Impact assessment study of an EU-wide collection for recycling target of beverage cartons

THE ALLIANCE FOR BEVERAGE CARTONS AND THE ENVIRONMENT

February 2022

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Our study highlights the positive impact of introducing a beverage carton collection target of 90% in 2030 at EU level

Overview of proposed target and study approach

What we propose:

- **Beverage carton collection[1] target of 90% in 2030 at EU level (transposed in national legislations)**
- Timeline – as soon as possible (considering required procedural steps and other legislation initiatives currently under discussion[2])
- Target to be enforced by countries similarly to all other material targets without additional admin burden at authorities' level[3], annual reporting by countries on target realization, penalties for non-realization

Study approach

- The study first reviews **key dimensions to outline the role of beverage cartons (BCs) and context** for the need for an EU wide collection target
- To illustrate the benefits of an EU-wide collection target for beverage cartons, the study considers both **qualitative and quantitative aspects in our exercise**
  - We employed a systematic approach to simulate a **"no target case" and two scenarios ("main" and "optimistic")** considering the introduction of a collection target of 90% in 2030 for BCs
  - To identify the impact of targets on evolution of collection rates, the study **analysed historical EU rates evolution vs. set targets & timing for all materials in past 20 years**
  - To complement the quantitative analysis, we also **reviewed EU countries with BC collection targets to derive qualitative insights**

1) Collection defined as volumes collected for recycling; 2) e.g. legislation of uniform collection guidelines at EU level; 3) Monitoring and reporting of responsibility at PRO level, similarly to all other targets

Source: Roland Berger

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We employed a systematic approach to simulate a "no target" case and two scenarios assuming a collection target of 90% in 2030 for BCs

Methodological approach to derive environmental impact (on collection rates and CO_2e reduction) in 2030

Historical analysis of the collection rate evolution for packaging materials across EU countries, corelated with the timing of new/ increased material targets' introduction

Qualitative analysis of countries with national BC specific targets (Belgium, Germany, Austria)

Current BC context, planned infrastructure investments along the collection, sorting & recycling value chain

Derivation of impact of target introduction on the increase/ evolution of the collection rate (over time, also corelated with market maturity)

Derivation of a **"no target"** scenario for BC collection until 2030 ("no-change baseline)

No target case

90% COLLECTION TARGET SCENARIOS IN 2030, ADOPTION IN 2022/2023

Main scenario

Scenario I ("no target") + full impact derived historically

Optimistic scenario

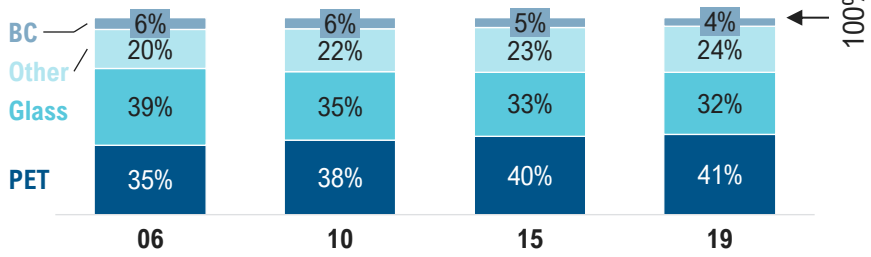
Derivation of an optimistic "what-if" scenario for 2030 – assuming what collection rate should be reached in each country to achieve a 90% collection rate at EU level in 2030

Source: Roland Berger

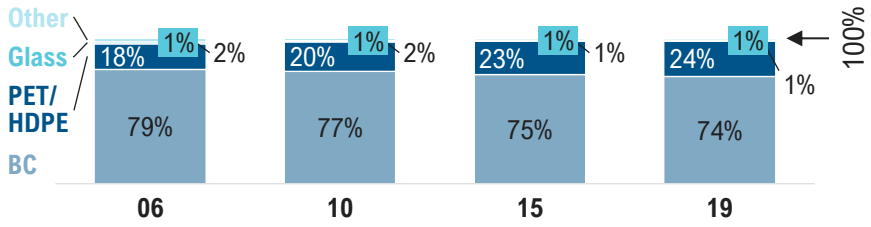
Beverage cartons play an important role in EU's food & beverage as a sustainable packaging with a low CO2 footprint

Role of beverage cartons in the EU packaging landscape, evolution

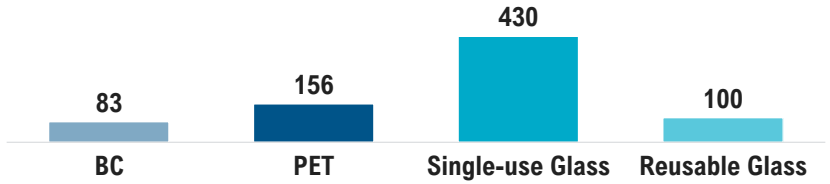
Beverage packaging volumes put-on-market [% of volumes by weight/ tons], 2006 - 2019



Milk packaging volumes put-on-market [% of volumes by weight/ tons], 2006 - 2019

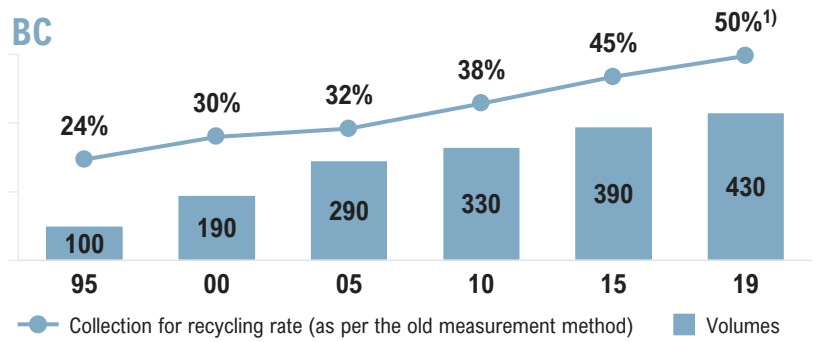


Comparison to other packaging [g CO_2e per liter]

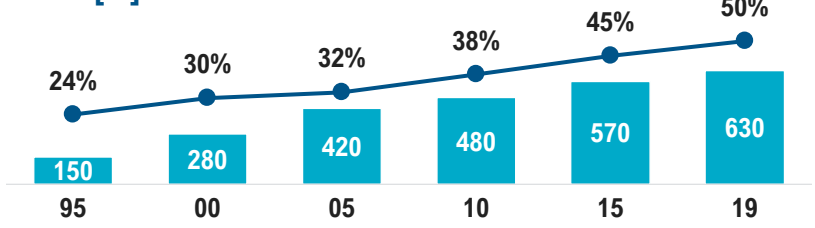


Source: Euromonitor, ACE, Extract, Circular Analytics; Roland Berger

Volumes collected for recycling [k tons] & rates as percent of put-on-market 1995 - 2019



CO_2e avoided due to BC recycling [k tons] & collection rates [%] 1995 - 2019



1 pp BC recycling = 12,700 tons CO_2e

1 pp BC recycling ≈ 10,400 fewer cars

1) Inclusion of EU 27, 51% in case of inclusion of UK, Norway and Switzerland
2) Available here
pp = percentage point

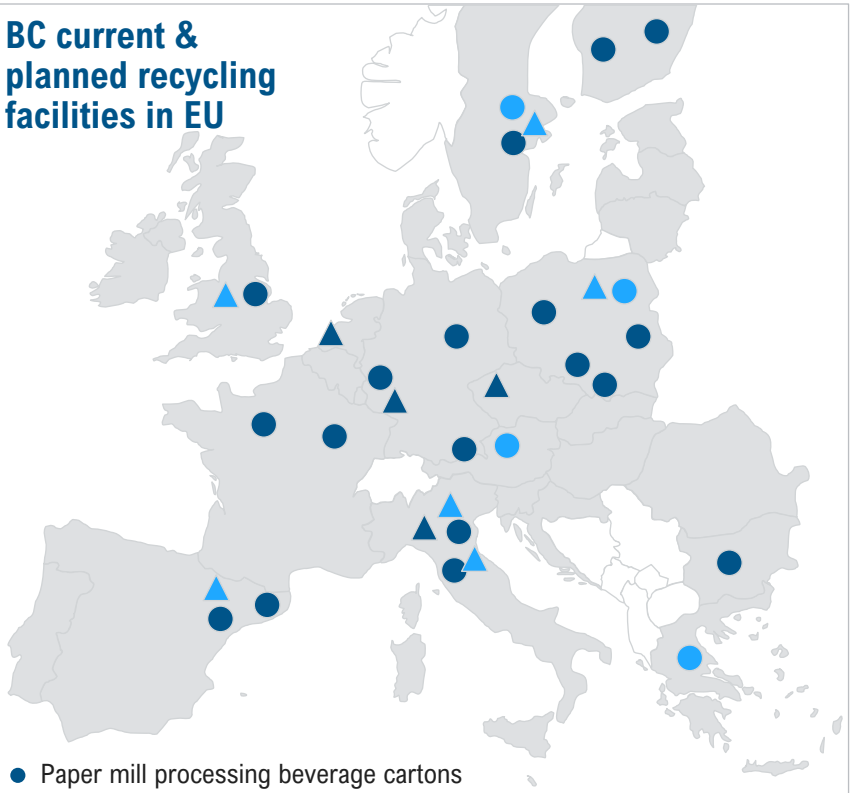
Key Takeaways

- Beverage cartons (BCs) are a key beverage packaging **with a share of 4% of EU beverage packaging** (alcoholic and non-alcoholic drinks) and **~75% of EU milk packaging**
- BCs contribute to food security and resilience across the EU by providing packaging for essential food with a long shelf-life
- BCs collection rates have increased steadily in the previous 15-20 years, driven by the increase of rates in countries with performant Producer Responsibility Organisation (PRO) collection schemes, but also enforcing national BC specific targets
- As per a Circular Analytics 2020 study[2], BCs are on average among the lowest emitting packages per liter, with the least amount of plastic, when compiling multiple sources with different methodologies
- Disposal of packaging entails ~54 g CO2e per 1 liter package; Collection and recycling emissions amount to ~7 g CO2e per 1 liter package; Resulting net emissions which are reduced through recycling are ~48 g CO2e per 1 liter package

Infrastructure for BC recycling well developed, further investments planned; BCs discriminated versus PET bottles

BC recycling infrastructure & collection schemes at EU level

BC current & planned recycling facilities in EU



- Paper mill processing beverage cartons
- Paper mill/ UBC facility under construction
- PolyAl recovery facility
- PolyAl facility under construction

Material recycling targets at EU level [%]

	2020	2025	2030
Plastic packaging recycling	23%	50%	55%
Glass packaging recycling	60%	70%	75%
Paper & board packaging recycling	60%	75%	85%

Specific targets at EU level [%]

	2020	2025	2030
Plastic beverage bottles collection target (SUPD)		77%	90%
Recycled content rPET		25%	30%

Key Takeaways

- BC industry has **so far invested ~EUR 200 m** in recycling capacities and plans **to further invest EUR ~120-150** m until 2027 (of which ~2/3 for PolyAl recycling capacities)
  - Without specific BC targets there is high feedstock risk for planned and in-construction recycling facilities
- Packaging material targets at EU level have been supplemented in various complementary legislation initiatives with specific targets impacting PET:
  - The 90% collection target included in the Single Use Plastics Directive for plastic bottles strongly stimulated the collection of PET bottles
  - Recycled content targets also create positive incentives for PET collection and recycling, stimulating the demand side
  - Both regulatory targets, coupled with the sustainability targets of the FMCG stakeholders result in **a "positive discrimination" of PET bottles**, thus potentially leading to a competitive distortion of market demand for beverage packaging

Source: Eurostat, ACE, Extract, Country research, Roland Berger

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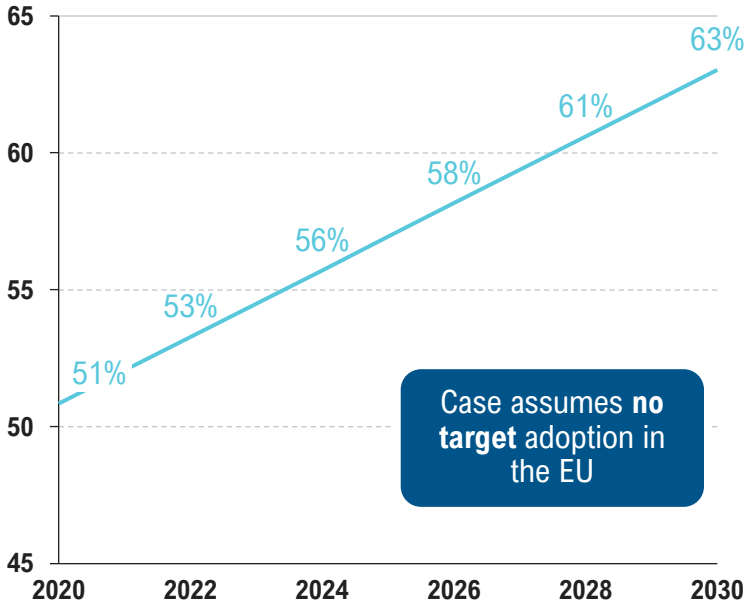
The 1st case simulated assumes that the proposed collection target will NOT be adopted ("no target case")

Environmental impact, collection rate outlook until 2030, **"No target case"**

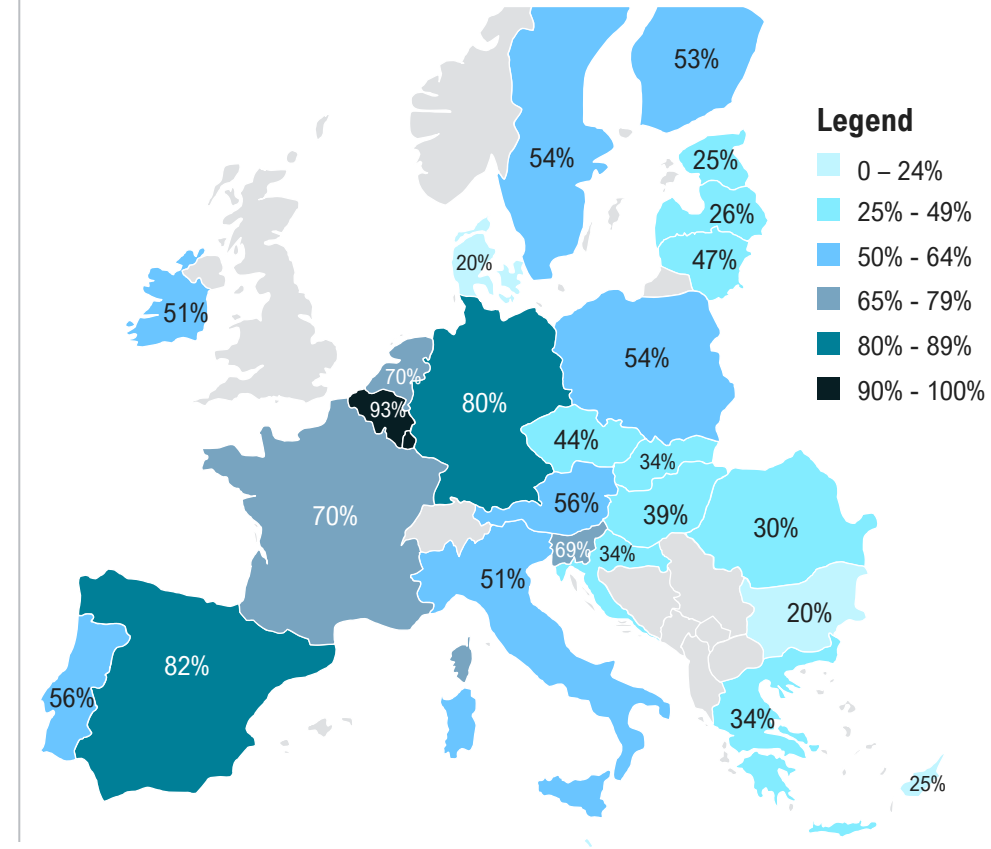
EU wide BC collection rate timeline [%]



Methodology

- Simulation conducted for each country and aggregated at EU level by weighting with BC volumes put on market (assuming 0% volume growth over time)

BC collection rate in 2030 [% of put-on market]



Key Takeaways

- The "no target case" is a **hypothetical and unadvisable scenario,** given the benefits of an EU wide collection target for BCs
- The scenario is based on the following hypotheses:
  - Current collection context (fractions, costs of collection, historical evolution of the rates)
  - Existing infrastructure for collection and recycling of BCs
  - Plans of stakeholders involved in the value chain (PROs, recyclers, collectors and sorters, BC packaging producers etc.) to invest in supplementing infrastructure
  - Presently known relevant national legislation initiatives, incl. planned national collection targets for BCs

Source: Eurostat, ACE, Roland Berger

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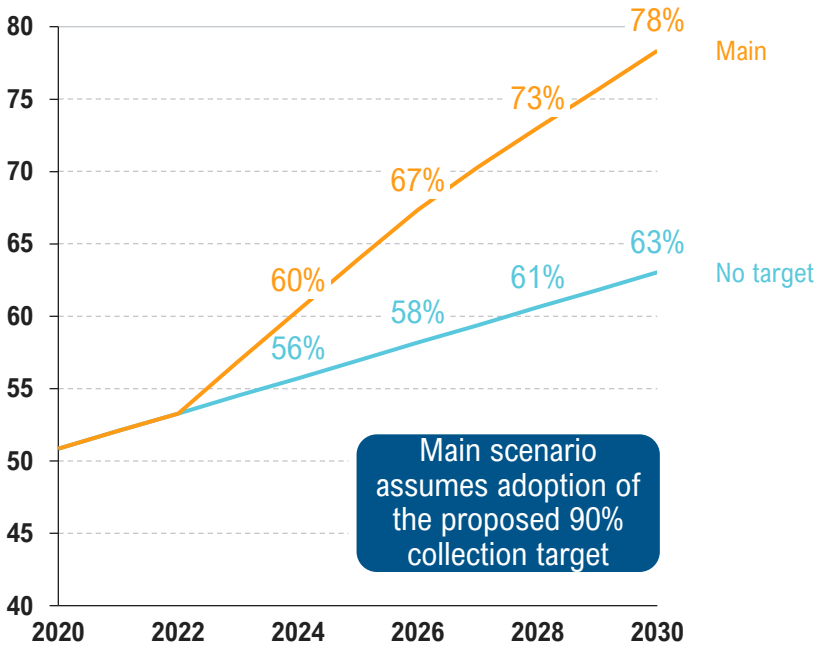
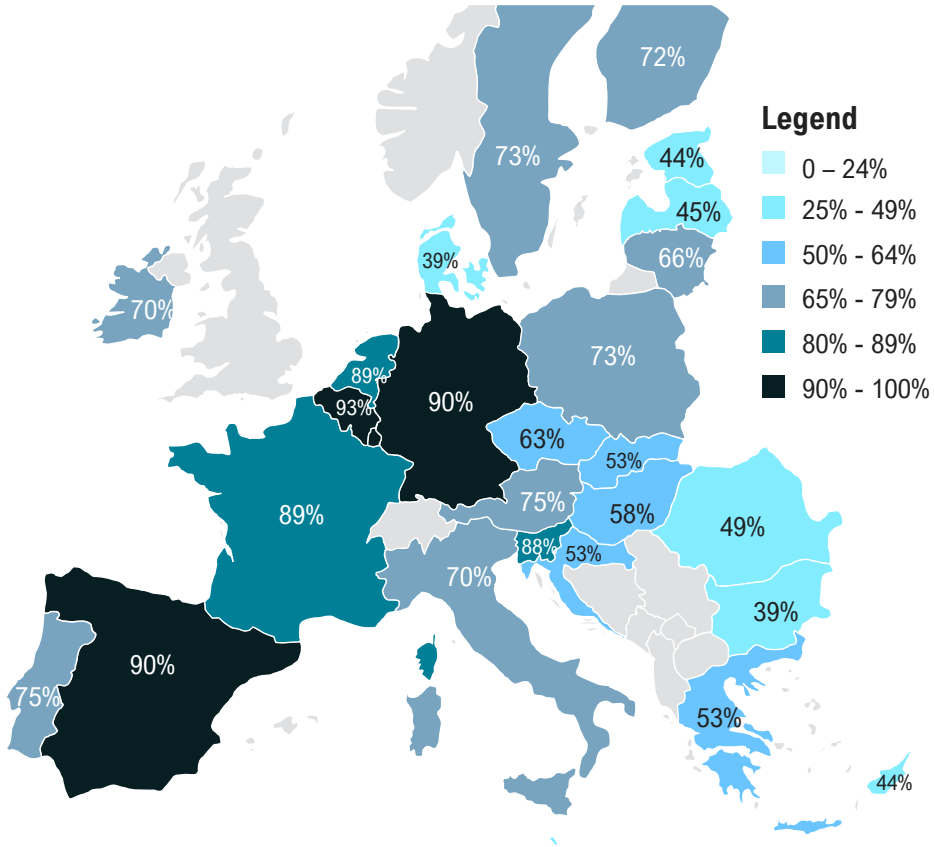
Main scenario (assumes target adoption) is derived based on hypotheses of full effect of the historically observed impact of targets, resulting in a 78% collection rate in 2030

Environmental impact, collection rate outlook until 2030, **"Main scenario"**

EU wide BC collection rate timeline [%]



BC collection rate in 2030 [% of put-on market]



Methodology

- Simulation conducted for each country and aggregated at EU level by weighting with BC volumes put on market (assuming 0% volume growth over time)

Key Takeaways

- 78% collection rate for BC in 2030 is achieved assuming a **full impact from historically observed impact of targets (2.4 pp excess collection rate growth)**
- Result of the introduction of a 90% collection target at EU level for 2030 (target introduction beg. of 2023)
- Given the **qualitative insights** obtained from the country case studies and the planned national BC collection targets in other key EU countries, **coupled with the quantitative derivation** of the impact observed historically, **we believe that this scenario is the most realistic**

Source: Eurostat, ACE, Roland Berger

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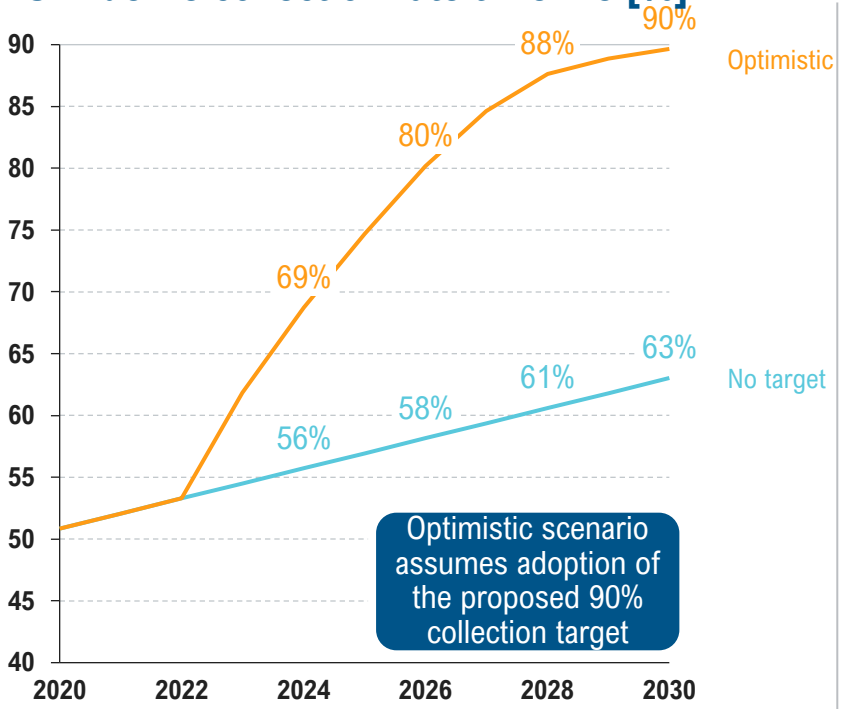
Optimistic scenario (assumes target adoption) is a "what-if" scenario, highlighting a 2030 collection rate for each country, required to reach 90% at EU level

Environmental impact, collection rate outlook until 2030, **"Optimistic scenario"**

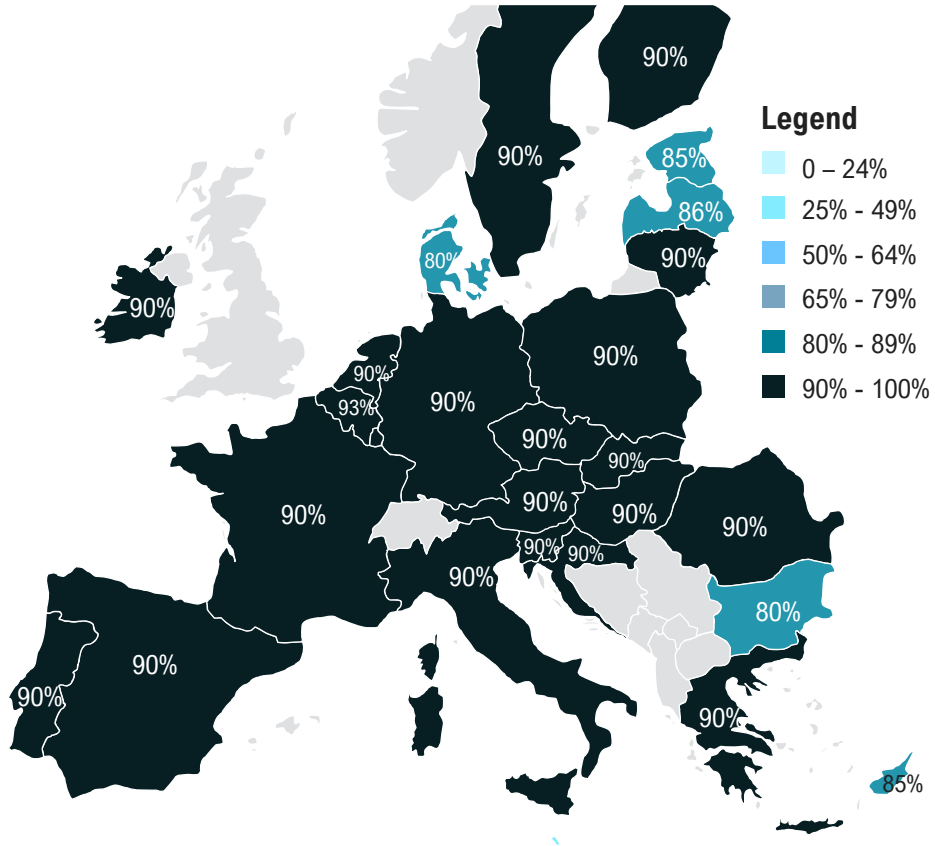
EU wide BC collection rate timeline [%]



Methodology

- Simulation conducted for each country and aggregated at EU level by weighting with BC volumes put on market (assuming 0% volume growth over time)

BC collection rate in 2030 [% of put-on market]



Key Takeaways

- **Scenario constructed as a "what if" scenario,** simulating which collection rate would have to be reached in each country by 2030, in order to achieve an EU-wide collection target of 90%
- The scenario is based on the following hypotheses:
  - Current collection context (fractions, costs of collection, historical evolution of the rates)
  - Existing infrastructure for collection and recycling of BCs
  - Plans of stakeholders involved in the value chain
  - Presently known relevant national legislation initiatives, incl. planned national collection targets for BCs
  - This scenario can be viewed as an optimistic upside with high probability, given the observed evolution in the country case studies (Belgium, Germany)

Source: Eurostat, ACE, Roland Berger

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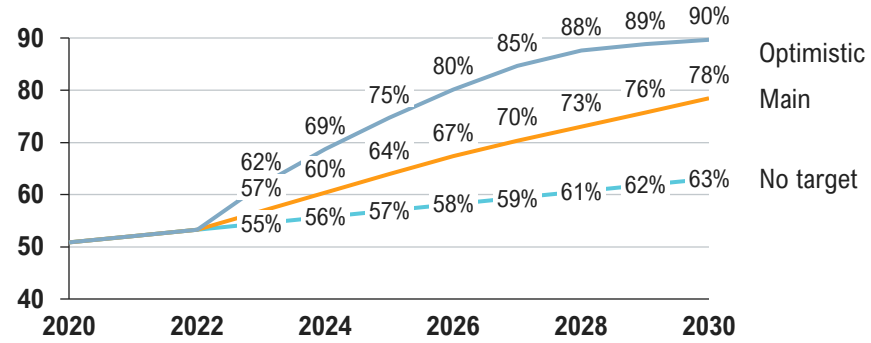
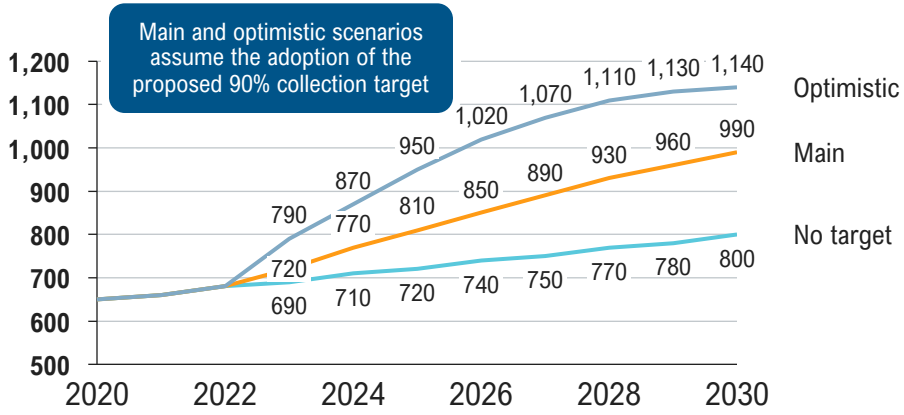
The CO_2e reductions from increasing BC collection are equivalent to removing additional 160-280 k cars off roads vs. "no target" scenario

Environmental impact, CO_2e reduction derived from simulated collection rates

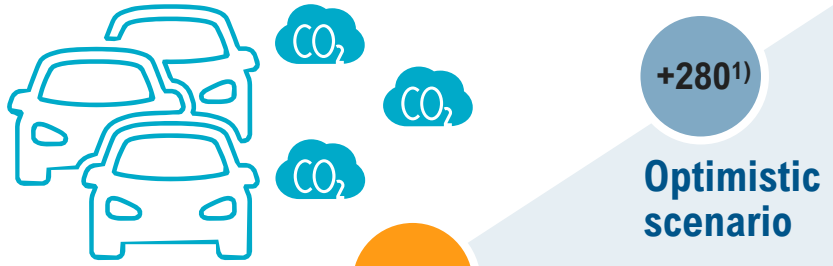
EU wide BC collection rate timeline [%]



Annual CO_2e emissions reductions in each scenario [k tons]



Equivalent car emissions in 2030 (per year) [k cars]



+280[1] **Optimistic scenario**

+160[1] **Main scenario**

650 **No target case**

Methodology:

- **EEA car emissions 2020:** 108 g CO_2e/ km
- **EU vehicle-km/ year:** 11,300 km
- **Vehicle emissions/ year:** 1.2 tons CO_2e

Key Takeaways

- Given the quantitative simulation exercise, coupled with the qualitative insights obtained from the review of the collection performance in the countries with existing BC targets, we believe that the main scenario has the highest likelihood
  - No target Scenario is used to facilitate the discussion on whether to introduce a collection target at EU level
  - Not only BCs, but also other materials would fail a realistic simulation to reach a 90% target by 2030 (in spite of existing targets)
- The main scenario would thus result in a reduction of ~1 million tons of CO2e at EU level in 2030
  - **190 k tons of CO2e in addition to "no target case" in which the 90% target would not be introduced**
  - This is equivalent to ~**160 k cars removed from the roads in 2030** in addition to 650 k cars removed in "no target case"

1) vs. no target case

Source: Eurostat, Circular Analytics, ACE, Roland Berger

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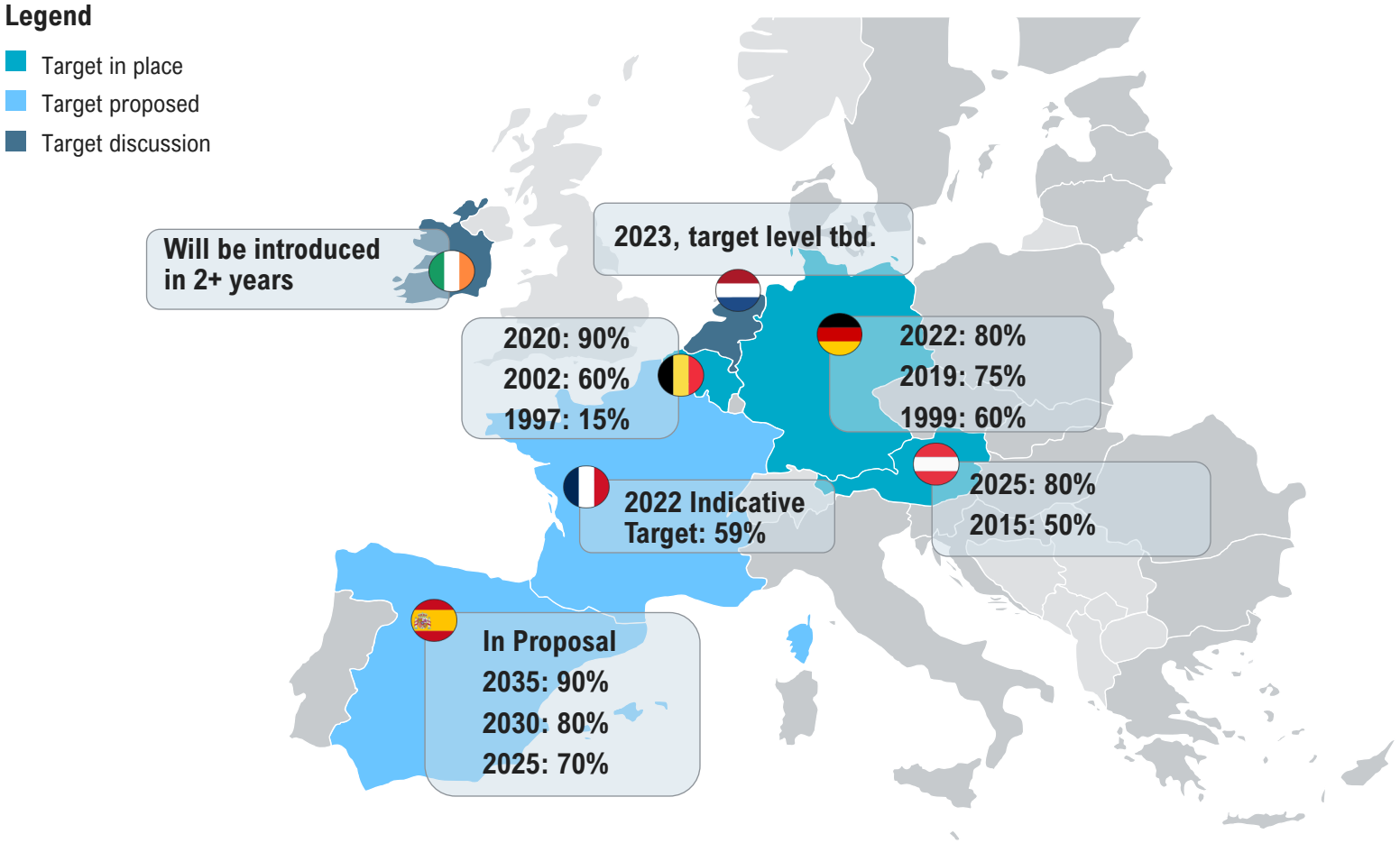
To complement the quant analysis, we also reviewed EU countries with BC collection targets to derive qualitative insights

Review of EU countries with current or planned BC collection targets



Source: Interviews, ACE, Roland Berger

Key Takeaways

- The countries where BC targets have been in place for some time (e.g. Germany and Belgium) display a BC collection and recycling performance well ahead of other European countries and above their own BC collection targets
- Certain key/ large EU countries will/ plan to introduce a BC specific collection target with the objective to increase their performance (e.g France, Spain)
- In Austria, the BC collection target introduction in 2015, which has been raised in 2021, has not impacted collection performance, in part due to:
  - Lack of consumer awareness regarding the correct collection bin
  - Recycling target set considerably lower than collection target, which disincentivizes further collection as sorting is limited to achieve volumes needed to achieve recycling target

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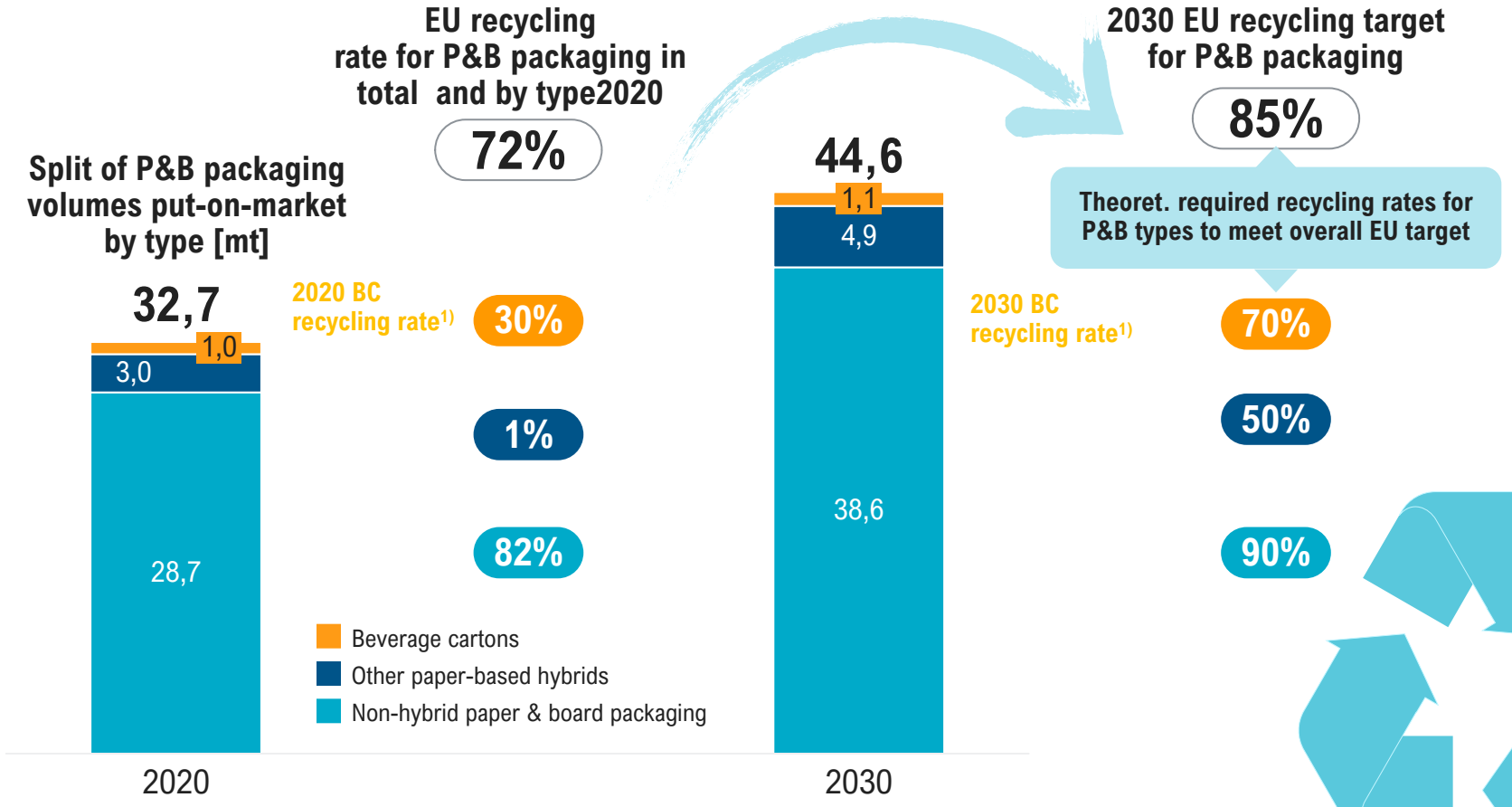
The collection target & resulting increase of the BC recycling rate will also contribute to the target realization for paper & board

Contribution to the recycling rate realization for paper and board (P&B) packaging



Key Takeaways

- Drastic increase required for paper-based hybrid packaging (incl. BCs) to meet the overall EU recycling targets for paper and board
  - Non-hybrid materials already at 82%, further increase will be more and more challenging
  - Hybrid materials aside from beverage cartons still largely untapped
- Recycling of hybrid materials including BCs also in own interest of Paper & Board Packaging producers
  - Strong need to meet expectations of environmentally conscious customers and consumers
  - Further cost reductions from reuse of hybrid paper waste; creates valuable secondary raw material
  - Further increase of recycled material usage required to drive ESG commitments

1) Equivalent to a required ~50% collection rate today and 90% collection rate in 2030

Source: EU legislation, CEPI, ACE, PCRRG, Indexbox press research, Roland Berger

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Both the quantitative impact simulation and the qualitative insights obtained from country case studies highlight the benefits of a BC collection target at the EU level

Summary of arguments in favor of the EU wide collection target for beverage cartons

Level playing field

- Ensuring a level playing field for all key beverage packaging categories (with **current "discrimination" for plastic bottles**, i.e. PET benefitting from the 90% collection target for plastic bottles for 2030, as per the SUPD)

Environmental impact (collection rate & CO2)

- Compared to other beverage packaging categories, BC have the **smallest CO2e footprint**; However, all BCs put on market impact the environment with ~630 k tons CO2e in 2019
- The introduction of an EU-wide target for **BCs would add 15-27 pp to the recycling performance of BCs**, thus reducing their impact by 190 k tons to 340 k tons per year relative to "no target case" in 2030

Contribution to overall P&B target realization

- Increasing the BC recycling rate towards a 90% target will significantly **contribute also to the realization of the already set recycling target of 85% for P&B at EU level**, specifically in the context of the difficult to collect/ recycle other paper based multi-layer food packaging

No additional financial impact on FMCG producers

- Financial impact assessed via EPR fees (which is also a proxy for the end consumer impact) - there is **no impact (based on a relevant statistical causal relationship) on EPR fees** from the introduction of targets
- The increase of EPR fees is typically corelated with the increase of the collection rates, given the required infrastructure for collection, sorting and recycling of packaging

Transparency

- The **two country case studies (DE, BE) underline the benefits of additional transparency and enforcement** for the monitoring of accurate BC volumes collected
- At national level PROs and packaging authorities will monitor and report the collection rate consistently, whilst ensuring accuracy of data
- Increases to national admin costs are negligible as the main responsibility will remain with the PROs as for the other targets); only effort is related to aggregation of data in case of frameworks with competitive PROs (e.g. Germany, where in fact a national BC collection target already exists)

Source: Interviews, ACE, Roland Berger