

Fact Sheet

The Wholesale Electricity Market (WEM) Western Australia

The Wholesale Electricity Market (WEM) commenced operation in September 2006. Its purpose is to supply electricity to homes and businesses in the South West of Western Australia efficiently and securely (through the South West Interconnected System or SWIS). Electricity retailers purchase electricity from generators either directly or indirectly through the WEM.

AEMO is responsible for operating the WEM in accordance with the Wholesale Electricity Market Rules (WEM Rules) and the related WEM market procedures.

The WEM enables wholesale electricity sales within the SWIS between sellers and buyers.

Other entities that play a role in the oversight and administration of the WEM are:

- The Minister for Energy, who established the initial WEM Rules, approves proposed changes to protected provisions in the Rules and has the ability to amend rules.
- The Department of Treasury - Public Utilities Office, which provides a range of services on energy matters to the Minister for Energy, the Western Australian Government, the energy sector and the Western Australian community.
- The Economic Regulation Authority, which performs regulatory and market surveillance roles and monitors and enforces compliance with the WEM Rules.
- The independent Rule Change Panel which undertakes the administration and decision-making functions for changes to the Rules.
- The Electricity Review Board which acts as an adjudicator for appeals.

WEM fast facts

The WEM provides electricity to more than 1.1 million households and businesses.

The WEM supplies about 20 Terrawatt hours of electricity each year.

The SWIS incorporates over 7,800 km of transmission lines and covers the majority of the population of WA.

There are more than 64,000 km of distribution lines.

It is geographically isolated from other systems.

It is a 'Summer peaking system', with peak demand around 4,000 MW and average demand around 2,000 MW.

The Reserve Capacity Mechanism, unique to the WEM, ensures sufficient generation is available to meet demand at all times.



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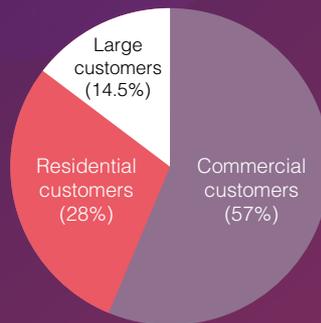
The Wholesale Electricity Market

WESTERN AUSTRALIA

Renewable energy

- WA has seen a high penetration in terms of solar installations, with five years of strong growth.
- One in four houses in the SWIS now has rooftop solar panels.
- There is now over 800MW of installed solar panels, making this in totality the single largest generator on the SWIS.

Energy consumption in WA (2015-16)



Buying and selling electricity

Transport of electricity

1

LARGE GENERATOR

Produces Electricity.

2

GENERATOR TRANSFORMER

Converts low voltage and electricity to high voltage for efficient transport.

3

TRANSMISSION LINES

Carries electricity long distances.

4

DISTRIBUTION TRANSFORMER

Converts high voltage electricity to low voltage for distribution.

5

DISTRIBUTION LINES

Carries low voltage electricity to consumers.

6

Homes, offices and factories

Uses electricity for lighting and heating and to power appliances.

7

ROOFTOP SOLAR PV AND BATTERIES

Can provide energy back into the grid.



Energy resources

Electricity is produced by converting the energy found in resources such as coal, natural gas or oil. Renewable energy resources are also used to provide electricity.

Annual generation by fuel type (2017)

49%



COAL

41%



GAS

8.4%



WIND

1.5%

OTHER

Data does not include generation from rooftop solar PV systems.

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WESTERN AUSTRALIA

How the WEM works

The WEM is a wholesale electricity market in which generators sell electricity to retailers who buy it to on-sell to consumers.

Market generators are participants which operate generation facilities such as conventional (also referred to as scheduled) generators (coal and gas) and intermittent generators

(wind and solar). There are currently around 60 generators in the market.

Market customers are retailers, large scale consumers and Demand Side Participants – which is a load or group of loads which reduce consumption, substituting the requirement for additional electricity generation. There are currently around 20 major customers in the market.

Under the WEM Rules, residential customers (or customers which consume less than 50MWh) can only purchase electricity from Synergy, the state's largest electricity generator and retailer of gas and electricity.

The Reserve Capacity Mechanism, unique to the WEM, ensures sufficient generation is available to meet demand at all times.

Objectives

The WEM rules establish that the objectives of the WEM are to:

- Promote the economically efficient, safe and reliable production and supply of electricity and electricity-related services in the SWIS.
- Encourage competition among generators and retailers in the SWIS, including by facilitating efficient entry of new competitors.
- Avoid discrimination in the market against particular energy options and technologies, including sustainable energy options and technologies such as those that make use of renewable resources or that reduce overall greenhouse gas emissions.
- Minimise the long-term cost of electricity supplied to customers from the SWIS.
- Encourage the taking of measures to manage the amount of electricity used and when it is used.

How electricity is measured

Watt (W)	1 WATT	Often seen on packaging for small household products such as light bulbs		A 40 W light bulb uses 40 watts of electricity.
Kilowatt (KW)	1000 WATTS (1 WATT X 1000)	The output of rooftop solar panels is often described in kilowatts.		A typical residential solar panel system can produce 3.5 KW of electricity.
Megawatt (MW)	1 MILLION WATTS (1 KILOWATT X 1000)	The output of a power station is described in megawatts.		The Tesla battery at Hornsdale, South Australia, can store and produce 100 MW of electricity.
Gigawatt (GW)	1000 MILLION WATTS (1 MEGAWATT X 1000)	Gigawatts are used to describe large amounts of electricity.		Peak demand for WA in 2016/17 was ~4GW.

A kilowatt-hour is the amount of electricity produced or consumed in an hour.
A typical Australian home's daily usage is around 17 kWh.