

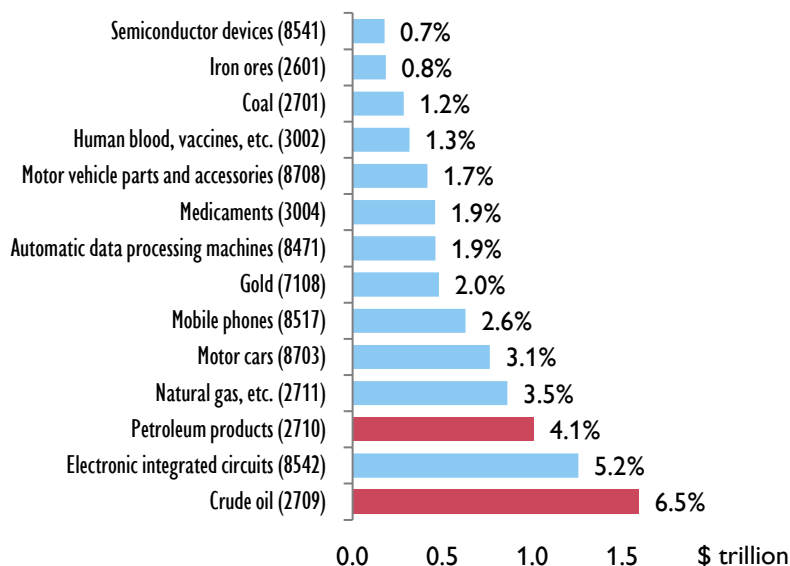
How will the influence wielded by the oil price change in a low carbon society?

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Discussions on carbon neutrality are widespread. Today, the world consumes large quantities of fossil fuels, beginning with oil (crude oil and petroleum products), but as the low carbon shift moves forward, reliance on oil will decline. The view that the importance of oil's role will likely change is not limited to the field of energy supply and demand.

The oil price is viewed as one factor that has a considerable economic impact. This is not a narrow argument about how the oil price is treated as an important variable in economic models. Crude oil is the principal feedstock of petroleum products that are consumed in large quantities on a daily basis as intermediary input goods or final consumption goods in various industries and scenes in effectively all countries, it is the largest internationally traded commodity and furthermore its price fluctuates intensely. As a result of these and other factors, oil price levels and trends exert a considerable influence on the economy.

Figure 1 | Trade values of the world's principal goods [2022]



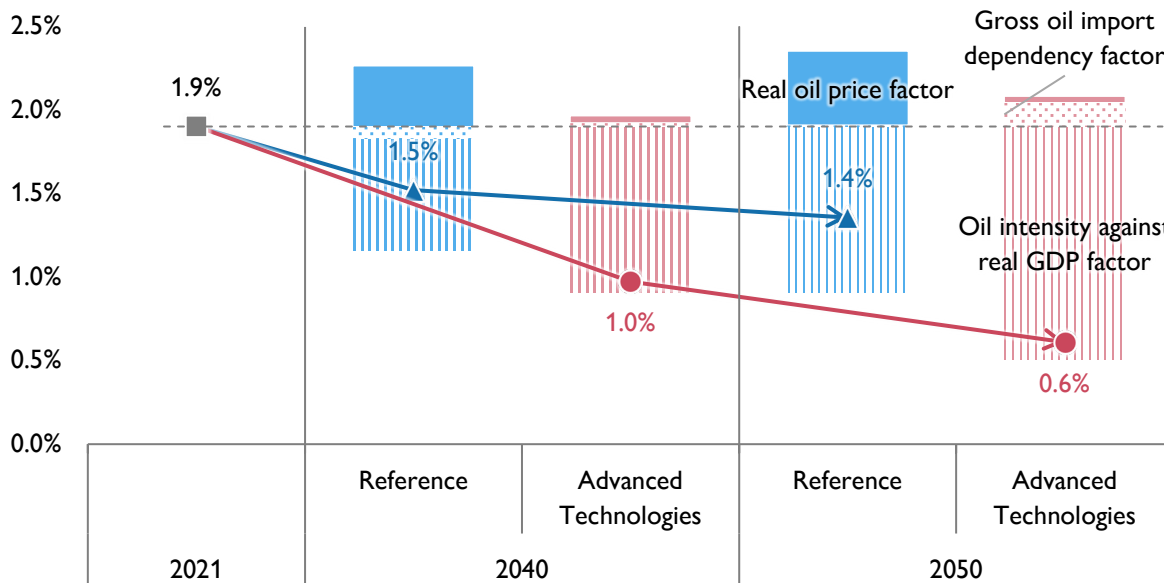
Notes: Based on import values; the figures within the brackets are HS codes; the % values are component ratios
Source: UN Comtrade Database

Supposing carbon neutrality is realised globally, accompanying the advent of a society that only uses small quantities of oil, the oil price is unlikely to possess the sort of economic influence that it wields currently. That said, carbon neutrality is not a goal that will be reached easily, and at least at the present point in time, the outlook for witnessing the carbon neutral future that is scheduled or promised is not particularly optimistic. However, even setting aside that idealised image, efforts to cut back on oil are likely to move forward from the perspective of measures to address climate change, energy security, etc.

The Institute of Energy Economics, Japan's "IEEJ Outlook 2024" puts forward a "Reference Scenario" in which the prevailing changes from the past continue, and an "Advanced Technologies Scenario" in which the introduction of energy and environmental technologies is strengthened to ensure a stable supply of energy and address climate change. Under both these scenarios, oil's proportion as a component of total energy consumption gradually declines. In particular, under the Advanced Technologies Scenario oil's consumption volume itself will decline by 36% toward 2050 amid significant curtailments in a broad range of fields, beginning with its use in automobiles.

As a result, the world's value of gross oil imports relative to nominal gross domestic product (GDP), which is a barometer that illustrates the intensity of the first impact that the oil price has on the economy when it changes, will diminish to around one third of what it is currently. Propelling the main component of that reduction will be a decline in oil consumption intensity against real GDP, which will arise from improvements in energy efficiency and the shift to fossil fuel alternatives, driven by macro and micro causes.

Figure 2 | The world's value of gross oil imports relative to nominal GDP and the contributions to the changes



Notes: Value of gross oil imports relative to nominal GDP is formulated as = primary consumption of oil per real GDP (oil intensity against real GDP) x gross oil imports per primary consumption of oil (gross oil import dependency) x real oil price.
 Source: Estimated with reference to the Institute of Energy Economics, Japan “IEEJ Outlook 2024”.

However, it is necessary to be aware that under the Advanced Technologies Scenario the real oil price largely makes no contribution to pushing up the value of gross oil imports relative to nominal GDP unlike the Reference Scenario. That is because under the Reference Scenario it is assumed that the real oil price (in 2022 prices) in 2050 will reach \$95/bbl, whilst under the Advanced Technologies Scenario it is assumed to be only \$70/bbl, well below 2022. In the low carbonisation process, it would be nice if everything moves forward in an orderly, systematic and overall optimised manner, but it is simply not possible to assert that spikes in the oil price arising from cutbacks in supply investment triggered by misgivings about a reduction in demand – which is exactly what has been experienced recently – will not occur. Even under the Advanced Technologies Scenario, in a case where the oil price climbs to \$95/bbl like under the Reference Scenario, the value of gross oil imports relative to nominal GDP only falls to around 0.8% in 2050. That is a value that compares favourably to the value of natural gas in 2022, which shook the world considerably. We should no doubt appreciate that even if powerful energy and environmental measures are taken worldwide, the economic impact wielded by the oil price will continue to be quite intense.

As one part of recent initiatives toward carbon neutrality, attempts are being made to penetrate solar photovoltaic and wind power generation and electric vehicles. Whether or not it is possible to stably secure critical minerals that are vital to storage batteries and magnets, which are closely connected to these technologies is also starting to attract attention as one factor with the potential to impact the economy, due in part to growing interest in economic security. If anything, this is probably a debate that centres on emergencies or on the economy’s supply-side. That is to say, it is a story in which the capacity to supply that the economy naturally possesses is significantly damaged as a result of interruptions, etc. in scarce critical minerals due to some eventuality. It, however, is not just emergencies/the economy’s supply-side that has to be considered. Even if the low carbonisation is powerfully advanced, oil will significantly sway the economy during times of peace and from the economy’s demand side, as well as of course during emergencies that interrupt or impede supply and from the economy’s supply side. In light of that, ensuring the security of oil – namely, the ability to procure it when needed, in the quantities needed and at an affordable price – is likely to continue to remain an important issue even as we aim for carbon neutrality.

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