

## The US Clean Air Act and International Competitiveness

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Corning Incorporated is more than 160 years old and has its headquarters and R&D center in Corning, NY, with three US manufacturing facilities for catalytic converter honeycomb substrates, two in Erwin, NY and one in Blacksburg, VA. Corning pioneered the technology enabling the catalytic converter, dating back to the Clean Air Act in the early 1970s. My role at Corning is to track the emerging trends in vehicle emissions, and communicate this around the world. Since starting this job 21 years ago, vehicle tailpipe pollution has dropped 98%, fuel consumption 25%, car price relative to wages about 25%. Performance, durability, and features have markedly improved as well. Today, consumers pay only a small percentage of the total cost of the vehicle, enabling significant pollution reduction relative to the vehicles of 20 years ago. Most importantly, the technology is there to go even further. I am here today to describe how progressive US regulations have enabled us to compete very effectively around the world, and especially in China.

Catalytic converters helped automakers meet the emissions reduction requirements of the 1970 Clean Air Act. Major companies competed to develop the technology on which the catalyst is placed. Corning won, and now virtually all vehicle catalysts leverage that original technology, whether supplied by us or other companies. Of course, as regulations tightened, the product needed to evolve.

Every regulatory change tightening the emissions standards resulted in product innovations from Corning. For example, to meet the new US Tier 3 regulation, currently phasing in, our newly introduced Corning® FLORA® substrate is 35% lighter to heat up quicker, dropping gaseous emissions about 10-20%. Catalyst and engine innovations will also improve to meet the remaining 60-70% reduction requirement. These regulations are nearly 10X tighter than those being introduced in China in 2020. Although we have the same international competitors in the Europe, Japan and other advanced regions of the world, China uniquely has domestic emissions control suppliers that sell only in China. They are supported by the government, but their technology is lagging behind, meeting regulations we had here in the US 10 years ago.

Given Corning's significant technological advantages, the Chinese government allowed us to build the first wholly-owned manufacturing plant in China more than 15 years ago to supply the Chinese market as the country's emissions regulations market started to tighten. Despite significant government incentives given to Chinese competitors, today they retain a small portion of the market and sell mainly to Chinese auto companies. Chinese regulations will tighten again in 2023, going beyond Europe and even the US in some regards, requiring new technology. However, given Corning's jump on product development and

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innovation that was needed to meet the continuously tightening US regulations, we are looking to expand our market in all regions.

The US currently still has a leadership position in vehicular emission control. In fact, China has modeled most of its enforcement and compliance regulations around those of the US. Today, there are about 70,000 high-quality US jobs to supply emissions control technology to the US vehicle industry as a result of the Clean Air Act. US emissions control sales are about \$20 billion per year and growing, but the value to society of this technology is in the \$100s billion. In addition, the emissions control industry supports thousands of US jobs in product development and innovation to provide the market with the technologies that help limit vehicle pollution globally.

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