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Solar, Wind, Speed and Smarts: How Delft Solar Team won the 2025 Bridgestone World Solar Challenge with Meandair Nowcasting Weather Data

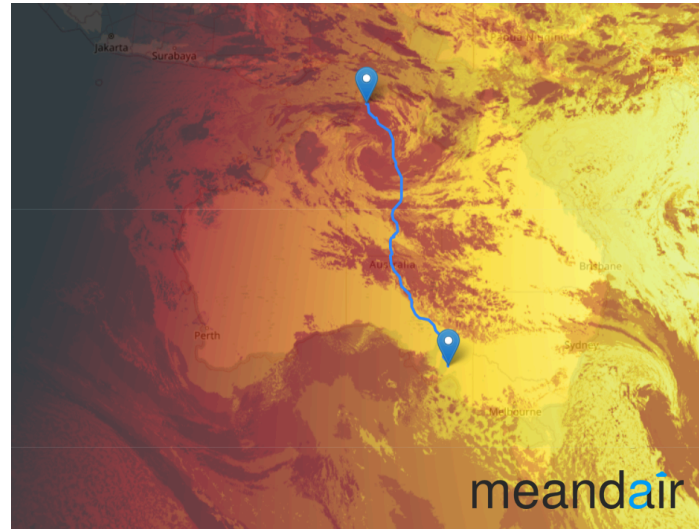
In August 2025, we embarked on our 12th participation in the Bridgestone World Solar Challenge as the Delft Solar Team. This bi-annual event challenges teams to drive their self-built solar cars for 3.000 kilometers through the Australian outback. For this edition, we partnered with Meandair to power the journey of Nuna 13 through the desert.

From a racing strategy perspective, the 2025 edition had a lot of extra challenges in store. The impact of weather conditions grew, with new rules decreasing the battery capacity threefold and increasing the solar panel size. As we realized weather uncertainty became our biggest risk, we started the search for a nowcasting partner – and Meandair was the perfect fit.

Meandair ingests real-time observations from satellites and sensors to generate short-term, high-resolution weather forecasts every 10 minutes. As a result, changing weather conditions are quickly captured on a local scale. This gives us an edge in our decision-making, as traditional weather models typically update only on hourly timescales.

Although Meandair's main focus is the aviation industry, a lot of similarities can be drawn with solar racing. Both areas require safe planning under uncertain weather conditions, which made it a natural fit for our use-case. With the nowcasting capabilities from the Meandair API, we suddenly got access to weather forecasts of unprecedented resolution. The impact on the racing strategy was major:

- Sub-kilometer GHI data allowed us to track the movement of clouds on a local scale, which was critical when choosing where to stop for overnight charging during the race. While numerical weather predictions were limited in their anticipation of clouds, Meandair reframed our strategy to fine-tune our cruising speed in real-time.
- Nuna 13 had a major new innovation: a fin that allowed us to sail on strong crosswinds. As the fin added the requirement for constant wind monitoring and forecasting, Meandair's high-frequency wind data helped us to use it optimally.



However, before we started using Meandair during the race, we embarked on an extensive validation study of the nowcasts in Australia. Our "Mission Control" car behind Nuna is responsible for all the data collection, including meteorological measurements. With a mobile rooftop weather station, we tracked solar- and wind data while driving the route before the race. After successfully comparing the results with the weather forecasts, we were confident to integrate the Meandair API into our racing strategy software.



Finally, the start of the race arrived. While the first two days were mostly cloudless, all traditional weather models predicted increasing cloud cover as we headed into southern Australia. Nuna 13 held the pole position, but it was clear to us that the limits of our battery would be tested. From then on, Meandair forecasting helped us to extensively assess the risk of different driving strategies with a low battery. In the end, our team managed to keep the lead on the competition, winning us our 8th championship title and bringing the solar cup back to Delft.



The partnership with Meandair proved that the use of high-quality weather data helped us make the right decisions when it mattered most. From the result of the 2025 partnership, it is clear that Meandair forms a core part of our strategy as we decided to extend the collaboration into the following years to come.

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