

# New long-run scenarios: A path to offset CO2 mitigation costs

Category: Uncategorized

written by oecdecoscope | December 14, 2023



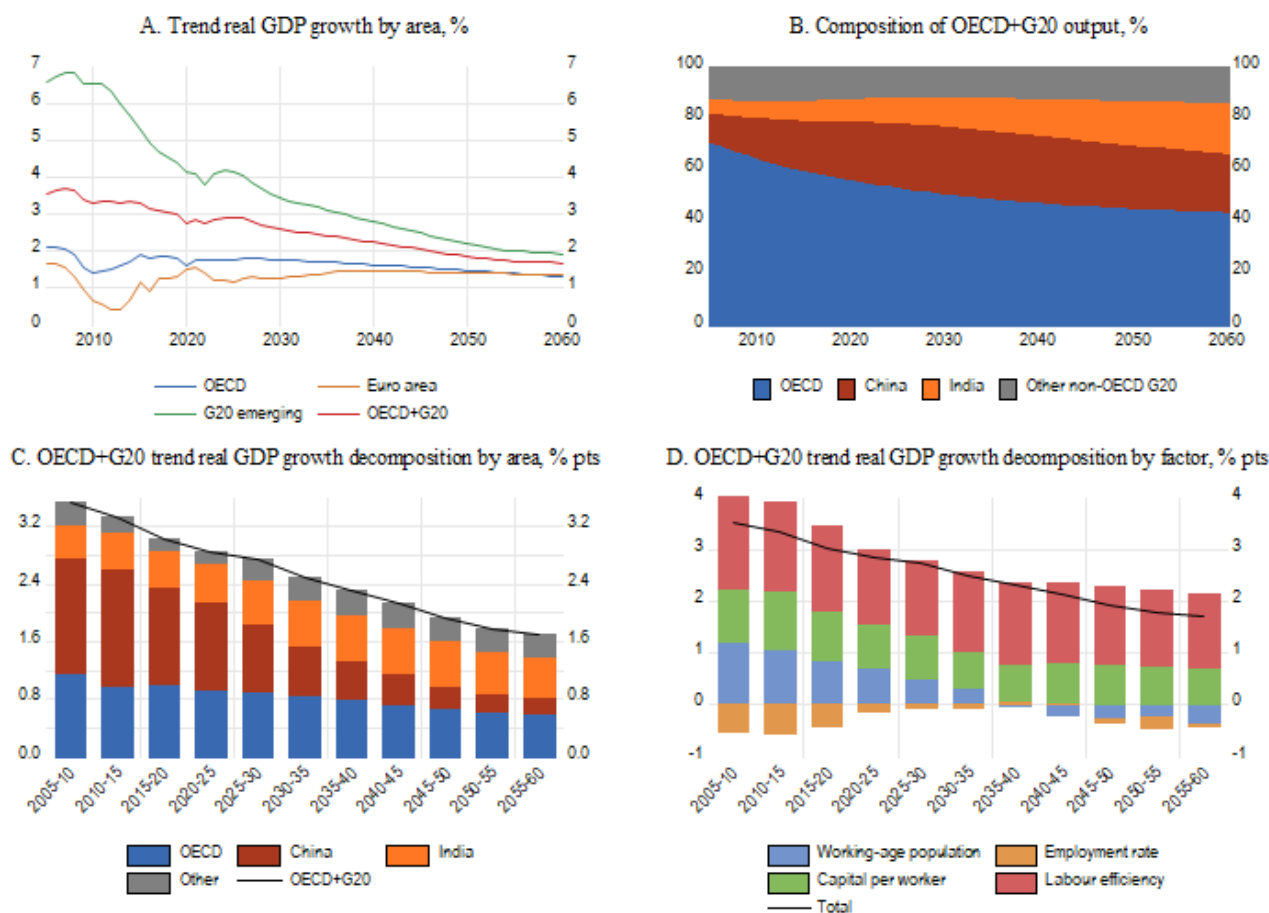
by Yvan Guillemette, OECD Economics Department

Every 2-3 years, the OECD Economics Department publishes a set of country-level economic scenarios to 2060 to quantify some of the most important long-term macroeconomic trends and policy challenges facing the global economy. The latest update includes the standard ‘business-as-usual’ scenario, in which no major reforms to government programmes are undertaken and progress on energy efficiency and energy decarbonisation continues along recent trends. For the first time, the update also describes a stylised scenario in which OECD and non-OECD G20 economies successfully transition to low-carbon energy in a way broadly consistent with a net-zero target for greenhouse gas emissions by 2050. While this represents a negative supply shock to all economies, the upshot of the analysis is that fiscal and structural reforms could fully offset the output costs associated with mitigation efforts over the first 10 years of the energy transition.

In the baseline scenario, global CO<sub>2</sub> emissions from energy use remain around current levels, a trajectory incompatible with the UN Paris Agreement’s ambition of limiting warming to 1.5°C. This failure occurs despite trend annual real GDP

growth for the combined OECD+G20 area gradually declining from around 3% pre-COVID to 1.7% by 2060, mainly due to falling working-age population growth and a deceleration of trend labour efficiency growth in emerging-market economies. China and India continue to account for most of global growth, with India's contribution surpassing China's in the late-2030s.

**Figure 1. The baseline scenario in a snapshot**



Note: 'G20 advanced' includes Australia, Canada, Germany, France, the United Kingdom, Italy, Japan, Korea and the United States. 'G20 emerging' includes Argentina, Brazil, China, India, Indonesia, Mexico, Russia, Saudi Arabia, Türkiye and South Africa. The OECD+G20 aggregate includes all OECD and non-OECD G20 countries.

In per capita terms, growth in the OECD area remains stable,

around  $1\frac{1}{2}$  per cent per annum, below historical norms. Real GDP per capita growth is projected to slow in most of the G20 emerging-market economies, except those where recent performance has been relatively weak (including Argentina, Brazil and South Africa).

In the energy transition scenario, all countries accelerate their CO<sub>2</sub> mitigation efforts as of 2026, eliminating coal as an energy source by 2050 and lowering oil and gas shares in total energy supply to 5% and 10%, respectively. Abstracting from gains due to avoidance of environmental damages, this acceleration of the energy transition leads to a reallocation of resources that impact GDP negatively. Global growth slows by 0.2 pp per annum initially relative to the baseline scenario, and by 0.6 pp toward the end of the transition period. The slowdown is more modest in the OECD area, but sharper in the G20 emerging-market area given higher carbon intensity.

An increase in carbon taxation sufficient to bring about the transition could bring in around  $3\frac{1}{4}$  per cent of GDP in additional government revenue in the OECD area over the 2026-2030 period. In the basic energy transition scenario, this extra revenue is channelled back to households as a direct transfer. However, an alternative scenario assesses a tax shift strategy in which revenue from higher carbon pricing is used to lower the tax burden on labour (labour tax wedges). Dynamics are important here because revenue from carbon pricing first rises, but later declines along with CO<sub>2</sub> emissions, implying that tax wedges could be lowered, but would eventually have to rise again. Nevertheless, because higher carbon pricing is politically awkward to implement, the tax shift strategy could facilitate the phasing in of higher carbon taxes, allowing at least the initial part of the energy transition to benefit from the greater efficiency of a price-induced transition.

Via positive effects on employment, this tax shift strategy is shown to fully offset the decline in output otherwise associated with the first 10 years of the energy transition, leaving living standards in 2035 higher than in the baseline scenario in the OECD area and most individual countries. At peak impact around 2035, the euro area and OECD aggregate employment rates are around 1½ pp higher than without the tax shift.

**Figure 2. Shifting tax burden from labour to carbon offsets most transition costs to 2035**

Level of potential output in 2035, % difference between scenarios (see legend and note)



Note: Blue bars show the % difference in the level of output in 2035 in an energy transition scenario with carbon revenue rebated as lump sums versus the baseline scenario. Orange bars show the % difference in the level of output in 2035 in an energy transition scenario with carbon revenue used to lower tax wedges versus when it is rebated as lump sums. Diamonds show the % difference in the level of output in 2035 in an energy transition scenario with carbon revenue used to lower tax wedges versus the baseline scenario, which corresponds to the sum of blue and orange bars. Chile, Colombia, Costa Rica, Mexico, Norway and Türkiye are not shown as these countries do not have a fiscal block in the OECD Global Long-Term Model.

Additional scenarios show that deploying the extra revenue into a combination of higher R&D expenditure and support for childcare would have similar effects. Other structural reforms, such as product market liberalisation and improvements in governance could also help to offset the output costs of CO<sub>2</sub> mitigation.

## Reference

Guillemette, Y. and J. Chateau (2023), "Long-term scenarios update: incorporating the energy transition", *OECD Economic Policy Papers*, No. 33, OECD Publishing, Paris, <https://doi.org/10.1787/153ab87c-en>

---

# Population ageing and government revenue: It is not all bad news

Category: Ageing

written by oecdecoscope | December 14, 2023



Population ageing should increase government revenue, but not enough to outweigh the higher public spending. Cutting spending and raising taxes would be needed to keep debt stable.