



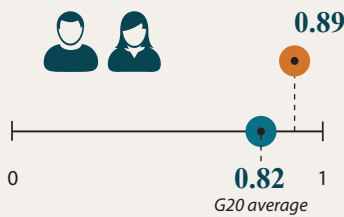
BROWN TO GREEN: G20 TRANSITION TO A LOW CARBON ECONOMY

Japan

This country profile assesses Japan's past, present and indications of future performance towards a low-carbon economy by evaluating emissions, decarbonisation, climate policy performance and climate finance. The profile summarises the respective findings from, amongst others, the Climate Change Performance Index (CCPI, operated by Germanwatch and Climate Action Network Europe), the Climate Action Tracker (CAT, operated by Climate Analytics, NewClimate Institute, Ecofys and the Potsdam Institute for Climate Impact Research), and analyses from the Overseas Development Institute (ODI).

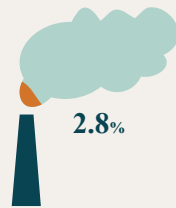


Human Development Index



Source: UNDP, data for 2015

Share of global GHG emissions



Source: World Bank Indicators, data for 2012

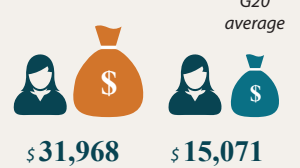
GHG emissions per capita (tCO₂e/cap)



Share of global GDP

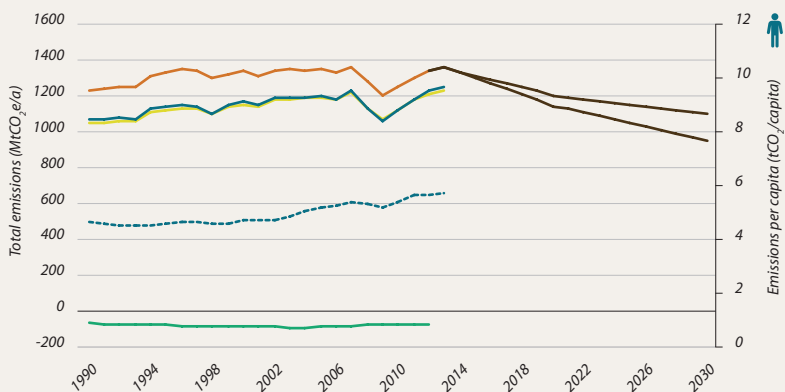


GDP per capita

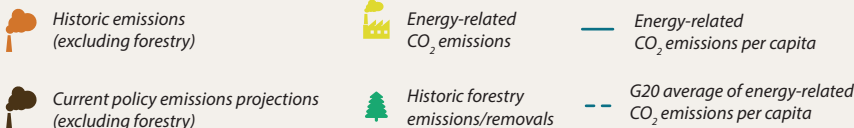


Source: IEA, data for 2013

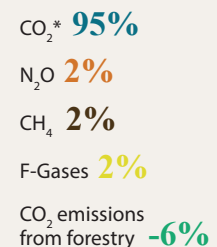
GREENHOUSE GAS (GHG) EMISSIONS



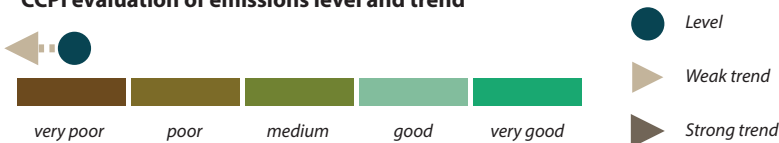
Japan's GHG emissions increased since 1990, except between 2008/2009 when they reached a low of 1206 MtCO₂e. Emissions have grown since, to 1343 MtCO₂e in 2012. Projections see a decline over the next decade and emissions dropping to a range of 952-1103 MtCO₂e in 2030. Emissions from land use, land-use change and forestry (LULUCF) are in the negative range. Energy-related CO₂ emissions account for over 90% of Japan's GHG emissions. CO₂ per capita emissions have risen since 1990 and are far above the G20 average. The CCPI rates the country's emissions level as very poor, with a negative trend.



Composition of GHG emissions



CCPI evaluation of emissions level and trend

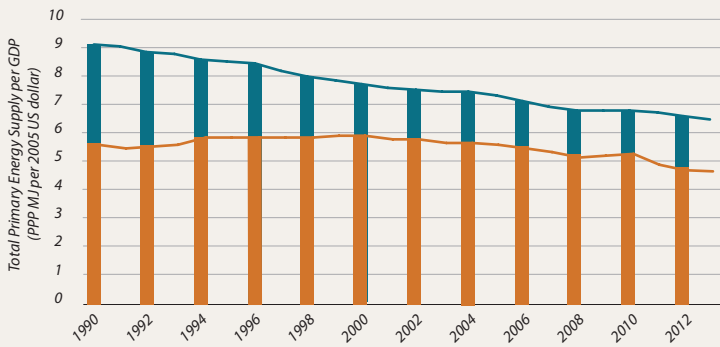


*CO₂ emissions incl. LULUCF
Source: Annex I countries: UNFCCC (2015);
Non-Annex I countries: IEA (2014) and CAT (2015)

Sources: Past energy related emissions from the Climate Change Performance Index (CCPI); past non-energy and future emissions projections from the Climate Action Tracker (CAT). CCPI calculations are primary based on the most recent IEA data; CAT calculations are based on national policies and country communications.

DECARBONISATION

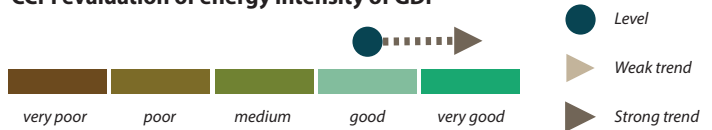
Energy intensity of the economy



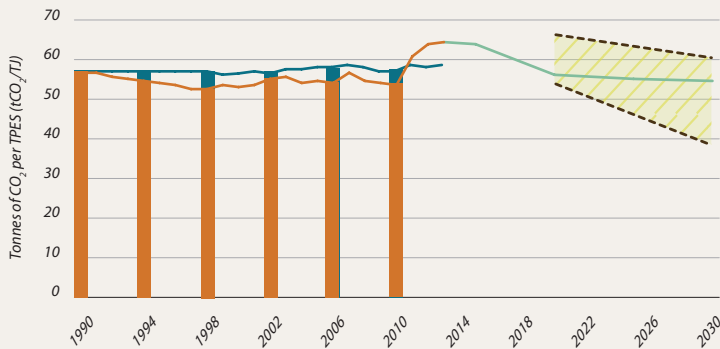
Energy intensity
Average energy intensity in G20

Source: CCPI, 2016

CCPI evaluation of energy intensity of GDP



Carbon intensity of the energy sector



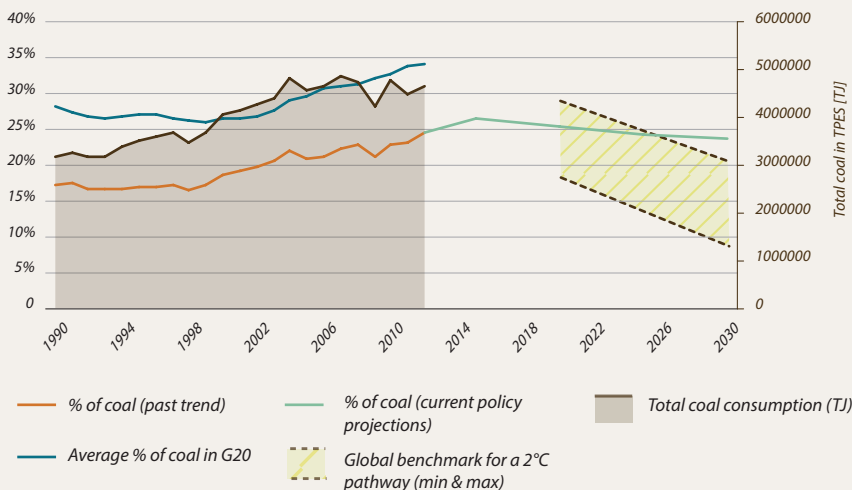
Carbon intensity (past trend)
Average carbon intensity in G20
Carbon intensity (current policy projection)
Global benchmark for a 2°C pathway

Sources: Past: CCPI; future projections: CAT

CCPI evaluation of carbon intensity of energy sector



Share of coal in Total Primary Energy Supply (TPES)



Source: CAT



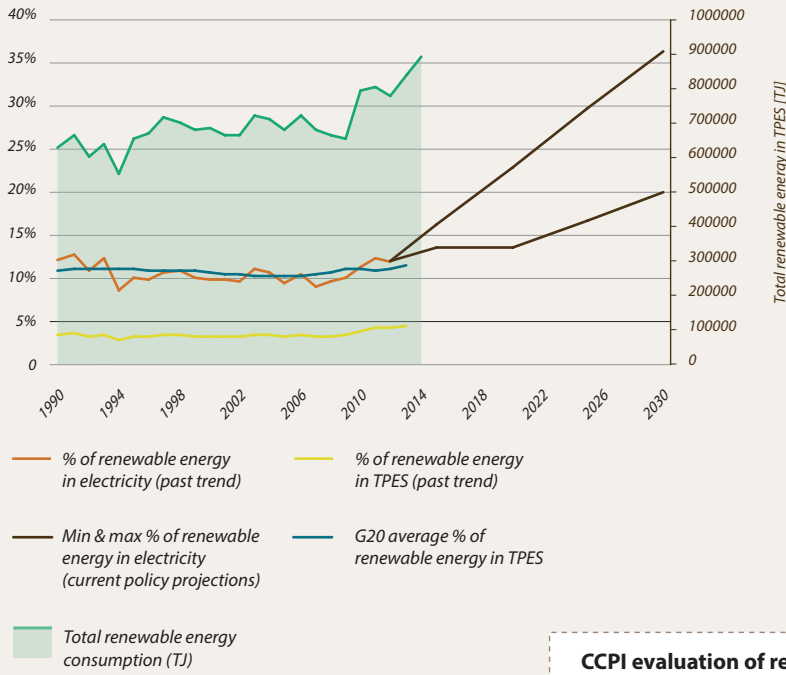
The share of coal in Japan's total primary energy supply has increased since 1998, and is now up to 25%. Although, Japan is still pursuing efforts to construct over 25GW of new coal capacity in the future, according to future projections, further increase and later stabilisation of the coal share can be expected until 2030. This, however, exceeds the minimal value of the 2°C compatible benchmark corridor.

Evaluation of coal share in TPES



Source: own evaluation

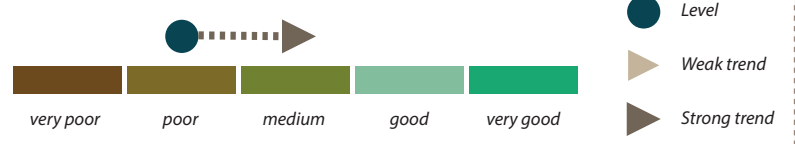
Renewable energy in TPES and electricity sector



Japan's share of renewable energy in electricity has remained relatively constant. In recent years, there has been a minor increase, and it is assumed growth will continue. Depending on effectiveness of implemented measures, especially the feed-in tariff, a share of 20% could be possible, as well as a share of 37%. However, the share of renewables in the country's total primary energy supply is relatively low, compared to other G20 countries. It remained constant on a level of 3-4% in recent years. The CCPI evaluation ranks Japan's level of renewable energy as relatively poor, but recognises a positive trend.

Sources: CCPI and CAT

CCPI evaluation of renewable share in TPES

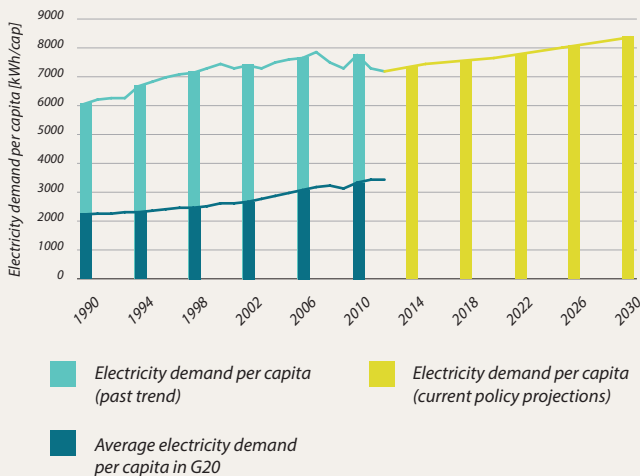


Electricity demand per capita

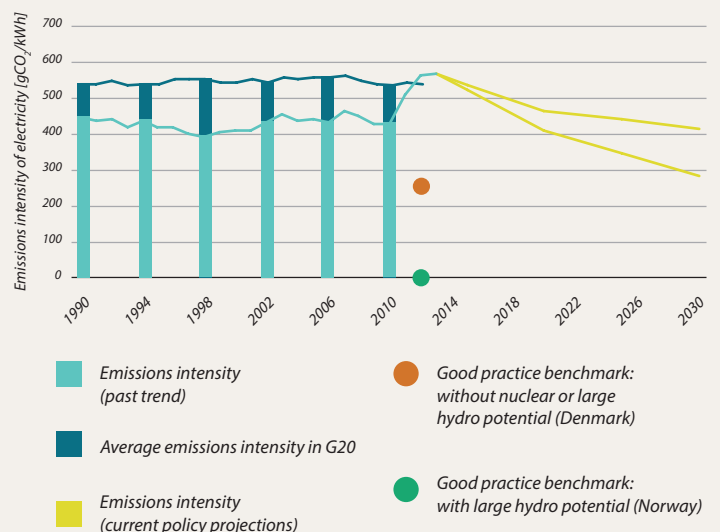
Japan's electricity demand per capita steadily increased since 1990 and is relatively high compared to other G20 members. Further growth can be expected.

Emissions intensity of the electricity sector

The emissions intensity of electricity remained relatively constant until 2010. The consequences of the Fukushima disaster are reflected in a strong increase since 2011, which led to the crossing of the G20 average. It is assumed that this is only a temporary development, and emissions intensity will decrease again.

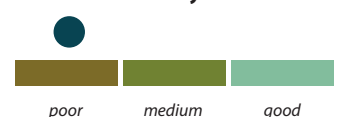


Source: CAT, 2015



Source: CAT, 2015

Evaluation of the electricity emission intensity



Source: own evaluation

CLIMATE POLICY PERFORMANCE

Checklist of the climate policy framework

Low emissions development plan for 2050*	✓
2050 GHG emissions target	✓
Building codes, standards and incentives for low-emissions options	✓
Support scheme for renewables in the power sector	✓
Emissions performance standards for cars	✓
Emissions Trading Scheme (ETS)	✓
Carbon tax	✓

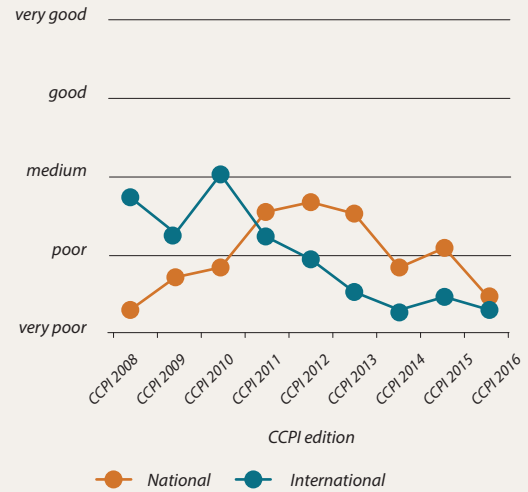
* Understood as decarbonisation plans and not specifically as the plans called for in the Paris Agreement

Source: Climate Policy Database, 2016

Climate policy evaluation by experts

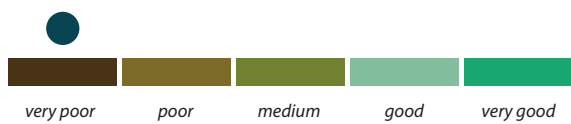
Japan's national climate policy performance initially steadily improved from a poor rating to nearly average, but has continuously worsened since then. Internationally, Japan began as a medium performer, but deteriorated, continuing this downward trend to the latest CCPI edition, leaving it with a very poor evaluation. Experts criticise a lack of policy direction to limit carbon-intensive power generation.

The CCPI evaluates a country's performance in national and international climate policy through feedback from national energy and climate experts.

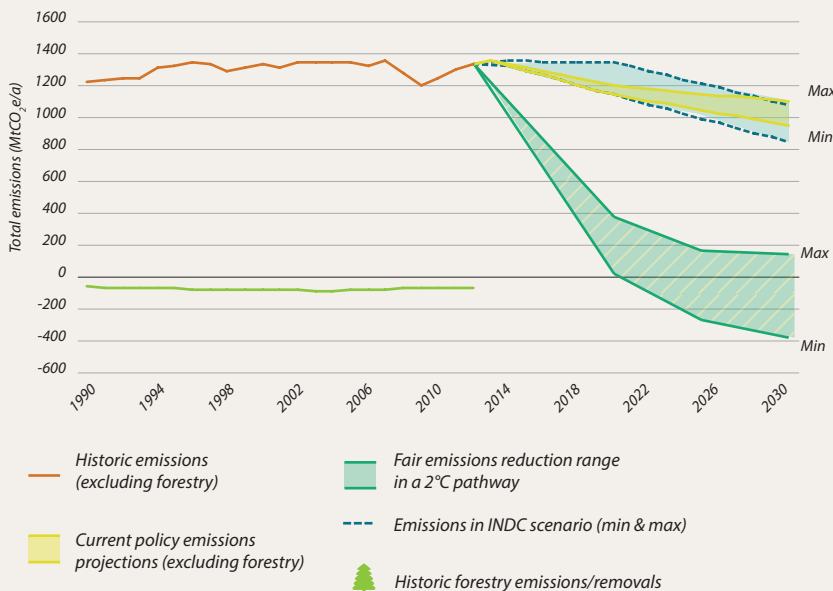


Source: CCPI, 2016

CCPI evaluation of climate policy



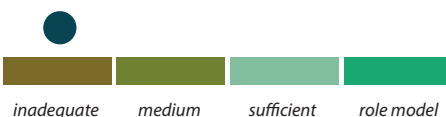
Compatibility of national climate targets (INDCs) with a 2°C scenario



Japan submitted its Intended Nationally Determined Contribution (INDC) on 17 July 2015. It includes a range of targets. On greenhouse gases, the target is to cut emissions to 26% below 2013 levels by 2030, equivalent to an 18% reduction below 1990 levels by 2030. After accounting for the proposed credits under Land Use, Land Use Change and Forestry (LULUCF), this target is equivalent to 23.3% below 2013 levels of emissions of greenhouse gases excluding LULUCF, and 15% below 1990 levels. Japan also proposes using the Japanese Crediting Mechanism (JCM), which could further reduce the domestic target to approximately 16–20% below 2013 levels (7–11% below 1990).

Climate Action Tracker (CAT) rates this target as "inadequate". If all countries adopted this level of ambition, global warming would likely exceed 3–4°C by the end of this century. With the policies it already has in place, Japan can almost reach its proposed INDC target without taking any further action. The INDC implies that fossil fuel power will continue to play an important role in Japan's energy mix (at 56% of generation in 2030), of which 26% is expected to come from coal-fired power plants.

CAT evaluation of Japan's Intended National Determined Contributions (INDC)



Source: CAT, 2015

FINANCING THE TRANSITION

Investment attractiveness



Allianz Energy and Climate Monitor

MEDIUM

RECAI* (E&Y index) Category (own assessment)

MEDIUM

Trend**



*Adapted from RECAI and re-classified in 3 categories (low, medium, high) for comparison purposes with Allianz Monitor.

**Taken from RECAI issue of May 2016

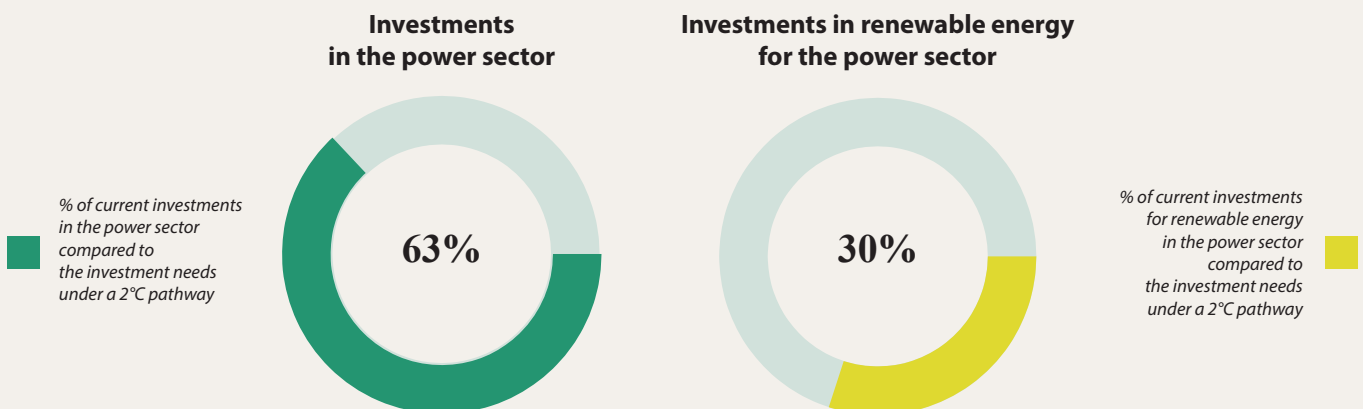
Climate Transparency rates Japan's investment attractiveness as medium, due to the absence of legally binding climate action plans beyond 2020, and the fragile and unreliable political support for a low-carbon transition with major differences among parties and non-state actors. Yet Japan has new policies supporting renewables (grants, subsidies and tax deductions) and attracts renewable energy companies due to a favourable technological and exporting industry base.

Sources: Allianz Energy and Climate Monitor and RECAI reports

The Allianz Energy & Climate Monitor ranks G20 member states on their relative fitness as potential investment destinations for building low-carbon electricity infrastructure. The investment attractiveness of a country is assessed through four categories: Policy adequacy, Policy reliability of sustained support, Market absorption capacity and the National investment conditions. The Renewable Energy Country Attractiveness Index (RECAI) produces score and rankings for countries' attractiveness based on Macro drivers, Energy market drivers and Technology-specific drivers which together compress a set of 5 drivers, 16 parameters and over 50 datasets.

Historical investments in renewable energy and investment gap

This section shows Japan's current investments in the overall power sector (including distribution and transmission), and also specifically in renewable energy as the share of the total annual investments needed to be in line with a 2°C compatible trajectory.



Source: Adapted from WEIO, 2014⁽¹⁾

⁽¹⁾ WEIO (2014) compares annual average investments from 2000 to 2013 with average annual investments needed from 2015 to 2030 under a 2°C scenario

Carbon pricing mechanisms

Emissions Trading Schemes (ETS)

An ETS caps the total level of GHG emissions and allows industries to trade allowances based on their marginal abatement cost. By creating a supply and demand for allowances, an ETS establishes a market price for GHG emissions.

Carbon Tax

A Carbon tax directly sets a price on carbon by defining a tax rate on GHG emissions or – more commonly – on the carbon content of fossil fuels. Unlike an ETS, a carbon tax is a price-based instrument that pre-defines the carbon price, but not the emissions reduction outcome of a carbon tax.

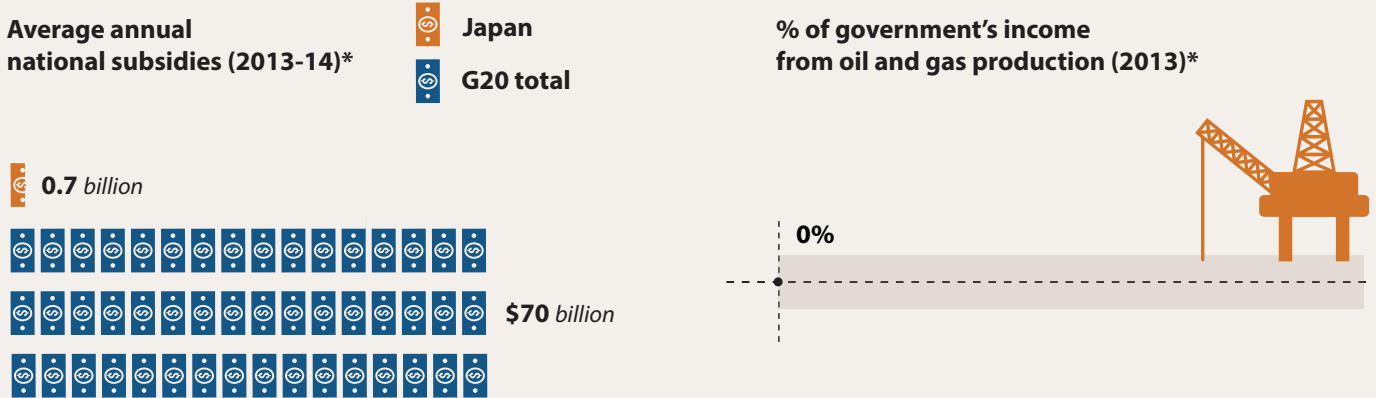
In 2012, the Japanese government introduced a tax on carbon dioxide emissions from fossil fuels, covering 68% of Japan's emissions. At the sub-national level, in 2010 the Tokyo Metropolitan Government launched its Cap-and-Trade Program (TMG ETS), which covers emissions from large offices and factories, representing 20% of Tokyo's emissions. Similarly, Saitama's ETS was established in April 2011 and covers 16% of the region's emissions.



Sources: World Bank and Ecofys, 2016; other national sources

Fossil fuel subsidies

Japan provides oil and gas production subsidies to Japanese companies overseas and, to a lesser extent, domestically. Due to its small fossil fuel resource base, a significant portion of the subsidies focuses on exploration of new reserves. In its submission for the G20 progress report for the rationalisation and removal of inefficient fossil fuel subsidies, Japan reported that it has no inefficient fossil fuel subsidies. OECD data shows that, in 2011, Japan phased out a subsidy that promoted natural gas exploration domestically. In June 2015, the Japanese government proposed measures to prevent the construction of energy-inefficient coal power plants.

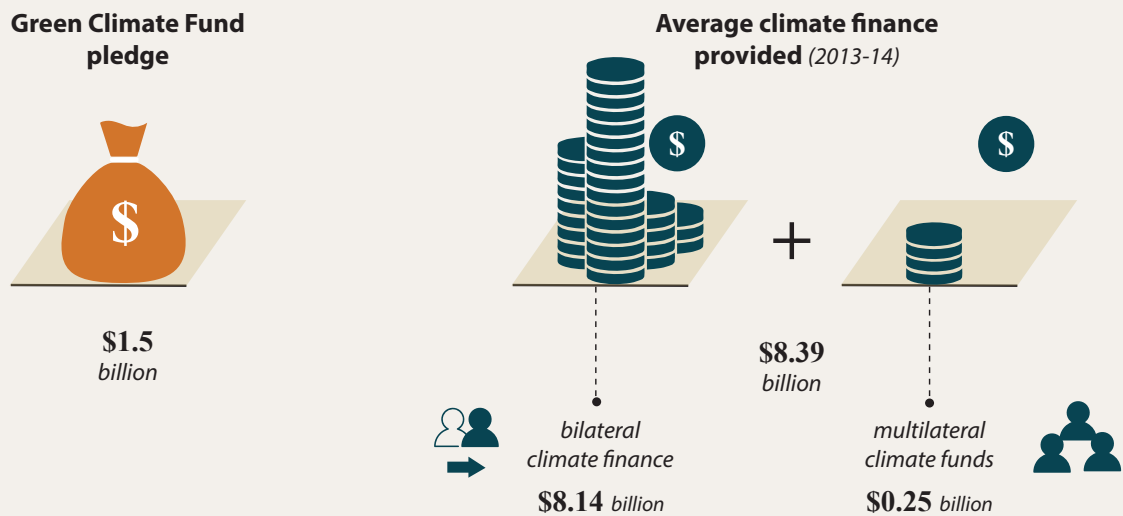


Source: ODI, 2015

*The indicators above refer only to subsidies for fossil fuel production, and include direct spending (e.g. government budget expenditure on infrastructure that specifically benefits fossil fuels), tax expenditure (e.g. tax deductions for investment in drilling and mining equipment) and other support mechanisms (e.g. capacity mechanisms).

Public climate finance

Japan's reported climate finance contribution was the largest of any G20 government but has to be viewed very critically. Most of this funding is delivered through bilateral channels including the Japanese Bank for International Cooperation (JBIC) and JICA. Japan's contribution includes export credits to support Japanese companies to invest in developing countries. It also includes funding for relatively efficient coal technologies. Japan's GCF pledge is the second largest in absolute terms and the third largest relative to GDP of G20 donors.



Source: ODI, 2016