

TEG deliberations on nuclear energy

The TEG assessed nuclear energy as part of its review on energy generation activities. Nuclear energy generation has near to zero greenhouse gas emissions in the energy generation phase and can be a contributor to climate mitigation objectives. Consideration of nuclear energy by the TEG from a climate mitigation perspective was therefore warranted.

The proposed Taxonomy regulation and thus TEG's methodology for including activities in the Taxonomy explicitly includes two equally important aspects, Substantial Contribution to one environmental objective and Do No Significant Harm (DNSH) to the other environmental objectives. In making its recommendations, the TEG used evidence and expert opinion from others, but ultimately was mandated to make recommendations about the inclusion of economic activities and screening criteria in the Taxonomy.

Evidence on the potential substantial contribution of nuclear energy to climate mitigation objectives was extensive and clear. The potential role of nuclear energy in low carbon energy supply is well documented^{265, 266}.

On potential significant harm to other environmental objectives, including circular economy and waste management, biodiversity, water systems and pollution, the evidence about nuclear energy is complex and more difficult to evaluate in a taxonomy context. Evidence often addresses different aspects of the risks and management practices associated with nuclear energy. Scientific, peer-reviewed evidence of the risk of significant harm to pollution and biodiversity objectives arising from the nuclear value chain was received and considered by the TEG^{267, 268, 269}. Evidence regarding advanced risk management procedures and regulations to limit harm to environmental objectives was also received. This included evidence of multiple engineered safeguards, designed to reduce the risks. Despite this evidence, there are still empirical data gaps on key DNSH issues.

For example, regarding the long-term management of High-Level Waste (HLW), there is an international consensus that a safe, long-term technical solution is needed to solve the present unsustainable situation. A combination of temporary storage plus permanent disposal in geological formation is the most promising, with some countries are leading the way in implementing those solutions. Yet nowhere in the world has a viable, safe and long-term underground repository been established^{270, 271}. It was therefore

265 IPCC, 2014: Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Edenhofer, O., R. Pichs-Madruga, Y. Sokona, E. Farahani, S. Kadner, K. Seyboth, A. Adler, I. Baum, S. Brunner, P. Eickemeier, B. Kriemann, J. Savolainen, S. Schlömer, C. von Stechow, T. Zwicker and J.C. Minx (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA;

266 International Atomic Energy Agency, Climate Change and Nuclear Power 2018, IAEA, Vienna (2018);

267 NEA Issue Brief: An analysis of principal nuclear issues No. 3, January 1989. The disposal of high-level radioactive waste. <https://www.oecd-nea.org/brief/brief-03.html>, more recently: Preservation of Records, Knowledge and Memory (RK&M) Across Generations: Developing a Key Information File for a Radioactive Waste Repository, OECD 2019 NEA No. 7377;

268 Verbruggen A., Laes, E. Lemmens, S., Assessment of the actual sustainability of nuclear fission power, renewable and Sustainable Energy Reviews 32(2014)16–28;

269 Tierney Kieran M., Graham K.P. Muira, Gordon T. Cook, Johanna J. Heymans, Gillian MacKinnona, John A. Howeb, Sheng Xua, Andrew Brownlowc, Nicholas J. Davisonc, Mariel ten Doeschatec, Rob Deavilled, Nuclear reprocessing-related radiocarbon (14C) uptake into UK marine mammals, Marine Pollution Bulletin 124 (2017) 43–50;

270 World Nuclear Waste Report (WNWR), Focus Europe, 7 December 2018, available on: https://rebecca-harms.de/files/1/4/14p1u61xrvco/attc_RiBS6hfU8CMhUiD1.pdf;

271 Blue Ribbon Commission (BRC) on America's Nuclear Future, Report to the Secretary of Energy, January 2012.

infeasible for the TEG to undertake a robust DNSH assessment as no permanent, operational disposal site for HLW exists yet from which long-term empirical, in-situ data and evidence to inform such an evaluation for nuclear energy.

Given these limitations, it was not possible for TEG, nor its members, to conclude that the nuclear energy value chain does not cause significant harm to other environmental objectives on the time scales in question. The TEG has not therefore recommended the inclusion of nuclear energy in the Taxonomy at this stage. Further, the TEG recommends that more extensive technical work is undertaken on the DNSH aspects of nuclear energy in future and by a group with in-depth technical expertise on nuclear life cycle technologies and the existing and potential environmental impacts across all objectives.