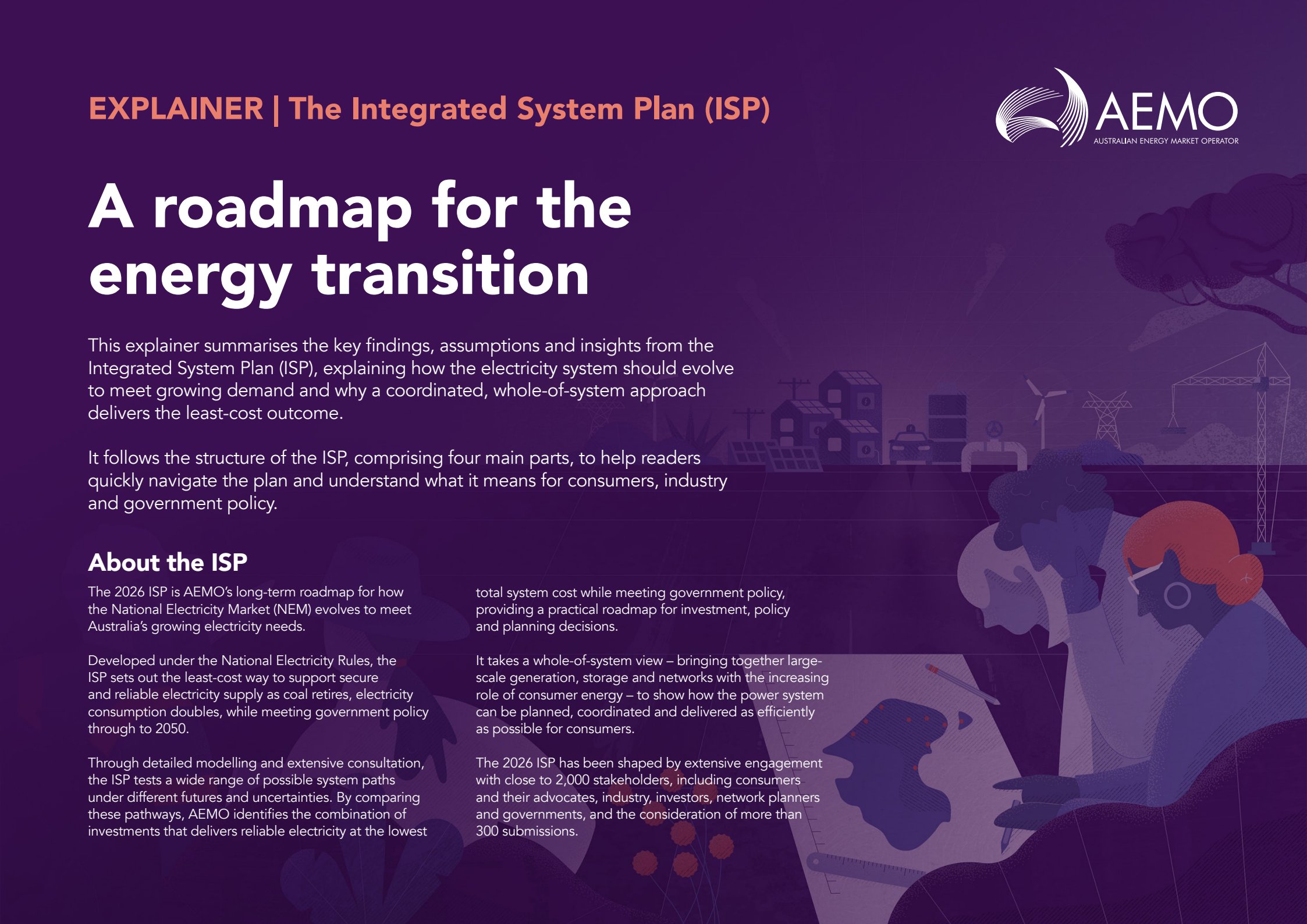
EXPLAINER | The Integrated System Plan (ISP)

A roadmap for the energy transition

This explainer summarises the key findings, assumptions and insights from the Integrated System Plan (ISP), explaining how the electricity system should evolve to meet growing demand and why a coordinated, whole-of-system approach delivers the least-cost outcome.

It follows the structure of the ISP, comprising four main parts, to help readers quickly navigate the plan and understand what it means for consumers, industry and government policy.



About the ISP

The 2026 ISP is AEMO's long-term roadmap for how the National Electricity Market (NEM) evolves to meet Australia's growing electricity needs.

Developed under the National Electricity Rules, the ISP sets out the least-cost way to support secure and reliable electricity supply as coal retires, electricity consumption doubles, while meeting government policy through to 2050.

Through detailed modelling and extensive consultation, the ISP tests a wide range of possible system paths under different futures and uncertainties. By comparing these pathways, AEMO identifies the combination of investments that delivers reliable electricity at the lowest total system cost while meeting government policy, providing a practical roadmap for investment, policy and planning decisions.

It takes a whole-of-system view – bringing together large-scale generation, storage and networks with the increasing role of consumer energy – to show how the power system can be planned, coordinated and delivered as efficiently as possible for consumers.

The 2026 ISP has been shaped by extensive engagement with close to 2,000 stakeholders, including consumers and their advocates, industry, investors, network planners and governments, and the consideration of more than 300 submissions.

Part A

The energy transition is well underway

Australia's electricity system continues to undergo rapid change, driven by the numerous individual investment decisions of consumers, industry and government.

The way electricity is generated has shifted.

Nearly 40% of the coal fleet has retired, and renewables are fast approaching the milestone of delivering half the annual electricity needs of NEM consumers. In the NEM, 34 gigawatts (GW) of grid–scale renewables and storage are already operating, with a further 67 GW in development.

Consumers and businesses are central to this change.

Around 36% of detached and semi-detached dwellings have rooftop solar and approximately 600,000 households have batteries.

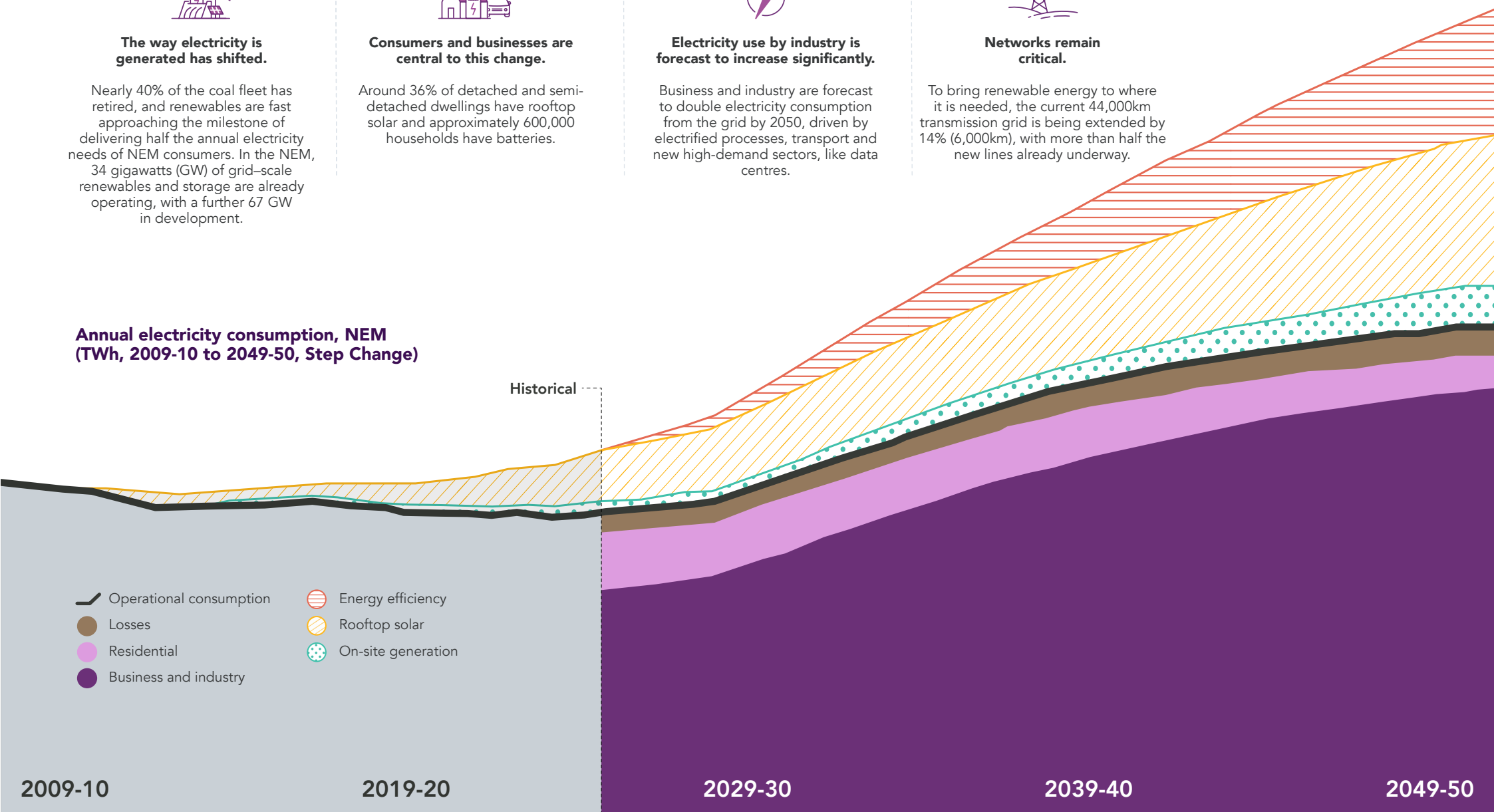
Electricity use by industry is forecast to increase significantly.

Business and industry are forecast to double electricity consumption from the grid by 2050, driven by electrified processes, transport and new high-demand sectors, like data centres.

Networks remain critical.

To bring renewable energy to where it is needed, the current 44,000km transmission grid is being extended by 14% (6,000km), with more than half the new lines already underway.

Annual electricity consumption, NEM (TWh, 2009-10 to 2049-50, Step Change)



Part B

Preparing a least-cost path for the NEM

To respond to changes in the energy system, AEMO prepares the ISP as a whole-of-system roadmap for the NEM.

The NEM is an intricate system of systems that meets consumer electricity needs through generation, storage and transmission, interacting with distribution and connecting consumers' own energy resources.

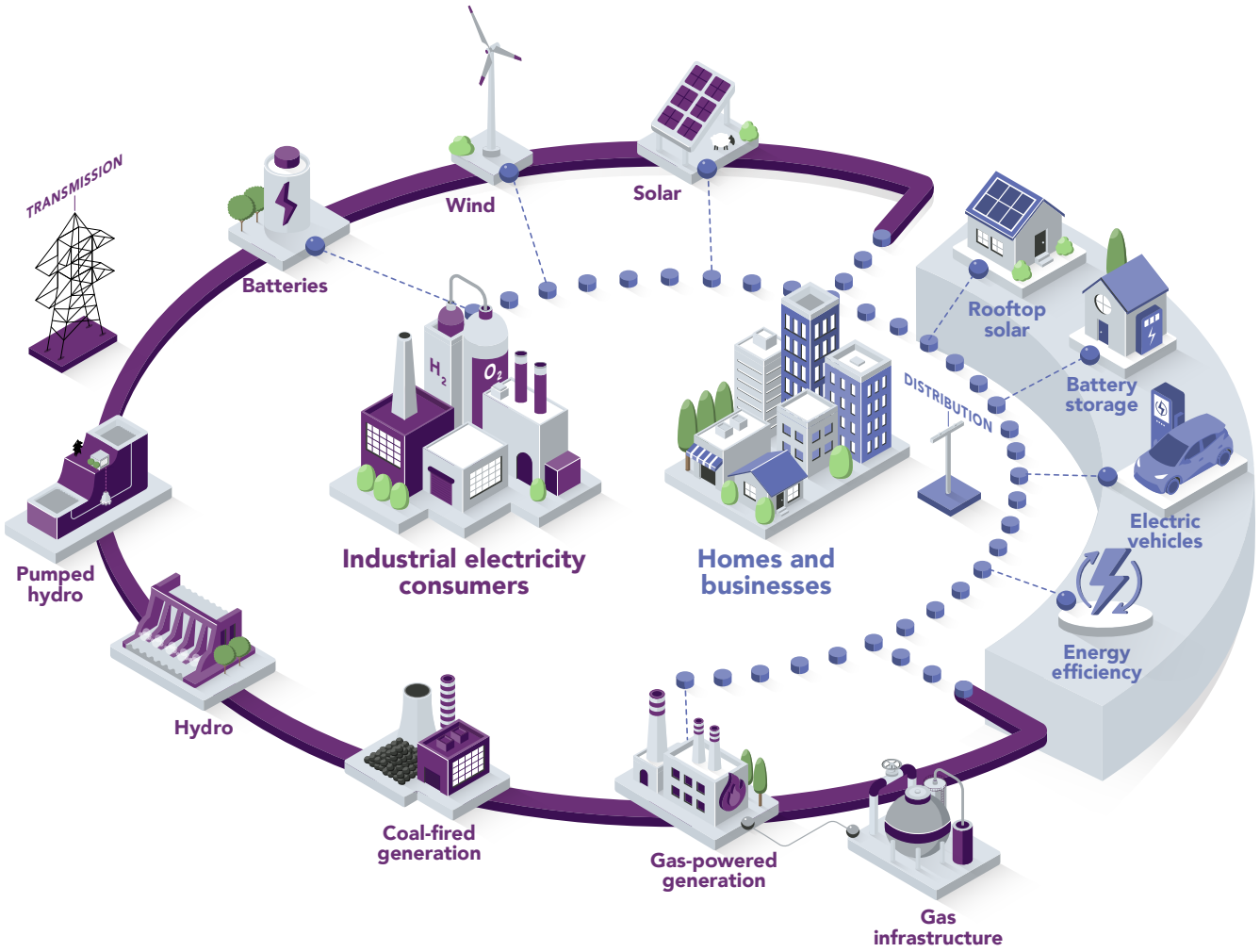
Updated every two years, the ISP reflects changes in technology, demand, policy and investment trends.

The centrepiece of the ISP is the optimal development path (ODP), which sets out the least-cost combination of generation, storage, transmission and distribution network, and consumer investments to replace retiring coal power stations and the doubling of electricity consumption.

To identify the ODP, AEMO tested around 1,000 different combinations of generation, storage, network and consumer investments across three future scenarios that meet government policy, supported by detailed cost-benefit analysis.

By optimising both large-scale infrastructure and consumer energy resources, including rooftop solar, batteries, energy efficiency and demand flexibility, the ISP reduces the need for more expensive generation and network upgrades while improving reliability, benefiting all energy users.

A power system with both grid-scale and consumer energy resources



Part C

Generation, storage and network investments in the ODP

The ODP is built on renewable energy connected by transmission and distribution, firmed with storage and backed up by gas, alongside growing consumer participation. It reflects how different technologies work together across the system, balancing cost, reliability and flexibility.

Key elements of the future system include:

Consumer Energy Resources reduce system costs: Small-scale solar and batteries can meet almost all residential needs, and help to reduce the cost of large-scale investment, benefitting all consumers.

Wind provides critical energy diversity: Wind will be essential for supplying electricity at night and during winter periods.

Storage and firming maintain reliability: Batteries and pumped hydro store and shift energy, while flexible gas generation provides critical backup during peak demand and low renewable output. Although gas plants operate infrequently, they play an essential role in maintaining system stability.

Networks connect and optimise the system: Transmission enables renewable energy to be delivered to demand centres and shared across regions, improving efficiency. The network expands by around 14% to support this transition.

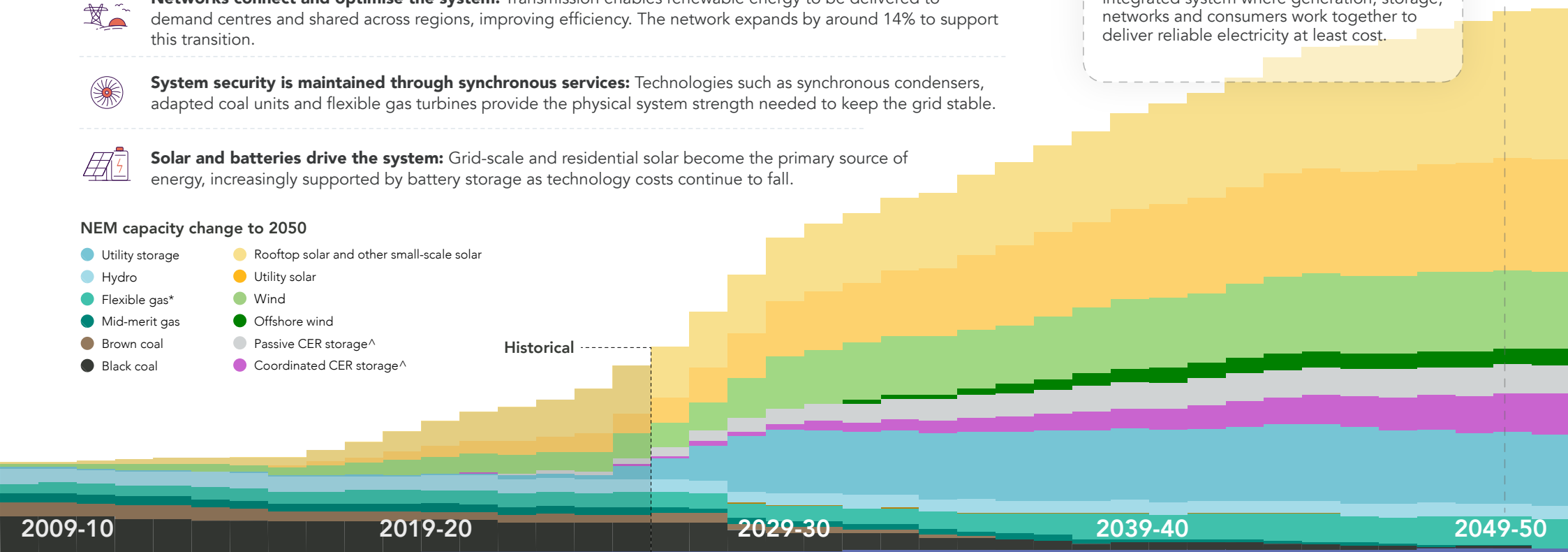
System security is maintained through synchronous services: Technologies such as synchronous condensers, adapted coal units and flexible gas turbines provide the physical system strength needed to keep the grid stable.

Solar and batteries drive the system: Grid-scale and residential solar become the primary source of energy, increasingly supported by battery storage as technology costs continue to fall.

By 2050, this coordinated system delivers:

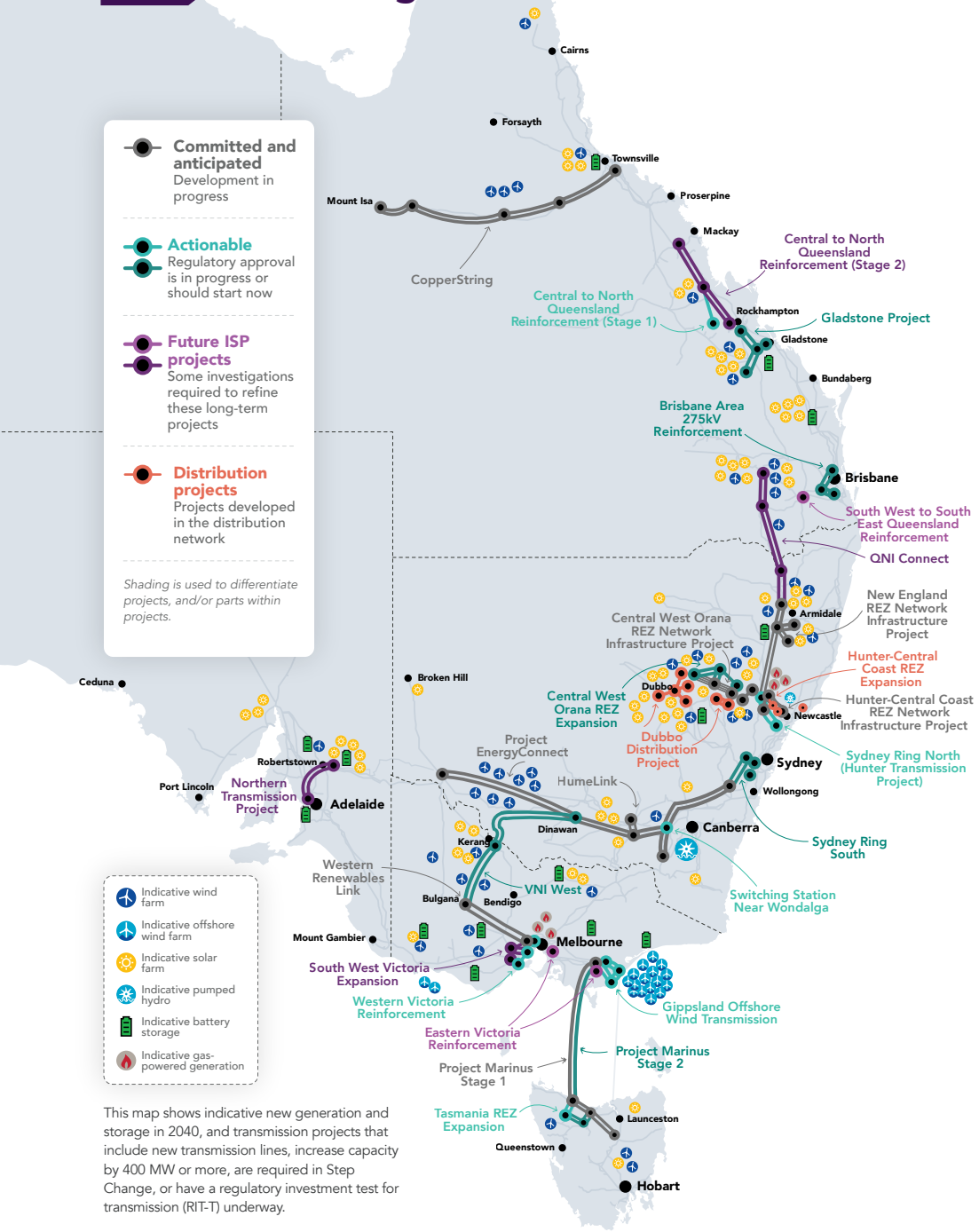
- around 66% of electricity capacity from wind and solar, delivering 96% of annual generation,
- nearly all energy supplied by renewables, rising to around 98% with hydro included,
- storage representing a growing share of capacity, enabling renewable energy to be used when it is needed,
- flexible gas playing a small but critical role, providing a small share of energy but supporting reliability,
- an expanded electricity network, enabling a more connected and efficient system.

Together, these investments create a highly integrated system where generation, storage, networks and consumers work together to deliver reliable electricity at least cost.



Part D

Delivering the ODP



This map shows indicative new generation and storage in 2040, and transmission projects that include new transmission lines, increase capacity by 400 MW or more, are required in Step Change, or have a regulatory investment test for transmission (RIT-T) underway.

Under the Step Change scenario, the ODP involves around $106 billion in annualised capital costs to 2050 (in today's dollars). This includes generation, storage, transmission and distribution, and system security costs.

The total upfront capital cost of the ODP's transmission projects is $16 billion (in today's dollars), of which $6 billion is recognised up to 2050 while the transmission continues to benefit consumers for decades to come.

At the same time, a number of projects have progressed and are no longer included, as the ISP focuses on future investments.

Transmission plays a particularly important role in enabling the system to operate efficiently, saving consumers $30 billion (Step Change scenario) in avoided capital, operating and fuel costs compared to a pathway without these transmission investments (actionable and future projects).

Delivering the ODP would provide secure and reliable electricity, keep energy costs as low as possible while meeting government policies.

It also supports investment in CER and broaden access to its benefits, help reduce emissions across the economy, add to energy self-reliance and insulation from global shocks to the price or supply of fossil fuels, and manage risks through a complex transformation.

AEMO thanks stakeholders for their input into the preparation of the 2026 ISP, and will continue to work with consumers, industry, governments and other stakeholders to deliver the energy transition and support reliable, least-cost energy for Australia.

Download the 2026 ISP report at aemo.com.au

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