Fiscal incentives may help reduce carbon emissions in developing countries

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A study has found that fiscal policies introduced by governments in developing countries can have a significant effect on lowering harmful carbon emissions and help countries with fulfilling their commitments under the UNFCCC Paris Agreement.

The research, published today in the journal *Climate Policy*, used Brazil as a case study and found that even early-stage ad hoc measures could be key to reducing emissions in the efforts to meet greenhouse gas mitigation targets.

Led by Camila Gramkow at the University of East Anglia (UEA) and co-authored by Dr Annela Anger-Kraavi of Cambridge University (both of the Tyndall Centre for Climate Change Research), researchers examined green fiscal instruments such as green taxes and innovation incentives, and found that a growing number of measures have been introduced in Brazil in recent years.

However, less than 14% of the more than 100,000 companies across 24 manufacturing industries included in the study have adopted greener technologies.

Mrs Gramkow said: "While Green Fiscal Policies (GFPs) have been effective and led to improved environmental performance in countries like Finland, Germany and the UK, the use of these incentives is still at an early stage in many developing countries."

"Brazil is the first major developing country to pledge for absolute reductions in greenhouse gas emissions and now needs to put in place policies to help deliver the country's pledge."

Researchers analysed how policies like government spending and taxation induced the uptake of green technologies and practices such as climate change mitigation, and as a result would contribute towards delivering Brazil's climate change mitigation commitments.

Mrs Gramkow said: "We found that the use of green fiscal policies is at an early stage in Brazil, but a growing number of measures have been adopted in recent years led by subnational-level policies. These measures, such as tax reliefs for businesses that use recycled materials in their production processes, already show considerable impact on green innovation. "

The study also found that fiscal incentives like low cost finance for innovation in general, not specifically for green projects, are pivotal to increase the diffusion of green technologies.

For every 10 companies benefitting from R&D tax incentives, 17 companies adopt green technologies. In the case of low cost finance for every additional firm accessing this incentive 3 more firms engage on green innovation.

"These incentives can present more than proportional impact on the uptake of green technologies due to positive feedbacks, increasing returns to scale and spill-overs," said Mrs Gramkow. "These are attractive features of green innovations to developing countries in addition to environmental benefits, as they favour the accumulation of technological capabilities that are critical for long-term technological and economic development."

"Our study clearly shows that green fiscal policies can play an important role in helping countries like Brazil deliver on their mitigation pledges. However, a shift towards development of these capabilities requires systemic policies and a broad incentives framework for innovation from favourable macroeconomic conditions to investment in training and creation of demand."

More information: 'Could fiscal policies induce green innovation in developing countries? The case of Brazilian manufacturing sectors' is published in the journal *Climate Policy* on 7 February 2017. dx.doi.org/10.1080/14693062.2016.1277683

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