Short Term Cloud Motion Forecast based on Boid's Algorithm for use in PV Output Prediction

Marius E. Penteliuc → marius.penteliuc@e-uvt.ro
West University of Timișoara, Romania

Marc Frîncu → marc.frincu@ntu.ac.uk
Nottingham Trent University, United Kingdom

1. Motivation

PV energy production is **variable** and difficult to integrate into grid systems. One of the main reasons are transient clouds **attenuating** solar irradiance.

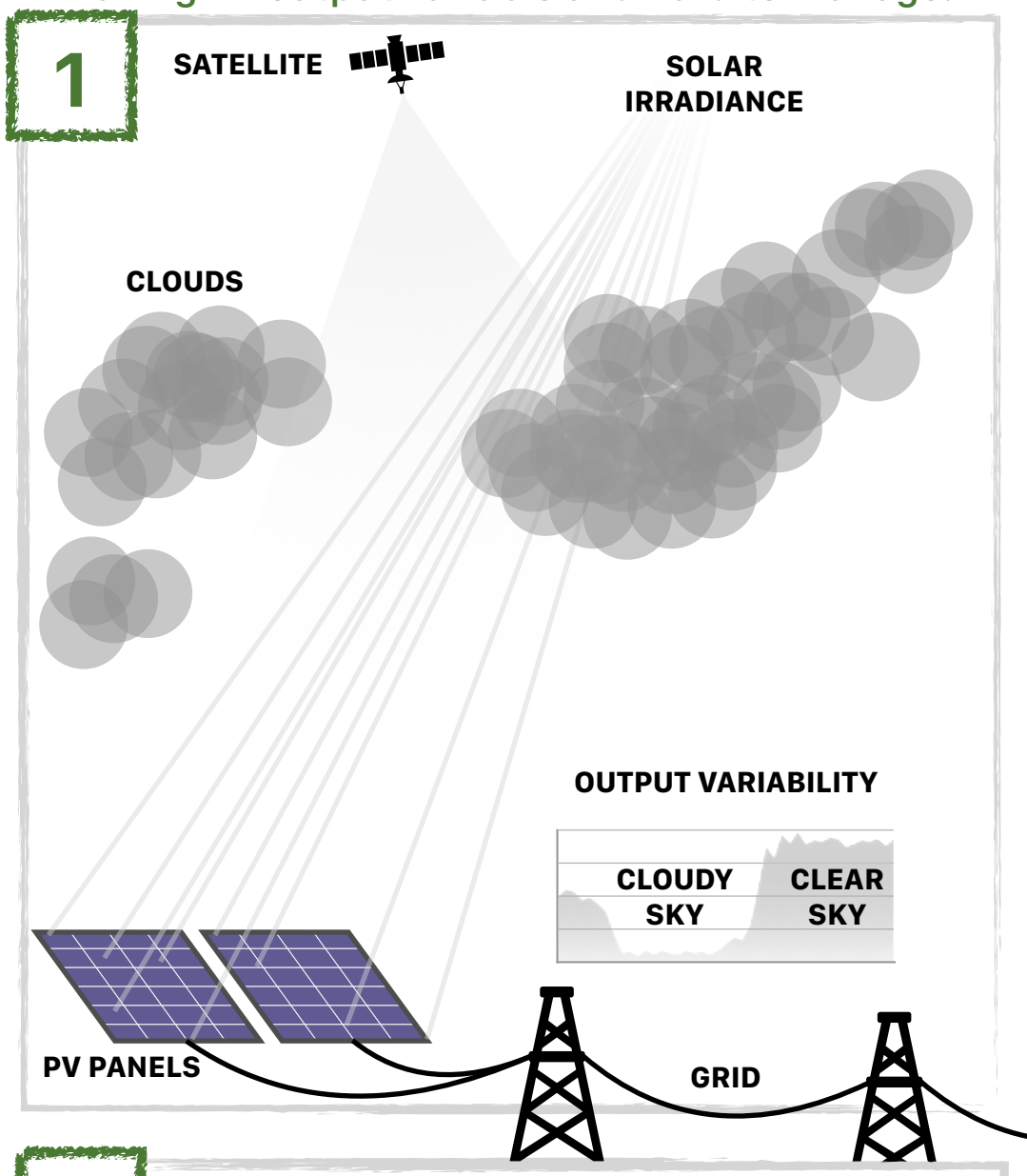
2. Solution

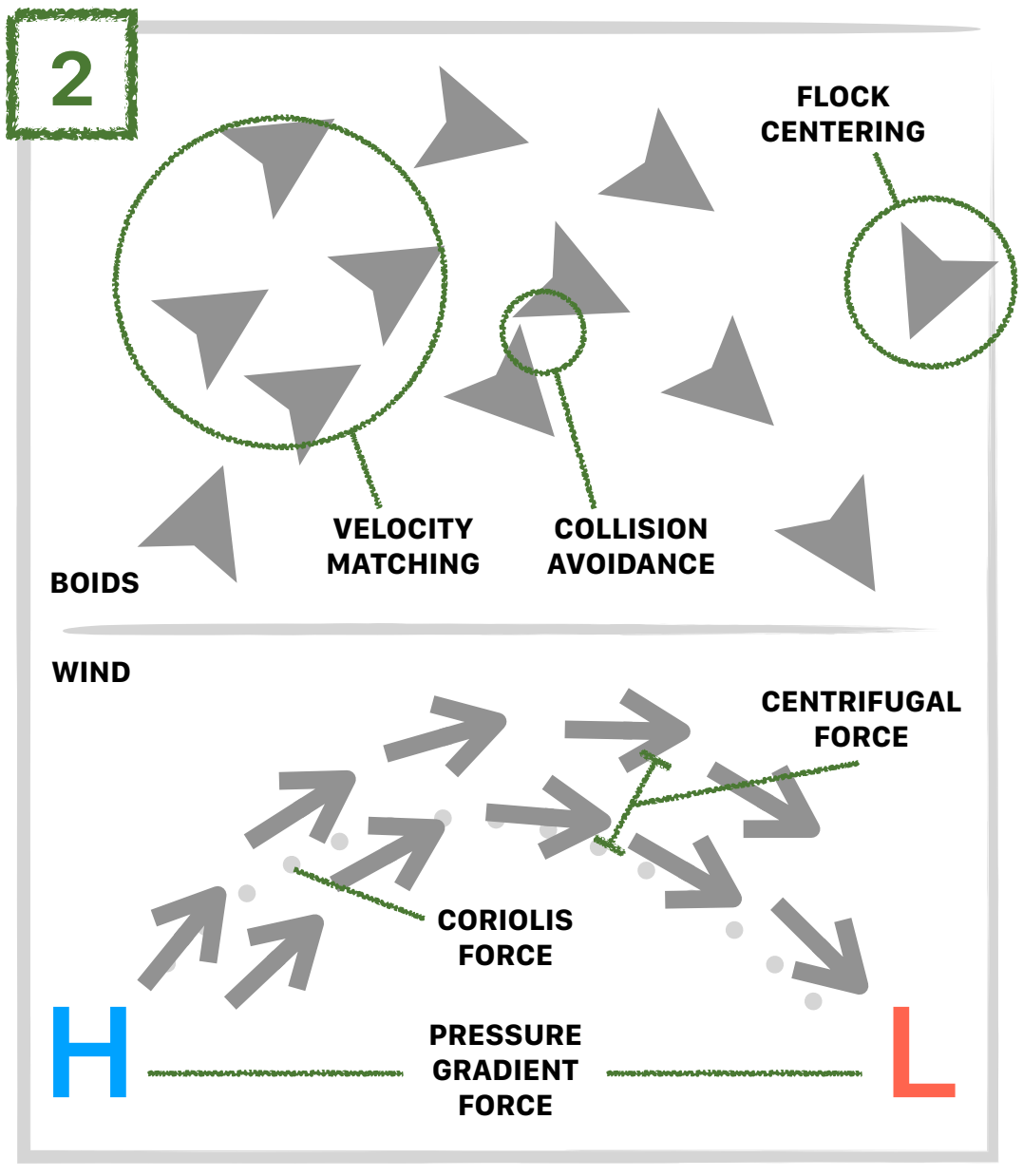
Wind modeled using **satellite** imagery and a modified flocking algorithm produces accurate **short-term** cloud **forecasts** up to several hours good for **scheduling** backup sources to stabilize the grid.

3. Results

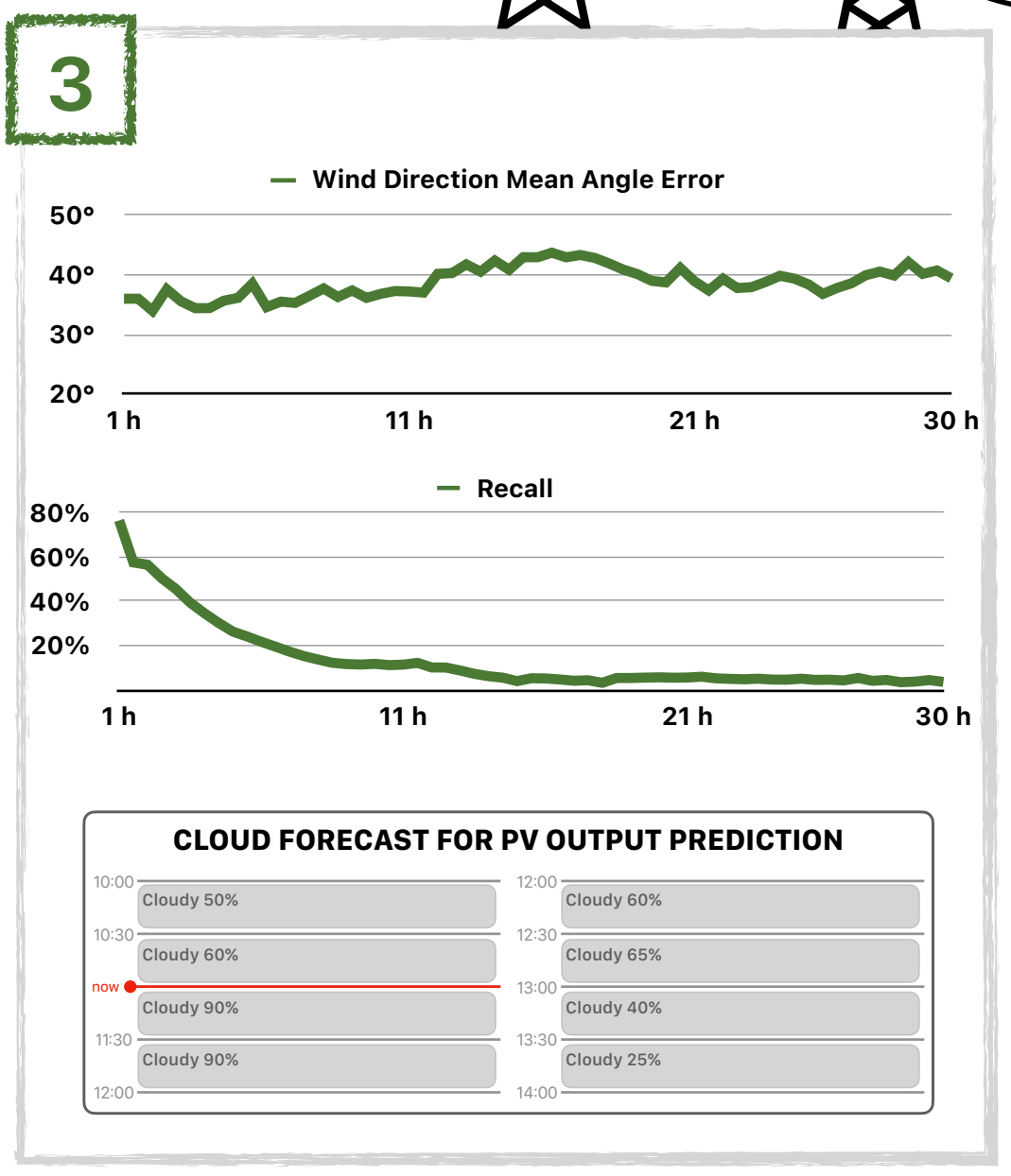
Wind **direction** is forecast with an angle error between 35° and 45°.
Cloud **position** recall drops from 80% to 50% in the first 3 hours.

Transient clouds attenuate solar irradiance making PV output variable and hard to manage.





Wind is detected from clouds in satellite imagery and simulated using the modified algorithm.



30 minute forecasts of cloud position facilitate output prediction and stabilization.

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