

# Forum for Circular Plastic Packaging - recommendations and action



FORUM FOR  
CIRKULÆR  
PLASTEMBALLAGE



This manual is a further development of the manual that was prepared in 2015 as part of the project “Increasing the Reuse of Packaging” under the EU LIFE+ project Plastic Zero - Avoiding Plastic as a Waste.

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# Foreword

The Forum for Circular Plastic Packaging is a role model for how we in Denmark can achieve constructive results when companies, NGOs, politicians and stakeholders get together and engage in fruitful dialogue.

The rationale of the Forum for Circular Plastic Packaging has been that we think in a circular way when developing tomorrow's packaging. Together, we have created concrete ideas for packaging that is not only effective in protecting its contents but is also designed to be returned and to become new products.

All parties are agreed that we shall become far better at reusing plastic packaging. We shall do this out of consideration for the environment and the climate and also to create more green workplaces, and this has been precisely the concept at the heart of the Forum for Circular Plastic Packaging.

As members of parliament, we are delighted to have been involved in the creation of the recommendations of the Forum for Circular Plastic Packaging and we look forward to incorporating them into our future parliamentary work.

## Enjoy reading them!

### **CHRISTIAN POLL**

*(environmental spokesperson for the Alternative Party),*

### **CARSTEN BACH**

*(environmental spokesperson for Liberal Alliance)*

### and **IDA AUKEN**

*(environmental spokesperson for the Danish Social-Liberal Party & former minister of the environment).*



## The Context

# Plastic today

Plastic packaging cannot be avoided. Packaging protects its contents, considerably extends the shelf life of food products and minimises food waste. A number of surveys conclude therefore that plastic packaging helps to reduce our CO<sub>2</sub> footprint<sup>1</sup>.

But our use of plastic packaging is not without its problems. Far too little packaging is collected and reused – both in Denmark and globally – and plastic packaging is one of the types of waste that most frequently ends up in the natural environment and in the sea. Both are very real problems – which we shall solve!

When developing future packaging it is therefore vital that we help ensure greater recycle and less waste ending up in the wrong places – while maintaining the packaging's positive properties.

Every year, Denmark generates 216,000 tons of plastic waste from packaging alone<sup>2</sup>. At a global level, 30% of today's plastic packaging must be fundamentally redesigned if it is to be recyclable. On the other hand, 50 % of today's plastic packaging would be economically attractive to recycle, if we adjusted the design and collection structure<sup>3</sup>.

In other words: a far greater proportion of the packaging shall be capable of being retained after use in a circular economy, where we can use its resources again and again.

With the adoption of the UN's 17 Sustainable Development Goals (SDGs), there is an increasing global demand for sustainable solutions that safeguard our climate and environment without compromising price, function or quality. If we can find the right solutions, the potential is enormous.

The launch of the EU's first plastic strategy in 2018 lays the foundations for unlocking the circular potential of plastic packaging. A potential that Denmark has a unique opportunity to fulfil, while achieving increased sustainable Danish exports.

For Denmark, the development of plastic packaging is a position of strength. Denmark is thus in a position to be right at the forefront of developing a circular flow for plastic packaging production and consumption. By rethinking the value chain for plastic packaging, we can put ourselves into a driving seat that can lead to innovation, new jobs, increased competitiveness – and better products for consumers and the environment.

<sup>1</sup><https://samvirke.dk/artikler/emballage-er-agurkens-bedste-ven>

<sup>2</sup><https://plast.dk/2017/07/plastblog-vi-skal-genanvende-langt-mere-vores-emballage/>

<sup>3</sup> Ellen MacArthur Foundation – New Plastics Economy: Catalyzing Action 2017

From challenge to opportunity

# The vision for circular plastic packaging in Denmark

There are thus very many good reasons for changing the way we produce and consume plastic packaging today. The tool for the solution can be found in the circular economy, in which we produce packaging that can be reused and recycled again and again.

But no single stakeholder can do this alone. If we join together across the value chain, we can jointly develop solutions for unlocking the circular potential.

The Danish Plastics Federation has therefore taken the initiative for the Forum for Circular Plastic Packaging in Denmark. The forum has been working with The Circular Way for over a year to create tomorrow's solutions for sustainable plastic packaging by bringing together stakeholders from all interests and all parts of the value chain to jointly initiate the necessary action.

The members of the forum include packaging manufacturers, politicians, food producers, NGOs, retail chains, municipalities, researchers, recycling companies and consultants, who have worked together to establish both a vision and concrete action.

We are working proactively and we are already putting concrete measures into action in the conversion to circular plastic packaging. But we must move in fellowship, both

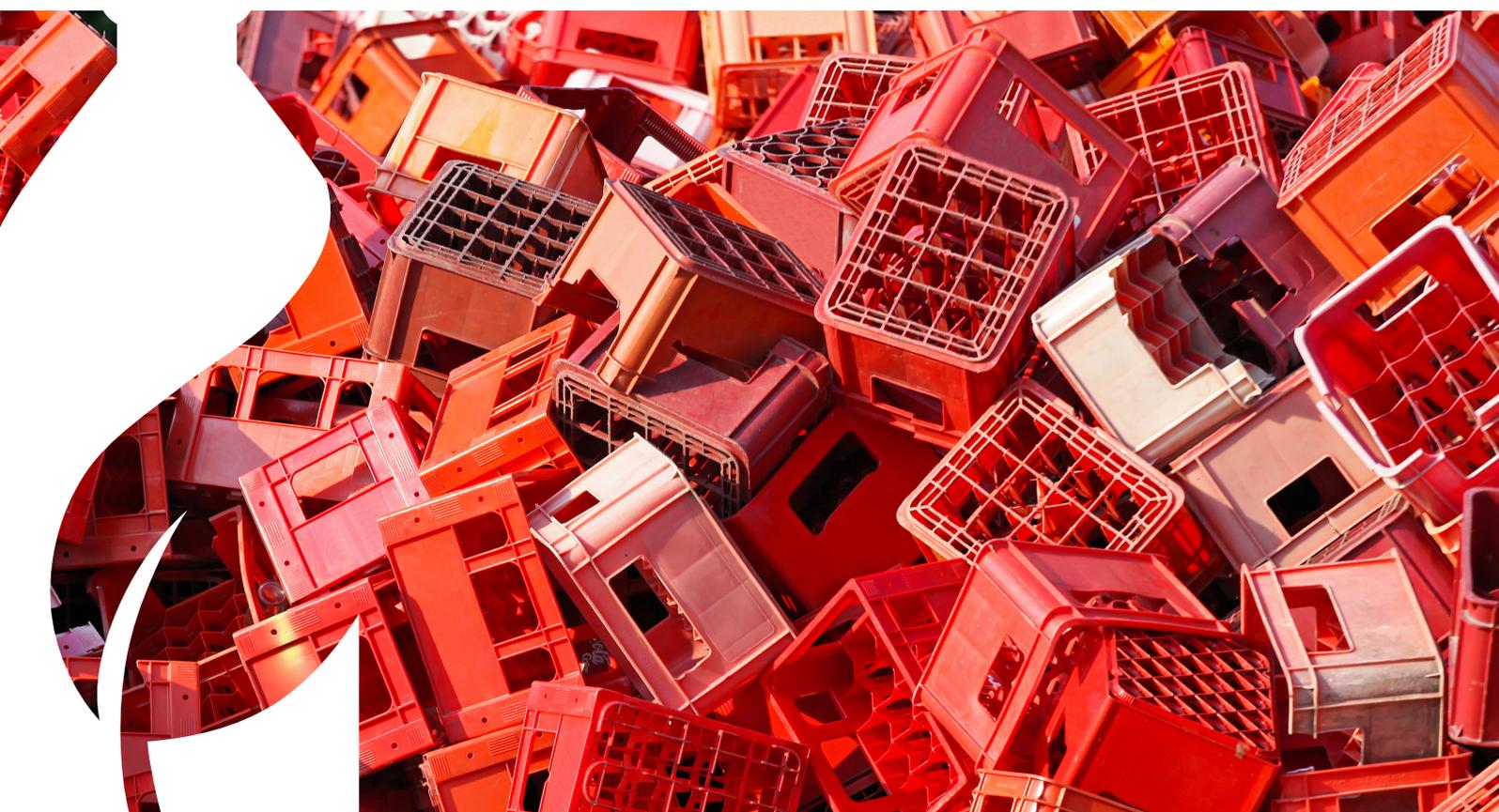
inside and outside the forum. These recommendations and activities shall therefore also be seen as input for the political work, including the Danish action plan for plastics which is currently being formulated. It is also our hope that industry and designers as a whole will adopt the results and draw benefits from the forum's work.

The potential is great. So are our ambitions. We therefore undertake, right across the forum, to work towards fulfilling the following vision:

## Denmark as a role model for circular plastic packaging

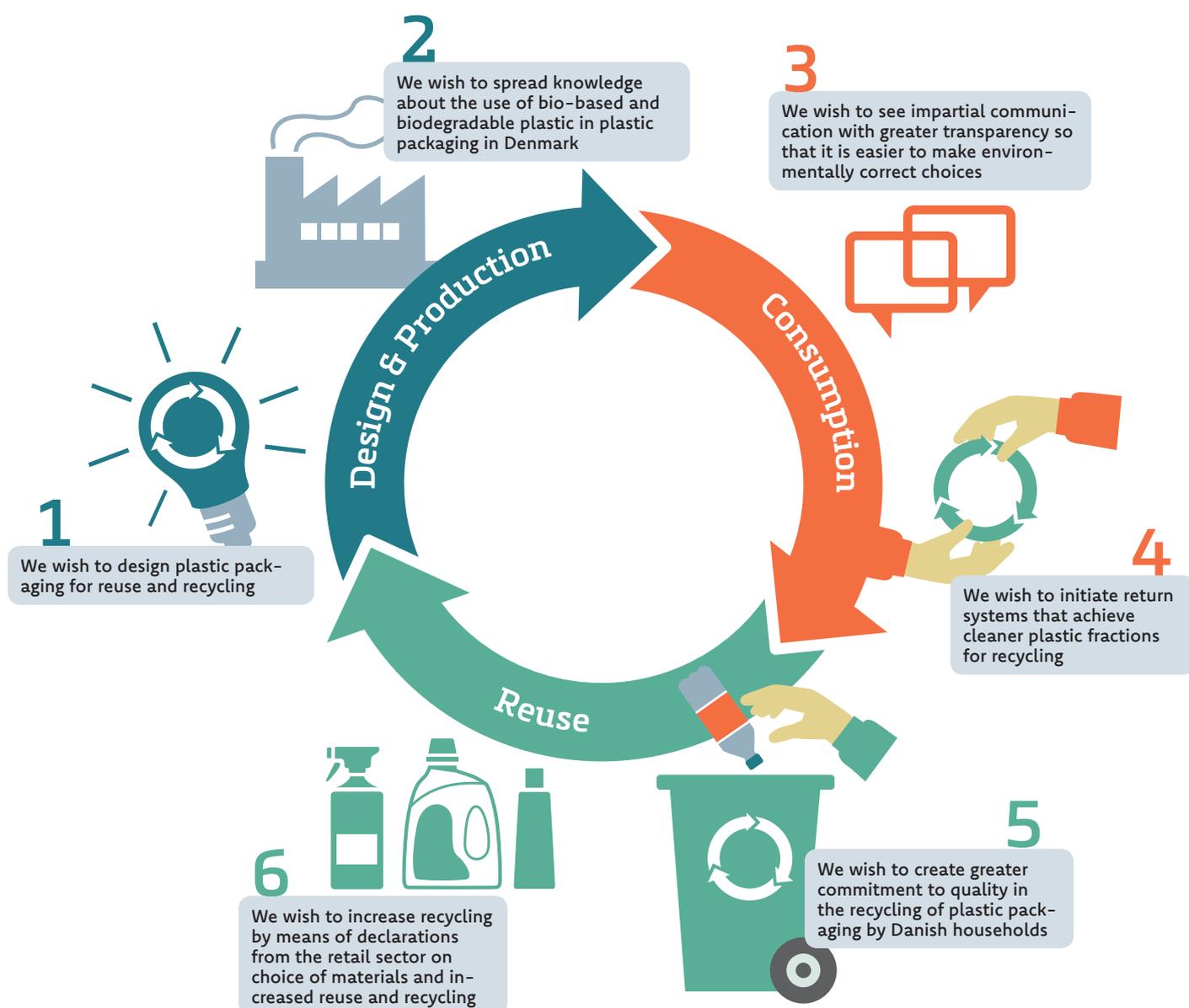
- ▶ Where there is an incentive to use plastic again and again
- ▶ Where we design plastic products that provide value for society, consumers and the environment
- ▶ Where the global plastic packaging solutions of the future begin

The vision for circular plastic packaging in Denmark has been set. The possibilities are enormous, but only through close collaboration with the focus on action can the vision be achieved and the potential unlocked.



The way forward

# The Forum for Circular Plastic Packaging's recommendations



In 2017, the government's Advisory Board for the Circular Economy issued a wide range of concrete recommendations for how Denmark can realise the potential of the circular economy. In this connection, the advisory board describes

the circular value chain as it is seen here. We have taken this illustration as our starting point and placed the recommendations of the Forum for Circular Plastic Packaging in it.

## 1 We wish to design plastic packaging for reuse and recycling

The path to circular plastic packaging starts in the design process. We have developed a design manual which shall ensure that packaging for private use can be reused or recycled. The manual addresses the critical points that enable reuse and recycling. Simple plastic materials shall be chosen rather than complex materials that make recycling more difficult. Materials chosen shall be kept to PE, PP and PET, because these represent the greatest uniform quantities at present. It is also vital that packaging can be easily cleaned of labels, covers and contents.

The design manual shall guide producers in the design of packaging for recirculation. It shall also help the retail sector to set requirements for the recyclability of plastic packaging. The design manual shall be updated annually so as to reflect developments in materials and collection and sorting techniques. Finally, the design manual provides direct input for the development of future legislation on producers' responsibility for packaging.

### WE PLEDGE THAT

- ▶ We will implement the design manual across all packaging producers in Denmark and distribute it to other countries
- ▶ In the retail sector, we will demand packaging that complies with the design manual
- ▶ We will revise the design manual every year so that it reflects new sorting and handling technology and the development of new types of material, such as recycled plastic

## 2 We wish to spread knowledge about the use of bio-based and biodegradable plastic in plastic packaging in Denmark

Bio-based plastic has great potential for circular plastic packaging. We can also see that at present there is a great deal of confusion about the definitions and use of bio-based and biodegradable plastic. We will therefore work to create greater transparency in the use of bio-based and biodegradable plastic.

We recommend that plastic packaging in Denmark is made from plastic materials that can be reused and recycled, so that it can be recirculated again and again. **BIODEGRADABLE** plastic cannot be recycled together with petroleum based plastic, because in principle it can be composted. We recommend therefore that biodegradable plastic is not used for packaging that ends up in household waste in Denmark. Instead, biodegradable plastic should be used where the plastic is composted so that it cannot contaminate the natural environment and recycling chains. This could be in agriculture, for example. Furthermore, EU standards for biodegradable plastic should be drawn up.

**BIO-BASED** plastic, on the other hand, can be reused and recycled together with traditional plastic. We therefore recommend that the use of bio-based plastic in PP, PET and PE is continued and expanded for packaging for private use on the condition that the biomass is based on sustainably cultivated crops. In this context, the environmental effects of bio-based packaging should be investigated further by the EU.

### WE PLEDGE THAT

- ▶ We will NOT use biodegradable plastic in the production of plastic packaging
- ▶ We will work for the development of EU standards for biodegradable plastic
- ▶ We will set requirements for the sustainable production of bio-based plastic and, provided that it is sustainably produced, we will extend the use of bio-based plastic in the production of plastic packaging
- ▶ We will work towards ensuring that the environmental effects of bio-based plastic are further investigated by the EU
- ▶ We will develop guidelines for the use of bio-based plastic according to the design manual

## 3 We wish to see impartial communication with greater transparency so that it is easier to make environmentally correct choices

It can be very difficult for both consumers and professionals to identify which packaging solutions are the best in terms of design, consumption, the environment and recycling. It is important to be able to make choices on an informed basis and to treat packaging as a valuable resource that shall be returned and become new products.

There is therefore a need for a platform to provide technical and balanced information about plastic packaging and its design - and recycling possibilities. This platform should be owned and operated by an impartial and trusted party. The portal can be used as a debate forum in which future packaging solutions are developed. The portal is aimed at the media, consumers, stakeholder organisations and companies.

### WE PLEDGE THAT

- ▶ We will work for the creation of a web portal for the dissemination of information about plastic packaging, strongly endorsed by the Danish Environmental Protection Agency and with content input from a board. This shall have its source in the Forum and consist of representatives from industry, scientific institutions, NGOs and other stakeholder groups.

## 4 We wish to initiate return systems that achieve cleaner plastic fractions for recycling

By initiating return systems, we can increase the recycling of plastic materials. The potential for recycling is greatest in the recycling of mono-materials rather than large quantities of mixed plastic types. Return systems can be created directly between consumers and producer or via the retail sector or other parties.

### WE PLEDGE THAT

- ▶ We will test the potential of an extended return system in the retail sector that could engage and involve consumers in the recycling process
- ▶ We will work to ensure that the advantages and disadvantages of closed return systems are investigated in a Danish context

## 5 We wish to create greater commitment to quality in the recycling of plastic packaging by Danish households

Almost 50% of all packaging ends up in Danish households. This is also the plastic source from which absolutely the least is recycled. Only 15% is recycled from households, compared with 64% recycling in commerce and industry<sup>4</sup>. There is therefore great potential. By aligning the sorting of plastic at national level so that households sort into plastic and sorting stations sort into PP, PET and PE, we can considerably increase the quality of recycling of plastic packaging. Sorting at the sorting stations can be extended on an ongoing basis to include more types of plastic, so that a certain quality and quantity can be achieved that can secure environmental benefits, marketing opportunities and economic sustainability.

### WE PLEDGE THAT

- ▶ We recommend aligning waste sorting in Denmark so that all households on a national basis shall in future sort the fraction Plastic (possibly both hard and soft plastic together) without mixing in glass or metal.

<sup>4</sup> Danish Environmental Protection Agency - Waste Statistics 2015

- ▶ We recommend that municipal sorting stations sort out PE, PP and PET, which currently represent 75% of all plastic from Danish households.

- ▶ We recommend that recycling stations on a national basis sort into the four fractions: PVC, soft plastic, hard plastic and product sorting so as to raise the quality of the sorted plastic.

## 6 We wish to increase recycling by means of declarations from the retail sector on choice of materials and increased reuse and recycling

We have identified great potential in standardising in the retail sector the materials that are used in packaging fractions and that do not reach consumers. These may be flower trays, flower buckets or straps, for example. We have therefore prepared declarations for the retail sector with the aim of changing and standardising the flow of waste so that greater quantities of plastic packaging are reused or recycled rather than incinerated.

The purpose of the declarations is to standardise demand for specific plastic products produced from specific types of plastic, to collect the material and to transport it for reuse and recycling. More and better recycling can be assured by creating a common demand for more standardised plastic products. Several retail chains have already signed the declarations.

### WE PLEDGE THAT

- ▶ We will encourage all retail chains to sign a declaration on the demand, collection and transportation of specific types of plastic products, such as flower trays, flower buckets and straps, which are not sold to consumers, for reuse or recycling.
- ▶ We will identify more product groups with potential for recycling through return systems via the retail sector and other plastic-consuming businesses and expand the concept of declarations

You can read more and find the recommendations and actions in more detail at [www.plast.dk/emballage](http://www.plast.dk/emballage)



# Denmark as a role model for circular plastic packaging

To ensure that Denmark becomes a role model, we must act – and we must act now. For this reason the Forum for Circular Plastic Packaging has already begun a number of tests

and initiatives to kick-start the circular conversion. You can see here how concrete action is already working towards the attainment of some of the components of the vision.

## DENMARK AS A ROLE MODEL FOR CIRCULAR PLASTIC PACKAGING

### Where there is an incentive to use plastic again and again

As demand for cleaner plastic packaging increases<sup>5</sup> and plastic packaging is being designed for reuse and recycling, larger quantities of cleaner plastic will be sent for recycling.

This provides economies of scale in the recycling process, thus improving its economy.

#### What we have done

We have prepared a business case for the collection of flower trays, buckets and straps that shows a financial gain for the individual retail store. In the longer term, when collection is expanded to include more plastic materials, the financial gains will increase.

#### BUSINESS CASE FOR STRAPS, FLOWER TRAYS AND FLOWER BUCKETS

##### POTENTIAL

- ▶ About 2,200 tons of plastic straps are scrapped every year in Denmark.
- ▶ About 7,500 tons of flower buckets and trays are scrapped every year in Denmark.
- ▶ By far the greater part of this total of 9,700 tons of plastic is currently sent for incineration.

**FLOWER TRAYS** are produced from 3 different types of plastic which cannot be mixed together in a recycling process. On the other hand, each of the three types is suitable for recycling individually. If each retail store only used one type of plastic – PS – for its flower trays, recycling would become much easier and more financially cost effective.

**FLOWER BUCKETS** are almost always made of PP, which is suitable for recycling. This will be maintained!

**STRAPS** are made from various materials and often each strap contains several different materials. The strap itself may be PS, the hook metal and the clamps PVC. A small number of the straps are made of only one kind of plastic and are therefore suitable for recycling, but these are usually sent for incineration. If each retail store only used one type of plastic – PS – for its straps, recycling would become much easier and more financially cost effective.

#### IF THE ABOVE PRODUCTS WERE SYSTEMATICALLY COLLECTED FOR RECYCLING

- ▶ Earnings for the retail sector from sorting rather than incineration: DKK 500 per ton
- ▶ 9,700 tons of plastic recycled instead of incinerated = min. 30 jobs and turnover of > DKK 50 mill. million
- ▶ 9,700 tons of reused plastic of a quality that makes it an alternative to virgin raw materials = 23,280 tons of CO<sup>2</sup> emissions saved

<sup>5</sup> <https://newplasticseconomy.org/news/11-companies-commit-to-100-reusable-recyclable-or-compostable-packaging-by-2025>

## Where we design plastic products that provide value for society, consumers and the environment

Design for recycling is a decisive step in attaining the vision of circular plastic packaging.

Most current plastic packaging is only suitable for energy recovery through incineration. In other words, the proportion of plastic packaging in Denmark that is made for reuse or recycling is far too small. We wish to raise this propor-

tion by ensuring that far more packaging is designed with recycling or reuse in mind. This has value for manufacturers, consumers and the environment.

### What we have done

We have developed a design manual to guide design for reuse or recycling, with the focus on recommended materials, dyes, covers and forms that should be chosen so that the packaging can be reused or recycled in the easiest possible and most financially cost-effective way.

It has been developed from the basis of how Danish plastic sorting technologies work now with the aim of achieving as high quality and value from the plastic in household waste as possible.

Today, packaging products are made from a wide range of plastic materials. This presents a challenge, because small quantities of many different materials are more difficult to manage and financially less attractive than larger quantities of fewer types of materials. To make recycling as easy and cost effective as possible, it is

vital that the number of different plastic materials that are used in packaging products is reduced. The manual therefore recommends the use of the plastic types PE, PP and PET in the design of future packaging. These types of plastic have been chosen because they are already the most widespread and currently represent about 75 per cent of the plastic in Danish household waste.

The manual will be revised once per year so as to reflect newly developed technologies and plastic materials, such as recycled plastic.

The table for plastic packaging for private use makes up most of the design manual, which also includes other material that clarifies the plastic's optimum design, including concepts for reuse. The full design manual is available at [www.plast.dk/emballage](http://www.plast.dk/emballage)

# Design manual for plastic packaging for private use

To be revised annually

Criteria Quality	Main component (Container, bucket, tray, bottle, foil)	Sub-component (Closures, lid, inserts, seals)	Decoration (Cover, print, glue and labels)	Emptying (By consumer)	Examples
<b>High</b>	<p>Main component is in mono-material: PET, PE or PP.</p> <p>Shall tolerate washing to a suitable degree.</p>	<p>Sub-components are in the same material as the container or completely separated from the container in use.</p>	<p>Cover and labels are entirely removed in use or simple dismantling.</p> <p>There is no coloured print on the container, only on the cover or labels.</p>	<p>The packaging can easily be entirely emptied of residues after normal use. Only needs a light rinse with water (e.g. meat tray).</p>	<p>rPET can for example be used for new bottles, food trays and food tubs.</p> <p>rPE and rPP can for example become pipes, buckets or containers for non-food products.</p>
<b>Moderate</b>	<p>Main component is of mono-material: PET, PE or PP.</p> <p>Or a minimum content of compatible material (cf. Appendix A).</p> <p>Main component is coloured.</p>	<p>Sub-components are not separated in use but are of materials that are compatible with the main component (cf. Appendix A).</p> <p>Sub-components are coloured.</p>	<p>Cover and labels are not separated from the container but are of the same material as the container or compatible materials (cf. Appendix A).</p> <p>There may be printing on the cover, labels or container.</p>	<p>The packaging is only partly emptied of residues after normal use.</p> <p>However sub-components are easily separated so that the consumer can rinse the packaging.</p> <p>(e.g. ketchup bottle)</p>	<p>rPET can for example be used for fibres for textiles.</p> <p>Can also be used for fleece sweaters, blankets etc.</p> <p>rPE and rPP can for example become pipes, buckets or containers for non-food products.</p>
<b>Low</b>	<p>Main component consists of laminated materials that are not compatible (cf. Appendix A)</p>	<p>Sub-components contain incompatible plastic types, metal, paper etc.</p> <p>Sub-components are not separated in use.</p>	<p>Labels and cover are incompatible with the main components and cannot be removed. There is a great deal of ink printing on the packaging.</p>	<p>The packaging cannot be emptied of residues after normal use.</p> <p>(e.g. toothpaste tube).</p>	<p>Mixed plastic can for example be used for concrete filling, RDF and plastic to diesel.</p>

## Where the global plastic packaging solutions of the future begin

We will innovate and develop new solutions and become a role model country for circular plastic packaging solutions.

In the forum, we are developing concrete solutions that can increase the recycling of plastic. We have demonstrated

that it is possible to produce plastic packaging made from plastic collected from Danish households - even of a quality that can meet the requirements for use with foods.

### What we have done

In the forum, we have worked on the testing and development of plastic food product trays made from recycled PET that comes directly from household waste, which is totally new in a Danish context.

The PET that comes from households consists mainly of food contact plastic packaging and PET's material properties mean that it is possible to reuse food contact plastic PET from mixed household plastic waste to make new, food contact packaging. Based on our knowledge of PET, it was decided to test the possibility of recycling PET from households in an application that can eventually be approved for use as food packaging.

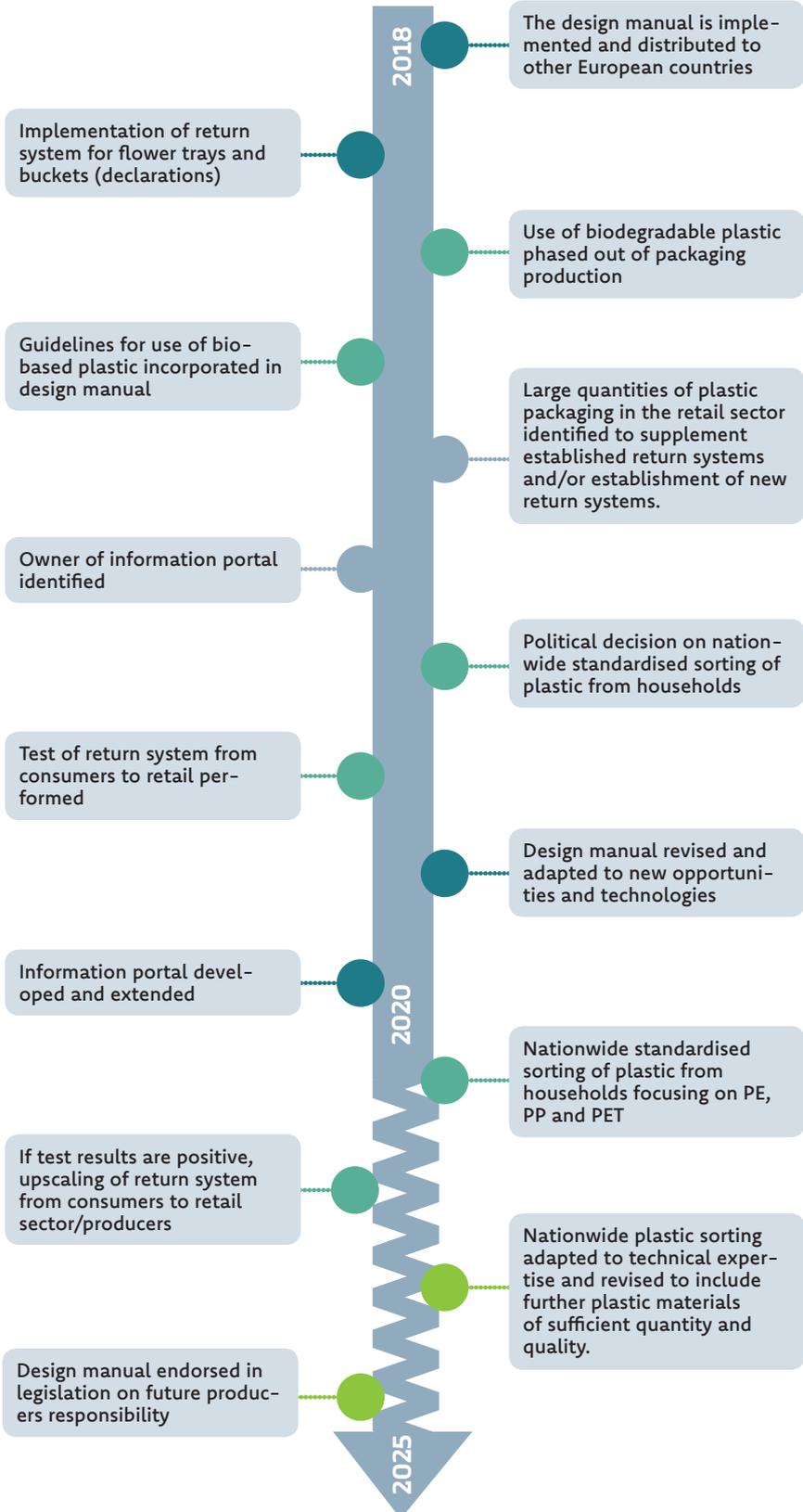
We have performed a trial with approximately 300 kg of PET collected by the City of Copenhagen that was then washed and milled by Aage Vestergaard Larsen A/S. The result is plastic trays of extremely high quality, produced by Færch Plast, that are also suitable for use with food.

PET represents 15-20 % of household-sorted plastic in Denmark. We recommend that a larger, forward-looking trial is performed on the recycling of PET of food quality. Our trial shows that the possibility of recycling household-sorted PET of food quality is greater than anticipated and is perhaps only dependent on putting existing technology together in a new way, so that we achieve better sorting and cleaning than previously.



# Timeline

We can get started on some measures and recommendations right now, while others will take a little time. We have illustrated this by describing the input in a timeline.



# From development to action

Denmark shall be a role model for circular plastic packaging. We have therefore joined together across many disciplines, worked hard and focused on developing the measures that will make Denmark a role model for the recycling of plastic.

We will reuse and recycle plastic again and again with a strong incentive structure among consumers and the retail sector. We will do this by extending the reach of declarations, by which the retail sector and the plastics industry will together raise the bar for the plastic packaging that is demanded and used in Denmark. This means that common, strict requirements will be set for plastic products. This means that new return systems will be created. And it means that the reuse and recycling of plastic will be not only a possibility but an economically and environmentally sustainable solution.

We will design plastic packaging that is suitable for reuse and recycling. Our design manual establishes a framework for how plastic manufacturers shall produce plastic packaging so as to achieve the greatest possible quality and economy in recycling. The manual creates the foundation for ensuring the quantity and quality that enables measures to be taken.

We will create tomorrow's solutions for plastic packaging. We test and develop return systems that create value for consumers, manufacturers, the retail sector and the environment. We develop technology and know-how, so that plastic packaging can be recycled into new plastic packaging - without compromising price, quality and function. We share our experience, good and bad, through an information portal and in the networks we set up based on the Forum for Circular Plastic Packaging. In this way, we continue to work together to create and develop new solutions.

By 2030, Denmark shall be a world-renowned hub for the circular economy because of its leading global position in the development, implementation and export of circular solutions<sup>6</sup>. This is a process of conversion that could appropriately be promoted with targeted funding, with both the environment and business benefiting from the results. We in the forum have set a common course for how the plastics industry will contribute to this goal.

**NOW IT IS TIME FOR ACTION.**



## Participants in the Forum for Circular Plastic Packaging



Aage Vestergaard Larsen A/S  
Mere end 45 års erfaring med genanvendelse



Within the Forum for Circular Plastic Packaging a decision-maker group has been set up, as well as a number of working groups. Results from the working groups have been evaluated and prioritised by the decision-maker group, since it has been important for the Forum for Circular Plastic Packaging to have one common approach. The combined recommendations and measures written in this publication have been sent for consultation to all participants in the Forum for Circular Plastic Packaging and amended to reflect the comments received.