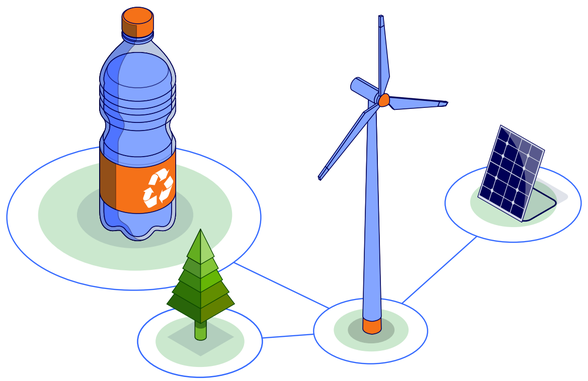
Towards circular packaging by 2050

Modeling circular strategies for different packaging types

Currently only ca. 7% of our consumer plastic packaging is based on recycled material and none of beverage cartons. What are the most effective strategies to achieve the circular packaging goals?

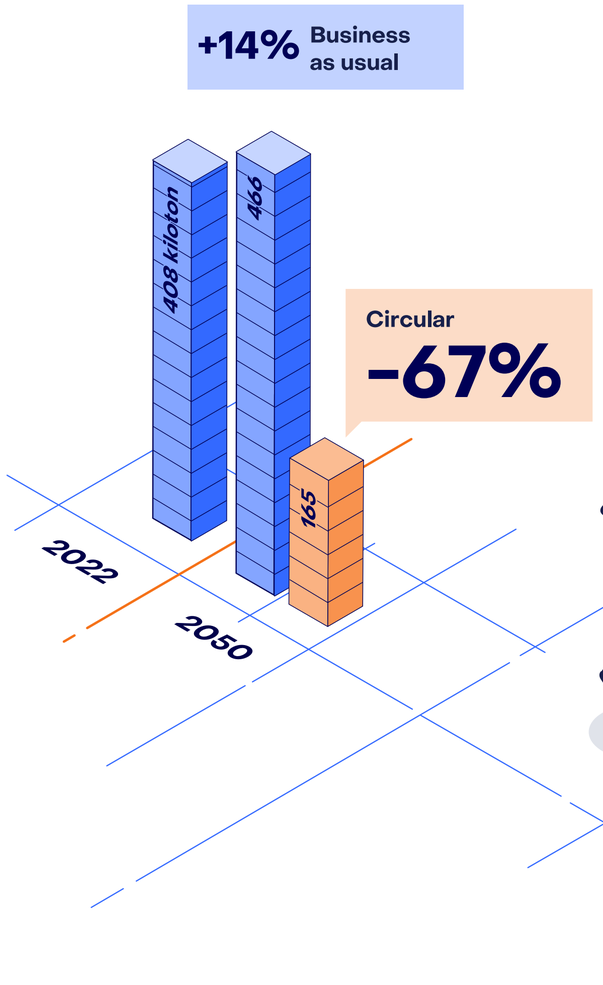
Since challenges vary between packaging types, specific policies need to be designed. We modelled the circularity and greenhous gas (GHG) emission impact of Dutch consumer plastic packaging and beverage cartons for a business-as-usual (BAU) scenario and a circular scenario. We provide specific conclusions for seven different packaging types based on four circular strategies.



Circular strategies can substantially reduce the impact of consumer packaging

Primary material use

in kiloton virgin plastic, cardboard & aluminium



Greenhouse gas emissions

in kiloton CO2-eq. (full life cycle)

Conclusion

- Circular scenario can reduce primary material demand by 67%.
- But even in the circular scenario, we still rely on new primary material input.
- Circular strategies can substantially reduce climate impact of consumer packaging.
- Renewable electricity further improves GHG emission reduction of circular packaging scenario.

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Assessed packaging types

12% Plastic bottles in contact-sensitive applications

13% Beverage cartons

6% Plastic bottles in other applications

18% Rigid plastic packaging in contact-sensitive applications

21% Flexible plastic packaging in other applications

21% Flexible plastic packaging in contact-sensitive applications

9% Rigid plastic packaging in other applications

Assessed scenarios

BAU business as usual - Continuation of our consumption patterns & waste management.

Circular scenario Combination of all circular strategies.

Assessed circular strategies

Refuse and reduce

Refuse e.g.' eliminate packaging that does not fulfil any customer needs but only marketing purposes. Reduce: using less packaging per product, e.g., reducing empty space in packaging.

Material substitution Using a different material, e.g., to reduce packaging weight or increase recyclability.

Reuse e.g., refilling of bottles.

High-quality recycling Improved collection, sorting, & recycling of waste, incl. chemical recycling technologies.

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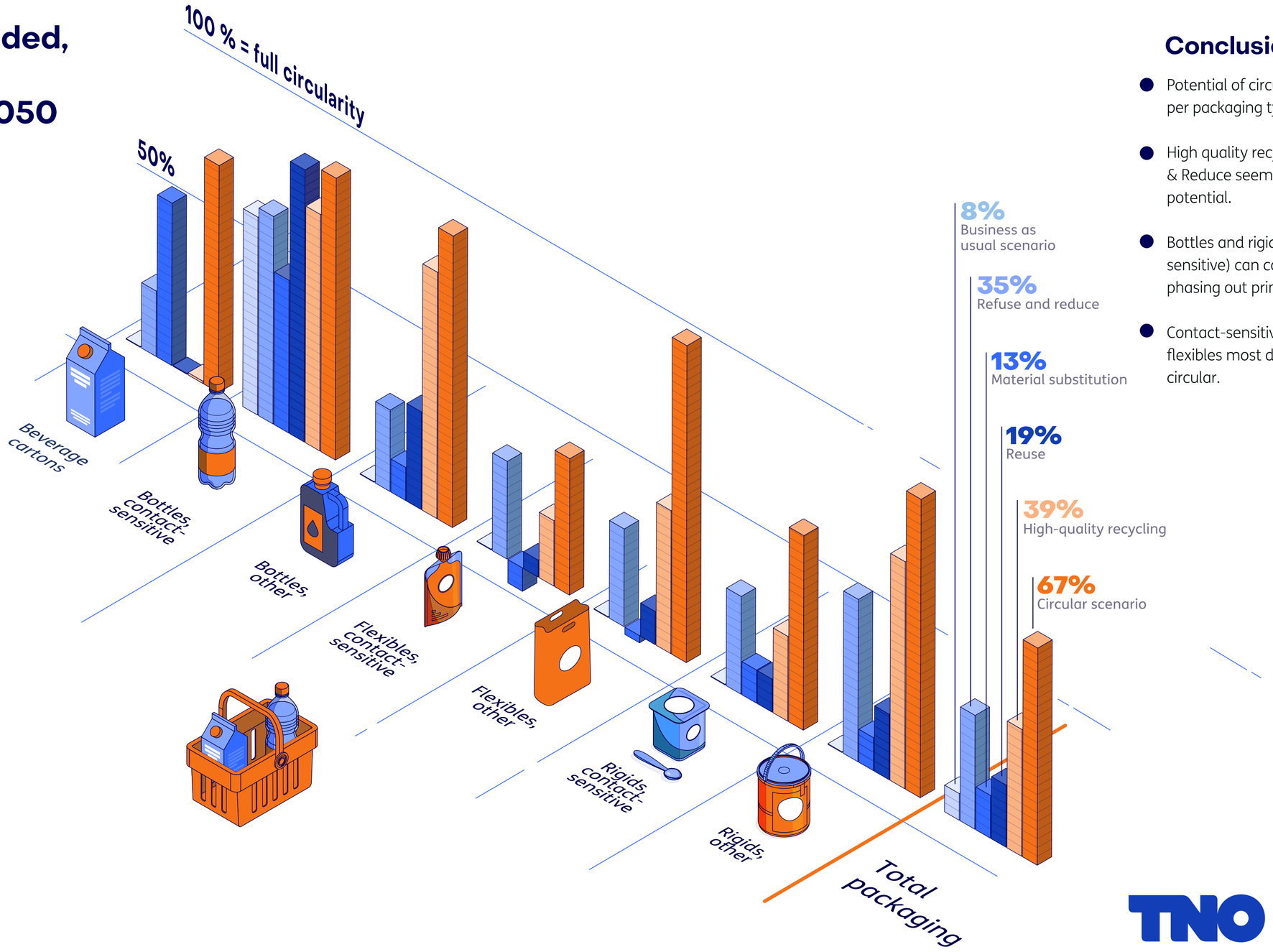
All strategies are needed, to come close to the circularity goals by 2050

% Avoided primary material per scenario and packaging type

- Business as usual scenario
- Circular scenario
- Refuse and reduce
- Material substitution
- Reuse
- High-quality recycling



Conclusion

- Potential of circular strategy differs per packaging type.
- High quality recycling and Refuse & Reduce seem to have most potential.
- Bottles and rigids (non-contact sensitive) can come close to phasing out primary material use.
- Contact-sensitive packaging and flexibles most difficult to make circular.

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