



Letter to the editor

Is nuclear energy the way? A response to Mateo-Tomás & López-Bao (2022) “A nuclear future for biodiversity conservation?”

Mateo-Tomás and López-Bao (2022) expose several arguments on why nuclear energy is needed for biodiversity conservation. The authors aptly expose that land use is the main driver of biodiversity loss and discuss the land footprint of renewable energy, namely solar, wind and hydropower, mining activities and hence the biodiversity impact, compared to nuclear energy. Likewise, Mateo-Tomás and López-Bao (2022) highlight the drawbacks of nuclear energy in such regard. In this sense, they state that “...nuclear power is not exempt of environmental and socioeconomic concerns, such as operating risks, long-term radioactive wastes, high costs, thermal pollution or mining”. Furthermore, they indicate that “all of these issues deserve further attention in order to be minimised, and some of them must be properly accounted for, especially if fair comparisons among the land footprints of nuclear and renewable energies are intended”. Lastly, the authors end by expressing that “nuclear energy should be integrated in the political agenda to prevent that acting against climate change will boost habitat degradation and, in turn, biodiversity loss.”

Although we agree with the authors' critical view toward institutional plans to tackle climate change while conserving biodiversity, the analysis lacks a broader and deeper view of the issue in question. Specifically, we consider that some assumptions underlay the main narrative and hinder other future alternatives. These assumptions are evidenced in the concluding sentence: “we risk to degrade what is left of our already decimated nature in the name of climate change”. Are we really risking degrading nature in the name of climate change or, otherwise, in the name of maintaining unquestionable the current pattern of energy use and resource consumption?

Firstly, Mateo-Tomás and López-Bao (2022) focus the analysis and discussion on renewables against nuclear energy. To this end, they only consider land footprint, which, despite being the main driver of biodiversity loss, can be seen as looking at the tip of the iceberg while keeping unobserved what lies beneath. In this sense, such an approach follows and reproduces the mainstream public debates and discourses. It centres merely on the *form*, that is to say, the source and how electricity is generated, thus distracting the attention from a questionable and critical point: the direct and indirect dependence on limited non-renewable resources for both renewable and nuclear energies. Furthermore, the authors do not manifest that the replacement of fossil fuels is not currently happening. On the contrary, both renewable and nuclear energies have been added up to the fossil-based power capacity (York and Bell, 2019). Therefore, the debate cannot merely focus on how to produce low-carbon energy.

Secondly and more importantly, as we advanced, Mateo-Tomás and López-Bao (2022) look at the tip of the iceberg but not at what is underneath. According to Otero et al. (2020), economic growth is the underlying cause of biodiversity loss via greater resource consumption including all the electricity and minerals required for renewable energy

technologies and nuclear power. Consequently, biodiversity conservation is neither about renewables nor nuclear energy.

As Mateo-Tomás and López-Bao (2022) also refer to sustainable development goals, we argue that as long as the current level of energy and resource use remains beyond dispute, sustainable development goals and hence (green) economic growth fall short of tackling the climate breakdown and ecological crisis (Hickel and Kallis, 2019; Capellán-Pérez et al., 2019). Considering that absolute decoupling between economic growth and resource use is unlikely to be achieved, degrowth could be the best pathway toward the mitigation of climate change and ecosystems and biodiversity conservation (D'Alessandro et al., 2020).

Therefore, even though the scientific and public debate about the best alternatives to produce low-carbon energy is crucial, we consider that assuming business as usual hinders imagining and creating alternative future pathways beyond economic growth. As stated by Otero et al. (2020), policymakers should “...acknowledge the conflict between economic growth and biodiversity conservation in future policies”. As a concluding remark, we suggest moving beyond the economic growth ideology and modern development thinking if biodiversity is to be preserved on Earth.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

References

- Capellán-Pérez, I., De Castro, C., González, L.J.M., 2019. Dynamic Energy Return on Energy Investment (EROI) and material requirements in scenarios of global transition to renewable energies. *Energy Strategy Reviews* 26, 100399. <https://doi.org/10.1016/j.esr.2019.100399>.
- D'Alessandro, S., Cieplinski, A., Distefano, T., Dittmer, K., 2020. Feasible alternatives to green growth. *Nature Sustainability* 3 (4), 329–335. <https://doi.org/10.1038/s41893-020-0484-y>.
- Hickel, J., Kallis, G., 2019. Is green growth possible? *New Political Economy*. <https://doi.org/10.1080/13563467.2019.1598964>.
- Mateo-Tomás, Patricia, López-Bao, José Vicente, 2022. A nuclear future for biodiversity conservation? *Biological Conservation* 270 (109559). <https://doi.org/10.1016/j.biocon.2022.109559>.
- Otero, I., et al., 2020. Biodiversity policy beyond economic growth. *Conserv. Lett.* 13 (4), e12713 <https://doi.org/10.1111/conl.12713>.
- York, R., Bell, S.E., 2019. Energy transitions or additions?: why a transition from fossil fuels requires more than the growth of renewable energy. *Energy Research & Social Science* 51, 40–43. <https://doi.org/10.1016/j.erss.2019.01.008>.

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