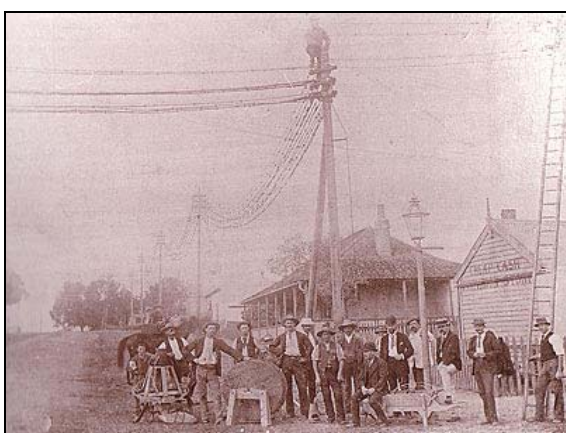


ENERGY *info*

HISTORY OF ELECTRICITY IN WESTERN AUSTRALIA

The Early Years - Lighting up the City of Perth



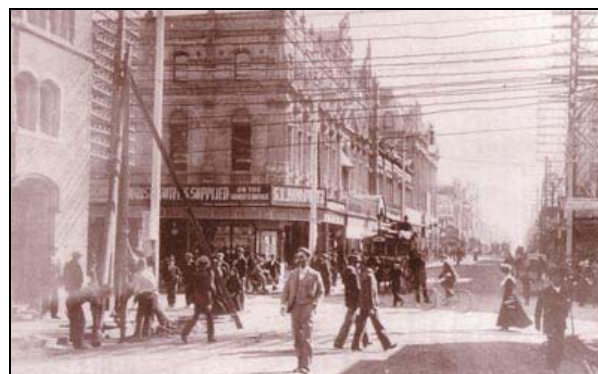
Above - Installation of power lines on the corner of Pier and Wellington Streets, 1893. Source: The History of Electricity in Western Australia, published by Western Power Corporation.

Western Australia's prosperity has depended upon the development of electricity services around the state. Electricity was introduced to Western Australia by the enterprising Mr C.J. Otte and his company, the Western Australian Electric Light and Power Company, in 1888. A small electric plant with a 40 horsepower portable engine and 15kW dynamo were installed in Mr Otte's premises next to the Criterion Hotel in Howick Street (now Hay Street) Perth.

The Perth Town Hall became the first building to receive a permanent electricity supply in Western Australia on 4 December 1891. In 1892, the first electric street light was erected by the WA Electric Light and Power Company. The Perth Gas Company operated the state's first power station from Wellington Street in 1894. The power station (110 volts direct current) supplied electricity to the Perth Town Hall, Wesley Church and Wigg & Son.

The Goldfields towns of Kalgoorlie-Boulder and Coolgardie embraced modern electric street lights in 1897. Small, independently owned power stations swung into action in Perth suburbs and south-western

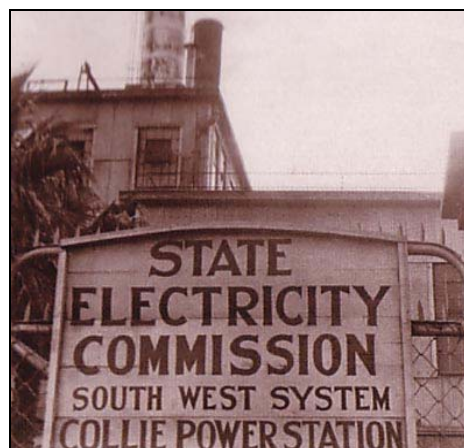
towns from 1900 onwards. Perth people enjoyed an electric tram service, which began to operate in the city from 1899.



Above - Corner of Hay and Barrack Streets in 1898 - Perth Town Hall is on the left. Source: The History of Electricity in Western Australia, published by Western Power Corporation.

Electricity was mainly used for lighting in the home during the first half of the twentieth century and WA's first electric stove was introduced in Kalgoorlie in 1905 by Mr Curle Smith, who devised and patented his own version of the new-fangled invention. In 1913, construction commenced on WA's first major power station, the East Perth Power Station, and it initially generated 12MW.

The SEC Brings More Power to the Bush



Above - State Electricity Commission's Collie Power Station in 1950.

The State Electricity Commission (SEC) was formed in 1945 following the sharp increase of customers' electricity demands after World War II. Its mission was to create a high-voltage transmission grid with the ability to carry power over long distances.

The SEC (which later changed its name to the State Energy Commission of WA and then to Western Power Corporation) was responsible for connecting the independent power stations to the main electricity grid. This program, known as the South West Power Scheme, made a big difference to the lives of country people by supplying them with alternating current (A/C) electricity. By 1957, four power stations in East Perth, South Fremantle, Collie and Bunbury were linked to form the interconnected electricity grid through the southern region of the state.

First Major Power Station Opens in Collie

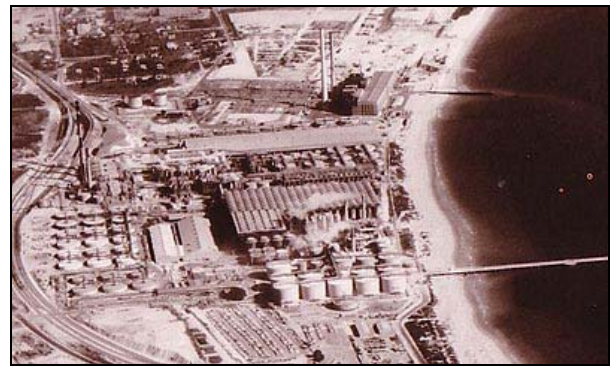


Above - Muja Power Station in Collie.
Source: Verve Energy.

Historically, the fossil fuel most commonly used in Western Australian power stations is coal mined in Collie. Coal is relatively easy to mine and it has a low sulphur and ash content. Muja Power Station was built in stages near Collie's coal mines between 1960 and 1985. This coal-fired, 1,040MW facility is owned by Verve Energy, and it supplies 60 per cent of the power to the main electricity grid in Western Australia. Verve Energy is planning a major upgrade of Muja Power Station, which will result in improved efficiency and more generating power.

Searching for Solutions to the Middle East Oil Crisis

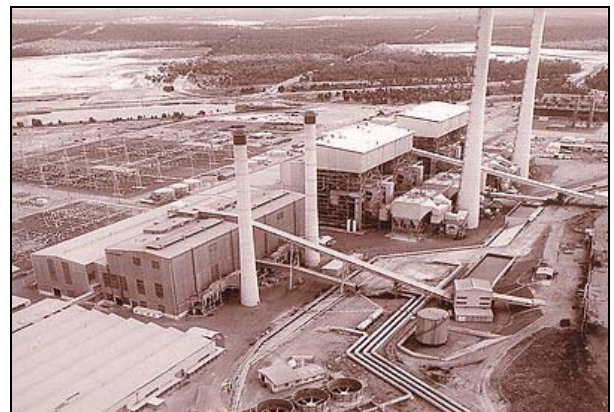
In 1970, the SEC built its second largest power station in Kwinana and the facility was designed to operate on Diesel oil. However, the Middle East oil crisis resulted in a sudden, sharp increase in oil prices in WA and it became too prohibitive to use this fuel to generate electricity on a large scale. In January 1973, the world price for a barrel of "Saudi Light" oil was a mere \$2.59 but it had risen to the princely sum of \$11.65 by January 1974.



Above - Kwinana Power Station 1971.

To reduce the reliance on diesel fuel, the SEC of WA decided to install two new units at Kwinana Power Station which could use coal as well as oil and natural gas. The new units – numbers five and six – were commissioned in 1978 and 1979. Later, Kwinana Power Station's Stages B and C were converted to natural gas in October 1984. Kwinana Power Station became one of the few power stations in the world that could use oil, coal or natural gas and change over to a different fuel at the mere press of a button in the mid-1980s. This was seen as an engineering feat, attracting industry visitors from all over the world.

Continued Advancements in the 1980s



Above - Muja Power Station.

In 1980, the state's energy consumption was one of the highest in the world on a per capita basis. WA was experiencing all the signs of a flourishing economy, with strong economic growth and a high use of energy, particularly for transport across large distances.

The SEC of WA extended the electricity grid to the gold-mining community of Kalgoorlie-Boulder in 1984. The project involved nearly 700km of high voltage transmission wires between Kalgoorlie-Boulder and Muja Power Station in Collie.

Following the sharp oil price increases, the SEC of WA investigated cheaper alternatives to diesel oil for providing electricity. The SEC of WA became a leader in the development of renewable energy in Australia.

The first gas turbine generating unit was commissioned in 1989 at Mungarra, near Geraldton. This is still operated by Verve Energy along with a gas turbine station at Pinjar.

Leading the State to a Bright Future

In January 1995, Western Power Corporation was created to supply customers' electricity demands while AlintaGas was formed to meet gas needs. Verve Energy owns four major power stations which are linked together by transmission lines. They form the South West Interconnected System (known as SWIS) which extends from Kalbarri in the north to Albany in the south and across to Kalgoorlie-Boulder in the east. Horizon Power operates 17 smaller power stations in regional and remote areas throughout Western Australia.

The four main power stations connected to the SWIS are Muja, Kwinana, Cockburn and Pinjar Power Stations.

Collie Power Station is owned by Verve Energy but it is privately operated and maintained. This innovative, 330MW coal-fired power station was opened in Collie in 1999. Clean, low-ash coal is being supplied by Wesfarmers Premier Coal to three Verve Energy stations – the Kwinana, Muja (Stages C and D) and Collie Power Stations.

The Western Australian Government has approved the construction of another coal-fired power station in Collie. The 200-megawatt Bluewaters Power Station will be built by privately owned Griffin Energy.

The power station will provide electricity to the Coolangatta industrial estate in Collie, as well as the South West Interconnected System. This will ensure a continuous and reliable power supply during the phasing out of the existing Muja A and B coal-fired power stations, which is expected by the end of 2007.

Although coal continues to be an economical power station fuel, Verve Energy's power stations now predominantly rely on natural gas. The ability to use natural gas as a fuel has been made possible by the development of some of the world's biggest natural gas reserves under the ocean bed off the North West Shelf.

Verve Energy's newest power station, Cockburn One in Kwinana, is a combined cycle plant that uses both gas and steam. Commissioned in 2003, Cockburn One has a generating capacity of 240MW. A gas turbine generates 160MW of electricity while a steam turbine generates another 80MW of electricity. This provides enough electricity to power four million light globes (using an average light bulb of 60 watt capacity).



Above - Cockburn One Power Station.

NewGen Power Pty Ltd is planning to open a new gas-fired power station in Kwinana in 2008. The \$400 million, 320MW NewGen Kwinana Power Station will provide electricity into the SWIS. The location of the power stations in Kwinana is of strategic importance to the state's power generation because they are conveniently accessible to an established transmission infrastructure, as well as to cooling water from the ocean and natural gas fuel supply pipelines.

Connecting Western Australia's Remote and Regional Towns



Above - In the Mid West town of Yalgoo, the old diesel-fired power station closed on 17 November 2003.

The great majority of people living in remote WA regions have access to electricity directly or indirectly through Horizon Power. Because WA stretches over such a vast area – about the same size as the whole of Western Europe – there are high costs involved in providing electricity to remote areas. Western Australia's remote towns have their own independent power stations, separate from the main SWIS grid. Diesel-oil fuelled engine-driven generators are the only practical way of generating electricity on a small scale for country power stations.

Local municipal authorities decided to build and operate their own "modern" power stations at the turn of the nineteenth century in Western Australia, but the councils charged different prices to regional customers. During 1970 and 1971, a number of remote shire councils were concerned by the escalating cost of providing their ratepayers with electricity. These remote councils were not connected to the South West Power Scheme.

To overcome their difficulties, they approached the Government of the day, requesting that a form of subsidy be paid to the respective councils to ensure that their ratepayers were not being disadvantaged by paying more for electricity than metropolitan customers.

As a result, the Country Towns Assistance Scheme was adopted in January 1973 and the SEC of WA becomes responsible for generating power to regional and remote communities. For an extremely low price, the Yalgoo local authority eagerly handed over its electricity responsibilities to the SEC of WA in January 1973. Another 20 shires followed Yalgoo's lead over the next two years. The SEC of WA immediately commenced major construction projects to improve power supplies and reduce operating costs. The scheme was an immediate success. Regional power stations were modernised and regional people were charged the same electricity prices as Perth customers.



Above - The new Yalgoo Power Plant, 2006.

Useful References

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Wesfarmers Premier Coal

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Independent Market Operator

<http://www.imowa.com.au/>

For more information about Wesfarmers Premier Coal

<http://www.wesfarmers.com.au>

For more information about Griffin Energy

<http://www.thegriffingroup.com.au>