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## Designing the tools for a more resilient national energy grid

On behalf of the Australian Government, the Australian Renewable Energy Agency (ARENA) has today announced \$499,744 in funding for Monash University to investigate oscillation issues in Australia's national energy grid.

The \$1.3 million project will develop a tool to help identify the root causes of oscillatory instability and identify potential solutions. The tool will be suitable for use by the Australian Energy Market Operator (AEMO) and Transmission Network Service Providers (TNSPs), and will have applications for system planning, grid connection and operations purposes.

The tool that is being developed by researchers at Monash University will allow faster solutions to the growing challenge of oscillatory instability, helping system planners design a more resilient grid.

The project is expected to reduce barriers to the connection and operation of inverter-based resources by helping system planners avoid upcoming oscillatory stability issues that can be caused by high levels of wind and solar and find solutions for this.

In today's power system, oscillatory instability is most often a symptom of low system strength. In 2019-20, oscillatory instability was observed in the West Murray Region, leading to AEMO reducing the output of 5 solar farms while it worked through its understanding of the cause and potential solutions.

If this project is successful, it will provide faster insight into the nature and origin of these sorts of events, which will help all stakeholders be more proactive to manage the associated risk.

The project will increase the stability of the grid to support renewable generation growth, reduce constraints on investment in renewable generation in weak grid locations, optimise the production from existing wind and solar farms in weak parts of the grid and enable the connection of additional renewable generation by addressing the oscillation risks.

ARENA CEO Darren Miller said these risks need to be addressed to avoid issues in the long term for the National Electricity Market.

"To manage the risk of instability in an increasingly inverter-based grid, it is necessary to build reliable and efficient tools that can identify root causes early. These tools should also be useful to explore the suitability of solutions for a grid increasingly dominated by renewable generation."

"Researchers at Monash University are working on the best solutions for oscillations and we're confident in the outcomes that could help in the ramp up of new renewable energy generation and storage projects.

Associate Professor Behrooz Bahrani, Director of Monash's Grid Innovation Hub said: Enhancing the resilience and stability of our national energy grid is paramount as we accelerate our transition to renewable energy. With the expertise of Monash University researchers and the support from ARENA, this groundbreaking project promises to address current oscillation challenges and pave the way for a robust, reliable and renewable future for our energy infrastructure. Our commitment to facilitating a seamless integration of renewables into our grid is unwavering, and we're optimistic about the innovative solutions this collaboration will bring forth."

ARENA has previously funded Monash University to [research inverter designs](#) that promotes stable operation in weak grid conditions. The outcomes found in the 2020 study will be used for the current study to show how multiple IBR's interact with one another across the National Electricity Market (NEM) and how oscillation issues can be resolved.

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