

The economics of climate change and why new technology might save us – again

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The climate crisis is both a challenge and a mystery. It shows an international community without capacity for joint action and this is despite the fact that humanity is exposed to serious risks and threats. At the same time, the costs are clearly manageable according to the all the latest IPCC assessment reports (see for example IPCC 2014) and this has been known at least since the Stern Review (Stern 2006). Assume our consumption growth were 2 percent then we would be 5.5 times richer by 2100. In reality this growth is threatened by climate change and if we do not act now to mitigate emissions then our growth rate in the long run will be lower. For more on why we should do more about the climate see Sterner and Persson 2008 or Haensel et al 2020).

Some people believe fossil resources will soon run out. This is not true. If they were, we should experience rising prices and reduced consumption of fossil fuels - as predicted by general equilibrium models. This is something that takes place automatically; in fact, we have already seen it in a number of areas: We eat less fish than we would have done if marine resources would have been ten times as large. We use less gold than we would have done if the metal had been more common.

The difference in terms of climate change is that the resource being used is the atmosphere's ability to (without climate disruption) assimilate carbon dioxide that is the result of our economic activity (see again IPCC 2014 or the latest report from 2022). The problem is that the atmosphere has no owner; it is not a market good. It is well known that this dilemma can be solved. Basically it is just a matter of putting a price on carbon in order to mimic the market - but it requires joint political action. First, we need to remove perverse subsidies for fossil fuels (Myers 1998; Fischer et al. 2012). Then we need, somehow, to put a price on carbon. If instead of a climate crisis we would have had a resource crisis – running out of fossil fuels – then this would happen automatically as described above. Fossil fuels would be more expensive, and research and deployment of alternatives would already be happening at scale. The whole cost of this would be the same as what we have to bear now – but it would just happen. It would not be a big deal and the cost is actually not that large (IPCC 2014). Humanity is constantly adapting to limitations. But there is a big difference: the price rise for fossil fuels does not come automatically but has to be decided by politicians. These politicians are afraid of taking unpopular decisions – and they may even be amenable to various types of lobbying or pressure.

The actual coordination between countries is itself a major and central area of climate policy. Some think that the UN process with the UNFCCC and IPCC is hopelessly inefficient and that it is enough for each country to set its own goals, and what we need is just linking emissions trading system to get a "decentralized architecture". However, it is a bit too optimistic to put faith in such a decentralized architecture (for a more extensive discussion on linking, see Green et al. 2014). The theory of public goods and behavioural economics clearly shows that people usually do not contribute sufficiently to the public,

unless they are forced, lured or at least think everyone else is contributing (for a seminal contribution on this topic, see Bergstrom et al. 1986). It is the same to think that everyone would voluntarily and without coordination pay half their income in taxes.

To combat climate change, international agreements are necessary. However, we must acknowledge the fact that these negotiations are both difficult and slow. They are constantly impeded by ethical issues, fairness and the distribution of costs. The truth is that despite thirty years of climate debate, very little has happened. We have neither used regulations, taxes or emission trading in any significant way. The whole apparatus of microeconomic-theory is there – waiting to be used. We know when permits are more efficient than taxes and vice versa (see for instance Stavins 1995, Denicolo 1999, Pezzey 2003, and Bovenberg et al. 2005). The trouble is that our hands and feet are tied. We cannot reach an agreement without dealing with fairness issues and with lobbies. In many countries, we cannot seriously start using instruments nationally before an international agreement is in place, see Ewald et al 2021 or Feindt et al 2021.

We should see it as a stress-test of the international community; if there is a really serious problem that requires us to agree on the instruments to change our lifestyle - then we will probably fail. This is grim, but when it comes to climate change, there is still some hope. That hope comes from new technologies and it would not be the first time new technology saves us from environmental problems: Without cars, our towns would have a number of difficult problems, such as 'waste' from horses. Without catalytic converters and particulate filters, our cities would be dangerously polluted and a health hazard.

What is currently hopeful is the growth of renewable energy. It grows fast, costs fall sharply, and we can almost discern the competitiveness of renewables (see for instance, IEA 2014). We still need sensible and strong climate policies, such as a price on carbon and international agreements, but the cost of such a policy would become so low it would be difficult to stop. Fossil fuel lobby groups would be weakened and new 'renewable' lobby groups emerge.

The importance of new technology and policy for industry is clear. Of course policy is needed, but they only have a realistic chance to be implemented when new technology and a new infrastructure of industry has emerged. We have been discussing climate policy for the last thirty years and with the exception of the Swedish carbon tax (Hammar et al. 2013) and gasoline taxes in a number of mainly European countries (Sterner 2012), climate policy is so weak that for an investor it appears as noise relative to fluctuations in the market price of oil or coal. Stronger instruments have consistently been stopped, simply because the fossil lobby groups and the lobbyists from energy-intensive companies are too powerful. As long as there are no clear alternatives, these lobbies will be able to appeal to the public for support. However, when renewables really become a reliable option, the support for an effective climate policy will hopefully be stronger.

There is an apparent – and impeccable – logic that says we should always use the first best instrument. The first best in this case are taxes that will incentivize the abatement with the lowest cost, and we should be sceptical of other policies (such as technology support) that seem to have a much higher marginal cost of abatement. However, the strategic perspective above can sometimes reverse this conclusion (Myers 1998). If lobbying,

human behaviour and other factors always impede the rational use of first best instruments, then we are stuck in a permanent trap. We need to think of what other instruments can do and in that perspective, temporary technology policy is worth careful consideration – and is currently proving very promising.

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