

30 years of success and frustration with LCA

75th LCA DF

Zürich, September 14th 2021

Authors

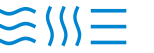
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1987 Schweizerhalle, a catastrophe in Basel



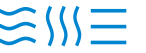
A catastrophe for Basel and the river Rhine.

⇒ focus on local risks especially water

Some questions raised:

- What about the everyday impacts even if they are
 - not so spectacular
 - not locally perceptible
- What is worse: the air or the water pollution?

the 90s: important insights on poor basis



Early 90s: In construction sector, questions could be answered such as:

- Doesn't the production of insulation materials require more energy than it saves?
- Does the recycling of insulation materials make sense?

=> and insights were incorporated into standards such as Minergie.

Mid 90s: Agriculture

- Agricultural strategies based on LCA
- Evaluation of renewable raw materials and fuels showed, for example, that RME is not ecological.
- **But what should not be, cannot be.** The project management was taken away from me and it took another 10 years until it was broadly recognised.



Schindler



Schindler Lift wanted to optimise their lift system ecologically with the following measures:

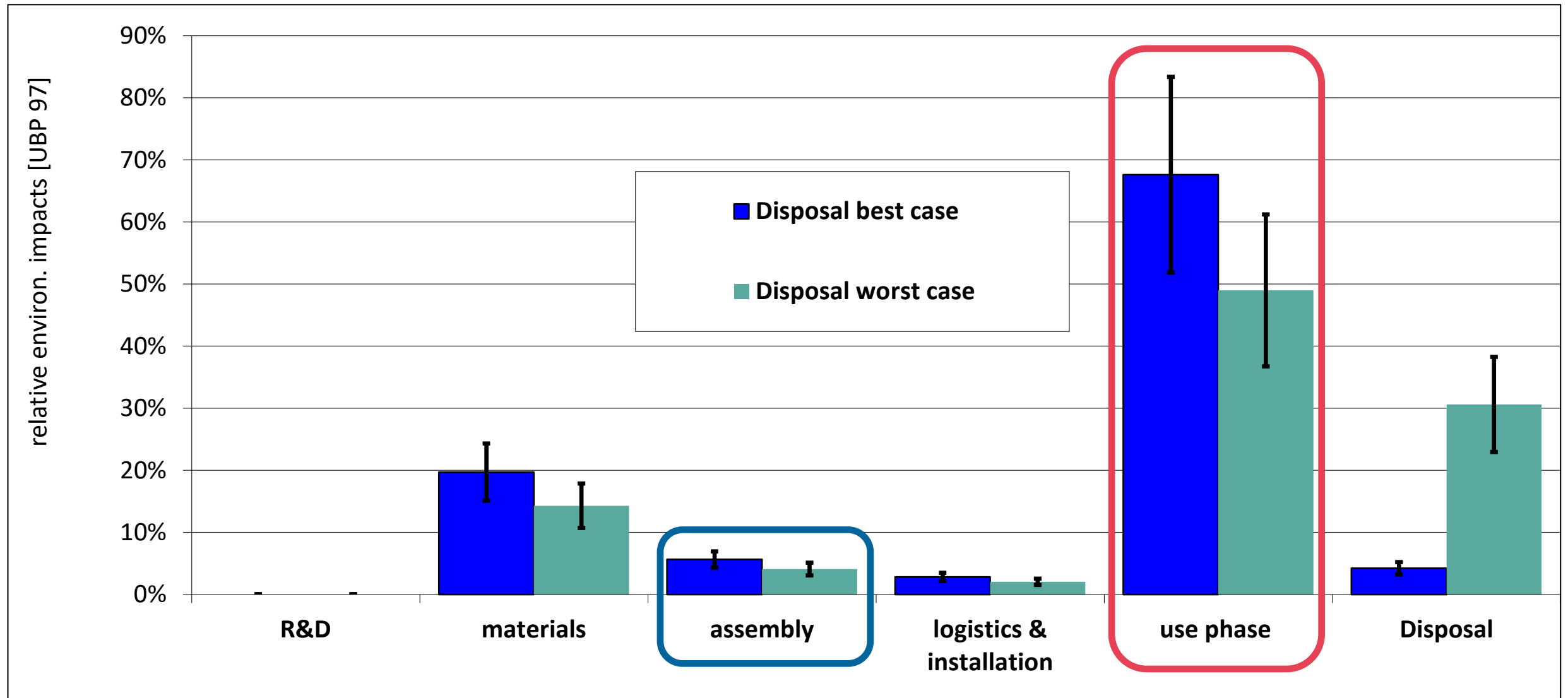
- PVC free
- EMS at the assembly site

Suggestion: first carry out an analysis of the entire life cycle of the product to find out what is relevant.

Environmental impacts of the Schindler elevator S100T (expected life time 30 years)



Results from the first LCA (1999) of the elevator S100T

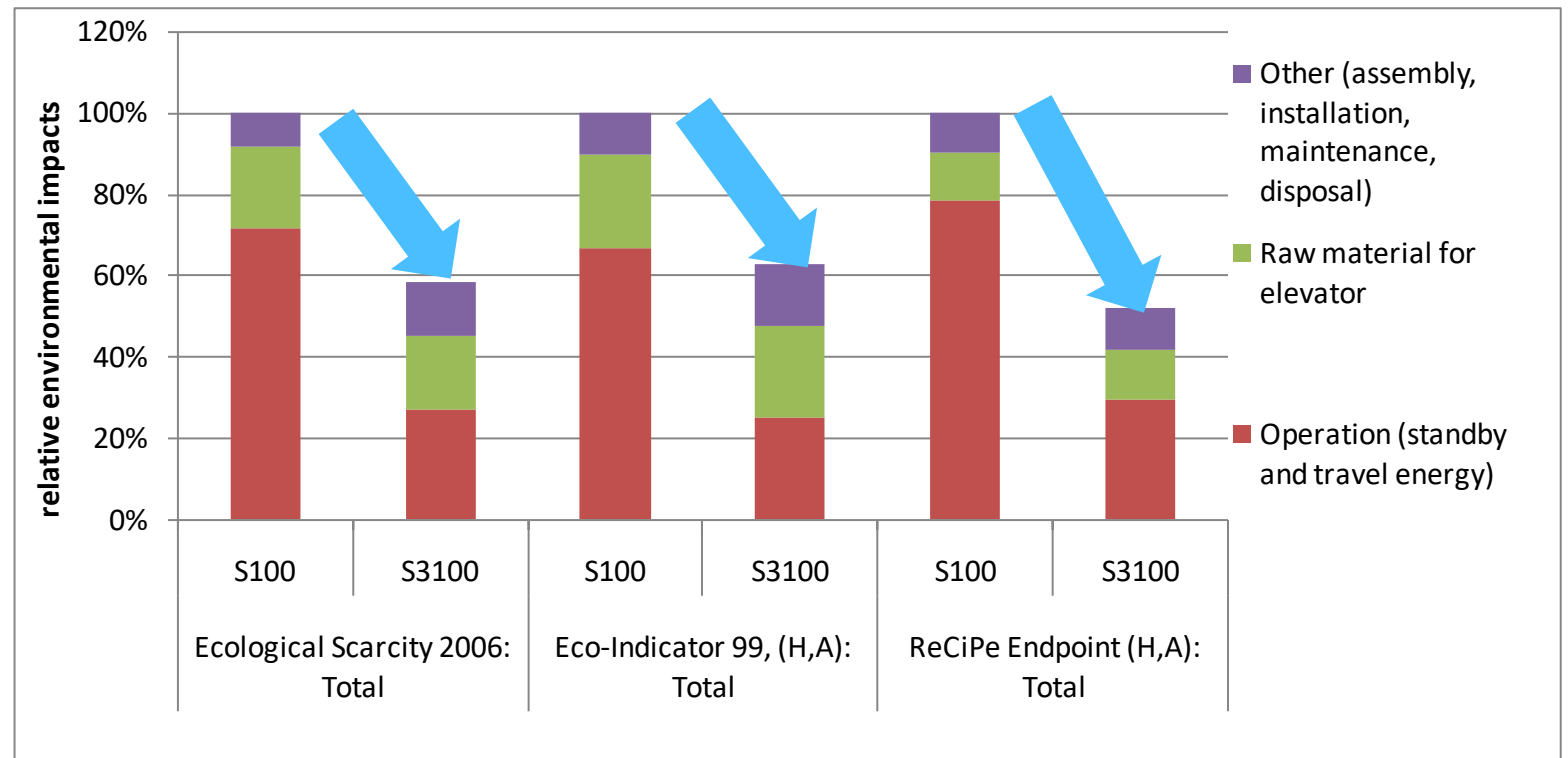


Findings => Strategies for R&D



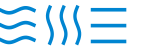
- Increase efficiency in the use phase
- Take-back and recycling system
- Together with Schindler we developed a simple tool for the designer helping them to estimate the environmental impacts of the material choices.

Leading to a reduction of 40% to 50% for the next generation of Lifts.



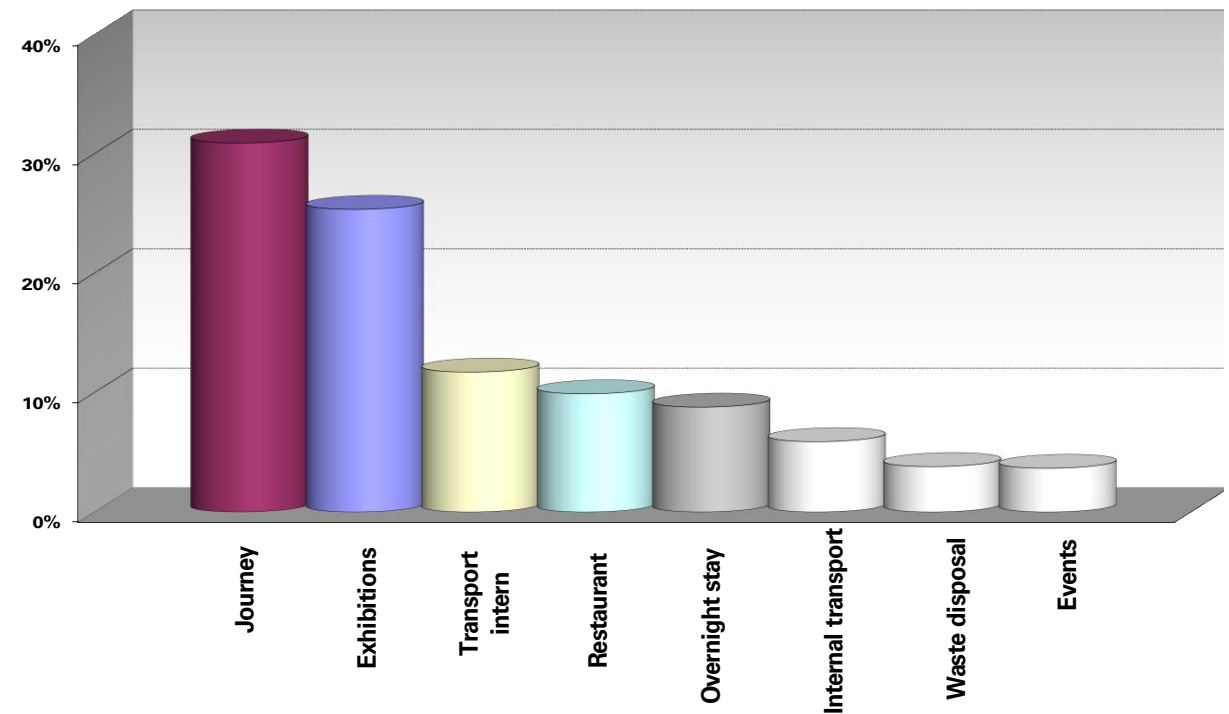
Millennium: LCA to develop visions

The national exhibition Expo 02

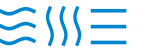


A comprehensive evaluation for the planning of the Expo in 1996 with LCA leads to visions:

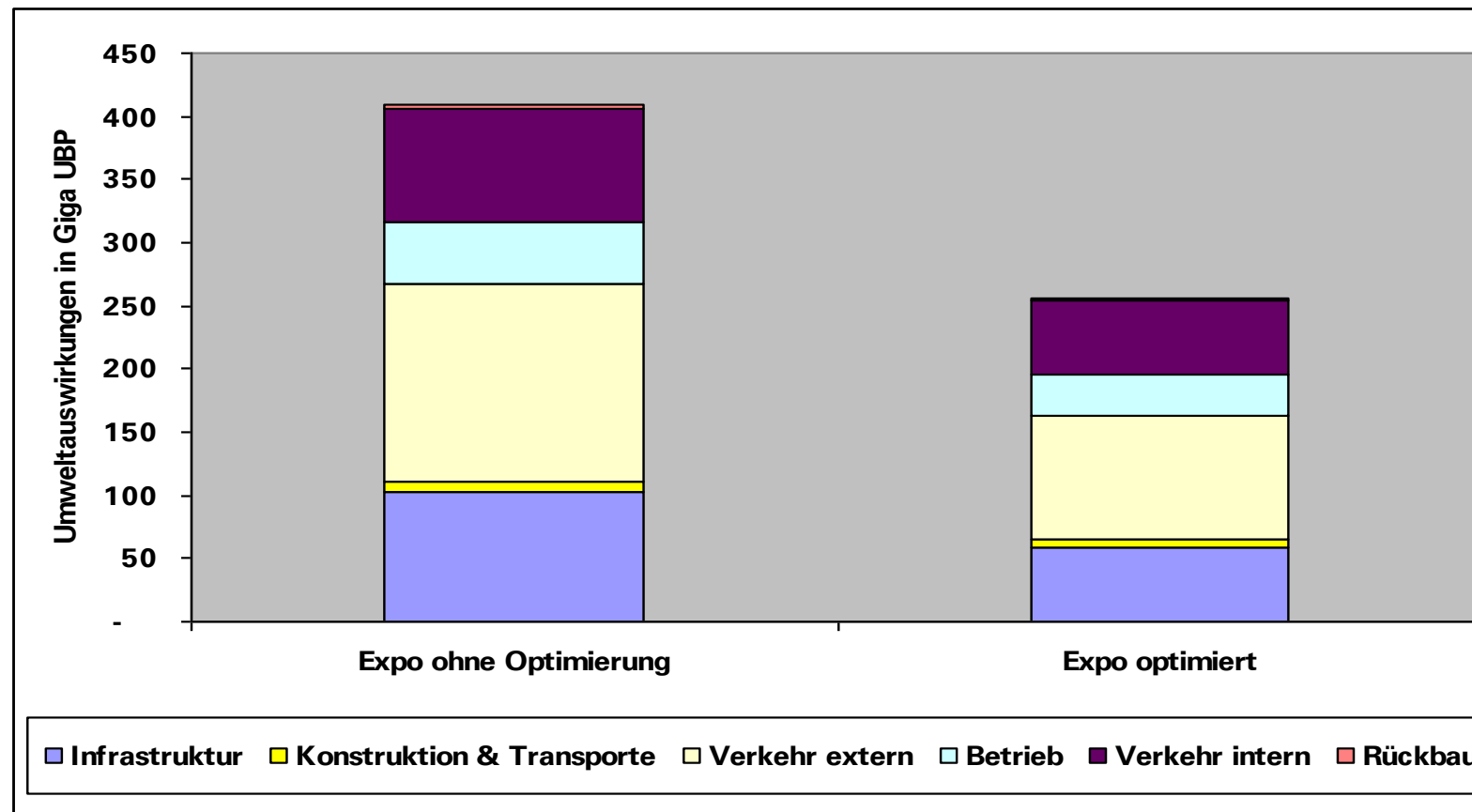
- From road to rail - experience the benefits of the train
- More than recycling - saving and reusing materials
- Transporting materials by rail
- Conserving non-renewable resources
- Seasonal food from regional production, attractive vegetarian dishes
- Innovative, environmentally friendly technologies



And this has been achieved

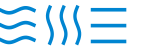


Expo.02 is not on a zero ecological diet. But thanks to the ecological support, the environmental impact of the national exhibition has been reduced by almost 50%.

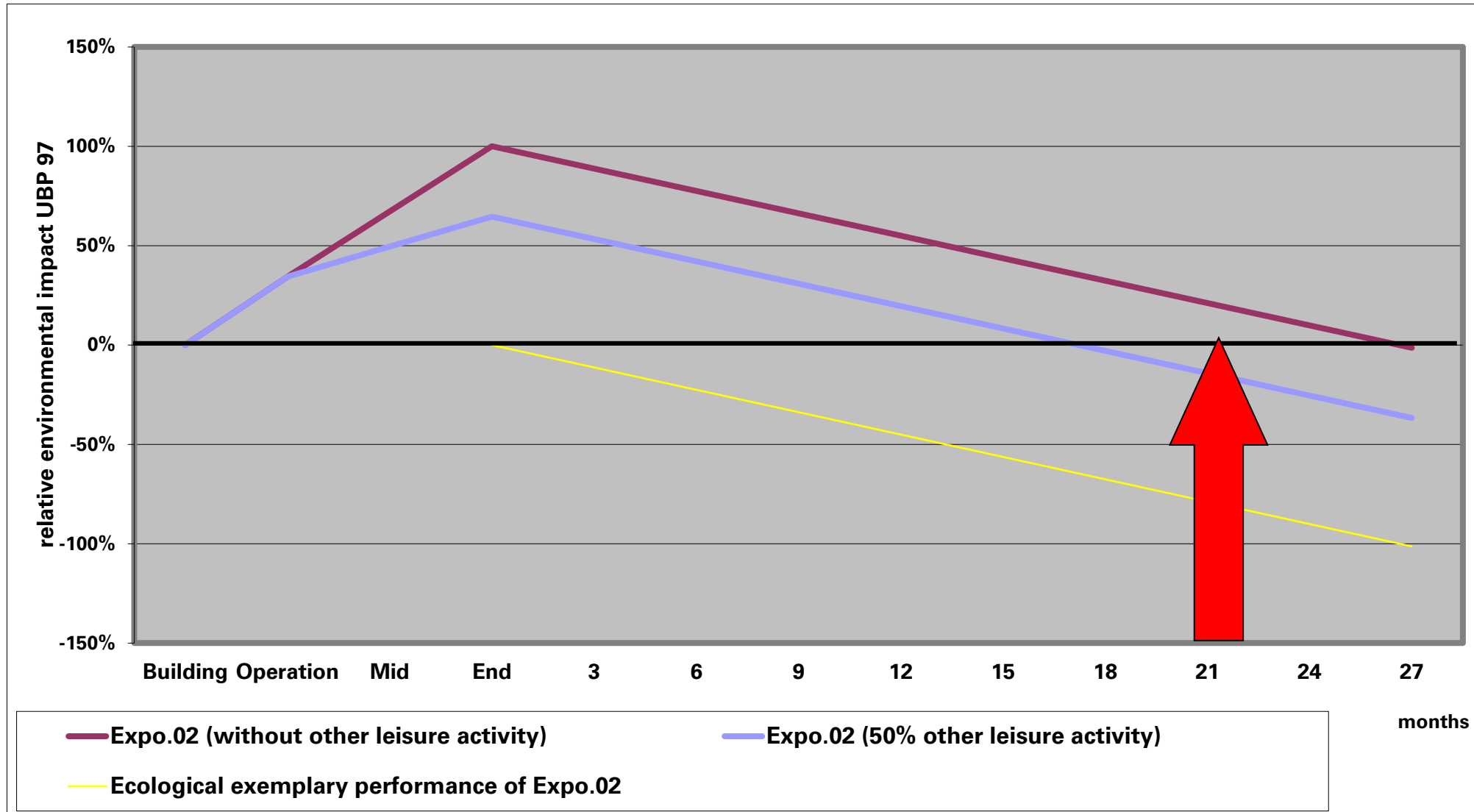


With the energy saved of 1,850,000 MJ or the equivalent of 350,000 barrels of oil, a city such as Neuchâtel can be supplied with heat for a year.

Visions leave traces

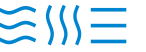


The ecological payback period of the Expo is considerable.



The marks made are intended to leave lasting traces and these far outweigh the environmental impact of the Expo

The 1st decade: acceptance and consolidations

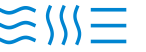


Inventory data - Methods - Tools – reached a certain maturity
Standards are published
LCA is used in industry and administration

According to the European Union (2003):

"LCAs provide the best framework for assessing the potential environmental impacts of products currently available."

The 1st decade: Legislation



Based on LCA, which has shown that biogenic fuels from agricultural cultivation can be more problematic than fossil fuels.

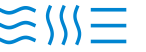
LCA entered into legislation: **Mineral Oil Tax Ordinance**

Tax relief for biogenic fuels is only granted if ecological requirements, **from cultivation to consumption**, as well as social requirements are met.

Ecological scarcity method is used to evaluate the ecological requirements.

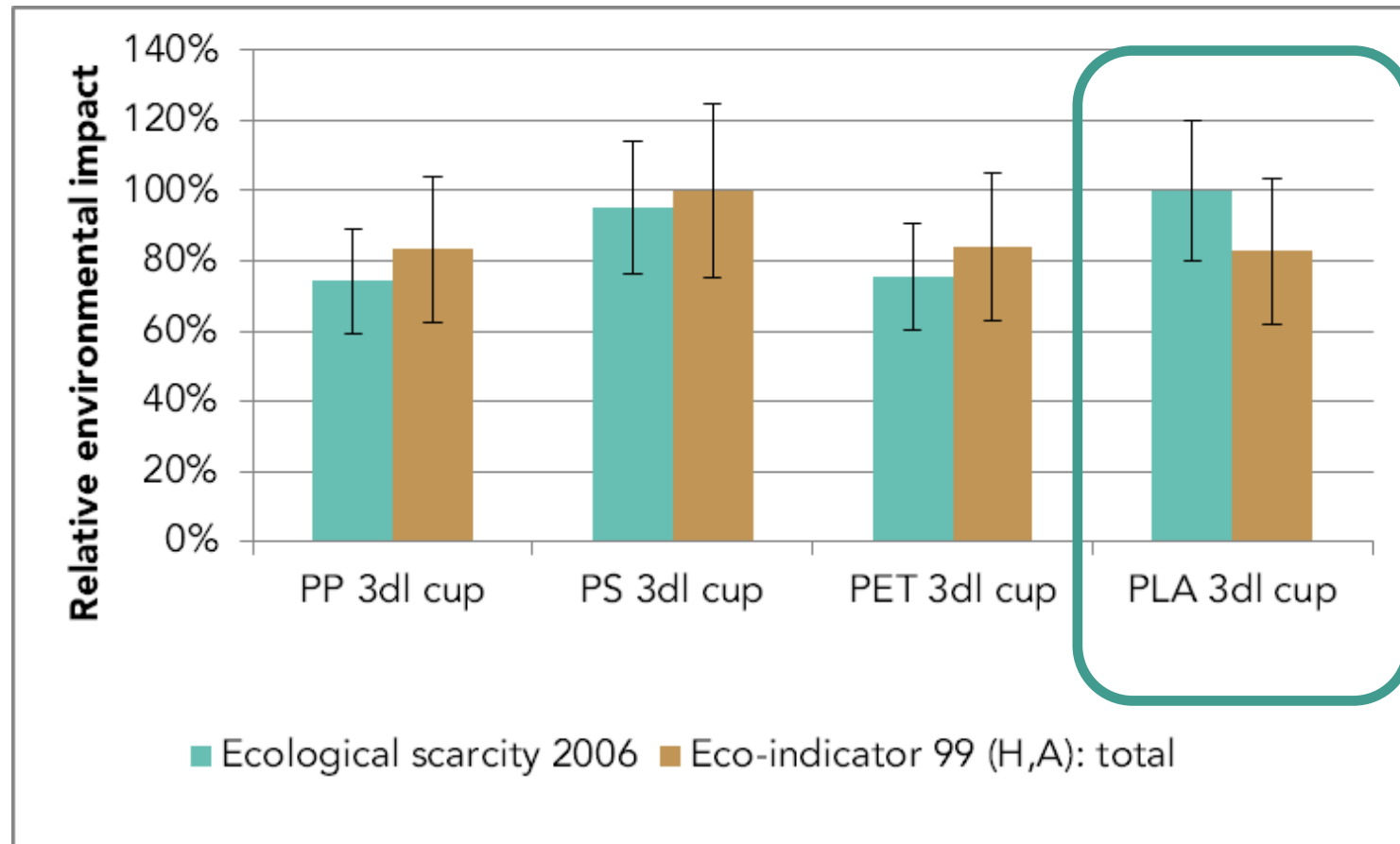
=> only bio fuels from waste or by-products are on the market in CH

The 1st decade: High acceptance can lead to risks



LCA on cups for the city of Basel

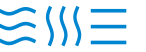
- **Bio-Polymer has no ecological advantage**



A distributor of PLA cups took me to court.

In the end I was acquitted and the distributor had to pay all the costs. But it was a hard year.

The 2nd decade: LCA for the masses



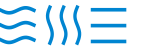
Life cycle thinking becomes commonplace, not only in LCA but in EMS ISO 14000, REACH etc.

LCA became the decision tool for:

- eco-design
- technology assessment:
 - Resource efficiency
 - New energy technologies
 - Water technologies to save or clean water
 - ...
- Effects of legislation
- communication: EPD (with some doubts what customers understand)
- ...



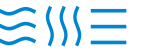
Conclusions on positives



There are a lot of success:

- there is a common understanding that life cycle thinking is needed not only in environment but also economy and social
- Relevant topics have been identified
- LCA is used for Eco-Design
- LCA is recognised as the most comprehensive tool to address environmental issues.
- LCA has found its way into legislation
- There are databases and tools available, of course, further developments are necessary
- ...

They were exciting years with a lot of development



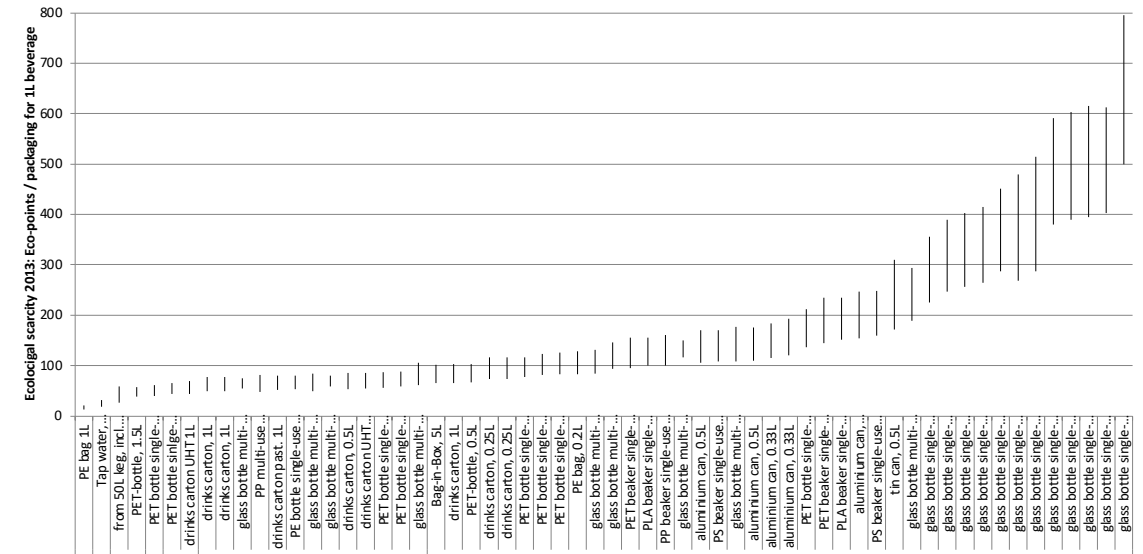
We experienced developments and could also contribute to:

- Methods
 - + the methods have become more and more comprehensive, including e.g.:
bio diversity, water scarcity, micro plastics, ...
 - clients focusing often on CO₂ alone
- Databases
 - + from zero to really large databases
 - quantity is fine but sometimes quality would be more desirable
 - even in our small community in CH we cannot agree on a common database.
- Application
 - + in industry, administration, consumption and legislation
 - not always implemented, rebound, etc.

There were a lot of changes but one constant remained

The focus on packaging

- In 1991 my first LCA was on packaging
- In 2014 with a beverage packaging study we illuminated the entire sector, with the hope that that this would answer the open questions and lead to the relevant issue, namely the content.
- **Frustration:** since then we were asked to analyse approx. 160 packages, with practically always the same statement – in the meantime we have developed a packaging calculator incl. CFF, so that our customers can calculate these questions themselves right away.



Similar is true for recycling



- **Pleasure:**

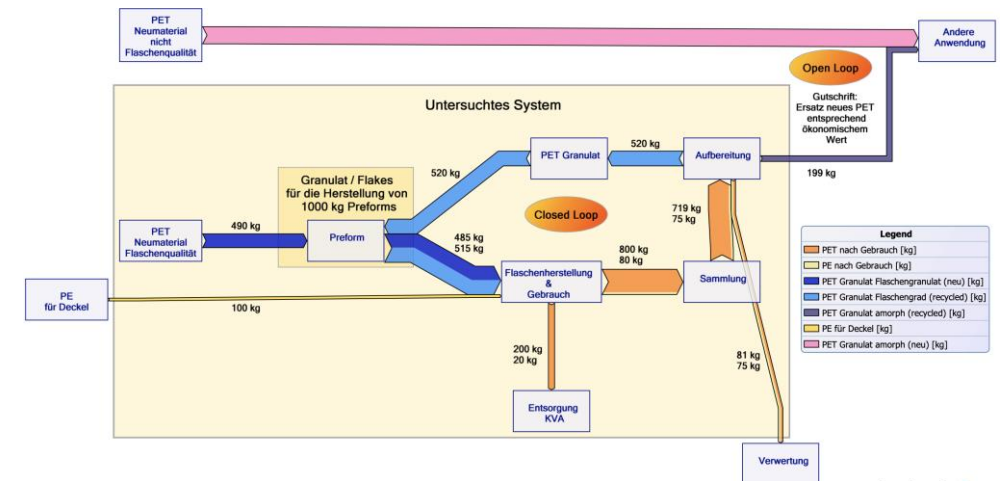
Analysing dozens of recycling systems in Swissrecycling and KuRVe Study:

illuminating the recycling systems, with the

hope that this will answer the question of the relevance of recycling (recycling makes sense from an ecological point of view) and that we can devote ourselves to the actual problem of excessive consumption.

- **Frustration:**

Since the KuRVe Study (2018) we have already calculated approx. 20 systems in the plastics sector alone, with the same statement coming up practically every time.



LCA is a measuring device

It answers a specific question from an ecological point of view - no more but also no less.

- Output:
The reductions realised were often eaten up by economic growth.
- Understanding:
Still today simple rules are much welcome, like:
 - But renewable must be best for the environment
 - Recycling solves all problems
 - Packaging and waste are the biggest environmental problems
- Knowledge and action have a very low correlation.
It is more difficult to change habits than technologies.
... but knowledge is crucial to do the right actions.

