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Nuclear-based science benefiting all Australians

15 January 2010

Senator Mathias Cormann
Chair
Senate Select Committee on Fuel and Energy
PO Box 6100
Parliament House
CANBERRA ACT 2600

Dear Senator

Thank you for your letter of 21 December concerning the Committee's inquiry into energy security. We have the following responses to your questions:

1. *Does ANSTO have a view of how the success or otherwise of Carbon Capture and Storage (CCS) technology will affect energy security in Australia? If so, please elaborate for us.*

   As outlined in the responses below, the impact that CCS technology may have on energy security in Australia will be dependent upon the eventual cost competitiveness of energy generation options using CCS.

2. *Does ANSTO have a view on when CCS is likely to be viable on a commercial scale?*

   ANSTO does not hold specific expertise on CCS. We note the Government's initiative to create the Global Carbon Capture and Storage Institute. We further note that the Institute has issued a number of reports, which recognise significant challenges exist and comment on the viability and costs of CCS. The technology maturity and cost of CCS will presumably be regularly reviewed as the development of existing and planned projects proceeds.

3. *If CCS technology proves successful, how will this affect the viability of nuclear power?*

   That depends on the cost of operation of CCS. Recent published estimates of the cost of CCS would indicate that its implementation would make fossil fuel technologies significantly more expensive than current estimates of nuclear power costs. In addition, current CCS concepts do not fully mitigate carbon emissions from fossil fuels, which therefore limits its usefulness if very deep cuts in carbon emissions are required to meet mitigation targets.

4. *In your evidence to the committee you noted "I think the first thing we need to do is to be more robust in our classification of renewables. There are renewables that are low carbon and there are renewables that are not low carbon… the discourse should move beyond renewables and non-renewables to low-carbon renewables, high-carbon renewables, low-carbon baseload sources and high-carbon baseload sources so that we can start to have a fuller debate" [Senate Committee Proof Hansard, Thursday 12 November 2009, p.29]. Can you please elaborate on this?*

In the public discourse, "renewable" is often equated with "zero carbon emissions". In fact, some "renewable" energy sources – for example, biomass – lead to high carbon emissions. Even those renewables which don't produce carbon emissions during the generation process – such as wind and solar – are responsible for carbon emissions during their manufacturing, as is also the case for nuclear power plants. The extent of such emissions will vary somewhat, depending on the source of electricity in the country where the components are manufactured. These full life-cycle emissions are reflected in the comparisons issued by such bodies as the OECD International Energy Agency and reflected in the UMPNER report. For this reason, it is necessary to look at the full life-cycle emissions from competing technologies, rather than adopting a simplified classification which can be mistakenly interpreted to mean that renewables are generically beneficial for a low-carbon outcome.

The second issue referred to in this comment is the distinction between intermittent power sources (such as wind and solar) and baseload supply. Some renewables (hydro and geothermal) have the capacity to supply baseload power, but an over-reliance on intermittent sources (such as solar and wind) can imperil power grids and security of supply. Currently, baseload power generation around the world is dominated by non-renewable sources, particularly the high-carbon fossil fuels, coal, oil and gas. Our point was to classify baseload power sources in a way that recognises the low-carbon characteristics of some well-established sources, such as hydro and nuclear, and potential future options, such as geothermal energy and CCS-mitigated fossil fuels, recognising that CCS does not fully mitigate carbon production from fossil fuel technologies.

5. *Have you made any approaches to government regarding the need to take a different approach to the classification of renewables and low-emission technologies? If so, how have your approaches been received?*

   ANSTO has not made any approaches to government regarding the need to take a different approach to the classification of renewables and low-emission technologies.

6. *The committee has received evidence that "low-emission technologies are the bridge between completely renewable and where we are today. You need to have a path… Renewables, between now and 2050, are not the only answer. They cannot be the only answer. There needs to be a transition" [Senate Committee Proof Hansard, Thursday 12 November 2009, p.40]. What is ANSTO's view? How important are low-emission technologies in Australia's transition to a low-carbon economy? How can the uptake of low-emission technologies best be encouraged?*

   ANSTO notes that this evidence reflects the misconception that "renewable" equates to zero carbon emissions, discussed in our response to question 4 above. There are currently no technologies which can truly be described as zero emission. Reduction of carbon emissions can only be achieved by the use of low emissions technologies (whether low emission renewables or nuclear) and CCS (although there are limits to the reductions which CCS can achieve). Questions as to how best to encourage the uptake of low-emission technologies are policy questions which fall outside ANSTO's remit.

7. *Does ANSTO believe that current policy settings provide sufficient incentive to adopt low-emission technologies, or does an opportunity gap exist between those technologies which are classified as "renewable" and technologies which are classified as "low-emission"? If so, how can this be addressed?*

   As noted above, ANSTO sees the failure to distinguish between "renewable" and "low-emission" as unhelpful. ANSTO understands that in international climate change

negotiations, Australia supports a technology neutral approach, and seeks to avoid rules that favour or exclude particular technologies. This approach allows individual Parties to determine at a national level which technologies and activities are most appropriate for their circumstances. ANSTO has espoused the view that a technology-neutral approach domestically would support an evidence-based policy advice framework which would be beneficial to all stakeholders.

8. *In ANSTO's view would it be useful to implement a scheme to encourage the use of low-emission technologies, similar to the Renewable Energy Target (RET)?*

   This is a policy question, which falls outside ANSTO's remit.

Please do not hesitate to contact me if you require further information.

Yours sincerely

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Chief Executive Officer