

Looking beyond the Kyoto Protocol

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Ten years ago, on 16 February 2005, the Kyoto Protocol came into force. The aim of this international agreement was to reduce the annual emissions of greenhouse gases. Targets and expectations were high, but have the goals been met, and what should happen next? We spoke with Martin Heimann, Director at the Max Planck Institute for Biogeochemistry in Jena, whose research interests include the carbon cycle and its consequences for climate change.

The Kyoto Protocol aimed to reduce the [global emissions](#) of [greenhouse gases](#) by 5.2 per cent by the end of 2012. In order for the agreement to come into force, it had to be ratified by at least 55 states. These were responsible for more than 55 per cent of greenhouse gas emissions in 1990. It was a difficult process. The US initially signed, but then exited the Protocol in 2001. Only with Russia's entry did Kyoto finally come into effect. Meanwhile, 191 states and the EU have ratified it.

"The Kyoto Protocol has provided an important impetus for politics, business and the wider community to grapple more with [climate change](#)", says Martin Heimann. It represents the first time that the international community has anchored an absolute and legally binding limitation on greenhouse gas emissions in an international treaty.

The Protocol pertained to primarily industrialised countries as the main perpetrators of emissions. Although individual emerging and developing economies also took part, they were not obliged to commit to any targets, as they were responsible for only minor emissions at that time. However, the Protocol provided individual guidelines for specific countries, and this was a sticking point in negotiations. The specific targets set were based on the degree of economic development in each country.

The possibility of trading emissions allowances was an important incentive for implementation of the agreement. Power plants, for example, were only permitted to emit a prescribed amount of greenhouse gases. If this allowed volume was not reached, the unused allowances could be sold to other corporate groups or states. Some firms even derived economic benefit from reducing their emissions and selling on their surplus allowances - a situation which many observers viewed in a critical light.

Negative balance

Martin Heimann is also critical of the fact that the obligations imposed were met only in part. The EU did reduce its emissions by 12.2 per cent, and Germany even exceeded its targets, bringing its emissions down by 23.6 per cent. Internationally, however, the trend was quite different. Global emissions of greenhouse gases rose by almost 30 per cent until the year 2010; global warming thus continued to increase, with grave consequences. "In future, climate zones will shift further north. In areas such as the Mediterranean region, periods of drought will increase, impeding irrigation. In more northerly regions, it will become damper and permafrost soils will thaw," says Martin Heimann. If the carbon dioxide content of the atmosphere continues to rise, not only will the Earth heat up, but there will be more extreme weather events such as lasting droughts, heatwaves, heavy rain and violent storms, he warns. With the higher temperatures, the soil will no longer be able to store so much carbon and this will be released into the atmosphere.

One major problem in Heimann's view is that the biggest emissions perpetrators have not signed the Protocol: "After all, China and the US account for more than 40 per cent of global emissions". The US was not prepared to agree to a contract that excluded emerging economies. "But it's worth remembering that in the past, industrialised countries had a blank cheque and simply pumped out greenhouse gases unhindered. Now we can't put obstacles in the way of the development of emerging economies," cautions Heimann. However, the expenditure required for renewable energies is huge only at first glance; in the long term, it's a different story. Conversion to clean energy also creates jobs, he points out. Funds to support emerging economies in the development of renewable energies have an important part to play.

Extension of the Kyoto Protocol

After several years of negotiations, an extension of the Kyoto Protocol

was agreed at the UN Climate Conference in Qatar in 2012. The second commitment period, or "Kyoto II", runs from 2013 to 2020. One of the suggestions was that greenhouse gases should be reduced by 25 to 40 per cent. The previous list of six greenhouse gases was expanded to include nitrogen trifluoride and nitrous oxide. In addition, member states are now expected to voluntarily tighten up their goals during the process, without the need for time-consuming procedures. Not all countries were happy with the new Protocol, and Russia and Japan were among those who exited. As with Kyoto I, the US is not numbered among the signatories. The participating countries now account for only some 15 per cent of global greenhouse gas [emissions](#). "The non-inclusion of emerging economies remains an obstacle in the way of approval by many countries", explains Heimann, "although it does currently look like the US may be prepared to sign up."

Paris 2015 expectations

Even though the Kyoto Protocol did not fully achieve the desired effect and global [greenhouse gas emissions](#) have not been truly stemmed, it has advanced the debate on forward-looking climate protection. For some time now, there have been discussions around a future climate protection agreement, although the breakthrough is yet to come.

Consequently, expectations of the 2015 World Climate Summit in Paris are even higher. During the climate conference in Lima in 2014, benchmark data were discussed in relation to a future contract that would have the overarching aim of restricting global warming to a maximum of two degrees until 2100. "A very sweeping, unrealistic goal", in Martin Heimann's opinion, "because changes in temperature have totally different consequences in function of the geographic location." As a result, scientists like him find regional climate change especially interesting. They hope that small-scale predictions will make it possible to develop specific measures for communities and regions in the

future.

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