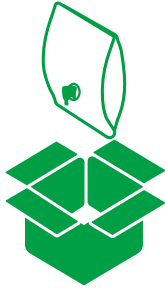


 Smurfit Kappa



BAG-IN-BOX

**A SUSTAINABLE
PACKAGING
SOLUTION**



ENVIRONMENTALLY FRIENDLY DURING THE WHOLE LIFE CYCLE

As the world continues to understand the relationship between packaging and the environment, here at Smurfit Kappa, we are passionate about leading in and providing the best and most sustainable packaging for all our customers.

Bag-in-Box is one of those solutions that can considerably reduce your packaging and the overall supply chain footprint.

While today's focus is on the end-of-life of a packaging, it is important to consider packaging in its whole life cycle (and not only end-of-life).

Bag-in-Box packaging offers many advantages:

GLOBAL WARMING

Best-in-class carbon footprint according to LCA studies



LESS FOOD WASTE

Bag-in-Box prevents food waste



75% TO 100% RECYCLABLE

Bag-in-Box is made of 75% corrugated box, fully recyclable. The bag can be recycled in a number of countries.



LESS MATERIAL

Bag-in-Box is a great example of packaging reduction



AT LEAST 75% RENEWABLE RAW MATERIALS

Corrugated is a fully renewable material, our bags can be made with 53% of renewable and recycled materials.



TRANSPORT REDUCTION

Bag-in-Box enables considerable transport and storage savings



LIMITED ENERGY AND WATER

The needs for water and energy is limited



NOT LITTERED

Bag-in-Box is consumed at home

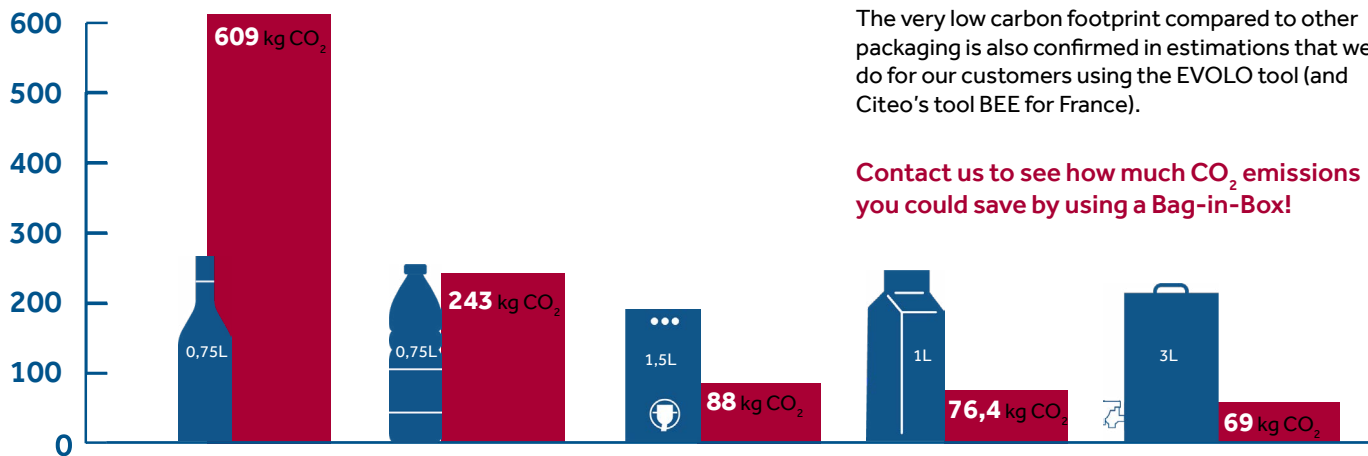
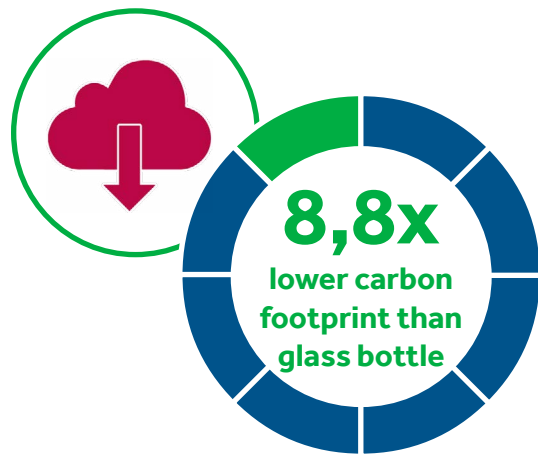


LOW IMPACT ON GLOBAL WARMING ACCORDING TO LCA STUDIES

Global warming occurs when carbon dioxide (CO₂) and other air pollutants and greenhouse gases accumulate in the atmosphere and absorb sunlight and solar radiation that have bounced off the earth's surface. A carbon footprint is the amount of greenhouse gases—converted into «equivalent CO₂»—released into the atmosphere. An increase in greenhouse gas emissions, is the primary factor associated with global warming leading to the rise of sea level, mass species extinction, extreme weather etc.

Today, Life Cycle Assessments (“from cradle to grave”) are the most comprehensive studies to evaluate the complete impact of a piece of packaging on the environment. In a study conducted in 2018 by Alko Oy, Bag-in-Box clearly shows the best results in terms of global warming potential.

In average, 90% of the carbon food print comes from the packed food and only 10% from the package (source Citeo). When a package prevents food spoilage, it's also better for global warming because most of the carbon emissions comes from the food production.



The very low carbon footprint compared to other packaging is also confirmed in estimations that we do for our customers using the EVOLO tool (and Citeo's tool BEE for France).

Contact us to see how much CO₂ emissions you could save by using a Bag-in-Box!

Kg CO₂ eq/unit, Unit = 1000L wine consumed in Norway, Source: Update of wine packaging LCA – Final report Alko Oy - Gaia Consulting Oy, April 2018

BAG-IN-BOX IS BEING USED DURING SEVERAL WEEKS AFTER OPENING

Thanks to its ingenious concept, air does not enter while dispensing, enabling thus the product to stay fresh during many months before opening and several weeks after opening.

It has no connection with single-use fast food containers or cups which are among the biggest marine polluters.

According to the European law, Bag-in-Box of ≤ 3 litres used for liquid beverage (wine, water, beer, juices, milk, etc.) are to be considered single-use plastic packaging. However, we strongly disagree with this decision. Bag-in-Box is not an individual drink packaging and should not be considered as such as it is designed as a multi-portion packaging enabling fractioned use over a very long time.

Even though the laws are regularly updated and modified, there is no objective of forbidding BIB, even in the long-term.



BAG-IN-BOX PREVENTS FOOD WASTE

By optimally protecting the product before and during use to maximise the shelf life and enable consumption by glass, Bag-in-Box prevents the contents from being wasted.

It is an important global problem, as over 930 million tonnes of food is wasted every year, representing almost a fifth of the global food produced in the world (source: U.N. report, 2021). As 90% of the carbon emissions comes from the packaged food (vs 10% packaging), it is extremely important to fight against food waste!

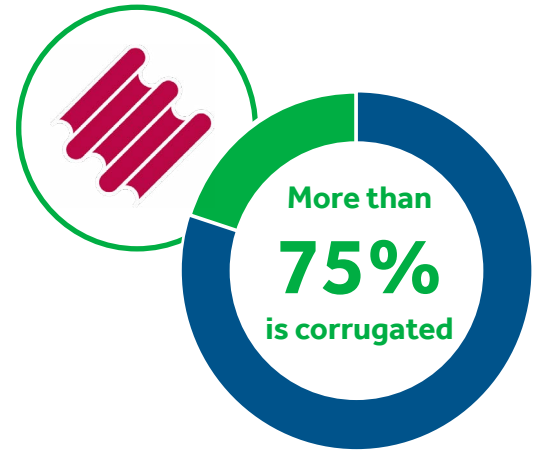
75% TO 100% RECYCLABLE

More than 75% of a 3-litre Bag-in-Box package is corrugated – light and fully recyclable, the remaining 25% is plastic which in many cases can nowadays be also recycled in a number of European countries.

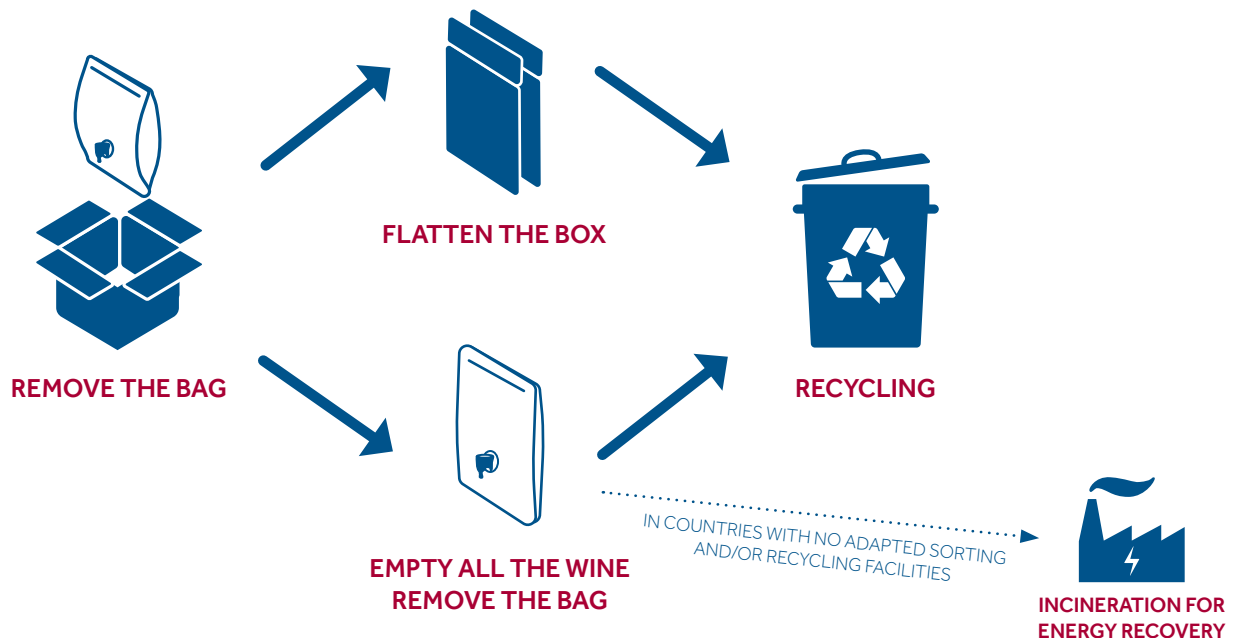
Corrugated cardboard is fully recyclable and biodegradable with 85% of corrugated packaging is currently recycled in Europe. The box and the bag are easily separable, facilitating sorting and sending the two components into correct recycling stream.

The standard 3L plastic bag with the tap weighs 35 grams only. In many European countries there are recycling facilities for standard PE and EVOH bags and relevant collecting and sorting regulations are in place.

Our R&D is focusing on improving the recyclability of bags. We are testing new materials and compositions to maintain high performance of Bag-in-Box and follow the recommendations of the plastic packaging resource management authorities.



WHAT TO DO WITH AN EMPTY BAG-IN-BOX?

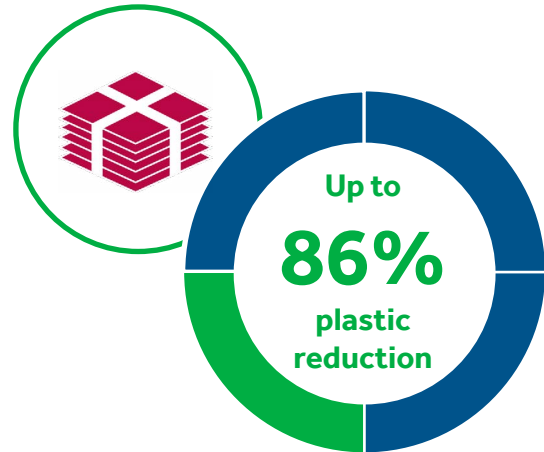


BAG-IN-BOX IS A GREAT EXAMPLE OF PACKAGING WEIGHT REDUCTION

One Bag-in-Box of 10L weighs only 359g (59g bag and 300g box), whereas one metallic jerrican of 10L weighs 2,5kg. And 13,3 bottles of 0.75L needed to pack 10L of product weigh up to 5,5kg, it means **15x more!**

We have compared our bags with different rigid plastic containers usually used for the same product and the plastic reduction is huge - between 54% and 86% according to different packaging types compared.

According to Flexible Packaging Europe, **26 million tonnes** of packaging materials would be saved if all food was packed in flexible packaging.





RIGID	20L TIN	10L TIN	5L TIN	10L BUCKET	5L BUCKET	BOTTLE PET 5L	BOTTLE 3L HDPE
WEIGHTING	816g	433g	152g	325g	179g	88g	125g
BAG	20L Nylon Maxiflow	10L EVOH NBV	5L EVOH Vitop	10L EVOH Topette	5L EVOH VOP	5L EVOH Vitop	3L EVOH Vitop
WEIGHTING	140g	61g	40,8g	55g	48,1g	40,8g	35g
% REDUCTION	83%	86%	73%	83%	73%	54%	72%



AT LEAST 75% RENEWABLE RAW MATERIALS

75% of a Bag-in-Box is made of corrugated - a paper-based material that is fully renewable, and our bags can be manufactured with over 50% of renewable and recycled materials.

Over 90% of our corrugated packaging is certified Chain of Custody.

Our bags can also be made of recycled and renewable materials upon request. In fact, when using our E-recycled EVOH film structure combined with the Vitop® Renew (made of bio-based PP resins), the complete bag is composed of 53% of recycled and renewable materials.

BAG-IN-BOX ENABLES CONSIDERABLE TRANSPORT AND STORAGE SAVINGS

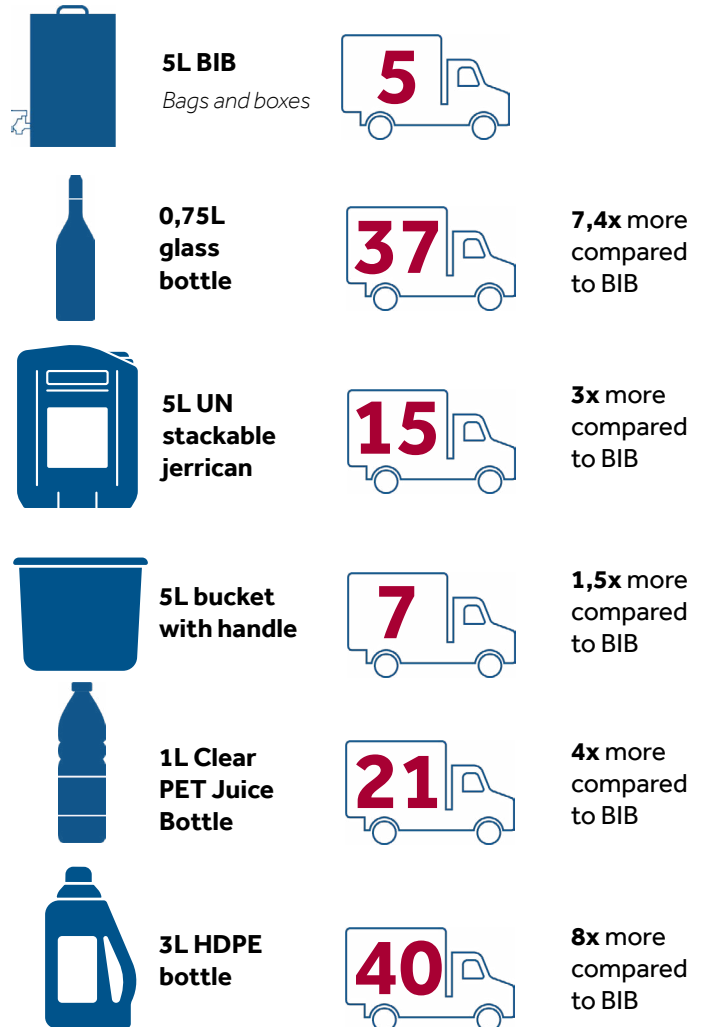
Empty packaging is delivered flat using very little space and, after filling, is easy to palletise. This leads to substantial savings in logistic costs and CO₂ emissions.

In a truck, 6x more empty Bag-in-Box packaging can be transported than bottles, and 40% more filled packaging than glass bottles. For example, a truck transporting 5 litre bags and boxes is equivalent to over 7 trucks transporting 75cL bottles.

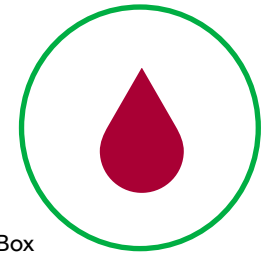
The Bag-in-Box takes limited space when stored thanks to its rectangular shape. It is easy and quick to place on shelf displays which enables full use of the facing space.



TRUCKS WITH EMPTY PACKAGING NECESSARY FOR FILLING 1 MILLION LITERS

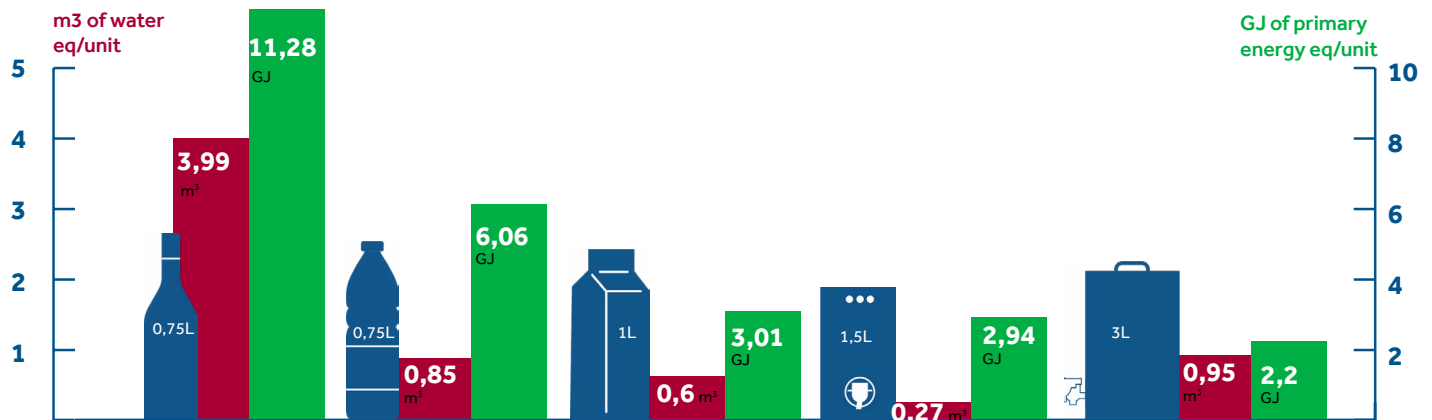


BAG-IN-BOX PRODUCTION REQUIRES LIMITED WATER AND ENERGY



Compared to other packaging types, the water and energy consumption for Bag-in-Box production is relatively low.

In a study conducted in 2018 by Alko Oy, Bag-in-Box clearly shows the best results in terms of water and energy consumption.



Unit = 1000L wine consumed in Norway

Source: Update of wine packaging LCA – Final report, Alko Oy - Gaia Consulting Oy, April 2018

BAG-IN-BOX IS NOT BEING LITTERED



Bag-in-Box is not among the plastic products frequently found on the beaches or in nature, such as PET bottles or snacks packs.

In fact, Bag-in-Box is consumed at home and disposed in a dust bin after use most of the time. It is not an individual packaging consumed on-the-go, therefore the risk of polluting a forest or a beach is limited.

A very small part of flexible packaging used in Europe is being littered. In fact, less than 0.1% ends up as marine litter (source: Flexible Packaging Europe, 2022).

BAG-IN-BOX HAS GREAT ENVIRONMENTAL CREDENTIALS IN ALL ASPECTS



	BAG-IN-BOX	GLASS BOTTLE	RIGID PLASTIC TIN	ALUMINUM CANS	PET BOTTLE
Low impact on climate change	😊😊😊	😊	😊😊	😊	😊😊😊
Limits food waste	😊😊😊	😊😊	😊😊	😊😊	😊😊
Recyclable	😊😊	😊😊😊	😊😊😊	😊😊😊	😊😊😊
Lightweight	😊😊😊	😊	😊😊	😊😊	😊😊
Saves transport	😊😊😊	😊	😊	😊	😊😊
Requires limited water and energy	😊😊😊	😊	😊😊	😊😊	😊😊
Renewable raw material	😊😊	😊😊😊	😊	😊	😊
Not littered	😊😊😊	😊😊	😊😊	😊	😊



OBJECTIVE :

IN ADDITION TO ALL THESE IMPORTANT ENVIRONMENTAL ADVANTAGES OF BIB, LET'S KEEP IMPROVING ITS SUSTAINABILITY CREDENTIALS!

Bag-in-Box is a highly technical and strictly regulated packaging that requires high barriers, excellent mechanical performance and, above all, it must be suitable for food contact.

Today, biodegradable materials simply do not achieve this level of performance and the development of new materials will take some time to ensure complete food protection.

Our bags that are certified by Institut cyclos-HTP GmbH are recyclable in countries where the collection, sorting and recycling of flexible plastic packaging is in place.

We are on a positive path to improve even more the quality and therefore the value of the recyclates obtained.

Constant improvement of our packaging solutions is at the core of our work, following closely guidelines and recommendations from the competent authorities.



We are taking our sustainability progress very seriously and we are intensively working on the following topics:

- Circular Economy Working Group
- Engaging with organisations working on Circular Economy in Europe
- Research and development of new materials with our partnering suppliers
- Continuous market intelligence in search of innovations
- Applied research - European project InGreen
- Environmental performance of our plants



We are fully committed to the circular economy philosophy and we share the idea that materials and systems for collecting, sorting and recycling waste need to be improved to reduce plastic pollution and landfill.



For more information about our actions, please read "Our actions" brochure!