
LUNCHTIME DEBATE

Ensuring a non-toxic circular economy

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ecodesign consultants



VHK Research (since 1984)

Areas EU:

- Ecodesign
- Energy Label/ Ecolabel
- Resources Efficiency

Deliverables:

Methodology (MEErP), preparatory studies, impact assessments, technical assistance & policy support

Clients:

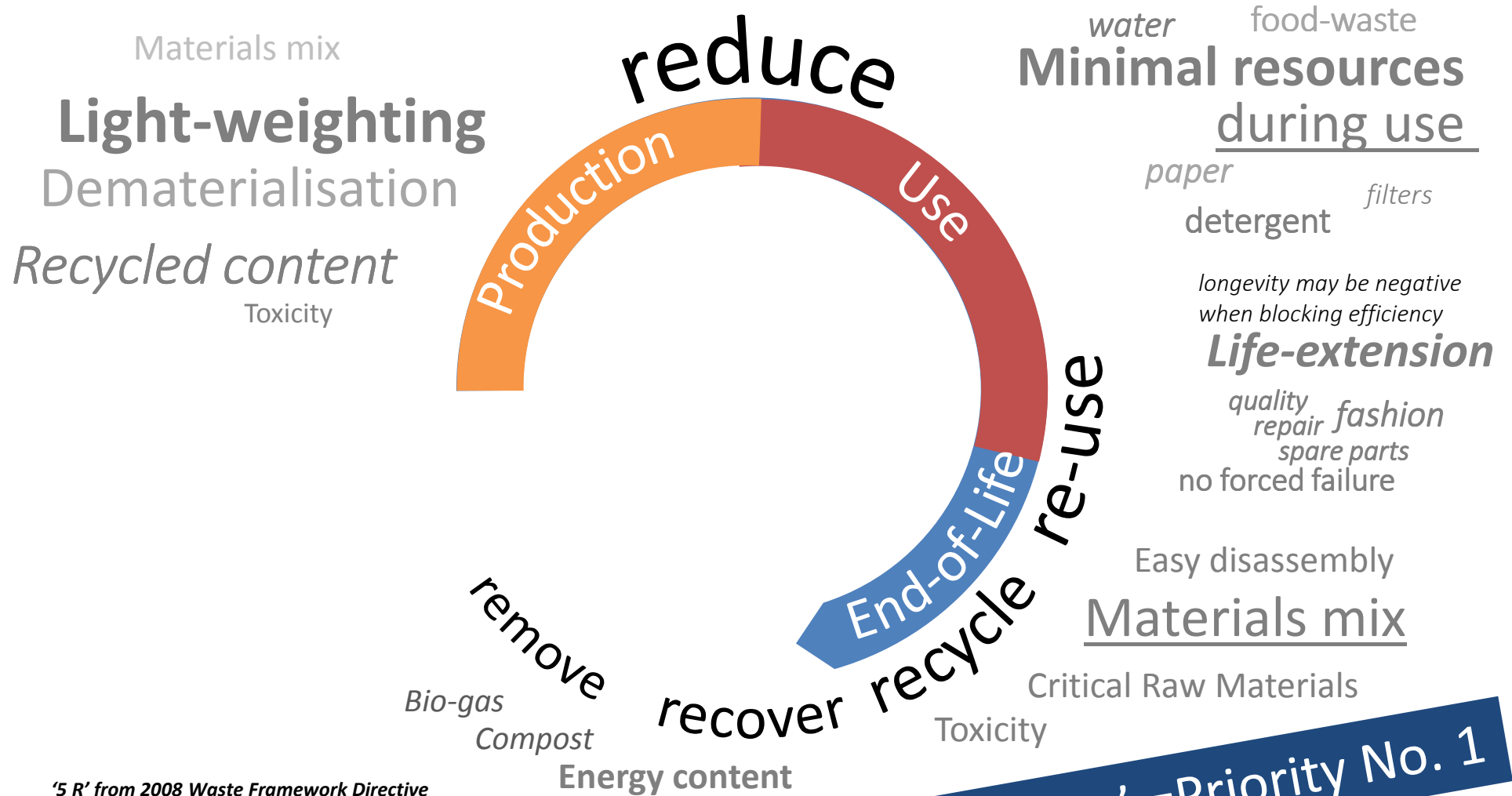
European Commission, DG ENER/GROW/ENV

Netherlands Ministry of Infrastructure & Environment

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Design Strategies

for a circular economy



'5 R' from 2008 Waste Framework Directive



'Reduce' = Priority No. 1

Tools

MEErP/ EcoReport

Proven Ecodesign Methodology

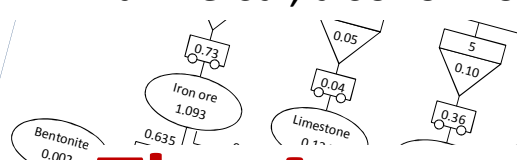
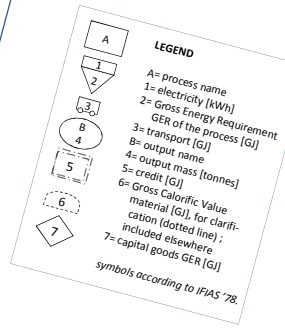
policy for >40 energy-related products since 2005
universal, also for non-ErP (packaging, cars, etc.)

The Accounting Principle

Materials input per tonne crude primary aluminium including fossil fuel 5.12 tonnes (GER 4.25 GJ/t) other 0.82 t (GER 227.9 GJ/t)

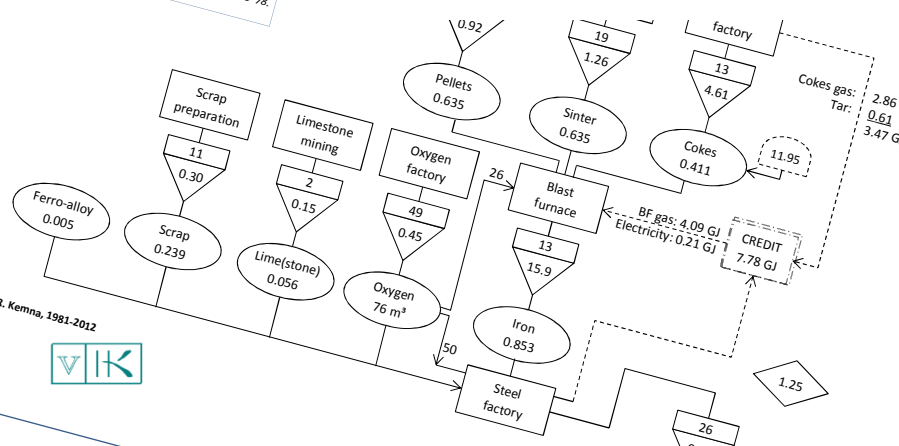
Primary aluminium
(Bayer / Hall-Heroult process from bauxite)

BF steel-making
(blast furnace/oxysteel process with ...)

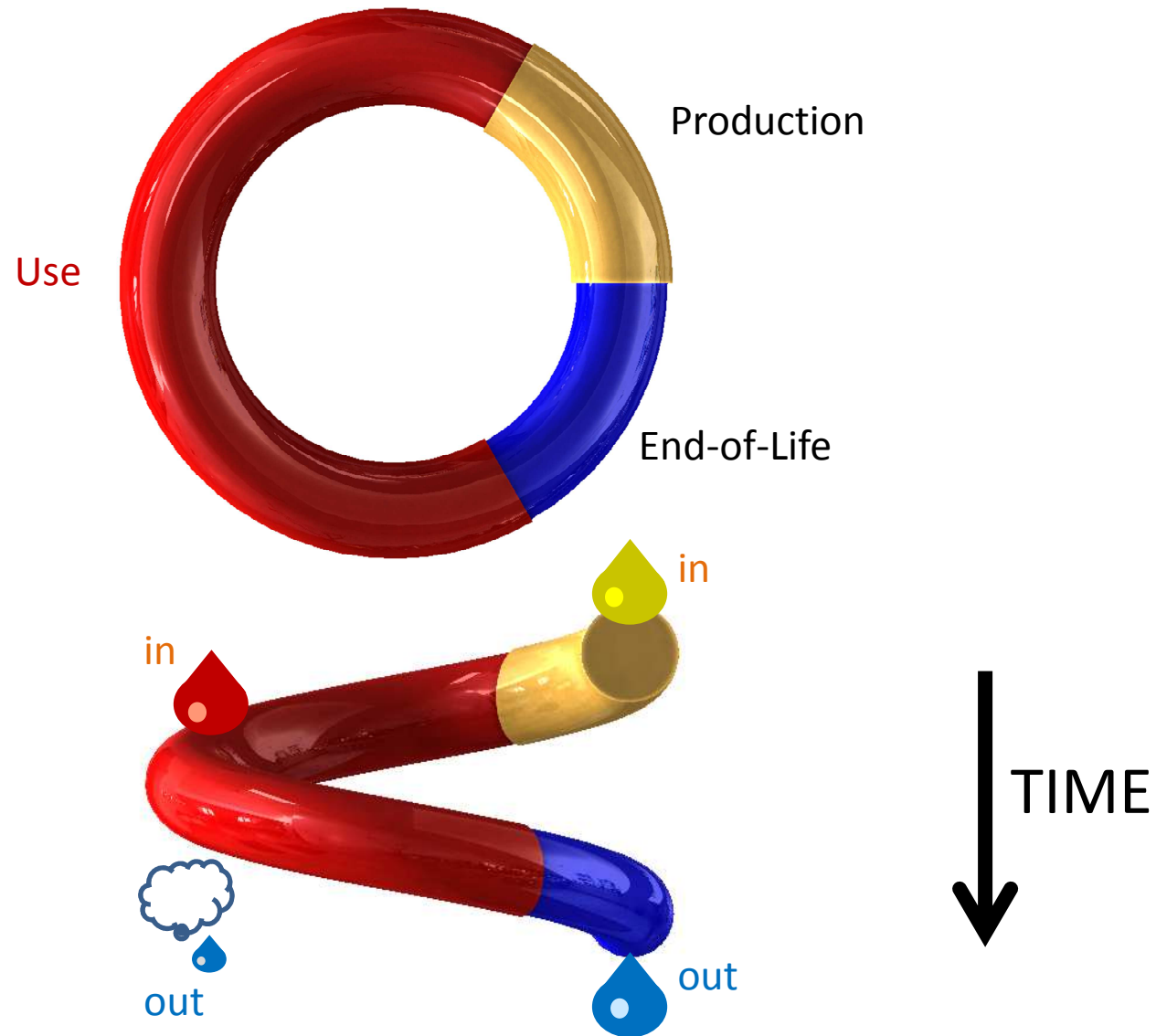


Materials input per tonne liquid steel: including 0.518 t coal, 0.082 t other fuel, 1.1 t ore, 0.24 scrap (GER 18.79 GJ)

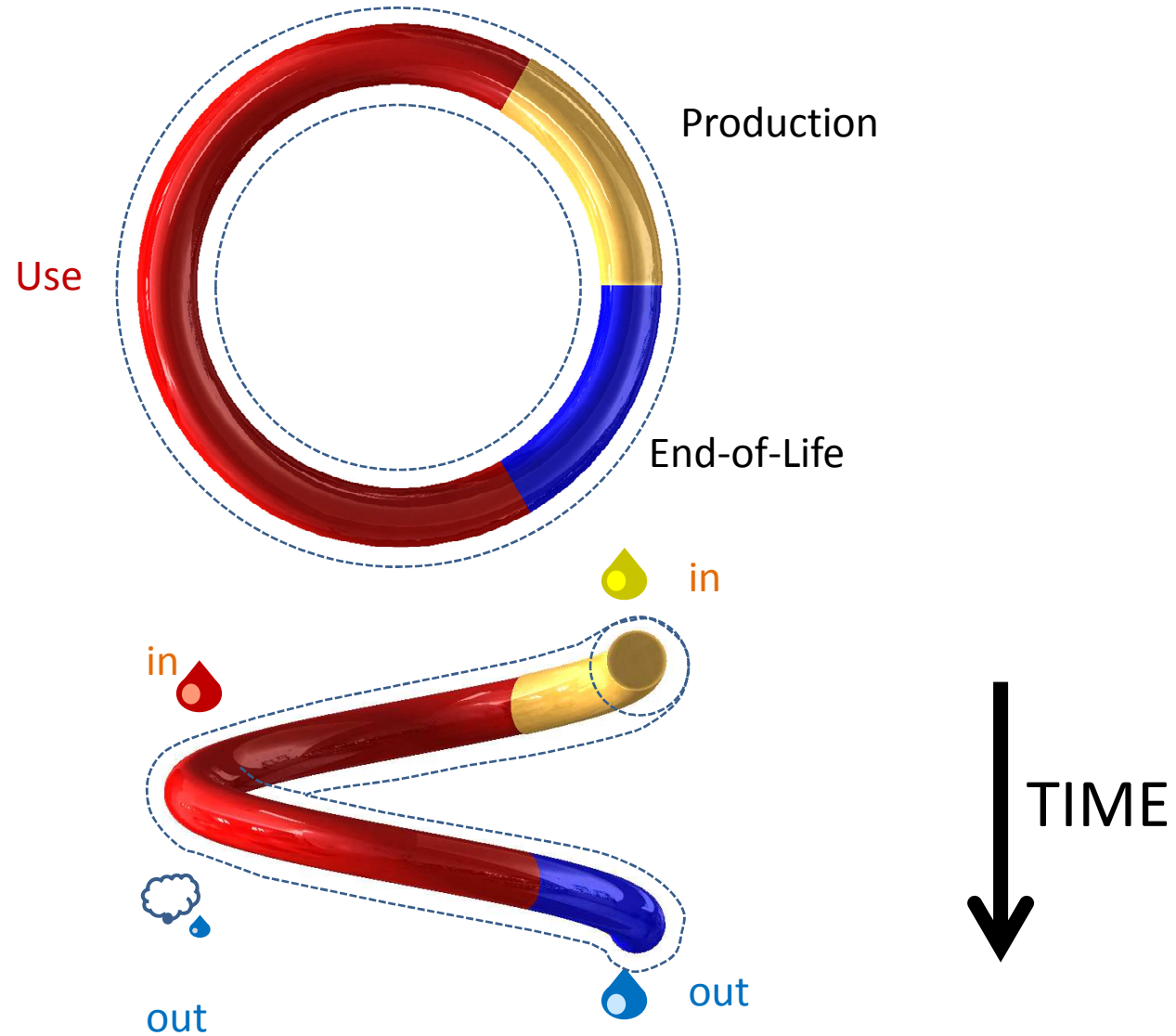
Materials input per tonne ErP plastics: ~2.5 tonnes >90% fossil fuel, of which 40% feedstock and rest energy (average GER ~100-110 GJ)



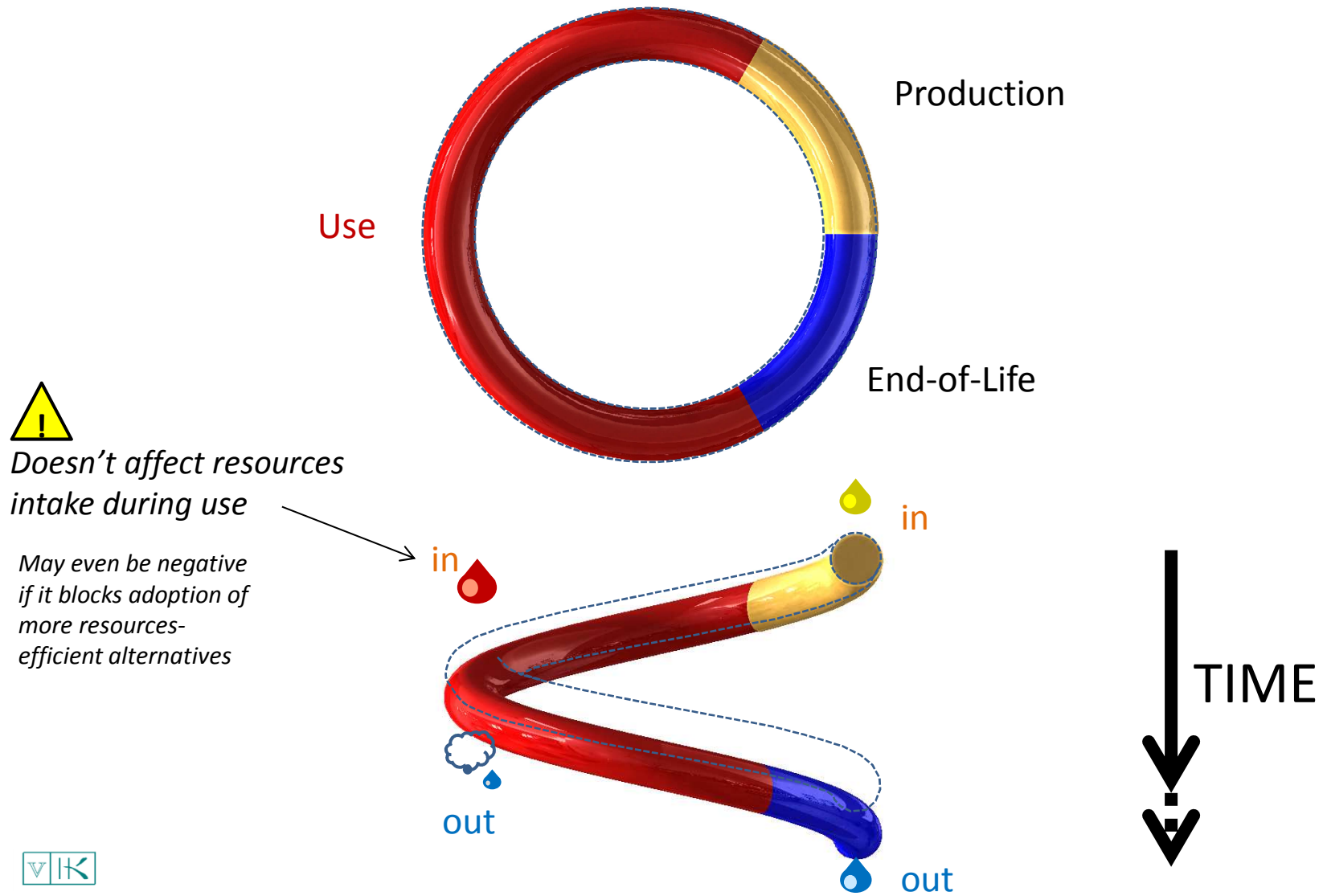
Circular = top view of a helix



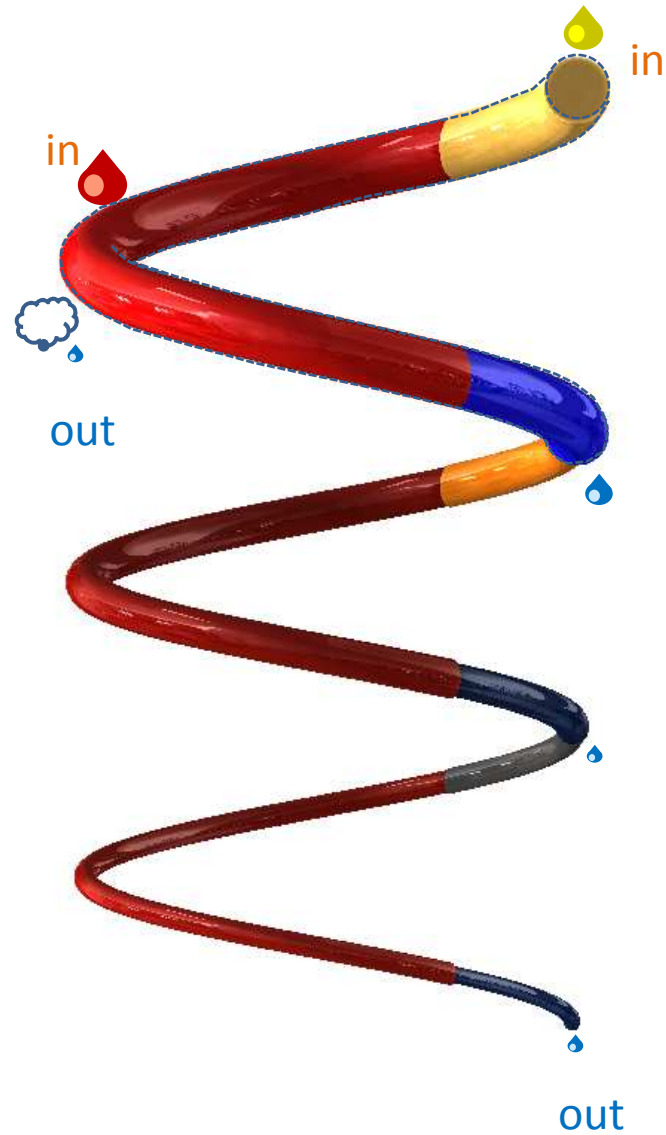
Reduce



Prolong



Re-use



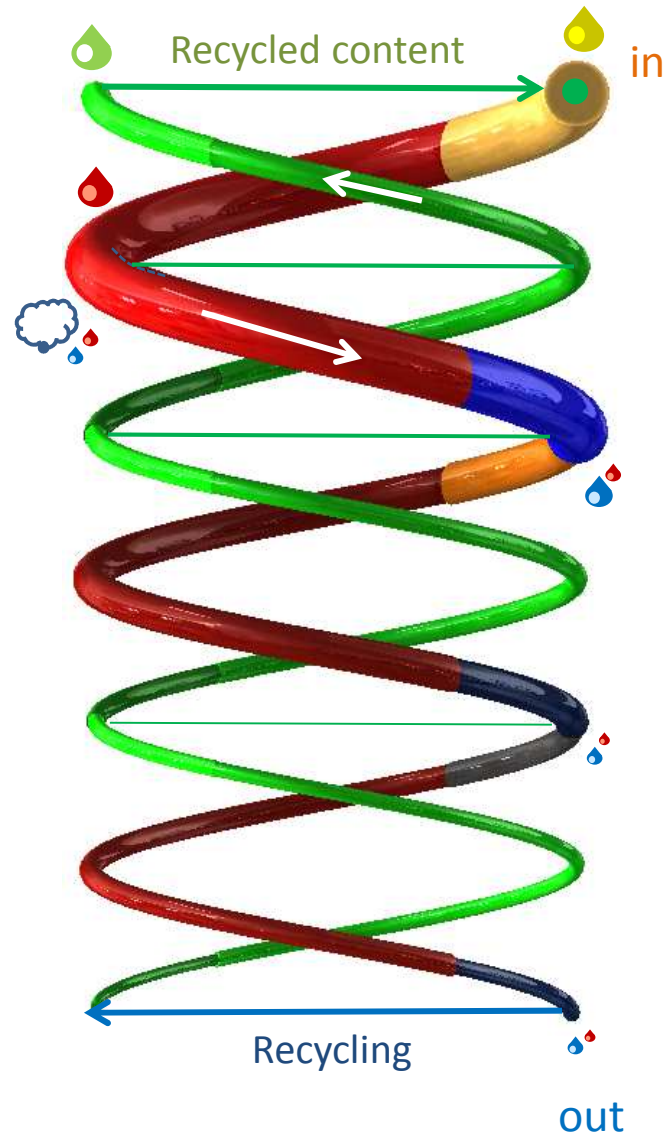
*Degradation in
functionality*



Recycle/Recover

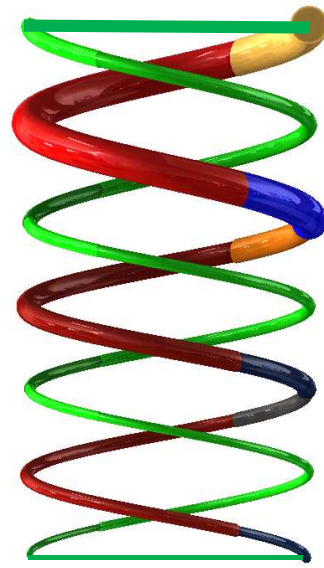
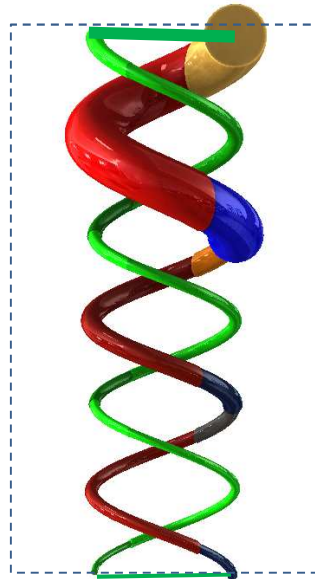
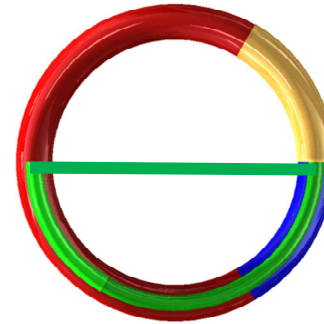
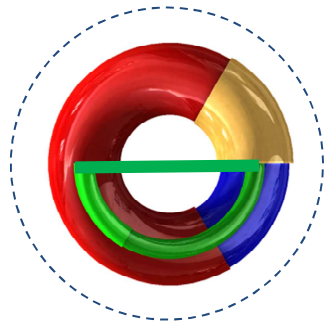


*Recycling also costs
(energy) resources*



The 6th dimension: People

more people, more products, more performance



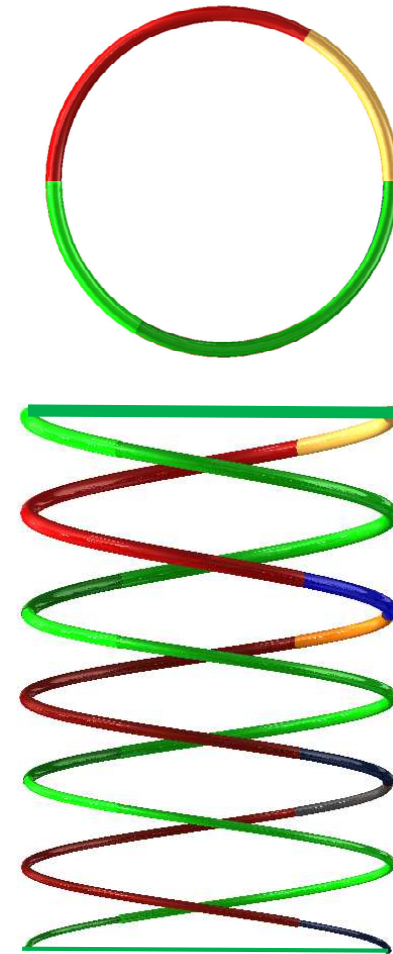
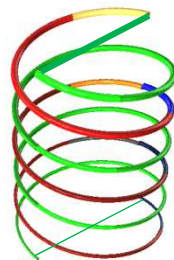
2000

2015



6 dimensions

- 2D: Circle (concept)
- 3D: Volume (reduce)
- 4D: Time (prolong)
- 5D: 'Parallel world' of recycling
- 6D: People



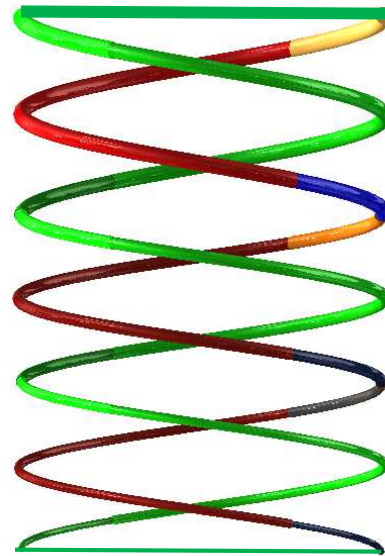
Closing the loop!

Some lessons learned

- **Reduce:** Least risks, highest effect. Applies to energy and production/distribution inputs, but also for water/paper/filter using products and those affecting food-waste (e.g. fridges).
- **Prolong:** For non-ErP a longer product-life is always OK. For ErP a long product life is not always OK and may block introduction of more efficient products.
- **Recycling:** Time is crucial. Uncertainties of what is good recycling policy are small for e.g. packaging and disposables (loop: 1 month) and large for ErP (loop: 10-15 years). 'recycled content' =production phase → uncertainties lower than for end-of-life oriented recycling promotion.
- **Re-use:** Does not improve resources intake during use. Focus on housing (renovation), furniture, etc. →the largest waste producers, in mass.
- **Recover:** Heat recovery versus recycling benefit of bulk plastics is a tight race. Just make sure you collect (no 'plastics soup' in oceans)
- **Remove:** Toxicity covered by RoHS and REACH. Don't ask designers to become chemical/medical specialists; just phase out (responsibly) where necessary.
- **People:** Maintain or possibly even improve product functionality. Look for synergy to get highest acceptance.



Thank You



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