Predico – Participation Rulebook

1. Introduction and Definitions

Welcome to *Predico*, a Collaborative Forecasting Platform initiative designed to enhance forecasting accuracy through collaboration between market makers and forecasters.

In its current form, this platform consists exclusively of an API server, with no front-end available. Therefore, every interaction is done via HTTP requests.

This rulebook outlines the guidelines and rules for participation.

Definitions:

- **Market Maker**: An entity that owns resources (e.g., wind farms) or manages a grid (e.g. a TSO) and seeks forecasts by opening and funding collaborative forecasting market sessions.
- **Forecaster:** An individual or organization registered in the platform, aiming to submit forecasts to collaborative forecasting challenges opened by the **Market Maker**, competing for the available prize money in each session.
- **Market Session:** A specific period during which **Market Makers** can create forecasting challenges, and **Forecasters** can submit forecasts for the open challenges.
- **Market Challenge:** An opportunity, published by the **Market Maker**, with meta-data regarding a forecasting challenge that **Forecasters** can try to submit forecasts for.
- **Gate Closure Time:** The deadline by which forecasts must be submitted for a market session.
- **Forecast Variables:** Quantities to be forecasted, such as quantile 10, 50, 90, and conditional mean.
- **Ensemble Forecast:** An aggregate forecast computed from multiple f**orecasters'** submissions.

Important:

- **This platform is a proof of concept, so rules may change to improve outcomes for all parties.**
- **This rulebook may be updated periodically to enhance the platform's operation. Forecasters will be notified of any significant changes. Any updates on these rules or the platform will be communicated via email.**

2. Roles and Responsibilities

Market Makers

Registration: Market Makers register their portfolio of assets (e.g., wind farms) or target quantities on the platform by providing relevant metadata.

Data Provision: Market Makers send, periodically, time-series with raw measurement data for their registered assets.

Challenge Publication: **Market Makers** can publish a forecasting challenge per resource in their portfolio, daily, during each market session.

Access to Ensemble Forecasts: After each session, **Market Makers** will access the forecasts computed based on **Forecasters'** submissions for their challenges.

Funding: The market maker funds its **Market Challenges** to obtain collaborative forecasts.

Important:

- For this proof-of-concept, Elia will be the **Market Maker** and sole buyer of collaborative forecasts.
- In future updates, a market session might have multiple entities interested in purchasing the challenges collaborative forecasts. These buyers will increase funding and respective prize pools available for each market challenge.

Forecasters

Competition: Forecasters can submit forecasts for open **Market Challenges**, competing for the prize money available. They may commence or stop contributing to the market at any time.

Application: Forecasters apply to participate by sending an email to predico@elia.be. Upon acceptance, they receive a registration link to complete their registration.

Forecast Submission: Forecasters can submit forecasts for open **Market Challenges**, created by **Market Makers,** competing for the prize money available. The forecasts must be submitted via HTTP requests, before the **Gate Closure Time**.

Monitoring: Forecasters can consult relevant participation metrics on the collaborative market sessions.

Compliance: Forecasters must adhere to all submission rules and guidelines this rulebook outlines.

3. Registration and Participation

Serious Applicants Only: Only serious applications will be considered. **Forecasters'** submitted forecasts should perform as well as or better than Elia's current forecast, published on Elia's Open Data Portal (https://opendata.elia.be/). Elia may request a one-day, day-ahead forecast before enrolling the **Forecaster** to verify seriousness.

Single Forecaster ID: For now, a maximum of one account can be issued per individual or organization wanting to participate as a **Forecaster.**

Historical Forecasts Submission: To assess their potential and define the ensemble methodology, a **forecaster** must submit a historical of time-series forecasts, with 15-minute time resolution, for a minimum of 30 days before the challenge start date (1st period to forecast). The **forecaster** should be careful with this step, as providing unrealistic historical forecasts (e.g., overfitting to historical data) might compromise its submission. The forecaster does not stand to gain more money by submitting a better historical forecast, as payment is based on ex-post performance calculations.

- This step is mandatory for the first time a forecaster participates in a collaborative forecasting session and will be optional for the remaining (unless a gap of 30 days passes between participation in challenges).

Commencement and Termination: Forecasters may start or stop contributing to the market at any time but must notify Elia accordingly.

4. Market Operation

Market Session Creation: Every day, at 10h00 CET, a new **market session** will open, allowing the **Market Makers** to publish **market challenges**.

Market Challenge Publication: Elia (**Market Maker**) creates one or more challenges, that the Forecasters can generate forecasts for.

- **Challenge Limits:** **Market Makers** can publish up to one challenge per target variable or resource (i.e., wind farm) in their portfolio during each **Market Session**.
- **Forecast Period Specification:** Each challenge specifies the period for which forecasters must provide time series forecasts. In this case, ELIA expects that forecasters submit forecasts for a **day-ahead and intraday** time horizon.
- **Forecast Resolution:** Challenges specify the required time resolution. In this case, ELIA will require forecasts with **15-minute** time resolution.
- **Example:** *Create day-ahead forecasts, in 15-minute time resolution of offshore wind generation average power, for wind farm X.* (this information will be decomposed in multiple fields of a JSON, accessible via an API endpoint).

5. Forecast Submission

Submission Timing: Forecasts must be submitted before the gate closure time for that market session. Late submissions will not be considered.

Submission Method: Forecasts are submitted to the platform's API via HTTP requests. There is no front-end provided.

Latest Forecast Considered: Only the latest forecast from a forecaster in a market session will be considered.

Unique Submissions: A forecaster may not submit multiple forecasts for the same variable (e.g., two P50 submissions) under the same or different forecaster IDs for the same challenge. A Forecaster can update their original submissions using a specific API endpoint. The latest valid submissions (before **Gate Closure Time**) will be considered.

Forecast Coverage: Forecasts must cover the entire period mentioned in the challenge (start and end date). Given the fixed 15-minute time resolution for the submissions, **Forecasters**, should submit up to 96 forecasted quantities per variable (P10, P50, P90, conditional mean) per challenge, except for DST change days where these quantities might vary.

Time Resolution Compliance: Forecasts must match the time resolution specified in the challenge.

6. Evaluation and Scoring

Ex-Post Evaluation: Both forecasting metrics and contribution assessment (i.e., for the final ensemble) will be computed and made available to the Forecaster and the **Market Maker** via a scheduled task after actual measurements are available.

Ranking: In deterministic forecasting, forecasters are assessed and ranked according to their root mean square error (RMSE). In contrast, forecasters are ranked based on pinball loss when evaluating forecasts at the 10th and 90th percentiles. In both cases, a lower value indicates a higher ranking for the forecaster.

Prize Distribution Based on Rank (50% of Total Market Value):

- 1st Place: 40%
- 2nd Place: 27%
- 3rd Place: 18%
- 4th Place: 10%
- 5th Place: 5%
- 6th Place and Lower: 0%

Contribution to Ensemble Forecast (Remaining 50% of Market Value):

- Calculated using methods like Shapley values or permutation feature importance.
- Measures the importance of a forecaster's submission to the overall forecast accuracy.

Payment Adjustments for Fewer Participants: If there are fewer than five **Forecasters**, unallocated prize money is distributed proportionally according to their ranking.

7. Incentives and Payments

Monthly Distribution: The full amount available on a forecast market will be distributed to the market participants every month, according to their performance (see **6. Evaluation and Scoring**).

Payment Conditions:

- Payments are made monthly to companies with a European bank account denominated in **Euro**.
- Payments will only be made when a forecaster's winnings reach €1,000.

Accuracy Ratio Requirement:

- **Definition:**
- **Let:**
- F = Forecast
- M = market
- a = accuracy
- m = month

$$Accuracy\ ratio\ =\ \frac{\dfrac{a_{M,m1} - a_{M,m0}}{a_{M,m0}}}{\dfrac{a_{F,m1} - a_{F,m0}}{a_{F,m0}}}$$

- **Minimum Threshold:** If the accuracy ratio is less than 0.55, no payment will be made to the **Forecaster**
- **Continued Non-Improvement:** If the accuracy ratio does not improve in the following month, the **Forecaster** will be removed from the market.

Non-Payment Participation: **Forecasters** who do not require payment can still participate to test their skills.

Important:

For now, the total incentive amount per month is distributed equally across all forecast points in the market. For example, if it is an hourly forecast made in D-1, there are 24 forecasting points per day. If it is a 15-minutely forecast, there are 96 forecast points per day. In future, value may be distributed according to the criticality of that period, e.g. ramping events for wind or demand, midday or broken-cloud period for solar.

8. Compliance and Enforcement

Fair Play Policy: The market is designed to reward **Forecasters** making accurate forecasts. Integrity and honesty are paramount.

Prohibited Actions: Any attempt to interfere with the proper functioning of the market, platform, or competitors—including gaming the market—is strictly prohibited.

Disciplinary Actions: Violations will result in removal from the market, non-payment, and possible legal action.

Elia's Rights: Elia reserves the right to remove a **Forecaster** from the market for any reason.

9. Data

Data Availability: All available input data in Elia's possession is published on **Elia's Open Data Portal** (https://opendata.elia.be/).

External Data Sources: Forecasters are encouraged to use other data sources such as weather forecasts, outage schedules, etc.

Data Protection: All submitted forecasts are subject to data protection regulations.

Confidentiality: Forecaster The platform is not designed to collect or store personally identifiable information. Forecaster identities will be kept confidential and stored in compliance with GDPR.

Access to Past Participation Performance: Forecasters can access their past performance via the API endpoints provided.

10. Communication

Updates and Changes: Elia will email updates and changes to the rules.

Responsibility to Stay Informed: Forecasters are responsible for staying informed about any rule changes or updates.

11. Contact Information

General Inquiries: Forecasters may contact Elia with questions or concerns at predico@elia.be .