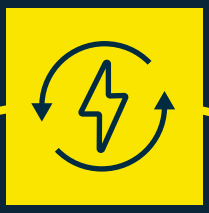
AN INDIA ECONOMIC STRATEGY TO 2035

NAVIGATING FROM POTENTIAL TO DELIVERY



ENERGY SECTOR SNAPSHOT

indiaeconomicstrategy.dfat.gov.au

#IES2035

OVERVIEW

- Energy is central to achieving India's development ambitions: bringing electricity to those who do not have it and developing infrastructure.
- India will provide the largest contribution (30 per cent) to global energy demand growth to 2035. India's integration into global energy markets will be a key shift in the global economy out to 2035, with India having a greater stake in their efficiency.
- Domestic energy demand – rising across all four sectors of industry, household, transport and agriculture – will outpace domestic supply and will remain price-sensitive.
- Energy consumption is forecast to grow at around 4.5 per cent annually to 2035, off a relatively low base of per capita energy consumption (1,010 kilowatt hours, against a world average of 3,200).
- India will remain reliant on energy imports, particularly for fossil fuels.
- Growth in the uptake of renewables is being driven by the advent of cheaper technologies and the need to reduce air pollution which is estimated to result in more than one million premature deaths in India each year.
- India aspires to simultaneously and rapidly: change its energy mix; be energy self-sufficient; ensure energy security; and meet its climate change goals.

OPPORTUNITIES FOR PARTNERSHIP

In terms of commodities, India will be heavily dependent on imports of oil and gas to meet its large and varied energy demand profile. It will be largely self-reliant in thermal coal in the long term, but will be import-reliant in the medium term.

There is growth potential for Australian commodity exports, subject to a range of variables, notably price. Prospects for Australian energy commodity exports to India are not as strong as for non-energy resource commodities (such as metallurgical coal).

The fact that India's domestic reserves of thermal coal are generally high ash and low energy does not necessarily translate to large-scale import demand for higher-quality Australian thermal coal because of India's price sensitivity and the potential to use technologies (including from Australia) to upgrade India's domestic supplies. LNG export prospects will depend on price dynamics, the roll out of gas pipeline infrastructure and India's desire to diversify supply away from Qatar and the US.

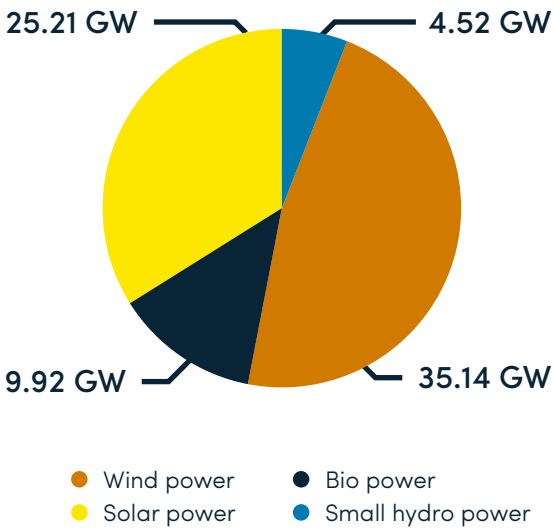
Opportunities will emerge for Australia through diversifying into new products. There will be a growing market for services and technologies in areas where Australia is competitive, including to support the development of a resilient, low emissions energy sector in India.

India will present not more than a moderate market for Australian uranium out to 2035. There are emerging prospects in hydrogen, including through partnerships with Japan, if Australia is able to stay ahead of the technological curve.

Australia should encourage India's deepening ties with the international energy policy regime, engage on regulatory barriers and foster a deeper bilateral knowledge partnership.

We should also seek to build on our bilateral investment relationship in this sector, particularly Indian investment in Australian renewable energy sources. India is looking to invest offshore, including for energy security and price-hedging reasons.

INDIA'S RENEWABLE ENERGY MIX



LNG PROJECTION

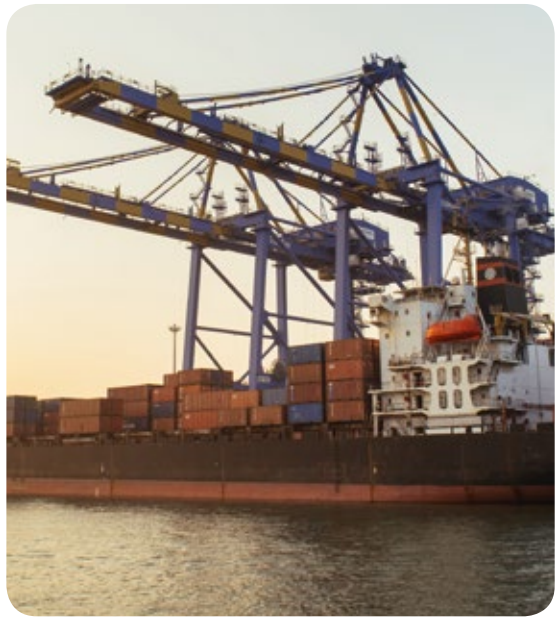
Increase share of gas from **7.5% to 15%** by 2030

THERMAL COAL PROJECTION

Increase demand by **3.5% to 4%** per annum to 2030

CONSTRAINTS AND CHALLENGES

- Despite the immense opportunities in India's growing demand, the energy sector in India is characterised by monopoly players, state-run corporations, controlled pricing and high barriers to market entry.
- India's energy sector is characterised by myriad, often highly inefficient policy interventions. Political sensitivity around the provision of affordable electricity drives government intervention.
- Controls on supply and the lack of transparent price signals reduce incentives to invest, improve efficiency or rationalise supply.
- Distribution is a bottleneck and an even bigger problem than capacity.
- While political constraints will make any change incremental rather than wholesale, India is seeking to tackle these challenges.



EXPLORE INDIAN STATE ECONOMIES IN-DEPTH

WHERE TO FOCUS

Generation companies are not bound by states and major energy Public Sector Undertakings are owned by the Central Government, so a focus on particular states is judged as less critical when it comes to trade in energy resources.

In terms of renewables and associated technology and services, the following states are particularly prospective:

ANDHRA PRADESH

India's highest installed solar capacity and strong potential in wind power. A state focus on innovation and technology.

TELANGANA

India's largest generator of solar energy, with plans for further expansion. Outperforms most states in terms of power supply.

RAJASTHAN

Recent oil and gas discoveries are expected to drive numerous upstream and downstream ventures. Strong solar prospects due to high solar irradiation and land for setting up solar parks.

WEST BENGAL

The coal industry hub, West Bengal is a natural target for engagement on fossil fuel generation efficiency.

TAMIL NADU

A leading solar and wind energy producer with among the highest installed capacity in India and the world's largest solar plant. A well-developed manufacturing sector which could be tuned to renewable energy technologies. Plans for a high capacity transmission corridor.

ENERGY EXPORT OPPORTUNITIES OUT TO 2035

		Near term	Medium/Long term
Goods	Conventional Commodities	Export conventional commodities Import refined oil products Export of specialty minerals and metals required for renewable energy sources	Export conventional and non-conventional commodities Invest in different links in the supply chain
Services and solutions	Renewable technologies	Export of technologies Joint research and development	Export of technologies Joint research and development Manufacturing of Australian technologies in India
	Training	Partner with Indian institutions to deliver training	Partner with Indian institutions to deliver training
	Grid management	Knowledge sharing on distributed systems, integration of renewables and remote electrification	Smart grids Smart metering Joint venture with Indian manufacturers
	Fossil fuel generation efficiency	Joint research and development and technology exchange, for example beneficiation and efficient coal use technologies	Collaboration on new technologies
	Energy Efficiency	Export of technologies Systems engineering	Collaboration on new technologies

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Australian Government

Australia-India Council

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