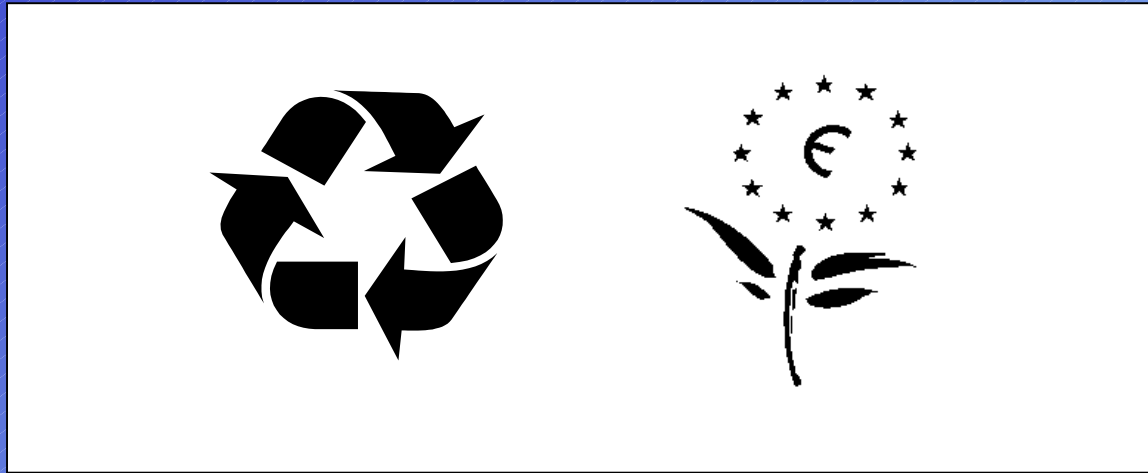


# Life-Cycle Assessment

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A systematic set of procedures for compiling and examining the inputs and outputs of materials and energy and the associated environmental impacts directly attributable to the functioning of a product or service system throughout its life cycle.

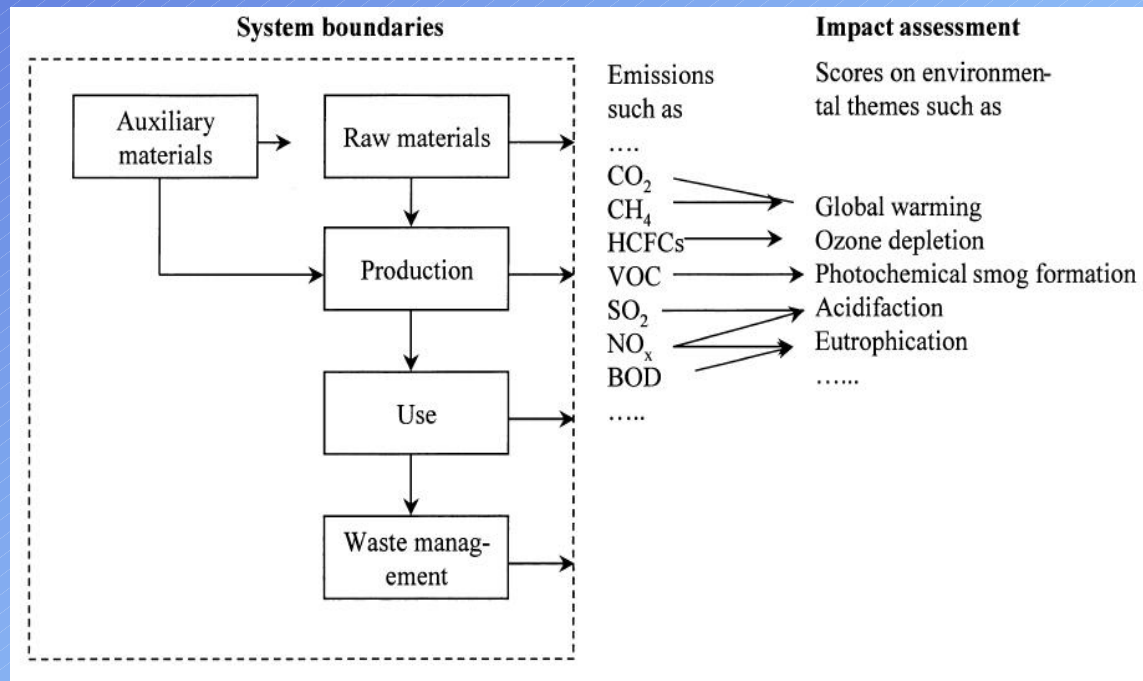
# Life-Cycle Assessment

## LCA most important applications:

- Analysis of the contribution of the life cycle stages to the overall environmental load, usually with the aim to prioritize improvements on products or processes
- Comparison between products for internal or external communications

## LCA stages:

- goal definition (i.e. study objectives) and scope
- preparing the inventory of burdens (e.g. resources used, pollutants emitted)
- assessment of the environmental impact of these burdens
- interpretation of the study



Typical environmental evaluation in an LCA

# Research Interests

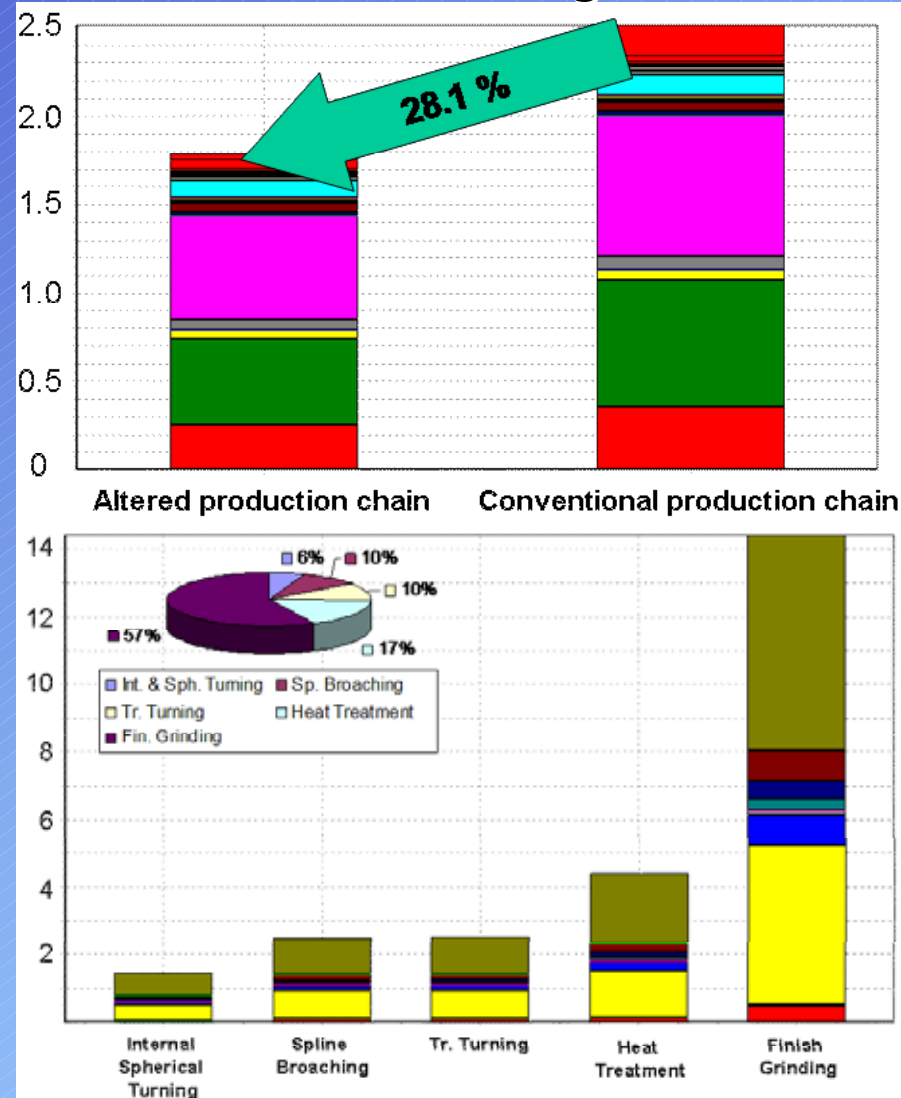
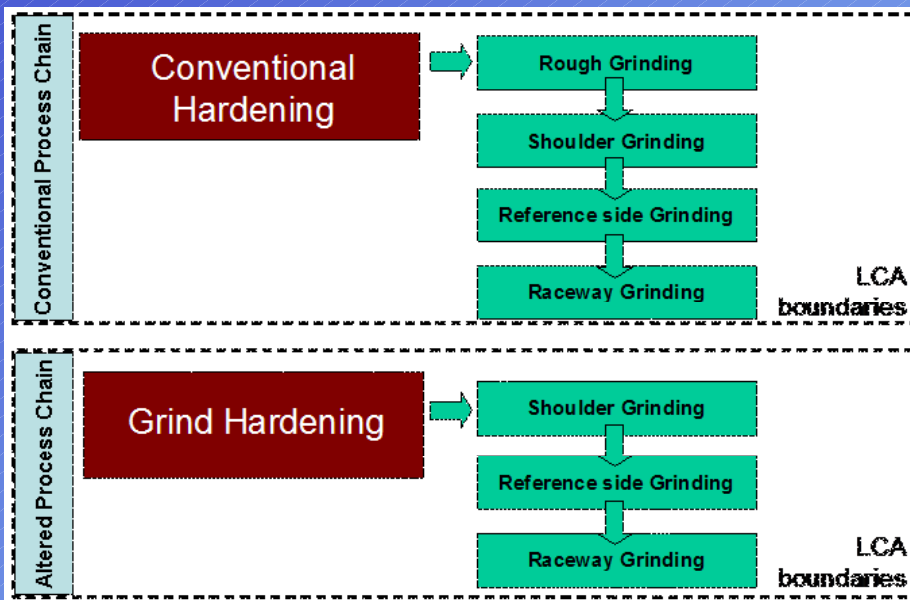
## Environmental Impact Assessment of Grind-Hardening Process

### Subject:

Environmental impact comparison between the grind-hardening process and the respective impact, caused by the utilization of conventional heat treatment methods.

### Pilot cases:

Production of raceways and tripod joints.



# Research Interests

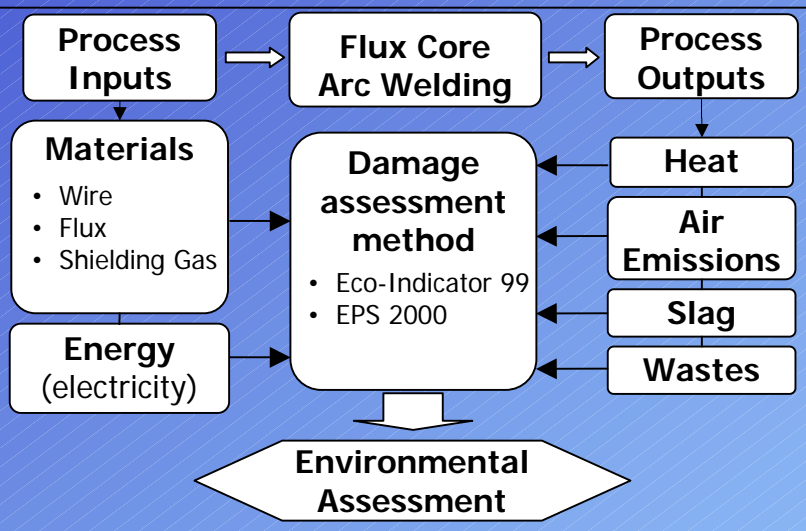
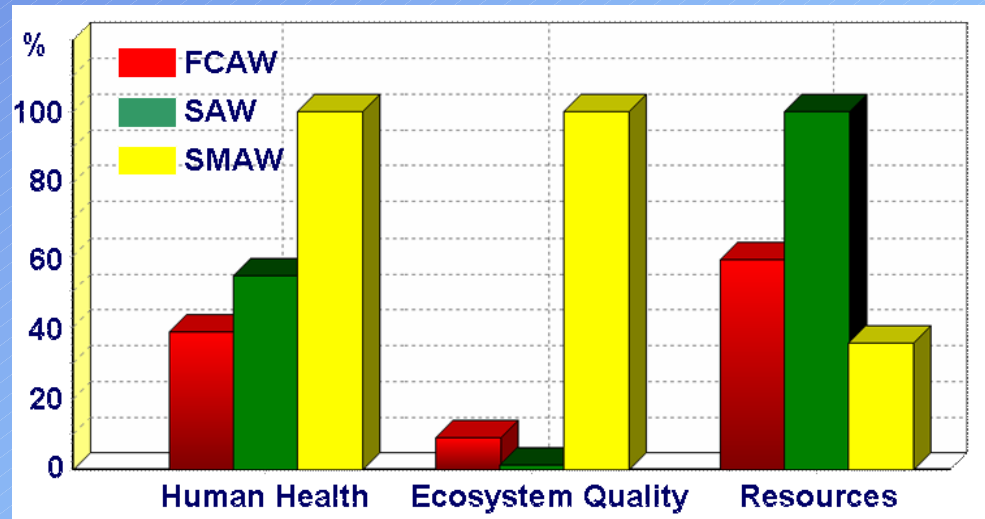
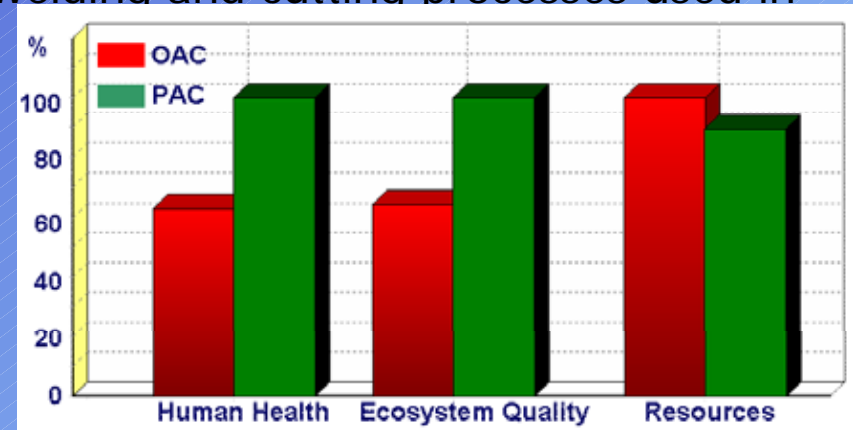
## Environmental Impact of Ship Hull Repair

### Subject:

Environmental impact comparison between welding and cutting processes used in the ship repair industry

### Processes:

- Flux Core Arc Welding (FCAW)
- Shielded Metal Arc Welding (SMAW)
- Submerged Arc Welding (SAW)
- Oxy-Acetylene Cutting (OAC)
- Plasma Arc Cutting (PAC)



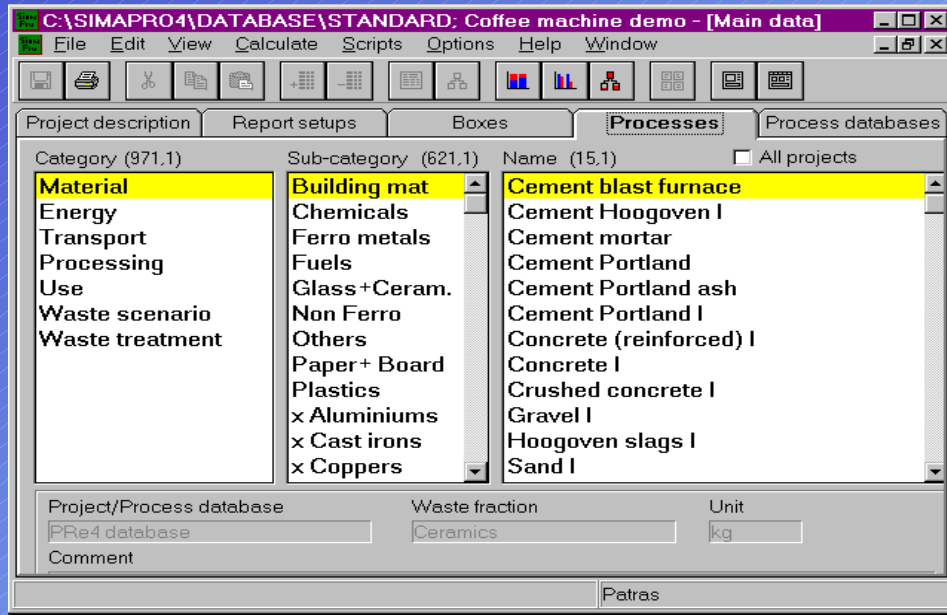
# Research Interests

## Life Cycle Assessment of complex products: An industrial case study

### Goal:

Evaluation of the environmental damage due to manufacturing, use and end of life of a commercial refrigerator and the formation of new design solutions to reducing the environmental impact.

### Software tool SimaPro interface



### Damage assessment chart – comparison of life cycle phases' impact

