SUSTAINABILITY OF ENERGY SUPPLY AND RESOURCES IN NSW

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Mr Alex Greenwich MP Chair, Committee on Environment and Planning Parliament House Macquarie Street Sydney, NSW 2000



Dear Mr Greenwich,

Re: Inquiry into sustainability of energy supply and resources in NSW

I would like to comment on sections 3, 4 and 5 of this Inquiry, and welcome any opportunity to address the committee if it holds hearings into this matter.

I have a PhD in adapting Australian houses for climate change and scarce resources, and am particularly concerned about water, soil and oil resources which are challenging Australia's ability to support its large and increasing population.

Yours sincerely, John Shiel PhD, MAppSc, MEngSc, BE

Terms of reference

That the Committee on Environment and Planning inquire into and report on the sustainability of energy supply and resources in NSW, including:

- 1. The capacity and economic opportunities of renewable energy.
- 2. Emerging trends in energy supply and exports, including investment and other financial arrangements.
- 3. The status of and forecasts for energy and resource markets.
- 4. Effects on regional communities, water security, the environment and public health.
- 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.
- 6. Any other related matters.

3. The status of and forecasts for energy and resource markets.

4. Effects on regional communities, water security, the environment and public health.

While mankind has surpassed its sustainable natural boundaries, the degradation of our water and soil systems has been particularly evident in Australia and even in NSW in recent times through the condition of our rivers and farms.

"The ecological footprint balance of living from the harvest of earth's capital was passed in the 1970s (Ewing et al., 2008). There are multiple interdependencies between population, energy, water, food, feed, climate and land (Arent et al., 2014; Kraucunas et al., 2015), across which more balance is needed." A nation's Ecological Footprint (Ewing et al., 2008) is the area in *global hectares per person* (gha/p) needed to support residents at their standard of living across water, food, energy, resources and for waste absorption - taking into account CO₂ emissions.

Figure **1** shows the Ecological Footprint (EF) of major countries against their Wellbeing, which is a UN index made up of equal weighting across Health, Wealth and Education. The bottom two rectangles show areas with high wellbeing, while having a sustainable level of Ecological Footprint for the global population in 2005 (the larger one), and for a projected population of 9bn in 2050 (the smaller one). Cuba and North Korea were in these regions in 2005, and most developed nations had an EF of 5 or more (2.5 times what the earth can sustain).



Ecological Footprint and Human Wellbeing - 2005 Data (and population rank 1-5.)

Figure 1 - Global Ecological Footprint against Human Development Index (Wellbeing), with ranking of Top 5 most populous nations, selected nations, a Low-footprint circle, and Sustainable regions. Source: (Shiel, 2017: p.70)

Figure **1** shows that Australia's Ecological Footprint is around 4 times (8gHa/p) its capacity to replenish its natural services (2gHa/p), and therefore we need to import essential goods from other countries. This becomes evident when we find that:

- NSW is in the middle of its worst drought on record, with towns total 150,000 residents (including Dubbo, Parkes, Forbes) running dry if there is insufficient rain in the next 9 months (Morphet, 2019).
- Australia in 2014 imported \$41bn of oil which is necessary for farm machines, agriculture and food growing, as well as transport in general (BZE, 2015),
- Undue pressure is being exerted on NSW's extremely important soil resource:
 - there has been a loss of soil carbon of 12.6%
 - \circ ~ soil pH is getting worse, and

• "soil loss from accelerated erosion, dryland salinity and subsoil acidity, are long-term and often irreversible, or, and costly to reverse" (EPA, 2018).

Soils can be considered a non-renewable resource due to the extremely slow formation process.

So it is evident that Australia has **insufficient natural resources** of water, oil and soil to support its population sustainably.

Coal is an unstainable energy fuel because Australia has almost expended its carbon budget for 2030, and black coal has a very high carbon intensity.

Gas' carbon intensity has been called into question recently over using the low value of methane's impact of 28 times that of CO_2 over the 100-year period for the Global Warming Potential (GWP100). Researchers are now arguing that a methane impact value closer to 86 times CO_2 , which is the 20 year GWP20, should be used because the world does not 100 years to become zero-carbon economies (BZE et al., 2013; Howarth, 2014; Lafleur, Forcey, Saddler, & Sandiford, 2016).

Uranium is a finite fossil fuel, and its residue can become a dangerous weapon which is difficult to safeguard and guarantee would never fall into the wrong hands.

Beyond the Limits of Growth

Limitations in the global availability of materials and energy are of major concern for:

- scientists and engineers (Aleklett, 2010; Bol, 2011; Campbell, 2002; Ginley & Cahen, 2011;
 C. A. S. Hall & Klitgaard, 2011; M. R. Hall, 2010; Heinberg, 2007; IEA, 2016; Klare, 2012;
 Michaux, 2016; Mohr et al., 2015; Turner, 2012) as well as
- economists who extend their concerns to future continued growth (Curtis, 2009; Daly & Farley, 2003; Garnaut, 2008; Kolstad et al., 2014; McKinsey & Company, 2011; Pauli, 2010; UNEP, 2011; Victor, 2008).

Dr Graham Turner (Turner, 2012) an ex-CSIRO resource flow expert now at RMIT, updated the Limits to Growth which recreated the model used by Meadows et al. (2004) by inserting current resource usage inductors. His analysis which was validated against C.A.S Hall's Energy Return on Energy Invested (EROI) figures for oil production showed that the standard run collapse would not happen in 2050, but in 2015. This in effect "forecasted" global collapse as the GFC, and could help to explain why low and negative interest rates are not stimulating the global economy.

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.

NSW already has unsustainable economic development occurring in its regions and cities.

To arrest this, NSW should put in policies to require developers of sub-divisions create locally sustainable and resilient developments where all houses must have:

• sufficient renewable power to power themselves over the year

- sufficient rainwater storage for potable water
- sufficient recycled water access for the garden, toilet and laundry
- sufficient additional parkland and reserves for community gardens to supply much of the local food required for all households, noting that 108m² can yield enough fruit and vegetables for 1 person per year, although usually the yield per tree is 2-4 times expected with sustainable organic practices (Blazey et al., 2007).

References

- BZE. (2015). *Renewable Energy Superpower*. Retrieved from <u>https://bze.org.au/research/renewable-energy-superpower/</u>
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- Morphet, J. (2019, September 15). Day Zero—Doomsday countdown reveals major towns to run dry in weeks. *Sunday Telegraph*, pp. 1, 6–7.