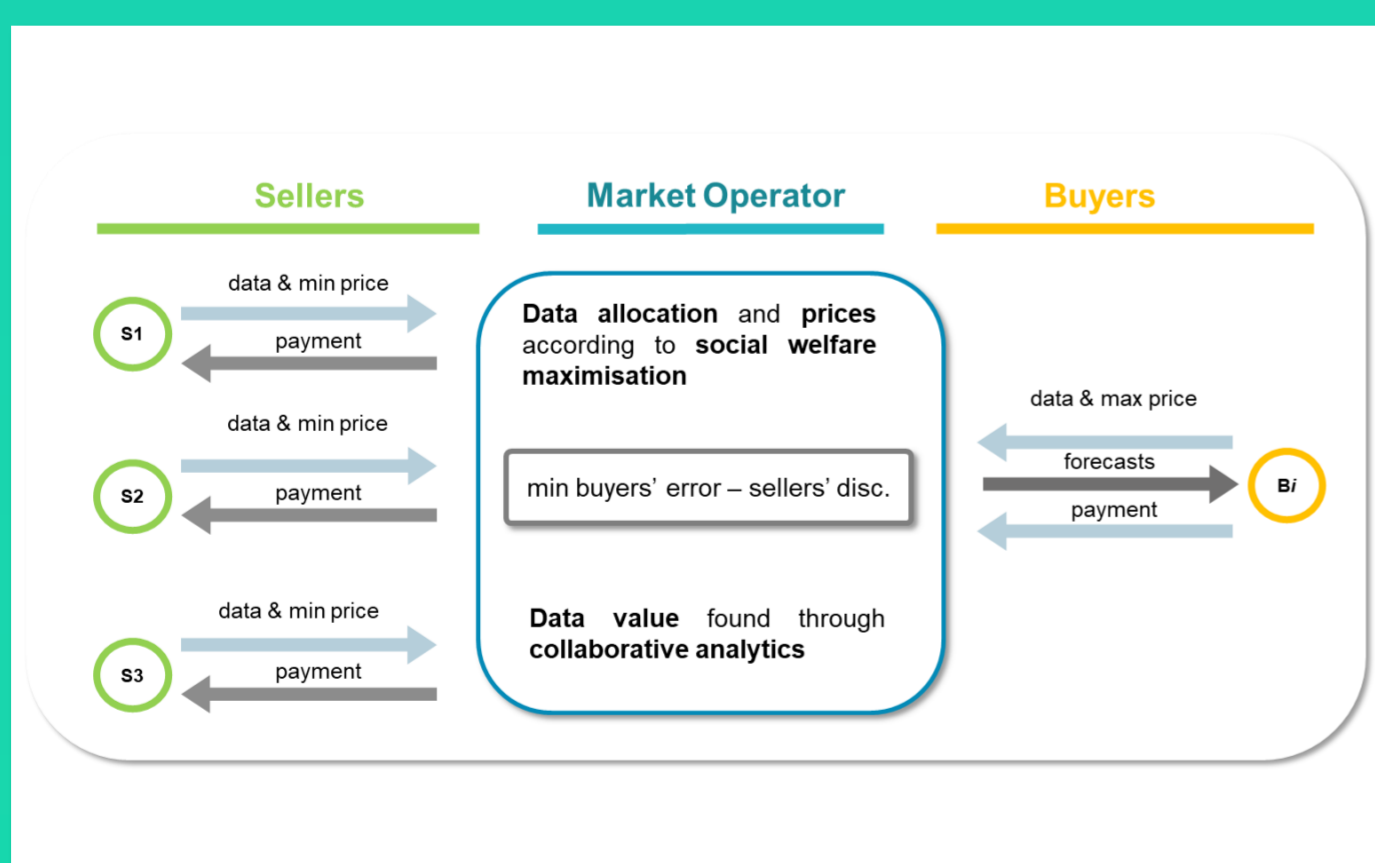
Data monetisation and market platform



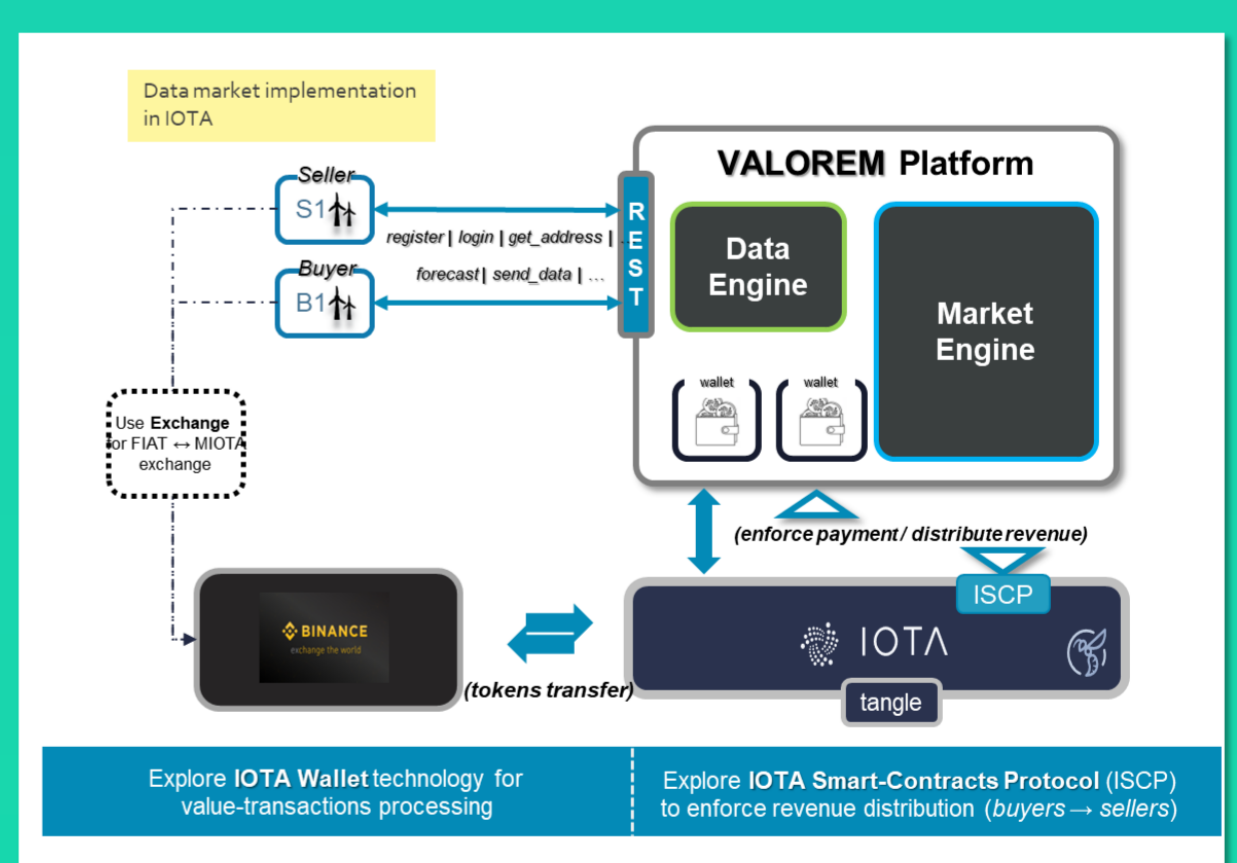
Algorithmic **game-theoretical concepts** allow to design markets for data for specific analytics tasks (e.g., regression) involved in renewable energy forecasting.



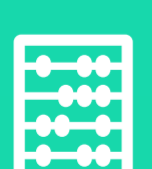
Distributed ledger technology-based platforms can be developed as a backbone for the deployment and operation of renewable energy forecasting data markets. A **prototype (IOTA-based) implementation** of data markets for renewable energy forecasting applications is today available.



Data market concept



INESC's IOTA-based prototype



Additional revenue streams can be obtained for those who collect relevant data (energy production sites, meteorological stations, remote sensing devices, etc.)

Data market platform demonstration

