

The benefits for Australia and India

- 2.1 This Chapter discusses the potential benefits of the proposed Agreement for Australia and India.
- 2.2 The proposed *Agreement between the Government of Australia and the Government of India on Cooperation in the Peaceful Uses of Nuclear Technology* (the proposed Agreement) if ratified, will be part of India's efforts to overcome its energy poverty through the expansion of electricity generation.
- 2.3 In principle, the export of Australian uranium to India will result in significant benefits to both Australia and India.
- 2.4 Australia has large reserves of uranium ore and a number of mining companies keen to exploit this resource, with resulting jobs and export revenues. India has a large population, a lack of electrical generating capacity, and a commitment to tackle the problem. India does not have a significant domestic supply of uranium, so must obtain it internationally.¹

The benefits

- 2.5 India's plan to expand electricity generation over the next few decades will, according to the Minerals Council of Australia (MCA):
 - ... deliver significant economic benefits to Australia. Australia is home to almost a third of the world's uranium resources, and India promises to be one of several growing markets for uranium fuel for nuclear power.²

1 Minerals Council of Australia (MCA), *Submission 9*, p. 1.

2 Dr Vanessa Guthrie, Board Member, Minerals Council of Australia (MCA), *Committee Hansard*, Canberra, 9 February 2015, p. 13.

- 2.6 India does not have sufficient domestic uranium reserves to meet its demands for nuclear fuel, and currently sources its uranium from Kazakhstan and Uzbekistan, predominantly.³
- 2.7 Should India's nuclear power generated electricity sector expand as expected, India will be dependent on uranium imports, providing a reliable long term income stream for Australia's uranium exporters.⁴ The MCA believes that Australia could provide up to one third of the uranium India will require into the future.⁵
- 2.8 In terms of the size of this market:
... Australian uranium sales to India by 2030 could be between 1,000 and 2,000 tonnes, worth between \$100 million and \$225 million in export earnings. The total additional revenue through to 2030 could be between \$750 million up to \$1.5 billion to the Australian economy.⁶
- 2.9 By way of comparison, according to the MCA, the uranium mining sector in Australia earned \$622 million in 2013.⁷
- 2.10 In specific terms, the sale of uranium to India is likely to facilitate an estimated increase in capacity from the established uranium mines in South Australia. The South Australian Chamber of Mines and Energy claims that capacity in South Australia could increase to 17,500 tonnes of ore, worth \$1.4 billion in revenue.⁸
- 2.11 In Western Australia, the sale would support the establishment of a new mining industry, with four mines under regulatory consideration at present.⁹ One of these is located at Wiluna, 1,000km north of Perth. The company involved, Toro Energy, expects that, should the mine be approved, it will have a life span of 20 years and will produce 1,200 tonnes of uranium oxide concentrate per year.¹⁰
- 2.12 One of the advantages Toro Energy considers will arise from the proposed mine is a generation's worth of jobs, income and business opportunities for the local Wiluna community.¹¹
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3 Dr Guthrie, MCA, *Committee Hansard*, Canberra, 9 February 2015, p. 13.

4 Dr Robert Floyd, Director General, Australian Safeguards and Non-Proliferation Office (ASNO), Department of Foreign Affairs and Trade, *Committee Hansard*, Canberra, 12 February 2015, p. 1.

5 Dr Guthrie, MCA, *Committee Hansard*, Canberra, 9 February 2015, p. 13.

6 Dr Guthrie, MCA, *Committee Hansard*, Canberra, 9 February 2015, p. 13.

7 Dr Guthrie, MCA, *Committee Hansard*, Canberra, 9 February 2015, p. 14.

8 South Australian Chamber of Mines and Energy, *Submission 18*, p. 1.

9 Western Australian Chamber of Minerals and Energy, *Submission 19*, p. 2.

10 Toro Energy, *Submission 17*, p. 2.

11 Toro Energy, *Submission 17*, p. 2.

- 2.13 The Queensland Government introduced a ban on uranium mining in March 2015. The Queensland mining industry may not be in a position to benefit from the increase in uranium sales should the proposed Treaty be ratified. The Queensland uranium mining industry has estimated that the ban has prevented the extraction of \$6 billion in uranium ore.¹²
- 2.14 Across Australia, the sale of uranium to India is expected to significantly increase employment in the uranium mining sector, with jobs being created particularly in rural and regional areas. In 2013, the MCA estimated that there were 4,200 jobs in uranium mining in Australia. Should the sale of uranium to India go ahead, the MCA expects that the number of those employed will nearly double to 8,000.¹³

Electricity generating capacity in India

- 2.15 India is the fourth largest energy consumer in the world.¹⁴ However, India also has one of lowest levels of per capita energy consumption in the world.¹⁵ The problems that characterise India's electricity supply include:
- rolling blackouts as a result of a lack of generating capacity;
 - 404 million people (30 per cent of the population) without access to any electrical supply;¹⁶ and
 - a predicted rise in demand for electrical supply of 70 per cent between 2012 and 2020.¹⁷
- 2.16 In 2001, electricity consumption in India was 408kWh¹⁸ per capita a year compared to the OECD average of 7,879kWh per capita a year.¹⁹ Further, India's per capita consumption is one fifth of China's.²⁰
- 2.17 To provide some sense of the amount of per capita electricity available to people in India, 408kWh a year is enough to run a refrigerator for eight months out of every twelve.²¹

12 Australian Mining, 18 March 2015, 'Investor Confidence Shaken after QLD Mining Ban', <<http://www.miningaustralia.com.au/news/investor-confidence-shaken-after-qld-uranium-minin>>, viewed 11 August 2015.

13 Dr Guthrie, MCA, *Committee Hansard*, Canberra, 9 February 2015, p. 14.

14 MCA, *Submission 9*, p. 1.

15 Government of India Department of Nuclear Energy, *Strategy for Growth of Electricity in India – Introduction*, <<http://www.dae.nic.in/?q=node/124>>, viewed 20 January 2015.

16 Dr Floyd, ASNO, *Committee Hansard*, Canberra, 12 February 2015, p. 1.

17 MCA, *Submission 9*, p. 2.

18 kWh (kilowatt hours) is a measure of electrical usage over time.

19 Government of India Department of Nuclear Energy, *Strategy for Growth of Electricity in India – Introduction*, <<http://www.dae.nic.in/?q=node/124>>, viewed 20 January 2015.

20 Mr John Carlson, *Submission 1*, p. 1.

- 2.18 Coal power stations generate one half of India's electricity. Other sources of power include: hydroelectric power (16 per cent), other renewables (12.7 per cent), natural gas (9 per cent), and nuclear (1.9 per cent).²²
- 2.19 In addition, India's electrical grid losses are very high at over 23 per cent of generated electricity.²³ The Uniting Church of Australia Justice and International Commission, Synod of Victoria and Tasmania notes that India could achieve its energy objectives to the year 2020 by improving the efficiency of the electricity grid alone.²⁴
- 2.20 The Indian Government believes that Indian electricity consumption per capita will increase to 5,300kWh per year in 2052, with a large contribution coming from nuclear power.²⁵ India's energy policy is aimed at securing adequate energy supplies to meet this demand.²⁶
- 2.21 According to Crispin Rovere:
- For India, nuclear power supports broader efforts to lift hundreds of millions of people out of abject poverty.²⁷
- 2.22 The Indian Government is prioritising nuclear power generated electricity over coal. Compared to coal, nuclear power results in insignificant carbon emissions. If the projected increase in nuclear generating capacity were met by coal, it would result in over 300 million metric tonnes of carbon dioxide emissions a year.²⁸

Increasing nuclear generation

- 2.23 India's civilian nuclear program was established in 1954, with the creation of the Government of India Department of Nuclear Energy and Atomic

21 Government of the United States of America, Department of Energy, *Energy Saver: Household Appliances*, <<http://energy.gov/energysaver/articles/tips-appliances>>, viewed 17 June 2015.

22 Mr Carlson, *Submission 1*, p. 1.

23 Mr Carlson, *Submission 1*, p. 1.

24 The Uniting Church of Australia Justice and International Commission, Synod of Victoria and Tasmania, *Submission 8*, p. 6.

25 Government of India Department of Nuclear Energy, *Strategy for Growth of Electricity in India – Electricity Demand Projection*, <<http://www.dae.nic.in/?q=node/128>>, viewed 20 January 2015.

26 MCA, *Submission 9*, p. 1.

27 Mr Crispin Rovere, *Committee Hansard*, Melbourne, 18 May 2015, p. 7.

28 United States Energy Information Administration, *Carbon Dioxide Emission Factors for Coal*, <http://www.eia.gov/coal/production/quarterly/co2_article/co2.html>, viewed on 21 July 2015; and the European Nuclear Fuel Society, *Fuel Comparison*, <<https://www.euronuclear.org/info/encyclopedia/f/fuelcomparison.htm>>, viewed on 21 July 2015.

- Energy Commission. Civilian nuclear reactors are run by a Government owned enterprise, the Nuclear Power Corporation of India.²⁹
- 2.24 The World Nuclear Association indicates that India is anticipating supplying 25 per cent of its electrical power through nuclear power generation by 2050, which represents a more than 600 per cent increase. India's nuclear reactors supplied 5.3 GW³⁰ of electricity in 2014. This is projected to increase to 1,094 GW in 2050.³¹ By way of comparison, this is ten times the current installed nuclear capacity of the United States.³²
- 2.25 The increase will require the construction on average of seven reactors every year from now until 2050.³³
- 2.26 By 2025 the Australian Safeguards and Non-Proliferation Office (ASNO) believes that India's uranium import requirement should grow to around 2,000 tonnes of uranium oxide each year valued at about \$200 million.³⁴
- 2.27 Given the size of the Indian population and the anticipated increase in per capita demand, Crispin Rovere argues that a failure on India's part to meet its nuclear power electricity generation target will result in that demand being met through coal power generation, with resulting increases in greenhouse gas emissions of a scale sufficient to impact global levels of greenhouse gasses.³⁵
- 2.28 In fact, if India were to use coal to generate the quantum of electricity planned to be generated by nuclear power, this would conservatively produce 315 million metric tonnes of carbon dioxide emissions a year.³⁶
- 2.29 None of the participants in the inquiry advocated coal as an alternative to nuclear power for India's energy demands. The Australian Conservation Foundation (ACF) summarised the general view:

...Coal is cheap and nasty. It is effective. It generates power. India now is overwhelmingly coal dependent. So yes: for unit price, it would be cheaper. In the long run, it is absolutely not going to be

29 Government of India Department of Nuclear Energy, *About us*, <<http://www.dae.nic.in/?q=node/634>>, viewed 20 January 2015.

30 GW refers to Gigawatts, a measure of electrical generation.

31 MCA, *Submission 9*, p. 2.

32 Mr Carlson, *Submission 1*, p. 1.

33 Mr Carlson, *Submission 1*, p. 1.

34 Dr Floyd, ASNO, *Committee Hansard*, Canberra, 12 February 2015, p. 1.

35 Mr Rovere, *Submission 2*, p. 5.

36 Calculated using figures from the United States Energy Information Administration, *Carbon Dioxide Emission Factors for Coal*, <http://www.eia.gov/coal/production/quarterly/co2_article/co2.html>, viewed on 21 July 2015; and the European Nuclear Fuel Society, *Fuel Comparison*, <<https://www.euronuclear.org/info/encyclopedia/f/fuelcomparison.htm>>, viewed on 21 July 2015.

cheaper, because it is a massive contributor to greenhouse pollution, to particulate pollution, to asthma and to all sorts of things. It is a massive fast-tracker of climate change, and many of the plants are old and will need to be retired. They do not have the capacity to upgrade to meet what are ambitious energy production targets.³⁷

Opposition to uranium exports

2.30 A number of participants to the inquiry are strongly opposed to the export of Australian uranium to India. Amongst those opposed are: Friends of the Earth;³⁸ the ACF;³⁹ the Uniting Church of Australia Justice and International Commission;⁴⁰ the Gundjeihmi Aboriginal Corporation;⁴¹ and the International Campaign to Abolish Nuclear Weapons (Australia).⁴²

2.31 Participants opposed to the export of uranium argue that it is unnecessary to export uranium to India because India has a large and thriving renewable energy sector that could meet the expected demand for power in India.⁴³ For example, ACF argues:

...There is no question that, while the Indian government is pursuing nuclear expansion, it is also assertively pursuing renewable energy development. We would strongly say that that is the way to go and that is the path to prioritise and take. There are 50,000 solar technicians being trained now in India. The Modi government, according to Bloomberg of March this year, is planning a \$200 billion investment. It is the seventh-largest clean energy investor in the world.⁴⁴

2.32 The Uniting Church of Australia Justice and International Commission argues:

37 Mr Dave Sweeney, Nuclear Free Campaigner, Australian Conservation Foundation (ACF), *Committee Hansard*, Melbourne, 18 May 2015, p. 15.

38 Friends of the Earth (FoE), *Submission 14*, p. 1.

39 Australian Conservation Foundation (ACF), *Submission 5*, p. 1.

40 The Uniting Church, *Submission 8*, p. 1.

41 Gundjeihmi Aboriginal Corporation, *Submission 12*, p. 1.

42 International Campaign to Abolish Nuclear Weapons (Australia), *Submission 10*, p. 1.

43 The Uniting Church, *Submission 8*, p. 7.

44 Mr Sweeney, ACF, *Committee Hansard*, Melbourne, 18 May 2015, p. 15.

India is able to double its generation from renewable energy from 25 gigawatts to 55 gigawatts by 2017. They believe that is possible, although ambitious.

- 2.33 The Uniting Church cited modelling conducted by the International Energy Agency showing that there can be a fourfold increase in energy production by 2050, with fossil fuel use falling from 80 per cent of energy needs to 25 per cent.⁴⁵
- 2.34 Renewable energy sources are, according to the Uniting Church, also better placed to provide power to the 400 million Indians without access to the electricity grid:
- ... one of the issues of India's vast size is actually getting electricity to the people who need it. Often, therefore, locally produced resources are needed. Certainly, to meet the needs of that [400] million, a significant part will be locally generated power, as opposed to centrally generated by things like nuclear power stations.⁴⁶

Conclusion

- 2.35 From Australia's perspective, selling uranium to India would double the size of an export industry, both in terms of income and employment opportunities. Moreover, it will do so in regional and remote Australia at a time when lower commodity prices are having an economic impact on these regions.
- 2.36 India's proposed expansion in electricity generating capacity of all types is prodigious to say the least. While a number of participants to the inquiry doubt that India has the capacity to undertake such an expansion, the Indian public, who generally consider themselves citizens of an emerging world power, are unlikely to settle for an average electricity supply per capita that does not run a fridge, let alone lighting, hot water and other utilities that together are considered to constitute to a reasonable standard of living.
- 2.37 The evidence presented to the Committee shows that the Indian Government is well aware of the significance of keeping greenhouse gas emissions to a minimum while increasing electricity supply. It is clear from the evidence presented that the Indian Government has as great a commitment to renewable energy as it does to nuclear energy.

45 Dr Mark Zirnsak, Director, Justice and International Mission, Uniting Church of Australia, Synod of Victoria and Tasmania, *Committee Hansard*, Melbourne, 18 May 2015, p. 2.

46 Dr Zirnsak, Uniting Church, *Committee Hansard*, Melbourne, 18 May 2015, p. 2.

- 2.38 Nevertheless, the Indian Government considers that a spectrum of energy sources will be necessary to meet the expected demand for electricity from the 400 million Indians without access to the electricity grid, and nuclear energy is a part of that spectrum.
- 2.39 Regardless of the quantum of India's future energy needs met by renewables, the evidence indicates that part of the projected increase in electricity generation will be met by either nuclear power or coal. Of those two generating options, nuclear is clearly the better. It will at least reduce, if not eliminate, the measurable increase in greenhouse gas emissions that would result from the use of coal.
- 2.40 In principle, therefore, the Committee supports the sale of uranium to India.
- 2.41 The Committee will now examine the Agreement in detail.