



WESTERN AUSTRALIA: ELECTRICITY NETWORKS

Western Australia has three major electricity networks that cover different regions of the state: the South West Interconnected System, North West Interconnected System and regional power.

The South West Interconnected System (SWIS) is WA's primary electricity system.

In 2015-16, over one million electricity customers lived in the area supplied by the SWIS, while around 46,000 customers lived in other parts of the state.

SOUTH WEST INTERCONNECTED SYSTEM

The SWIS has a network of over 7,800 km of transmission lines. It includes Perth and spans from Albany (south) to Kalgoorlie (east), up to Kalbarri (north), as highlighted in green in figure 1.

Western Power is the main licensed distributor and Synergy is the largest licensed retailer within the SWIS. Synergy is the only retailer permitted to supply electricity to small-use residential and business customers who consume less than 50MWh per year.

SWIS WHOLESALE ELECTRICITY MARKET

In 1998 the Australian Government reformed the electricity industry, and wholesale electricity in eastern and southern Australia began trading through the National Electricity Market (NEM).

WA and the Northern Territory are not connected to the NEM. The vast size of Australia and the spread between heavily populated areas means that it is not economically sustainable to have a completely interconnected national electricity grid.

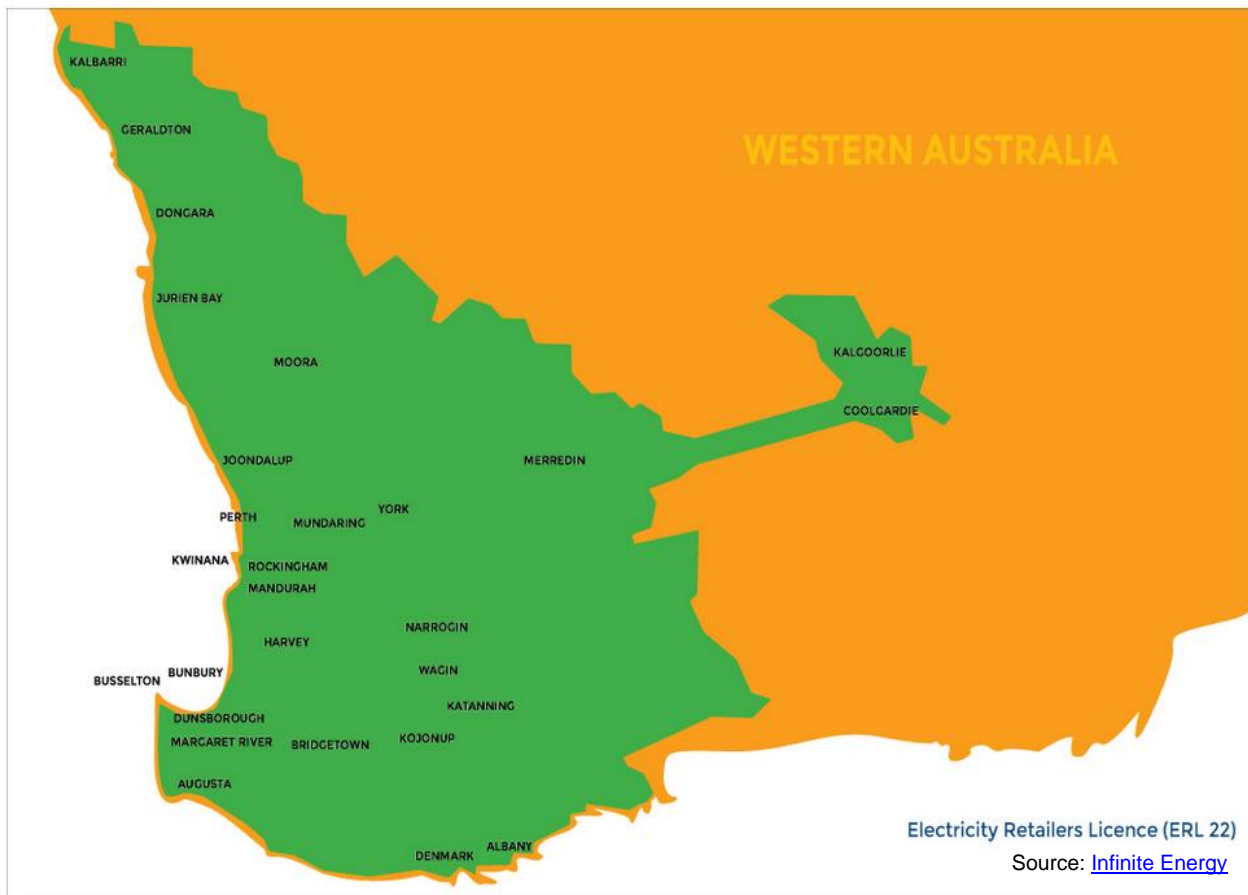
In September 2006 the Wholesale Electricity Market (WEM) commenced within the SWIS. Electricity cannot be easily stored, so the WEM acts as a centrally coordinated market where electricity generation and consumption is matched in real-time to supply the SWIS. Generators sell electricity into the market and retailers buy this

electricity to on-sell to businesses and households.

The WEM encourages competition among generators and retailers within the SWIS, which in turn, results in competitive prices for consumers. The design has similarities to the NEM in the east coast ([see NEM fact sheet](#)) however there are also important differences. In particular, the WEM has a “reserve capacity mechanism” which guarantees all generators income regardless of whether they are running, whereas the NEM is described as an “energy-only market”.

The Australian Energy Market Operator is responsible for the WEM’s operation in accordance to the market rules, which establish the structure and processes of the WEM.

Figure 1: South West Interconnected System





NORTH WEST INTERCONNECTED SYSTEM

The North West Interconnected System (NWIS) covers the Pilbara region, WA's primary area for mining and mining communities. It spans 400 km from east to west and 350 km from north to south.

State government-owned Horizon Power oversees the operation of the NWIS and owns around 25 per cent of the system.

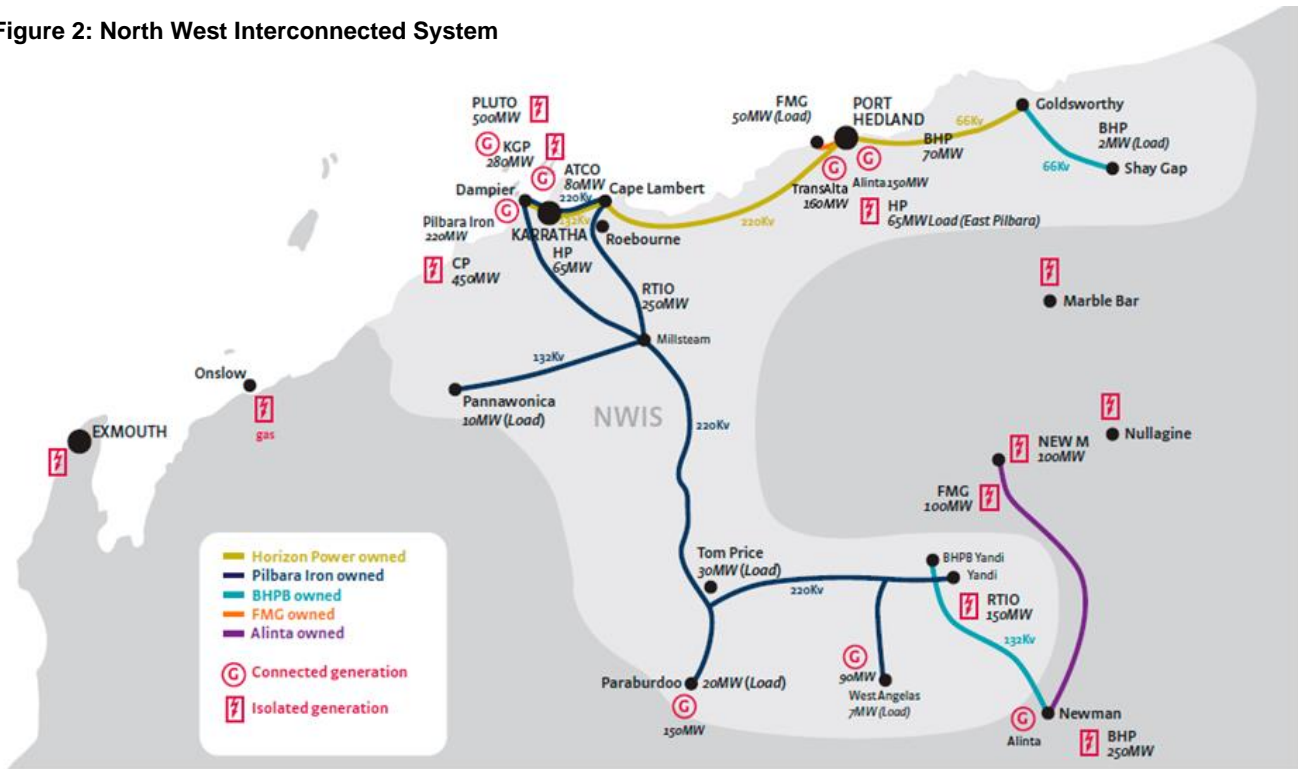
The NWIS operates through five electricity companies - Horizon Power, Alinta, BHPBilliton, Pilbara Iron (Rio Tinto) and ATCO Australia - that

are responsible for generating, distributing and selling energy supplies within the NWIS.

Four companies operate generators in the NWIS. There are also five stand-alone generation facilities within close proximity to the Pilbara.

There are over 15,000 retail accounts within the NWIS. Horizon Power is the electricity retailer for most customers connected to its network, while Alinta Energy supplies a small number of large-use customers on its transmission network.

Figure 2: North West Interconnected System



Source: <https://nwis.com.au/the-nwis/>

Uniform Tariff Policy

WA is a regulated market, so there is little variation in the price of electricity. The State Government has a Uniform Tariff Policy (UTP) that applies to small-use customers who consume less than 160MWh per year (most households and small businesses).

The state sets the maximum price retailers can charge small-use electricity customers. The Economic Regulation Authority also regulates the costs of some gas and electricity transmission and distribution networks.

Under the UTP, all WA customers pay the same price for electricity regardless of where a customer lives. The costs of supplying electricity to customers in regional and remote areas is usually higher than when compared to the SWIS. This means that regulated retail prices are usually lower than the expenses Horizon Power incur for servicing remote and regional communities, but the shortfall is recouped in two ways:

The Tariff Equalisation Contribution funds the difference between cost and supply, by adding an amount to electricity network charges for customers in the SWIS; and,

The Tariff Adjustment Payment is a subsidy from the State Government to fund the difference between regulated retail tariffs and the cost of supply within the SWIS.

In many of these grids, Horizon is discovering that renewable energy, particularly solar, combined with battery storage is a cheaper option than relying entirely on small diesel generators. Similarly Western Power is finding that in some more remote parts of the SWIS, it can be cheaper to disconnect customers from the main grid and use these new technologies to operate them as remote micro grids.

REGIONAL POWER

Horizon Power is solely responsible for the operation of systems in regional towns and to remote communities across the state.

Due to the vast size of the state, regional and remote electricity generation varies between interconnected systems and micro grids.

Shown in Figure 3, Horizon Power maintain three systems in the East Kimberley (Kununurra, Wyndham, Lake Argyle) and two rural systems (Esperance, Hopetoun). There are also 32 micro grids or isolated power systems.

Figure 3: Horizon Power service area



Source: Horizon Power