

LCA – TYRE RECYCLING RECYCLERS' TALKS

LARS RAAHAUGE

CLIMATE & ENVIRONMENT



WHAT IS A LIFE CYCLE ASSESSMENT?

- An LCA (Life Cycle Assessment) study determines and assesses known environmental and climate -related impacts of a specific choice for a given product. An LCA study must cover all known stages of a product life cycle.
- The use of LCAs can help policy -makers and civil servants make science -based decisions, where all known environmental and climate -related impacts are taken into consideration.
- LCA studies should be prepared by independent and renowned institutes in compliance with current standards – and should subsequently be peer reviewed by other independent experts.



LIFE CYCLE ASSESSMENT OF WASTE TYRE TREATMENTS: MATERIAL RECYCLING VS. CO-INCINERATION IN CEMENT KILNS

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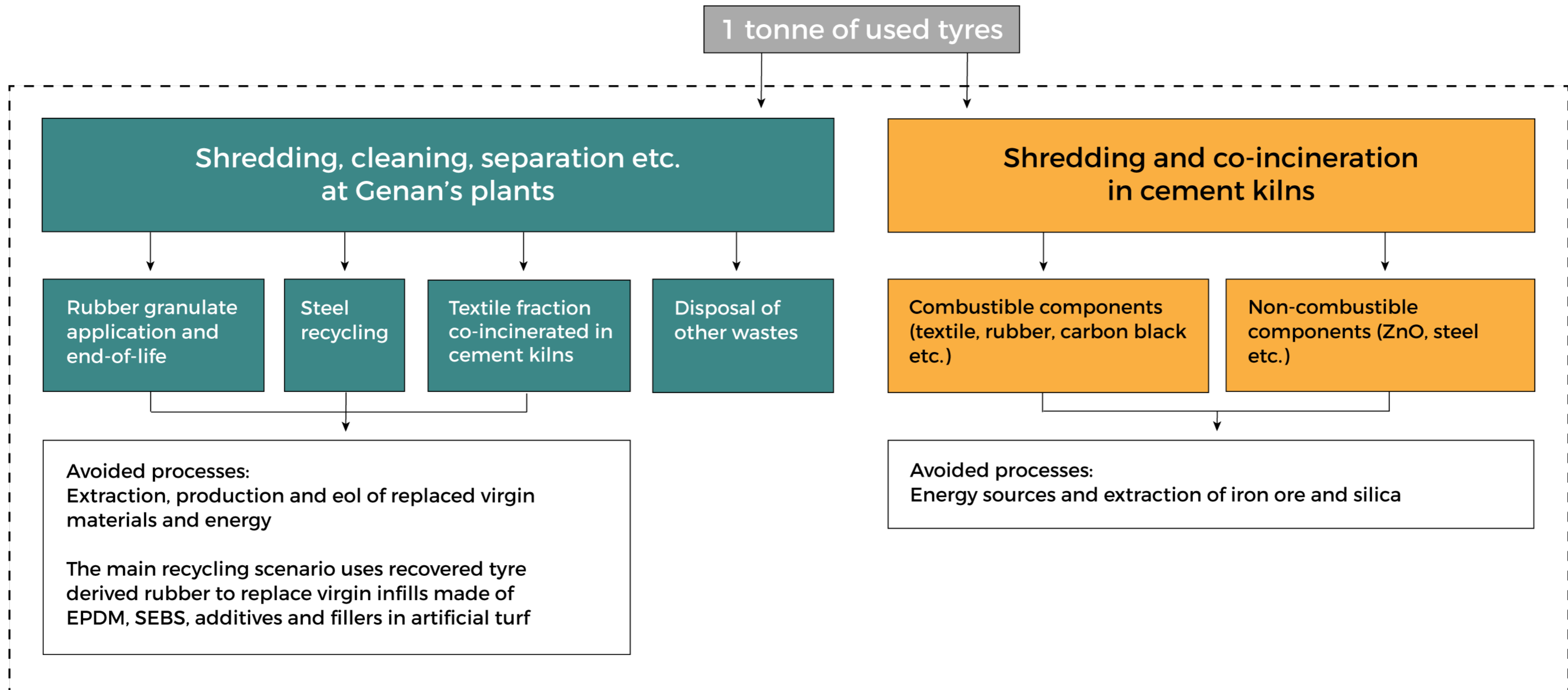
The full LCA report is available on https://www.euric-aisbl.eu/images/PDF/LCA_tyre_recycling.pdf

BRIEFLY ABOUT THIS LCA STUDY

- Comparison of the two most common disposal routes for end-of-life tyres (ELT) in the EU: material recycling and co-incineration in cement kilns
- Adherence to ISO standards 14040 and 14044
- Representative results for the entire EU
- The most common application for processed ELT rubber granulate is as infill in artificial turf pitches – and this application is thus the basis of calculations.
- Updated Genan technology
- Updated cement kiln technology



SYSTEM BOUNDARIES



16 IMPACT CATEGORIES RESEARCHED

Table 19 – Results (green figures in the material recycling scenarios indicate that the impacts are lower than corresponding impact category in the co-incineration scenario).

Impact category	Material recycling (infill)	Co-incineration
Climate change (kg CO ₂ -eq.)	-905	-197
Acidification terrestrial and freshwater (Mole of H ⁺ eq.)	-2,84	-0,801
Eutrophication freshwater (kg P eq.)	-0,00635	-0,0039
Eutrophication marine (kg N eq.)	-0,6	-0,237
Eutrophication terrestrial (Mole of N eq.)	-7,78	-2,69
Ozone depletion [kg CFC -11 eq.]	3,83E -07	-3,37E -06
Photochemical ozone formation (kg NMVOC eq.)	-1,95	-0,656
Ionising radiation (kBq U235 eq.)	-216	-3,15
Respiratory inorganics (Disease incidents)	-2,39E -05	-4,38E -06
Ecotoxicity freshwater (CTUe)	-110	26,6
Cancer - human health (CTUh)	-5,89E -06	-1,46E -06
Non -cancer human health effects (CTUh)	9,70E -05	4,99E -05
Land Use (Pt)	-4,68E+03	-5,90E+02
Resource use, energy carriers (MJ)	-3,25E+04	-1,02E+04
Resource use, mineral and metals (kg Sb eq.)	-0,0251	-0,0000299
Water scarcity (m ³ world equiv.)	-84	-12,6

CARBON FOOTPRINT – POTENTIAL UPSIDES

- For each tonne of end-of-life tyres processed into rubber granulate and applied as infill material in artificial turf, instead of being incinerated in cement kilns, the climate is spared the emission of **700 kg CO₂**.
- Each year, 1 million tonnes of tyres are incinerated in European cement kilns.
- If these tyres were instead processed into rubber granulate and e.g. applied as infill material in artificial turf, the climate would be spared the emission of **700,000 tonnes CO₂** annually.



CARBON FOOTPRINT – POTENTIAL DOWNSIDES

- If a ban on granulate infill is adopted, **527,000 tonnes of end-of-life tyres** will have to find other disposal routes.
- These tyres will most likely go to **co-incineration** – and the majority will be incinerated outside the EU, as the demand for tyre fuel in cement kilns within the EU is decreasing.
If not exported, tyres might simply be incinerated within the EU – but without energy recovery.
- This will lead to **increased, annual CO₂ emissions of $0.7 \times 527,000 \approx 370,000$ tonnes**.



WHICH SCENARIO TO CHOOSE?

More recycled tyres means...
..less CO₂ emitted to the atmosphere

Fewer recycled tyres means...
..more CO₂ emitted to the atmosphere



WE HAVE ONE PLANET ONLY...

- For the sake of future generations, let us all strive not to consume more resources than Mother Earth can regenerate...

–for a sustainable future...

