Correspondence

Carbon tax to aid economic recovery

The fall in fossil-fuel prices offers governments a chance to offset the potentially massive public debt incurred by the COVID-19 pandemic. Large revenues could be raised by placing a global price on carbon while oil prices are low. For oil alone, a levy of US$30 per barrel on 100 million barrels per day would return $3 billion per day, or $1.1 trillion per year.

A consistent charge applied to all fossil-carbon emissions, irrespective of source, could return overall fossil-fuel prices to pre-pandemic levels in a simple, efficient and transparent way. As well as raising revenue, it would reduce uncertainty about energy prices, buffering against future price spikes and protecting investments in energy efficiency and renewable energy. The economic recovery from the pandemic would follow a low-carbon trajectory.

If world leaders act fast, using the same decisive and coordinated approach they have applied to combat the spread of the virus, they can help to protect both the economy and the climate through a single simple instrument.

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Antibody production to bypass animals

The European Commission's Joint Research Centre has just released its recommendations on non-animal-derived antibodies (see go.nature.com/2ypgstg), in accordance with the EU's 2010 directive on protecting laboratory animals (go.nature.com/2wxd9as). We urge government authorities, funding agencies and publishers to endorse this technical advance to improve scientific reproducibility and benefit society.

Animal-derived antibodies are plagued by efficacy issues (A. Bradbury and A. Plückthun *Nature* **518**, 27–29; 2015), with repercussions for research reproducibility, diagnosis and health management. By contrast, non-animal antibodies derived from universal naive display libraries (see, for example, P. Mondon *et al. Front. Biosci.* **13**, 1117–1129; 2008) are defined by sequence and so are consistently reproducible.

Such libraries contain an enormous repertoire of structurally diverse antibody genes, comparable to those of the naive immune system. This facilitates the selection of antibodies for specificity, stability, yield and affinity. The libraries can also be used repeatedly, unlike recombinant animal-derived ones, which require a new immunization protocol for each antigen under investigation. Non-animal antibodies can be engineered in immunoglobulin formats to have properties that are indistinguishable from those of animal-derived ones. They are therefore able to replace them in all known applications.

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Boost longevity of economic model

The COVID-19 pandemic has led economists to weigh up the 'dollar value' of human lives against the effect of lockdown measures on gross domestic product — in order to justify lifting them. Given the burgeoning medical crisis, we should instead be questioning the wisdom of persisting with an economic model that cannot survive a pause of even a few months.

The pandemic presents an opportunity to rethink the rationality of our socio-economic model and to replace it with a more resilient one. A system that relies on complex webs of growing debt, and that ultimately endorses the ever-increasing use of finite physical resources, is by definition unsustainable, even without pandemics. We also need to build in the near-certain emergence of other lethal pathogens in the future (see, for example, K. E. Jones *et al. Nature* **451**, 990–993; 2008).

Scientists and scientific organizations have a responsibility to clearly communicate these long-term considerations to policymakers if such goals are to be realized.

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COVID-19: lessons from Lombardy

Since becoming Europe's first epicentre for COVID-19, Lombardy in northern Italy has been a testing bench for managing the coronavirus. Last month, its Regional Forum for Research and Innovation (go.nature.com/3fmtupu) issued recommendations for responsible governance in those areas. Others might also find these recommendations useful during the pandemic.

I write on behalf of the forum, which is an independent advisory board. As well as emphasizing the importance of citizens' participation in creating practical solutions to the crisis and its aftermath, it strongly recommends clarifying to the general public the role and limits of the public-health data on which policymakers' decisions are based — just as data processed through artificial intelligence and algorithms must be openly scrutinized.

The forum also encourages contributions from voluntary human resources, citizen-science initiatives and social innovation organizations — for example, information on and support for the socio-economic and psychological impacts of lockdown measures against the virus. To help speed up resolution of the public-health crisis, the forum advises governments — and not just those in Lombardy — to coordinate and sustain the actions of organizations that can provide such collaborations.

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