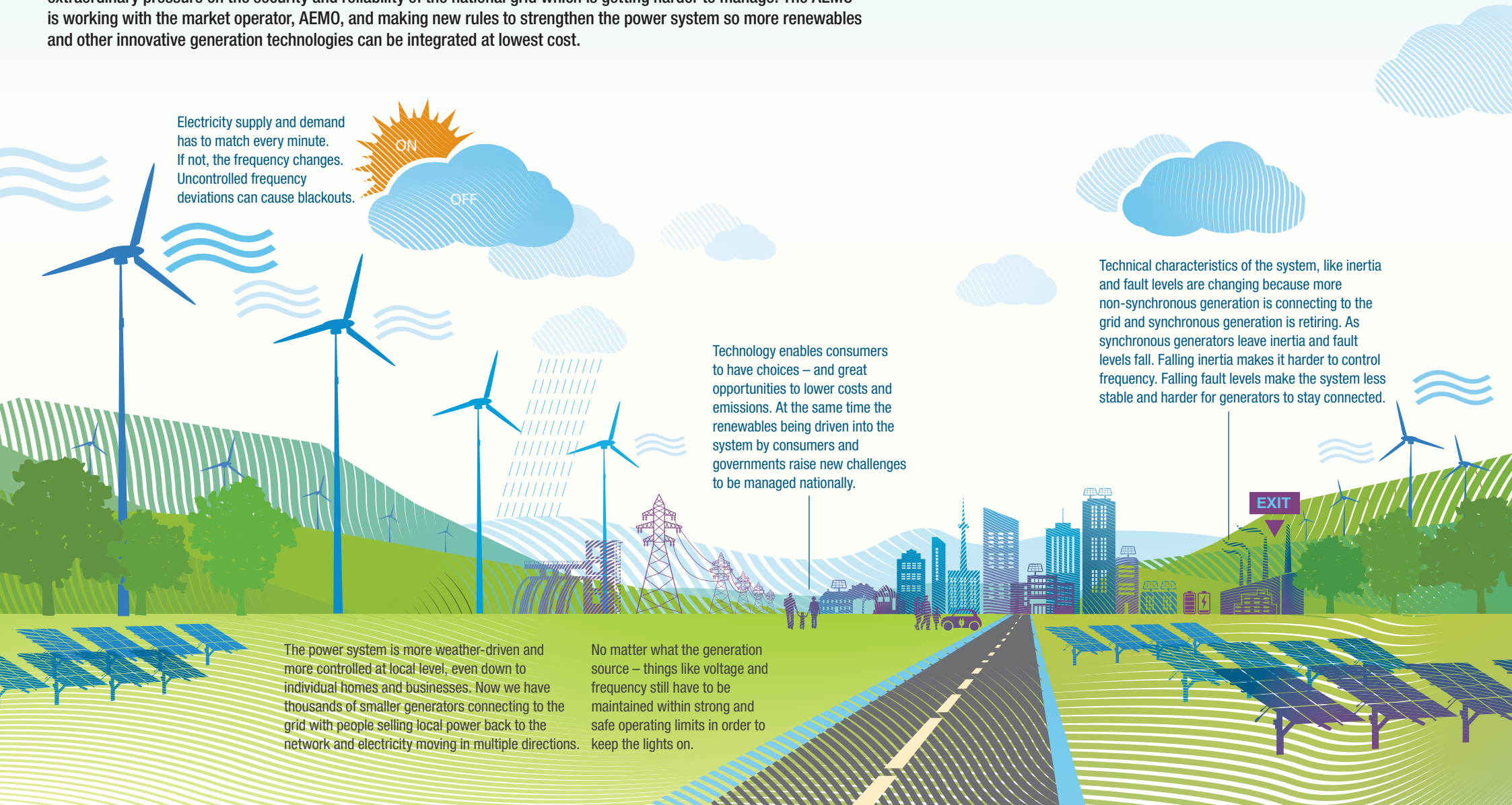
AUSTRALIAN ENERGY MARKET COMMISSION

THE BIRTH OF A CLEANER GREENER POWER SYSTEM IS HAPPENING BUT THERE ARE STABILITY PROBLEMS TO FIX ALONG THE WAY

Guarding against technical failures that cause blackouts

Electricity generation is changing. Power coming from new technologies like wind and solar farms is accelerating and consumers are driving strong growth in rooftop PV. Unprecedented in their breadth and scope these trends are putting extraordinary pressure on the security and reliability of the national grid which is getting harder to manage. The AEMC is working with the market operator, AEMO, and making new rules to strengthen the power system so more renewables and other innovative generation technologies can be integrated at lowest cost.



AUSTRALIAN ENERGY MARKET COMMISSION

AUSTRALIA'S POWER GRID IS INTEGRATING HISTORIC LEVELS OF RENEWABLES AT GREAT SPEED

AEMO and transmission companies have to manage the system differently to deal with the different technical characteristics of weather-driven generation

Big changes in the power system

In 2016 the AEMC accelerated its security and reliability work program to give the market operator, AEMO, more tools to integrate renewables into the national electricity market. This work started even before the system black happened in South Australia.

SYSTEM SECURITY

RECENT/PAST

- **Generator technical performance standards rule** new deal on negotiations to connect generators to the power system
- **Register of distributed energy resources rule** including rooftop solar so AEMO can better manage the power system
- **Frequency control frameworks review** to integrate new technologies and demand response to help keep supplies secure for consumers
- **Managing power system fault levels rule** to make networks meet minimum levels of system strength
- **Managing the rate of change of power system frequency rule** to make networks provide minimum levels of inertia
- **System security market frameworks review** recommended ways to deliver a stronger and more resilient system with better frequency control as the generation mix changes

ONGOING

- **Frequency control interim arrangements project** to work with AEMO on immediate action to manage frequency deterioration
- **Frequency control work plan** to work with AEMO and the AER on designing coordinated and lowest-cost ways to deliver frequency control services in the medium to longer term
- **Review of the frequency operating standard** by the Reliability Panel to assess whether the existing standard is appropriate to maintain a secure power system
- **Reliability Panel assessment of protected event request** by AEMO to declare the risk to South Australia's power system from destructive winds as a protected event
- **Improving intervention compensation and settlement processes rule** to improve administrative processes related to AEMO's interventions in the power system
- **Intervention mechanisms and system strength project** to evaluate the effectiveness of the interventions framework in light of the increasing use of directions by AEMO to manage system security
- **Review of the system black event in South Australia** to consider investigations completed by the AER in relation to changing the regulatory frameworks

INTERVENTIONS

Directions: AEMO issues directions to synchronous generators like gas and diesel units to operate when necessary to maintain sufficient levels of system strength and secure electricity supply. These directions are mandatory and generators are obligated to comply.

Instructions: AEMO issues instructions to large energy users or network service providers to temporarily disconnect their load or reduce demand if there is a risk to the secure or reliable operation of the power system.

RELIABILITY

RECENT/PAST

- **Early implementation of ISP priority projects rule** to streamline the regulatory processes for key time-critical projects identified in AEMO's integrated system plan
- **Coordination of generation and transmission investment review** (implementing the ISP) to better coordinate investment in renewable generation and transmission infrastructure
- **Generator three-year notice of closure rule** to require large generators to give at least three years' notice before closing
- **Reliability frameworks review** to look at lowest cost ways to make enough energy available for consumers when they need it
- **Establishing values of customer reliability rule** to make the AER responsible for calculating and updating values of customer reliability, used to develop reliability standards

ONGOING

- **AEMC/AEMO/AER virtual power plant trial** to collaborate on ways for virtual power to play a bigger role in the market
- **Coordination of generation and transmission investment implementation (access and charging)** to consider how security services may be procured in a coordinated manner by multiple parties as part of an improved access regime for the connection of generators
- **Retailer reliability obligation** led by the energy security board to incentivise retailers and other large users to invest in dispatchable electricity generation to fill any gaps between generation and forecast peak demand
- **Definition of unserved energy review** by the Reliability Panel to clarify and simplify the definition of unserved energy used in post-event analysis of supply interruptions
- **Transparency of new projects rule** to enhance publicly available information about new generation projects and allow their registration with AEMO to get access to key technical information
- **Short term forward market rule** to provide an AEMO-operated platform for market participants to contract for electricity in the week leading up to dispatch enabling more demand response
- **Enhancement to the RERT rule** to make broad changes to the NEM's strategic reserve improving its effectiveness and giving AEMO more flexibility
- **Generator registration thresholds rule** to reduce the threshold for registration as a generator from 30 MW to 5 MW so AEMO can better manage the power system
- **Wholesale demand response rules** to introduce a new mechanism, register or separate market to enable more demand response

INTERVENTIONS

RERT (Reliability and Emergency Reserve Trader): The RERT is an emergency mechanism that is used when the power system is under extreme pressure. It allows AEMO to intervene and buy electricity reserves not otherwise available in the market. It has been used by AEMO three times.