

## How to design carbon taxes

The levies raise revenue and reduce emissions. But their unpopularity is a problem



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ECONOMISTS view pricing greenhouse-gas emissions as an elegant way to reduce them. There are more than 70 national and regional schemes, covering perhaps a fifth of global emissions, which charge polluters for the carbon dioxide they belch out. But that leaves an awful lot of the world to be convinced of the merits of such schemes. Sceptics point to the lacklustre decarbonisation record of places that already price carbon. Higher charges would help; but then the politics also has to add up.

Governments have two ways to price carbon. They can levy a tax on each tonne of CO<sub>2</sub> emitted, an approach pioneered by Finland in 1990. Or they can issue a fixed number of pollution permits to companies, which can then trade the permits with others. The European Union (EU), a handful of American states and, starting this year, China have opted for some version of this “cap-and-trade” approach. These schemes have tended to be limited to a few carbon-intensive industries, such as power generation, oil-refining and steel- and cement-making.

A new IMF working paper by Ian Parry, Victor Mylonas and Nate Vernon finds that taxes raise around twice as much revenue as today’s cap-and-trade schemes, and are roughly 50% better at cutting emissions (see chart). A levy of \$70 on each tonne of CO<sub>2</sub> by 2030 would typically raise between 1% and 2.5% of GDP in the G20 club of big economies. It would also allow most to come close to, or even exceed, their pledges under the Paris climate agreement of 2015, which aims to keep global temperatures no more than 1°C or so hotter than today. Researchers from the Potsdam Institute and the Mercator Institute find that if developing countries were to replace fuel subsidies with carbon taxes consistent with the Paris target, the windfall would cover much—95% in India’s case—of what they must spend on infrastructure and public services to meet the UN’s sustainable-development goals.

Politicians scoff at such hypotheticals. They are loth to upset voters, who dislike taxes, or powerful lobbies in industries that would be hardest hit. So cap-and-trade schemes, which can issue new permits to depress prices, outnumber tax-based ones. The taxes that exist tend to be symbolic. As a result, merely 1% of the emissions covered by both pricing schemes fetch more than \$40 per tonne of CO<sub>2</sub>. That is the lower limit of the \$40-80 range that a World Bank-backed committee chaired by Joseph Stiglitz and Lord Nicholas Stern, two economists, considers necessary by 2020 to stay on track for the Paris goal. Existing programmes have barely dented global emissions, which ticked up again last year. Nor do they raise a lot of cash: \$30bn annually worldwide. Three-quarters of covered emissions are priced under \$10 per tonne.

As a result, carbon prices have not been high enough to drive real changes in behaviour. The price in the EU's carbon market more than doubled to €18 (\$20) this year, after plans to remove excess permits were announced. But forecasts still put it below Messrs Stiglitz's and Stern's band. In 2013 Britain introduced an additional levy on top of the EU carbon price that was meant to increase every year. But it has since frozen the fee until 2021. Policies that increase energy bills are rarely popular.

And taxes that appear high may in practice have little bite. Sweden's rates in excess of Skr1,000 (\$108) per tonne favour the climate-friendly hydro and nuclear power plants that already produce much of its electricity. True, car emissions are lower than they would have been in the absence of the tax—by 11% in an average year, according to one study. But they have dipped by only 4% since the tax was introduced in 1991. Taxes might stem growth in emissions, but they do not foster deep decarbonisation, observes Michael Mehling of the Massachusetts Institute of Technology. Unless, that is, they get much higher.

## **Tax and spend**

How, though, to make high taxes palatable? Labels help. Behavioural economists have discovered that one way to make taxes acceptable is to rebrand them as “fees” or “contributions”. Alberta, in Canada, and Switzerland call their taxes “levies”. A more substantive approach is to return the money raised to citizens or affected businesses. Switzerland's programme doles out two-thirds of its receipts to households—SF68 (\$68) for each citizen last year—and to firms. The rest goes towards green investments, such as renewable power. This builds public support and makes it hard for a future government to reverse course.

It also makes a typically regressive tax more equitable. Anders Fremstad of Colorado State University and Mark Paul of Duke University calculate that taxing a tonne of CO<sub>2</sub> at \$49 would leave 59% of Americans worse off, including 75% of the bottom half, if the revenue were used to lower personal-income taxes. By contrast, recycling the receipts as lump-sum payments would leave 89% of the bottom half with an average net gain of \$788.

Democrat-controlled state legislatures in California and Massachusetts are debating such “fee and dividend” measures. A group of Republican grandees, including two former secretaries of state, are recommending a similar proposal to their climate-change-sceptical party. A new paper co-written by Lord Stern and pointedly entitled “Making carbon pricing work for citizens” singles it out as the best choice in most circumstances.

Other options exist. The Republican plan also includes duties on dirty imports and tax credits for clean exports, to support businesses that face competition from high-carbon jurisdictions. Mr Mehling reckons such border adjustments may be legal; World Trade Organisation anti-discrimination rules favour products that are “necessary to protect human, animal or plant life or health”. Calculating the carbon footprint of products would be tricky but not impossible. A trade partner's industry average could serve as a benchmark for duties or credits, unless an exporter there can demonstrate that its wares use less carbon; developing countries could be cut some slack. This is one race to the bottom even environmentalists would welcome.

“Mitigation policies for the Paris agreement: an assessment for G20 countries”, by Ian Parry, Victor Mylonas, and Nate Vernon, IMF Working Paper, forthcoming.

“Mobilizing domestic resources for the Agenda 2030 via carbon pricing”, by Max Franks, Kai Lessmann, Michael Jakob, Jan Christoph Steckel and Ottmar Edenhofer, *Nature Sustainability*, 2018.

“Carbon pricing and deep decarbonisation”, by Endre Tvinnereim and Michael Mehling, *Energy Policy*, 2018.

“Making carbon pricing work for citizens”, by David Klenert, Linus Mattauch, Emmanuel Combet, Ottmar Edenhofer, Cameron Hepburn, Ryan Rafaty and Nicholas Stern, *Nature Climate Change*, 2018.

“Beat protectionism and emissions at a stroke”, by Michael Mehling, Harro van Asselt, Kasturi Das and Susanne Droege, *Nature*, 2018.

“Why carbon pricing isn’t working”, by Jeffrey Ball, *Foreign Affairs*, 2018.

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