

Japan

Emissions targets and implications for business

What is Japan's contribution...

1. To reduce emissions by 26% on 2013 levels by 2030.
2. To reduce the emissions and energy intensity of GDP by 20-40% by 2030.
3. To reduce energy-related CO₂ by 25% by 2030.
4. To reduce methane emissions by 12.3% on 2013 levels by 2030.

Prime Minister Abe recognises the significance of his term post-Fukushima - Japan's 4th Strategic Energy Plan released in April, 2014, 'rebuilds the energy strategy from scratch'. But positive messages may be countered by uncertainty from electricity market reforms, nuclear's future and the feasibility of meeting the targets. The Environment Ministry and the Ministry of Economy, Trade and Industry also disagree on plans for 45 coal power plants with estimated annual CO₂ emissions of 120 million tons.

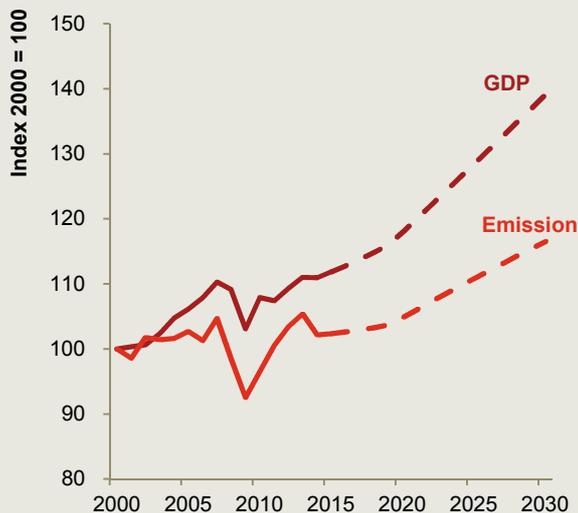
...and what are the implications for business

- 9 major industry sectors have voluntarily pledged emissions reduction targets as part of Keidanren's (Japan's Business Federation) commitment to a low carbon society. A long list of **energy efficiency** and technology improvements are detailed for industry to reduce emissions and showcase Japanese technology.
- With **electricity market reform** new entrants will be allowed to enter the market from 2016. The number of new entrants may also increase in 2020 when generation and distribution functions are split up.
- A **low carbon tax of around \$2-3 applies** to coal and oil which raises approximately \$2.2bn per year. This is coupled with government subsidies aimed at the promotion of a low carbon society.
- Approximately \$2.3bn has been earmarked to support renewable energy generation and achieve a target of 10% of total primary energy supply by 2020. The **feed-in tariffs** vary by technology ranging from \$0.10-0.33 per KWh for biomass to \$0.18-0.45 per KWh for wind.

- Japan restarted the first **nuclear** reactor in August 2015, after a 23 month interval and there are plans to restart additional reactors following completion of safety inspections.
- Over \$400m will be invested in the transport sector (vehicles and infrastructure) which is expected to be the main driver of energy efficiency improvements as it targets **50-70% next-generation vehicles by 2030**. Low carbon transport provides a significant demand for high-tech parts and automobile manufacturing. Road infrastructure will also improve efficiency using technology to manage traffic flows.
- Over \$90m will be directed to research and development of **carbon capture and storage**, and further funding is available for batteries.
- Gas prices in Japan are expected to rise as cheap long term **Liquefied Natural Gas** contracts with Middle Eastern suppliers expire in the next few years.
- Solar prospects beat wind and geothermal in the short term due to easier installation and grid connection, but interest in geothermal is growing with Softbank announcing plans for its first **geothermal** investments. Restrictions and regulations on safety and the environment on wind and geothermal are hurriedly being reviewed and so may improve prospects for investors in the medium term.
- Reducing CO2 emissions from the **iron and steel** sector by 9 million-tons compared to BAU by 2030 creates new market opportunities for efficient technologies. The steel industry – the world’s second largest after China – will continue servicing domestic automobile manufacturers and construction and is internationally competitive due to the weak yen.
- A **Joint Crediting Mechanism** may create a \$90m opportunity for low carbon investment if it obtains international consensus.

GDP, energy and related emissions

GDP forecast: 1.4% per year
Emissions forecast: 0.8% per year



Our absolute emissions trend is based on combining the GDP forecast above with the average decarbonisation rate so far this century



GDP: Japan started the century with a year of significant GDP growth at 11.9%. Since then however, GDP growth has struggled to surpass 2%, with the economy contracting for four years from 2010-2014.



Renewable energy: For such a technology rich nation, the 6% share of energy from renewables in 2014 is surprisingly low. Wind still registers a 0% contribution and Solar and Geothermal and Biomass provide 1% each in 2014. Hydro provides a steady 3-4%.



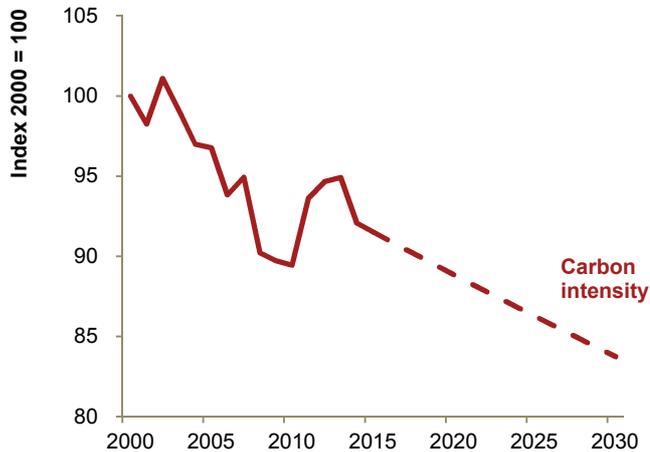
Energy: Between 2000 and 2010, 14% of Japan’s energy came from nuclear power. But following the disaster at the Fukushima Dai-ichi power plant in March 2011, this fell to 8%, 1% and zero in subsequent years. This 14% gap was filled by gas (5%), coal (4%), oil (3%) and hydro and solar (2%) having a significant impact on Japan’s carbon intensity. Absolute oil consumption was declining and probably would have continued to decline without the accident, but use of the other fuels were increasing anyway and just had to step up the pace.



Emissions: By Sector, Power contributed 46% of emissions in 2012, industrial emissions were 14%, transport 17%, buildings 13%, the remaining 10% came from agriculture, others and non-energy use.

Carbon Intensity

Carbon intensity forecast: -0.6% per year

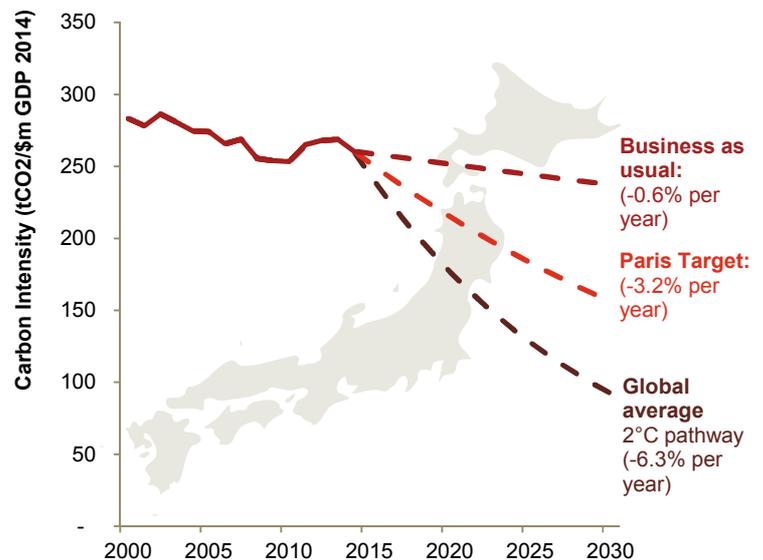


- Before the Fukushima disaster and shutdown of nuclear generation in 2011, carbon intensity in Japan was falling by 0.9% on average each year (2000-2010).
- Unsurprisingly, 2010-2012 saw a 2.6% average increase in carbon intensity, but the overall average trend for the century is a 0.6% reduction per year.
- Japan is decoupling GDP growth and carbon emissions at a very modest rate compared to other developing countries.
- We use the 0.6% trend as our business as usual forecast opposite and below.

How ambitious is Japan's 26% target?

- To meet its target, Japan needs a 3.2% decarbonisation rate assuming our economic growth forecast of 1.4% each year to 2030. Given Japan's average intensity reductions of only 0.6%, this target implies a significant shift in policy for carbon or energy intensive businesses in Japan.
- For comparison, carbon intensity in the US and EU has been falling at 2.6% each year on average since 2000. Achieving their emissions targets will require the US and EU to decarbonise at 4.3% and 3.1% respectively. Like the US and EU, Japan's target falls short of what's needed to reach two degrees (a global average 6.3% decarbonisation every year). Overall, Japan's current and target decarbonisation rate is still significantly lower than the US or EU's. This slow decarbonisation rate (even before Fukushima) suggests there may be plenty of opportunities for low carbon investment in Japan.

How ambitious is Japan's 26% target?



Sources:

Historic GDP: World Bank, 2014

GDP Forecasts: PwC World in 2050, 2015

Energy data: BP, Statistical Review of World Energy, 2015

Historic emissions data: UNFCCC

The Steel Industry of Japan, 2015, Review

International Energy Agency, 2014, Policies and Measures database

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