Regional Outlook 2021 - Country notes

Korea

Progress in the net zero transition

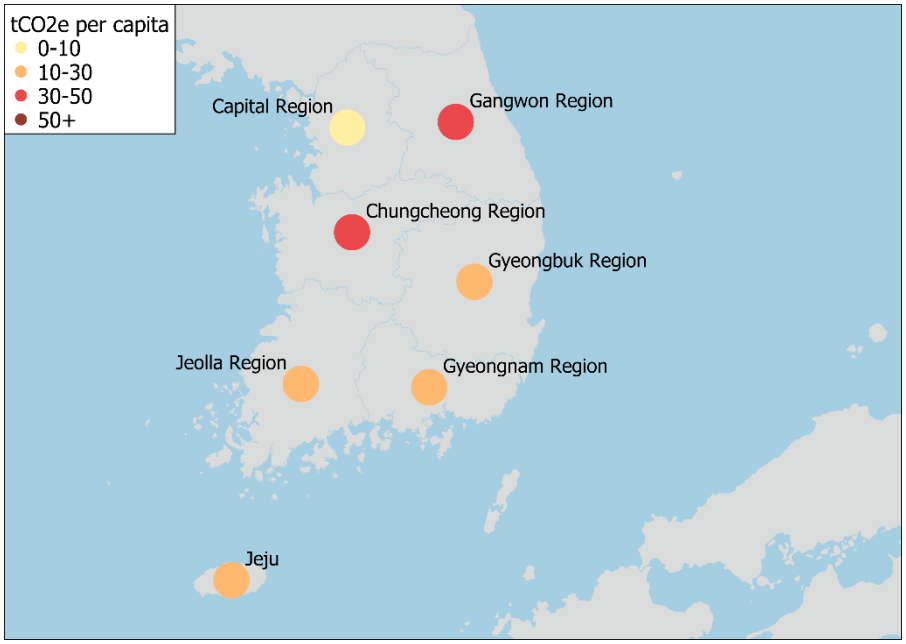
EMISSIONS

2018 OECD average: 11.5 tCO_2e/capita	2018 Korean average: 14.1 tCO_2e/capita	Korean target: net zero GHG emissions by 2050

Large regions (TL2)

Figure 1. Estimated regional greenhouse gas emissions per capita

Tons CO_2 equivalent (tCO_2e), large regions (TL2), 2018



Greenhouse gas (GHG) emissions per capita generated in all Korean large regions, except Seoul Region, are above 10 tCO_2e per capita. Only Jeju and Seoul have lower emissions per capita than the OECD average of 11.5 tCO_2e per capita.

Estimated emissions per capita in Gangwon are more than seven times higher than in Seoul.

Small regions (TL3)

Figure 2. Contribution to estimated GHG emissions

By type of small region, 2018

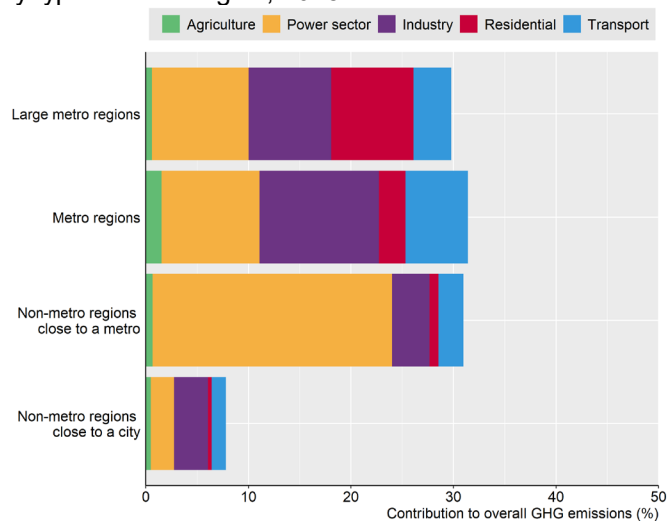
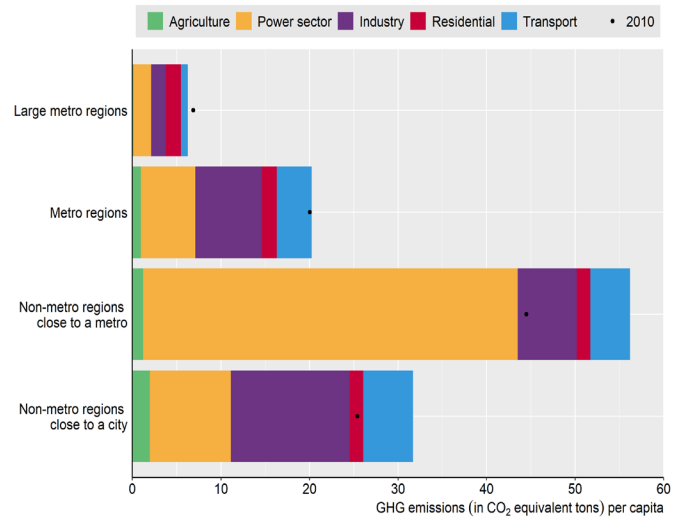


Figure 3. Estimated GHG emissions per capita

By type of small region, 2018



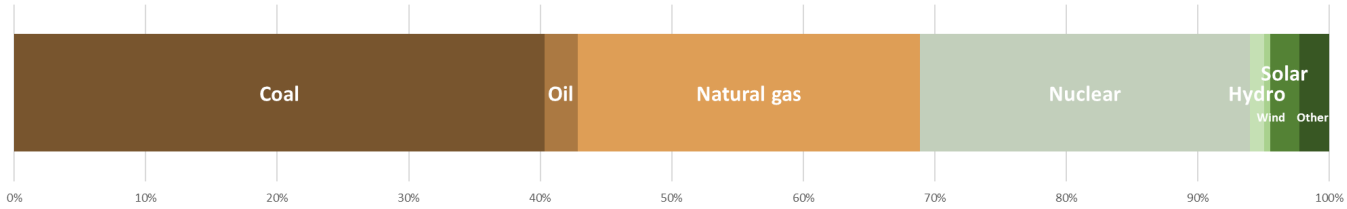
As in the OECD area overall, in Korea, metropolitan regions emit more greenhouse gases than non-metro regions. Emissions per capita in Korean non-metro regions are higher than in metropolitan regions.

Target notes: Emissions targets included in the Net Zero Tracker database from ECIU before January 25, 2021 are considered.
Figure notes: Figures 1, 2, 3, the national and the OECD average show OECD calculations based on estimated greenhouse gas emissions data from the European Commission's Joint Research Centre (ECJRC). The Emissions Database for Global Atmospheric Research of the ECJRC allocates national greenhouse gas emissions to locations according to about 300 proxies. See Box 3.7 in the 2021 *OECD Regional Outlook* for more details.

ENERGY

South Korean electricity mix

Figure 4. National electricity generation by energy source in 2019

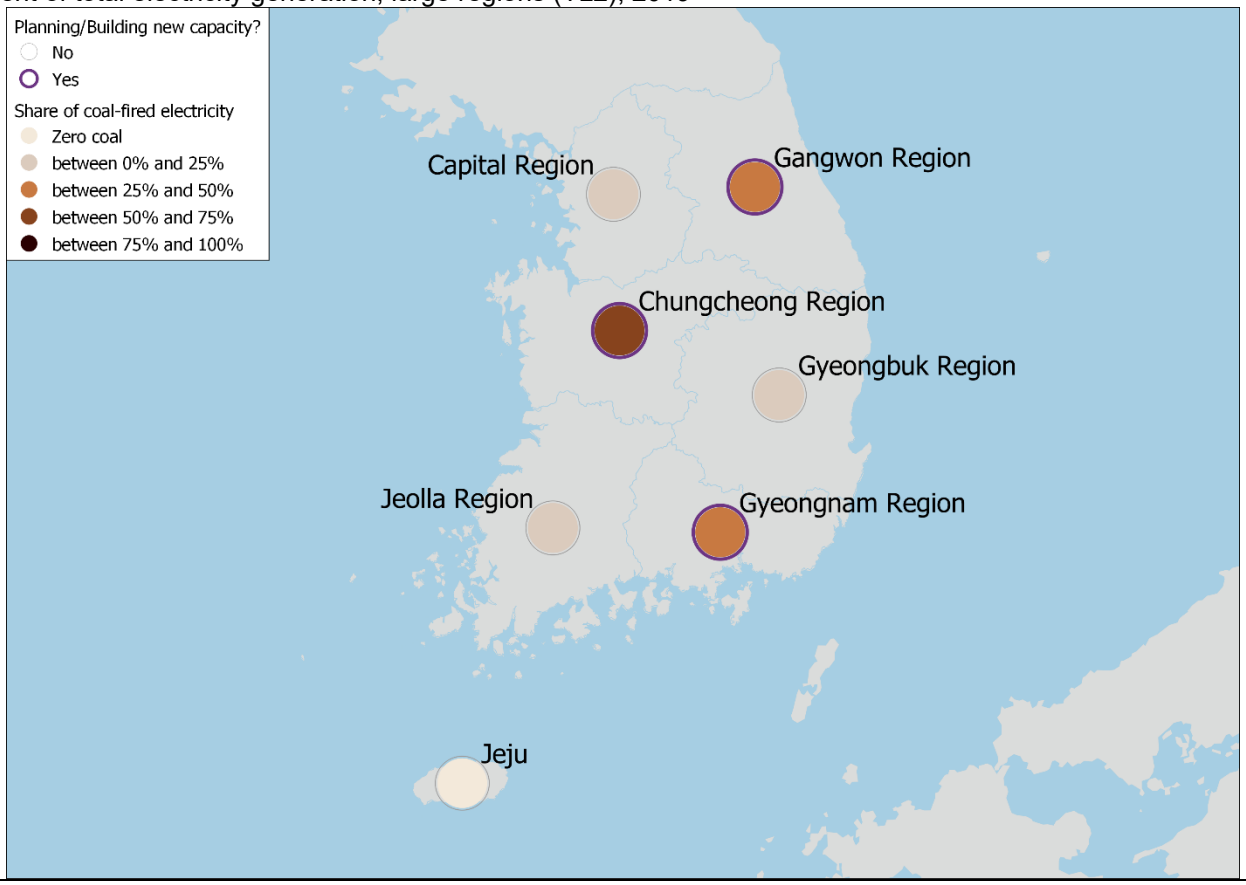


Share of coal-fired electricity generation

2019 OECD average: 23%	2019 Korean average: 40%	2030 well below 2°C benchmark for OECD countries: <2% 2030 1.5°C benchmark for OECD countries: 0%

Figure 5. Regional coal-fired electricity generation

Per cent of total electricity generation, large regions (TL2), 2019



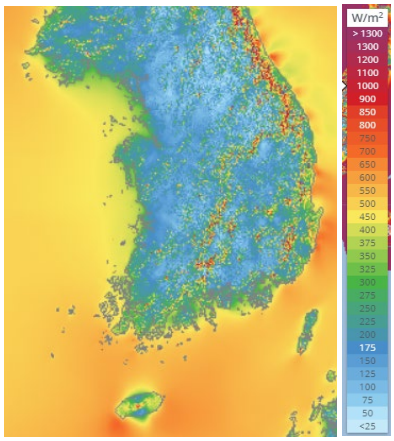
All regions, except for Jeju, use coal in electricity generation. Some regions still rely largely on coal. For example, Chungcheong depended on coal for over 67% of their electricity generation in 2019. In Chungcheong, Gangwon and Gyeongnam, new capacity is being planned or built. Seeing that OECD regions should be phasing out coal by 2030 and the average lifespan of a coal power plant is 40 years, adding such capacity would expose regions to stranded asset risks, resulting in financial market risks and economic costs.

Wind power

2019 OECD average: 8%	2019 Korean average: 0.5%	2030 well below 2°C benchmark for OECD countries: >13%

Figure 6. Wind power potential

Mean wind power density (W/m²)



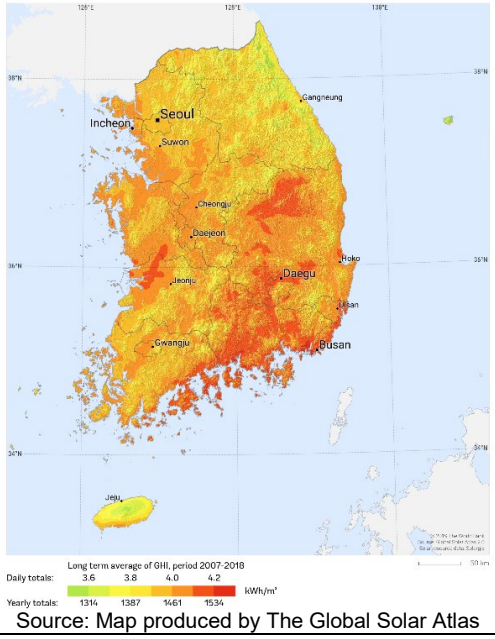
Source: Map produced by The Global Wind Atlas

Solar power

2019 OECD average: 3%	2019 Korean average: 2%	2030 well below 2°C benchmark for OECD countries: >20%

Figure 7. Solar power potential

Global horizontal irradiation (kWh/m²)



Source: Map produced by The Global Solar Atlas

There are no reliable regional wind and solar power data. The national average shares are still far below the 2030 benchmarks. Wind power density is highest offshore, solar power potential is higher in the south.

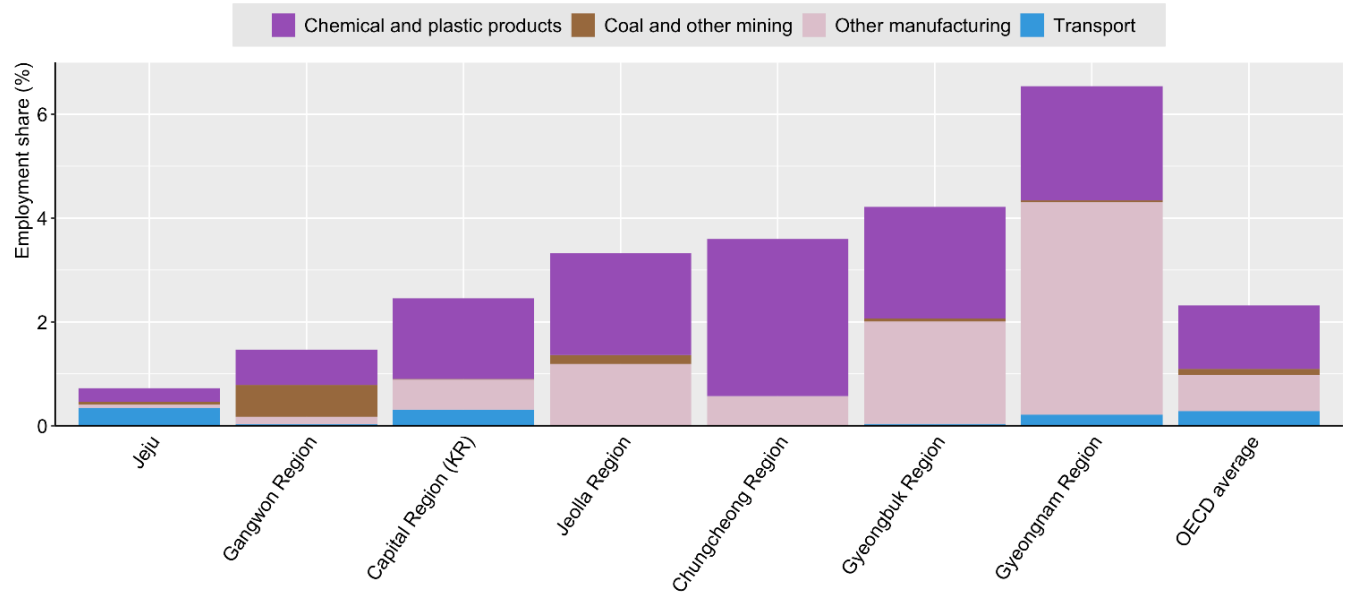
Benchmark notes: The well-below 2 degrees benchmarks show IEA Sustainable Development Scenario (SDS) numbers. The SDS models how the global energy system can evolve in alignment with the Paris Agreement's objective to keep the global average temperature increase well below 2°C above pre-industrial levels. According to the Powering Past Coal Alliance (PPCA), a phase-out of unabated coal by 2030 for OECD countries is cost-effective to limit global warming to 1.5°C.
Figure notes: Figure 4 shows data from the IEA (2020). Figure 5 shows data from Statistics Korea. Figure 5 also includes coal plans (defined as new capacity announced, pre-permit, permit or in construction) from the Global Coal Plant Tracker published by Global Energy Monitor. Figures 6 and 7 show the power potential of solar and wind. Mean wind power density (WPD) is a measure of wind power available, expressed in Watt per square meter (W/m²). Global horizontal irradiation (GHI) is the sum of direct and diffuse irradiation received by a horizontal surface, measured in kilowatt hours per square metre (kWh/m²).

Figure notes: Figure 8 is based on data from OECD Statistics. Sectors are selected based on macroeconomic simulations of a scenario limiting global warming to well below 2 degrees. See Box 3.9 in the 2021 *OECD Regional Outlook* for more details.

SECTORAL EMPLOYMENT RISKS

Figure 8. Employment in selected sectors which may be subject to employment loss by 2040 if emissions are reduced in line with the Paris climate agreement

Per cent of total regional employment, large regions (TL2), 2017



There will be both employment gains and losses due to the transition to net zero greenhouse gas emissions. They may not be distributed in the same way across regions. Employment in sectors that may be subject to some job loss by 2040 as a result of policies to reduce emissions in line with the climate objectives in the Paris Agreement amounts to less than 6.5% in all Korean regions. Most Korean regions have more employment in these sectors than the OECD average. Gyeongnam has a larger share, largely driven by other manufacturing (mainly in manufacture of other transport equipment). The selection of sectors is broad and based on employment effects simulated across OECD countries (See Box 3.9 of the 2021 *OECD Regional Outlook*). It does not take specific local characteristics into account.

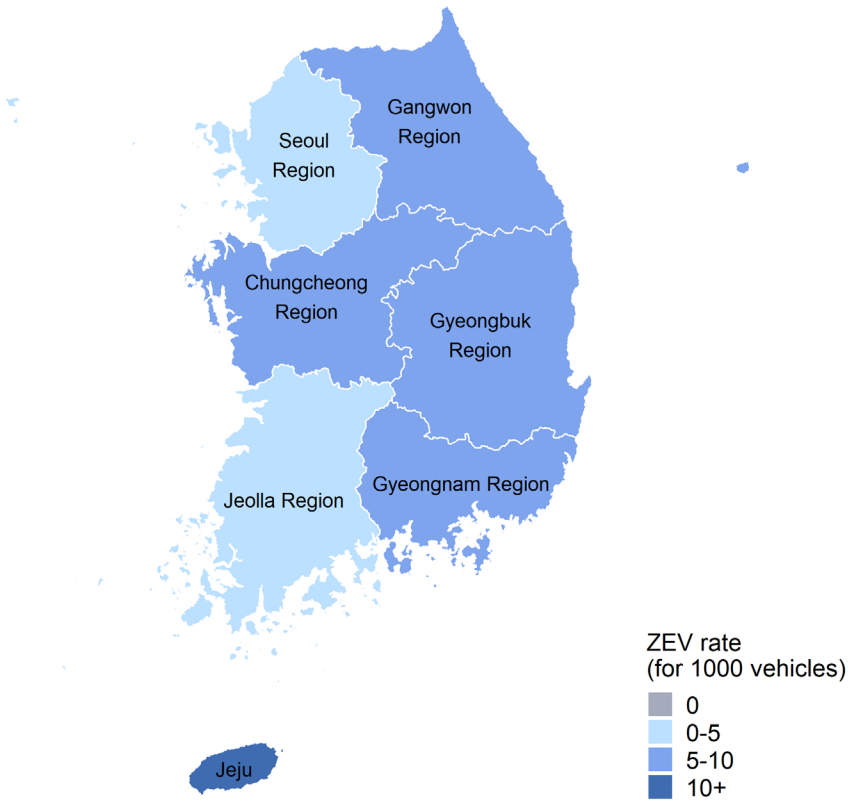
TRANSPORT

Electrification of passenger cars

2020 Korean average rate of zero-emissions road motor vehicles stock: 6 per 1000 vehicles	Benchmarks for new zero-emission passenger car sales: IEA well-below 2°C benchmark: 100% by 2040. Aligned with net zero emissions by 2050: 100% by 2035 at the latest. 2030 cost-effective.	South Korean target sales of zero emission new passenger cars: No full phase out date of internal combustion cars yet

Figure 9. Zero-emissions road motor vehicles stock

Per 1000 vehicles, large regions (TL2), 2020



Most Korean regions have more than five zero-emissions vehicles per 1000 road motor vehicles. Jeju has, with 35 zero-emissions vehicles per 1000 vehicles, the largest share of zero-emissions vehicles in its road motor vehicles stock. Gyeongbuk follows with around seven zero-emissions vehicles per 1000 road motor vehicles.

Countries with a net zero target by 2050 will need to phase out sales of new conventional cars by 2035 at the latest (considering cars have an average useful life of 15 years). A phase-out by 2030 is more cost-effective.

Benchmark notes: In the IEA's Sustainable Development Scenario, OECD countries (such as the European Union, Japan and the United States) as well as China fully phase out conventional car sales by 2040. This scenario is aligned with the Paris Agreement's objective to keep the global average temperature increase well below 2°C above pre-industrial levels. The UK Committee on Climate Change finds that all new cars and vans should be electric (or use a low carbon alternative such as hydrogen) by 2035 at the latest to reach net zero GHG emission targets by 2050. A more cost-effective date from the point of view of users is 2030.
Figure notes: Figure 9 is based on data from Statistics Korea.

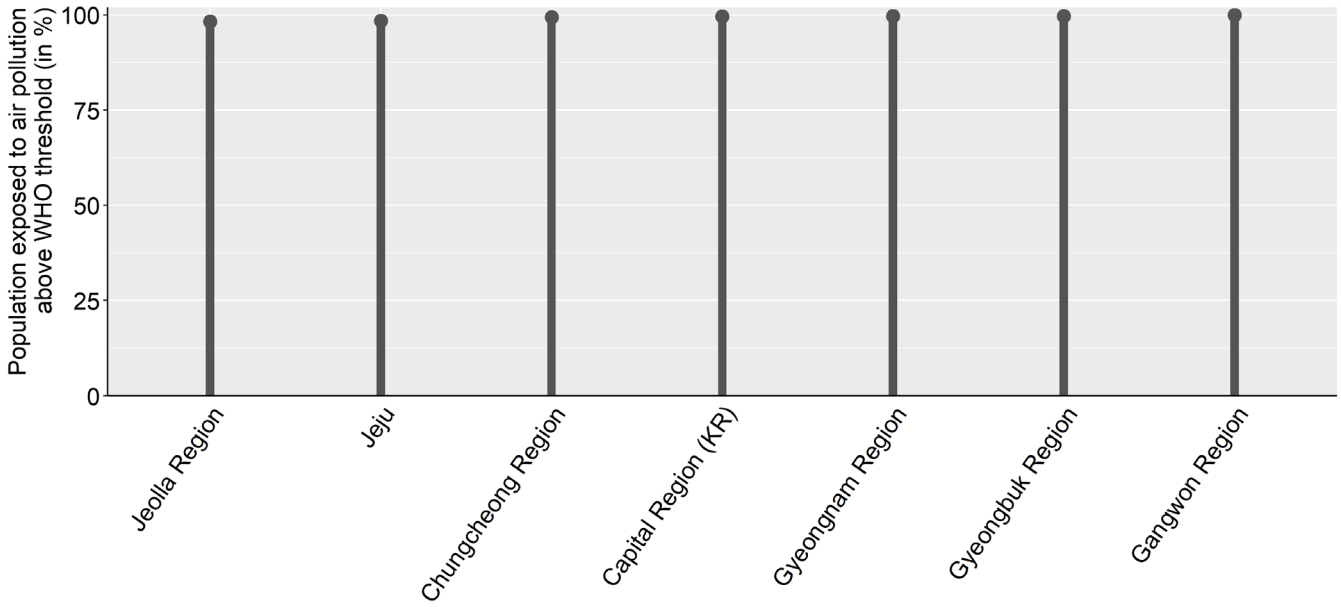
AIR POLLUTION

Large regions (TL2)

2019 OECD share of population exposed above the WHO-recommended threshold: 62%	2019 Korean share of population exposed above the WHO-recommended threshold: 99%	WHO-recommended air quality threshold: PM2.5 annual mean concentration < 10 µg/m^3

Figure 10. Share of population exposed to levels of air pollution above the WHO-recommended threshold

Percentage of population exposed to above 10 µg/m^3 PM2.5, large regions (TL2), 2019



Policies towards net-zero greenhouse gas emissions can bring many benefits beyond halting climate change. They include reduced air and noise pollution, reduced traffic congestion, healthier diets, enhanced health due to increased active mobility, health benefits through thermal insulation, and improved water, soil and biodiversity protection. Some are hard to quantify.

Small particulate matter (PM2.5) is the biggest cause of human mortality induced by air pollution. Major disease effects include stroke, cardiovascular and respiratory disease. Air pollution amplifies respiratory infectious disease such as Covid-19. It affects children the most. It reduces their educational outcomes as well as worker productivity.

Figure notes: Figure 10 is based on data from OECD Statistics.