

New digital controls for NSW's electricity grid



As we retire our aging coal power plants, our grid is changing with more solar, wind and batteries to meet a growing and changing demand for electricity

For more than 50 years, Transgrid has looked after the high voltage electricity network that every home and business in NSW and the ACT relies on. As Australia shuts down its aging coal power plants, there's an urgent need to connect more solar, wind, hydro and batteries to the grid, to give us cleaner electricity. At the same time, households and businesses are increasing their demand for more power- for electric cars, replacing gas appliances, bigger data centres and industries shifting from gas to cleaner electricity. This once-in-a-lifetime shift means your power will soon come from hundreds of new renewable generators in NSW and other states, replacing four large coal power plants. It's like going from dial up internet to high-speed broadband in just a few years.

“Transgrid has a comprehensive plan to deal with this challenge and make sure the NSW grid is ready for more renewables.”

Inside the grid's nerve centre

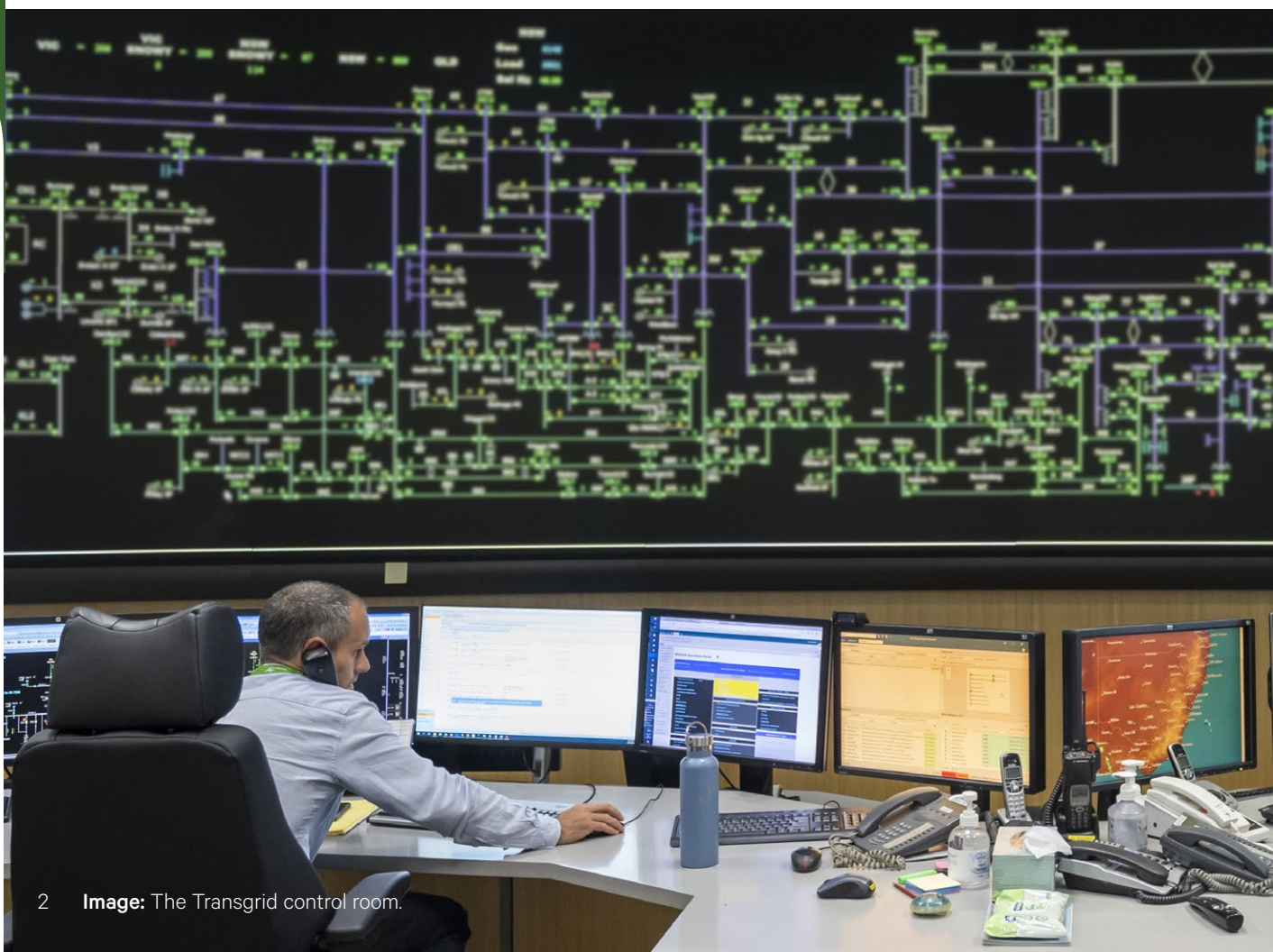
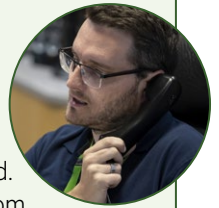
Sam has the important task of keeping the grid running smoothly in Transgrid's control room.

His work means your lights stay on when issues happen across the grid.

When NSW was largely powered from coal power stations, the work that Sam and his team did was largely routine and problems were expected and familiar.

When some problems happened, they could even call the power stations to fix problems when they happened. Australia is moving to use more electricity for our cars, replacing gas and even larger data centres that support the new wave of AI features on our phones.

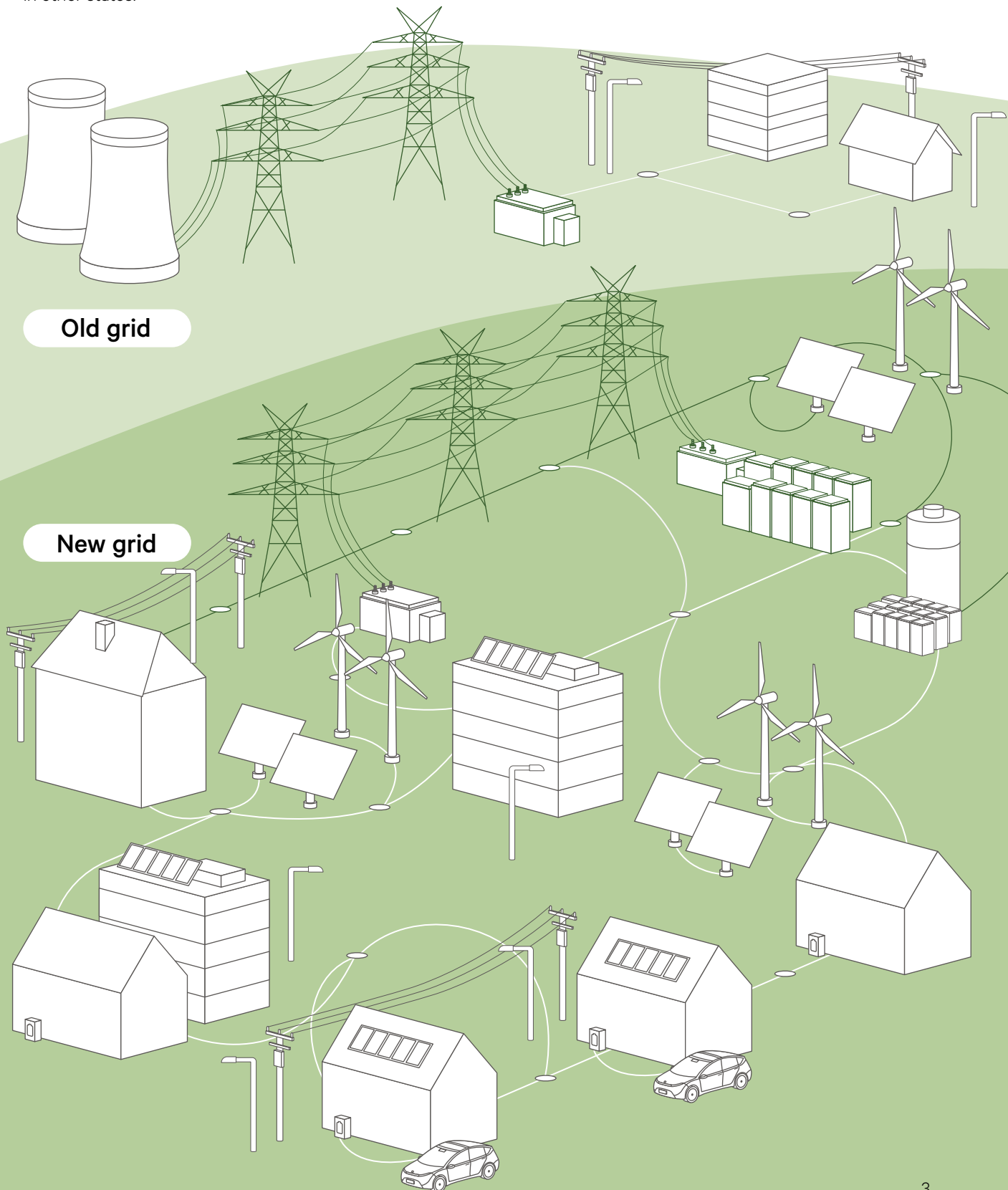
At the same time, we're getting more of our power than ever from renewable generators – each impacted by nature, such as the sun, clouds and the wind – Sam's job is becoming much more complex. While his job of keeping the lights on remains the same, it's getting so much harder.



What is the grid?

Power from large generators is sent to our cities and towns in NSW and the ACT from Transgrid's high voltage grid. However, your home is supplied by low-voltage electricity by a different company – your local electricity network. Transgrid's grid today is made from 13,000km high voltage powerlines, 128 substations and connections to grids in other states.

But it's growing and changing rapidly as more power than ever flows in every direction- from one of the biggest collection of rooftop solar in the world to more wind and solar farms with large batteries. Control room operators manage the smooth and safe flow of power across this growing and evolving grid, 24/7.



Our plan to tackle notification overload and keep the grid running smoothly

More generators, more grid, more notifications

New tools for monitoring and remote control

New skills in the control room

Maintain and upgrade new tools in the control room

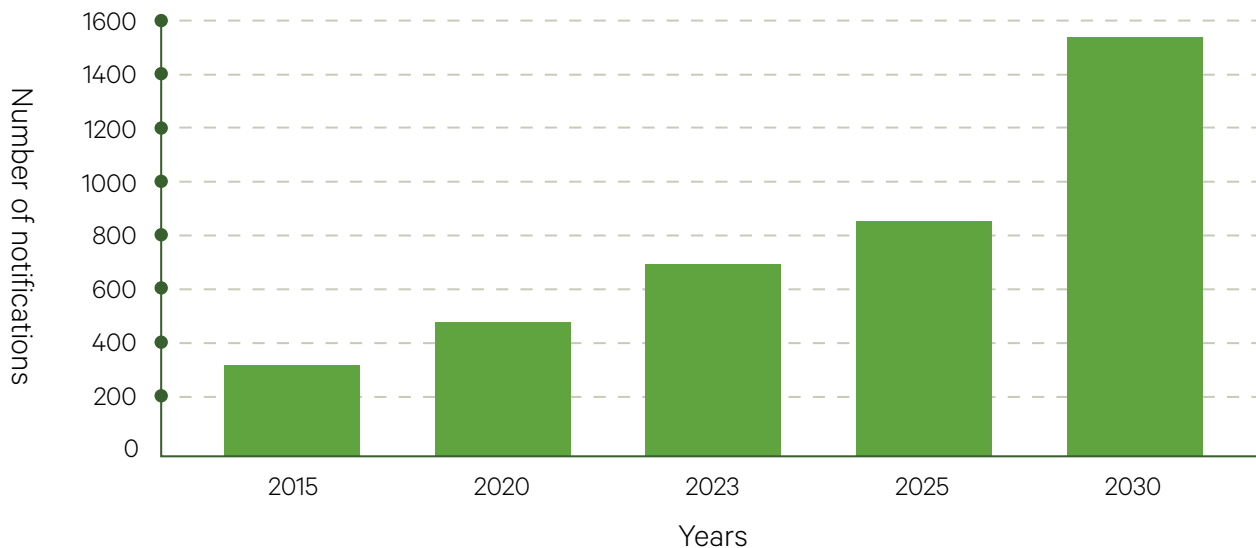


Sam relies on 'central control systems' to make on-the-spot decisions that keep the grid running smoothly and ultimately, the lights on for everyone. Notifications from across the grid alert Sam to every issue. Sifting through them all to take immediate action on the most critical- like when a section of powerline has automatically shut down because of a fault- is part of the job. But the job is getting less predictable. Imagine a very large cloud suddenly forms in the middle of the day, cutting the power generated from solar. This can cause a sudden fluctuation on the grid that needs to be stabilised right away. With thousands of new devices across a much bigger grid, the risk of notification overload or missing an important notification could cause blackouts in part of the state.

That's why Transgrid is planning for new digital controls and skills for our control room operators. This will help them better keep the lights on. Earlier notifications of issues across the grid, better insights that reduce the need to prioritise immediate problems from less urgent ones, and even a simulator where operators can train how to better manage the new grid of renewables.

By 2030, Sam could be faced with responding to more than 1,500 notifications each shift. That's almost double what he's dealing with now and five times more than what it was in 2015. Our plan would bring that number down to about 500 each shift- even less than today's levels. We think that's the right level to make sure Sam can focus on the most critical tasks to keep NSW's grid running smoothly.

Notifications per operator per shift



Did you know?

On Monday, 28 April 2025, the power grid of Spain and Portugal went into a total blackout- in a matter of minutes. In the five minutes between 12:30 and 12:35, a sudden drop of power on the grid led to a total loss of power across the two countries for reasons that are still being investigated. Although the time that operators have to respond to an issue can be very short, the impact of an issue can be widespread.

What the new digital controls mean for you

Good to know

Transgrid looked at different ways to give control room operators the tools to best manage the challenges and complexities of the new renewable grid. We spoke with experts from Australia and around the world and narrowed it down to two main options:

- Make small updates to the systems we already have
- Invest in new controls that help us better manage more renewable power connected to the grid

While making small updates would help us get by for a couple of years, investing in new controls helps us maximise the shift to cleaner energy and stay ahead of the growing challenges this will bring. These new digital controls would be instated by 2030 and last about five years, we would then consider maintenance and upgrades to take place from around 2035.

Investment

The new digital controls and training come at a cost, which we estimate to be up to \$179 million. After this time, we would review how it's working and plan for any maintenance or upgrades that may be needed. The plan is being closely reviewed by consumer representatives and an independent regulator and if it proceeds, would be paid for in your electricity bills. For the typical home in NSW, this increase would be less than the cost of a postage stamp a year.

Benefits

Thanks to more detailed monitoring in real time, the new digital controls will help us increase the amount of more energy sources on the grid. With smarter controls, our day-to-day operations to keep the grid- and our lives- running smoothly becomes easier, so we can connect more renewable generators and batteries while meeting our growing demand for power in the state.

Key outcomes at a glance



Increased access to more renewable energy sources



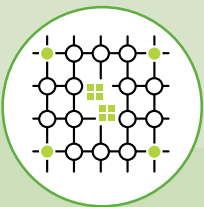
Faster response to incidents



Very small increase in electricity bills



Lower risk of outages



More efficient operations with more generators



Smarter day-to-day decisions across a more complicated grid



Ready to handle growing energy needs from homes and businesses



Lower carbon emissions