Department of
Energy and Economic Diversification

GOVERNMENT OF WESTERN AUSTRALIA

Approach to Determining Scenarios

For the Future Energy System Outlook 2027

July 2026

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Contents

Glossary

Term	Definition
AEMO (Australian Energy Market Operator)	AEMO manages electricity and gas markets in Western Australia.
'agent'	An 'agent' in the context of demand forecasting represents a modelling construct that mimics a particular type of consumer. Each 'agent' responds to changing inputs and economic signals such as changes in technology or policy.
Coordinated DER	Coordinated DER refers to the integrated management and operation of distributed energy resources including solar panels, battery storage and electric vehicles and represents a resource that can support peak demand management and grid stability.
Coordinator of Energy (Coordinator)	The Coordinator of Energy (Coordinator) is a statutory role that leads Energy Policy WA, a division of DEED. The Coordinator is responsible for the ongoing evolution of the energy market, including several market reviews.
DEED (Department of Energy and Economic Diversification)	DEED is responsible for the State's transformation to a renewable energy future, trade and investment attraction, activation of industrial land, industry development and advanced manufacturing, leveraging our innovation and science capability, and economic diversification. The Coordinator and EPWA are a part of DEED and leading delivery of FESO 2027.
Distributed energy resources (DER)	Includes distributed PV, distributed battery storage, and electric vehicles (EVs).
Distribution System Operator (DSO)	The DSO is responsible for managing the distribution of electricity to end users and the integration of distributed renewable energy sources into the distribution network.
Electricity System and Market Rules (ESM Rules)	The Wholesale Electricity Market (WEM) is governed by the Electricity System and Market Rules (ESM Rules). These ESM Rules detail the roles and functions of AEMO and other governance bodies and guide the operation of the market including the trading and dispatch of energy, the Reserve Capacity Mechanism (RCM) and settlement.
Future Energy System Outlook 2027	FESO 2027 is the publication that will fulfil the requirements for a Whole of System Plan under the ESM Rules and is required to be completed by 30 September 2027. The purpose of the FESO is to plan for the efficient development of the SWIS power system to meet the needs of SWIS consumers over at least the next 20 years. The FESO will help guide the transition to a secure, reliable, least-cost and lower-emissions power system by identifying the least-cost electricity supply mix for the SWIS, ensuring

Term	Definition
	the continued integration of renewable generation and identify opportunities for emerging technologies.
Major loads	Major loads include facilities connected to the distribution network at high voltage; facilities connected to the distribution network at low voltage with an average daily consumption greater than 10 MWh; and transmission-connected loads. The total number of existing major loads now sits at around 630 connections and represents around half of energy consumed on the SWIS in 2025.
Reserve Capacity Mechanism (RCM)	A market mechanism administered by AEMO to ensure there is sufficient electrical generation capacity within the WEM.
South West Interconnected System (SWIS)	The South West Interconnected System (SWIS) is the State's main electricity system serving more than 1.1 million customers.
SWIS Demand Assessment 2023	The SWIS Demand Assessment (SWISDA) collated industry data to understand the potential change in electricity demand over 20 years, considering the requirements of existing industrial users on the SWIS and potential growth in new industries like hydrogen and critical minerals.
The SWIS Transmission Planning Update 2024	This SWIS Transmission Planning Update outlined a series of proposed new network investments for the SWIS.
The South West Interconnected System Transmission Plan 2025	The South West Interconnected System Transmission Plan sets out the State Government's vision for Western Power's transmission network, along with the investment needed to deliver on that vision. The FESO 2027 will consider this plan and build on it with the latest available information.
Transmission System Plan (TSP)	The TSP is published by Western Power each year, in conjunction with a Network Opportunities Map. It outlines the challenges and opportunities of the transmission network over the next ten years and identifies potential opportunities for network and non-network solutions to address identified challenges.
Virtual Power Plant (VPP)	An aggregation or grouping of DER that is actively controlled and coordinated via a software and communications platform by an operator. VPPs can operate in a coordinated manner to provide services to other parties (such as the wholesale market and/or network).

Term	Definition
V2G (Vehicle to Grid)	V2G is an emerging technology that enables an electric vehicle's battery to export electricity to a home, business or the grid.
Wholesale Electricity Market (WEM)	The market that supplies electricity to the South West Interconnected System (SWIS).
Whole of System Plan (WOSP) 2020	The inaugural Whole of System Plan was released in 2020 as part of the Energy Transformation Strategy.
Whole of System Plan (WOSP) 2027	Whole of System Plan is the statutory term used in the ESM Rules. The 2027 iteration is referred to as the Future Energy System Outlook (FESO) 2027.

Abbreviations

Term	Definition
AEMO	Australian Energy Market Operator
BTM	Behind the meter
Coordinator	Coordinator of Energy
DEED	Department of Energy and Economic Diversification
DER	Distributed Energy Resources
EPWA	Energy Policy Western Australia (the Energy Policy group within DEED)
ESM Rules	Electricity System and Market Rules
ESS	Essential System Services
EV	Electric Vehicle
FESO	Future Energy System Outlook
ISP	Integrated System Plan (for the National Electricity Market)
MISA	Methodology, Inputs, Scenarios, and Assumptions publication
PV	Photovoltaic
RCM	Reserve Capacity Mechanism
SEO	State Electricity Objective
SWIS	South West Interconnected System
SWISDA	South West Interconnected System Demand Assessment
TSP	Transmission System Plan
VPP	Virtual Power Plant
WA GSOO	Western Australian Gas Statement of Opportunities
WEM	Wholesale Electricity Market
WEM ESOO	Wholesale Electricity Market Electricity Statement of Opportunities
WOSP	Whole of System Plan

1. Introduction

1.1. The Future Energy System Outlook

The Future Energy System Outlook 2027 (FESO 2027) is a detailed scenarios-based study to guide planning for the South West Interconnected System (SWIS) to 2050. Each scenario will present a distinct and plausible view of how electricity demand and supply in the SWIS may change over time.

In presenting detailed model outputs of these scenarios, the FESO 2027 will:

- guide planning and investment in the transmission network, generation and storage capacity of the SWIS;
- inform regulatory and market development initiatives; and
- help to manage the transition to a secure, reliable, least-cost and lower-emissions power system.

FESO 2027 replaces the previous Whole of System Plan (WOSP) publication and will fulfil the statutory requirements of a WOSP under clause 4.5A of the Electricity System and Market Rules (ESM Rules). While the ESM Rules continue to use the term “Whole of System Plan”, the 2027 iteration will be published as the Future Energy System Outlook to better reflect its scenario-based approach and role in providing insights into long-term energy system planning.

FESO 2027 will remain the current Whole of System Plan for the purposes of the ESM Rules until it is replaced in accordance with those Rules.

1.2. ESM Rules and the FESO

From 1 July 2021, the Coordinator of Energy (Coordinator) has had ongoing responsibility for preparing a Whole of System Plan under the ESM Rules. The Coordinator is required to complete the next WOSP prior to 30 September 2027, and at least once every five years thereafter.

Under clause 4.5A.7 of the ESM Rules, the Coordinator must develop an approach to determining the scenarios to be modelled. This document sets out that approach. As per clause 4.5A.8 of the ESM Rules, this document must be published on the Coordinator's website.

The ESM Rules include the State Electricity Objective (SEO). The SEO is to promote efficient investment in, and efficient operation and use of, electricity services for the long-term interests of consumers of electricity in relation to:

- the quality, safety, security and reliability of supply of electricity;
- the price of electricity; and
- the environment, including reducing greenhouse gas emissions.

FESO 2027 will support the SEO by providing scenario-based analysis to inform efficient investment, planning and policy decisions for the long-term interests of SWIS consumers.

1.3. Working group

The Coordinator will lead the delivery of FESO 2027 with the support of Energy Policy WA (EPWA) within the Department of Energy and Economic Diversification (DEED). A FESO 2027 Working Group (Working Group) has been established with representatives from DEED, AEMO and Western Power to coordinate the development of the scenarios, inputs, assumptions, modelling approach and outputs for FESO 2027.

The Working Group will help ensure FESO 2027 reflects an integrated view of the SWIS by bringing together:

- AEMO's expertise in system demand forecasting, generation capacity requirements, essential system services (ESS), Wholesale Electricity Market (WEM) operation and power system operation; and
- Western Power's, expertise in transmission and distribution network planning, network demand forecasting, asset management and network investment requirements.

Through this collaboration, the Working Group will test key assumptions and support modelling that is robust, internally consistent and fit for long-term planning.

1.4. Steering committee

To support the delivery of FESO 2027, a Steering Committee has been established to provide senior oversight of the project and ensure the final outlook addresses the requirements of the ESM Rules, supports the SEO and considers priority issues raised by stakeholders.

The FESO 2027 Steering Committee is chaired by the Coordinator and includes senior executive representatives from DEED, AEMO, Western Power and Treasury. The Steering Committee will provide direction on key project decisions, support coordination between participating agencies and consider material issues escalated by the FESO 2027 Working Group.

Deep engagement with stakeholders will support the robustness and credibility of the FESO 2027 outputs.

1.5. Recurrent energy system planning for the SWIS

FESO 2027 is part of the regular planning work for the SWIS. Each planning process has a different role, timeframe and focus, but together they support a secure, reliable and efficient energy system.

FESO 2027 will draw on related work by AEMO and Western Power, including the WEM Electricity Statement of Opportunities (WEM ESOO), the WA Gas Statement of Opportunities (WA GSOO) and Western Power's Transmission System Plan (TSP).

FESO 2027 takes a longer-term, whole-of-system view. It uses scenarios to explore how electricity demand, generation, storage, networks and gas infrastructure may need to change under different plausible futures.

Table 1-1 summarises the role of key recurring planning processes relevant to the SWIS.

Table 1-1: Energy system planning for the SWIS

Plan	Organisation	Description
WEM ESOO and WA GSOO	AEMO	• The WEM ESOO identifies necessary investments to maintain power system reliability in the SWIS over the coming 10 years. • The WEM ESOO focusses on determining the generation, storage and demand-side management required to meet the reliability standard in the SWIS and does not explore the more uncertain drivers of change, including changes in energy policy, optimal generation mix, emerging technologies or required network expansion. • The GSOO forecasts WA domestic gas supply and demand (including for electricity generation) and includes an analysis of the gas pipeline and storage network's ability to support peak demand.
TSP	Western Power	• The TSP considers a representative electricity transmission network expansion pathway focused on the next 10 years. • Near term challenges and opportunities in the transmission network are identified.

		• Where a commitment is made by Government to progress a priority project designated by a WOSP or under the Electricity Networks Access Code 2004, this will be reflected in the next TSP.
FESO	DEED AEMO Western Power	• The FESO is a comprehensive and integrated planning analysis for the SWIS. It uses scenario analysis to explore the least cost capacity mix of generation and energy storage requirements, and transmission network and distribution network changes and impacts, over at least 20 years. • The FESO has a broad focus and will explore a wide range of trends, policies and plausible directions that could shape electricity supply and demand in the SWIS over the long term.

1.6. Previous energy system planning for the SWIS

The FESO 2027 will build on previous SWIS planning exercises completed by the WA Government including:

- the inaugural WOSP completed in 2020 (WOSP 2020);
- The South West Interconnected System Demand Assessment (SWISDA) completed in 2023;
- The SWIS Transmission Planning Update completed in 2024; and
- The SWIS Transmission Plan completed in 2025.

FESO 2027 will update and test this previous work using the latest available information, including changes in demand, technology costs, project status, economic conditions, policy settings and actual demand growth since the 2020 Whole of System Plan.

1.7. Document layout

This document is structured as follows:

- Section 1 provides the background on FESO 2027 and explains how stakeholders can provide feedback;
- Section 2 details how the FESO 2027 scenarios will be developed; and
- Section 3 sets out the draft scenario narratives, potential sensitivities and case studies.

1.8. Opportunities for stakeholders to engage

The FESO 2027 Working Group is seeking feedback on the draft scenarios outlined in this document.

Stakeholder feedback will help test whether the draft scenarios are clear, plausible and useful for long-term planning. Feedback may include comments on the scenario narratives, key parameter categories, potential sensitivities and potential case studies.

Further opportunities to provide feedback will be available as FESO 2027 progresses, including consultation on the draft Methodology, Inputs, Scenarios and Assumptions publication and the draft FESO 2027 report. Feedback can be provided through EPWA-info@deed.wa.gov.au.

Table 1-2: Timelines for engagement

Event	Date	Information
Webinar: Introduction to FESO 2027	15 July 2026	Register
Webinar: Draft MISA (Methodology, Inputs, Scenarios and Assumptions)	August 2026	
Public consultation period: Draft MISA	August 2026	
Flagship event: Draft FESO 2027	Q2 2027	
Public consultation period: Draft FESO 2027	Q2 2027	
Flagship event: Launch of FESO 2027	Q3 2027	

2. Scenario development

2.1. What is a scenario?

The FESO 2027 scenarios will present distinct and plausible views of how electricity demand and supply in the SWIS may evolve over the coming decades.

A scenario is not a forecast or prediction. It is a structured way to explore an uncertain future by combining assumptions about key drivers such as economic growth, decarbonisation, technology uptake, consumer behaviour, industrial demand and energy infrastructure.

Each scenario will describe a plausible future state and pathway for the SWIS. Together, the scenarios will allow readers to compare how different assumptions may affect electricity demand, the generation and storage mix, network requirements, gas infrastructure needs, costs, reliability and emissions outcomes.

FESO 2027 will include a 'central' scenario that reflects current policies and trends. This scenario will be broadly aligned with AEMO's expected demand outlook for at least the first five years of the modelling horizon, noting that no long-term modelling exercise can accurately predict the future.

The impact of changes to a scenario may also be explored through sensitivity analysis. A sensitivity changes a single parameter, or a small group of related parameters, to test how strongly that change affects the modelling results.

FESO 2027 may also include case studies focused on specific challenges or opportunities facing the SWIS. These may be used to complement scenario analysis.

2.1.1. Scenario analysis

Scenario analysis will be used to explore how different plausible futures could affect the development of the SWIS.

For each scenario, the analysis will identify the least-cost mix of generation, storage, and infrastructure investment that may be required to meet electricity demand under that scenario. This will reflect changes in electricity demand, technological progression, economic activity and decarbonisation.

Scenarios will consider:

- the optimal mix of wind, solar, battery storage, long duration storage, gas-powered generation and distributed energy resources (DER), including behind-the-meter batteries;
- electricity network investments that may be required to connect new generation and storage, and continue to integrate DER;
- the adequacy of gas infrastructure to support the energy transition, including the potential need for new investment, in storage or other infrastructure; and
- reliability, pricing and commerciality outcomes.

The analysis will help readers understand how these outcomes may change under different assumptions, including assumptions about decarbonisation pathways, industrial load flexibility, energy efficiency, DER uptake and coordination, economic growth and new industrial demand.

2.2. Scenario development process

Scenario development is an iterative process informed by stakeholder consultation, data availability and modelling capability. The ESM Rules set out technical and procedural requirements for FESO, but do not prescribe the number, nature or focus of the scenarios to be modelled.

The approach to determining FESO 2027 scenarios includes:

- identifying key parameters likely to materially affect electricity demand, supply and infrastructure needs in the SWIS;
- presenting draft scenario narratives that combine these parameters into distinct and plausible pathways;
- seeking stakeholder feedback on whether the draft scenarios are clear, plausible and useful for long-term planning; and
- finalising the scenarios and the accompanying inputs and assumptions.

2.2.1. Inputs and assumptions for scenarios

In the FESO 2027 modelling, each scenario will be represented by detailed inputs and assumptions consistent with the scenario narrative.

This document identifies the key parameter categories that will be used to develop the scenarios (discussed in section 2.3 below).

Alongside feedback on the draft scenarios, industry engagement will help inform demand and supply assumptions. The detailed inputs and assumptions to be used in the modelling will be included in an Inputs and Assumptions workbook. The workbook will be published alongside the draft *Methodology, Inputs, Scenarios and Assumptions* (MISA) publication, proposed for Quarter 3 2026.

This document also identifies common assumptions that are expected to apply across all scenarios. These common assumptions will help stakeholders understand what is held constant across the scenarios and what is being varied.

2.2.2. Common assumptions

Retaining some common inputs across scenarios helps show the effect of changing the key parameters that differ between scenarios and allows results to be compared more clearly.

A wide range of inputs and assumptions are expected to remain common between all scenarios such as:

- solar and wind resource availability;
- technical parameters for existing generation assets; and
- representation of the current transmission network.

Common assumptions will use information available to Western Power, AEMO and DEED. They may also be supplemented by information requested from Market Participants, as outlined in the *Guidance on Information and Assistance Required from Australian Energy Market Operator, Western Power, and Rule Participant* publication.

2.3. Key parameter categories

A key parameter category represents a group of inputs and assumptions that, if varied, could materially affect the projected electricity demand, supply, or infrastructure requirements in the SWIS.

To identify key parameter categories, the FESO 2027 Working Group has considered consumer, technology, economic and policy trends that could shape the evolution of the SWIS. This includes population and economic forecasts, Commonwealth and State Government policies, market reforms, technology uptake, industrial development and global decarbonisation trends.

For each scenario, specific key parameters will be developed within these categories to reflect the scenario narrative. The detailed inputs and assumptions for each scenario will be published in the MISA publication. The following table outlines some of the key parameter categories and their potential impact on demand and/or supply of electricity.

Table 2-1: Key parameter categories

Category	Description
Economic growth, and demographic changes	The magnitude and timing of economic growth in Western Australia is expected to drive electricity demand over the modelling period, and impact natural gas demand. Economic growth can increase electricity consumption over time as industry expands. This requires more electricity to be available. Higher economic growth also influences population growth and the growth in income and wages. This may stimulate consumers' investment in rooftop photovoltaics (PV) and battery storage as well as EVs and air conditioners. The nature of economic growth also impacts electricity demand. In Western Australia, growth in the mineral and resources sector and in advanced manufacturing could significantly increase electricity consumption if these facilities connect to the SWIS. If they are within the SWIS footprint but not grid-connected, any growth could have minimal impact on the SWIS. Commonwealth or State Government support for sectors like critical minerals via the Critical Minerals Production Tax Incentive[1] and increased defence sector activity may also impact the resources driven economy of Western Australia. The future competitiveness of some industries or growth of energy intensive industries will be heavily dependent on having access to a reliable, low-emissions supply of electricity to either avoid penalties, maintain competitiveness or demand a higher price relative to competitors.
Global decarbonisation	The pace of global decarbonisation will drive demand for critical minerals and determine the demand for products and supply chains with low embedded emissions. This will affect demand for low-emissions electricity as well as the electrification of industrial processes, such as critical minerals processing and refining. Other drivers are also interlinked with the pace of global decarbonisation. These include the rate of electric vehicle (EV) uptake, future cost changes of electricity generation technology, supply chain constraints, demand for electricity, and uptake of new technologies.
Decarbonisation policy and	The Western Australian Government is committed to net zero by 2050 and an 80% reduction in Government emissions by 2030 relative to 2020.

[1] https://www.ato.gov.au/about-ato/new-legislation/in-detail/businesses/hydrogen-production-and-critical-minerals-tax-incentives#ato-CriticalMineralsProductionTaxIncentive

electrification in the SWIS	The Commonwealth Government's Safeguard Mechanism is expected to drive industrial decarbonisation over time. The pace and scale of industrial decarbonisation can substantially increase electricity demand growth in the SWIS. The electricity sector will play a key role in enabling existing industry to decarbonise, which may materially increase electricity demand.
New industries	Emerging energy intensive industries, such as data centres, green hydrogen production, green iron, and critical minerals processing have the potential to significantly impact electricity demand in the SWIS. As with other major sources of demand, such as in the minerals and resources sector, whether these new industries connect to the SWIS will materially affect the optimal development of the power system.
Energy efficiency	Energy efficiency can reduce electricity demand as more efficient devices, processes or buildings are adopted. Energy efficiency remains one of the most effective and lowest-cost measures available to reduce emissions and can also help to reduce peak electricity demand. Social and technological trends such as climate awareness or lower-cost technologies, regulations, and policy may all influence how quickly buildings or devices become more efficient over time. As with other drivers, this will depend on availability and cost assumptions for new technologies and assumed rates of uptake. Assumed rates of economic growth will similarly influence consumers' ability to invest in more energy efficient products. The rate of energy efficiency improvement will impact electricity demand. For the purposes of FESO 2027, energy efficiency will be explored predominantly through impact on residential demand. Industrial efficiency may be explored through large load models or industrial load flexibility.
Industrial load flexibility	The level of industrial load flexibility can affect peak demand and the infrastructure necessary to meet this demand. As the level of intermittent generation, including rooftop PV, has increased, the typical shape, variability and uncertainty of the daily load profile has changed significantly. Increased volatility within the SWIS continues to be driven by increasing levels of DER. Load flexibility from industrial loads can be a cost-effective way to manage peak demand periods, reducing the need for new generation and potentially network augmentation. The WEM's Reserve Capacity Mechanism (RCM) provides price signals that encourage large consumers to decrease their electricity consumption during certain time intervals through existing Demand Side Management programmes. If demand growth from industry formed a much greater proportion of peak demand, the flexibility or inflexibility of this demand may significantly alter the required capacity needed to maintain reliability.
Distributed Energy Resources	DER are small-scale technologies that can use, generate or store electricity for part of the local distribution system. The uptake of DER, such as rooftop PV, household batteries, controllable load and EVs, can have a major impact on the daily demand profile for electricity supplied by transmission connected electricity generation. A

	policy response to manage rooftop PV in Western Australia has been necessary to mitigate risks to the SWIS at times of low load[2]. Increased uptake of other kinds of DER could impact the grid in new ways. Consumer behaviour, such as undertaking evening charging of EVs, could result in large spikes in demand, while increased adoption of battery energy storage could increase utilisation behind the meter consumption of energy produced from PV. For the purposes of FESO 2027, smaller consumer or residential demand response is assumed to be managed by an aggregator as part of Coordinated DER resources.
Coordinated DER	As household energy storage or other DER, become more prevalent, there is an opportunity to coordinate these resources to help manage the electricity system. Vehicle to Grid (V2G) capability could have a material impact due to the depth of energy storage resource that electric vehicles present. DEED's *DER Roadmap*[3] outlines a set of actions to address system stability, pilot new tariff structures that support a high-DER future, where DER is an active participant in the power system (including through the role of DER aggregators). Coordinated DER technologies continue to mature, *Project Symphony*[4] has demonstrated their potential and highlighted areas to be addressed to allow for growth and are now being explored by *Project Jupiter*[5], launched in January 2025.
Supply chain constraints	Supply chain constraints and skills shortages could limit the growth of electricity consumption in the SWIS and affect the timing or cost of building the required renewable generation, transmission and storage projects needed to meet electricity demand. For example, national supply chain constraints are already impacting the development costs and lead times of energy infrastructure components such as gas turbines, and transformers. These trends could impact growth of electricity consumption, particularly for new industries, and the speed of the energy transition.
Natural gas cost and supply	AEMO's 2025 WA Gas Statement of Opportunities (GSOO) forecasts a widening supply gap over the coming decades and highlights emerging risks facing the adequacy of gas infrastructure to meet future peak electricity demand events. Fuel prices are a significant component of short-term costs for gas powered generation and industrial processes. If gas prices increase further there may be a material impact on the optimal generation mix, the emergence of new demand, and the pace of industrial electrification.

[2] https://www.synergy.net.au/Your-home/Solar-and-battery/Emergency-Solar-Management

[3] https://www.wa.gov.au/government/distributed-energy-resources-roadmap

[4] https://www.wa.gov.au/government/media-statements/Cook-Labor-Government/Project-Symphony-findings-to-inform-future-of-virtual-power-plants--20240604

[5] https://www.wa.gov.au/government/announcements/project-jupiter

2.4. Guiding principles for scenario development

The following guiding principles will be used to develop, test and refine the FESO 2027 scenarios before they are finalised. Guiding principles for scenario development include:

- scenario inputs and assumptions should be internally consistent within each scenario and should not be contradictory;
- scenarios should be plausible and use credible sources and inputs, noting there is inherently greater uncertainty with longer term projections[6]; and
- scenarios should respond to the key parameter categories identified in this document and to opportunities for improvement identified through stakeholder feedback.

These principles will guide how the Working Group considers stakeholder feedback and finalises the scenarios, inputs and assumptions for the draft MISA publication.

2.5. Scenario modelling inputs and outputs

A key output of each modelled scenarios will be a projection of potential demand that reflects the scenario narrative and its specific assumptions. The following steps describe how key parameter settings will be converted into demand traces and then used in the FESO 2027 modelling:

- key parameter settings will inform the inputs used in Western Power's long term demand model, which processes complex and wide-ranging data inputs to produce demand and DER uptake data for each hour over the study period (known as traces);
- an agent-based model is used by Western Power, where customer behaviour is simulated over time for many 'agents'. Electricity demand and DER settings for these agents will be aggregated to form time-series traces for FESO 2027 modelling;
- existing and new major loads are modelled separately as discrete loads, with the selection of new major loads for each scenario being a key part of how each scenario reflects the scenario narratives outlined in the MISA. These assumptions will be informed by direct industry engagement;

[6] With a modelling period of at least 20 years there is inherent uncertainty. It is the role of scenarios to explore this uncertainty within the context of each scenario to understand impact on the SWIS.

- demand traces will be used as inputs into FESO resource planning and market dispatch models, which will solve for the least cost mix of network, generation, and storage capacity required to meet the electricity demand on a per-interval basis; and
- the methodology associated with the long-term demand model and major loads will be detailed in the MISA document.

Together, these steps link the scenario narratives and key parameter settings to the modelled outputs presented in FESO 2027.

3. Draft scenarios

This section outlines the three draft scenarios proposed for FESO 2027. The scenarios are intended to present distinct and plausible future pathways for the SWIS and will be refined following stakeholder feedback.

Some assumptions will apply across all scenarios. These common assumptions help focus the scenario analysis on the key parameters that vary between scenarios.

3.1. Common assumptions

Table 3-1 outlines common assumptions that are expected to apply across all scenarios. This is not an exhaustive list. The full set of common assumptions will be finalised and published in the MISA.

Table 3-1: Common assumptions

Common assumptions	Description
Facility retirements	Assumed retirements and exits of existing facilities will be consistent across scenarios.
Gas fuel costs	A common gas fuel cost trajectory, reflecting forecast supply shortfalls, will be used across all scenarios.
Goldfields Regional Network (GRN)	Development of the GRN concept is progressing. Additional decarbonisation load, or the connection of existing loads to the SWIS in the Eastern Goldfields, is expected to considered through the GRN process and will not be modelled as part of FESO 2027. Existing loads and generation facilities in this region will continue to be modelled.
Emissions constraints	All scenarios will consider the decarbonisation of the SWIS power system by 2050, with different assumptions about the pace and scale of industrial electrification. An emissions constraint will be applied in Central and Rapid Change scenarios, with the Constrained scenario having greater residual emissions reflecting slower progress on decarbonisation.
Network augmentation options	Network augmentation options presented in the SWIS Transmission Plan will be further tested. Phase 1 projects identified in the SWIS Transmission Plan will be treated as committed for modelling purposes in all scenarios.
Modelling horizon	All scenarios will be modelled from 2027 to 2050.

Resource availability traces	All scenarios will use common wind and solar resource availability traces for each representative zone modelled.

3.2. Draft scenario narratives

The Central FESO scenario will be broadly aligned with AEMO's WEM ESOO Expected forecast for the near term to support consistency between major SWIS planning processes.

The Rapid Change and Constrained scenarios are not intended to directly replicate AEMO's High and Low WEM ESOO scenarios. They are broader whole-of-system scenarios that test different assumptions about industrial development, electrification, demand flexibility, DER, network development, gas and emerging technologies. This allows FESO 2027 to explore how different plausible futures may affect the least-cost development of the SWIS, rather than only testing higher or lower demand.

3.2.1. Scenario 1– Central

This scenario reflects current policies and trends and is expected to be aligned with AEMO's WEM ESOO 2026 *Expected* forecast for at least the first five years of the modelling horizon.[7] Moderate levels of economic growth are driven by continued demand for commodities and results in moderate population growth in the South West of Western Australia.

Steady decarbonisation of existing industry connected to the SWIS , including some alumina electrification. Progress is made towards net zero by 2050 as existing industry electrifies. Global decarbonisation also progresses, supporting demand for low emission products.

Growth in emerging sectors, new industries and defence activity drives some new demand in priority industrial areas. Most new large loads and electrified existing loads operate flexibly and may adopt emerging technologies over time. Some very large loads related to emerging energy intensive industries emerge, but most of their demand is met by co-located generation.

[7] The WEM ESOO 2026 Expected forecast is informed by the Step Change scenario in AEMO's Inputs, Assumptions and Scenarios Report: https://www.aemo.com.au/energy-systems/major-publications/integrated-system-plan-isp/2026-integrated-system-plan-isp/2025-26-inputs-assumptions-and-scenarios

Industrial electrification reduces gas demand in the South West over time, although medium-term gas supply shortfalls drive prices higher for a period.

DER uptake continues and Coordinated DER opportunities grow in response to the WA Residential Battery Scheme. V2G emerges as a viable resource.

3.2.2. Scenario 2 – Rapid Change

This scenario is characterised by higher global demand supporting the emergence of new industries, including green iron or data centres. The diversification and growth of the Western Australian economy, alongside the decarbonisation of existing industry, drives higher population growth in the South West.

More rapid and deeper decarbonisation of existing industry connected to the SWIS occurs, including greater alumina electrification. Faster progress is made towards net zero by 2050 as existing industry electrifies more quickly. Rapid global decarbonisation drives demand for low-emissions products, resulting in private sector-led decarbonisation of existing industry.

Industrial electrification reduces gas demand in the South West over time, although medium-term gas supply shortfalls drive prices higher for a period. Growth in emerging sectors, new industries and defence activity drives stronger demand in priority industrial areas. Most new large loads and electrified existing loads operate flexibly and may adopt emerging technologies. Very large loads related to emerging energy-intensive industries emerge, but do not necessarily fully connect to the SWIS. Some may connect partially to the SWIS, with a significant proportion of demand met by co-located generation.

DER uptake continues and Coordinated DER opportunities grow in response to the WA Residential Battery Scheme. Coordinated DER continues to grow rapidly, with V2G emerging as a viable resource more quickly and at greater scale.

3.2.3. Scenario 3 – Constrained

This scenario is characterised by lower electricity demand growth and reduced international commitment to decarbonisation. The development of new industries slows, and flat commodity prices restrict economic and population growth in the South West of Western Australia.

Gradual progress is made to decarbonise industry connected to the SWIS. Existing industry partially electrifies but with limited alumina electrification. Slower global decarbonisation results in subdued demand for low-emissions products. New large loads and electrified existing loads operate less flexibly.

Weaker economic conditions reduce gas demand in some sectors, even as more speculative sources of gas supply are brought online. Medium-term gas supply shortfalls still drive prices higher for a period.

There is increased defence sector activity, which drives some activation of priority industrial areas. Supply chain and resource constraints slow the delivery of electricity infrastructure and result in a greater reliance on gas-powered generation and existing industrial processes.

DER uptake plateaus over time as cost-of-living pressures persist. Coordinated DER opportunities are not taken up at scale after initial uptake driven by the WA Residential Battery Scheme slows, and V2G does not emerge as a viable resource.

3.2.4. Summary of scenario parameters

Table 3-2 summarises how the key parameter categories are expected to vary across the three draft scenarios. These settings are intended to reflect the scenario narratives above and will be used to guide the detailed inputs and assumptions developed through the MISA process.

The table should be read as a high-level summary of the scenario settings, rather than a complete list of all modelling assumptions. The detailed inputs and assumptions for each scenario will be published in the MISA.

Table 3-2: Draft scenario parameters

Scenario category	Scenario parameter	Scenario 1 - Central	Scenario 2 - Rapid Change	Scenario 3 - Constrained
Global decarbonisation and climate impact	**International Energy Agency (IEA) World Energy Outlook scenario alignment**[8]	IEA Stated Policy Scenario	IEA Stated Policy Scenario	IEA Current Policies Scenario
Economic growth and demographic changes	**WA Economic growth**	Expected growth	Higher growth	Slower growth
	WA Population growth	Expected growth	Higher growth	Slower growth
Decarbonisation policy and electrification in the SWIS	**WA Government Emissions 80% by 2030**	Met	Met	Met
	Net Zero by 2050	Met	Met	Delayed
	Consumer decarbonisation	Occurs over time	Occurs more quickly	Occurs more slowly

[8] Global Energy and Climate Model 2025

	Electrification of existing industry	Occurs over time for a proportion of existing industry	Occurs more quickly for a greater proportion of existing industry	Occurs slowly for a lesser proportion of existing industry
New industries	**New industries connected to the SWIS**	Data centres, green iron or hydrogen occur gradually and are progressed with co-located generation	Data centres, green iron or hydrogen experience more rapid growth and are progressed with mostly co-located generation	Very large data centres, green iron or hydrogen projects do not emerge
	Hydrogen availability	Moderate to low production for domestic use	Moderate production for domestic industries and green commodities	Low production for domestic use
Industrial load flexibility	**Industrial load flexibility**	Both new industrial loads and electrification of existing industry exhibit increased demand flexibility over time	Both new industrial loads and electrification of existing industry exhibit increased demand flexibility	There is limited additional industrial load flexibility
Distributed Energy Resources	**DER uptake and operation, including batteries, PV and EVs**	Expected uptake	Higher uptake	Expected uptake that plateaus
Coordinated DER	**Coordinated DER, comprising VPP and V2G uptake**	Current, including a V2G component over time	Higher, including a higher V2G component	Current rate, but V2G does not materialise
Energy efficiency	**Energy efficiency**	Expected improvement	Faster improvement	Expected improvement
Natural gas cost and supply	**Gas-powered generation**	Prices rise for a period, with some gas demand reduction and some additional supply	Prices rise for a period and gas demand falls	Prices rise for a period and supply shortfalls addressed
Supply chain constraints	**Delayed delivery of new industry and energy infrastructure due to logistics and workforce availability**	Expected constraints	Less constrained	More constrained

3.3. Potential sensitivities

Sensitivities may be used to test the robustness of the scenario results. Unlike a scenario, which combines a range of assumptions into a plausible future pathway, a sensitivity tests the impact of changing a specific parameter, or a small group of related parameters.

The sensitivities in Table 3-3 may be explored depending on stakeholder feedback and the insights observed through early scenario analysis.

Table 3-3: Potential sensitivities

Sensitivity	Description
Industrial load flexibility	Higher or lower industrial load flexibility.
DER / Distribution network	Higher or lower forecast uptake of DER.
Gas price	Higher or lower gas prices.
New technology	Inclusion of an emerging technology, such as a long-duration energy storage candidate.

3.4. Potential case studies

Case studies may be used to explore specific challenges or opportunities in greater detail. Unlike scenarios, which consider whole-of-system outcomes under different plausible futures, case studies focus on a narrower issue that may warrant more detailed analysis.

The potential case studies in Table 3-4 may be explored depending on stakeholder feedback and the insights observed through early scenario analysis.

Table 3-4: Potential case studies

Case Study	Description
Very large loads	The connection of very large industrial loads to the SWIS in different locations, with and without co-located generation.
Reliability	System reliability in a high-renewable energy system.
Distribution network	Opportunities for, and evolution of, the distribution network as DER continues to be integrated.