

Appendix D: Supply, fuel, gas and emissions assumptions for FESO 2027

September 2026

1. Existing supply

1.1. Existing facilities

Existing facilities are informed by information held by AEMO, Western Power, and direct engagement with existing market participants. All facilities that are connected to the SWIS and are operational at the time of developing the FESO are included. DSP is aggregated to a single resource.

DEED obtains additional information about existing facilities directly from market participants. Details such as heat rates to support the modelling however remain confidential. A complete list of existing supply facilities and parameters are published in the I&A workbook.

1.2. Retiring facilities

Where existing facilities retire or become unavailable, forecast capacity is reduced to zero from the relevant date for the remainder of the outlook period. Retirement dates align to those dates published in the AEMO 2026 WEM ESOO.

A complete list of retiring facilities is published in the I&A workbook.

2. New entrant supply

Forecast supply comprises facilities projected to meet annual consumption and includes:

- Grid-scale generation including thermal and renewable generation;
- Grid-scale energy storage, including batteries and pumped hydro; and
- Demand Side Programme facilities that reduce load or increase injection from embedded generation or non-dispatchable loads.

The future committed supply methodology uses existing data and assumptions to forecast new supply for each FESO 2027 scenario. It aims to:

- Describe project selection under each scenario;
- Reflect technology-specific annual build limits;
- Support least-cost modelling; and
- Account for uncertainty in project timing, scale and likelihood.

2.1. Committed facilities

The FESO will broadly align with the list of facilities considered committed through recent AEMO assessments and ongoing capacity processes. Entry of projects classified as committed will be modelled in all FESO scenarios, although commissioning dates may be delayed where responding to a scenario narrative.

2.2. Future supply

The volume of new capacity available to be built by the model through to 2031 will be broadly aligned to ESOO committed, anticipated and proposed projects and in consideration of each scenario's narrative.

The FESO least-cost capacity expansion model will use a "fixed" capacity development schedule until October 2031, informed by the FESO's working group assessment of the development status of committed, proposed and anticipated facilities. After 2031, the model will optimise through the entry of "generic build candidates", subject to applicable build limits related to a particular area or at a system level.

This hybrid approach aims to reflect practical challenges in delivery, the likelihood of new entrants emerging in future capacity cycles while also understanding optimal outcomes at a system level over the long term.

Developing pipelines of potential new entrant capacity over the next 5 years will be assessed qualitatively in line with scenario narratives, and informed by:

- Committed, anticipated and proposed project status in recent AEMO assessments;
- Progress and status in the Western Power connection process; and
- DEED engagement with project proponents regarding project progress.

Demand side participation will not be included in the least cost modelling but will feature within the dispatch modelling – please refer to relevant methodologies for further detail.

2.3. Scenarios

The FESO 2027 scenarios provide distinct and plausible views of future SWIS supply. Energy infrastructure development is considered in the context of each scenario narrative across challenges like network access or dependency, workforce constraints, project financing and supply chains.

The I&A Workbook provides further detail on generation capacity build limits through to October 2031 for each scenario and core technology. These build limits are described in the *Inputs and Assumptions workbook* and informed by annual build rates, suitability of a zone to host a particular technology and overall system build rates.

Scenario assumptions

The future supply outlook is influenced by a range of factors affecting electricity demand, investment requirements, and the pace of infrastructure delivery. Consistent with the FESO 2027 scenario framework, supply assumptions are informed by the parameters outlined in Table 1.

These parameters help to guide translation of narrative to project specific build limits for each scenario.

Table 1: Supply scenario parameters

Parameter	Constrained	Central	Rapid Change
Generation and storage development	New investment in wind, solar and storage proceeds more slowly, with greater reliance on existing generation assets, in particular gas-fired generation.	Additional generation and storage are developed as needed to meet forecast demand and reliability requirements.	Greater volumes and faster deployment of generation and storage are required to support higher demand and emissions reduction.

Constrained

Under the Constrained scenario, supply chain constraints, elevated capital and delivery costs, and ongoing project development challenges limit the pace of new capacity deployment over the first five years of the outlook. As a result, fewer renewable projects are expected to reach FID and proceed. Less capacity enters compared with the Central scenario with a portion of otherwise expected developments delayed.

This pipeline presents a lower bound entry of new generation capacity where construction and commissioning limits new entrant volume. As a result, project delivery occurs at a slower rate than in other scenarios.

Central

The Central scenario assumes moderate industrial growth and electrification outcomes, with supply development supported by committed, anticipated and a proportion of proposed projects. Build volumes are based on planned project delivery rates, reflecting a balance between ongoing development challenges and continued improvements in project execution.

While network, workforce, financing and supply chain constraints persist, they are managed to enable projects to proceed broadly in line with planned timelines. This results in a steady trajectory of renewable generation, energy storage and firming capacity

additions across the SWIS. However, challenges with additional projects reaching FID limit overall entry.

The Central scenario reflects a build rate based on the expected delivery of committed and anticipated, alongside additional capacity identified through FESO engagement with Western Power, AEMO, developers and Powering WA.

Renewable generation and energy storage continue to expand throughout the outlook period, but at a slower pace than the Rapid Change scenario.

Rapid Change

The Rapid Change scenario assumes that key development barriers are successfully overcome. Development and delivery barriers are assumed to be progressively resolved, supported by effective implementation of a renewable energy mechanism that supports investment decisions and market outcomes that enable faster project delivery.

Supply chain, workforce and financing constraints ease over time, allowing projects to be delivered on schedule and a greater share of proposed developments to proceed. As a result, projects progress more rapidly through development and commissioning, are delivered closer to schedule, and a greater proportion of proposed projects reach completion.

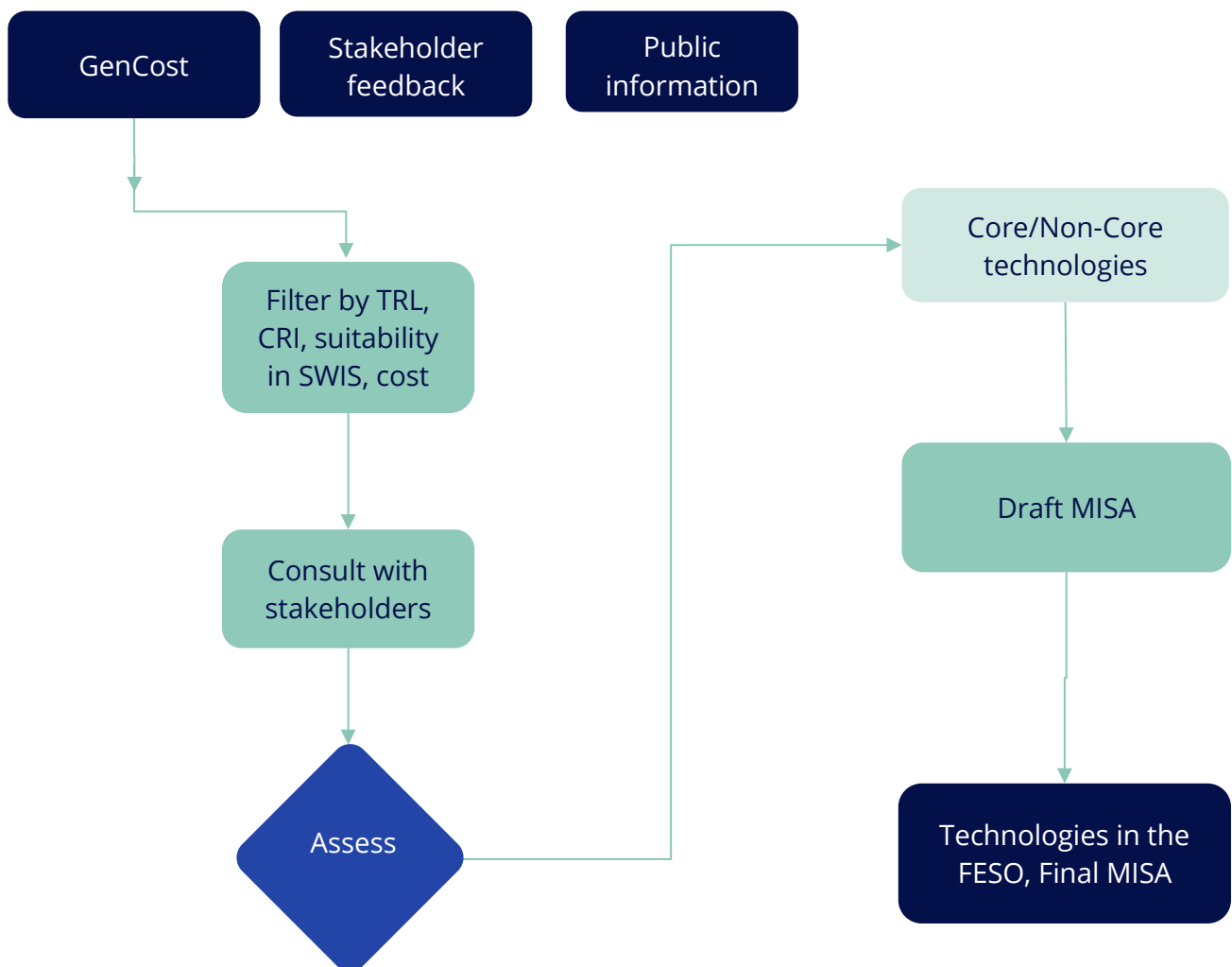
This supports accelerated deployment of renewable generation, storage and firming capacity across the SWIS.

3. Candidate technologies

The evolution of the SWIS will be influenced by the current storage and generation technologies available, those that may emerge and the cost of each. To determine if technologies are suitable for inclusion into the FESO modelling process DEED has applied an assessment criterion outlined in this section. The criterion includes consideration of legality, technical feasibility, fuel availability cost, development timelines and ability to scale.

Technology assessment for FESO

Figure 1 describes the assessment process to determine which generation and storage technologies are available and considered in FESO expansion modelling.



Technologies will not be considered for inclusion as a core technology in the FESO modelling process if any of the following conditions apply:

- Prohibited by existing policy or legislation.
- More expensive than alternatives which have similar operational characteristics.
- Not suited for the SWIS due to fuel or resource availability.
- Technically feasible, but commercially unproven. Some technologies that fall into this category may be explored through sensitivities.
- In development with commercial or technical hurdles which mean there is limited ability to scale the technology.
- Current trends and commercial proposals in the SWIS.

The following table provides an overview of the generation and storage technologies to be included in the FESO modelling. Non-core technologies are proposed to be considered

through a sensitivity to understand the potential impact on emerging new technologies. Not all emerging technologies will be modelled, the proposed technologies are intended to reflect a range of operating parameters that will help to inform the potential evolution of the SWIS. Refer to *Inputs and Assumptions* workbook for aggregated zonal build limits and zones where generic candidates are present.

Plant type	Core Technology	Sensitivity	Earliest Entry Date for generic candidate	Scale Limit
Large scale solar PV	Yes		2032	By zone
Concentrated solar thermal*		*	2033	200MW, limit removed in 2040, by zone
Onshore wind	Yes		2032	By zone
Offshore wind (fixed)	Yes		2035	Declared area, 2000 MW
Flexible gas (OCGT)	Yes		2032	By zone, gas access
Gas with CCS	Yes		2035	By zone, gas access
Battery storage (4 hr)	Yes		2032	zone
Battery storage (6 hr)	Yes		2032	zone
Battery storage (8 hr)	Yes		2032	zone
Battery storage (12 hr)	Yes		2032	zone
Long duration energy storage (100 hr)^	Yes		2035	200MW, limit removed in 2040, by zone
Long duration energy storage (12-24 hr)~	Yes		2033	200MW, limit removed in 2040, by zone
Small Modular Reactors (SMR)*		*	2035	By zone
Flow battery storage*		*	2033	200MW, limit removed in 2040, by zone

4. Gas model constraints

The DBNGP is WA's main gas transmission system, extending almost 1,600 km from the Burrup Peninsula near Dampier in the Pilbara to the South West, connecting major gas supply sources in the Carnarvon Basin with mining, industrial, commercial, electricity generation and distribution network customers throughout WA.

The DBNGP's current throughput is around 845 TJ/day today. The system comprises the main north-south trunkline, approximately 300 km of laterals and ten compressor station sites distributed along the route.

To capture the nature of gas supply limitations in the electricity market modelling, a 'reservoir model' has been proposed to be integrated into the least cost capacity model for the FESO, with nodes: Dampier (receipt), CS8, CS9, CS10, and Bunbury (terminal end point).

The model continues to be developed in response to further information, as it becomes available.

5. Emissions

The FESO will apply emission budgets derived from previous DEED SWIS energy emissions modelling until 2032, at which point a fixed percentage reduction is applied year after year until net zero emissions are achieved on or before 2050.

The Constrained case will not have an emissions budget and as a result, does not achieve net zero emissions by 2050.