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## Industrial restructuring: does it have to be "jobs vs. trees"?

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*Suggested Citation:* Simonis, Udo E. (1993) : Industrial restructuring: does it have to be "jobs vs. trees"?, Work in progress / United Nations University, ISSN 0259-4285, United Nations University, Tokyo, Vol. 14, Iss. 2, pp. 6-

This Version is available at:

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# Industrial Restructuring

## Does It Have to be "Jobs vs. Trees"?

By Udo E. Simonis

Too often, debate between environmentalists and economists has quickly descended to an unseemly hassle over "jobs vs. trees," with neither party doing much to advance their cause. Clearly a sustainable society will have to be one whose factories minimize waste and otherwise be more ecologically kind. But this does not mean a nation's economic activities must go into reverse, as Udo Simonis demonstrates in the following article. His study of 32 industrialized countries shows that a number of nations have been able to cut back on activities by the worst environmental offenders, while their GNP continued to show healthy growth. But all-out pursuit of economic success, his analysis seems to suggest, can neutralize even the most ambitious conservation measures.

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One way to begin to understand the crucial role of industrial restructuring in sustainable development is to analyse the impact of de-linking or separating from the gross national product those polluting activities whose environmentally negative effects are rather certain. Such an examination allows us to suggest directions for future environmentally benign policies.

We use the term "restructuring" here primarily to describe changes over time in certain sectors, groups of industries, or regions in the gross national product. It can also refer to a transformation in the mix of goods and services produced, or to a broader set of changes in the economy. As, for example, changes in the social relations of production (e.g., unionization, part-time vs. full-time jobs), or in the means of production (e.g., handcrafting, robotics).

### Indicators of Change

Sheer quantity of output has for long been considered to be the indicator of a nation's economic success. In Eastern Europe, the importance attached to this criterion led to "tonnage ideology." In Western societies, steel production and transport volume were once considered to be central indicators of economic success; currently housing starts, energy consumption and the number of cars produced play this role. Today, however, such examples of energy and materials consumption may turn out to be signs of economic failure. Today, those countries which have drastically reduced their specific energy and materials consumption are at the top of the international list of economic performance. Because of the serious environmental effects resulting from overtaxing the ecosystem, resource use efficiency — sometimes called "materials productivity" — has become a major new strategy for achieving sustainable development.

### New Benchmarks Needed

Resource conservation, materials productivity, and environmentally significant structural change can not be appropriately described by the monetary values used in the standard national accounts. An alternative is to select indicators which serve as synonyms for certain characteristics of the production process. Only a few indicators are thus far available to be tested in a cross-national comparison of Eastern and Western economies. Our research used four such factors whose direct and indirect environmental significance is indisputable: **energy, steel, cement, and the weight of freight transport.** While not a precise picture of the real world, the results will at least offer some patterns of environmentally significant structural change.

The intensity of energy use is probably the central ecological dimension of the production pattern of a country. Steel consumption is also an indicator of structural environmental stress in that it reflects an important part of the material side of industrial society. Cement production is in itself a polluting process, and cement represents the physical reality of the construction industry. The weight of freight transport is a

measure of production volume since nearly all methods of transportation are accompanied by high materials input as well as hazardous emissions.

Our investigation covered the period 1970-1987 in 32 countries of the East and West, nearly the whole industrialized world. It utilized data from the *National Accounts of OECD Countries*, the Statistical Office of the United Nations, and other established series.

Purely empirical analysis shows that environmentally benign effects of structural change emerge when one separates economic growth from the consumption of environmentally significant resources, like energy and materials. Whether one decreases the resource input (through, for example, recycling) or increases effective productivity, several major goals are accomplished: (1) The resource consumption and production costs decline, at least in the medium- and long-term. (2) It results in "preventive" environmental protection measures which are much cheaper and more efficient than so-called "end-of-pipe" technology, for example, a costly pollution abatement process installed at the end of the process. (3) This is more effective environmentally, since end-of-pipe technologies normally treat only single, "outstanding" pollutants, whereas **integrated technologies** deal with several environmental effects simultaneously. (4) It opens up a broad range of options for technological innovation.

### German Industrial Restructuring

The benefits to the environment of industrial restructuring were clearly noted in the case of the Federal Republic of Germany during the years 1960-1987, as the chart on this page demonstrates. The GNP more than doubled in these years, a period during which the composition of the nation's industry changed markedly, with decreasing reliance on those sectors which were the most environmentally destructive. Beginning about 1970, steel, cement, energy and heavy transport are in decline, while the GNP continues to grow. The change began with a decline in steel consumption in the late 1960s. This was followed by a drop in cement use in the early 1970s. Roughly a decade later, overall energy use and weight of heavy transport began to dip.

The drop in primary energy use and steel consumption in Germany reduced emissions, despite a comparatively sluggish clean air policy in this period (desulfurization and decarbonization of power plants came into full swing only in the second half of the 1980s). The fall in cement production represents a direct environmental bonus in lowered emissions from cement factories. This decrease reflects the trend from new construction towards modernization of the housing stock.

Of all the industrial countries studied, Sweden was the environmentally most positive case. The drastic reduction in cement production (- 41.2%), the decreasing consumption of crude steel (- 37.9%), and the decrease in the weight of freight transport (- 21.4%)

add up to a notable overall improvement in Sweden's environmental impact.

### Japan: Too Much Success?

In Japan, the process of reducing environmentally negative sectors was partly neutralized by the rapid growth in overall industrial production and thus only resulted in relative structural improvement. The conclusion can be drawn from this that a forced rate of industrial growth interferes with the environmental relief from structural change.

Countries with high growth rates must therefore strongly engage in remedial (curative) environmental measures in order to achieve a net relief for the environment.

In the former Czechoslovakia, no real decline in the four environmentally injurious areas took place; some of them even increased. The development profile of Czechoslovakia, with its lack of industrial structural change for the time under investigation, was representative of all the economies of Eastern Europe.

This leads to several questions: Do all latecomers have to experience these stages of increasingly negative environmental impact? What is it that prevents old industrial countries from reaching an environmentally friendly development path? And a more general concern: What is to be learned from past experience, i.e., under what conditions can economic restructuring become a strategic variable, or point of departure, for sustainable development?

There is obviously room for refinement in the methods used in this study. The question of substitution processes (from steel to plastic, for example) is of high relevance here and the international trade in wastes and the transfer of polluting industries need further investigation.

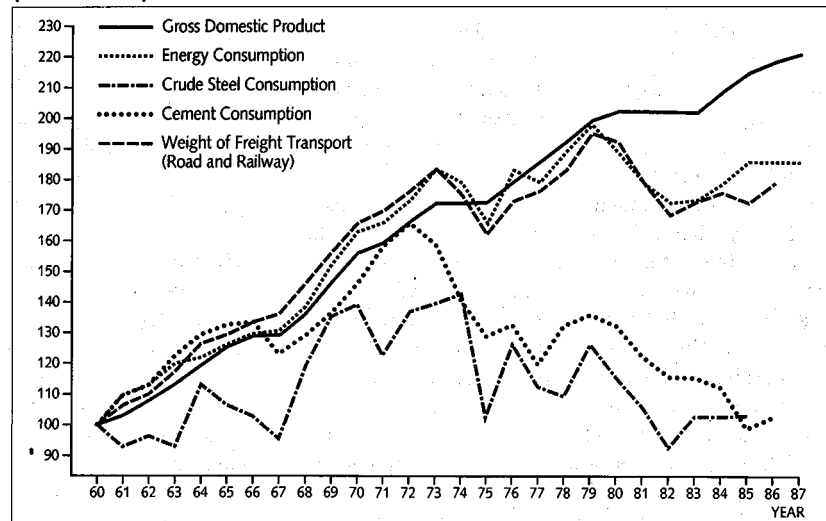
### Advantage in Comparisons

But the advantages of comparing the development patterns of individual countries are evident. We can see, for example, that industrial restructuring was environmentally beneficial in many but not all industrial countries. The economically advanced countries featured fairly rapid structural change, but active pursuit of rapid economic growth, as in the case of Japan, can neutralize the impacts become evident. In the low- and medium-income countries among the industrial countries, distinct development patterns emerged. All in all, however, it is, unfortunately, not yet possible to speak of one dominant development.

The differences observed in the development patterns should be of particular interest for future environmental policy in general, and structural policy in particular. Industrial restructuring can be a key to solving present and preventing future environmental problems. Obviously, the better the environmental impacts of industrial structures are understood and the earlier they are taken into consideration, the easier it should be to channel industrial development in a way concomitant with environmental conservation.

In this sense, the economic latecomers need not fall into the environmental trap of most of the forerunners. By the same token, there is enough evidence that some of the economic forerunners could do much better if they wish to escape being environmental latecomers. This, however, would require not only economic structural change but also a preventative environmental strategy. This means that environmentally benign market forces would have to be stimulated by structurally innovative policies. ■

Structural economic change in the Federal Republic of Germany, 1960-1987 (1960 = 100)



Source: Jänicke, Mönch, Ranneberg, Simonis