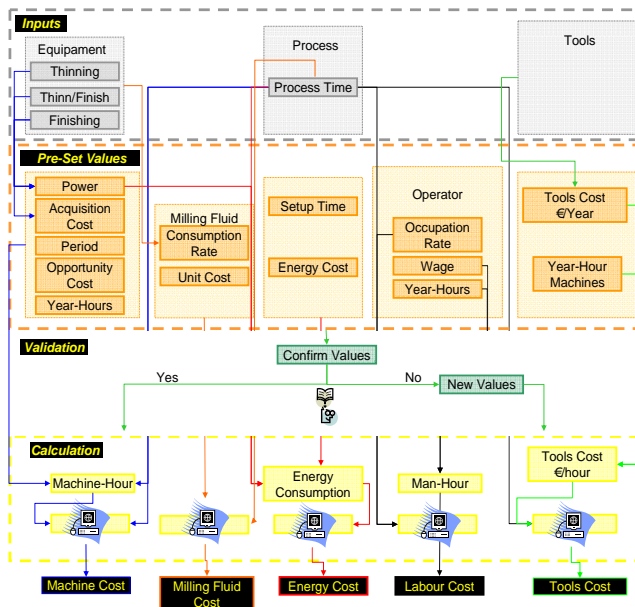




## LCC and LCA Simplified Models to Foster the Design of Sustainable Plastic Injection Moulds

### Plastic injection moulds

- ✓ Usually designed by the mould maker company that will afterwards produce it
- ✓ No available time and/or knowledge to build up and interpret LCC and LCA analysis since it is a resources consuming task



Efficient and less time-consuming life cycle models in the context of plastic injection moulding;

Forecast of the life cycle cost and environmental impacts in their design practices;

Models based on the **specific industrial context**;

Deviation acceptable for the **comparison of engineering alternatives in the context of decision making** → not accounting or financial tools;

Useful **decision supporting tool for the mould making industry**.

Enables more informed decisions based on their impacts throughout the whole life cycle of the mould and produced parts.

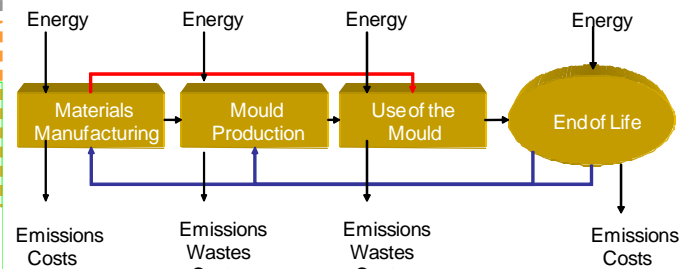
### Mouldmaking Industry

Deep insight along the manufacturing chain in a early design phase

The materials and the manufacturing technologies used in different moulds are highly similar



Potential to implement life cycle approaches in the mould design phase



- Compilation of common industrial practices
- Correlations between: mould size vs. production equipment dimensions; equipment dimensions vs. equipment power
- Bibliographical research
- Build LCC and LCA Models
- Models application to a case study: Full model vs. Simplified Model
- Measure associated error and compare nº required inputs

### Results

- ✓ 1.50% error regarding the total production cost of the mould
- ✓ 16.76% error for the mould in use phase (injection phase)
- ✓ 5.66% error regarding the environmental impact analysis
- ✓ Required inputs: **16** instead of 173