

Climate change and trade risk: South Africa's trade with Japan

SUMMARY

Exports to Japan accounted for 5% of South Africa's exports between 2010 and 2019. Production processes in Japan have been characterised by high fossil fuel use, especially following the Fukushima nuclear accident which saw nuclear power being substituted by fossil fuels. Japan's climate change mitigation is centered on carbon capture technologies, increasing energy efficiency, and the introduction of new technologies such as hydrogen. In 2016, Japan also enforced a carbon tax on oil, gas and coal imports, and on consumption. This has, however, been inconsequential to its trading relations with South Africa. This brief is based on a comprehensive review of Japan's climate change policy framework in relation to industries, [available here](#), as well as a review of South Africa's climate and trade risks, [available here](#).

SOUTH AFRICA'S EXPORT BASKET TO JAPAN

In 2019, South Africa's exports to Japan totaled US\$4.3 billion (R71.4 billion). Platinum exports composed 52% of exports by value to Japan, followed by motor cars (10%), iron ore (7%), ferroalloys (5%) and manganese (4%). Platinum exports have been the highest value exports to Japan over the past decade. Following the peak in 2011, the export value of this product has remained consistent.

South Africa's exports to Japan are overall highly carbon intensive. This is particularly

the case for mining products, metals and transport equipment, which are much more carbon intensive than exports from other countries. In addition, South African export of automotive products (vehicles as well as platinum for catalytic converters) are increasingly threatened by the shift to e-mobility.

INDUSTRY-RELATED CLIMATE CHANGE LEGISLATION IN JAPAN

The Japanese state has adopted a light-touch approach towards the enforcement of its climate change policy framework, characterised by mandatory reporting

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Figure 1: South Africa's exports to Japan (left)

Figure 2: Mining export per country per carbon intensity, share of exports and export value (right)

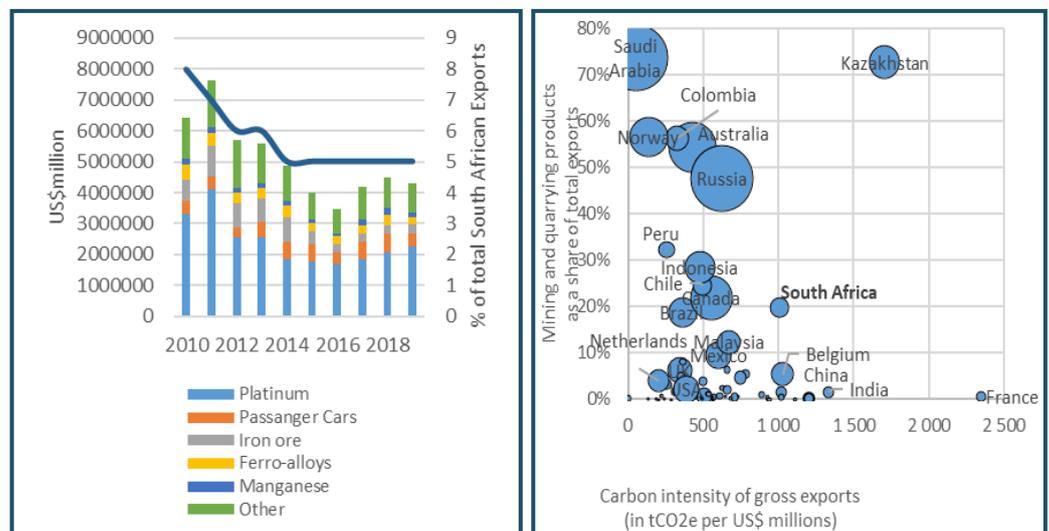


Figure 1 source: Author, based on data from Trade Map, dataset on bilateral trade between South Africa and Japan, downloaded from <https://www.trademap.org> in June 2020.

Figure 2 source: Montmasson-Clair, 2020, based on data from the OECD, dataset on carbon dioxide emissions embodied in international trade, downloaded from <https://stats.oecd.org> in March 2020.

Figure 2 note: bubbles indicate the relative value of countries' mining and quarrying export in US\$.

(via the Mandatory Greenhouse Gas Accounting and Reporting System introduced in 2006) and light fines for non-compliance. Industry bodies have taken the lead in establishing voluntary regulatory mechanisms that are far more stringent than state regulations.

Japan is the world's fifth largest greenhouse gas (GHG) emitter and the third-largest economy in the world. It is also one of the only high-income countries still building and financing new coal-fired power

stations domestically and abroad (Timperley, 2018). In 2020, Japan pledged to achieve a carbon-neutral society by 2050, but has been criticised for failing to set clear timelines or strict policy positions for the achievement of this goal. Japan's 2020 nationally determined contribution merely reaffirmed the 2015 target of cutting emissions by 26% by 2030 from 2013 levels, despite pressure from the international community to ramp up ambition (Sauer, 2019).

Table 1: Japan's key climate change policy instruments in relation to industries

| POLICY NAME | CORE GOAL(S) OF THE POLICY | COSTS OF POLICY ADAPTATION | PENALTIES FOR LACK OF CONFORMANCE TO POLICY |
|--|--|---|---|
| Act on Promotion of Global Warming Countermeasures of 1998 revised 2016 | Carbon mitigation: The policy commits the state, local government and companies to develop emission reduction plans. | Designated emitters, which are typically firms with GHG emissions exceeding 2000 tonnes, are compelled to report on their emissions annually to the Minister of Environment. | Persons or firms that have made false statements in applications or submissions to the state shall be punished by a fine of up to ¥500 000 (US\$4 700). A fine of no more than ¥200 000 (US\$1 900) is imposed for failure to submit reports. The state and local governments have, however, found the monitoring of designated emitters to be cumbersome and financially costly. As a result, enforcement of this policy is weak (IGES, 2017). |
| Energy Conservation Act of 1979 revised 2013 | Managing energy consumption by promoting the use of energy efficient machinery. | Designated firms ¹ must appoint an energy manager (accredited and certified by the Energy Conservation Center). Reporting of the status of energy consumption every year. Mandatory periodic report by designated energy management factories. An average of 1% reduction of energy intensity in annual base during the mid- and long-term plan. Submission of a medium- to long-term energy conservation measures plan. | The key penalty for non-compliance is the publication of the name of the manufacturers and importers and the issuance of an administrative order for not meeting the standards. A fine of no more than ¥500 000 (US\$4 700) is imposed for non-submission of periodic reports, false reports or refusing inspections. |
| Global Warming Tax | The tax was designed with the intention of generating revenue for developing clean energy technology and energy-saving measures, and reducing fossil fuel use. | The tax is imposed on the import and consumption of fossil fuels, such as petroleum, natural gas and coal. | Penalties are assigned in relation to the seriousness and duration of the offence and range from US\$1 500 to US\$3 000 (R25 000-R30 000). |

Source: Source: Author, based on Ministry of Foreign Affairs of Japan, 2020. ¹Type 1 Designated Energy Management Factories: The level of fuel consumption was set at the volume of annual fuel consumption equivalent to at least 3 000 kilolitre of crude oil or an annual electricity consumption of at least 12 GWh. Type 2 Designated Energy: Management Factories annual fuel consumption equivalent to over 1 ,500 kilolitres of crude oil or annual electricity consumption over six GWh.

As Japan moves towards a hydrogen-based society, there is significant opportunity for South Africa to supply inputs into the hydrogen economy, such as green hydrogen and green hydrogen-based products.

Japan's climate change mitigation measures are centered on minimising GHG emissions through technological innovations, such as the wide use of carbon capture technology and increasing energy efficiency. In the longer run, the country aims to lower the cost of hydrogen production towards the goal of establishing a hydrogen-based society. The country is currently piloting demonstration projects to confirm the feasibility of creating a supply chain of hydrogen (Sauer, 2019).

In 2012, Japan implemented a carbon tax on oil, gas and coal imports, with revenues going towards measures to curb GHG emissions. The carbon price, however, remains low at under US\$3 per tCO₂eq.

ENERGY DEVELOPMENTS IN JAPAN

Around 90% of Japan's total GHG emissions come from energy-related activities, making these the most critical focus for its climate policy (Timperley, 2018). The 2011 Fukushima nuclear accident, which resulted in the gradual shutdown of nuclear power plants, has had a significant impact on Japan's energy policy by increasing its dependence on fossil fuels (initially mainly natural gas and oil, and later coal) (Suzuki, 2018).

More recently, Japan became the first country to adopt a hydrogen strategy. This strategy primarily aims to achieve cost parity with competing fuels, such as gasoline in the transportation sector or liquefied natural gas in power generation, and covers the entire supply chain from production to downstream market applications. To this end, between 2015 and 2020, the government has supported low-cost, zero-emission hydrogen production; an expansion of the hydrogen infrastructure; and an increase of hydrogen use in various areas, such as mobility, cogeneration and power generation (IEA, 2019). However, at present, the hydrogen market is not yet economically viable and almost all hydrogen and fuel cell technologies are highly dependent on public funding.

RISKS FOR SOUTH AFRICA'S EXPORTS TO JAPAN

Japanese mitigation efforts have centered on reducing GHG emissions from the commercial, residential and

transport sectors more than industries. When mitigation efforts have focused on industry, the approach taken has been the setting of emissions targets and self-monitoring. Vehicle exports are most at risk, due to the increasingly stringent fuel efficiency standards being adopted in Japan under the Top Runner Programme and the transition to e-mobility. In the long run, this also has implications for platinum exports, which are primarily used for the manufacturing of catalytic converters. As Japan moves towards a hydrogen-based society, there is significant opportunity for South Africa to supply inputs into the hydrogen economy, such as green hydrogen and green hydrogen-based products. Production of hydrogen fuel cells also offers an opportunity, given South Africa's platinum resources.

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This Country Brief forms part of a research project for the Department of Trade, Industry and Competition examining the vulnerability of South African trade to evolving climate change legislation. The research comprises a main report on *The global climate change regime and its impacts on South Africa's trade and competitiveness: A data note on South Africa's exports*; case studies on various sectors; detailed briefs that explore South Africa's trade risks with different countries; and key data in Excel format. The reports, country briefs and excel sheets are available on the TIPS website (see link).