Is nuclear energy indispensable to fight climate change?

As a low-carbon energy, nuclear is considered as one of the solutions to limit global warming. It is sometimes even presented as the only silver bullet to supply massive amounts of electricity with little greenhouse gas emissions. Is there no alternative?

Nuclear energy is not totally free of carbon emissions, yet it is indisputable that the electricity it supplies is responsible for much less CO₂ emissions than that from fossil fuels. Nevertheless, this fact is insufficient to conclude on the role it should play in a global strategy of decarbonisation of the economy.

So far, nuclear energy has only marginally contributed to reducing worldwide greenhouse gas emissions. Annual growth rates in CO₂ emissions related to energy supply have been twenty times higher than the rate of avoided emissions through nuclear since 1950. Even France, where the share of nuclear in the electricity production is very high (about 75 %), does not have a level of carbon emissions that can be considered sustainable.

No official global outlook relies on a strong rise of nuclear energy. The International Energy Agency (IEA) does propose an ambitious scenario where the installed nuclear capacity is multiplied by a factor 2.5 by 2040; yet, it concludes on a limited role in reducing emissions. In this context, nuclear energy is no silver bullet, and its relevance needs to be evaluated against the performance of other available options – such as energy savings, energy efficiency, and renewable energy sources, and the compatibility between them. In this regard, nuclear energy may appear as hindering the implementation of a consistent combination of solutions, and its development a barrier to an efficient energy transition.