HYDROELECTRICITY FACT SHEET 1

An overview of hydroelectricity in Australia

About hydroelectricity in Australia

- In 2011, hydroelectric plants produced a total of 67 per cent of Australia's total clean energy generation[1], enough energy to power the equivalent of 2.8 million average Australian homes.
- Australia's 124 operating hydro power plants generated 6.5 per cent of Australia's annual electricity supply in 2011[2].
- The Australian hydro power industry has already attracted over one billion dollars of investment to further develop Australian hydro power projects[3].
- Opportunities for further growth in the hydro power industry are principally in developing mini hydro plants or refurbishing, upgrading and modernising Australia's current fleet.

The Clean Energy Council's most recent hydro report provides an overview of the industry and highlights opportunities for further growth. Climate Change and Energy Efficiency Minister Greg Combet stated:

"This is a welcome report and highlights the importance of iconic Australian power generation projects such as the Snowy Mountains Scheme and Tasmanian hydro power. This report reminds us of the importance of the 20 per cent Renewable Energy Target, and the need for a carbon price to provide certainty to investors. Reinvestment in ageing hydro power assets will form an important part of the future energy market and efforts to reduce carbon pollution."

Source: Hydro Tasmania

[1] Clean Energy Council Clean Energy Australia Report 2011 pg. 28)

[3] ibid

[2] Clean Energy Council Hydro Sector Report 2010 pg 14

Clean Energy Council

hydroelectricity

The Clean Energy Council is the peak body representing Australia's clean energy sector. It is an industry association made up of more than 550 member companies operating in the fields of renewable energy and energy efficiency.

visit cleanenergycouncil.org.au Last update: October 2012

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What is Hydroelectricity?

Hydroelectricity is electrical energy generated when falling water from reservoirs or flowing water from rivers, streams or waterfalls is channelled through water turbines. Most commonly, water is dammed and the flow of water from the dam drives turbines that generate energy, which is then converted into electricity.

Hydroelectricity power plants can range in size from very small (10 megawatts or less) to very large, sometimes with over 2000 megawatts of capacity. Large plants, which usually involve the damming of a river, are the most developed form of hydroelectricity generation, while mini or micro plants are by comparison at a relatively early stage of development.

Along with the varying size of hydroelectricity plants, there are a range of hydro technologies currently employed in Australia. The type of technology depends on the intended use of the power plant – peak or base load generation – as well as geographical and topographical factors.

These technologies include:

- Pumped storage –the only large-scale commercial means of storing electricity. By using excess electricity generated in times of low demand to pump water into higher storages, the energy can then be stored and released back into the lower storage in times of peak demand[4].
- Run-of-river systems – as the name suggests, run-of-river systems utilise the natural steady and consistent flow of rivers to generate electricity.

The benefits of hydro power

Well-established clean energy source

Hydro power is the most established source of clean energy in the world, and this holds true in Australia. The 124 operating hydro power plants contribute 6.5 per cent to Australia's annual electricity supply, making up 67.2 per cent of the total clean energy generated annually in Australia[5].

Efficiency

Hydro power stations are also highly efficient at energy extraction. Compared to coal power stations that can only extract 25 per cent of the energy contained in their fuel source, hydro power stations are able to achieve over 90 per cent efficiency.

Flexibility

As a flexible, readily available and zero emissions source of renewable energy, hydro power will continue to play a critical role in our clean energy future. Hydro energy is able to start up and supply maximum power within just 90 seconds, meaning it can produce electricity for both base load and peak demand. This natural flexibility and reliability allows hydro power to provide back-up generation for networks and more intermittent sources of renewable energy, such as wind and solar.

Durability

Hydroelectricity stations have a long life. Some hydro power stations around the world built 50 to 100 years ago are still fully operational today. Here in Australia, a significant proportion of the current fleet of hydroelectricity power plants are over 40 years old. With this in mind, ongoing investment in the maintenance and modernisation of these well-established clean energy power plants is critically important in order to retain and improve their significant contribution to Australia's renewable energy mix.

[4] Clean Energy Council Hydro Sector Report 2010 pg 14)

[5] Clean energy Council Report pg. 6

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Industry Snapshot

Figure 1 Top five largest hydro plants in Australia – by capacity (MW)
Source: Clean Energy Australia Report, 2011

HYDRO PLANT	OWNER	STATE	INSTALLED CAPACITY
Tumut 3	Snowy Hydro	NSW	1500 MW
Murray 1	Snowy Hydro	NSW	950 MW
Murray 2	Snowy Hydro	NSW	550 MW
Wivenhoe	Tarong Energy	QLD	500 MW
Gordon	Hydro Tasmania	TAS	432 MW

Figure 2 Top five largest hydro plants in Australia (2008-2012) – by generation (GWh)
Source: Intelligent Energy Systems (IES)

HYDRO PLANT	OWNER	STATE	GENERATION GWh
Murray	Snowy Hydro	NSW	8103.678 GWh
Upper Tumut	Snowy Hydro	NSW	4235.144 GWh
Poatina 101 & 220	Hydro Tasmania	TAS	3982.959 GWh
Reece 1 & 2	Hydro Tasmania	TAS	3827.56 GWh
Tarraleah	Hydro Tasmania	TAS	2269.203 GWh

Source: Hydro Tasmania