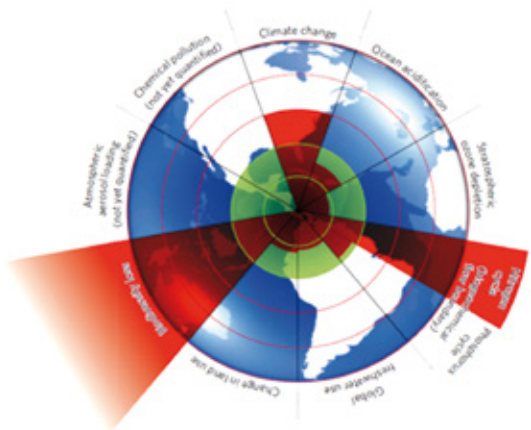
CESQA: Strategic Environmental Management tools to support the sustainable development of Industrial Processes

Environmental sustainable development of Industrial processes has become a key issue for the competitiveness of companies worldwide. Reasons for this interest are manifold and directly related to the development of green markets and the consequences of climate change. CESQA research group is characterized by the conduction of applied research projects related to the development of models and tools to support companies in understanding their performances with reference to their environmental, economic and social interventions and consequently set adequate strategies and actions towards continuous improvement.

One of the research frontier is the quantification and management of scarce resources such as energy, water, land, minerals and metals. Our research is focused at the organizational level, product level and process level. The organizational level deals with the combination and where possible the integration of environmental sustainability tools such as Environmental Management Systems for the identification of critical issues and suitable solutions towards continuous improvement, and Organizational Life Cycle Assessment for the quantification and interpretation of organizational environmental hot-spots in a life cycle perspective. The product level deals with the development of environmental footprints, as Life Cycle Assessment, Carbon Footprint, Water Footprint, Nitrogen Footprint, Energy Footprint, defined as metrics used to report the overall environmental impacts of a product with a life cycle perspective, addressing a specific Environmental topic defined by the interest of managers, markets and stakeholders. The process level deals with the implementation of environmental metrics and models with the aim to explore the environmental hot-spots related the industrial processes, and to underline where it is preferable a technological or organizational improvement, in terms of environmental benefits and economic costs. Within these topics, currently the main research lines of CESQA concern the design and testing of new Scarce Resource footprints ranging from water to land scarcity, with focus on various industrial sectors interested in environmental assets.

The CESQA's activities can support the companies in their projects related product innovation, process and organization improvement, marketing strategies, supply chain cooperation. The results of CESQA's research are systematically discussed through the publication in scientific journals and the communication in international congresses.



Rockström et al., Nature, Vol 461, 24 September 2009.
"A safe operating space for humanity"
Figure 1 "Beyond the boundary"

Processi, prodotti e servizi
Processes, products and service

DII research group

CESQA

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Main research topics:

- Life Cycle Assessment modelling of Industrial processes
- Product eco-design for the minimization of environmental Imapcts
- Development of Footprints
- Environmental Impact Asssessment modelling
- Design and development of Sustainability Indicators
- Carbon and Water Footprint of products and Organizations
- Design and Development of innovative Environmental Managent Systems
- Integration and combination of Environmental Assessment tools and methods