

Background

Evaluating and comparing the environmental performance of manufacturing plants is a challenge. The environmental discharges of a plant will depend on the product being made, the plant output, and plant age and facilities, including control. The issue has become particularly sensitive in the context of free trade negotiations (e.g. NAFTA). Some groups assert that the low environmental standards and enforcement in poor nations will lead to major environmental problems. However, a number of multinational companies claim that they work hard to achieve stringent environmental standards throughout the world, even when local regulations do not require this.

Statement of Work

The broad aim of this research is to demonstrate the potential for benchmarking the environmental performance of manufacturing plants. We desire to use a common metric to evaluate performance across industries and countries.

Approach

We define environmental performance of an industrial process to be the ratio of pollution discharges to the output of the process. This ratio forms an Environmental Performance Indicator (EPI) that is used to compare facilities. The EPI can change to focus on environmental impacts of greatest concern.

We also examine the technology being used in each manufacturing plant. Our initial analysis considers vehicle tire manufacturers, Portland cement producers, and coal-fired power plants in the U.S. and Mexico.

Results

The initial results are surprising. Tire manufacturing facilities in both the U.S. and Mexico have comparable environmental performance. Cement producers in Mexico generally have better environmental performance, due to newer technology and economies of scale. U.S. coal-fired power plants emit fewer air pollutants due to better control technology and higher quality fuel. The research indicates that policy differences among nations may not be a sufficient indicator of environmental performance.

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	Mexico Facilities	U. S. Facilities
Tire Manufacturing EPI: grams / Metric ton estimated tire weight		
NO _x	373	452
SO ₂	1506	485
PM	614	212
Portland Cement Manufacturing EPI: kg / Metric ton clinker		
NO _x	0.726	2.81
SO ₂	0.129	1.69
PM	0.191	0.334
Power Plants EPI: grams / kilowatt-hour		
NO _x	4.69	1.89
SO ₂	13.50	3.128
PM	1.45	0.196