# ARENA INSIGHTS SPOTLIGHT: SOLCAST 'NOWCASTING' DEMONSTRATION AND THE SOUTH AUSTRALIAN RAMPING EVENT:

AN INTERVIEW WITH SOLCAST

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Australian Government
Australian Renewable Energy Agency

ARENA

# INTRODUCTION

On 13 January 2021 a thick cloud band moved across South Australia, causing over 400 MW of renewable energy generation to rapidly become unavailable. While AEMO's centralised forecasting system was unable to predict the cloud band, Solcast's Nowcasting trial successfully demonstrated the ability to forecast the timing and magnitude of the cloud band and the associated ramping events. This development in 'nowcasting' can inform AEMO of future ramping events ahead of time and allow AEMO to balance rapid changes in generation and demand with prior warning.

INTERVIEW WITH:

## NICK ENGERER

CHIEF TECHNOLOGY OFFICER AT SOLCAST

### ARENA: CAN YOU EXPLAIN THE SIGNIFICANCE OF BEING ABLE TO FORECAST RAMPS IN GENERATION FROM RENEWABLES SUCH AS THE SOUTH AUSTRALIA EVENT?

**SOLCAST:** AEMO from the beginning has identified the importance of ramping events such as the one we're discussing – I have a quote here from their COO, Michael Gatt. He said, "one of the biggest challenges this project is helping to develop capability of is the forecasting of the timing and magnitude of ramping events, such as the movement of large cloud banks over South Australia, which can quickly impact rooftop solar generation." So this has been recognized as a challenge.

The principal reason it is a challenge is that it is changing the underlying demand for electricity in a large way, very quickly. This is because the rooftop PV resource in South Australia is very concentrated. There is nearly a gigawatt of total solar on rooftops in the greater Adelaide region.

When you look at the spatial distribution of that region, most of the rooftop solar is in an area which is only 100 kilometers by 100 kilometers. That means that single cloud events such as these cold fronts, which bring cloud cover very suddenly, and also have it depart very quickly, will obscure all those rooftop solar sites within the same 30 to 60 minute window, which means that with half a gigawatt plus of solar, maybe 60 to 70% of that will effectively ramp down.

So we're down to around maybe 200 megawatts of contribution from rooftop solar before the cloud band departs, and then immediately after, it ramps back up very quickly. And this means that the fundamental role that AEMO holds of balancing supply and demand is now subject to an effect that is equivalent to a large coal power plant being unavailable for a few hours suddenly.

Simply put, this needs to be forecast ahead of time, and the existing AEMO forecasting system cannot forecast those cloud events with a high degree of confidence and accuracy. Despite it overall being a good system. This highlights the importance of producing rapidly updating high resolution forecasts of cloud cover that respect the local meteorology and move cloud layers in realistic ways according to the weather event as it unfolds.

## ARENA: WHAT ARE SOME OF THE POSITIVE IMPACTS THAT THE FORECASTING TAKING PLACE AS PART OF THE PROJECT COULD HAVE FOR THE GRID MOVING FORWARD?

**SOLCAST:** This is a nice follow on to the first question - where we discussed the core responsibility of the grid operator to balance supply and demand of electricity. To do that, we need to guide and signal the market ahead of time on what supply of electricity will be required to meet demand.

The first step is to have accurate demand forecasts that capture fast moving, fast changing cloud cover that moves over the Adelaide region and obscures the rooftop solar. More holistically, we need to do the same thing for the medium and utility-scale solar in South Australia, which make up about a gigawatt more of solar capacity in that area, as well as the 20 or so wind farms in the general vicinity.

When a cold front comes through, in addition to the cloud cover, we also have aggressive wind shifts that occur not only in direction, but also the magnitude of the gustiness of the wind. So being able to forecast all four of these components – rooftop solar, demand, utility scale solar and large scale wind - is absolutely necessary to balance supply and demand of electricity.

However, the importance of this work goes further than simple supply-demand balance. It goes on to whole-of-network security and resilience. If we want a resilient network that simultaneously has a high penetrations of renewables, we need to accurately forecast fast changing weather conditions - specifically the magnitude of any changes in generation or demand from rooftop solar that occurs, as well as the timing of those changes.

The focus of this project was to do that holistically. And do that in a way that respects how weather changes quite quickly over the near term – meaning forecasts for the next few minutes through the next few hundreds of minutes.

Further information is available at
**arena.gov.au**

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