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Life Cycle Systems



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FÉDÉRALE DE LAUSANNE

**Green-E:
Company-LCA:
a tool for the quantification of company
environmental performances**

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<http://gecos.epfl.ch/lcsystems>

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Ways to identify environmental effects for companies is **poorly defined** in the majority of international norms.

Companies often employ in-house methods based on **qualitative** criteria

mainly consider **on-site emissions** during manufacturing, without looking at life cycle burdens.

Often not valid for SME's (Small and Middle Enterprise)



Errors in the identification of environmental priorities;

reduce the effectiveness of the Environmental Management System (EMS) and

Result in **inefficient use** of economic resources.

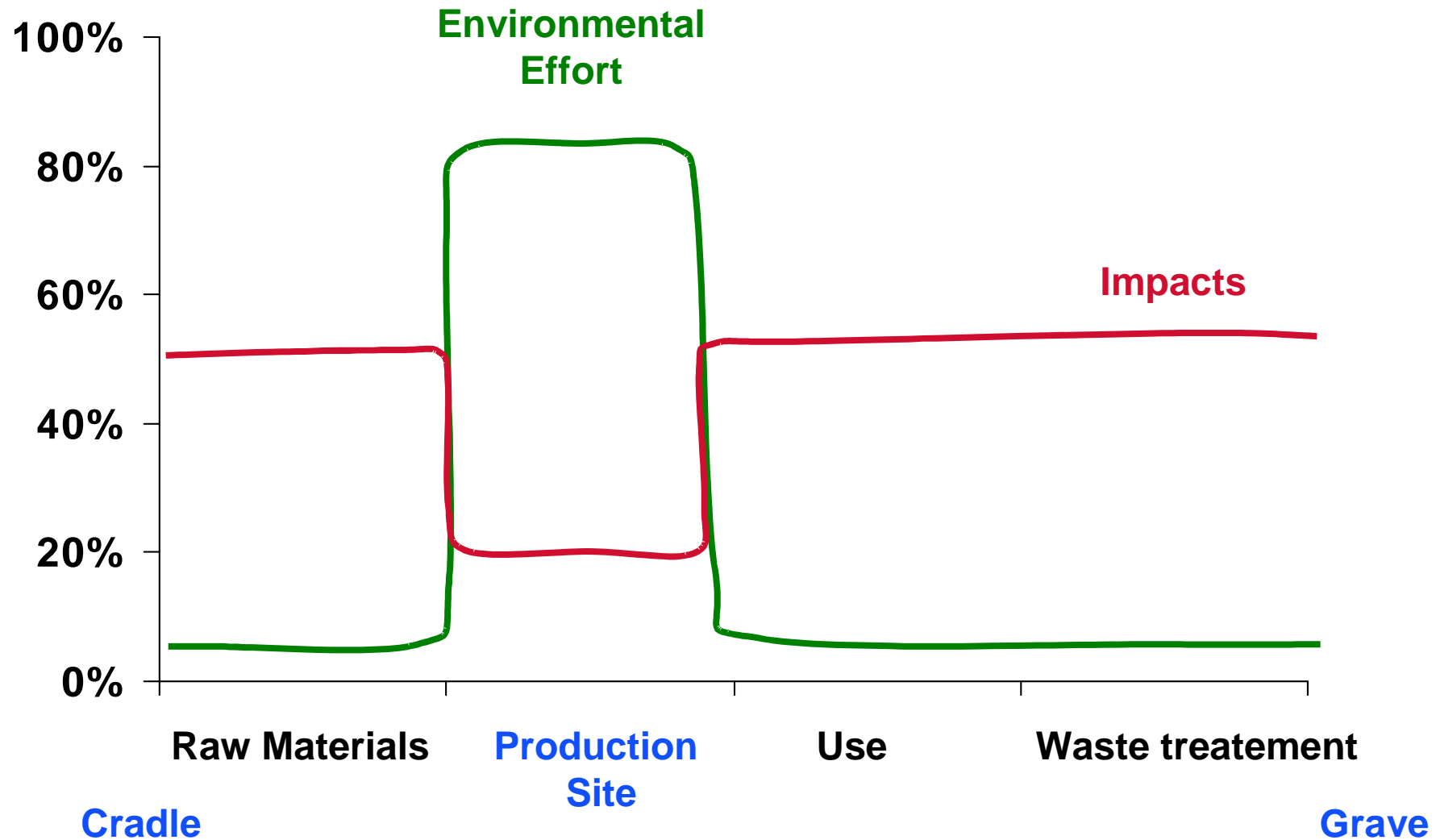


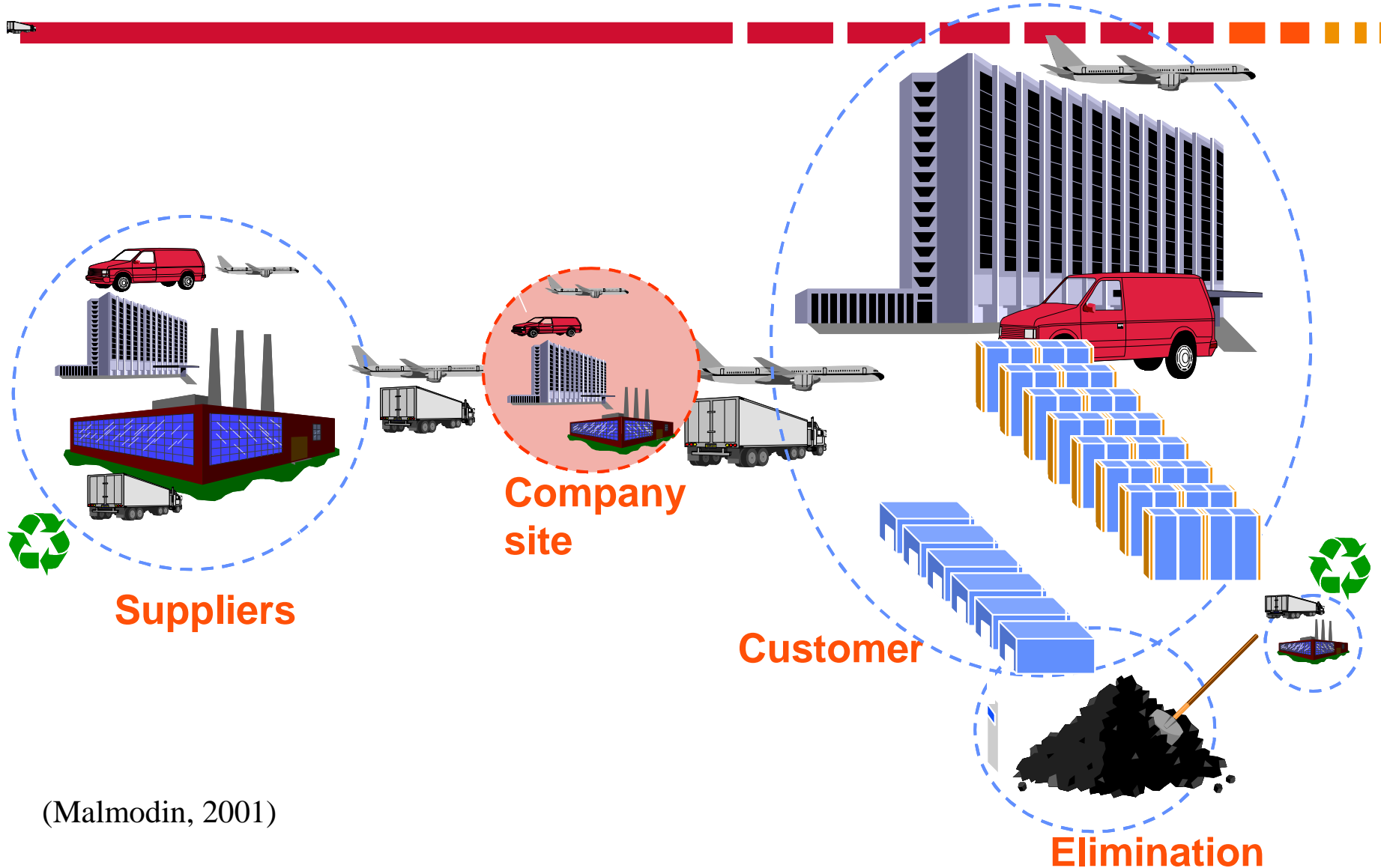
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Environmental efforts: a shift vs. to the impacts!



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(Malmodin, 2001)

Elimination

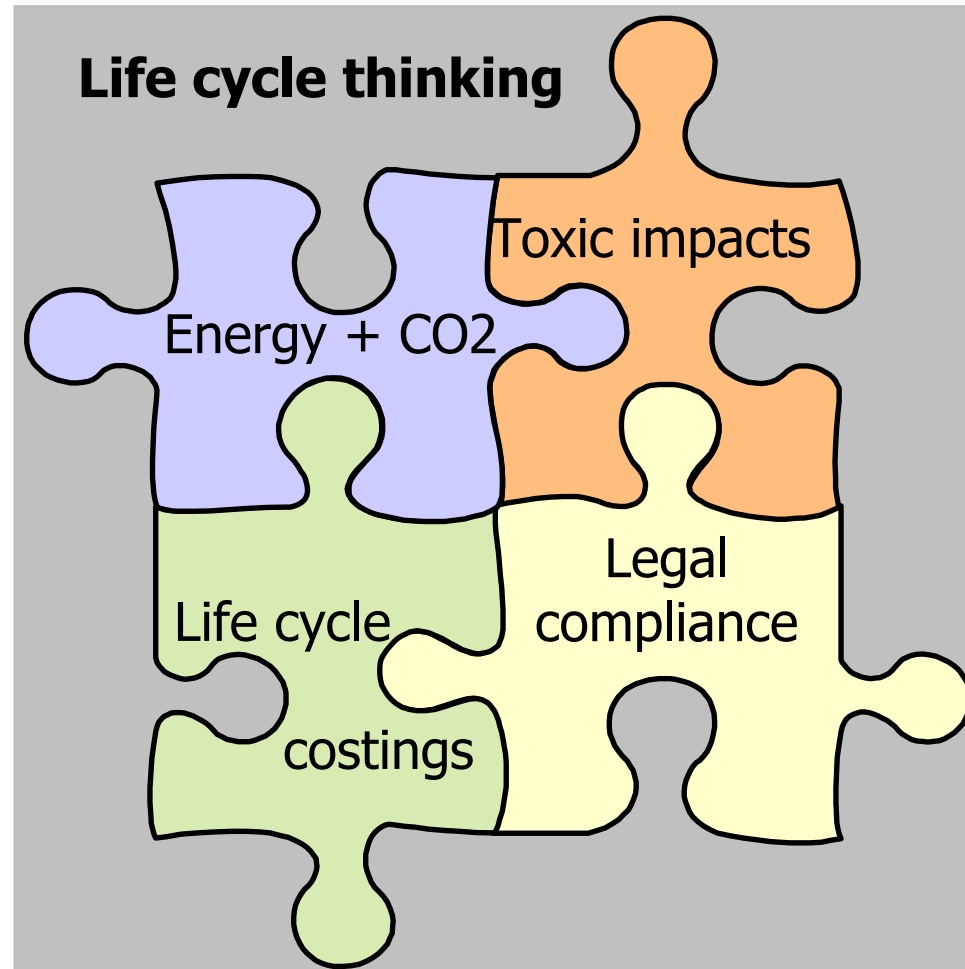


- 1. How to assess the environmental impacts of a company going beyond on site emission?**
- 2. How to make use of existing LCA databases in a more company oriented decision support tool?**
- 3. How to do so following a clear and reproducible standard approach in a time-efficient way?**
- 4. How to assess the company LC impacts consistently with the life cycle costs?**



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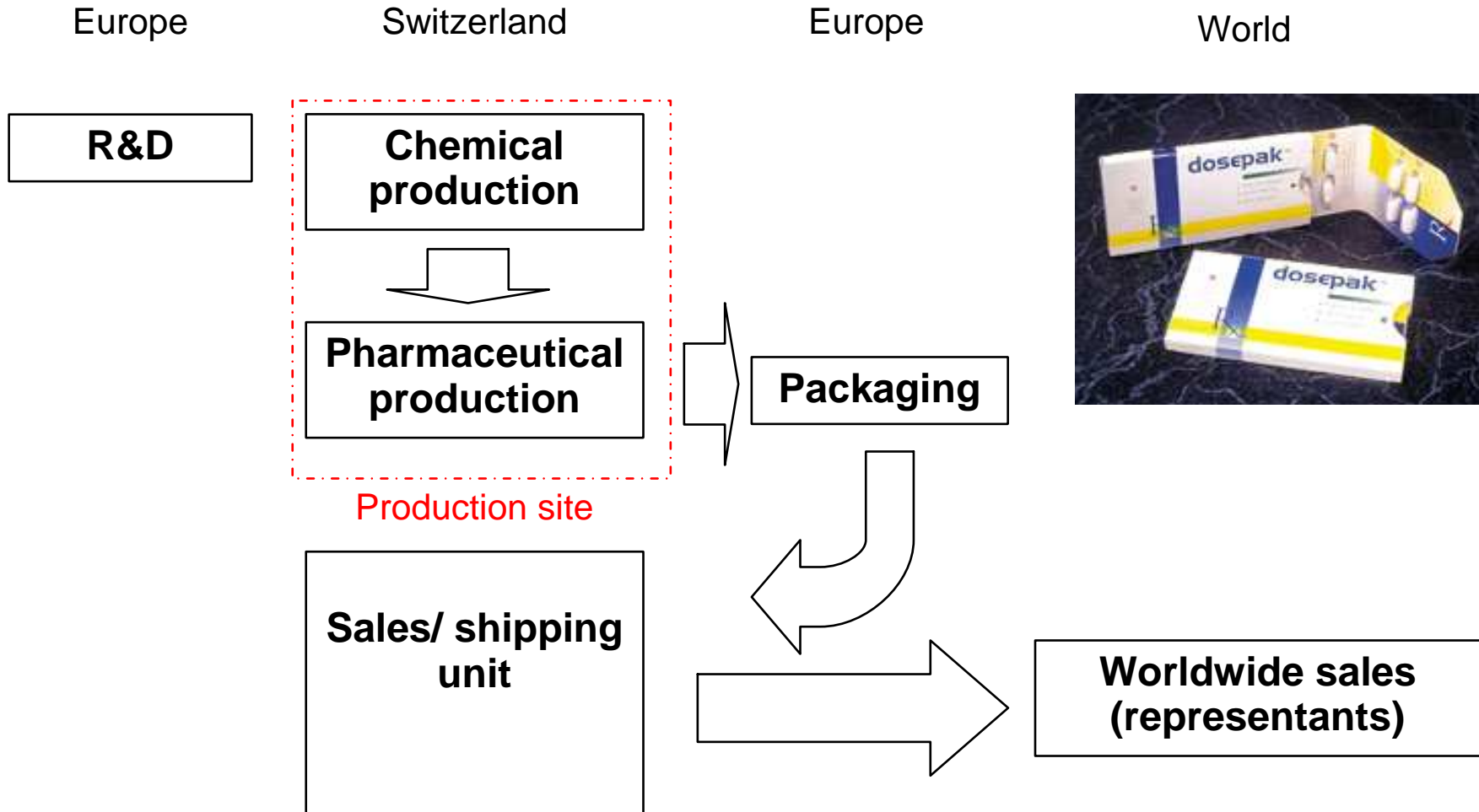
Green-e: combination of 4 analysis modules





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Pharma Industry

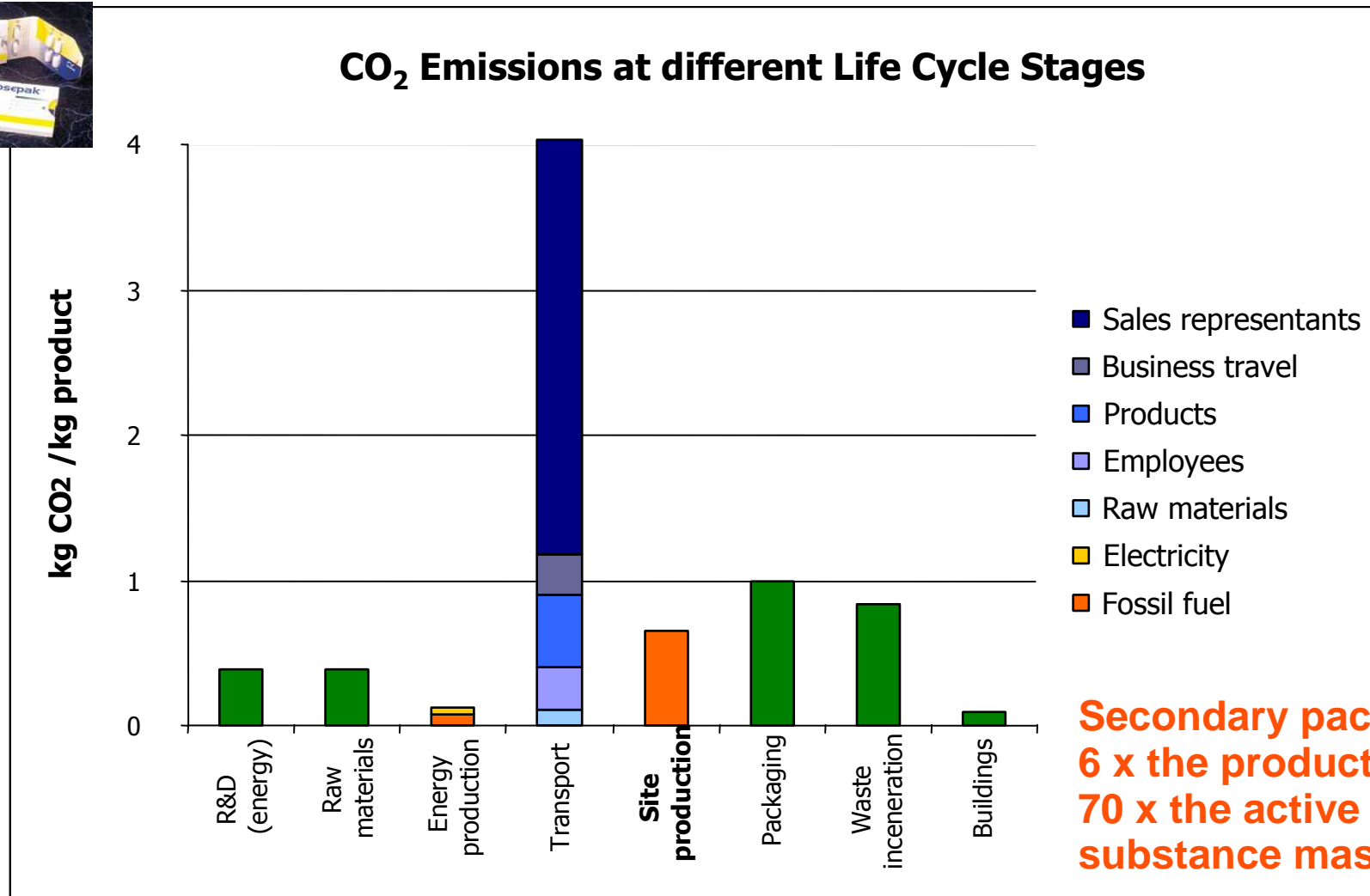




CO2 Emissions Pharma Industry



CO₂ Emissions at different Life Cycle Stages



- Sales representants
- Business travel
- Products
- Employees
- Raw materials
- Electricity
- Fossil fuel

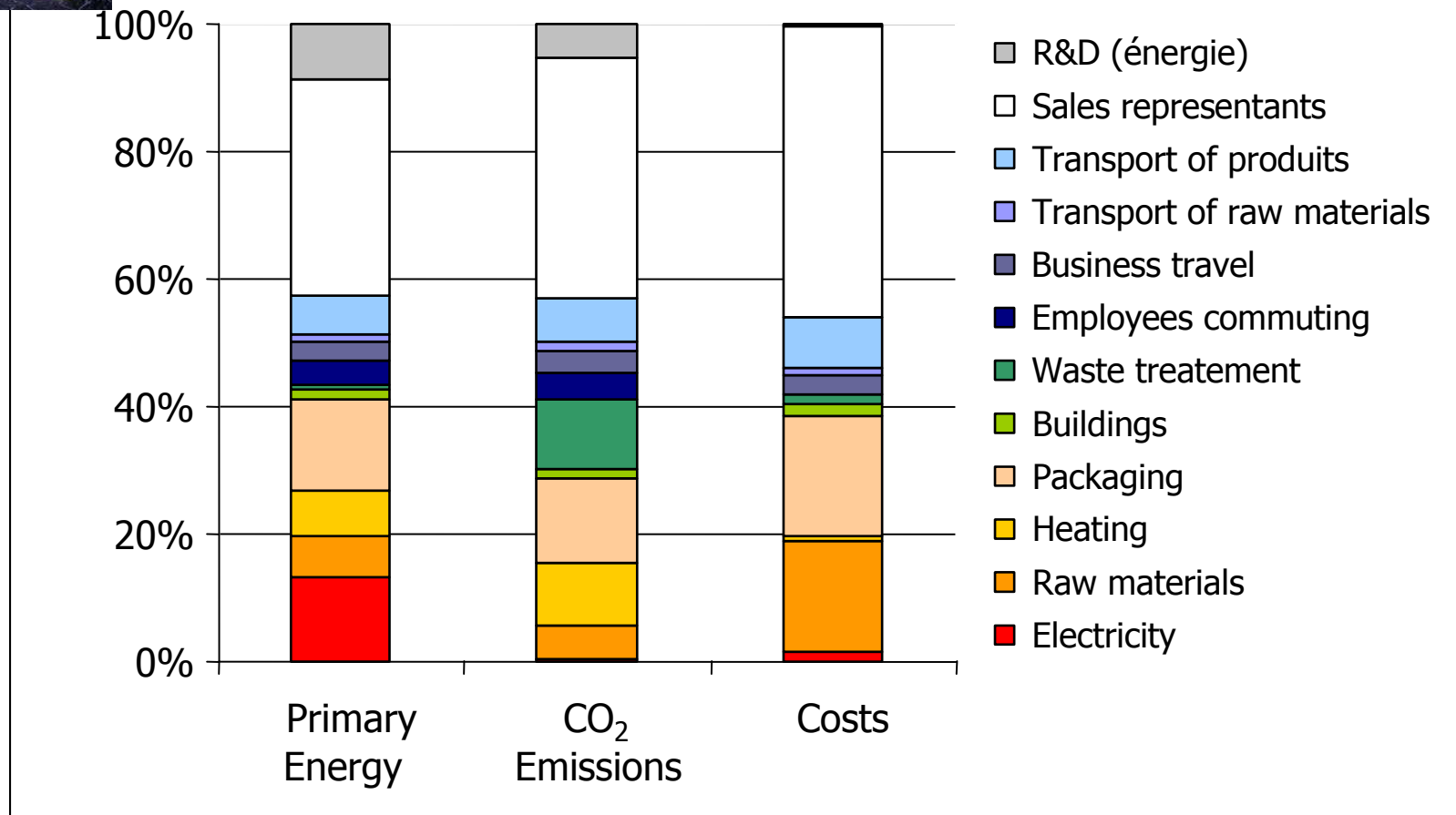
**Secondary packaging
6 x the product mass
70 x the active
substance mass**



Results: Pharma exemple



Life cycle primary Energy Balance and related costs

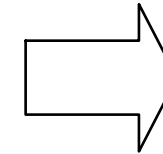
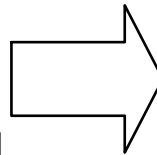




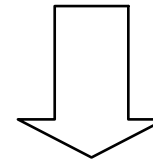
-
- **Reductions of impacts have to be considered also outside the classical company boundaries**
 - **Decision-makers should realize that a consistent environmental management has to be based on a life cycle perspective**
 - **Merging LCA and LCC enables to validate the right correlations**



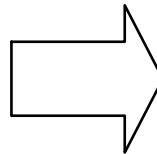
Electricity consumption
Heating
Physical inputs
Transport, incl. commuting
Infrastructure: buildings and network (m2; Faist et al. 2003)
Advertising
...



Waste



Electronic devices
(Production ; EOL)
Electricity consumption



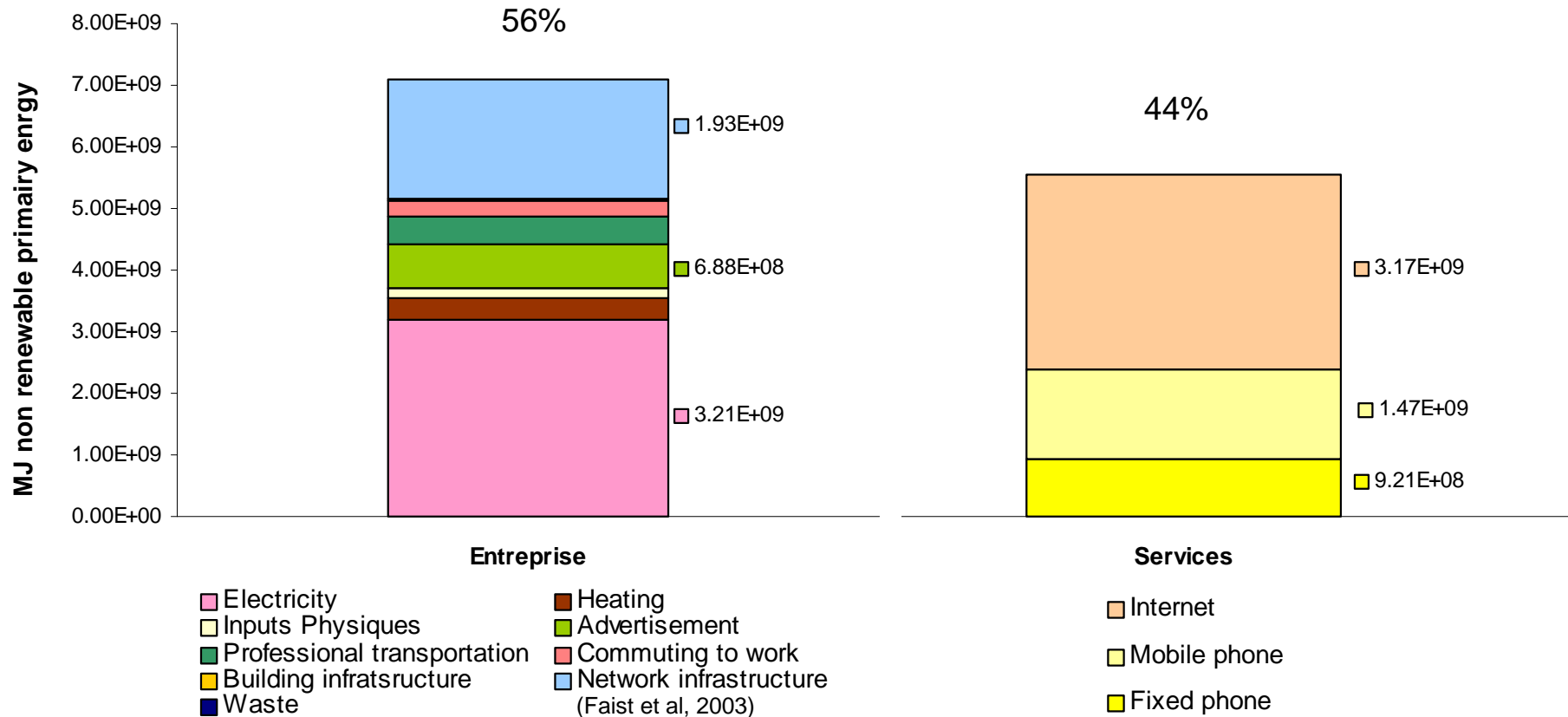
Fixe Phone
Mobile phone
Internet

} 80%



Results: life cycle performances, incl. services

Primary energy consumption over the company life cycle directly related to the company activities and linked to the use of the service by customers



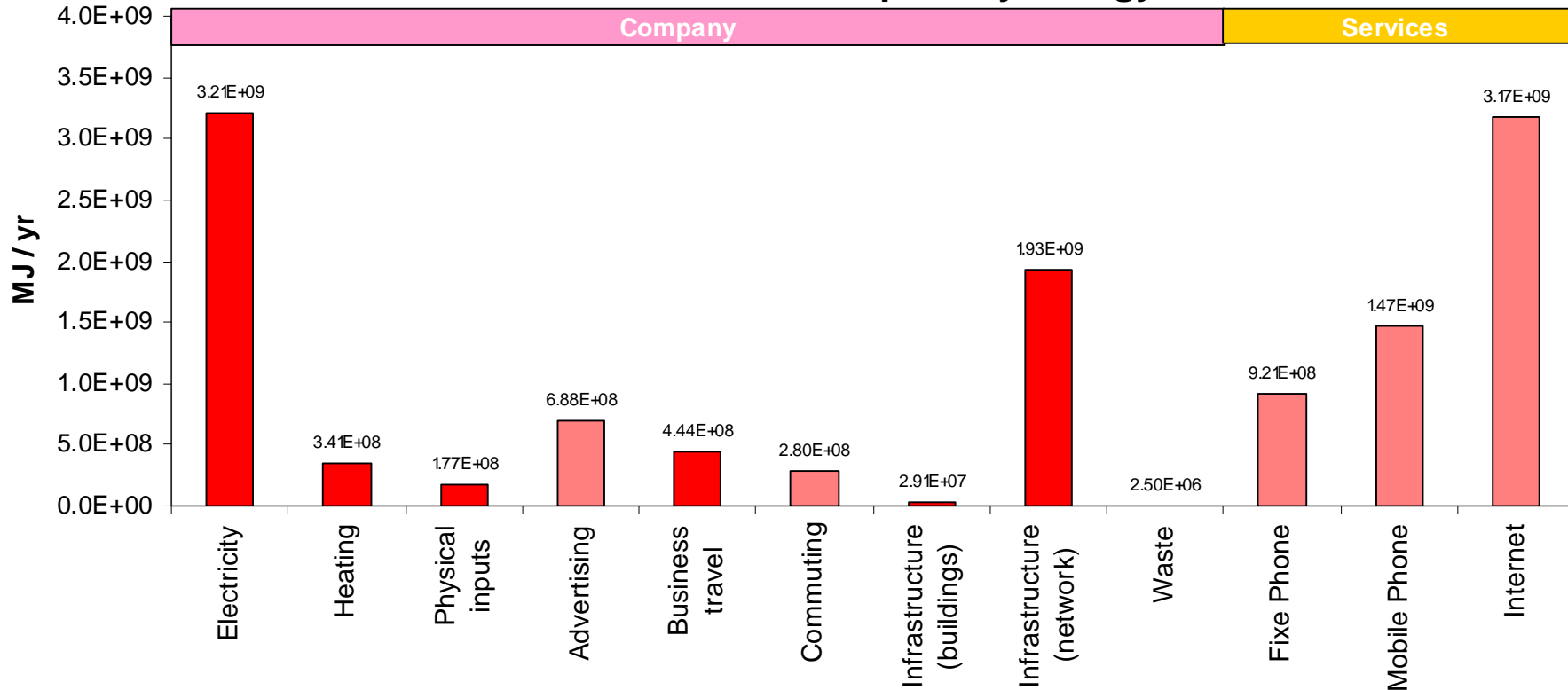
(ESU and ecoinvent databases)



Direct vs. Indirect impacts



Non-renewable primary energy



Directs: 48% **Indirec**ts: 52%



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Telecom study: recommendation



- **to introduce purchase criteria for low consumption devices and environmental friendly compositions**
- **to analyse the commuting behaviour of employees**
- **to offer a range of attractive low consumption telephones**
- **to sensitise the customers to the impacts that the use of the services involves.**



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Conclusions for Swisscom (P. Salina)



“This study has fulfilled its objectives: it put figures on the indirect impacts, located them along the chain and provided useful recommendations.”

“The magnitude of these impacts is compelling and requires swift actions. As a first step, Swisscom:

- has enhanced its purchasing criteria for terminal equipment and adopted on Feb. 17th the limits given in the new EU Code of Conduct on Energy Efficiency.
- will introduce optimised cordless phones with a low radiation mode and low energy consumption before June 05.
- will provide its customers with information on the indirect impacts on its internet site before June 05.”



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Originality of the approach



**Simple and scientifically reliable screening
approach**

**Quantified analysis of environmental impacts
for Environmental Management Systems**

**Life cycle philosophy: from suppliers to
users, through to end of life**

**Flexibility to others environmental evaluation
tools like LCA, RA, etc.**

Links environmental impacts to costs

**Benchmark to standards and similar sectors
of activity**