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Methane metrics: the political stakes

The 100-year global warming potential (GWP100) metric used to compare methane and carbon dioxide emissions could soon be superseded by a recalculated GWP (dubbed GWP*). GWP* is intended to make comparisons between short- and long-lived greenhouse gases more objective. However, it could alter the playing field for international policy.

Unlike GWP100, in which each entity's contribution to the global total is calculated according to its concurrent emissions, GWP* considers an entity's contribution to be its additions to its own baseline, as measured in a past year. GWP* and GWP100 therefore rely on different theoretical causal assumptions about whose emissions count as additional.

Controversially, GWP* allocates greater CO_2-equivalent emissions to historically lower-emitting developing countries (J. Rogelj and C.-F. Schleussner *Environ. Res. Lett.* **14**, 114039; 2019). Countries and industries with historically high methane emissions stand to benefit. But these concerns have been dismissed by the metric's proponents as secondary matters, best left to policymakers (M. Cain *et al. Environ. Res. Lett.* **16**, 068001; 2021).

In fact, the political outcomes associated with GWP* stem from its arbitrary causal assumptions, which are a philosophical issue and cannot be settled by scientific evidence alone.

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Research-impact bonds: young scientists lose out

As a PhD student in biomedical engineering, I am alarmed by Michael Hill's proposal to use research-impact bonds (RIBs) as a financing system (*Nature* **618**, 887; 2023). This kind of public–private funding mechanism could further undermine the appeal of academia to my generation of scientists.

RIBs would put universities under pressure to generate quantifiable output, which would compound the demands on researchers already struggling with high workloads, job insecurity and sub-par salaries. Furthermore, their research aspirations could be compromised by the need to adapt to the requirements of RIB investors bent on lucrative but low-risk research.

Academic researchers use teaching and mentoring to encourage early-career scientists to think critically. This invaluable contribution to the future of science could be displaced if senior researchers must meet overly ambitious or unrealistic private-market goals. As a result, drop-out rates could increase and researchers' mental health deteriorate.

Criteria for public funding are becoming broader to improve diversity and equity in the research system. By contrast, non-specialist investors in RIBs have to consider only the impact of researchers' publications. This narrow focus could lead to the exclusion of early-career scientists and those with parental and caring responsibilities, for example.

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Consciousness: one-celled organisms know the secret

In 1998, neuroscientist Christof Koch bet philosopher David Chalmers that it would be known by 2023 how the brain achieves consciousness. In June, Koch agreed that Chalmers had won the wager (*Nature* **619**, 14–15; 2023). This was no surprise to us, given that Koch's aim relied on unpacking the workings of the most complex organ in the known Universe.

All life is sentient. Both life and sentience involve self-awareness, evaluation of perceived information and mutually reactive sensory and perceptual functions. For our research into the cellular foundations of consciousness, we found it most productive to start with the simplest prokaryotic species.

Our model is based on empirical evidence from dozens of studies. The data indicate that unicellular organisms are highly social, display associative learning (grasping, for example, navigational routes and simple patterns) and form stable memories. They also make decisions, evaluate events, communicate within and between colonies and, fascinatingly, show a form of altruism (W. B. Miller Jr *et al. Commun. Integr. Biol.* **16**, 2196145; 2023). In our view, sentience and cognition began in unicellular species — their development is akin to the evolution of all species from simpler life forms.

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