



A student examines solar panels at Strathmore University in Nairobi.

Africa: renewables infrastructure avoids stranded assets

We applaud Vijaya Ramachandran's call for a stable energy supply on the African continent (*Nature* **592**, 489; 2021), but disagree that this might be best achieved by wealthy countries continuing to invest in fossil-fuel projects in Africa. These would bring insurmountable costs to Africa in the long term.

As fossil-fuel infrastructure builds up, its facilities become deeply rooted in society. This creates carbon lock-in, a resistance to shifting over to low-carbon living – even when cost-effective renewable alternatives exist, and the social and environmental costs to consumers are rising. Exporting old fossil-fuel technologies and infrastructure to energy-poor African countries risks trapping them in an outdated techno-institutional complex for decades to come, and would stifle the innovation that is essential for alleviating poverty.

Advanced economies recognize that investment in renewables will maintain the energy supply as well as the competitive technological advantage that underpins prosperity. Development projects therefore need to focus on these new technologies, by investing in both the physical and the institutional infrastructure that can foster a stable and innovative low-carbon future.

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Pollution from hydrogen fuel could widen inequality

Hydrogen holds promise as a clean, low-carbon fuel (see, for example, go.nature.com/3arm2nq). But under current plans – including those in the United Kingdom's sixth carbon budget (see go.nature.com/3hjkvgvp) – the gas would be mostly burnt in engines and boilers rather than being used in fuel cells. The burning of hydrogen generates toxic nitrogen oxides (NO_x) as well as steam (Y. B. Zel'dovich *Acta Physicochimica URSS* **11**, 577–628; 1946). This pollution could disproportionately impact the urban poor.

Reducing nitrogen-oxide emissions from hydrogen boilers and engines is possible. But there is often a trade-off with fuel efficiency or with cost, because of the need for exhaust-gas after-treatment equipment (A. C. Lewis *Environ. Sci.: Atmos.* <https://doi.org/gmjmj>; 2021). By the 2040s, hydrogen combustion for domestic heating could be the last major source of NO_x in cities, as ever more road vehicles switch to electric power.

Nitrogen-oxide emissions from hydrogen boilers will be concentrated in areas of high-density housing, often associated with low-income households. A widening of inequality in exposure to NO_2 could be an unwelcome side effect of this net-zero policy without new regulation and innovation in after-treatment technologies.

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Italy: Forest harvesting is not green growth

We question plans to step up the harvesting of forest biomass, as set out in Italy's *Fourth Report on the State of Natural Capital* (see go.nature.com/3hmpygq). Rather than supporting a transition to a green economy, this could translate into more logging and perturbation of forest ecosystems.

The loss of trees in Italy's forests in recent years (go.nature.com/3yzvdp9) is only partly explained by disturbances such as Storm Vaia in 2018, and salvage logging thereafter. The dominant driver is the production of wood fuel (D. Pettenella *et al. Forest@18*, 1–4; 2021), mainly from coppice. This probably removes about 50% of estimated annual growth (see go.nature.com/3xr1mzc).

The new biomass policy could threaten the functionality of forest ecosystems unless it includes measurable targets and a reliable monitoring system for tracking the impacts of removing wood. In a geographically complex country, rich in biodiversity, this could undermine progress towards the European Union's 2030 biodiversity strategy.

For Italy's forests to contribute to the economy, provide ecosystem services, halt biodiversity loss and mitigate climate change, the country needs ecological planning, data monitoring, forest protection, restoration and rewilding.

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