

Efficiency

“Do not expect nature to produce more – expect people to achieve more with what nature produces.”

(quoted from “Zukunftsfähiges Deutschland in einer globalisierten Welt” [A Sustainable Germany in a Globalised World])

Efficiency describes the ratio between a particular benefit and the expenditure required to achieve it. In the context of sustainability, we are interested above all in the quantity of resources (raw materials and energy) needed to manufacture a product or provide a service. Accordingly, to operate more efficiently is to improve the ratio of resources used to the results achieved with them, i.e. producing the same or more with less. This is done by minimising material consumption (material intensity), energy consumption (energy intensity) and emission of pollutants such as CO₂ in the production of products and services. Accordingly, the approach is also referred to as eco-efficiency. The efficiency strategy is applied to the production process, where change is sought primarily through technological progress.

Given that lower consumption of materials and energy also allow companies to save a great deal of money, many sectors are constantly in search of ways to increase efficiency. In other words, in addition to the ecological benefits, eco-efficiency is economically advantageous (efficiency = cost-effectiveness).

A few examples: some years ago, an answering machine was a separate device using cassettes on which callers could record a message, whereas now it is a part of almost every telephone in digital form. This saves material, and consequently resources. Modern answering machines are therefore much more efficient than their predecessors.

Another example: while early floppy discs had a capacity of under 1 megabyte (not even enough for a single MP3 song), a tiny USB stick now has a capacity of several gigabytes. This much data would have required several crates of floppy discs to store, using a huge amount of metal, plastic and energy.

Products requiring fewer resources often also take less energy to produce, leading to a reduction in greenhouse gas emissions.

Efficiency as a path towards sustainability was brought into the German debate mainly by Ernst-Ulrich von Weizsäcker, driven by a desire to alter the course of technological progress as a destructive force. His approach consists in diverting the principle of achieving as much as possible with as little as possible – a fundamental axiom of the capitalist economy – away from higher work productivity towards higher resource productivity. By means of an “efficiency revolution” and “factor four” (now “factor five”), his goal is to double prosperity (in particular for southern countries) while halving environmental impact. This involves discarding older “dinosaur technologies” in order to achieve sustainable technological progress.

Sources :

Manfred Linz: Weder Mangel noch Übermaß, Wuppertal Papers 2004; BUND, eed et al.: Zukunftsfähiges Deutschland in einer globalisierten Welt, 2008.