Encouraging uptake of low-carbon technologies in developing countries has an essential role to play in reducing future global carbon emissions. Researchers investigating the transfer of low-carbon technologies to India have made a number of policy recommendations.

Many low-carbon technologies are owned by firms in developed countries. Understanding how these technologies could be developed and used in developing countries is therefore an urgent priority. For example, with India’s rapidly developing economy, the country’s carbon emissions will rise significantly, particularly through increases in the use of private and public sector vehicles and increased demands for energy, which will largely be met through coal-fired power stations.

Using two case studies of low-carbon technologies, hybrid vehicles and integrated gasification combined cycle (IGCC) (a ‘clean coal’ technology used to turn coal into synthetic gas), the researchers suggested six key considerations for developing effective policy for technology transfer to developing countries.

Simply transferring the hardware that constitutes these technologies would not be sufficient to ensure sustained adoption of low-carbon technologies. It is essential that the knowledge that underpins the development of these technologies is also transferred. Such knowledge flows underpin the development of new, low carbon capabilities in developing country firms, which in turn will enable sustained, low carbon economic growth. The authors suggest this can be achieved through sharing knowledge and expertise, including via collaboration in Research and Development (R & D) between developed and developing countries. It is essential to include the private sector in such initiatives.

Domestic policy incentives to support emerging low carbon technologies will be required in both developed and developing countries if commercial-scale deployment of the technologies is to be achieved. This includes support for technology development from the R & D stage, through demonstration, to commercial application, as well as for taking the technologies to other regions.

One way of ensuring that technology transfer initiatives result in a greater level of knowledge exchange is to ensure that as many companies in the recipient country are involved in the initiative as possible. For example, local suppliers could be used to manufacture parts or supply engineering expertise. This is something that developing country firms can encourage by taking a strategic approach to knowledge accumulation when engaging with international technology suppliers.

Whilst access to Intellectual Property Rights (IPR) is often identified as a potential barrier to technology transfer, the researchers found no explicit evidence of this in relation to the technologies studied. What seemed to be more of a barrier were the capabilities of host country firms to work with advanced new technologies, or to adapt these to local conditions. For example, the viability of the IGCC process using poor-grade Indian coal has not been tested. Collaborative research between developed and developing countries could overcome these problems.

The switch to lower carbon technologies requires a mix of both national and international policies. National incentives are needed to reduce high cost risks of development and uptake of new low-carbon alternatives and can be implemented through subsidies, taxes, carbon trading schemes and enforced limits on carbon emissions. Although mass production of hybrid cars would reduce costs, for example, without clear guidelines on incentives and penalties for carbon emissions, Indian manufacturers would be reluctant to commit to such large volumes.

A second phase of this research is now underway that looks more explicitly at IPRs and international collaborative research, development, demonstration and deployment initiatives.1

1. See www.sussex.ac.uk/sussexenergygroup/barriers for more details.


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