SUSTAINABILITY:
PUTTING THE PROCESS INTO CONTEXT

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Abstract

Too much engineering effort is devoted to finding more efficient ways to do things that should not be done because they are incompatible with living sustainably on a finite planet. This talk will address the need for engineers to examine critically the interactions between a process or project and the environment, rather than being content to "optimise" design and operation within prescribed parameters and boundary conditions. The talk will outline how the concept of "Sustainability" can be made operational in process selection, design and operation, using examples drawn mainly from the energy and waste management sectors. Life cycle thinking is essential: i.e. considering where all inputs to a process originate, what emissions arise from the whole supply system and how the product is managed at the end of its economic life. Life Cycle Assessment (LCA) is a form of environmental system analysis that derives in large part from process systems thinking. Purely qualitative LCA can often be used to identify processes that should be rejected from the outset, most commonly on the basis of their contribution to global climate change. Detailed quantitative Life Cycle Assessment can be used to guide the development of new processes. LCA can also guide the operation of existing processes, particularly when used in combination with Pareto optimisation. The combination of LCA and Life Cycle Costing can lead to valuable insights into the sustainability (or, too often, the unsustainability) of production systems.

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Organization:

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