

# Strategic Energy Plan

November 2019



COAG  
Energy Council

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*This Strategic Energy Plan ('Plan') establishes COAG Energy Council's vision for the future of the electricity and gas markets operating under the national energy laws<sup>1</sup> for the next five years. It communicates the Energy Council's desired outcomes and provides a framework of accountability for coordinated action and monitoring against the stated outcomes and objectives.*

## Context

Significant change is underway in Australia's energy systems. For decades electricity generation and gas technologies were relatively unchanged and customers were relatively passive consumers. Today, electricity and gas markets are increasingly interconnected with gas being recognised as a transitional and peaking fuel in the electricity market.

Technological advances and changing consumer behaviours are leading the rapid transition in the electricity sector. It is crucial that the planning, market and regulatory arrangements keep pace with the evolution of the power system and the challenges that emerge. The drivers of the transition impact the electricity system and market in different ways:

- Rapidly decreasing technology costs are resulting in record investment in more decentralised large-scale variable renewable generation. At the same time aging coal-fired generation is being retired in some regions, sometimes at shorter notice than was expected.
- Over 2 million households have installed solar PV and batteries are increasingly being deployed. This significant uptake of new distributed energy resources is changing the way in which electricity networks operate, moving from exporting electricity from a small number of power stations to accommodating two way flows of electricity at the distribution level.
- The increasing ability to control electrical appliances in our homes and businesses through digital devices means that consumers are better placed to manage consumption themselves or through third parties. Demand management and energy efficiency will be key ways in which consumer bills can be reduced in the future. It is important that consumers are empowered to take control of their energy costs, and that they continue to benefit from suitable consumer protections in doing so.

Gas markets have also been through a fundamental transition. The development of export LNG gas capabilities on Australia's east coast has transformed the gas market by opening up vast new gas reserves and by linking domestic markets to international oil and gas markets for the first time. This has brought significant investment and jobs to new LNG export industries but has placed pressure on domestic energy users that have historically used low-cost gas as a source of competitive advantage.

These technological and societal changes across our energy markets require major reform to almost every element of the energy supply chain – from network planning and operation, to system security services, to coordination of generation operating at both the very large and very small scale and to customer participation in the market. These reforms are essential to provide the right environment for investment in the infrastructure and services required to continue to operate the system and the market, securely and reliably, under changing conditions.

Given the complexity and rapid pace of change, strategic planning is critical to a successful transition, alongside effective engagement with our key trading partners and regional economies in relation to energy investment opportunities. While markets are likely to continue to be used as the principal agent of investment and drive efficiencies, oversight from governments is needed to coordinate the transition and the reforms needed to ensure it is coordinated and meets community and customer expectations.

Complementing the current significant body of work underway from governments and energy market bodies to manage the risks and opportunities of the transition, this document is intended to provide a clear strategic focus for the Energy Council's work in addressing the issues, overseeing the transformation of the energy system and ensuring we achieve our vision for our energy markets.

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<sup>1</sup> National Electricity Law, National Gas Law, National Energy Retail Law

## Strategic Vision

Irrespective of the changing market, technological and societal conditions, the vision for Australia’s energy markets remains the same: deliver a reliable, secure, affordable and low emissions energy supply in an efficient and timely way that meets the expectations of energy customers and the community.

One of the roles of the Energy Council, as the collective body representing jurisdictions on energy matters, is to provide energy market bodies, market participants and consumers with clear and consistent long-term policy direction to support this vision.

The Plan will act as a guiding force in rapidly changing markets, where complexities emerge at different times in different sections of the supply chains and across markets.

## The Plan

Broadly, the Plan is comprised of five elements:

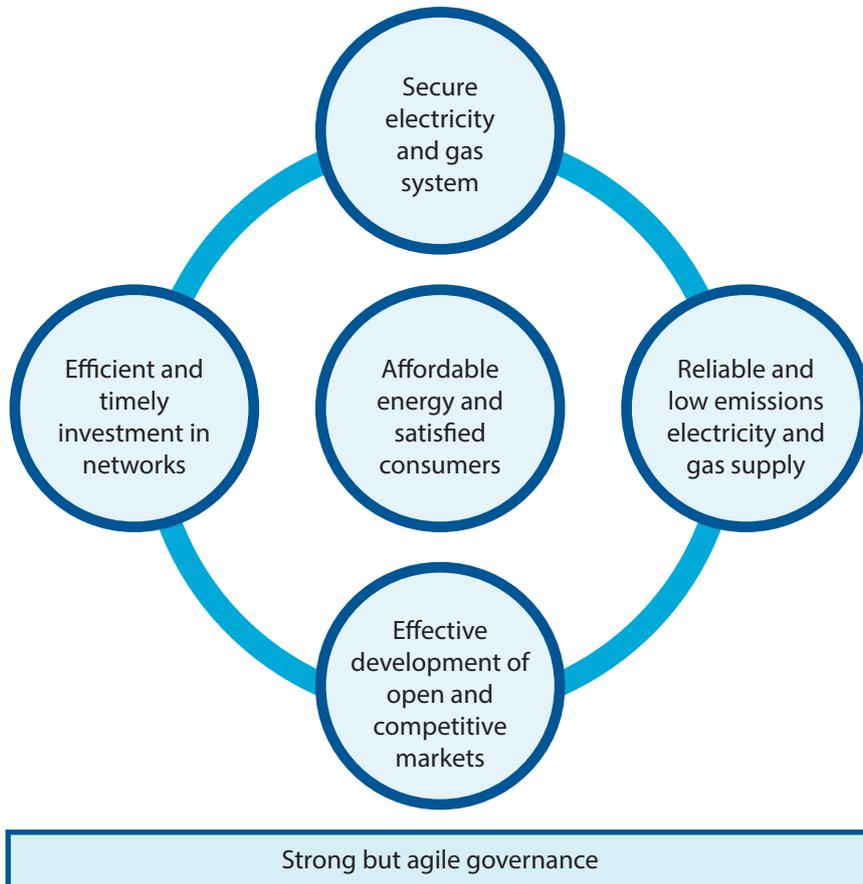
- Key priorities, articulated as desired **outcomes** for both markets and consumers;
- A set of discrete and measurable **objectives** for each outcome that collectively contribute to achievement of that outcome;
- An agreed **action plan** to deliver progress towards the Plan’s outcomes.
- Progress will be monitored through a set of **metrics** relevant to each objective and which will inform consideration for corrective action if necessary.
- A **governance framework** that establishes accountability for progress and describes roles and responsibilities for maintaining the Plan.



Figure 1—Architecture of the Strategic Energy Plan

## Tangible outcomes

The Plan's five high-level outcomes are centred around one key priority which is for consumers to have access to affordable energy and to be satisfied with the energy services they receive. In support of this central priority are four outcomes covering key elements of the supply chain where a managed evolution in energy policy, market design, and system services is most critical. Strong but agile governance of the market and its regulatory bodies underpin the achievement of those five outcomes.



**Figure 2—Strategic Energy Plan outcomes**

## Measurable objectives for each outcome

Table 1—Outcomes and corresponding objectives

Outcomes	Objectives
 <p><b>Affordable energy and satisfied consumers</b></p>	<ul style="list-style-type: none"> <li>Energy is increasingly affordable for all consumers, supported by adequate consumer protections and access to dispute resolution. <b>(AC.O1)</b></li> <li>Consumers are empowered to manage their demand and can access distributed energy and energy efficiency solutions. <b>(AC.O2)</b></li> <li>Consumers are able to easily identify and secure the best deal for their circumstances. <b>(AC.O3)</b></li> <li>Vulnerable consumers are on suitable pricing plans, receiving concessions when needed, and can benefit from distributed energy and energy efficiency schemes. <b>(AC.O4)</b></li> </ul>
 <p><b>Secure electricity and gas system</b></p>	<ul style="list-style-type: none"> <li>Markets operate safely, securely and efficiently, under full range of operating conditions, with minimal intervention. <b>(S.O1)</b></li> <li>System planning and development is informed by clear and transparent rules. <b>(S.O2)</b></li> </ul>
 <p><b>Reliable and low emissions electricity and gas supply</b></p>	<ul style="list-style-type: none"> <li>Electricity and gas sectors efficiently deliver at least their share of emissions reduction target/s while ensuring reliable supply. <b>(R.O1)</b></li> <li>Investors efficiently manage risk to support investment, operation, retirement and innovation decisions. <b>(R.O2)</b></li> </ul>
 <p><b>Effective development of open and competitive markets</b></p>	<ul style="list-style-type: none"> <li>Wholesale and retail markets are competitive and deliver efficient outcomes for consumers. <b>(M.O1)</b></li> <li>Deep, liquid and transparent financial markets for electricity and gas and related services. <b>(M.O2)</b></li> <li>Access to efficiently priced fuel and transport. <b>(M.O3)</b></li> <li>Innovation is incentivised and enables value from new technologies. <b>(M.O4)</b></li> </ul>
 <p><b>Efficient and timely investment in networks</b></p>	<ul style="list-style-type: none"> <li>Investment solutions are optimal across all resources. <b>(N.O1)</b></li> <li>Efficient regulation of monopoly infrastructure. <b>(N.O2)</b></li> <li>Networks incentivised to be efficient platforms for energy services. <b>(N.O3)</b></li> </ul>
 <p><b>Strong but agile governance</b></p>	<ul style="list-style-type: none"> <li>Governance arrangements support the achievement of the national energy objectives, and emerging issues are addressed in a coordinated, timely and consultative manner. <b>(G.O1)</b></li> </ul>

## Actions for implementation

Delivering the outcomes of the Plan requires a comprehensive set of co-ordinated actions across market bodies and governments. Actions and tools available to implement the plan across electricity and gas markets include changes in legislation, regulation, rules, operational conditions and market and consumer driven solutions.

The Energy Council's action plan is informed by the recommendations of recent major reviews into NEM security, reliability and affordability including the *Finkel Review*, the *ACCC's Retail Electricity Pricing Inquiry* and *ACCC's Gas Inquiry 2017–2020*.

Since the completion of those reports, the Energy Council and the market bodies have developed and are delivering under the strategic guidance of the ESB - further coordinated actions. These actions respond to both imminent issues to improve the resilience of the NEM in the short-term and consider long-term major market reform to improve efficiency and investment.

While the Plan provides a basis for agreement, in relation to the East Coast gas and electricity markets, it is not intended to capture all the work underway in the energy sector. The work that is currently underway is necessary to address current and imminent challenges and issues.

## Existing and imminent challenges

Existing and imminent challenges include the need to co-ordinate and bring forward investment in transmission infrastructure, and the need to respond to immediate threats to system security and reliability in some NEM regions through regulatory and market approaches.

The actions responding to these challenges include *Converting the Integrated System Plan into Action* led by the ESB and *AEMC's System security and reliability action plan*.

## Emerging and anticipated challenges

Emerging and anticipated challenges may be issues not yet having a pressing or material impact on energy markets or consumer outcomes, but which have the potential to do so, and must be addressed through longer-term actions in order to fulfil the energy market vision described in this Plan.

Longer-term actions in this 2019 release of the Plan are informed by recent major reviews and further strategic work by the market bodies. In future years, annual reviews of the performance of energy markets and consumer outcomes will inform the consideration of revised or new actions.

In addition to this incremental and iterative approach, there is also a need for a comprehensive and holistic assessment of whether the current market framework will be sufficient to support the transition in the coming years. At the direction of the Energy Council, the ESB has begun assessment of whether the existing market design is fit for purpose post-2025 under a range of possible future scenarios. The outcomes and objectives in this Plan will also inform this work.

Table 2 below describes the major actions in the Energy Council’s work plan and their alignment to the stated outcomes and objectives. Where actions in the current work plan are informed by recommendations from recent market reviews, this is noted in the table below.

**Table 2—Energy Council Work Plan**

Objective descriptors refer to abbreviations included in the earlier objectives section. The letter descriptors refer to the overarching outcomes: AC—Affordable energy and satisfied consumers, S—Secure electricity and gas system, M—Effective development of open and competitive markets, N—Efficient and timely investment in networks. The number descriptor refers to the individual objectives to meet the outcome.

Time horizons refer to the timeframe the initiative is likely to remain a focus for the Energy Council’s work program. Descriptors: ST—short term, MT—medium term, LT—long term

Action	Description	Relevant Objectives / Time horizon / Relevant market review
<b>Affordability / Consumers (Affordable Energy &amp; Satisfied Consumers)</b>		
<b>ACCC recommendations—Retail electricity pricing inquiry report</b>	Further work to improve the <b>competitiveness, transparency and clarity of retail prices</b> including; rule changes to improve how retailer discounting and switching operates; work by the ESB to streamline retail price reporting and work by the AER and ECA on adoption of cost reflective tariffs.	S.O3, M.O1 <b>ST</b> Finkel BluePrint
<b>Reforms to support energy efficiency and consumer action</b>	The <b>Open Energy Networks program</b> , a joint initiative between AEMO and Energy Networks Australia, to ensure the operation of distributed energy resources remains safe and efficient as the scale of these resources increases. The ESB has also continued this work through a focus on embracing DER.	AC.O1, AC.O2 <b>MT</b>
	Assessment of a <b>Wholesale Demand Response Mechanism</b> , which aims to recognise demand response providers on an equal footing with generators in the wholesale market.	AC.O2 <b>MT</b> Finkel BluePrint
	The <b>National Energy Productivity Plan</b> (NEPP) is a COAG Energy Council agreed package of measures to improve Australia’s energy productivity by 40% between 2015 and 2030.	AC.O2, AC.O4 <b>MT</b>
<b>Security (Secure Electricity and Gas System)</b>		
<b>Cyber security</b>	Investigation of options to address cyber risks across all energy systems and markets.	S.O1 <b>ST</b>
<b>Fuel security</b>	Investigation of options to ensure availability of coal and gas to ensure reliability.	M.O1, M.O3 <b>MT</b>

Action	Description	Relevant Objectives / Time horizon / Relevant market review
<b>Reliability (Reliable and low emissions electricity and gas supply)</b>		
<b>System security and reliability action plan</b>	The <b>Retailer Reliability Obligation</b> and related assessment of the <b>Reliability and Emergency Reserve Trader</b> (RERT) mechanism, which will give greater confidence that market participants will invest to maintain system reliability.	M.O2 <b>ST</b>
	The <b>Frequency Control Work Plan</b> , a collaborative work plan between the AEMC, AEMO and the AER, which sets out actions to support the stable and secure operation of the power system in relation to frequency control.	M.O1 <b>ST</b>
	The AEMC's <b>Intervention Mechanisms and System Strength Project</b> , which will evaluate the effectiveness of the interventions framework in light of the increasing use of directions by AEMO to manage system security, and of related system strength frameworks.	M.O1, N.O1, N.O3 <b>MT</b>
<b>Open &amp; Competitive Markets (Effective Development of Open and Competitive Markets)</b>		
<b>Post-2025 market design</b>	This review will assess how the National Electricity Market (NEM) can continue to provide all the services necessary for it to remain secure, reliable, low cost and working in the best interests of stakeholders.	<b>MT, LT</b>
<b>Hydrogen Strategy</b>	Development of a national strategy to map the development of a hydrogen industry in Australia.	<b>LT</b>
<b>Gas Reforms (Transparency)</b>	<b>Measures to Improve Transparency in the Gas Market</b> seeking to address information gaps and asymmetries across the gas market (excluding pipeline transport).	M.O3, M.O2, M.O1, S.O2 <b>MT</b>
<b>Investment in Network (Efficient &amp; Timely Investment in Networks)</b>		
<b>Integrated System Plan</b>	The <b>Integrated System Plan</b> ; Action Plan, which develops a regulatory framework that will deliver an optimised portfolio of network investments to maintain the reliability and affordability of the energy system.	N.O1, N.O3 <b>MT</b> Finkel's BluePrint
	The <b>Coordination of Generation and Transmission Investment</b> review, which recommends reforms to better coordinate investment in renewable generation and transmission infrastructure and assists in delivering the Integrated System Plan.	N.O1 <b>ST, MT</b>
<b>Electricity Networks Economic Regulatory Frameworks review</b>	The review will provide a blueprint for how network regulation can evolve to efficiently optimise distributed energy resources in a manner that lowers costs for all consumers.	N.O2, N.O3 <b>MT</b>
<b>Gas Reforms (Pipelines)</b>	<b>Better Regulation of Gas Pipelines</b> to address outstanding deficiencies and constrain the exercise of market power (through monopoly pricing and restricting third-party access).	N.O2 <b>MT</b>

## Additional consideration

While the Plan provides a basis for agreement for direction and coordination action, it is not intended to capture all the work underway in the energy sector. As the technological, social and economic environments and consumer behaviours are evolving at increasing pace, market bodies and market participants will continue to seek and implement regulatory changes as issues emerge in the market.

It is essential that proposed reforms are assessed as a collective package to ensure that emerging risks are adequately managed, duplication is avoided and that the reforms are integrated and complementary. These matters will be reported to the Energy Council separately as they are identified and addressed, and maybe reflected in a revised work program if necessary.

## Metrics as measures of progress

Metrics to track progress against the outcomes and objectives are a key element of the Plan.

Four primary metrics have been identified to track high-level progress against affordability, security, reliability and sustainability, as detailed in Table 3 below.

**Table 3: Primary metrics of the Strategic Energy Plan**

Category	Metric
<b>Affordability</b>	Representative consumers retail bills for electricity and gas
<b>Security</b>	Number of system interventions related to system security
<b>Reliability</b>	Amount of unserved energy (with reference to reliability standard) and interruptions to gas supplies
<b>Sustainability</b>	Electricity and gas sector emissions

In addition, 37 detailed metrics will allow reporting against the 16 objectives of the Plan. The metrics may be subject to review as the market evolves. The full list of metrics is included in Attachment A.

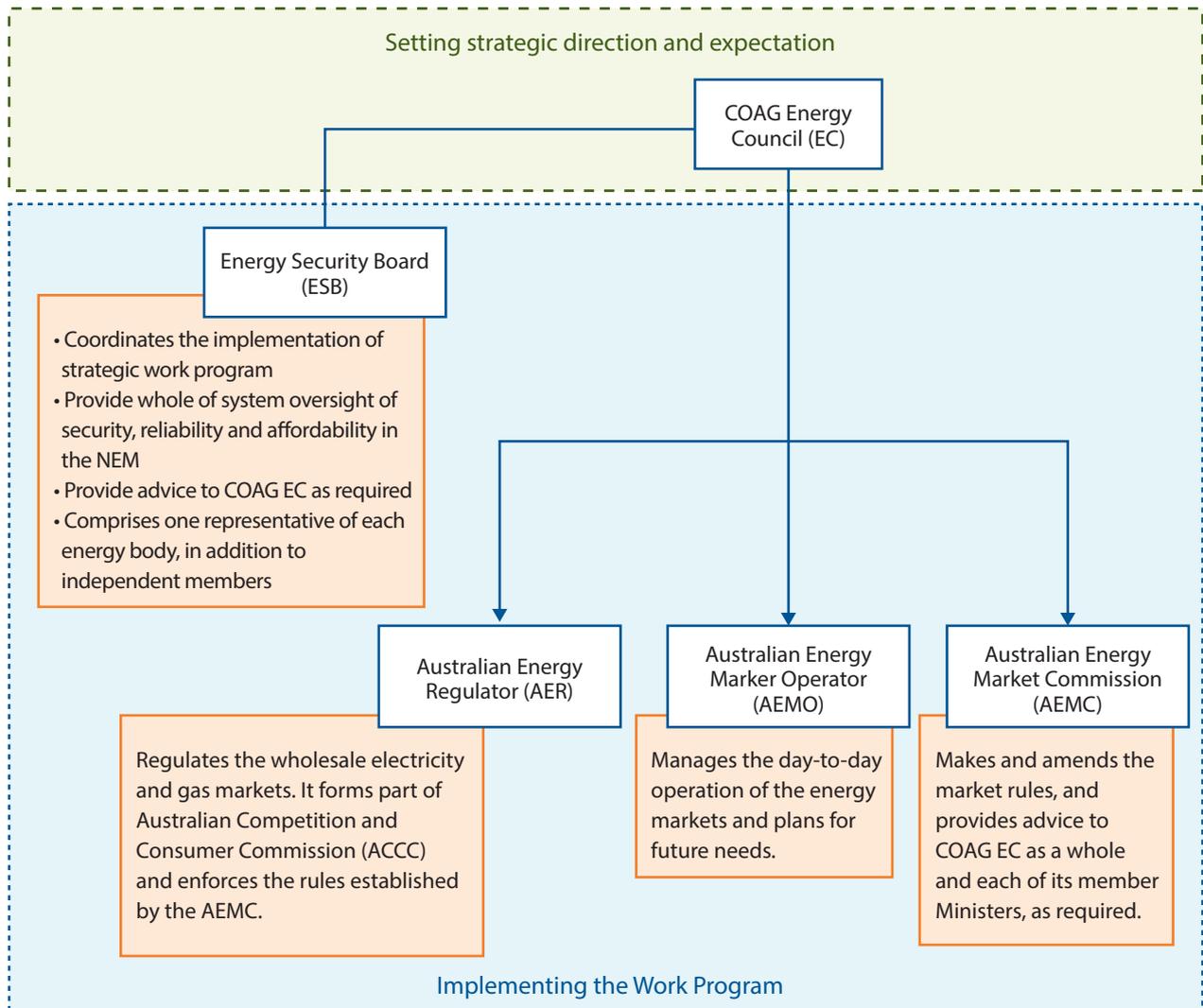
The metrics are not intended to act as implicit goals or targets in and of themselves. Rather, they are a transparent and independent set of measures by which progress (or otherwise) can be measured and reported on a consistent and replicable basis over a period of time. Some of the metrics have multiple sub-components or include potential other measures that could be used to provide context or qualification of the main metric. The intention is not that all this supporting information is used in all cases, rather, it is provided to assist in the evaluation process undertaken in the Health of the NEM report.

In all cases, it will be important to consider metrics within the broader context of a rapidly changing energy market and the circumstances in each NEM region. Given the interdependencies in the energy sector, a change in a particular metric year on year could be a result of a range of external factors and may not necessarily represent an improvement or worsening in circumstances. In reporting against the metrics, assessing the reason for change will be as important as assessing the direction of change.

# Governance framework

## Organisational structure

The electricity and gas markets are governed under a framework of legislation and regulations administered and enforced by regulatory bodies reporting ultimately to the COAG Energy Council. Details of that framework are included in Figure 3 below.



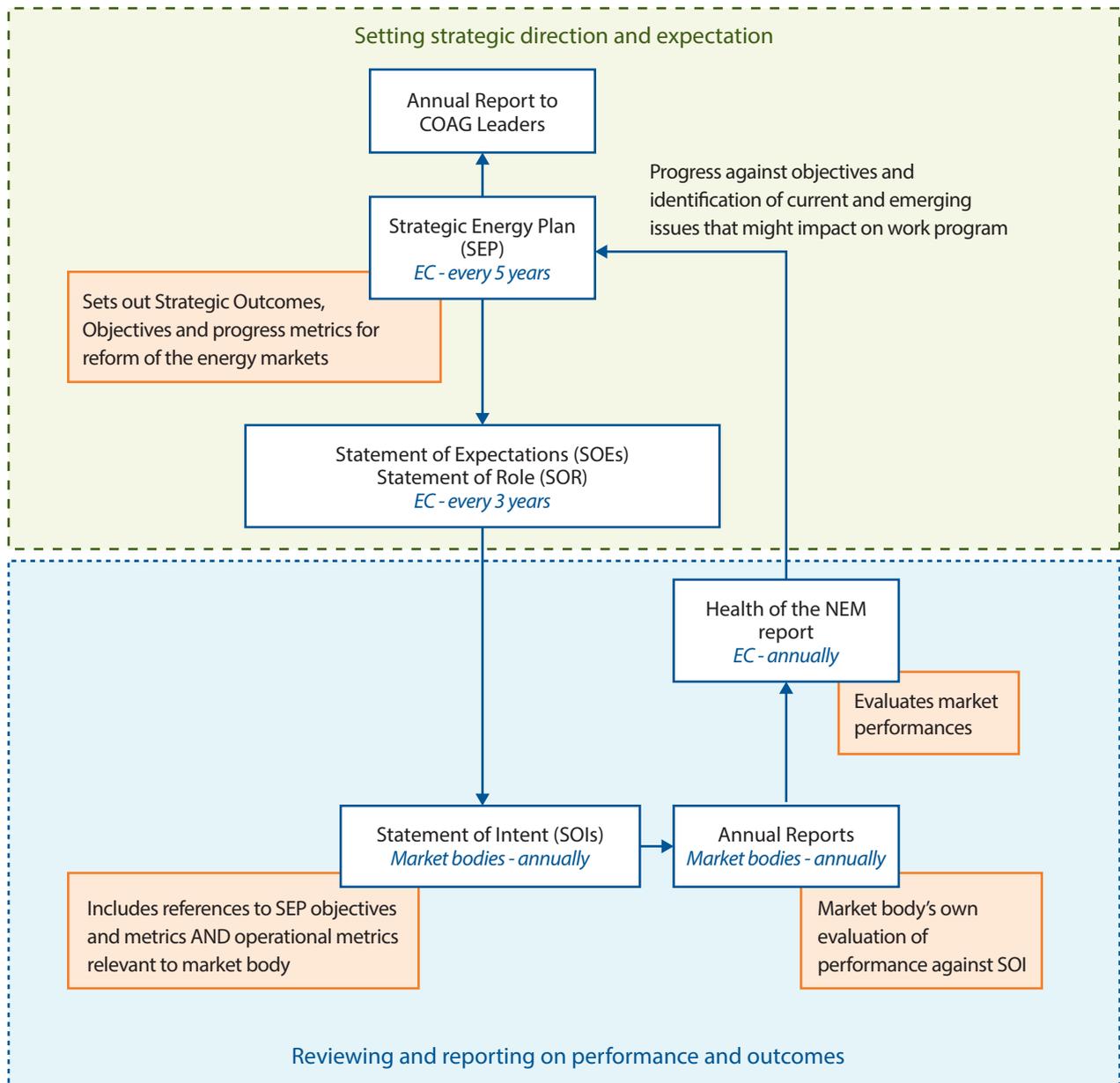
**Figure 3—Organisational structure**

## Assessing delivery and performance

Energy Council is accountable for delivery of the Plan. The annual *Health of the NEM* report will monitor progress of the market towards the Plan's objectives and outcomes. This report will use the Plan's metrics to evaluate progress against the Plan's objectives. This annual review will also assist with identifying new emerging issues and, potentially, to review the key focus for actions in the Plan.

The Plan also forms the basis for setting three-year strategic directions and performance expectations for the market bodies: Statements of Expectation for the AEMC and AER and the Statement of Role for AEMO. These documents describe Energy Council's strategic direction and expectations for each market body, supported by measurable, outcomes-based performance indicators drawn from the Plan and its metrics. The Statements emphasise shared accountability, as market bodies need to work collaboratively to pursue whole-of-system performance objectives.

Figure 4 below details the sequence of setting strategic direction by the Energy Council and the reporting and assessment mechanism across the ESB and the market bodies.



**Figure 4 – Managing the Strategic Energy Plan**

### Energy Council’s interaction with stakeholders

The Council considers participation from stakeholders critical to the successful transition of the energy markets and invites stakeholders to engage with governments and market bodies in all aspects of the reform process. Energy Council will continue to engage publicly in the delivery of this Plan and in its consideration of future iterations.

## Attachment A—Strategic Energy Plan Metrics

To the extent they are available, metrics will be discussed at the jurisdictional level to ensure that geographically based challenges are appropriately identified and relevant actions can be considered by the market bodies and the COAG Energy Council.

### Outcome: Affordable energy and satisfied consumers

Energy is increasingly affordable for all consumers, supported by adequate consumer protections and access to dispute resolution

Metric(s)	Source	Notes
Real representative domestic retail tariffs and bills in each NEM-region over time	AER <i>Annual report on compliance and performance of the retail energy market</i>	Provides estimated cost of standing and market offer in each NEM-region for average residential customer. Trend over time (in real terms) gives an indication of change in affordability.  Relevant context also includes energy spend as % of household disposable income (reported by AER) across a range of household circumstances (including income quintiles, family composition, energy solutions deployed), spread of market offers (potentially reported by ACCC), comparison with CPI over a period of time and customer perceived value for money (reported by ECA).
Number of consumer disputes/complaints to retailers and ombudsman schemes over time	State ombudsman reporting; AER <i>Annual report on compliance and performance of the retail energy market</i>	Provides insight into customer satisfaction and need to access dispute resolution.  Report number of complaints resolved as well as number of complaints which proceed to investigation.
Number of customers on hardship programs over time in each NEM-region	AER <i>Annual report on compliance and performance of the retail energy market</i>	Provides insight into the total number of consumers struggling to afford energy over time, as a percentage of all consumers for each NEM-region.  Discuss energy stress metrics to the extent they are available, which could include # of low-income high-cost households, households reporting an inability to keep home warm/cool, arrears on bills, hidden energy poverty and number of households whose share of expenditure (% disposable income) on energy is more than twice national median.
Representative real commercial and industrial energy prices over time	Work with large C&I customers to develop benchmarks and survey required to reliably report against this metric.	Provides estimated energy costs as an input to business activity which impacts business profitability and competitiveness. International comparisons to be considered as context.  There is large variation in C&I energy prices, particularly between transmission connected and other C&I customers. Separate benchmarks to be developed for these two categories to the extent possible. Commercial and Industrial users might also have different capacity to manage their energy demand and therefore to the extent possible some differentiation based on sector/activity would be useful.  <i>AER Annual report on compliance and performance of the retail energy market covers small businesses on retail contract.</i>

## Consumers are empowered to manage their demand and can access distributed energy and energy efficiency solutions

Metric(s)	Source	Notes
% customers who use technology to control energy costs over time	Energy Consumers Australia <i>Consumer Sentiment Survey</i>  AER <i>State of the energy market</i>	Indicates the extent to which consumers are actively managing their electricity demand.  ECA reports % who use digital/smart meter, smart thermostat, energy management system to control energy use. AER's State of the energy market incorporates a section on smart meters including uptake.  <i>Uptake of energy efficient technologies and intentions</i> (also reported by ECA) and <i>availability of offers in the market that facilitate demand response</i> could be discussed as context. Context could also include the ability and ease of consumers to access their data to indicate how technology adds value to the customer.
Uptake of behind the meter generation and storage over time	Clean Energy Regulator  AEMO	Indicates the extent to which consumers are accessing and investing in distributed energy resources.
Energy productivity of economy over time	National Energy Productivity Plan ABS	Energy productivity (GDP/energy use) is a measure of economic output relative to energy consumption, and indicates the relative efficiency of the economy.  The NEPP reports energy productivity on a national level. Sectoral analysis of electricity and gas for NEM-states will be undertaken to the extent possible.

## Consumers are able to easily identify and secure the best deal for their circumstances

Metric(s)	Source	Notes
% customers on standing and market offers over time	AER  Electricity and gas retailers	Intended to indicate whether customers are engaging in the market and the extent to which retailers are helping customers get a better deal.  <i>Consumer confidence in their own ability to make choices about the energy market</i> (reported by ECA) could be reported as additional context.  This metric could include discussion of the range of unique retail products available in the market, to identify if the market is offering the products and services that cater for the evolving range of customers' circumstances including their access to DER and other energy management solutions.
Number of clicks it takes for a customer to switch retailers online	ESB analysis	Customer friction/switching metric is a measure of how easy it is for a customer to switch retailers if they are unhappy with their service. Low barriers to switching is desirable to ensure effective competition in the retail market.  This should consider the number of clicks for a 'vanilla' customer (i.e. not for customers with special circumstances such as life support and concessions).  Additional context could also include: <ul style="list-style-type: none"> <li>• # of unique hits on government supported energy comparison websites</li> <li>• consumer confidence in ability to make choices about energy products and services (reported by ECA)</li> <li>• customer switching rates</li> </ul>

Vulnerable consumers are on suitable pricing plans, receiving concessions when needed, and can benefit from distributed energy and energy efficiency schemes

Metric(s)	Source	Notes
% hardship customers on market vs standing offer over time	Electricity and gas retailers	Indicates the extent to which retailers are assisting hardship customers by placing them on a better offer.
Number of customers receiving concessions over time	AER Electricity and gas retailers	<p>Number of customers on concessions provides an indication of number of customers experiencing difficulty paying energy bills. Important to consider the absolute number as well as the relative %, to account for change in population, and also the criteria by which a concession is awarded in different states and territories.</p> <p>Context could also include measures that indicate whether vulnerable consumers (eligible for concessions or not) have access to the right support.</p>
Support programs for low-income households to access DER and energy efficiency	AER Qualitative assessment	Indicates the availability of government and retailers support programs to support low-income households to access DER and energy efficiency. Context could also include access criteria, and whether the programs are self-referral or retailer/NGO/government-led.

## Outcome: Secure electricity and gas system

Markets operate safely, securely and efficiently, under full range of operating conditions, with minimal intervention

Metric(s)	Source	Notes
Number of system interventions (directions by AEMO) related to system security	AEMO Reliability Panel <i>Annual Market Performance Report</i>	Requirement for AEMO to direct on generators to maintain system security could indicate security services are not being provided by the market at a level sufficient to meet system security, or that there is a delay in the deployment of the preferred option to address the security need.  As context, discuss <i>compliance with system security operational obligations</i> such as time outside frequency operating band, time spent outside of a secure operating state, maintaining minimum fault and inertia levels as determined by AEMO.
Major gas plant availability factor	AEMO Gas Bulletin Board	Sourced from the Gas Bulletin Board, the availability factor shows the proportion of major gas plant nameplate capacity that was available.

System planning and development is informed by clear and transparent rules

Metric(s)	Source	Notes
Degree to which work underway efficiently addresses emerging security risks	ESB Qualitative discussion	Include assessment of the adequacy of work underway to address system security, cyber security and physical (e.g. climate) security challenges and risks efficiently, with consideration of the roles of market participants, their ability to participate effectively and efficiently in the market and their ability to manage risks arising under the proposed work program

## Outcome: Reliable and low emissions electricity and gas supply

Electricity and gas sectors efficiently deliver at least their share of emissions reduction target/s while ensuring reliable supply

Metric(s)	Source	Notes
Electricity and gas sector emissions as a proportion of national emissions.	Department of the Environment and Energy <i>National Greenhouse Gas Inventory</i>	<p>Indicates electricity and gas sector contribution to economy wide emission abatement task. Requires flexibility to accommodate any process the Government may follow to set emissions reduction targets.</p> <p>Important that electricity sector emissions are considered in context, as electrification of transport or other industry may increase sectoral emissions in absolute terms.</p> <p>Discuss absolute NEM emissions, emissions intensity and comparison against emissions in the target reference year as context. Emissions intensity per unit of production and per unit of consumption could be considered as context to understand the efficiency of the system as a whole in reducing emissions.</p>
Amount of unserved energy (with reference to reliability standard)	AEMO Reliability Panel <i>Annual Market Performance Report</i>	<p>Measure of reliability which indicates whether generation capacity was adequate to meet reliability standard in a given year.</p> <p>Discuss Reliability and Emergency Reserve Trader (RERT) as context (amount procured, number of times deployed, cost).</p>

Investors efficiently manage risk to support investment, operation, retirement and innovation decisions

Metric(s)	Source	Notes
Accuracy of AEMO forecasting	AEMO	<p>Accurate short, medium and long-term forecasts are important for market participants to make efficient investment and operational decisions.</p> <p>Include mean percentage error of AEMO annual operational consumption forecast vs actual and accuracy of PASA and pre-dispatch forecasting (expected to be published from 2019 onwards in line with recommendation of AEMC's Reliability Frameworks Review).</p> <p>Discuss accuracy of maximum and minimum demand forecasts as key signals for investment in generation, network infrastructure and non-energy services.</p>
Access to relevant system and market information and data to support effective and efficient decision making	AEMC	<p>Transparent and universal access to relevant system and market information and data promotes efficient and effective decision making for investment and operation of assets.</p> <p>Discuss range of information available to market participants per jurisdictions, relevance to objectives and limitations of access.</p>
Committed investment in electricity generation capacity and gas supply by region	AEMO ES00/GSOO	<p>Gives an indication of whether forecast capacity is expected to be adequate to meet forecast demand in the short to medium term.</p> <p>Discuss technology breakdown of investment pipeline for electricity generation, projected unserved energy over next 10 years, and potential triggering of retailer reliability obligation as context.</p> <p>Assessment of whether notice of closure was made in line with three year notification rule could also be discussed</p> <p>As context, discuss where risks of large capital intensive projects cannot be borne by private sector investors, the extent to which policy makers provide clear and transparent criteria for how governments plan to overcome these risks in a manner that does not deter private sector investment.</p>

## Outcome: Effective development of open and competitive markets

Wholesale and retail markets are competitive and deliver efficient outcomes for consumers

Metric(s)	Source	Notes
Extent to which competition in retail and wholesale electricity and gas markets is identified as an issue by market bodies.	AER <i>Wholesale Electricity Market Report</i>  AEMC <i>Retail Energy Competition Review</i>	AER assessment includes traditional measures of market concentration such as Herfindahl- Hirschman Index and new entrant generator costs relative to potential revenue by region (i.e. LRMC relative to average spot prices).  Discuss forward contract prices where relevant.  ACCC Gas Inquiry reports on factors affecting the pricing, volume and availability of wholesale gas in Australia.

Deep, liquid and transparent financial markets for electricity and gas and related services

Metric(s)	Source	Notes
Liquidity and trading volume for electricity, gas and gas pipeline capacity	ASX AFMA/OTC Trade Repository (if established) Gas Bulletin Board Gas Supply Hub	Contract liquidity is essential for the efficient operation of secondary markets. Traditional measures of liquidity such as traded volume (both volumes traded and open interest) relative to underlying demand will be assessed. Assess by NEM region for electricity, gas and gas pipeline capacity and if applicable electricity transmission capacity.  Evolution of new financial products could also be discussed as context.

Access to efficiently priced fuel and transport

Metric(s)	Source	Notes
Transparency of fuel reserves and prices (coal, gas, hydro) for market participants	Qualitative assessment (ESB) ACCC  Exchanges AER gas market reporting	Transparency of fuel reserves and costs are important for market participants to make efficient investment and operational decisions.  Include discussion of transport costs (e.g. rail access for coal deliveries and gas pipeline charges) and estimated fuel costs relative to export parity as context, noting fuel costs can be highly variable by generator and this data may be challenging to obtain.

## Innovation is incentivised and enables value from new technologies

Metric(s)	Source	Notes
Extent to which rules and regulations support innovative technologies or business models to meet customer and market needs	ESB Qualitative discussion	<p>Discussion will include extent to which new technologies and business models are introduced in the market across the supply chain and the extent to which barriers to entry have been identified and are being addressed. For example, AEMC Frequency Control Frameworks Review identifies barriers to DER participating in FCAS markets and tasks AEMO with submitting rule change to resolve these barriers.</p> <p>Further discussion could include:</p> <ul style="list-style-type: none"> <li>• Extent to which various technology types are participating in ancillary service markets, and the value of those markets, as context.</li> <li>• The use of regulatory sandbox and other incentive schemes to support new technical and policy approaches and market solutions.</li> <li>• The impact of changes to support a level playing field across technological and commercial approaches along the supply chain.</li> <li>• The value to the system and the consumer of energy market innovations.</li> </ul>

## Outcome: Efficient and timely investment in networks

Investment solutions are optimal across all resources

Metric(s)	Source	Notes
Congestion levels on electricity transmission/distribution networks and gas pipelines	AEMO/AER	High congestion could indicate that network capacity is insufficient.  Also discuss cost of constraints and extent to which congestion is being examined through RIT- T/Ds as context.  Asset utilisation is also relevant and will be discussed under the below objective.
Progress on delivering an Actionable Integrated System Plan	Qualitative discussion (ESB)	The need for an integrated approach to transmission planning was recognised by the Finkel Review and endorsed by Energy Council.  While this is a time limited program, given its significance it is appropriate to report against progress over the five-year time horizon of the Strategic Energy Plan.
% customers with retailer exposed to cost reflective network tariff	AER	Retailers which are exposed to cost reflective network tariffs have incentive to offer innovative solutions to help consumers manage their demand and costs. Network prices do not necessarily need to be passed directly onto customers, therefore the most relevant metric to assess is the proportion of retailers which are exposed to cost reflective network tariffs.
Number and \$ value of non-network solutions selected in RIT-T/D per jurisdictions	AER	Gives an approximate indication of extent to which non-network solutions are competitive with network solutions. Noted that RIT-T/D process currently assesses non-network options and lack of non-network options does not necessarily indicate a negative outcome. Context could include the number of non-network solutions proposed to the AER compared to solutions approved as well as number of responses to tenders by network service providers.  Identify contributions related to Demand Management Innovation Allowance and Incentive Scheme to the extent possible.

### Efficient regulation of monopoly infrastructure

Metric(s)	Source	Notes
Regulated rate of return for new network investments relative to risk free rate of return (e.g. 10 year Commonwealth Government security yield)	AER Rate of Return Instrument Explanatory Statement  Regulatory determinations	Intended to assess changes in the regulated return in electricity/ gas sectors over time, relative to base funding costs across the economy.  Network business profitability measures published by AER could also be considered as context.
Network productivity, utilisation and reliability	AER	Poor productivity or reliability could suggest there are untapped opportunities for greater system efficiency. Trend over time (e.g. 5–10 years) likely to be more informative than year on year change.
Customer engagement by network service providers	AER evaluation based on network determination process  ENA-ECA Customer Engagement Awards	Intended to measure extent to which monopoly service is subject to improvements in customer experience.

## Networks incentivised to be efficient platforms for energy services

Metric(s)	Source	Notes
Progress towards implementing a DER coordination framework	AEMO and Energy Networks Australia Open Energy Networks program	<p>Coordination of DER will be key to efficient provision of energy services across networks in the long-term.</p> <p>Factors such as <i>number of DER connection applications that are being subjected to export constraints</i> to be discussed as context.</p> <p>While this is a time limited program, given its significance it is appropriate to report against progress over the five-year time horizon of the Strategic Energy Plan.</p> <p>Context could include the extent to which regulation of networks and connection processes support a range of customer business models.</p>

## Outcome: Strong but agile governance

Governance arrangements support the achievement of the national energy objectives, and emerging issues are addressed in a coordinated, timely and consultative manner

Metric(s)	Source	Notes
Energy market institutions and COAG Energy Council have published and co-ordinated priorities, work programs and statement of expectations/roles, with regular reporting.	Market bodies COAG Energy Council	Assesses transparency and accountability of market bodies' actions.
Market bodies' outcomes in line with their statements of expectations/role/intent	Qualitative assessment (ESB)	Assess whether market bodies' actions align with goals. Include whether Rule change requests processed within standard timeframes as context.
Nature of regulatory sandboxes utilised to trial new regulatory approaches.	AEMC, AER	Assesses the extent to which new policies and regulations are piloted. New regulatory approaches where sandbox approach not applied could also be discussed as context.
Extent to which regulatory costs are minimised	Qualitative assessment (ESB)	Factors to consider include: <ul style="list-style-type: none"> <li>• # of regulatory obligations for market participants (including change over time).</li> <li>• Cost of compliance (including upfront cost for new regulation and ongoing costs).</li> <li>• Extent to which regulatory obligations are consistent across NEM jurisdictions to support inter- regional investment (and derogations are limited to unique circumstances only).</li> </ul>
Level of government subsidies in the energy sector	Qualitative assessment (ESB)	To the extent possible, provide a stocktake of subsidies over time across all segments of the supply chain. This could assist with identifying areas where the market arrangements are not meeting stakeholders' expectations in relation to delivering the NEOs.

## Acronyms

ABS	Australian Bureau of Statistics
ACCC	Australian Competition and Consumer Commission
AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
AFMA	Australian Financial Markets Association
ASX	Australian Stock Exchange
C&I	Commercial and Industrial
CPI	Consumer Price Index
DER	Distributed Energy Resources
ECA	Energy Consumers Association
ENA	Energy Networks Australia
ESB	Energy Security Board
ESOO	Electricity Statement of Opportunities
FCAS	Frequency Control Ancillary Services
GDP	Gross Domestic Product
GSOO	Gas Statement of Opportunities
LNG	Liquefied Natural Gas
NEM	National Electricity Market
NGO	Non-Government Organisation
OTC	Over the Counter
PASA	Projected Assessment of System Adequacy
RIT-T/D	Regulatory Investment Test for Transmission/Distribution

