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Opinion Article

Nuclear Energy, Neutral Renewable and Power

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1. Description

Monoclonal CO_2 neutral renewable and low carbon sources of energy have to substitute the currently prevailing fossil fuels and limit additional CO_2 emissions as far and as fast as possible. Although many people concur that it is important to reduce CO_2 emissions, there is no universal agreement on the best way to do so particularly, the utilization of nuclear power to generate energy is under question. Nuclear power as a means of reducing greenhouse gas emissions was first suggested in 2000, although discussion has continued since then. Scientists have recently expressed their support for and opposition to the usage of nuclear power in letters to media and heads of state. But there is disagreement in scientific journal articles as well over the place of nuclear energy in a world with minimal carbon emissions. Some writers contest the notion that nuclear power is a low carbon technology and, as a result, steadfastly support a future devoid of nuclear energy.

According to some writers, nuclear power could at the very least, completely replace all coal-fired power plants and serve as the mainstay of energy supply in a low carbon future with ten times the capacity already deployed up to 2050. Others once again call for maintaining at least the present nuclear fleet, even if doing so requires paying subsidies. A new report describes nuclear power's promise as a low-carbon solution, but points to cost reduction as the key challenge. In order to achieve the Paris Agreement's climate targets, nuclear energy is crucial. There it is said that "one low-carbon dispatch able alternative that is almost endless and accessible today" is nuclear energy. A study on a variety of topics related to nuclear energy as a technology for climate mitigation was also produced by the IAEA. The research provides a broad range of possibilities, from phase out to growth scenarios, with, consequently, highly varying contributions, regarding the future impact of nuclear power on mitigating climate change. However, a comparison of the CO_2 emissions and energy output of nations over a 25 year period suggests that large scale national nuclear initiatives do not seem to result in much reduced carbon emissions. By assessing nuclear power's ability to safeguard the environment for the next 20 years and by considering the available uranium supplies, we contribute to the conversation.

Carbon Dioxide Emissions from Nuclear Power

During operation, nuclear power facilities emit very little direct Carbon dioxide (CO_2). Nuclear power is undoubtedly not emission free, though; when you take into account both direct and indirect emissions as well as the entire life cycle of the technology (uranium mining, milling, conversion, enrichment, fuel fabrication, construction and decommissioning of nuclear power plants, spent fuel processing and storage). In a review article summarizing estimates of Carbon dioxide (CO_2) emissions from nuclear fuel cycle analysis, values ranging from 1.4 g CO_2/kWhe to 288 g CO_2/kWhe are reported, with a mean value of 66 g CO_2/kWhe for all the studies that were analysed. Different uranium ore grades, various procedures and techniques used during mining, milling, enrichment, and fuel fabrication, as well as various power sources

utilized during mining and enrichment, are to blame for the wide variation in CO_2 emissions.

Climate Change Mitigation Potential

The ratio of yearly prevented CO_2 emissions to the total annual emissions of a given year is how they define the possibility for mitigating climate change. In each of the four predictions or scenarios for nuclear development that are taken into consideration, they analyze the maximum amount of annual emissions that may be saved in 2040. With the exception of emissions from land use change, detailed comparisons are made between the upper bound of avoided CO_2 emissions and total CO_2 emissions from the energy sector, total CO_2 emissions related to fossil fuels, and total greenhouse gas emissions expressed as CO_2 equivalents from all sectors.