

Science for Environment Policy

Green technology transfer promoted by emissions standards - even in absence of trade

China does not export cars to Europe, yet it has adopted the Euro emissions standard for vehicles. A recent study argues this is because international standards can encourage foreign investors to share advanced technical knowledge with companies in developing and emerging economies – thus bringing a package of environmental and economic benefits. In China's case, its car industry is now better prepared for future trade in a global market, thanks to this strategy.

In 2000, China adopted the Euro 1 standard for automobiles – the first standard to require catalytic converters to be fitted. Since then, it has also brought in the Euro 2, 3 and 4 for passenger cars¹. This presents a puzzle. Generally, a country will make goods that comply with another country's regulations if it exports the goods to that market. In this way trade can drive the spread of legislation. However, China does not export cars.

To help solve the puzzle, the researchers interviewed 78 people from the car industry, government and research, in China and other countries, about the Euro standard in China. They also explored other studies into the topic.

China suffers from serious air quality problems, which the Euro standard would help tackle. Indeed, the standard's clear environmental benefits partly explain why it was adopted, the researchers say. However, their investigations indicated that the main reason that China's government brought it in was to make its car sector more competitive and productive. These improvements occur because the standard encourages foreign firms with direct investment in Chinese companies to share their advanced technical knowledge.

More than 80% of Chinese car companies are part-owned by foreign firms. While most Chinese companies were against the Euro standard at first, their foreign partners often saw economic benefits. This was despite some concerns about protecting the intellectual property of their [cleaner technologies](#). The investing companies found that improving their partner firms' technologies gave them an edge over other Chinese competitors. Some foreign firms even lobbied government for the Euro standard, as unfamiliar Chinese standards would entail extra R&D costs.

It might be expected that the standard was adopted to meet requirements for China's WTO membership and trade agreements with the EU and USA. However, this study found no evidence of this. The requirements for joining the WTO do not include emission standards, and neither the EU nor the USA mentioned them in negotiations leading to trade agreements with China. Furthermore, the USA had completed its trade negotiations with China before the Euro was adopted.

It seems that high foreign direct investment (FDI) in combination with the Euro standard have advanced the once-outdated automobile industry in China, preparing it for exports in the future. This is an important technology transfer strategy for a range of developing and emerging economies, the researchers argue.

Further investigations supported their theory. For example, they also assessed automotive FDI for 76 developing/emerging nations that did not have emissions standards in 2000. By 2006, around half (53%) of the 17 countries with high FDI had adopted standards. However, of the 59 countries *without* high FDI, just 10 (17%) had introduced them. Thus, countries that receive high FDI are 3 times more likely to adopt standards. The results of a modelling exercise also revealed that FDI and emissions standards have more influence on automotive technology transfer than other factors, such as WTO membership or car exports.

International emissions standards can help tackle both poverty and environmental decline, the study concludes. However, it suggests this strategy will not work in small developing nations with small markets, where there is no strong incentive for foreign companies to invest.

10 April 2014
Issue 369

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Source: Saikawa, E. & Urpelainen, J. (2014). Environmental standards as a strategy of international technology transfer. *Environmental Science & Policy*. 38: 192-206. DOI: 10.1016/j.envsci.2013.11.010.

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To cite this article/service: "[Science for Environment Policy](#)": European Commission DG Environment News Alert Service, edited by SCU, The University of the West of England, Bristol.

1. For more information on European emission standards: <http://ec.europa.eu/environment/air/transport/road.htm>