FACT SHEET

Minimum system load (MSL)

Australia's electricity grids were originally designed for one-way power flow, from large power stations to homes and businesses.

Today, unused electricity from millions of rooftop solar systems is flowing back into the grid.

However, in certain conditions, high volumes of rooftop solar can reduce the need for electricity from grid-scale generation, known as minimum system load (MSL) or demand events, which can pose risks to grid security.

AEMO is working to unlock the full potential of rooftop solar, residential batteries and electric vehicles to support energy reliability and security.

AEMO
AUSTRALIAN ENERGY MARKET OPERATOR

What are the power system risks when demand is low?

AEMO can operate the power system with high levels of rooftop solar most of the time.

However, power systems require electricity demand at safe levels and essential system services, which are provided by large power stations with spinning turbines, to maintain a safe and resilient electricity system during normal operating conditions, but also respond to issues that can impact grid security.

On sunny, mild-temperature days, typically in autumn and spring, large volumes of electricity from rooftop solar can reduce the need for electricity from grid-scale generators via the transmission network, limiting access to essential system services.

When low demand (minimum system load) periods occur AEMO as the power system operator may need to take actions to keep the grid secure, mitigating the risk of critical infrastructure damage and widespread or prolonged blackouts.

How does AEMO manage these risks?

AEMO alerts market participants through minimum system load market notices to the risks and actions being taken before rooftop solar management programs are activated as a last resort.

This process is similar to when AEMO communicates forecast low electricity reserve conditions, such as when heatwaves are causing high electricity use.

While a process with industry and governments has been established to manage these low demand conditions, AEMO is contributing to trials, research and reforms to enable more benefits from consumer energy resources, like rooftop solar, which will benefit all energy users.

Market notices are categorised over three tiers:

MSL 1

Advance notice

AEMO provides advance notice of a possible minimum system load event.

The notice will generally be issued in advance, such as a day, to provide the market time to prepare and respond. However, it could be issued quite quickly if an unexpected condition arises.

MSL 2

Grid-scale actions needed

This notice is issued if the risk remains. It states AEMO is taking available steps to maintain system security. These steps can include:

- Recalling planned transmission outages.
- Reducing grid-scale generation.
- Increasing electricity demand by large users.
- Procure or direct re-secure reserves (grid-scale batteries) where applicable.

MSL 3

Solar management activated

If actions taken by AEMO with industry have not sufficiently reduced the risk, AEMO would notify the relevant state transmission network service provider to maintain demand at the required threshold.

This may trigger the need to dial down or disconnect rooftop solar systems temporarily through solar management programs run by state governments and distribution network service providers, owners of the low voltage powerlines.

Where will this happen?

The National CER Roadmap requires emergency backstop mechanisms within each state and territory to help maintain grid stability, prevent widespread power outages, and support the continued uptake of rooftop solar.

Each of the electricity distribution businesses in each region will have complementary programs to remotely turn down or switch off rooftop solar systems during an energy supply emergency.

Further information by region: Western Australia, Queensland, New South Wales, Australian Capital Territory, Victoria and South Australia.

About us: AEMO is the independent energy market and system operator and system planner for the National Electricity Market (NEM) and Western Australia's Wholesale Electricity Market (WEM). We are a not-for-profit company, with a membership of state and federal governments (60%) and energy industry members (40%).

More info:
aemo.com.au/about/who-we-are