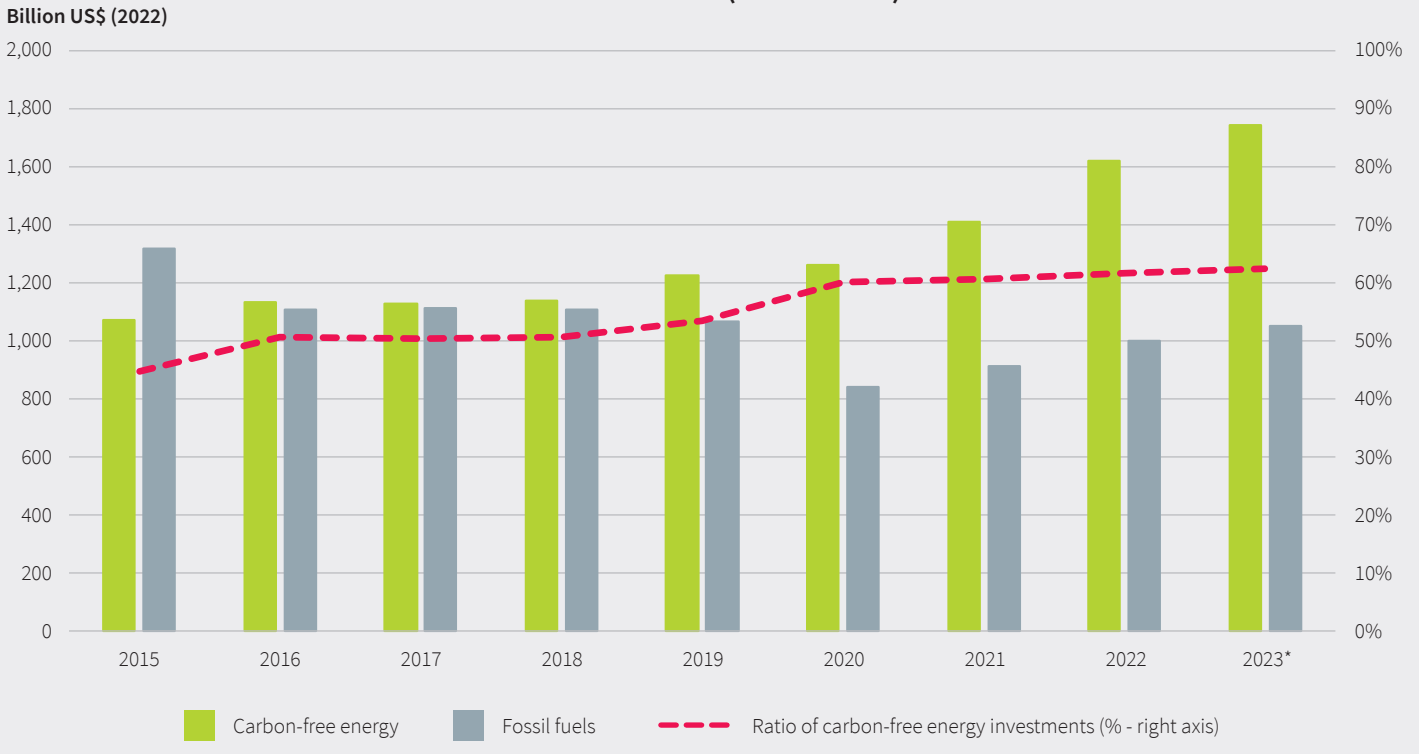


Analysis by the International Energy Agency (IEA) reveals that the recovery from the Covid-19 pandemic and the subsequent response to the global energy crisis increased the investments in carbon-free energy sources. The increasing trend in carbon-free technology investments is expected to continue in 2023 to reach US\$ 1.7 trillion by the end of the year.

### Global investments for carbon-free energy technologies and fossil fuels (2015-2023\*)

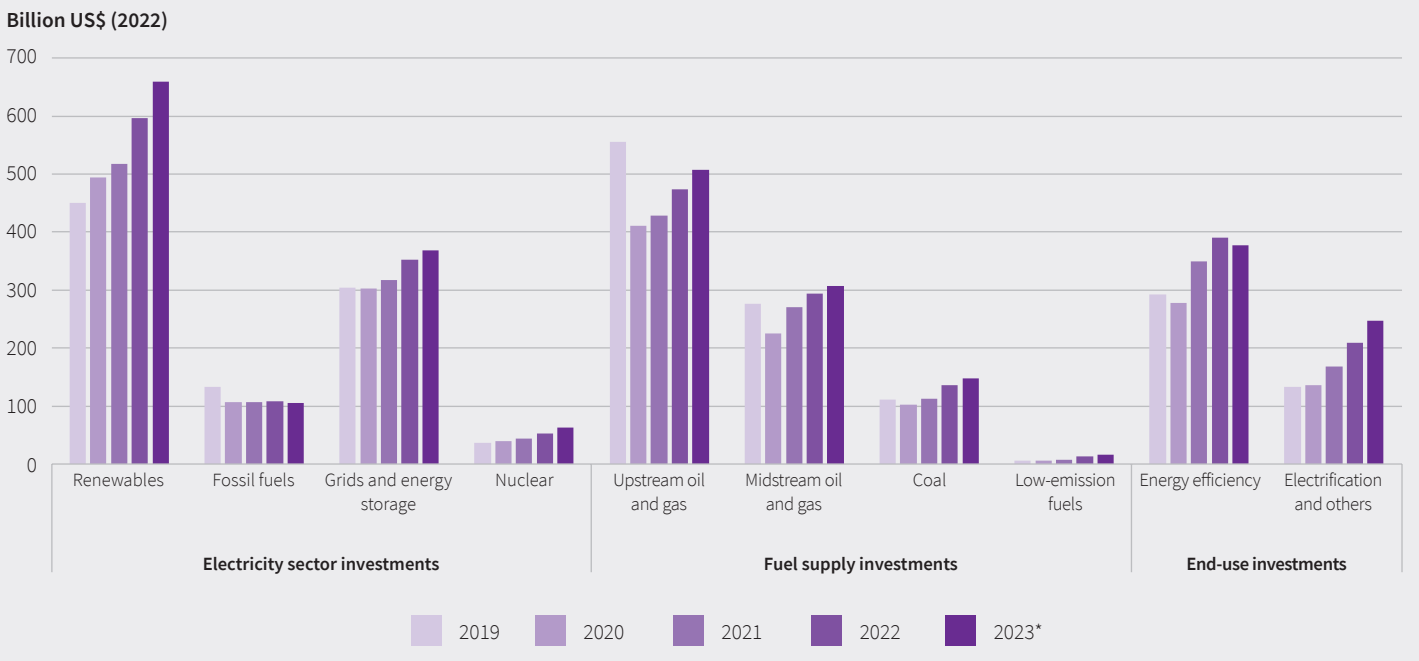


\* Estimated values for 2023

Source: IEA (2023)

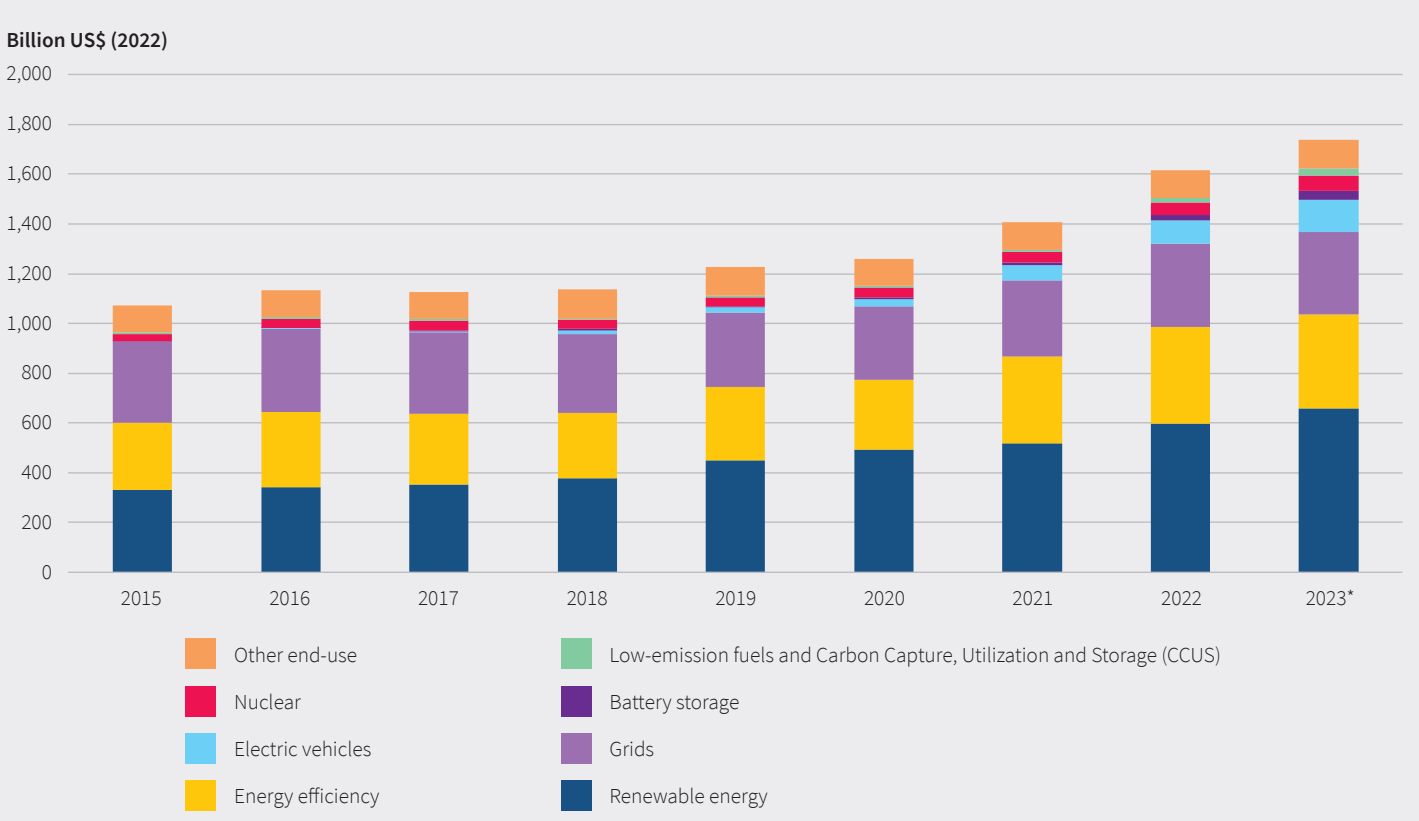
The IEA foresees that the total global energy investments, which were US\$ 2.3 trillion in 2019, are expected to reach US\$ 2.8 trillion by the end of 2023. While in 2019 for every dollar spent on fossil fuels 1 dollar was spent on carbon-free sources, in 2023, the spending on carbon-free resources went up to 1.7 dollars to 1 dollar spending on fossil fuels.

### Global energy sector investments (2019 – 2023\*)



\* Low-emission fuels are defined as biofuels in liquid and gaseous forms, low-emission hydrogen and other low-emission hydrogen-based fuels.  
\* Other in end-use sector electrification refers to renewables in buildings, transportation and industrial sectors.  
\* Grids refer to both distribution and transmission lines.  
\* Estimated values for 2023

### Carbon-free energy investments 2015 – 2023\*



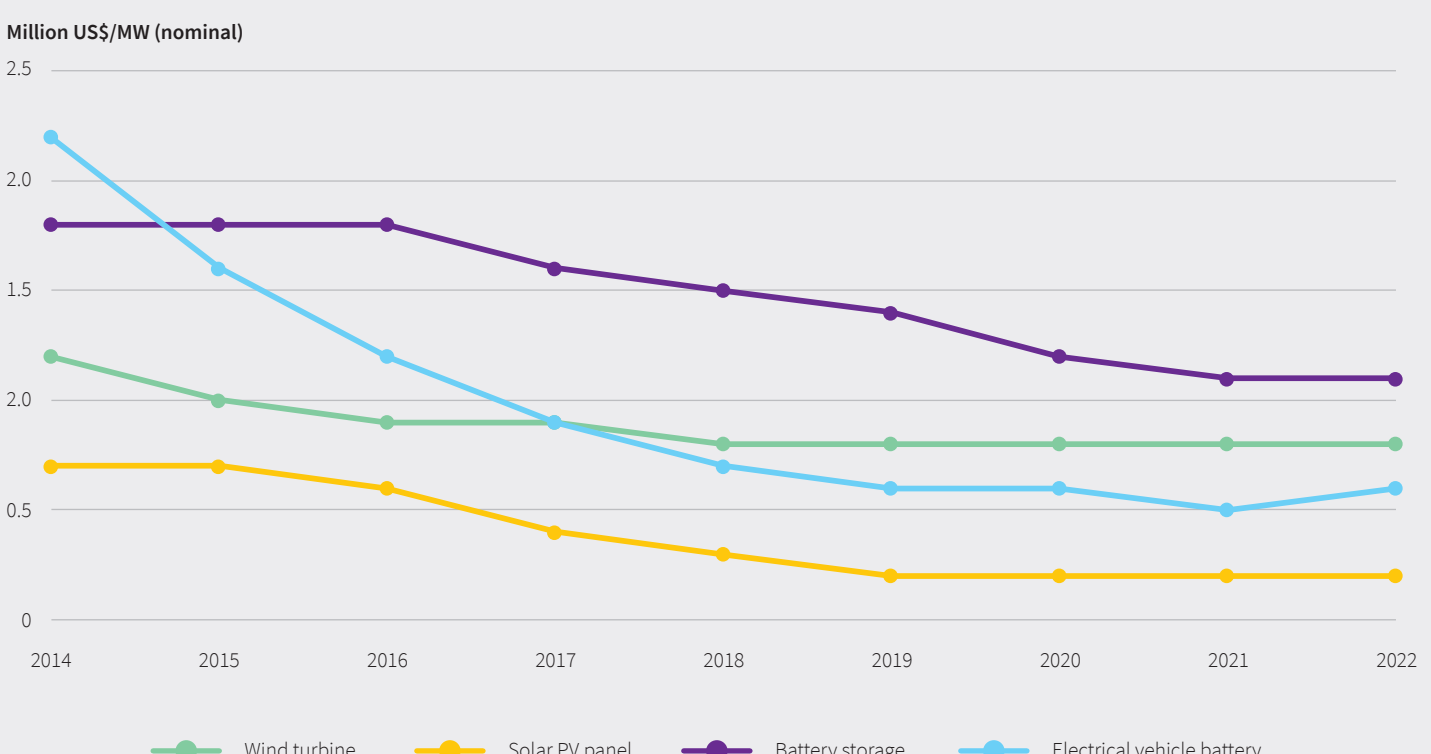
\* Low-emission fuels are defined as biofuels in liquid and gaseous forms, low-emission hydrogen, and hydrogen-based fuels that cause low-carbon emissions in production but do not cause carbon emissions when used directly.  
\* Other in end-use sector electrification refers to renewables in buildings, transportation and industrial sectors.  
\* CCUS: Carbon capture, utilization and storage systems  
\* Estimated values for 2023

Source: IEA (2023)

Following a long-term reduction in technology costs, some carbon-free energy technology costs increased during 2021-2022 mainly due to cost increases of critical minerals, semi-conductors and bulk materials such as steel and cement. Despite cost increases, carbon-free technologies maintained their competitive position within this period when compared to fossil fuel prices. As the price pressures are easing in 2023, it is expected that the carbon-free technologies will maintain their competitive advantage.

Electric vehicles, and renewable energy sources, especially solar energy, are leading carbon-free energy investments in 2023. The rapid increase in the carbon-free energy investments are driven mainly by national policies (e.g., the Inflation Reduction Act enacted in the USA) supporting renewable energy sources as well as high and volatile fossil fuel prices.

### Annual average cost of selected carbon-free energy technologies (2014 – 2022)



Source: IEA (2023)

- IEA findings reveal that 90% of electricity generation investments in 2023 will consist of low-emission technologies.
- With US\$ 380 billion, solar energy leads low emissions energy investments in 2023 while in the end-use sectors, the trend towards electrification (especially heat pumps and electric vehicles) is gaining momentum since 2020.
- Türkiye displays a trend similar to the global long-term growth tendency especially in renewable energy investments. In Türkiye, the estimated share of carbon-free energy investments in total energy investments increased from 49% during 2002-2018 to 67% during 2019-2021. However, due to recent economic difficulties, it is estimated that the average annual investment amount in the energy sector declined by approximately 5% compared to the previous 17 years.
- Renewable energy has a leading role in carbon-free energy investments in Türkiye as well as in the world. In Türkiye, renewable energy facilities constituted 70% of the new installed power capacity between 2015 to 2022. In end use sectors, though, there is room for development in both energy efficiency and electrification investments.
- In order to achieve the net-zero emission targets both in Türkiye and in the world, clean energy investments need to reach 2-3 times the average levels observed in the past. In order for Türkiye to access the required financing for these investments, it is crucial to implement supporting policies and coordination mechanisms to provide predictability in the market for investors and financiers.