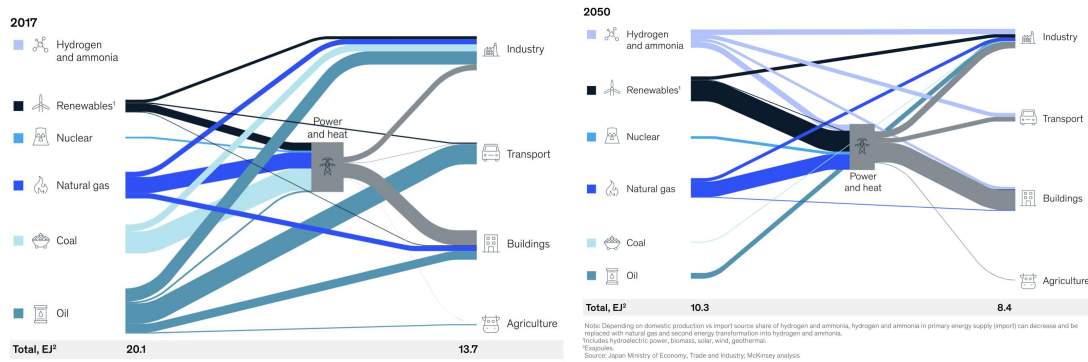


## Japan's net zero target

Japan is one of 130 countries that set a target of minimizing greenhouse gas to net-zero by 2050. However, Japan also finds this challenging for them due to the country's power sector mostly based on fossil fuels. Government also plans to use the financial transition such as carbon taxes as an implementation. However, by decelerating the increase in fossil fuel emission, this includes stimulating the use of clean technologies to generate power rather than using fossil fuels or overall known as mitigation policies, here are some actions that can be done to decarbonize and reach their goal

The cost-optimal pathway through 2030. The building sector would be the most significant to reduce emissions by installing better insulation and switching to electric heat pumps instead of fossil-fuel boilers. The power sector would reduce emissions by replacing coal power plants with combined-cycle gas turbines and expanding offshore wind and solar power capacity. The industry sector is the most difficult sector to reduce emissions due to its high-temperature processes, but using gas instead of oil and using heat pumps for some processes, industry emissions could be reduced. The transportation sector would be the smallest reduction for carbon because it will take a while to increase the production of electric vehicles and to make people switch from their own cars to electric cars.

The cost-optimal pathway from 2030 to 2050, After 2030, to provide green electricity, the power sector needs to start using alternative fuels such as hydrogen and ammonia and apply CCUS to thermal-power assets. Moreover, owners of the buildings would have to install hydrogen boilers in addition to better insulation and electrification. In transportation, Japan would have to supplement the electrification of passenger and light-duty vehicles by switching to fuel cell technology for long-haul trucks and hydrogen and biofuels for aircraft and ships. During the transition, primary energy inputs and energy consumption would drop as activity reduced in line with Japan's declining population and increased process and fuel efficiency. Renewables and clean hydrogen and ammonia would become the primary energy supplies while oil and coal consumption would disappear.



Japan plans to use other alternative energy sources such as hydrogen and ammonia, along with more renewable energy to be a primary energy supply by 2050. The diagrams above show that in 2017, their main source of energy was from coal, but in 2050, more renewables will play a bigger role in this part and natural gas will remain significant. Oil and nuclear power will also be less relied on, mainly because these sources generate high carbon emissions.

The achievement of net-zero will be caused by significant actions. For example, The capacity of power will increase 3 times to 275 gigawatts in 2050, which in 2030 we forecast the capacity of power will be 97 gigawatts. Because electrification can't generate the heat, the industry sector needs to rely on hydrogen and CCUS to reduce the emissions. In the transportation sector, the target of emission-reduction aims to 90% of all types of cars will be BEV production in 2030 and 100% in 2050.

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