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australian taxpayers' alliance
fighting tax, regulation & waste

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Questions on Notice to the committee for the Inquiry into electricity prices in NSW

The Australian Taxpayers' Alliance (ATA) again thanks the committee for the opportunity to provide evidence and comments. Please find enclosed the following answers to the questions on notice.

NSW state government subsidies to renewables

Feed-in tariff schemes for renewables, paid for by electricity customers in NSW, amounted to $202 million AUD in 2015-16,[1] and an Auditor-General report from 2011 estimated that the Solar Bonus scheme would cost taxpayers $1.05-$1.75 billion AUD over the subsequent 7 years – finding that the scheme was poorly planned, poorly designed, poorly implemented and lacked operational controls and basic risk management.[2] Furthermore, AEMC data from 2016 reveals that in that year alone, NSW residential customers paid close to $100 per MWh each to fund environmental policy costs and will pay approximately the same in 2018.[3] [4] Policies covered by this subsidy include Large scale Renewable Energy Target (LRET), feed-in tariffs, Small scale Renewable Energy Scheme (SRES) and energy improvement schemes.

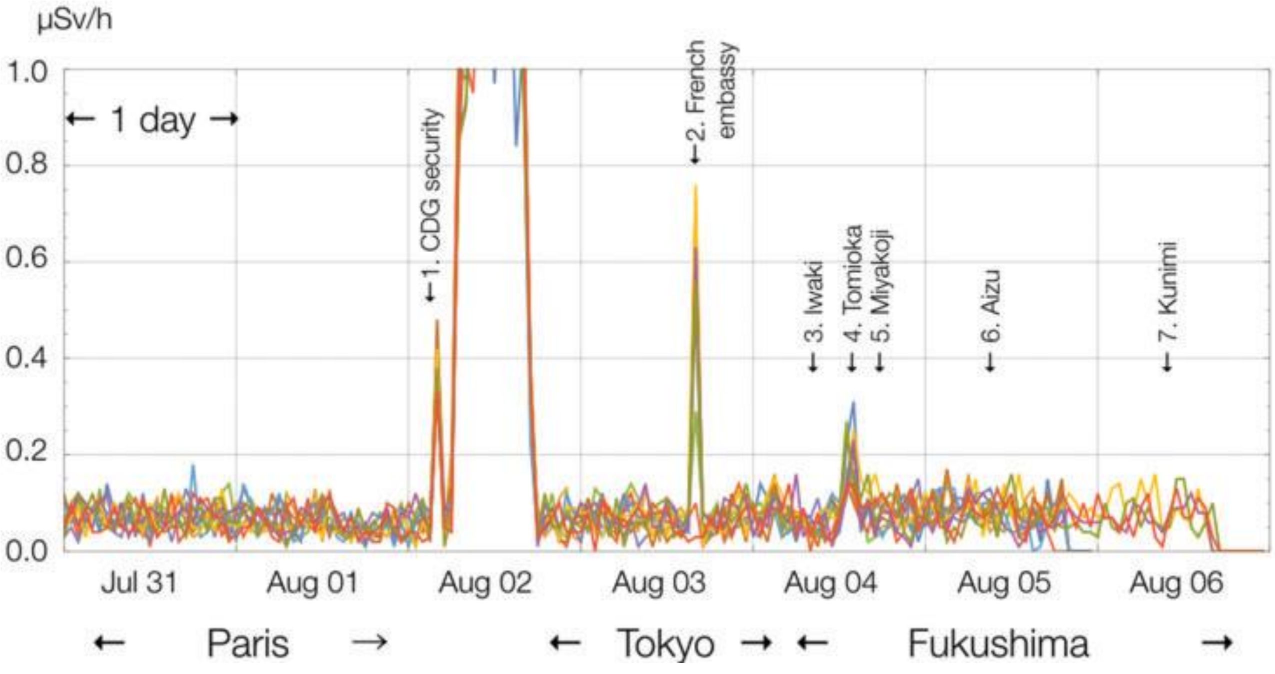
Radiation aftermath in Fukushima: 2016 study

A 2016 study found that "*The accident at Fukushima Daiichi nuclear power plant contaminated the soil of densely populated regions in Fukushima Prefecture with radiocaesium, which poses risks of internal and external exposure to the residents. However, extensive whole-body-count surveys have shown that internal exposure levels of residents are negligible. In addition, data from personal dosimeters have shown that external exposure levels have decreased, so the estimated annual external dose of the majority of people is <1 mSv in most areas of Fukushima*."[5] The study further noted that while problems remained in Fukushima, a majority of these issue are psychosocial rather than radiological, indicating that the purported or expected ill impact of the Fukushima disaster and fear of radiation extends far beyond the actual magnitude of risks.[6]

Cited and discussed in the abovementioned paper (pg 18-22), is a previous 2016 study which measured the radiation exposure experienced by French high school students from Paris who visited the Fukushima area and radiation zone in Japan.[7] The students wore decimeters (Geiger counters) that measured their radiation exposure throughout their trip. The study found that radiation exposure spiked when the students passed through security screening at Paris and Tokyo airport as well as when they passed through the French embassy screening. By contrast, the increase in

[1] Schnittiger & Fischer, *BAEconomics*, 'Primer on Renewable Energy Subsidies in Australia: a report to the Minerals Council of Australia' (2017) http://www.minerals.org.au/file_upload/files/reports/MCA-renewables-subsidies-8Jan2017-2.pdf
[2] Audit Office of New South Wales 2011, Solar Bonus Scheme, Special Report, Sydney.
[3] Australian Energy Market Commission, 2016. 2016 Residential Electricity Price Trends, 14 December.
[4] Footnote 1.
[5] Hayano, R. (2016). Measurement and communication: what worked and what did not in Fukushima. *Annals of the ICRP*, *45*(2_suppl), 14. http://journals.sagepub.com/doi/full/10.1177/0146645316666493
[6] Ibid.
[7] Adachi, N., Adamovitch, V., Adjovi, Y., et al., 2016. Measurement and comparison of individual external doses of high-school students living in Japan, France, Poland and Belarus – the 'D-shuttle' project. J. Radiol. Prot. 36, 49–66.

radiation exposure upon visiting various towns in the Fukushima area, including Tomioka which was directly exposed to the radiation plume, was relatively low. (see graph below)



Nuclear energy construction & expansion worldwide

Argentina has three operating reactors and nascent plans for two units to be constructed by China National Nuclear Corporation (CNNC).

In **Armenia** construction is planned to start on a new reactor in 2018 following government approval in May 2014.

Bulgaria is planning to build a large new reactor at Kozloduy.

In **Brazil** construction of the country's third unit is ongoing following the signing of an agreement with CNNC in September 2017.

In **China**, now with 38 operating reactors on the mainland, the country is well into the growth phase of its nuclear power program. There were eight new grid connections in 2015, and five in 2016. 20 more reactors are under construction, including the world's first Westinghouse AP1000 units, and a demonstration high-temperature gas-cooled reactor plant. Many more units are planned, including two largely indigenous designs – the Hualong One and CAP1400. China aims to have more nuclear capacity than any country except the USA and France by 2020. It is projected that the combined nuclear generation capacity in China will be 60 GW by 2030 which is equivalent to Australia's TOTAL electrical generation capacity.

In the **Czech Republic** the government remains strongly committed to new nuclear capacity. Talks were held in early 2017 with parties interested in constructing new units in the country.

In **Finland**, construction is under way on a fifth, very large reactor which is expected to come online in 2019, and plans are progressing for another large one to follow it.

France is building a similar 1600 MWe unit at Flamanville, for operation from 2019.

India has 22 reactors in operation, and six under construction. This includes two large Russian reactors and a large prototype fast breeder reactor as part of its strategy to develop a fuel cycle which can utilise thorium. Nineteen further units are planned, and proposals for more – including western and Russian designs – are taking shape following the lifting of nuclear trade restrictions.

In **Iran** a 1000 MWe PWR at Bushehr began commercial operation in September 2013, and further units are planned.

Japan has two reactors under construction.

Pakistan has two Chinese ACP1000 reactors under construction.

Romania's second power reactor started up in 2007, and plans are being implemented for two further units to be built there.

In **Russia**, several reactors and two small ones are under construction, and one recently put into operation is a large fast neutron reactor. About 25 further reactors are then planned, some to replace existing plants. This will increase the country's present nuclear power capacity significantly by 2030. In addition about 5 GW of nuclear thermal capacity is planned. A small floating power plant is expected to be commissioned by 2019 and others are expected to follow.

Slovakia is completing two 440 MWe units at Mochovce, to operate from 2018.

South Korea plans to bring a further three reactors into operation by 2019. All of these are advanced PWRs of 1400 MWe. These APR1400 designs have evolved from a US design which has US Nuclear Regulatory Commission (NRC) design certification, and four have been sold to the UAE (see below).

In the **UK**, 11 units are planned, including four 1670 MWe EPR units, four 1380 MWe ABWR units and three 1135 MWe AP1000 units.

In the **USA**, there are plans for two new reactors, beyond the two under construction now. Small to Medium Reactor (SMR) designs are gaining traction. One of these, NuScale, has successfully managed to attract private funding, first from Fluor to the tune of about $220 million then from the municipal utilities conglomerate UAMPs for $450 million. UAMPs owns the poles and wires in 6 states on the West coast of the US (minus California). Along with the initial DOE (Dept. of Energy) grant of $220 million, matched by $220 million from Fluor and $450 million from UAMPs - This $1 billion or so is being used to build the first of a kind NuScale 50MWe SMR in Idaho National Labs by 2026. The NuScale SMRs are designed to be deployed in batches of 12 in a common pool containing 80 Olympic pools worth of water which takes care of reactor decay heat after the reactor is shutdown. UAMPs has a plan to massively roll out these passively safe reactors as brownfield replacements for their aging coal fired power plants. They are also testing the NuScale reactor's load following capability with the HorseButte windfarm next to Idaho National Labs. This SMR design is particularly conducive to integration with renewables, as discussed in a recent paper.[8] These developments have occurred despite strong competition from cheap and widely available natural gas and a strict regulatory environment.

Nuclear power is planned in over 20 countries which do not currently have it, and is under some level of consideration in over 20 more.

Belarus is building two large new Russian reactors at Ostrovets.

The **United Arab Emirates, like Australia, has a low population base and far, far less nuclear expertise than what we have, yet they have built 5.6 GW of reactors in 5 years.** The UAE government recently awarded a $20.4 billion contract to a South Korean consortium to build four 1400 MWe reactors by 2020. They are under construction and on schedule with the first two units due to begin operation in 2018.

Other emerging countries with committed plans for nuclear include: Lithuania, Turkey, Bangladesh, Jordan, Polandand Egypt.

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[8] Ingersoll, D. T., et al. "Integrating nuclear and renewables." (2016): 37-39. https://www.researchgate.net/publication/295114246_Integrating_nuclear_and_renewables