

## Why China is investing in climate protection

German and Chinese economists demonstrate: The improvement of air quality in China's cities is an additional motivation for climate protection

China is the world's largest emitter of carbon dioxide (CO<sub>2</sub>) and thus contributes significantly to global warming. However, the Peoples Republic is now investing significantly in reducing its CO<sub>2</sub> emissions. The reason for this is probably more than just the desire for climate protection. After all, a reduction in CO<sub>2</sub> emissions goes hand in hand with an improvement in air quality at a local level. Prof. Bodo Sturm from the Leipzig University of Applied Sciences (HTWK Leipzig) demonstrates for the first time in a joint study with Prof. Andreas Löschel (University of Münster), Prof. Wolfgang Buchholz (University of Regensburg) and Prof. Jiansuo Pei, Dr. Ran Wang and Prof. Zhongxiu Zhao (University of Foreign Trade and Commerce Beijing) that the local co-benefits of climate protection influence the individual decisions of Beijing's inhabitants. The results are now published in the journal "[Land Economics](#)".

Air pollution by sulphur dioxide, nitrogen dioxide and particulate pollutants represents a significant health risk in Chinese cities. According to an assessment by the Health Effects Institute, air pollution caused around 366,000 premature deaths in China in 2013. In the same year, the country introduced a regional CO<sub>2</sub> certificate-trading scheme in seven provinces. In 2021, the trading has been extended to the entire People's Republic. The principle is that there is a predefined quantity of CO<sub>2</sub> certificates. Energy and industrial companies must purchase a certificate for every tonne of CO<sub>2</sub> produced. The number of available certificates is decreased over time. This raises their price and thus the incentive to produce less CO<sub>2</sub>.

"From an economic perspective, investments in climate protection are not very attractive, because they are accompanied by so-called free rider incentives: if one person invests, everyone else benefits without having to bear any costs. That's why nobody wants to take the first step," explains Bodo Sturm. According to the environmental economist, the fact that China is nevertheless contributing to climate protection with its certificate trading and other measures such as investments in e-mobility is also due to the positive effects of climate protection at local level. Economists call these effects "co-benefits", i.e. additional benefits of climate protection.

For their research, Bodo Sturm and his German and Chinese colleagues conducted an experiment with 317 randomly selected inhabitants of Beijing. They were able to contribute to climate protection by using their own money to buy CO<sub>2</sub> certificates either for Beijing or for Shenzhen, a metropolis around 2,000 kilometers south of the capital. Study participants received an expense allowance. In total, certificates for 60 tons of CO<sub>2</sub> were purchased for around 150 euros. Since these were subsequently destroyed, they can no longer be used for emissions.

"For climate protection, it doesn't matter where CO<sub>2</sub> is avoided - it's a global concern. However, the positive side effects are local. For example, if less coal is burned, not only CO<sub>2</sub> emissions are reduced, but also emissions of local pollutants such as sulphur dioxide and particulate emissions," explains Bodo Sturm. In the experiment, the demand for emission rights for Beijing was significantly higher than for Shenzhen. The researchers conclude: For the Beijing inhabitants, it is not global climate protection that has priority, but the associated local additional benefits such as clean air. "For international climate policy, this means that the co-benefits of climate protection, such as clean air, but also employment effects or energy security, must be more strongly at the focus of attention", explains Andreas Löschel from the University of Münster. This is particularly true in emerging and developing countries where fossil fuels are used with relatively "dirty" technologies: Here, the incentives for investments in climate protection increase significantly through the consideration of co-benefits.

The study "The Demand for Global and Local Environmental Protection - Experimental Evidence from Climate Change Mitigation in Beijing" is published in the journal "Land Economics" (DOI number: 10.3368/wple.97.1.061219-0076R1). An earlier version is freely available online as ZEW Discussion Paper No. 18-017.

### Picture:



Prof. Dr. Bodo Sturm

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