

**Submission  
No 235**

## **SUSTAINABILITY OF ENERGY SUPPLY AND RESOURCES IN NSW**

**Organisation:** Wodonga Albury Towards Climate Health (WATCH)

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**Submission to the enquiry into Sustainability of energy supply and resources in NSW** being conducted by the Committee on Environment and Planning. This submission is from Wodonga Albury Towards Climate Health (WATCH).

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### **Preamble.**

WATCH members believe that energy, especially electrical energy, is in the midst of a major transformation which needs to be managed to minimise social and economic disruption on the one hand, and on the other hand to take advantage of emerging opportunities. The opportunities for NSW include:

- Solar and wind generation costs are competitive with coal fired electricity and cheaper than nuclear, even when storage is taken into account
- Storage of electricity can be done by multiple technologies such as:
  - Pumped hydro
  - Batteries
  - Compressed air
  - Hot salts
  - Hydrogen/ammonia storage
  - And other methods.
- Vast areas of land suitable for solar farms
- Many hundreds of sites are suitable for pumped hydro projects
- Intellectual talent in universities and organisations such as the CSIRO
- Low interest rates to help in funding projects

Addressing the specific terms of reference (ToR)

### **ToR 1. The capacity and economic opportunities of renewable energy.**

NSW is large which allows for renewable energy generation (wind and solar) to be spread across the state. The advantage of this is that weather conditions are likely to be different in different parts of the state. Even the longitude difference of nearly an hour can be utilised to spread the generation peaks and troughs. Spreading this activity across the state also benefits regional communities.

One of the main weaknesses of renewable energy is its intermittency. To overcome this storage is required. One of the most cost-effective ways to store large amounts of electrical energy is to use pumped hydro. NSW has had Tumut and Shoalhaven pumped hydro schemes in operation for many years and Snowy 2 will also be in NSW. In addition, the work by Prof. Andrew Blakers of ANU has identified many hundreds of suitable sites in NSW, none of which are in national parks. See the atlas of pumped hydro sites at <https://www.arena.gov.au/assets/2018/10/ANU-STORES-An-Atlas-of-Pumped-Hydro-Energy-Storage-The-Complete-Atlas.pdf>

Government action to speed up the identification of the best pumped hydro sites would allow early construction of such projects. Similarly, the government could assist in providing some of the venture capital because it has access to lower interest rates than commercial ventures.

Many organisations such as the reserve bank are crying out for government infrastructure projects to boost the economy and pumped storage projects can assist and will have long-term benefits. In addition to boosting local economies, building a few trial sites would help to give a better indication of the cost of pumped storage than the theoretical estimates that exist at present.

On the matter of economic opportunities, NSW could be helping to determine the viability of producing green hydrogen using electrolysis of water. Australia's chief scientist has already pointed out in Hydrogen for Australia's Future at [https://www.chiefscientist.gov.au/wp-content/uploads/HydrogenCOAGWhitePaper\\_WEB.pdf](https://www.chiefscientist.gov.au/wp-content/uploads/HydrogenCOAGWhitePaper_WEB.pdf) some of the opportunities that hydrogen presents.

Quoting from that report:

“Hydrogen Strategy Group Vision Statement. Our vision is a future in which hydrogen provides economic benefits to Australia through export revenue and new industries and jobs, supports the transition to low emissions energy across electricity, heating, transport and industry, improves energy system resilience and increased consumer choice.”

NSW could be part of that vision.

## **ToR 2 Emerging trends in energy supply and exports, including investment and other financial arrangements**

A trend that is already evident is that renewable energy costs are competitive with coal and lower than nuclear. See for instance GenCost 2018, published by CSIRO at <https://publications.csiro.au/rpr/download?pid=csiro:EP189502&dsid=DS1> provides comparative data.

Another possible trend is replacement of our large and very profitable exports of gas and coal by renewable energy using hydrogen/ammonia as the carrier. See for instance <https://www.energymatters.com.au/renewable-news/solar-powered-hydrogen-export/>

Another need is to build more transmission infrastructure to support 'renewable energy zones' as identified by the AEMO in its 2018 Integrated Systems Plan at <https://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Planning-and-forecasting/Integrated-System-Plan/2018-Integrated-System-Plan> At present solar farm developers are being constrained by the lack of suitable sites close to the transmission network.

## **ToR 3 The status of and forecasts for energy and resource markets.**

No comment.

## **ToR 4 Effects on regional communities, water security, the environment and public health**

WATCH believes that is a disgrace that emissions (other than CO<sub>2</sub>) from coal fired power stations in NSW are much higher than in many other jurisdictions. See the table below which is from <https://www.envirojustice.org.au/wp-content/uploads/2018/11/EJA-submission-on-NSW-power-station-licences-05-Nov-2018-with-attachments.pdf>

**Table 1: Comparison of stack emission limits in various countries for key pollutants**

	Particle pollution	Sulfur dioxide	Oxides of nitrogen	Mercury
United States	125mg/m <sup>3</sup>	1517mg/m <sup>3</sup>	875mg/m <sup>3</sup>	1.5µg/m <sup>3</sup> (black coal) 14µg/m <sup>3</sup> (brown coal)
European Union	50mg/m <sup>3</sup> (black coal) 100mg/m <sup>3</sup> (brown coal)	400mg/m <sup>3</sup>	200mg/m <sup>3</sup>	30µg/m <sup>3</sup> (Germany only, no EU standard)
China	30mg/m <sup>3</sup>	200mg/m <sup>3</sup> (400mg/m <sup>3</sup> for provinces with high sulfur coal)	200mg/m <sup>3</sup>	30µg/m <sup>3</sup>
Vales Point	100mg/m <sup>3</sup>	1716mg/m <sup>3</sup>	1500mg/m <sup>3</sup>	1000ug/m <sup>3</sup>
Eraring	50mg/m <sup>3</sup>	1716mg/m <sup>3</sup>	1100mg/ m <sup>3</sup>	200ug/m <sup>3</sup>
Mt Piper	50mg/m <sup>3</sup>	1716mg/m <sup>3</sup>	1500mg/m <sup>3</sup>	200ug/m <sup>3</sup>

It is therefore clear that converting electricity generation from coal to renewables will be beneficial to public health.

As regards water security, it is worth noting that coal-fired generators are big users of water. Subject to checking, it appears that NSW's generators use an amount of water equivalent to about 6% of Sydney's total water storage capacity.

In contrast, renewable energy generators use next to no water.

**ToR 5 Opportunities to support sustainable economic development in regional and other communities likely to be affected by changing energy and resource markets, including the role of government policies.**

Some of the benefits to regional areas have already been mentioned above.

**ToR 6. Any other related matters.**

No comment

In addition to the above, WATCH endorses the submission lodged by CROW of Wagga Wagga.

Submitted by WATCH, the contact details for which are included at the beginning.