

# How vehicle emission standards can boost motor industry international competitiveness

The research literature supports the following observations on emissions standards and industry competitiveness:

1. Strict, well-designed environmental regulations spur innovation
2. Domestic firms achieve a first-mover advantage through “learning by doing” and economies of scale
3. Policy diffusion of emission standards leads other markets to adopt similar standards after a brief lag time, and the technological innovations they induce diffuse throughout industry in a related but independent process
4. Domestic manufacturers (automakers and suppliers) are able to comply with standards adopted in other markets at lower cost than their competitors
5. Global automakers exporting to markets with stringent emission standards will lobby their home governments to raise their standards to gain a competitive advantage over other, non-global domestic manufacturers
6. Research and development, assembly plants, and component supplier production facilities tend to be located in those markets with advanced auto emission standards

Experts at ICCT have reviewed the political science, regulatory, and economics literature to examine how vehicle emission standards affect international competitiveness in the motor industry. This includes whether motor vehicle emission standards adopted in one market create a future competitive advantage for domestic manufacturers if these are adopted by other markets.

Countries that adopt strict environmental standards can secure an early-mover advantage for their firms by creating conditions in which economies of scale can develop, network effects can grow, and technological “learning by doing” can take place.

Well-designed environmental regulations can increase firm innovation, leading to greater resource productivity and increased profits that fully offset the initial costs. In the U.S. penetration rates for energy-efficiency technology have soared as a result of stringent fuel economy/CO<sub>2</sub> standards. For example, direct injection fuel systems increased from zero in 2007 to 46% in 2015 and variable valve timing from 58% in 2008 to 98% in 2015. There is evidence that suppliers support stringent fuel efficiency and greenhouse gas standards in the U.S.

In the future, most growth in vehicle sales will happen outside OECD countries. China and Brazil view auto standards as a way to encourage domestic manufacturers to become competitive with global manufacturers. Growth in electric vehicle sales has created a new competitive dynamic within the global auto market. The regulatory push towards electric vehicles in California has been influenced by a desire to become more economically competitive in the global auto market.

**Reference:** ICCT Briefing (May 2017) International Competitiveness and the Auto Industry: What’s the Role of Motor Vehicle Emission Standards? <http://theicct.org/auto-industry-intl-competitiveness-and-role-of-emission-stds>

