

The Green Practices of Automakers in Japan and China

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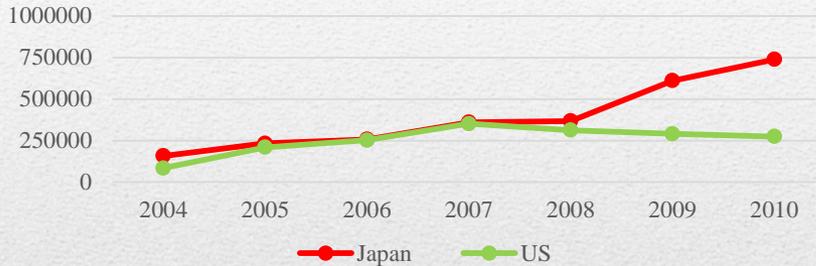
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As the automotive industry has grown substantially in the past several decades, there are heightened concerns regarding sustainable practices of manufacturing giants. In order to study the growing industries in Japan and China, our team completed site visits at manufacturing plants, recycling facilities, and 4S shops, and conducted corporate literature analyses and interviews with various ranking members of automotive companies. In our analysis, we compared three different companies in terms of their economic practices and use of metal and nonmetal components in recycling.

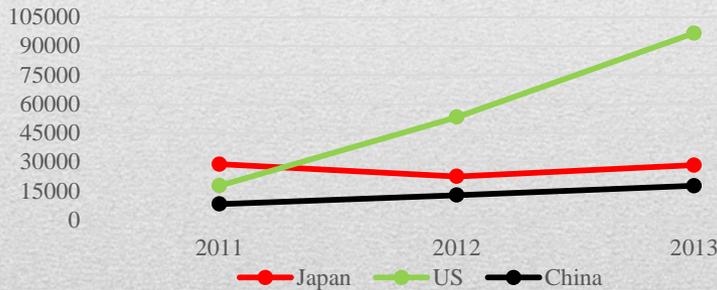


In general, we found that China and Japan are doing an excellent job when it comes to promoting environmental sustainability amongst their respective auto-manufacturers. This is accomplished in two facets: metal and nonmetal recycling along with economic efficiency in implementing certain green initiatives either in production itself or through an automobile that is offered. The following graphs show how green car sales have been a significant part of both countries over the past years.

Electric Vehicle Sales: 2004-2010

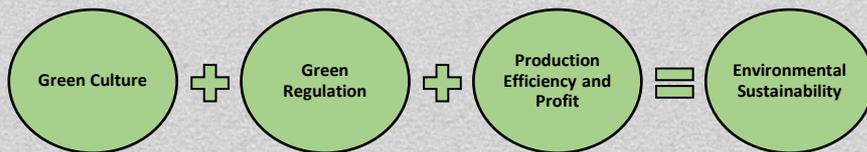


Plug-In Electric Vehicle Sales: 2011-2013



Economics

The following general equation captures the essence of how the companies we studied produced the social good (a good that everyone consumes) of environmental sustainability. Each variable in the equation, to some degree, played a role of producing environmental sustainability.



As Table 1 displays, each plant we visited had efficiency measures in place in order to turn a profit and each company was invested in some green initiative. In this way, each company was able to produce the social good of environmental sustainability while also making a profit.

Table 1. Regular and Green Aspects of Automobile Production

Company and Plant	Inventory?	Cars/Day	Efficiency	Green Initiatives
Company 1	Yes	1040	Parts made in country, avoids tariffs.	Plant has zero CO ₂ emissions and zero water waste.
Company 2	No	315	Specialty production facilities for complex parts.	Car produced (25% of output), which has zero CO ₂ emissions.
Company 3	No	280	Every assembly line worker is an inspector.	Metal recycling plant: 10,000 cars a month with 94% of the car being recycled.

Metals and Nonmetals

The three companies made significant strides towards sustainability related to recycling materials. To qualify their efforts, four major categories were considered: primary materials used to create lighter vehicles, use and recycling of metals in general, innovations in rare metal recycling, and nonmetal recycling.

Table 2. Automotive Company Site and Treatment of Materials

Automobile Company	Primary Materials used to create a lighter vehicle weight	Use and Recycling of Metals	Innovations in rare metal recycling	Nonmetal recycling
Company 1	AHSS, aluminum, magnesium, polymers	Closed-loop recycling (exact metals not specified), elimination of waste, "green purchasing"	Finding alternatives to rare metals, recycling strategies for nickel-metal hydride batteries	Reusable parts, bumpers, oil filters
Company 2	AHSS	Closed-loop recycling, reduce newly-extracted resources, minimizing metal waste (especially steel and aluminum)	Joining with other companies to reuse lithium-ion batteries from vehicles as a new power source, trying to find alternatives to rare metals	Protective caps for parts, ASR (400 tons/month)
Company 3	magnesium, carbon-fiber bodies	Closed-loop recycling, reuse of parts removed during repair, elimination of waste, more focus on plastics	Recycling strategies for nickel-metal hydride batteries, less use of rare metals, vehicle-to-vehicle recycling of magnets, Tungsten, copper recycling	ASR (processes 15,000 cars monthly at ASR recycling plant)