



Norwegian Institute for
Sustainability Research

Seminar EPD-Norge: Improve data for module C and D How to model circularity in EPDs?

27. oktober 2022

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Head of Research

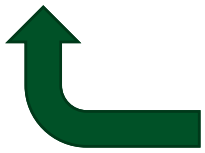
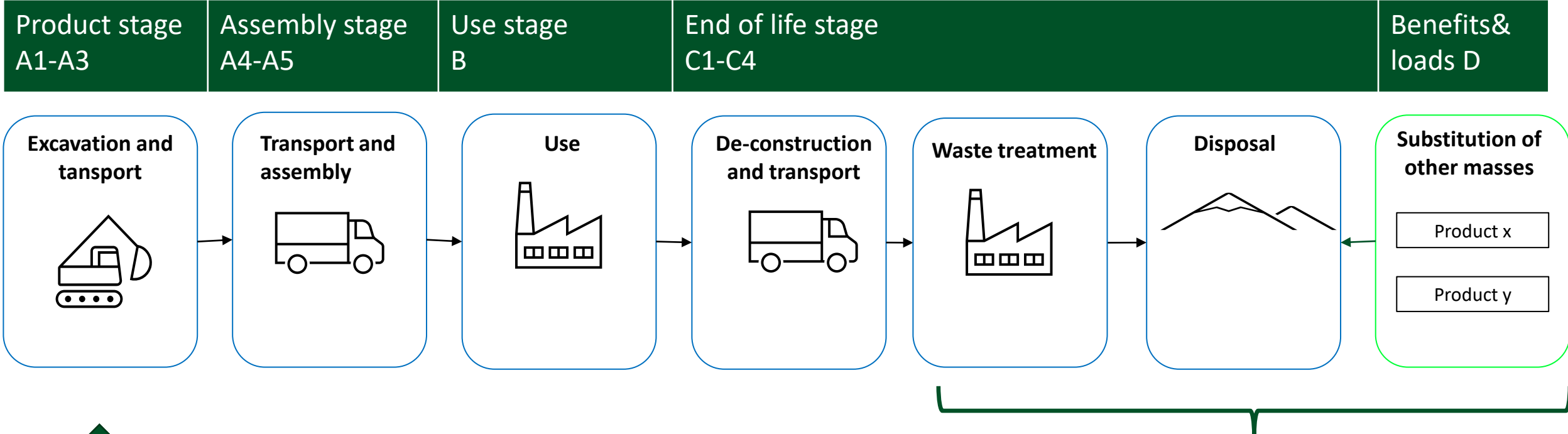


NORSUS Norwegian Institute for Sustainability Research

- Norway's leading life cycle assessment (LCA) centre of expertise
 - Assessing and improving the environmental performance of products and services
- 30 employees (50% PhD)
- Locations: Fredrikstad & Oslo
- Turnover in 2020: 35,3 mill NOK

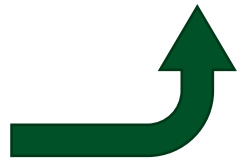


Typical system to be modelled using the modules in EPDs



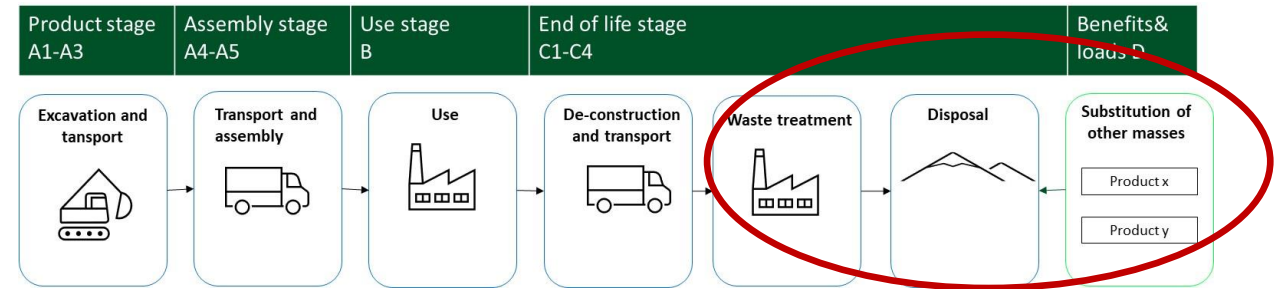
Where does recycling and circularity affect the EPD value chain?

- Production of materials (A1-3), recycled content
- Waste treatment (C3 and 4) and benefits beyond system boundaries (D)



Waste treatment (C3 and 4) and benefits beyond system boundaries (D)

ALLOCATION OF WASTE (GPI
International EPD-system (2021)/EN 15804



Allocation of waste shall follow the polluter pays principle and its interpretation in EN 15804: “processes of waste processing shall be assigned to the product system that generates the waste until the end-of-waste state is reached.” The end-of-waste state is reached when all the following criteria for the end-of-waste state are fulfilled (adapted from EN 15804):

- the recovered material, component or product is commonly used for specific purposes
- a market or demand, identified e.g. by a positive economic value, exists for such a recovered material, component or product;
- the recovered material, component or product fulfils the technical requirements for the specific purposes and meets the existing legislation and standards applicable to products; and
- the use of the recovered material, product or construction element will not lead to overall adverse environmental or human health impacts.

Practical implications for incineration, energy recovery and recycling

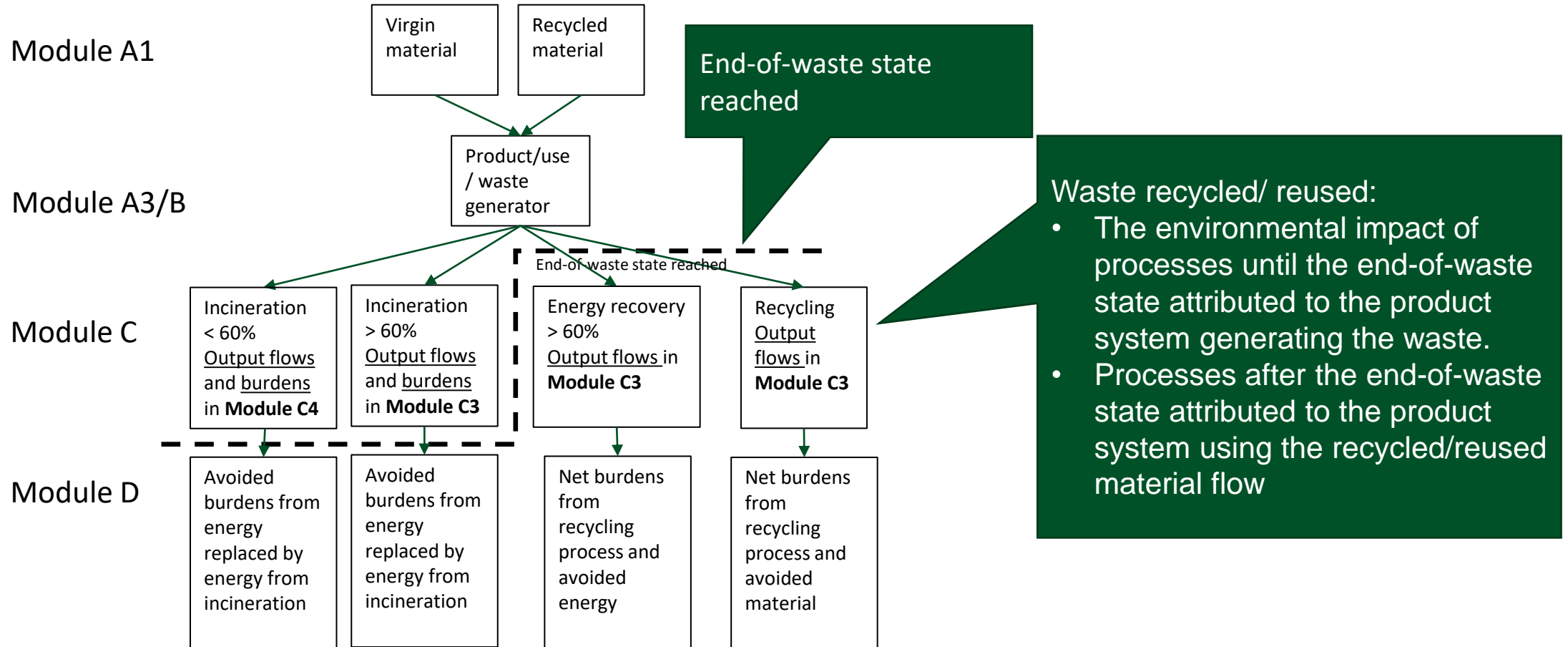


Figure developed by NORSUS
(based on EN 15804:2012+A2:2019 and ISO 21930:2017)

Module 3: Waste processing
Module 4: Disposal

Practical implications for incineration, energy recovery and recycling

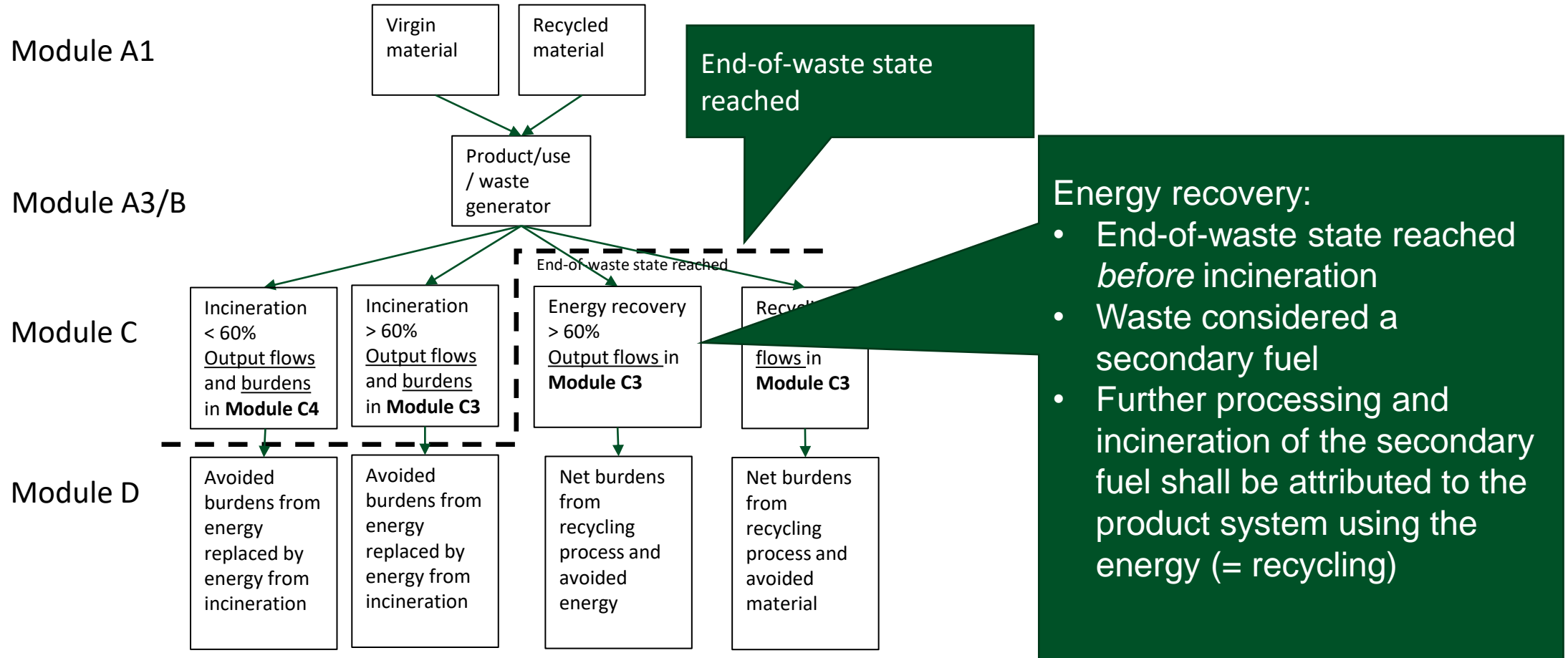
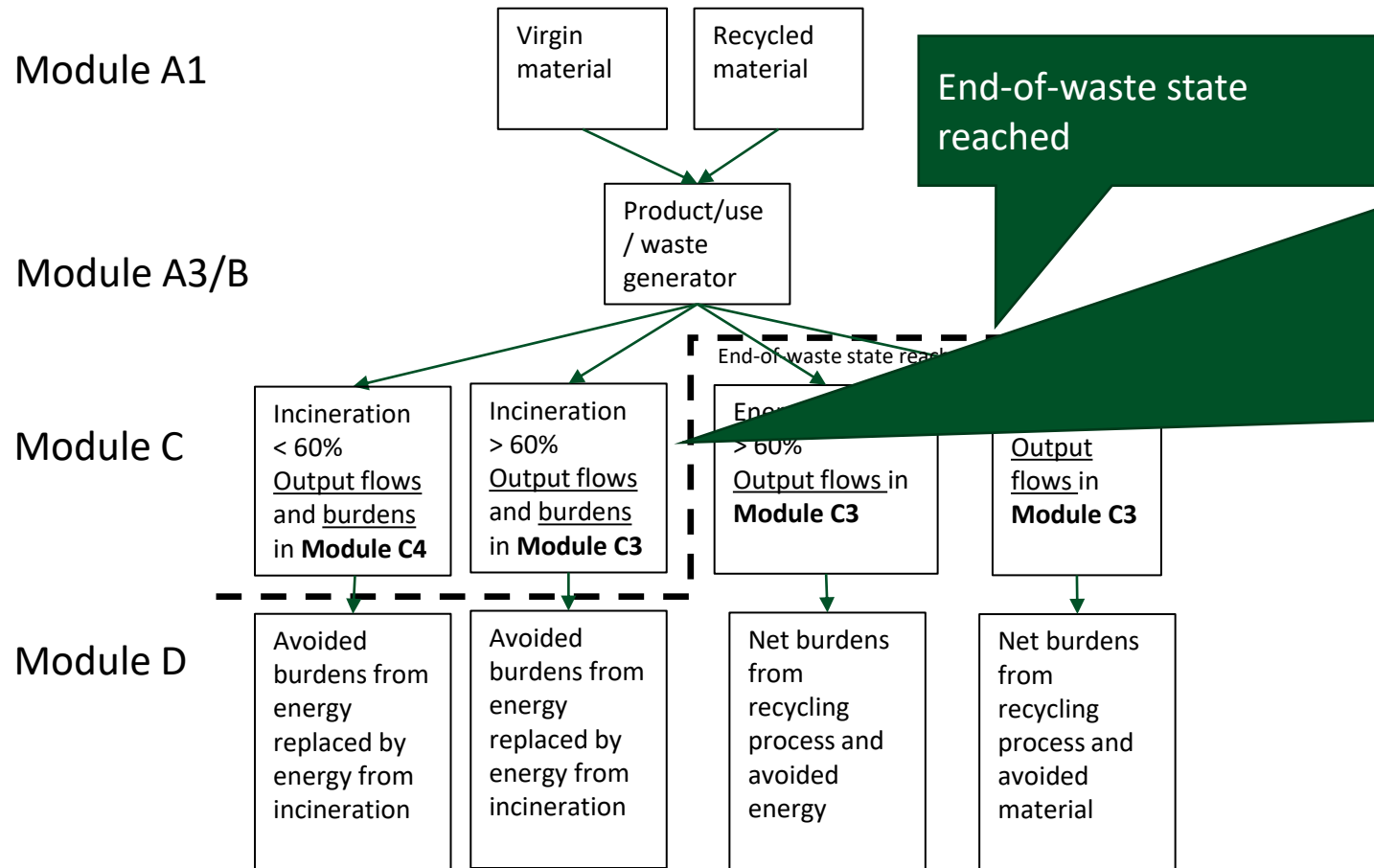


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Module 3: Waste processing
Module 4: Disposal

Practical implications for incineration, energy recovery and recycling



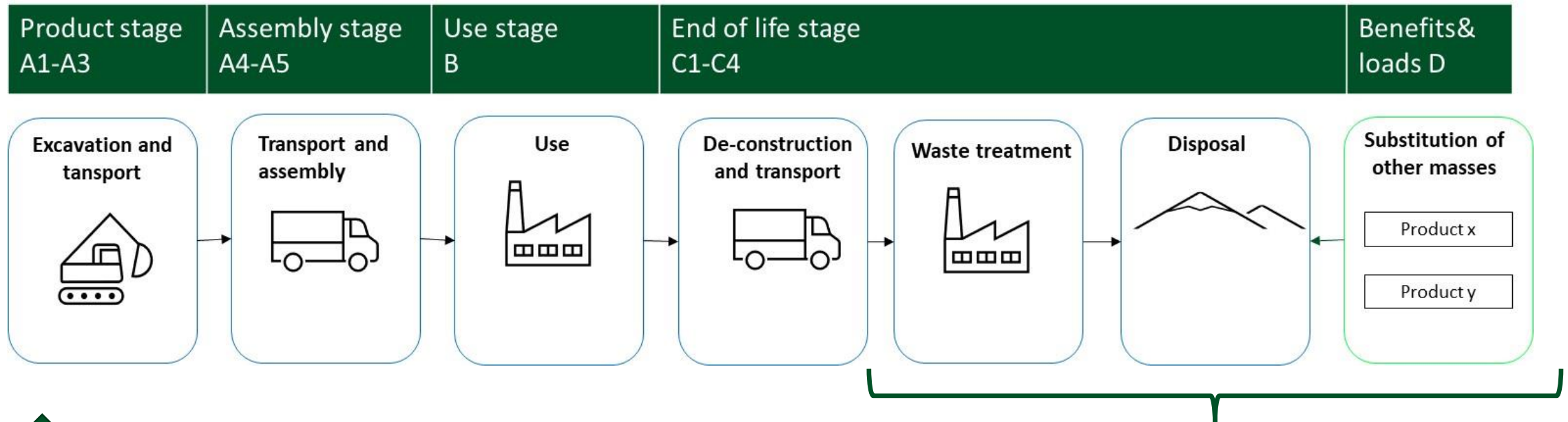
Waste incineration

- The end-of-waste state is reached after the incineration
- The environmental impact of collection, pre-processing and incineration attributed to the product system generating the waste.
- Impacts related to making use of the energy and avoided burdens from this attributed to the product system using the energy
- Energy efficiency $> < 60\%$ defines Module C3 or C4

Figure developed by NORSUS
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Module 3: Waste processing
Module 4: Disposal

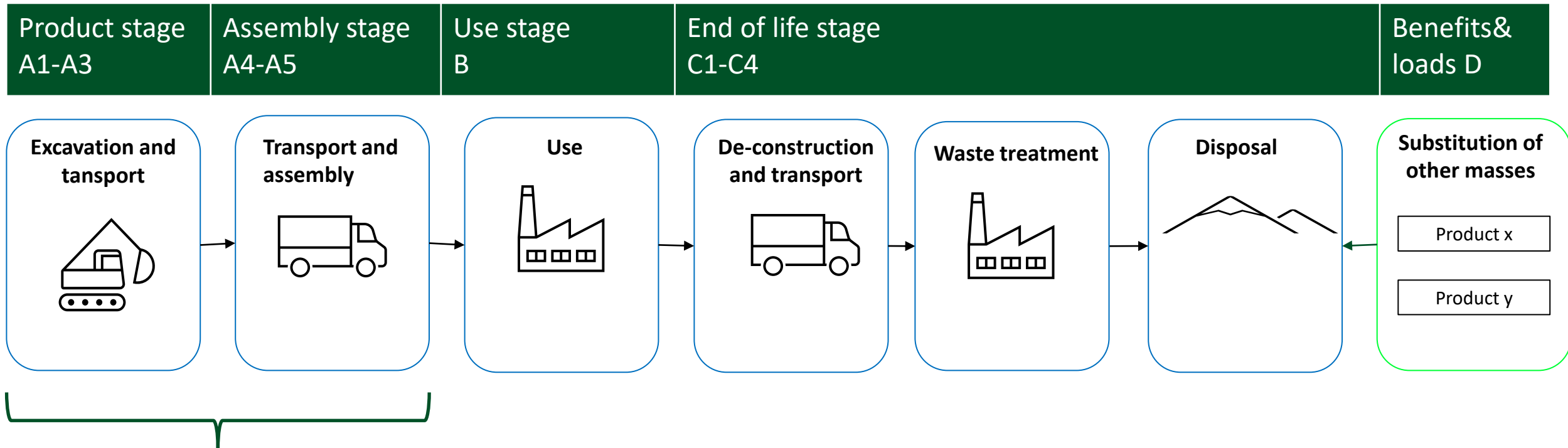
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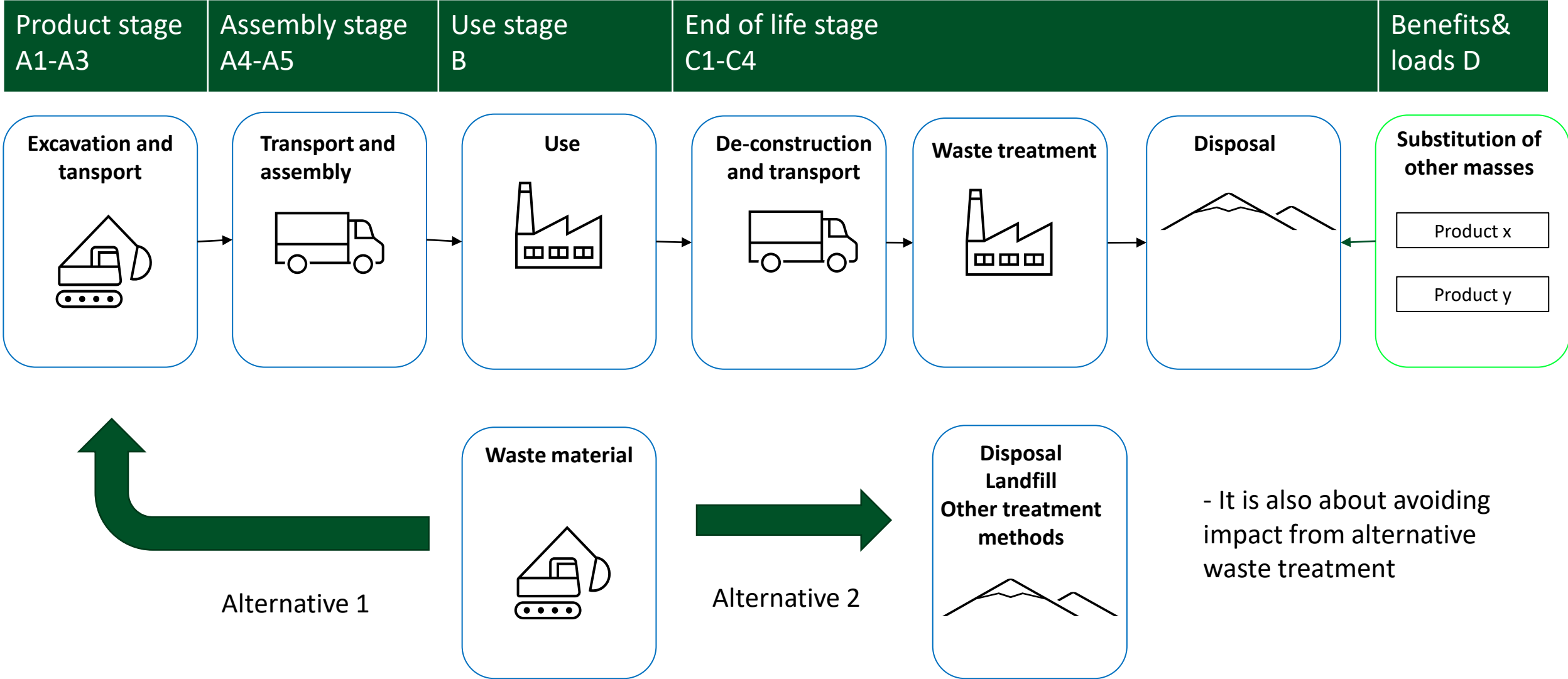
Production of materials (A1-A3)



Production of materials affected by whether or not the raw materials are based on

- Virgin or recycled raw materials: respective life cycle burdens
- Recycled materials: take the net burden approach (recycling production or waste process)

The benefit to society is more than using recycled material in a product



- It is also about avoiding impact from alternative waste treatment

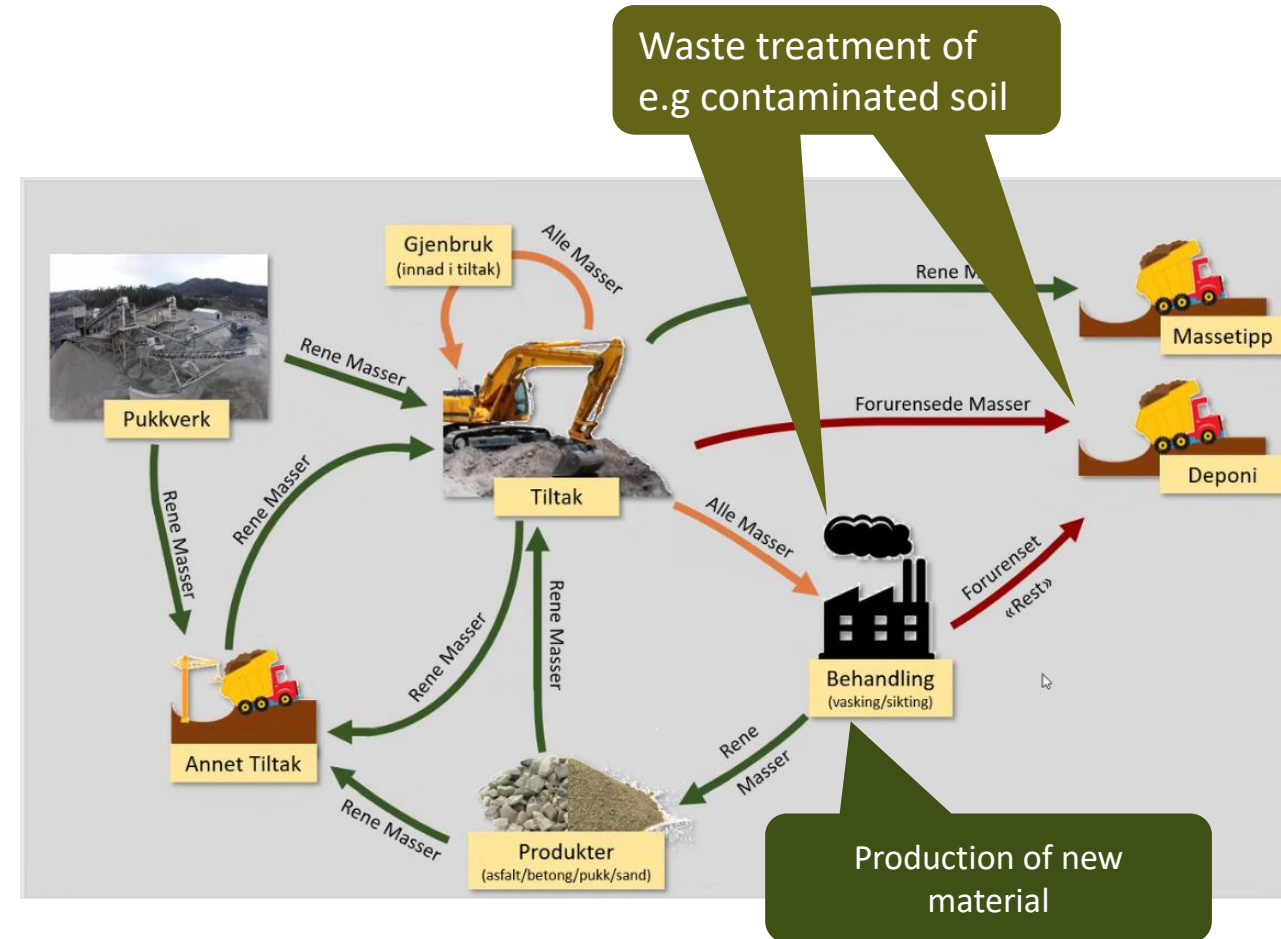
Circular treatment of waste resources - example

2 functions are delivered to the society:

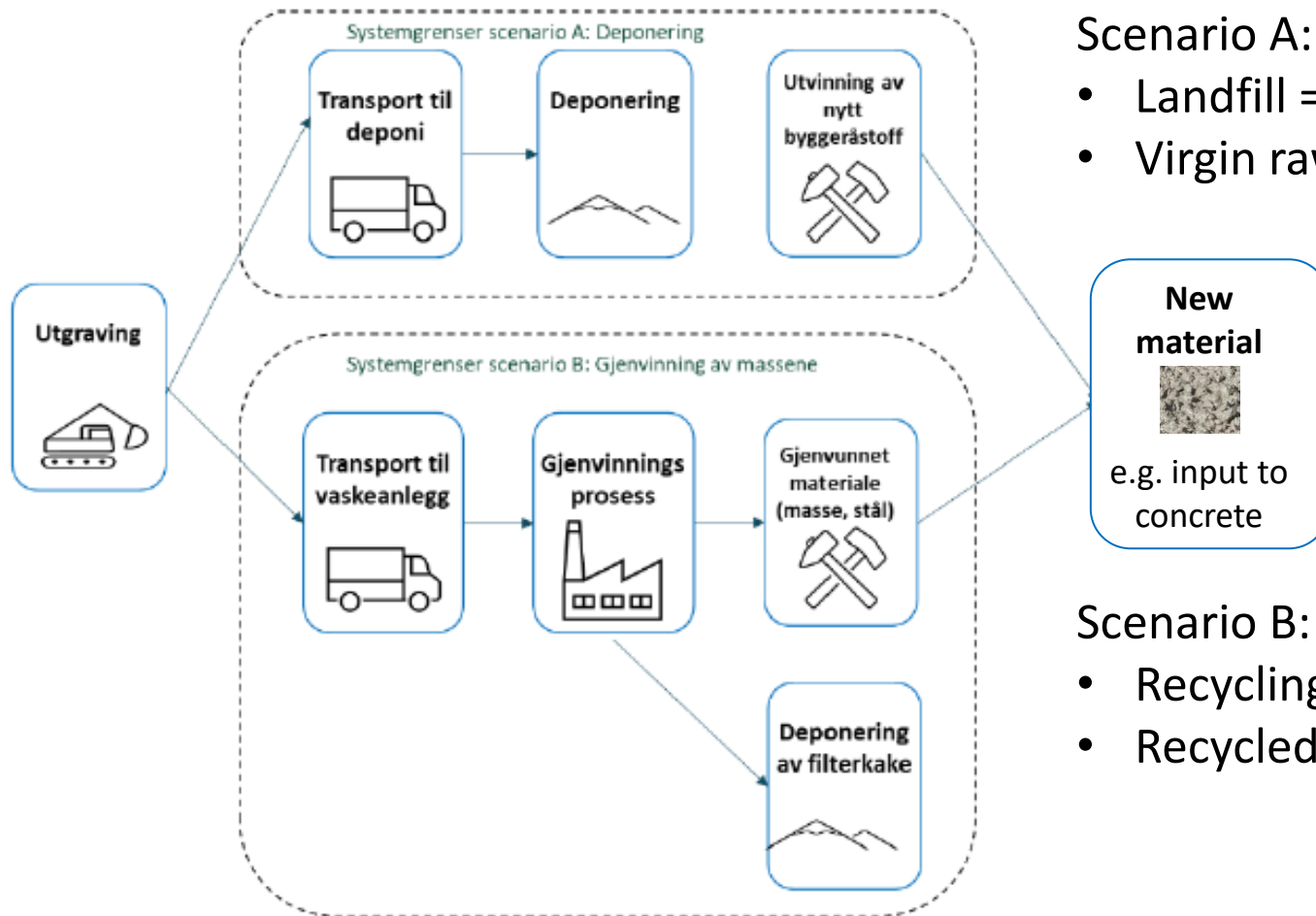
1. Waste treatment of contaminated soil
2. Production of new material



Compare 2 systems who give the same functions/benefit to the society



How to model the total benefit to society when the raw material input is a waste resource?



Scenario A:

- Landfill = Waste treatment
- Virgin raw material = Production of new material

Scenario B:

- Recycling plant = Waste treatment
- Recycled product = Production of new material

More overall LCA analyses needed as a supplement to the EPD?

- Different perspectives (product/building vs overall use of resources)
- Different stakeholders
- ...

Thanks!

Hanne Lerche Raadal



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