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"INTEGRATING CLEANER PRODUCTION INTO SUSTAINABILITY STRATEGIES"

Unsustainability: A Syndrome of Human Systems

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Sustainability is an ideal state, and therefore it is difficult to measure per se. What is quantifiable is the distance from the ideal point of sustainability, i.e. UNsustainability. The 3-dimensional representation of sustainability is misleading since environment, society and economy have very different features and time characteristics, with the environmental part that is condicio sine qua non for sustainability, while things can change rapidly in society and even more in the economy. A key to the quantification of the environmental part is offered by H. Daly's principles of sustainability:

1) Resources should be used at a rate that allows their re-formation (sustainable yield);

2) Wastes should be produced at a rate which allows the environment to absorb them.

In Thermodynamics there are two categories of functions: intensive and extensive. As suggested by the observations of Jevons in the mid XIX century, improvement of intensive parameters (e.g., energy efficiency, CO_2/person or CO_2/$) is not enough to reduce unsustainability. Therefore, it is not possible to

assess sustainability/unsustainability by means of intensive parameters, because the problem is strongly correlated with the size of the system.

If we want to try to give a measure to unsustainability the indicators should be based on systems characteristics (not reductionist) and extensive.