

# Corporate Plan

FY2022



# Message from the Chair



I am pleased to present the Australian Energy Market Operator's corporate plan for the 2021/22 financial year.

This is the third corporate plan AEMO has produced to articulate our priorities in delivering on our core mission: to design and operate a sustainable energy system that provides affordable, safe and reliable energy for all Australians. This plan provides a window into the way AEMO plans to deliver on our obligations and is shaped by listening and responding to feedback from our stakeholders.

This third plan also marks a development from the previous two, in content, style and online publishing. In a way, the plan, and changes within AEMO itself, reflect the disruption and transition of the electricity and gas markets and grids that make up the energy system. AEMO is operating in a radically different environment now: the days of

'incremental change' and 'business as usual' are well behind us.

The pace of decarbonisation of the energy system is accelerating. We are seeing record investments in renewable sources, commercially and domestically. At the same time, we are preparing for the progressive retirement of coal generators over the coming decades.

The challenge is to integrate the new variable renewable generation and storage technologies with the existing grids and markets in an orderly two-way design that maintains investor confidence and allows energy consumers to maximise the benefits from their participation.

Additionally, as the energy system and market increasingly rely on advanced computing, AEMO must modernise our IT systems and strengthen cyber defences. These challenges are core priorities in this plan.

The plan also supports the implementation of the Energy Security Board's reform program for the post-2025 National Electricity Market and the Western Australian Government's Energy Transformation Taskforce's program for Wholesale Electricity Market (WEM) reform. These reforms, to systems and markets, aim to modify the energy system to be more flexible to cope with variable generation, consumer

participation, more efficient operation of the energy market and network access. This work includes drafting new market rules, developing and or modifying market procedures, and conducting significant system upgrades.

In essence, this plan's support for these reform programs seeks to ready AEMO, the technical systems and market mechanisms for Australia's changing energy system as it sheds its analogue past and embraces its digital future.

This plan also recognises more is being asked of AEMO than ever before, beyond carrying out our mandated and statutory obligations. Jurisdictions around Australia are seeking AEMO's involvement in significant projects.

An AEMO subsidiary entity has been appointed by the New South Wales Government as the Consumer Trustee for its Electricity Infrastructure Roadmap. AEMO is assisting the Victorian Government's Renewable Energy Zone development plan and its recently announced VicGrid initiative. In South Australia, AEMO has advised on standards for distributed energy resources. In the west, AEMO is also supporting the evolution and implementation of the WA Energy Transformation Strategy as an adviser to Energy Policy WA.

In delivering this growing body of complex work streams, I would like to thank our previous chief executive officer and managing director, Audrey Zibelman, who successfully led AEMO through an era of substantial change. I would also like to thank our interim chief executive, Nino Ficca, who maintained the momentum while the Board undertook a global search for a new CEO.

That search ended with the appointment of Daniel Westerman, who we are proud to have as our new chief executive officer and managing director. Daniel brings substantial energy industry and managerial experience gained in the United Kingdom and the United States. Welcome.

Daniel and I are in lock-step on the need to further improve AEMO's engagement, collaboration and transparency practices for the benefit of all of our stakeholders; our industry members, our participants who fund AEMO, governments, regulatory bodies, consumer representatives, community groups and the public.

After all, our energy mission encompasses all Australians.

A handwritten signature in dark ink, appearing to read 'Drew Clarke'. The signature is fluid and cursive, with a long horizontal stroke at the end.

Drew Clarke

# Message from the CEO and MD



As AEMO's new chief executive officer and managing director, I am delighted to be entrusted by the Board to lead an organisation that provides an essential service to all Australians.

Energy is an essential service and yet it is undergoing its most rapid and far-reaching change for a century. Renewable energy and storage technologies are transforming the way we manage electricity. The success of the grid of the future will rest largely on how well we integrate the renewable power technologies over the coming years with the existing infrastructure that has served us so well to date.

I have returned to Australia after seven years working overseas in energy utilities, mainly in the United States and the United Kingdom. Coming back to Australia, I am struck by the extent and

pace of technological and social change that has occurred in the energy sector, in our capital cities, suburbs and towns.

The expansion of solar and wind generation is, per capita, leading the world. We are now seeing instances where solar energy, from rooftop PV and solar farms, can supply all of a state's energy needs in the middle of the day.

AEMO forecasts that by 2025 solar and wind generation will reach momentary peaks where it fulfills 100% of demand. To accommodate this, our ambition is to co-design with industry and governments grids that can manage 100% instantaneous penetration of renewable energy by 2025.

This brings extra impetus to the changes we are making at AEMO to manage the energy systems of the future. We are changing the way we operate by being more consultative, collaborative and transparent with our stakeholders.

This corporate plan tackles these changes by focusing our efforts on four priority areas for the 2021/22 financial year. They are:

- Operating today's systems and markets – making sure we continue to deliver on our core electricity and gas responsibilities and meet our statutory obligations;

- Navigating the energy future – tackling the technical, commercial and social dimensions of the energy transition;
- Engaging our stakeholders – embedding a new engagement approach to incorporate stakeholder perspectives into decision-making, to be collaborative and to be easy to work with.
- Evolving the way we work – having the right people in the right place supported by the right tools for the digital era.

Our industry stakeholders will see evidence of this new approach through consultations over the updated Integrated System Plan, an actionable map of the future grid. The energy industry will see our focus on sharing information as we implement major reforms to improve the operation of the system and markets. AEMO will support reforms by the Australian Energy Market Commission and the Energy Security Board.

As we seek to deliver the best possible outcomes for Australian consumers, our commitment is to work closely with all stakeholders to understand their perspectives and interests, and develop shared solutions to current and emerging challenges.

In a rapidly shifting energy landscape, the creation and operation of our future energy system is too large for any one organisation to handle. Consultation,

cooperation and partnering between governments, regulators, business and consumers will be crucial to delivering the economic, social and environmental benefits we all expect from technological progress. Building social licence with communities over benefits of creating new transmission and distribution infrastructure is crucial to our mission to design and operate a sustainable energy system for the future.

As governments around Australia continue to make policy decisions on the path to decarbonising the energy system, AEMO will ensure we provide expert advice and high-quality services without distracting from our core responsibilities to manage the day-to-day operations of the electricity and gas systems and markets.

I am proud to lead a group of talented people at AEMO, and want to particularly thank them for their additional efforts through the challenges of COVID-19. We will be doing everything in our capability to keep Australia's energy safe, reliable and affordable.

This plan sets AEMO's course for the next 12 months. We invite you to be part of the journey.

**Daniel Westerman**

# AEMO at a glance

## Vision

To be a world-leading energy system and market operator and system planner.

## Our role

To ensure safe, reliable and affordable energy today, and enable the energy transition for the benefit of all Australians.

## Our services

AEMO operates four around-the-clock control rooms, in Melbourne, Sydney, Brisbane and Perth, and provides a range of core services to the Australian energy industry.

## The way we work

Together we will work as one AEMO. Our approach is to collaborate with our stakeholders and adapt to changing industry needs. We will deliver and be accountable for our core obligations as we manage our way through the energy transition. Living our values is central to our role. We will empower our people and stakeholders, we will collaborate in an inclusive and transparent manner, we will approach each stakeholder and problem with integrity, and ultimately, we will deliver excellence in our outcomes.



## AEMO's core responsibilities and services

### System operations

- Real-time operations
- System service and security management, monitoring and review
- Engineering analysis, support and modelling
- Operating reserves and operational forecasting
- Emergency and outage management

### Market operations

- Metering
- Generator and industry registrations and accreditation
- Settlements, prudentials and payments
- Market monitoring
- Retail market operations and procedures

### System planning

- Energy system forecasting
- System modelling and planning (including Victorian planning)
- Integrated system planning and WEM planning support
- Network connection enablement
- Technical analysis and resource adequacy assessments

### Others services

- Stakeholder, member and industry support
- Technologies and data

# Energising a nation

**AEMO's primary activity is to safely operate Australia's energy systems and markets, balancing supply and demand in real time, to provide safe, reliable and affordable energy to all Australians.**

AEMO operates the bulk power system and wholesale electricity markets in eastern and south-eastern Australia, the National Electricity Market (NEM). The NEM is the world's longest continuous network, stretching about 5,000 kilometres from Port Douglas in far north Queensland to New South Wales, the Australian Capital Territory, Victoria and Tasmania in the south, and across to South Australia. Electricity is generated and traded transparently between the regions.

In the west, AEMO operates Western Australia's South West Interconnected System (SWIS) power grid and its associated Wholesale Electricity Market (WEM) that supplies power to the south-west of the state. The SWIS is geographically isolated, with no interconnections to other networks in Australia. The WEM also has a reserve capacity mechanism which ensures there is sufficient generation capacity.

These roles are at the heart of AEMO's duties, along with specific electricity and gas responsibilities in different states in Australia.

AEMO manages a number of wholesale gas markets including the Short Term Trading Market (STTM) in Sydney, Brisbane and Adelaide, and the Gas Supply Hubs (GSH) in Wallumbilla in Queensland and Moomba in South Australia.

AEMO manages the Pipeline Capacity Trading (PCT) market that supports secondary trading and encourages the efficient use of gas and pipelines, to be used efficiently, as well as retail markets in electricity and gas.

AEMO also operates gas bulletin boards in the east and west, that provide up-to-date gas market and system information.

In Victoria, AEMO controls the security and operation of the Victorian Gas Declared Transmission System (DTS) and scheduling the Victorian Declared Wholesale Gas Market (DWGM).

The retail electricity and gas markets underpin the wholesale markets by enabling retail competition and allowing consumer choice.

**AEMO system and market operations and system planning by state**



		WA	SA	VIC	NSW & ACT	QLD	TAS	NT
System Operations	NEM Power System		●	●	●	●	●	
	WEM South West Interconnected System	●						
	Victorian Transmission Network Service Provider			●				
	Victorian Declared Transmission System			●				
Market Operations	NEM		●	●	●	●	●	
	WEM	●						
	Gas Bulletin Boards	●	●	●	●	●	●	●
	Gas Retail Markets	●	●	●	●	●		
	Day Ahead Auction		●	●	●	●		●
	Short Term Trading Market		●		●	●		
	Gas Supply Hubs		●			●		
System Planning – Major Publications	Declared Wholesale Gas Market			●				
	NEM Integrated System Plan		●	●	●	●	●	
	NEM Electricity Statement of Opportunities		●	●	●	●	●	
	WA Electricity Statement of Opportunities	●						
	Gas Statement of Opportunities for East Australia		●	●	●	●	●	
	WA Gas Statement of Opportunities	●						
	Victorian Annual Planning Report			●				
System Planning – Major Publications	Victorian Gas Planning Report			●				

While AEMO is not the retail price regulator, we are responsible for the systems and infrastructure – such as metering data – that support customer transfer and retail competition.

**In addition to operating transparent markets and managing real-time operations, in the NEM AEMO fulfills the role of national system planner through the collaborative development of the biennial Integrated System Plan.**

As the independent operator of Australia's major energy systems and markets, AEMO is also often engaged by our government members to provide expert advice on technical and policy issues under consideration. AEMO produces medium- to long-term gas and electricity supply and demand reports on the east and west coasts.

Through the Energy Security Board, AEMO is supporting policy reform in the NEM to help ensure the full range of consumer services necessary to deliver a secure, reliable and low-emissions electricity system at least cost. In Western Australia, as an adviser to Energy Policy WA, AEMO is also supporting the evolution and implementation of the WA Energy Transformation Strategy.

To perform our real-time electricity and gas operating responsibilities, we monitor system performance and security via four 24/7 control rooms and associated IT systems. These ensure that the production and supply of energy can meet demand at the least cost to consumers. In the NEM and WEM, we also manage the essential services that support a secure electricity system, such as regulation balancing, frequency control, inertia, system strength, voltage management and system restart capabilities.

The changing composition of Australia's energy mix, increasing system complexity, interdependencies, vulnerabilities and the accelerating pace of technological change means AEMO is facing significant operational challenges. These challenges require a quantum shift in our engagement and collaboration, to bring the best thinking across our sector to focus on finding potential solutions that resolve challenges in the short term, whilst realising opportunities for the long-term outcomes of consumers.

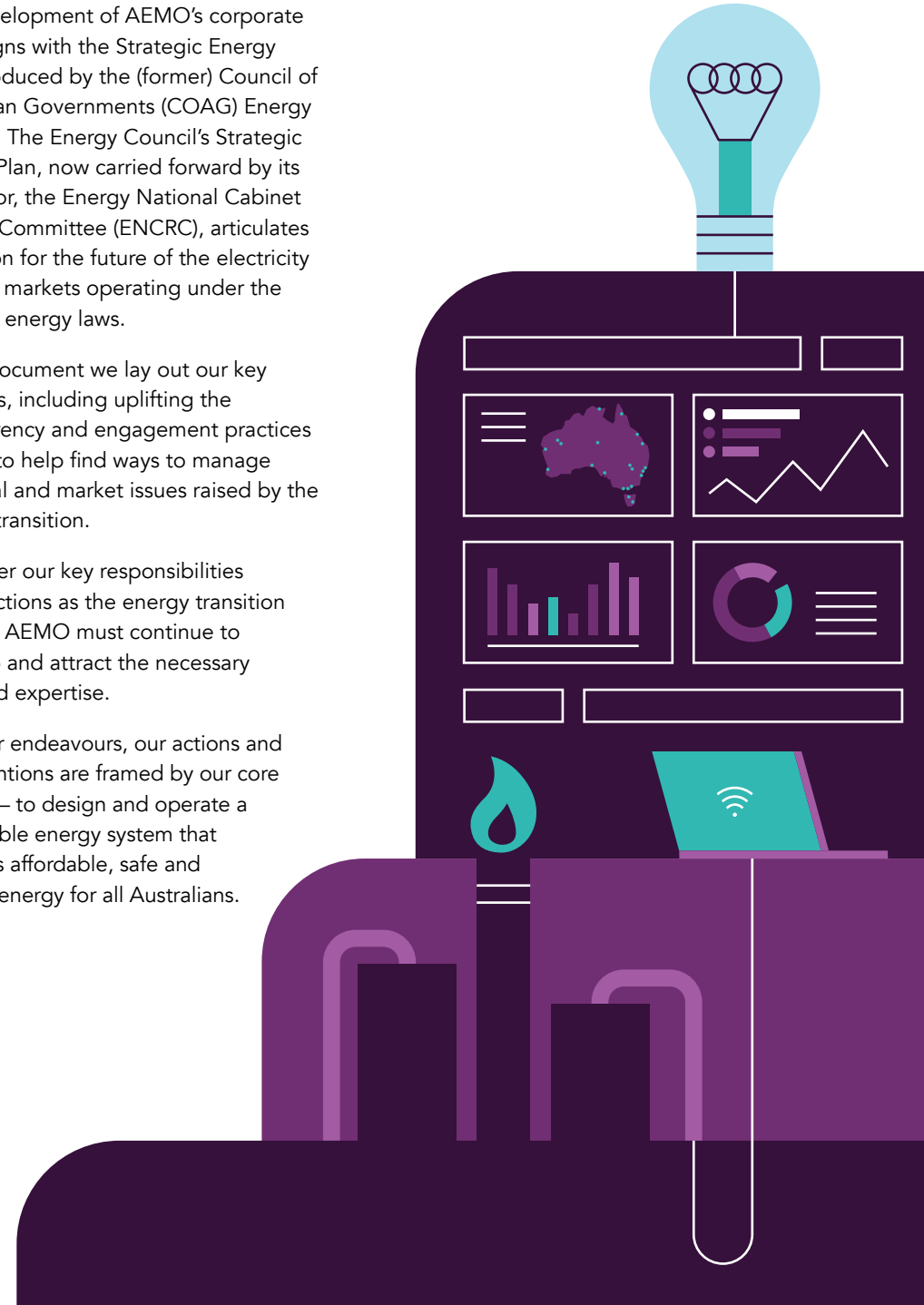
**This corporate plan outlines AEMO's strategic response to the changes that are sweeping the energy landscape amid the continuing COVID-19 pandemic, and builds on last year's efforts to progress major reforms and projects.**

The development of AEMO's corporate plan aligns with the Strategic Energy Plan produced by the (former) Council of Australian Governments (COAG) Energy Council. The Energy Council's Strategic Energy Plan, now carried forward by its successor, the Energy National Cabinet Reform Committee (ENCRC), articulates the vision for the future of the electricity and gas markets operating under the national energy laws.

In this document we lay out our key priorities, including uplifting the transparency and engagement practices we use to help find ways to manage technical and market issues raised by the energy transition.

To deliver our key responsibilities and functions as the energy transition unfolds, AEMO must continue to develop and attract the necessary skills and expertise.

In all our endeavours, our actions and our intentions are framed by our core mission – to design and operate a sustainable energy system that provides affordable, safe and reliable energy for all Australians.





# The energy transition gathers pace

Coal has decreased from 76.8% to

↓ **69.6%**

of total NEM generation (FY2017 to FY2021)  
(↓ 9% in black coal and ↓ 22% in brown coal)

...and is anticipated to decline to

↓ **47%**

of total NEM generation by FY2031

World leading rooftop solar PV installation...

**10** times world average

(25% avg year on year growth in rooftop solar PV generation in the NEM FY2017 to FY2021)

...which could generate

**30%**

of total NEM renewable energy and

**14.7%**

of total NEM generation by FY2031

## Our world is changing at speed and scale and ongoing change is expected to dominate Australia's energy future

Australia's energy transition is accelerating, as it continues to move through its most extensive transformation in a century, becoming at once more decarbonised, decentralised, digitalised and democratised.

This decade may prove to be one of the most pivotal. Some of the nation's oldest, yet most significant, coal-fired power stations will reach the end of their operating life and close; four of Australia's 16 coal-fired plants are set to retire this decade, and five more in the 2030s.

Persuasive economics, government policies, consumer preferences and environmental concerns are all combining to deliver increasing investment in a suite of renewable generation, storage and energy management systems. The Australian Energy Regulator notes more than 93 per cent of investment in generation since 2012-13 has been in wind and solar capacity<sup>1</sup>.

The instantaneous penetration of renewable energy is increasing year on year, from 38 per cent in 2018 to 57 per cent this year in the NEM, and from 39 to 65 per cent in the WEM over the same period.

This shift reflects global trends, where the International Energy Agency forecasts that renewables are set to account for 95% of the net increase in global power capacity from now to 2025<sup>2</sup>.

**As Australia increasingly relies on weather-dependent power generation, both new system challenges and opportunities are emerging.**

While solar and wind projects are being planned for locations where these natural resources are abundant, often these sites are on the electrically weak fringes of the existing transmission network. This underlines the need for the alignment of new generating and transmission capacity.

<sup>1</sup> [State of the energy market 2020 | Australian Energy Regulator \(aer.gov.au\)](#)

<sup>2</sup> [Renewables 2020 – Analysis - IEA](#)



As variable renewable generation progressively replaces traditional thermal synchronous generators, there are also implications for the technical specifications of the grid. Imbalances can cause low inertia, weak system strength, and sudden deviations in electrical frequency and voltage.

On a per capita basis, Australian businesses and households lead the world in the adoption of distributed energy resources, such as rooftop solar systems. In 2008, there were about 20,000 rooftop solar systems connected to the grid. That has grown to around 2.5 million systems in 2020<sup>3</sup>.

Today solar systems are being installed at a record rate, approximately 3 gigawatts last year, up 50 per cent on the year before<sup>4</sup>. On a per-capita basis, this rate is double its nearest rival, Germany and is about 10 times the world average<sup>5</sup>.

**Decisions on energy investments that were once the preserve of boardrooms are now taking place around suburban kitchen tables across Australia, and these decisions are having a marked effect on the grid's operation and future design.**

As households become electricity generators on a significant scale, new physical challenges for the power system can arise. In some locations, networks are struggling to cope with the quantum of rooftop solar exports flowing into the grid, in the opposite direction to the way the network was originally designed.

Rooftop solar is just the first wave of energy-focused consumer technology. Batteries and plug-in electric vehicles are expected to take advantage of low power price periods.

Interconnected neighbourhood solar and battery networks can create virtual power plants that aggregators or operators can orchestrate. Smart appliances and tariff changes can enable consumers to time-shift their peak demand on the grid.

Just as the power system is changing, natural gas has grown from fuelling local industry and households to being a major export for Australia. Exports of liquefied natural gas are exposed to international pricing dynamics that have implications for the cost and availability of gas for local use.

Battery storage capacity in the WEM is expected to grow by

**↑ 35%**

on average year-on-year, over the next 10 years

(86 MWh 2020-21 capacity year to 1,708 MWh 2030-31 capacity year)

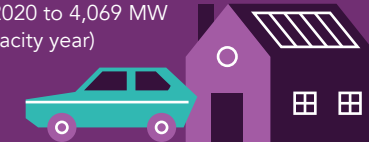


Distributed PV capacity is expected to grow by

**↑ 120%**

in WEM over 10 years

(1,877 MW in 2020 to 4,069 MW in 2030/31 capacity year)



Hydro as a proportion of NEM generation was relatively stable at

**7.8%**

(FY2021) vs 7.9% (FY2017)

...and is anticipated to increase to

**↑ 8.8%**

of total NEM generation by FY2031



Rapid increase in grid solar from 0% to

**↑ 4.1%**

of total NEM generation

(FY2017 to FY2021 due to a ↑1,285% in this fuel type)

...with an anticipated year-on-year increase to

**↑ 7.3%**

of total NEM generation by FY2031



Wind generation increased from 5.4% to

**↑ 11.2%**

of total NEM generation

(FY2017 to FY2021)

...with a further increase anticipated to

**↑ 17.8%**

of total NEM generation by FY2031



See [AEMO's Quarterly Energy Dynamics - Q2 2021](#) for more information on current market and system insights

See [2020 Inputs, Assumptions and Scenarios](#) for more information on future energy scenarios. Figures from Central Scenario

<sup>3</sup> [Clean Energy Regulator](#)

<sup>4</sup> [QED 2020 Q4 report](#)

<sup>5</sup> System strength workshop 1\_ 6 Nov 2020 online Dr Alex Wonhas  
[AEMO | System strength workshop](#)



How natural gas is moved around the country is also being re-examined, with ideas to solve pipeline constraints ranging from building new hubs, pipelines and compressor stations, to constructing gas import terminals at ports.

Beyond natural gas, the prospect of hydrogen<sup>6</sup> offers potential solutions for low-carbon energy in sectors that are difficult to electrify, in renewable generation integration and a re-imagined future for gas infrastructure.

**For AEMO, this accelerating transition is creating new operational risks that we are working to manage in both the short and long term, for the ultimate benefits of consumers.**

Recent market changes AEMO is implementing include five-minute and global settlements for energy buyers and sellers, a wholesale demand response mechanism, customer switching and a consumer data right for energy.

The pace of change heightens the urgency of the Energy Security Board's post-2025 policy and regulatory reforms, which AEMO is supporting. These reforms include:

- Making sure the right mix of resources exists to efficiently provide energy at all times;
- Ensuring those services essential to maintain the system's secure operation are available when needed;
- Improving access to the grid and that necessary new transmission can be developed; and
- Providing for the integration of distributed (or behind-the-meter) energy resources into the overall market.

In the west, the Western Australian Energy Transformation Strategy includes significant reforms to the WEM. AEMO is implementing market reforms, improving access to the SWIS for new generators and enabling enhanced power system security.

In this work, the need for collaboration and engagement with our members, stakeholders and energy consumers is more vital than ever.

**Goal: To co-design and co-engineer the NEM and the WEM to manage**

**100%**

**instantaneous penetration of renewables – at any moment in any day – by 2025**

Instantaneous renewable (grid-scale solar, wind, hydro, biomass and rooftop PV) generation continues to rise.

In the NEM 35% in 2018  
up to a new record of

**↑57%**

last year (based on  
30-minute trading intervals)

In the WEM 39% in 2018  
up to a new record of

**↑64%**

last year (based on 30-minute  
instantaneous values)

Energy generated by variable renewable energy resources increased by

**↑99%** since 2016

(from 12% of the WEM generation mix in 2016 to 24% in 2020)

Output of distributed PV grew by

**↑150%** since 2016

(from 4% of WEM generation mix in 2016 to 10% in 2020)

<sup>6</sup> ARENA Hydrogen Feasibility and demonstration projects, CSIRO National Hydrogen Roadmap, Federal Government's National Hydrogen Strategy

# Embracing the future

Market intervention increasingly required with the market under direction

## 46%

of time in FY2021

(compared to <1% of time FY2016)

Zero or negative prices occurred

## 13.2%

in the NEM between 10am and 3pm in 2021, compared to 1% of the time in 2017

Average minimum daytime demand in the WEM has fallen

## ↓ 29%

since 2016

(2,124 MW in 2016 to 1,500 MW in 2020)

Minimum demand is expected to fall

## ↓ 232 MW

in the WEM by the 2025/26 capacity year

(the current record stands at 954 MW in March 2021)



Negative prices occurred in WEM

## 30 x

more frequently than 5 years ago

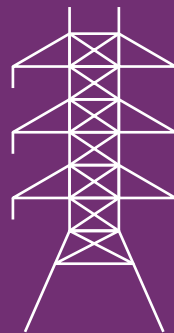
(0.3% of intervals in FY2016 vs 9% in FY2021)

Minimum operational demand in NEM reaches

## 19

year low

at 14,614 MW, equating to 34% below avg op demand



**Traditional power system operations, regulations and market functions are challenged as the provision of secure and reliable energy becomes more complex. AEMO is embracing this future.**

In a rapidly transforming energy landscape, it is becoming increasingly complex to coordinate the seamless delivery of energy to households, businesses and industry.

This corporate plan articulates AEMO's strategic response to embrace the challenges and opportunities the advancing energy system presents.

**AEMO's goal is to co-design and co-engineer, with industry and governments, NEM and WEM grids able to manage 100 per cent instantaneous penetration of renewable energy, and do this by 2025.**

We are reshaping in response to our rapidly changing environment with an increased focus on delivering efficient, impactful outcomes for the benefit of all energy consumers. This means we are committed to greater transparency, commercial accountability and effective collaboration across the sector.

Changes underway at AEMO are aimed at enabling our primary mission and delivering our vision to be a world-leading

energy system and market operator and system planner. To achieve this, we are keen to learn from, and adopt, best practices from our members, stakeholders and other jurisdictions to fulfil our core roles and responsibilities.

As Federal and state governments expand the range of their policies to support the energy transition, they are also requesting AEMO support a broadening range of roles.

Much of AEMO's major work in FY2022 can only be delivered in collaboration with market bodies, participants and other stakeholders. For AEMO, effective collaboration and transparency are now critical business enablers.

In FY2022 in the NEM, we will work collaboratively with members of the Energy Security Board to develop the suite of post-2025 reforms. These include the integration of distributed energy resources, renewable energy zone development and network access, resource adequacy and system security.

AEMO will release an updated Integrated System Plan (ISP), providing an actionable roadmap for the development of the NEM over the next 20 years.

To realise the full potential of the ISP, AEMO and the energy industry are developing the NEM Engineering Framework. The framework complements the ISP, providing a coordinated approach to planning for system operability during the transition to the futures envisaged in the ISP. This will inform future priority projects for AEMO and the other market bodies.

In FY2022, AEMO will implement major NEM reforms on behalf of the industry, including the five-minute and global settlement systems, customer switching and a wholesale demand response mechanism.

These are major reforms entailing significant systems uplifts both for AEMO and participants. In delivering these reforms, AEMO is focused on addressing a range of implementation risks to maximise consumer benefits.

In Western Australia, AEMO is supporting the delivery of the State Government's Energy Transformation Strategy<sup>7</sup>.

Throughout FY2022, AEMO will improve organisational efficiency, achieve cost savings and expand our user-pays model to ensure the best long-term outcomes for consumers.

AEMO will provide our stakeholders with reasoned cost estimates for our proposals with clearly articulated risks, and look to make least-cost, least-regret recommendations.

**We are also designing simpler structures, systems and processes, and building new capabilities where required.**

The exponential growth in data and more demanding short-term and long-term forecasting, along with complex market reforms, require a strategic technological response to embrace the challenges and opportunities the advancing energy system presents.

To this end, a key enabler of our corporate plan is our digital strategy which is delivering technological improvements in data and integration, cyber security, IT systems and infrastructure and digital business transformation.

Regulatory change is accelerating

**↑ 33%**

in the number of AEMC projects completed and underway  
(FY2017 to FY2020) (as per AEMC's 2019-20 Annual Report)

Total gas and electricity registration applications

**↑ 44%**

from 301 in 2017 to

**433** in 2020

**80%**

change to AEMO's obligations, systems and processes expected from WA Government's WEM reform

Daily forecasts explode.

**↑ 5,800%**

in daily wind and solar forecasts  
(43,776 in 2007 vs 2,582,784 in 2021)

<sup>7</sup> [WA energy transformation strategy](#)

AEMO's digital strategy is delivering a new IT platform and services that will provide a frictionless, secure, and scalable digital experience for members, employees, and consumers.

By using modern, contemporary technology, AEMO will be able to operate more effectively and deliver market and power system changes more efficiently and at a reduced cost.

Not only is AEMO strengthening cost controls, processes and systems, we are also drawing on the capability, passion and teamwork that defines our people and our organisation.

**We seek to foster an organisational culture based on three overarching principles: one team, consumer-centric and stakeholder-focused.**

Together we will add value to stakeholders by working as 'One AEMO', learning and adapting and taking accountability to deliver on our role in managing the energy transition while delivering our core obligations.

We are striving to create an atmosphere of trust and openness with our stakeholders, members and the public.

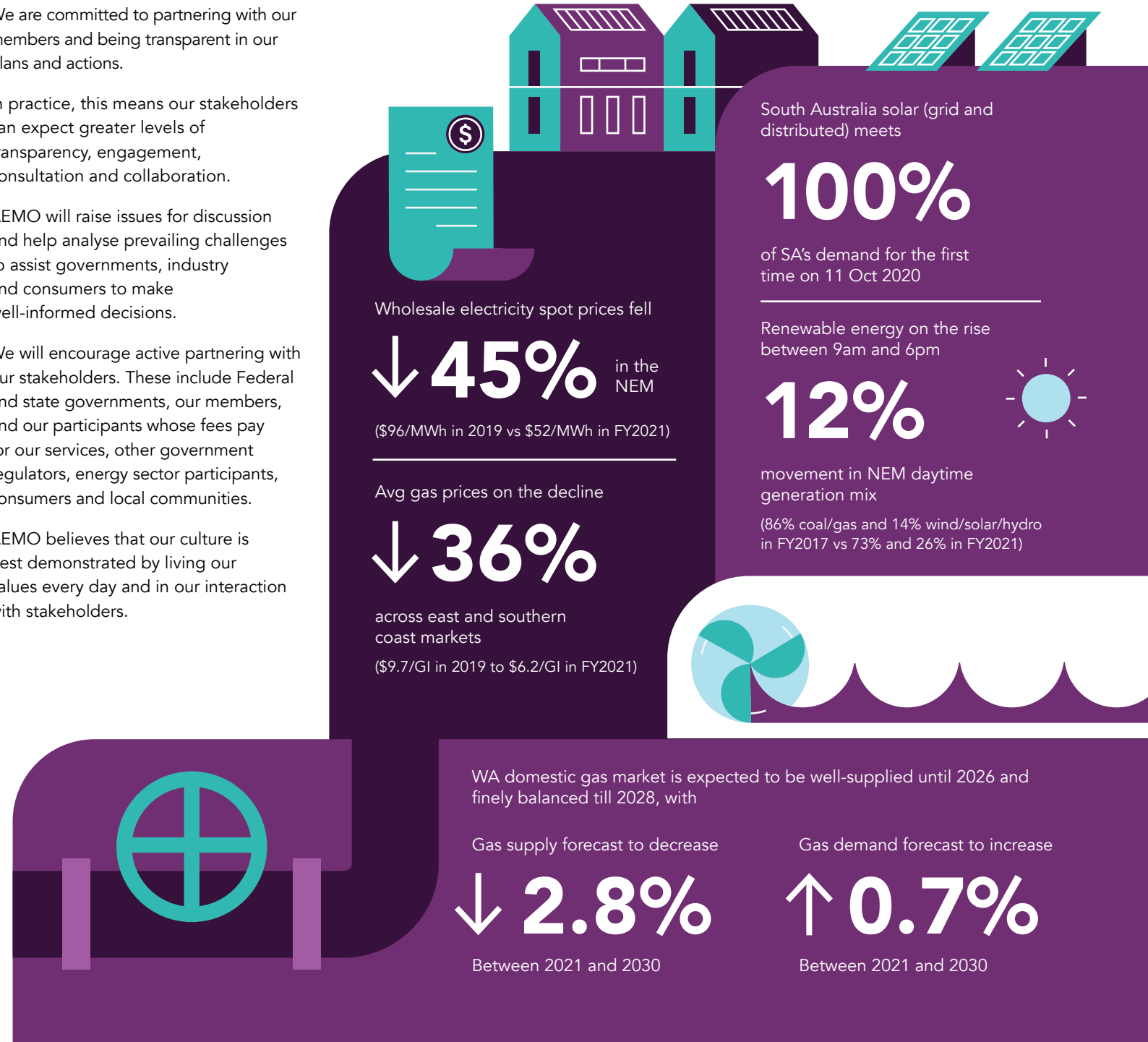
We are committed to partnering with our members and being transparent in our plans and actions.

In practice, this means our stakeholders can expect greater levels of transparency, engagement, consultation and collaboration.

AEMO will raise issues for discussion and help analyse prevailing challenges to assist governments, industry and consumers to make well-informed decisions.

We will encourage active partnering with our stakeholders. These include Federal and state governments, our members, and our participants whose fees pay for our services, other government regulators, energy sector participants, consumers and local communities.

AEMO believes that our culture is best demonstrated by living our values every day and in our interaction with stakeholders.



# Our priorities at a glance

This year, to guide AEMO to deliver our core obligations, responsibilities and major work streams, the AEMO Board and Executive have identified four high-priority areas that will shape AEMO's strategic journey in FY2022.

These four priority areas ensure we deliver our core obligations and responsibilities to the Australian energy industry, while simultaneously preparing for the energy systems and markets of the future, and driving critical change in the way we operate. The priorities are:



## 1. Operating today's systems and markets

Delivering the electricity, gas and other statutory responsibilities that are fundamental to AEMO's mission.

AEMO is committed to maintaining secure and reliable operation of energy systems and markets, while maximising benefits in the interest of consumers.



## 2. Navigating the energy future

Collaborating with our members and stakeholders to identify emerging issues, provide technical and economic expertise and support new and ongoing reforms.

AEMO works to meet the physical and commercial challenges associated with the energy transition by developing a roadmap that delivers least-cost and lowest risk outcomes for consumers. AEMO will also ensure clarity of scope, costs and outcomes for industry participants and members in any reform process we are engaged on.



## 3. Engaging our stakeholders

Being transparent, collaborative and stakeholder-focused. AEMO is establishing new ways to better incorporate feedback into our decision-making.

We are uplifting our external engagement across all functions to enhance the stakeholder experience, deliver better value to our members and improve collaboration and transparency with – and for – the industry.



## 4. Evolving the way we work

Being a more transparent, efficient, stakeholder and customer-focused business with clear accountabilities, while improving our service delivery, external engagement and responsiveness.

This includes ongoing organisational efficiency and capability work, renewing our data and information technology system capabilities, and embedding a consumer and stakeholder mindset in our culture and governance.

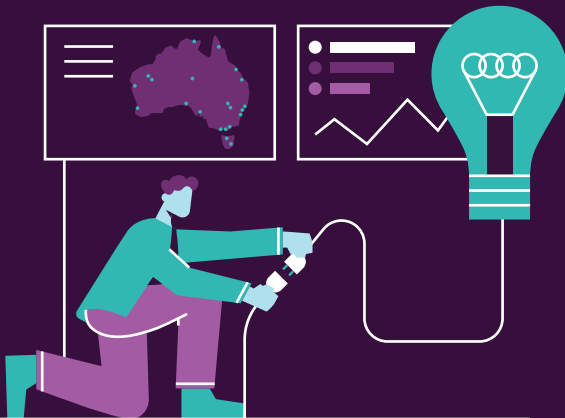
# Priority 1 – Operating today's systems and markets

## Deliver our core responsibilities in accordance with electricity, gas and other laws and regulations.

Our primary role is to ensure that Australia's energy systems and markets are operated reliably and securely every day.

In an environment where day-to-day operation of the nation's energy systems and markets has never been more challenging, AEMO will maintain our focus on constantly adapting our operations through FY2022 and meeting this ongoing commitment to Australian consumers.

We will maintain and enhance our focus on effective real-time system and market operations, power system resilience, cyber security and robust market and system intelligence.



How we will achieve this priority:

### 1. System and market operations

We ensure Australia's energy systems and markets can be securely and reliably operated under all foreseeable conditions.

In addition to delivering effective day-to-day real-time system and market operations, AEMO will:

- **Engage on, and manage emerging power system resilience issues** through cost-effective measures that improve the ability of the power system to ride through extreme events.
- **Ensure operational plans are in place** to manage increasingly common challenges that stem from a changing energy mix, including minimum electricity demand, lower levels of synchronous generation, and new ways to optimise ancillary services to maintain system strength and security.

### 2. Energy system and market insights

We publish statutory publications, reports and energy and market intelligence to the satisfaction of our stakeholders.

- **Deliver quality, timely reports and publications** that are valuable to AEMO stakeholders.

### 3. System and market technologies

We leverage technological innovations, uplift systems and invest in advanced analytics and forecasting capabilities to improve the efficient and secure operation of energy systems and markets. Significant investment is being made to better deliver system performance at a reduced cost.

- **Upgrade and/or replace legacy grid and market IT systems** with more intelligent and scalable technology that meets the evolving demands of the industry.
- **Enhance our forecasting and real-time operations capabilities** to streamline control room decision-making processes. New technologies will provide access to timely and accurate data, advanced analytics and workflow-driven visualisations and forecast through a common platform.
- **Ensure enhancements to IT systems and procedures can manage the energy system** at lower levels of demand, synchronous generation dispatch and increasing levels of variability (including improved forecasting).

### 4. Cyber security

We work with government and industry to safeguard AEMO's and Australia's energy systems and data from malicious intent and intrusion.

- **Mature our cyber security capability** by enhancing our monitoring and detection of malicious activities through automated tools and Security Operations centre and enhancing our threat response by upgrading system recovery and back up options.
- **Actively engage with governments and industry to strengthen cyber security** by supporting industry insights and readiness assessments regarding cyber threats and activities, providing input into Commonwealth Critical Infrastructure Systems of National Significance Legislation, and sharing cyber information with members.



# Priority 2 – Navigating the energy future

## Support and deliver mandated reforms and improvements to critical systems and markets efficiently, cooperatively and cost-effectively.

The suite of wide-scale and complex reforms facing the Australian energy industry form a significant portion of AEMO's portfolio of work for FY2022. The majority of this work is mandated through the various decision-making bodies.

While AEMO and the industry confront immediate and emerging operational and technical issues, the answers to these challenges are complex.

Our approach is to be open and transparent with network operators, market bodies and the wider industry to provide facts and advice, and co-design innovative and cost-effective potential solutions.



How we will achieve this priority:

### 1. Forward challenges and opportunities

We identify, communicate and consult on critical operational issues, and plan and advise on future energy system needs.

- **Deliver the 2022 Integrated System Plan**, mapping a least-cost pathway for consumers through the energy transition.
- **Embed the NEM Engineering Framework** to provide a holistic view of the changing energy system and help prioritise effective approaches for resolving the most pressing technical issues, such as minimum demand and periods with high inverter-based resources. For more information see the [NEM Engineering Framework](#).

### 2. Reform partner

We proactively support the energy transition through collaboratively sharing key insights, providing timely technical analysis, and supporting the industry, market bodies and governments in meeting challenges, lowering costs and capturing opportunities.

- **Reshape how we engage and collaborate throughout the reform lifecycle**, providing transparency around costs, funding and fee considerations, and stakeholder implications.
- **Ensure reform implementation costs and cost recovery mechanisms are well understood** prior to final decisions being made.

### 3. Reform implementation

We efficiently deliver mandated reform programs on behalf of the industry, as required, with a strong focus on reducing costs to industry and consumers.

- **Deliver market reforms** mandated through the regulatory processes of the various decision-making bodies. Key reforms include WEM Reform, five-minute and global settlements, wholesale demand response, and customer switching. For more information on all reforms see [NEM reform roadmap](#) and [WA Energy Transformation Strategy](#).
- **Support implementation of the actionable Integrated System Plan projects** and other projects identified through State schemes.
- **Support the Energy Security Board's NEM Post-2025** work to provide evidence, thought leadership and support for future NEM regulatory and market design under the post-2025 program, ensuring all proposed changes articulate clear costs and benefits.
- **Develop a National Simulator that supports energy reforms**, through more efficient and scalable processes and benefits for managing operational grid complexity and new renewable connections.

# Priority 3 – Engaging our stakeholders

## Be a trusted partner that puts our members and stakeholders at the centre of everything AEMO does.

Progress in adopting a new model of collaborative engagement and enhanced transparency has been achieved over the past year. But there is more to do.

We are listening and responding to our members and stakeholders to understand how to improve our engagement, processes and systems. We will focus on effective stakeholder interactions, embedding a new stakeholder framework, incorporating stakeholder perspectives into our decisions and transparently sharing information about AEMO's operations and financial decisions.

To deliver our workstreams, it is vital AEMO builds our social licence with stakeholders. Stakeholders can expect AEMO to follow the principle of 'says what it does and does what it says' in the delivery of our commitments.

As new functions are requested of AEMO by Australian governments, we will work to capture synergies for the benefit of consumers, and ensure the effectiveness of AEMO's existing functions is maintained or enhanced.



How we will achieve this priority:

### 1. Transparency and collaboration

We will uplift external engagement, increasing transparency to build trust and provide value to our members and the wider energy industry.

- **Embed our new engagement framework** and establish an ongoing mechanism to measure and share stakeholder assessments of our engagement processes and their effectiveness.
- **Ensure our role in the Australian energy ecosystem is transparent and valuable** to the Australian energy industry.

### 2. Service excellence

We are responsive, adaptive and supportive in our interactions, motivated by a strong customer focus and committed to delivering what we promise.

- **Ensure that participants, members and other stakeholders' day-to-day interactions with AEMO are easy, positive and worthwhile.**
- **Better manage, respond to, and incorporate stakeholder feedback and perspectives.**

### 3. Grid connections

We transparently inform and support participants to evaluate investment choices and cooperate with all parties throughout the grid connection process in a timely manner.

- **Develop and implement a streamlined end-to-end connections, registration and onboarding process**, and support implementation of other necessary structural reforms, co-created with industry.
- **Deliver a project and document management system for connections projects** to enhance transparency, provide tools and systems to effectively manage and navigate the connections process, and assist proponents in making informed investment choices.

### 4. Jurisdictional support

We will undertake functions and provide advice to each member jurisdiction, providing high quality services without distraction from AEMO's core responsibilities.

- **Provide high quality bespoke services** with no cost impact to, and zero distraction from, core obligations.
- **Create new functions as required by governments**, with appropriate governance, risk management and cost-recovery mechanisms.

# Priority 4 – Evolving the way we work

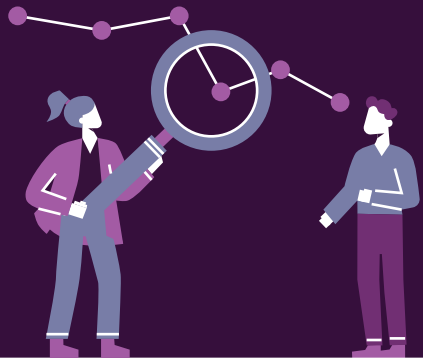
## Be an adaptive, commercial and consumer-focused organisation.

It would not be possible for AEMO to fulfill our role in the Australian energy industry without the right people, processes, technology, governance and financial management.

As the complexity, speed and agility of tasks asked of AEMO evolve overtime, we will build a strong platform to equip our workforce and our business. We will ensure cost-effective and efficient delivery of existing and new functions, and foster an expert workforce and customer-focused culture. We will give consideration to how our activities and financial decisions impact our members and our fees.

In addition, we will build strategic technology assets for the enterprise and our core businesses (operations, markets, forecasting) through our multi-year digital transformation program.

This will reduce complexity and cost while enabling effective decision-making with quality data, analytics and strategically rich insights.



How we will achieve this priority:

### 1. Talent, culture and capability

We strive to be an inclusive, excellent and adaptive workforce that embraces a stakeholder and consumer mindset in the delivery of positive change for the future.

- **Build a culture roadmap** delivered through our leaders that supports a fit-for-purpose culture and embraces internal, stakeholder and consumer considerations.
- **Develop and initiate a talent strategy** to have the right people in the right place and at the right time.
- **Implement an organisational capability plan** that ensures AEMO has the right strategic capability (people, process and system) to deliver on core obligations and future needs.

### 2. Organisational excellence

We will constantly work to be a more efficient and effective organisation with clear accountabilities, improved service delivery, effective external engagement, and a customer and commercial focus.

- **Embed risk management practices into day-to-day work** to manage the risk environment and support decision-making
- **Deliver brilliant basics** to ensure accurate, dependable and accessible information for internal and external use, increase capability, and simplify and improve business foundations, including through the replacement of finance, human resource, payroll and governance systems.
- **Develop and embed new post-Covid ways of working** that appropriately connect and enable our people to perform at their best, supported by appropriate tools and facilities.
- **Ensure financial sustainability** through implementing activity-based costing and an enhanced benefits capture and realisation framework, and in collaboration with members, review funding model options.

### 3. Digital, data and technology

We ensure our digital and data solutions maximise the performance, reliability and security of Australia's energy systems and markets, and support efficient and low-cost integration and business operations.

- **Deliver key technology platforms and a more contemporary IT landscape** to enable efficient use of technology and agile adaption for the benefit of stakeholders.
- **Invest in data and process digitalisation** to improve productivity and operational efficiency that leads to consumer price benefits.

# Delivering our budget

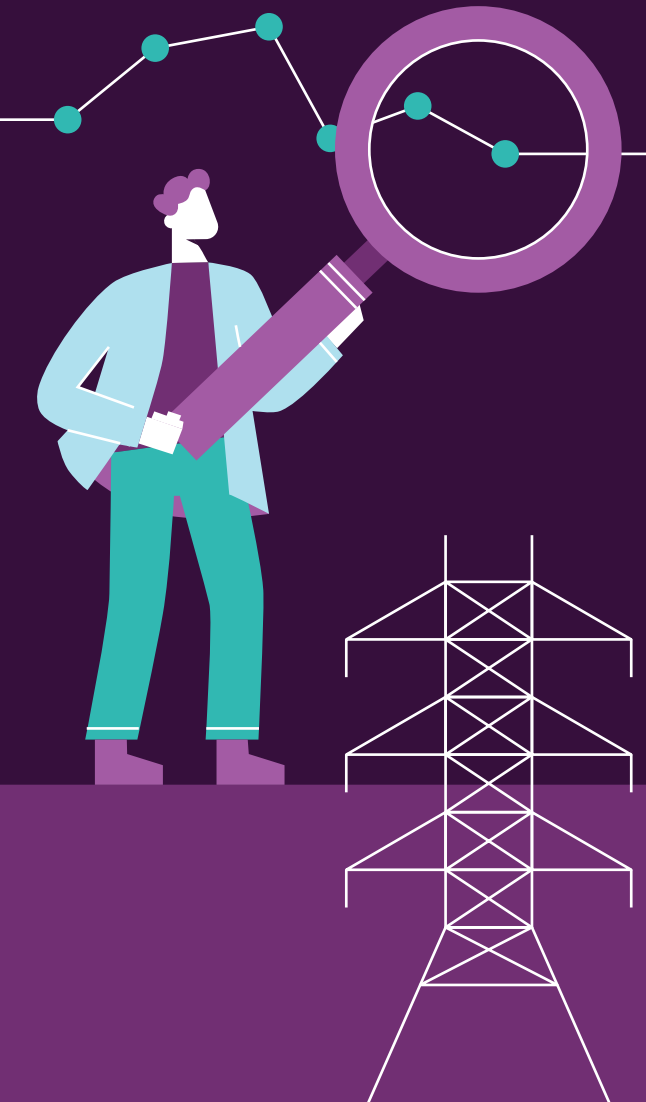
AEMO's annual revenue requirement, as reflected in our budget, is established to recover operating expenditure for each energy market we operate and the recovery of other services consistent with our legislative authority. In Western Australia the fees and charges are approved by the Economic Regulation Authority.

For FY2022, AEMO's revenue budget is \$302 million and the total operating expenditure budget is \$314 million, resulting in an annual budget deficit of \$12 million and an estimated accumulated deficit of \$54 million.

The operating expenditure in the budget incorporates all costs of operating the markets and systems, as well as a return of debt principal and interest amounts associated with AEMO's funding of investments in assets, systems, and tools. AEMO's current governance model requires debt funding of investments upfront with the debt repaid over the life of the asset, funded through a depreciation and amortisation recovery.

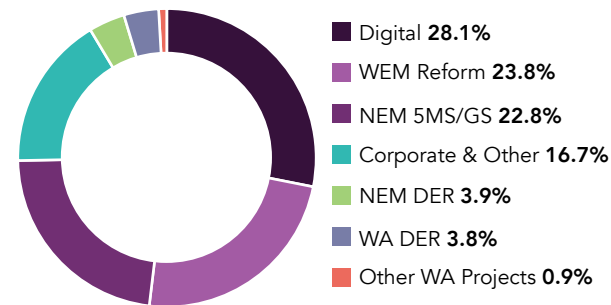
## Financial summary for FY2022

AEMO Financial Overview (\$M)	Budget FY2022
REVENUE	
Fees and Tariffs	\$ 255.0
Other Revenue	\$ 46.7
<b>NET REVENUE</b>	<b>\$ 301.7</b>
OPERATING EXPENDITURE	
Expenditure	\$ 267.6
Depreciation and Amortisation	\$ 43.9
Borrowing costs	\$ 2.1
<b>TOTAL OPERATING EXPENDITURE</b>	<b>\$ 313.6</b>
<b>ANNUAL SURPLUS / (DEFICIT)</b>	<b>\$ (11.9)</b>
Accumulated Surplus (Deficit)	\$ (53.6)



In recent years, AEMO has invested heavily in foundational platforms and systems that achieve asset renewal and uplift to deliver against regulated energy market reforms. In FY2022, our net investment will be \$136 million, of which \$37 million is supporting the Western Australian Market reform program.

#### Investment profile (net) for FY2022



Only reform programs that are underway are captured in the FY2022 investment program. Energy Security Board post-2025 NEM reform projects are not captured in this budget investment program.

AEMO's reliance on debt funding in FY2022 is \$111 million, which takes the outstanding debt balance to \$469 million at the end of the budget year.

This total outstanding debt balance reflects funding of projects in progress and investments in service, as well as the accumulated deficit.

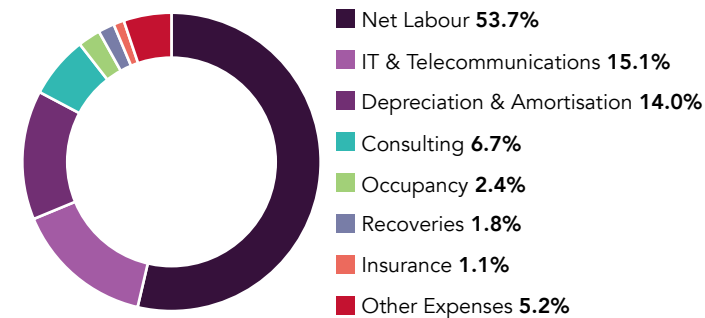
Market participants and consumers will benefit as industry reform programs such as the five-minute and global settlements, NEM Distributed Energy Register and data and digital enablement projects go live in FY2022.

AEMO's FY2022 operating cost budget incorporates achieving identified labour and non-labour savings arising from our Operational Excellence Program (OEP) activities. In addition, a further saving is factored into the budget.

While AEMO is working hard to deliver ongoing efficiencies, our operating costs increase in FY2022.

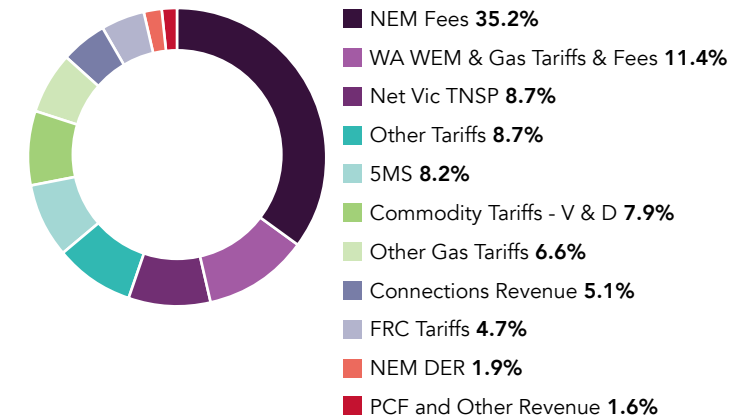
The increase is largely a result of higher Information Technology (cloud and service and support contracts) and Depreciation and Amortisation expenditure. Such increases are predominantly due to market reform investment projects going live in FY2022, as mentioned above.

#### Operational cost profile for FY2022



Fee increases for almost all services are increasing by less than 9% in FY2022. For further information see [AEMO's FY2022 budget and fees](#).

#### Revenue for FY2022



# Governing our organisation

AEMO is governed by a Board of Directors, which oversees the management of AEMO's business affairs to meet the company's objectives and responsibilities under relevant legal and regulatory regimes, and also monitors the performance and cost-effectiveness of AEMO's operations and systems.

Our FY2022 Corporate Plan reaffirms the priority the Board and leadership places on meeting AEMO's core obligations and responsibilities, collaboratively supporting energy transformation, fostering strong stakeholder relationships and delivering an efficient and cost-effective organisation.

The COVID-19 outbreak and continuing domestic and global government restrictions have had wide-scale implications for the Australian economy. Our people continue to adapt to the changed governance and organisational needs arising from the COVID-19 pandemic and a transforming energy industry. AEMO is committed to ensuring that a robust corporate governance framework is in place and that industry best practices are adopted.

## Risk statement

AEMO faces a variety of strategic, operational and emerging risks given the nature of our functions. These include industry transformation, cyber security, regulatory, compliance, financial, prudential, reputational, people and operational risks. Our strategic risks are set out in the table in this section.

Our strategic risks have been factored into the development of this Corporate Plan's four high-priority areas, and key risk controls have been incorporated into the goals, outcomes and performance measures throughout this plan.

In this way, the plan is aligned to identify and manage risks that could have material adverse impacts on:

- Operating today's systems and markets;
- Planning and navigating the energy future;
- Engaging our stakeholders; and
- Evolving the way we work.

Accountability for risk management, including guidance on the level of risk acceptable or appropriate to meet our corporate plan objectives and its implementation across AEMO, sits with the Board. The Risk and Audit

Committee, a sub-committee of the Board, assists the Board in the effective oversight of risk. The Managing Director has accountability for implementation of the Risk Management Policy and Framework and through the executive leadership team integrating risk management into key operational decision-making.

AEMO has in place a risk appetite statement and risk tolerances for functions across the business that provides guidance on the level of risk that is acceptable or appropriate to meet our Corporate Plan objectives.

Key strategic risks for AEMO are set out below. Each key risk has mitigations and controls in place.

## AEMO's strategic risks

### Key risk

Inability to adapt our workforce and culture to execute our strategy.

Ineffectively articulating and achieving necessary changes to manage industry transformation, resulting in an inability to perform our core functions over time.

Our legacy technology systems compromising our ability to perform our core functions.

Increasing complexity of compliance risks impacting our ability to deliver on our core objectives as an independent systems and market operator.

Ineffective delivery of projects impacting our ability to meet the demands of a changing energy industry.

Inability to maintain power and gas system security and reliability due to disruption in the energy ecosystem, extreme events and climate change.

A cyber incident resulting in a loss of grid system and/or market suspension.

Insufficient financial health to be able to deliver against our core obligations.

Inability to maintain member confidence and support in AEMO's strategic direction and key initiatives in an environment of member interests becoming more divergent.

Assumption of new functions distracting from core responsibilities or not having appropriate governance, cost recovery mechanisms in place.



# Achieving corporate plan objectives

AEMO will continually measure how effectively we achieve our key business and strategic objectives.

To demonstrate progress toward our objectives, we will track delivery against the four priority areas articulated in this plan.

Our key strategic outcomes for FY2022 are detailed throughout this plan, and our key business and strategic measures are summarised on this page.

We believe our FY2022 outcomes and measures provides the right balance and focus for our day-to-day responsibilities, while ensuring that AEMO is accountable for our commitments in enabling Australia's future energy system and driving critical change in the way we operate.

## AEMO's key business and strategic measures against our four priorities

Priority	Key measures for FY2022	Target
Priority 1	No region-wide system black event	0
	No preventable load shedding	0
	Meet all operational energy system security and reliability requirements	100%
	Achieve forecast accuracy ( <i>Covering medium-term, short-term and pre-dispatch forecasts</i> )	80%
	Achieve all material prudential supervision obligations	99%
	Settlement statements issued and settled on time	99.9%
	No loss of system and/or market suspension due to preventable cyber incidents	0
	Maintain IT availability for NEM, gas and WA markets and systems	99.65%
	Meet all material legal and reporting obligations	100%
Priority 2	High priority regulatory reform projects delivered on time to approved budget	100%
	Achieve stakeholder satisfaction with AEMO engagement ( <i>Combined committee member survey and stakeholder perception score</i> )	65
Priority 3	Achieve improved stakeholder perception ( <i>Weighted score including net advocacy, transparency, reputation, and relationship quality</i> )	57
	Achieve participant satisfaction with AEMO's connection process ( <i>Surveyed at time of application, registration and commissioning</i> )	70
Priority 4	No significant deterioration in AEMO's health and safety performance	0%
	Achieve FY2022 expenditure budget	Budget -2%
	Achieve year-on-year improvement in employee engagement	+ 10%
	Achieve capital efficiency (dollar value of projects delivered to scope and ≤ budget)	100%

### AEMO's major publications and consultation

In addition to tracking the outcomes and measures documented in this plan, AEMO will publish the information necessary to fulfil our regulatory obligations and inform our members.




AEMO produces a significant number of publications and reports relating to our energy systems. Please visit our website for our library of [major publications](#).

We will also undertake broader stakeholder consultation to discover additional information of value to participants seeking to remain well-informed on system and market performance.

For more information see our [schedule of consultations](#).

### Interconnection between our major publications

Publications over the planning and forecasting horizon consider the credible future scenarios in line with the published methodologies

	Electricity	Gas	Whole of System
 <b>NEM &amp; East Australia</b>	<b>NEM Electricity Statement of Opportunities (ESOO)</b> (Annually - August) Forecast of electricity supply, demand and reliability in the NEM, including assessment against the reliability standard for a 10-year outlook.	<b>Gas Statement of Opportunities for East Australia (GSOO)</b> (Annually - March) Forecast of annual gas consumption, maximum gas demand and the adequacy of eastern and south-eastern Australian gas markets to supply forecast demand for the next 20 years.	<b>Integrated System Plan (ISP)</b> (Biennial at minimum - July) A whole of system plan for the efficient development of the power system that achieves power system needs for a planning horizon of at least 20 years (including transmission, generation, gas pipelines and distributed energy resources).
 <b>WA</b>	<b>WEM Electricity Statement of Opportunities (WEM ESOO)</b> (Annually - June) Forecast and analysis of peak demand and energy use in the South West Integrated System for a 10-year outlook.	<b>WA Gas Statement of Opportunities (WA GSOO)</b> (Annually - December) Forecast of gas supply and demand for the Western Australia gas industry, including overview of gas infrastructure and emerging issues for a 10-year outlook.	<b>Contribution into the WA Whole of System Plan (WA WoSP)</b> (As required by Energy Policy WA) A whole of system plan developed to meet demand at the lowest sustainable system cost over a 20-year outlook period by identifying the generation capacity mix and network investment.
 <b>VIC</b>	<b>Victorian Annual Planning Report (VAPR)</b> (Annually - June) Forecast of electricity supply, demand and network capability in Victorian Declared Shared Network in Victoria for the next five years.	<b>Victorian Gas Planning Report (VGPR)</b> (Annually - March) Information relating to electricity supply, demand, network capability and Victorian Declared Transmission System for the next five years.	

Forecasting and planning reports and frameworks that support our major publications			
<b>Inputs, Assumptions and Scenarios Report (IASR)</b> (Annually at minimum) Presents a range of credible future scenarios representing possible policy settings and technology updates, which feed into AEMO's planning publications.	<b>Engineering Framework</b> (March 2021, ad hoc updates) A map to help stakeholders stay informed of the changing technical needs of the power system, the work underway to meet these changing needs, how the different pieces fit together, and how they can engage on topics of interest.	<b>South Australian Electricity Report (SAER)</b> (Annually - November) Forecast of electricity supply and demand in South Australia prepared for the South Australia Minister for Energy and Mining.	<b>Energy Adequacy Assessment Projection (EAAP)</b> (Annually at minimum - November) Quantifies the impact of potential energy constraints on expected levels of unserved energy in the NEM for the next two years.