

HYDRO ELECTRIC POWER, PUMP STORAGE, AND BATTERY STORAGE.

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TUMUT 1 HYDRO ELECTRIC POWER STATION.



There has been so much talk and false information about Hydro Electric Power Stations, pump storage, and system battery storage that I felt it was time to put the facts straight. Some of the most incorrect and misleading information is from self-appointed university “experts” who have made all sorts of ridiculous statements; as well as from some politicians who either live in fairy land or are deliberately lying. You decide.

Do I know what I’m taking about? I was with the Electricity Commission of N.S.W. for 26 years in a number of positions including the commissioning and in charge of the Coal-Fired Thermal Generators at Tallawarra, Wallerawang and Munmorah Power Stations.

As part of our job we supplied power for the Snowy when required, and of course supplied and controlled the State power grid along with a number of other power stations.

Without doubt the Snowy Mountain Hydro Electric Scheme is the greatest project Australia has ever undertaken. A magnificent project that the governments of today would be incapable of matching. Why? Because they lack the vision, the courage, and the foresight to plan and create such a project.

The money that should be put into this type of project is being wasted on almost useless Wind and Solar Farm subsidies. Then billions more to the U.N. in the name of ‘*Global Warming*’ which after nearly 40 years still does NOT have a shred of proof that our climate is affected by man.

The Snowy River has the greatest source of water in Australia and draws away a large proportion of the waters from the south-eastern New South Wales snowfields. Prior to the “*Snowy Scheme*” construction, nearly all the water from the Snowy Mountains in the Australian Alps flowed down through mountainous and practically uninhabited country until discharging onto the river flats of East Gippsland, and a major proportion of its waters flowed wasted into the sea.

This was while the inland regions of NSW on the inland side of the Australian Alps desperately required water for irrigation.

After a great deal of planning, the idea of the Snowy River Scheme was created and was considered an excellent means of employment for the new migrants coming from all over the World.

The primary intention was to turn the waters inland as well as maintain a flow to the Snowy River. The ability to generate Hydro-Electricity was a major bonus to the original plan.

The construction began in 1949 and was finally completed by 1974.

It consists of sixteen major dams, seven power stations, two pumping stations, and 225 kilometres (140 miles) of tunnels, pipelines, and aqueducts. The Scheme was completed under the supervision of the Chief Engineer, [Sir William Hudson](#), and is the largest engineering project undertaken in Australia.

The melting snow and rainfall flows into the Snowy River and some of its tributaries, much of which formerly flowed southeast onto the river flats of East Gippsland, and into Bass Strait/Tasman Sea, is captured at high elevations and diverted inland to the Murray and Murrumbidgee Rivers irrigation areas, through two major tunnel systems driven through the Continental Divide of the Snowy Mountains, known in Australia as *The Great Dividing Range*. The water falls 800 metres (2,600 feet) and travels through large hydro-electric power stations which generate power generally for peak-load for New South Wales: the Electricity Commission of NSW receiving about two-thirds, Victorian power about one-third, and a small amount for the ACT.

Power stations

Hydro-electric power station	Installed capacity	Year completed
Guthega	60 megawatts (80,000 hp)	1955
Tumut 1	330 megawatts (440,000 hp)	1958
Tumut 2	286 megawatts (384,000 hp)	1961
Blowering	80 megawatts (110,000 hp)	1967
Murray 1	950 megawatts (1,270,000 hp)	1967
Murray 2	550 megawatts (740,000 hp)	1969
Tumut 3	1,650 megawatts (2,210,000 hp)	1974
Tumut 3 Micro Hydro	0.72 megawatts (970 hp)	2004
Jounama Small Hydro	14.4 megawatts (19,300 hp)	2010
Jindabyne Dam Mini Hydro	1.1 megawatts (1,500 hp)	2011

The total installed capacity is 3.772 gigawatts (5,058,000 hp).

The added bonus of the Hydro-Electric generators is that they not only made it possible to supply cheap power for the states, but also enabled a share the load of the spinning reserve of the power supply grid system.

Hydro-Electric generators can be run up to full load in two minutes. No expansion problems, no fuel feed problems, just a quiet smooth run up to synchronise, and then to full load if required.

Also the lower Hydro stations such as T3 can run three of their generators in reverse and (when available) pump the water back up to the higher levels. But this does not come free, and requires 25% more power than they generate.

But this is offset by the **improved efficiency** of the thermal coal-fired power stations supplying the power.

The maximum thermal efficiency in a coal- (or gas-) fired power station is at full load due to maximum heat transfer in the boilers, with minimum heat loss. As the units decrease in load so does the thermal efficiency. By way of example: the units at Munmorah power station at full load of 350 MWs generate power at 10,000 b.t.u. per kilowatt. At 180 Megawatts that falls back as low as 14,000 B.T.U. per kilowatt.

When the units are doing load control, and are down in load in the early mornings, due to reduced demand, this is the time power is supplied to the Snowy Hydro units to pump the water back up to higher level.

By increasing the unit load the efficiency is increased and that gain is offset against the 25% loss of pumping the water back up. This can reduce the overall loss to as low as approximately 12%.

Pump-Hydro has always existed at the Snowy but it is ONLY available *when the water is available*, and that is after the snow melt and any rainfall. By mid- to late- summer there is little to spare, depending on the amounts of snowfall and rain received previously.

The primary purpose of the Snowy Scheme **is to provide permanent water flow for irrigation inland** to the Murrumbidgee and Murray rivers, plus to a few tributaries on the western side, and to the Snowy River on the eastern side.

The idea that pump-hydro is some sort of new saviour is typical 'Green' daydreaming. Where do they think the power comes from to do it? **Thermal Power Stations!** Without them there is no power to drive the hydro pump/generators. Also it is not the pumping water back up is the answer, **it is sufficient water/snow falling on the Snowy Mountains to be able to do it.**

Increasing the storage capacity may make a slight improvement, but knocking down the thermal power stations without building replacement new ones **is insane to say the least.**

Many in the power industry, including me, have said that knocking down Thermal Power Stations without replacement **is absolute insanity!** The mass destruction of these power stations, initiated and organised by the ideological 'Greens' will be the downfall of our power industry, and both sides of politics are too stupid to see it.

The grid system ALWAYS had a spinning reserve of 20% of load. **This has now gone**, and the power supply companies have moved us much closer to blackouts and power failures that most certainly will be occurring in South Australia, and probably Victoria.

The sale of the power industry to private enterprise is the worst thing that the previous governments could have done. It was almost an act of treason placing our total existence in the hands of the overseas moguls whose only interest is to extract as much money as possible, and who could NOT give a damn about reliability of power supply for Australia.

Worse are the 'Green' ideologues whose plan seems to be to totally destroy the thermal power stations, and put Australia on her knees. Instead of wasting so many billions of dollars on unreliable and inconsistent *wind generators* and *solar farms*, the State and Federal governments could build the latest high-efficiency, low-emission power stations of say 4 x 660 Megawatts for two billion dollars each.

The idea of building battery storage is ludicrous. A thermal generator such as, say, Bayswater's 4 x 660 Megawatt generators, supplies 63,360 Megawatt hours each 24 hours, *ad infinitum!*

The battery bank storage in S.A., drawing power from the grid to charge the batteries, will supply less than 100 Megawatts for ONE HOUR. The supply after that: **nothing.**

The suggested construction of battery storage by the Turnbull government is just as ridiculous with the same result. A TEASPOON of power for a VERY short time when they should be building new thermal power stations ASAP!

**For not too much more cost you can have 633.6 times more power
*ad infinitum!***

The 'Greens' say that coal is finished, so perhaps that is why there are over 700 new HELE coal-fired thermal power stations being built right now in India, China, USA, Europe, and South America, and in many other places!

The people of Australia may start to listen when they are sitting in the dark with no power for their employment or business. Maybe then it might sink in that they have been lied to, and deceived, for years.

One tip I can give: that is for residents in the southern states to buy a 5 Kilowatt portable generator. There is every possibility you will need it.

P.S. And stand by for the completely *new-technology* thorium-fuelled molten salt nuclear reactors. Some easily-digestible information about this may be obtained via pages 3 to 5 of this PDF about the climate:

<http://galileomovement.com.au/media/ShouldYouReallyBeAlarmed.pdf>.

This is mind-opening stuff! (By the way: the Norwegians started their first reactor back in April 2013. [Didn't hear about this?](#) "Good news does not sell newspapers!")

And, just as The Snowy River Scheme was about providing water to irrigate our inland, so also is a by-product of this new nuclear technology: the ability to produce large amounts of fresh water than can be pumped inland using ultra-cheap electricity.

And then there's the medical isotopes that can be harvested to be used to cure cancers!

IMPORTANT: *No nuclear melt-down risk, and very little low-level waste with this new technology – quite unlike existing nuclear plants. Because these new units will be modular, and operate at normal atmospheric pressures (unlike previous systems), construction costs will be much lower.*