



FAQ: Climate Policy and Economics



December 2019

During the *Summer Meeting In Lausanne Europe* ([SMILE](#), 05.-09.08.2019), young activists from Fridays for Future asked questions about the climate crisis. These were collected and then answered by experts who attended the meeting and others who are engaged with Scientists for Future. At the end of the document, you find a list of the people who were involved.

The questions have been organized in different documents by topic. This document answers questions about Climate Policy and Economics.

Feel free to read, reuse and share them with friends, parents, teachers, neighbours, colleagues.

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How do we change politicians?

Politics and politicians can be changed in a few ways:

By voting and being politically active. In democratic countries politicians can be voted into or out of office. In many countries voter turnout is low, especially among younger people. This is why it is so important to participate in elections and to motivate as many people as possible to vote. Politics can also be influenced by meeting and writing to politicians, writing to the media, by convincing others to be politically active, etc.

By numbers. Public opinion does influence politicians. If people protest in large numbers, politicians will have to act at some point. The key is that protests have to be large and sustained over a long enough period of time. Already we can see the impact FFF has had on politics.

By money. Politicians and parties do need money. Unfortunately the fossil fuel lobby has long taken advantage of this fact. But we can counteract that at least to some extent, by supporting good candidates and by calling for transparency and campaign finance reform, so politicians are less reliant on lobbying money.

By law. Courts can force politicians to change. This is why there are lawsuits in many countries to try to force good climate legislation. For more info, see for example the children's lawsuit in the US, <https://www.ourchildrenstrust.org/>, <https://www.climateabilitynews.org/> and <http://climatecasechart.com/>

How do you deal with the climate sceptics?*

There are many websites that give answers to the questions climate sceptics. See for example

English:

- www.skepticalscience.com
- www.realclimate.org

Deutsch:

- www.klimafakten.de
- [Blog des Klimaforschers S. Rahmstorf](#)

Could we decouple global economic growth from resource consumption without some regions experiencing a recession?

There is a fierce debate between those who believe it is possible to have economic growth and stay within planetary boundaries (green growth advocates) and those that believe it is not possible (post-growth advocates). Although some decoupling has been observed, there is little evidence that decoupling can be anywhere near the scale needed to address the global ecological crisis.

On the other hand, John Steward Mill said already in 1857: "Any human activity that does not require large amounts of nonrenewable resources or sets free large amounts of pollutants that harm the environment can grow without limit practically indefinitely. Especially those activities that many experience as especially desirable and satisfying activities as education, playing music, religion, scientific research, sports, and social contacts, could develop without boundaries."

In a transition to a fossil fuel free world, there will be winners and losers. Governments can help ensure that a "just transition" is possible, for example by retraining workers.

More information:

- [Decoupling debunked: Why green growth is not enough](#)
- [A third option for climate policy within potential limits to growth](#)

Could a fast introduction of a circular economy help to overcome the climate crisis?

Yes circular production can and has to be part of the solution. Mining raw materials such as metals has serious environmental consequences, such as high energy, water and land consumption, use of chemicals and air and water pollution. Remanufacturing and recycling materials usually has a smaller environmental impact than producing materials from scratch.

The challenge is that products and business models have to be designed for circular production. Products are usually made from many different materials. They have to be designed so they can easily be taken apart and the materials fed back into the production cycle. Not all products can be designed for circularity. For those, alternatives have to be found. Also conventional business models are usually based on maximizing sales. Circular products are therefore often not competitive because they are too expensive. This means for a successful circular economy we need the right government policies, new business models, and product designs for circularity.

More information:

- [Growth Within: A Circular Economy Vision For A Competitive Europe](#)
- [The circular economy – a powerful force for climate mitigation](#)
- [Study on socioeconomic impacts of increased reparability of increased reparability](#)

Socio-ecological tax models: Which models do exist, how do they look like?

An ecological/environmental tax reform aims to shift away from taxing good activities (such as work income) to taxing environmentally damaging activities (polluters pay principle). Such a reform can have several benefits:

1. Environmentally damaging activities, such as CO₂ emissions become more expensive and therefore less attractive.
2. Revenue is raised which can be used to support climate action by investing in 1) mitigation action (e.g. insulation and geothermal heat in housing), 2) adaptation measures (e.g. dams that protect against floods), 3) research etc.
3. Revenues can also distributed back to the population to ensure that such taxes do not negatively impact poorer people. Or other taxes can be lowered.
4. Innovations and new jobs may be created by making new, more sustainable industries more competitive (e.g. renewable energy). Such new technologies could then be exported globally.

Putting a price on CO₂ and other greenhouse gases (together abbreviated as CO₂e) makes harmful activities more expensive. But what is the right price per tonne of CO₂e? The answer depends on what your aim is, either “internalizing externalities” or to have a price signal high enough to lower emissions.

1. Internalising externalities

Internalizing externalities means the costs that CO₂e emission put on society are reflected in the price of a tonne of CO₂e. If your aim is to have prices that include the true costs greenhouse gas emissions, you have to estimate those costs.

There are many studies that do exactly that and the costs range from [USD 12](#) (estimate from US government) to [Eur 640](#) per tonne of CO₂e (estimate from the German government). The large range is due to the fact that the estimates depend on many assumptions. For example, how do we account for the damages of future generations? Should we assume the costs are the same (like the German government does in the estimate above) or should we value those costs less, because they are in the future? (The US government uses a discount rate of 5%, meaning the same damages that costs USD 100 today, are assumed to cost only USD 22 in 30 years). And how do you put a money figure on years of life lost, e.g. if a retired person dies in a heat wave (made 100 times more likely because of climate change) 5 years earlier than they would have otherwise.

2. Price high enough to lower emissions

Putting a high enough price on CO₂e to make polluting industries more expensive and therefore ensure there is a decrease in emissions. For example, Switzerland has a tax on oil and natural gas used for heating. At the same time it has CO₂ reductions targets for the building sector. Whenever the target is missed, the tax is raised. It has been raised from CHF 18 to currently CHF 96. How high the price should be, depends again on many factors such as, which sector (industry, power, agriculture, etc.), energy prices, and the details of the policy design. Again there are many studies on this, see for example [here](#).

It is important to note that a carbon price alone is not sufficient to get to zero emissions, more on this [here](#). In Switzerland for example, the carbon tax has not led to enough change and politicians are now debating, introducing an efficiency standard in addition.

Also, for carbon pricing to work, subsidies for fossil fuels have to be removed. They undermine the effectiveness of CO₂ pricing. According to the [International Monetary Fund](#), fossil fuel subsidies amount to about [\\$ 5 billion per year worldwide, which is over 6% of GDP](#). If these subsidies were not provided, global CO₂ emissions would be 28% lower and we would have nearly 50% fewer deaths due to air pollution, according to the IMF.

There are several policy instruments to put a price on CO₂ and other greenhouse gases. Below we compare CO₂e taxes and Emissions Trading Schemes (also called cap-and-trade).

	CO ₂ Tax	Emissions Trading Schemes (ETS)
How is the price determined?	Set by the government (may be tied to emissions reduction targets and raised if those are not reached.)	An ETS sets a limit on the total amount of CO ₂ e that can be emitted by all companies included in the ETS. The cap becomes more stringent every year so that total emissions decline over time. The fewer pollution permits, the higher the price.
Who has to pay?	Depends on the policy design. Usually the tax is payed up-stream, e.g. by fuel importers. They then add these costs to the price of their products, so the costs are passed down to industry and to the consumer.	Each company covered by the ETS receives or buys pollution permits. Each permit allows for one tonne of CO ₂ e to be emitted. Companies add some of the costs to the price of their products, so some of the costs are passed down to the consumer.
What happens to the revenue?	The government decides, how to use the revenue, e.g. invest in climate action, distributed back to the people or added to the general government budget.	Same as for taxes, but the government only receives the revenue of those permits it sells. (In the EU ETS only a little more than half the permits are sold, the rest is handed out for free.)
Is it fair?	In order to make CO ₂ e pricing politically possible, lots of exceptions are usually granted. For example, in Switzerland, industry and transportation is exempted from the CO ₂ tax. In the EU only the power sector has to buy all its permits, all other industries get a large share for free.	

	CO ₂ Tax	Emissions Trading Schemes (ETS)
Does it burden the poor too much?	<p>On average, rich people use considerably more energy than poor people. This means, they also pay more CO₂ taxes if they use fossil fuels.</p> <p>It is also true that lower-income households spend a larger part of their income for energy and a carbon tax would therefore also make up a larger part of their income, especially if they consume fossil fuels (e.g. heat their home with oil).</p> <p>But this burden on the poorer can be alleviated by redistributing the revenues from the tax back to the people, and/or by subsidizing energy-efficiency measures for the poor.</p>	<p>Under ETS revenues are usually not given back to the people but some of the funds are used to subsidize energy-efficiency measures. This can help offset some of the impacts on the poor.</p>
What are the benefits?	Fairly easy to design and administer.	<p>Politically sometimes more acceptable, because decision makers don't have to agree on the price.</p> <p>Each company has to account for their CO₂e emissions.</p> <p>In the EU, it can be passed by majority decision.</p>
What are the challenges?	<p>Getting political acceptance for a high enough price.</p> <p>In the EU needs unanimous decision by all member states (It is the reason why the EU ended up with an ETS and not a CO₂e tax)</p>	<p>Very complex to design and administer.</p> <p>Therefore lots of entry points to weaken the system with exemptions.</p>

The European Union's Emission Trading System is the biggest in the world. It started in 2005. Its effect on emissions so far, however, has been limited. Since 2008 the cap has always been *higher* than the total of the emissions included in the market - that means there has not really been a regulating effect (see [here](#)).

More information:

- [Overview of carbon markets](#) from ICAP
- [Climate Action Network Europe ETS reform position](#) (details and links on the EU ETS)
- [Carbon Market Watch](#): NGO working on the ETS and carbon pricing
- German council of economic experts special report: [Setting Out for a New Climate Policy](#)
- In German: [Antworten auf zentrale Fragen zur Einführung von CO₂-Preisen](#)

What about climate compensation /offsetting?*

Opinion: Climate compensation should not be seen as an alternative to reducing emissions.

Some people argue that it is unethical to pay someone else to do the work (the reducing) for you. Even if you don't agree with that opinion, there are problems with offsetting your emissions by buying emissions certificates (also called offsets). These certificates (or offsets) have in the majority of cases not achieved the additional reductions they claim to have realized. The most in-depth research that looked at the largest two offset mechanisms found that about 3 out of 4 offsets does not have sufficient quality. See more on this in the next question.

Research on this topic: Cames M. et al. (2016). [How additional is the Clean Development Mechanism?](#) and Kollmuss A. et al (2014). [Has Joint Implementation reduced GHG emissions? Lessons learned for the design of carbon market mechanisms.](#)

Why does the Paris Agreement allow for greenhouse gas emissions to be sold to another country?

Article 6 of the Paris Agreement allows for such trading of emissions reductions between countries but the rules have not been finalized yet. Only very few countries still want to buy emissions reductions from other countries to meet their own target. The EU for example does not allow this anymore after 2021 (only trading within the EU is allowed).

The sale of emissions reductions to another country is based on two basic principles:

- Since climate change is a global problem, it does not matter where reductions occur.
- It is better to invest in the cheapest mitigation options, because that way more emissions reductions can be achieved.

However, trading of reductions is only beneficial for the climate if the following applies:

1. **No double counting:** The emission reduction can only be counted once, i.e. only by the buyer and not also by the seller.
2. **Environmental integrity:** The units sold must represent the correct amount of CO₂e reduced and must be from activities that would not have occurred anyway. [Research shows](#) that about ¾ of offsets from the Kyoto Protocol have insufficient environmental integrity.
3. **No incentives for weak climate targets:** trading only makes sense if it does not incentivize the seller country to set weaker reduction targets in order to be able to sell more reductions. Also the buyer should not postpone their own mitigation actions because reductions can be purchased more cheaply abroad.

Only if all these requirements are met, can the sale of reductions help lower emissions. But failure to meet these requirements harms the climate and will be economically inefficient because the purchased reductions either do not represent actual emission reductions or lead to higher emissions in the medium term and therefore increase climate change and adaptation costs.

Are there figures that show that decisions which put economics prior to environment are more expensive in the long term?

The first discussion on the costs of action or inaction that became widely known is the Stern Review on the [Economics of Climate Change](#), published 2006. It concludes: "This Review has assessed a wide range of evidence on the impacts of climate change and on the economic costs, and has used a number of different techniques to assess costs and risks. From all of these perspectives, the evidence gathered by the Review leads to a simple conclusion: the benefits of strong and early action far outweigh the economic costs of not acting."

More information:

- More recent, and more detailed is [The Economic Consequences of Climate Change](#) OECD, 2015
- For the US "[Fourth National Climate Assessment](#) - Volume II: Impacts, Risks, and Adaptation in the United States" (), summarizing its findings for the economy under "Summary findings" at "2. Economy".

Do small countries have no responsibility? Is it alright that they do not react?*

Small countries share a global responsibility to act to reduce climate change. One hundred and forty-four of Earth's 235 countries are smaller than Sweden. Their combined population is larger than the population of the United States of America.

- *Data: UN, 2019: United Nations Department of Economic and Social Affairs Population Division: World Population Prospects 2019.*

Is there sufficient other power sources than fossil fuels?*

Many people in the world use very little energy, while the world's richest use a huge amount. To create a fair future requires a huge growth of carbon free energy for the world's energy poor. Such an achievement is possible with existing technology.

The IPCC (Intergovernmental Panel on Climate Change) concluded that the global technical potential for renewable energy (solar energy, wind energy, bioenergy, geothermal energy, hydropower and ocean energy) is significantly higher than global energy demands.

Investing in developing cheaper, safer, and more ecologically sound energy would make the transition easier, as would reducing the energy use of the rich.

- *Source: IPCC, 2011: Special Report on Renewable Energy Sources and Climate Change Mitigation. Prepared by Working Group III of the Intergovernmental Panel on Climate Change*

How do solar, wind and hydro power compare to fossil fuels in terms of emissions?*

Although all energy sources have some greenhouse gas emissions from the materials that are used (e.g. metals, cement) fossil fuels have 10-100 times higher emissions than solar, wind and hydropower.

Solar and wind power have emission in the range of <10 g to < 100 g of CO₂e per kWh of electricity generated.

Hydro power has higher emissions because dams need a lot of cement and can also emit considerable amounts of methane from rotting biomass. The emissions vary from plant to plant. The estimates range from [70g](#) to [270g](#) per kWh of electricity generated.

Natural gas produces around 500g CO₂e per kWh, coal about 1000 g CO₂e per kWh.

Sources:

- See the graph on p. 539 of this [IPCC report](#)
- Good journalistic overview with more details: <https://www.carbonbrief.org/solar-wind-nuclear-amazingly-low-carbon-footprints>

What about hydropower?*

The electricity produced from hydro dams has lower emissions than that from fossil fuel power plants but dams can emit methane a very potent greenhouse gas, see above. Also

especially large hydro dams can have many negative environmental and social impacts (flooding land, displacing people). The overall impacts vary from small to very large.

No energy source is without impact. Therefore the challenge will always be to weight the benefits against the harmful impacts. Also, this is why reducing demand, using less energy is so important.

In addition, a lot of research is performed on more environmentally friendly ways of harnessing power from e.g. tidal water movements and wave action. These possible alternatives are however for the future, and nothing we can count on now.

Is hydrogen a good or bad power source?*

Hydrogen as a fuel is good because burning hydrogen releases H₂O (not CO₂). However, currently, most hydrogen is produced from fossil fuels, specifically natural gas. Hydrogen produced by renewable (solar, wind, water) energy is a potentially good power source.

What are the worst consequences of climate change for people living in Central Europe (e.g. Switzerland)?

There are many studies on the impacts of climate change on Europe (and on Switzerland). We will therefore just provide you with a few useful links:

More information:

Impact on Switzerland:

- [Bafu](#): Auswirkungen des Klimawandels
- [Klimaszenarien für die Schweiz](#)

Impacts on Europe:

- [Infographic: Costs of inaction on climate change in Europe, Climate Action Network Europe](#)
- [Information by the European Commission:](#)
- <https://helixclimate.eu/>
- [Cross-border climate change impacts: implications for the European Union.](#)
- [The cost of inaction](#) study by Ecologic
- A [nice graphic on the impacts](#).
- Also interesting is the court case against the EU of people impacted by climate change: <https://peoplesclimatecase.caneurope.org/>
- [Climate change, impacts and vulnerability in Europe 2012](#) EEA 2012

Contributing experts and scientists

Please note that the responsibility for the content of the answers lies solely with the listed authors and not with the whole scientists for future community. However, all answers have been reviewed and edited by experts in the field.

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