Denmark without Waste II

A Waste Prevention Strategy

April 2015

The Danish Government
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Preface

We generate large amounts of waste in Denmark. Denmark is one of the highest per capita users of resources and generators of municipal waste in the world: waste that could have been prevented to benefit the environment, the climate and the economy. We have a common responsibility to protect the world’s natural resources. They are scarce and we must be more intelligent in the way that we use them in the future.

With this Waste Prevention Strategy, the Government aims to reduce wastage of resources and to prevent valuable resources from becoming waste in households and businesses throughout Denmark. In short, we want Denmark to get more out of its resources.

In 2013, the Government launched its resources strategy entitled Denmark without Waste, which focused on ensuring a greater extent of recycling. Recycling the resources can take us a long way, but we also need to explore other paths if we are to prevent waste. There is much to be saved from preventing waste from being generated in the first place. Therefore, this Waste Prevention Strategy deals with how we can produce and consume using fewer resources.

Products can be designed better from the start so that they are manufactured with fewer resources and substances of concern. The right design can also ensure that products do not break easily and are easier to fix and maintain. This generates less waste, and once we have finished using the products, we can recycle the materials in the manufacture of new ones. In that way we spend fewer resources.

Developing into a more resource-efficient society requires involvement and close collaboration between all players. The change must be anchored in society and propelled by businesses and individuals. Therefore, we must make it easy for businesses and individuals to make green choices.

This Waste Prevention Strategy outlines the Government’s directions for more efficient and effective use of our resources. The Government will provide support for the required transition by launching initiatives and by exemplifying how waste prevention pays off.

I am very pleased to be able to present this first Danish Waste Prevention Strategy. The ambition is to achieve a Denmark without waste; a Denmark where we reduce the environmental impacts from waste, so that economic growth is decoupled from impacts on nature and the environment. We have a common responsibility to ensure a healthy and sustainable environment for future generations.

Kirsten Brosbøl
Minister for the Environment
What the Government is doing

The strain on the world’s natural resources – such as metals and biomass – is, and has been, increasing over the past many years. We are increasing in numbers and consuming ever more food and materials. Our current use of resources is depleting the sources of raw materials. At the same time, increasing prices of resources will make it ever more attractive to develop and apply solutions which make our use of raw materials more efficient, replace virgin raw materials and therefore minimise waste.

Consumption affects the environment. However, the environmental problems we have are not only caused by the waste we throw away. Our manufacture and use of products often entail enormous consumption of resources in the value chain, from raw materials extraction over distribution to ordinary use of the final product. For example, the total amount of resources consumed in the production of a flat-screen TV is estimated to be more than 100 times greater than the weight of the finished product.1

It is important that overall efforts in the waste area are organised cost-effectively. Efforts must take place in all areas where the socio-economic benefits from recycling and preventing waste outweigh the costs.

This Strategy has two cross-cutting topics, Transition in Danish businesses and Green consumption, and five action areas: Less food waste, Construction, Clothing and textiles, Electrical and electronic equipment, and Packaging.

Efforts by businesses and consumers are crucial in terms of reducing waste volumes, and they are therefore essential for the two cross-cutting topics. The five action areas have been selected on the basis of an assessment identifying areas with great potential for waste prevention, as well as on the basis of extensive stakeholder engagement.

Cross-cutting topics

Businesses can enhance their competitiveness by utilising resources more efficiently and effectively and by designing their products so that products and materials can re-enter the production chain.2

The Government will support Danish businesses in becoming better at producing more for less, because this can enhance their competitiveness and pave the way for more sustainable use of resources. The Government will provide support and sparring for businesses with a view to strengthening their strategic environmental work and their resource-efficiency.

Green consumption contributes to less waste generation and increases demand for products manufactured with as little use and wastage of resources as possible. The Government will work to make it easier for consumers to buy products and services that are less resource intensive, that contain fewer substances of concern, and that generate less waste. The Government will stimulate demand for green goods and services through central and local government procurement from retailers, and for the individual consumer through information campaigns, increased use of ecolabels, and guidance about green public procurement, for example.
**Action areas**

There is **avoidable food waste** when producers, the food industry and retailers discard perfectly good food products just because they have the ‘wrong’ size, date label, or appearance. Consumers play a key role, because they often demand the very freshest food and are easily lured by volume discounts. **The Government will work to have avoidable food waste reduced in all links in the food product value chain.** The Government will make it easier for consumers themselves to take action against avoidable food waste and will support businesses in developing technical and logistic solutions, and provide guidance to the food service sector, – public as well as private.

**The construction sector** is the largest source of waste in Denmark and holds a great potential for reusing materials and for avoiding substances of concern in building materials. **The Government will work to make it easier for the construction sector to act more resource-efficiently, to ensure that substances of concern are managed in a manner that is appropriate in terms of both human health and the environment, and to ensure better knowledge sharing throughout the sector.** The Government will contribute with specific initiatives and instruments which can help make it easier to avoid wastage of resources and prevent substances of concern in construction and demolition waste.

**The textile sector** is one of the most polluting sectors in the world because of its intensive consumption of water, chemicals and energy. However, there are good prospects for changing manufacturing methods and reusing more. **The Government will work to make it easier for textile businesses to reduce their environmental impact during the manufacturing phase, as well as to make it easier to reuse and recycle textiles, e.g. by reducing the use of substances of concern in the textiles.** The Government will encourage textile businesses to reduce the environmental impact of the manufacturing and use phases. This will be achieved through a new Nordic action plan, partnerships, environmental labelling subsidies, public procurement, etc.

**Electrical and electronic equipment** becomes obsolete in a relatively short time because of fast-paced technological development, and products are often discarded even though they are still fully functional. The potential for saving resources by extending the life span of electrical and electronic equipment is therefore large. **The Government will work to make it easier to reuse and recycle electrical and electronic equipment and waste electrical and electronic equipment, so that products will have longer life spans and can be a part of circular production models to a greater extent.** The Government will make more knowledge available and will work in an EU context to promote resource efficiency and reduce the number of substances of concern in new electrical and electronic products so that they are easier to reuse and recycle.

We need **packaging** to protect products and ensure their durability. However there is much to be gained from using packaging with fewer substances of concern and that can more easily be reused and recycled. **The Government will work to reduce the overall impact of packaging on the environment.** The Government will work together with businesses to focus on the environmental significance of their choice of packaging.

With the two strategies for waste prevention and waste management, the Government has established a good foundation for work to achieve a more resource-efficient society and for work on the EU Roadmap to a Resource-Efficient Europe.

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*Furthermore, the Strategy also meets the requirement of the EU Packaging Directive for national measures for prevention and reuse of packaging.*
Bekæmp madspild!

Værsgo' - gode varer med kort holdbarhed til reduceret pris
Waste prevention

In essence, waste prevention is about wasting as few resources as possible, reducing waste volumes and minimising the content of substances of concern in products. Waste prevention comprises all types of activity which can be instigated before a product becomes waste. For example, through product designs which enhance the durability of the product, lengthen its life span, and make it possible to reuse subcomponents.

Resource productivity went up by 17% in Denmark from 2000 to 2012. This means that we are achieving a 17% greater economic value than previously from each kilo of material used. During the same period, total waste generation has more or less followed economic developments. This means that we are generating about the same amount of waste per unit of GDP today as in 2000. In other words, we have become better at producing more from fewer resources, however, we have not reduced the amount of waste we generate per DKK.

The guiding principle for waste policy in Denmark and the EU is to place top priority on waste prevention because the best outcome in terms of environmental effect is achieved by preventing waste from being generated at all. After waste prevention comes preparation for reuse, which involves cleaning, repair or similar with a view to re-using the product. If the products are unsuited for reuse, it is important, as far as possible, to recycle the materials in the waste, e.g. paper, glass and metal, so that these materials can re-enter.
the production chain. The next step involves recovery, e.g. of energy in connection with incineration of the materials to generate heat and electricity. At the bottom of the waste hierarchy is disposal, which involves landfilling the resources and therefore not exploiting them at all.

Traditionally, goods have been produced and consumed according to a linear model that starts with the extraction of resources and ends with the generation of waste. However, if we prevent waste, reuse products and recycle materials, we will move toward a more circular economy. In a circular economy, resources that would traditionally be used only once and then discarded, re-enter the production chain and thus stay in the cycle. The philosophy behind the circular economy rests on recycling materials or, even better, preventing waste by designing products that generate less waste in the production process and that can be reused and repaired and then fed back into the cycle again and again. It is important that a transition to a more circular economy makes sense from a socio-economic perspective.

Most of the environmental impact is already determined when the products are designed. In the design phase, decisions are made as to which materials will be used to produce the product and in which volumes. This phase already determines how durable the product will be and whether parts of it can be replaced so that it can be repaired if required. Furthermore, this phase will also determine whether the products will contain substances of concern, which could prevent them from being reused and recycled at a later stage.

A number of environmental regulations currently exist to support waste prevention. These include the Danish Environmental Protection Act; the Statutory Order on deposits and collection etc. of certain soft drinks; the Statutory Order on certain packaging; the Statutory Order on RoHS; the EU Ecolabel Regulation; and the EU REACH Regulation. For several years now, various taxes have been in place to prevent waste by limiting raw materials consumption, reducing waste volumes, and to promote green products which are easier to reuse or recycle. Furthermore, there are several state-owned funds, programmes and pools which provide support for the transition of businesses to more resource-efficient production. In 2015, the funding was as follows:

- The Danish Green Investment Fund: lending capacity of DKK 2 billion.
- The Energy Technology Development and Demonstration Programme (EUDP): DKK 374 million.
- The Green Development and Demonstration Programme (GUDP): DKK 211 million.
- The Danish Eco-Innovation Programme (abbreviated as MUDP in Danish): DKK 81 million.
- The Fund for Green Business Development: DKK 38 million.
- The Pool for Green Innovation: DKK 20 million.
- The Pool for Green Enthusiasts: DKK 10 million.
GOOD IDEAS FOR HOW TO PREVENT WASTE

As preparation for this Waste Prevention Strategy, an extensive stakeholder engagement process was carried out, during which individuals, businesses and organisations were able to contribute their ideas for waste prevention. Several hundred ideas were brought forward during this process. The list below presents some of the ideas that will be executed in full or in part under this Strategy:

Businesses
- Need for dialogue and insight across value chains

Consumption
- Teaching about reuse at schools

Avoidable food waste
- Establish network so that primary producers of fruit and vegetables are hooked up with relevant business partners
- Amendment of the regulations for date labelling food products

Textiles
- Stimulate waste prevention through public procurement of goods with longer life span and durability

The construction sector
- Establish a working group tasked with preparing tools to reduce waste generation in connection with new building and with proposing waste reduction targets

Electrical and electronic equipment
- Lay down requirements on the design of electrical and electronic equipment, e.g. requirements for repairability, software updating, and access to spare parts.

Packaging
- Design packaging which can be used in closed-loop production
- Packaging sizes fitted to the content
Transition in Danish businesses
– efficient use of materials

Billions for businesses to save

Much of Danish consumption of resources and materials and most waste generation takes place at businesses. This is where a substantial proportion of the environmental impact of products is determined in connection with design, production and sales activities.

The world’s population is growing and getting richer every day. Growing global consumption is putting pressure on the earth’s natural resources and has made a large number of raw materials more expensive on global markets. The trend is inciting businesses to transition to alternative manufacturing processes and business models in order to become more effective and efficient in their consumption of resources and in order to curb their resource costs.

Global prices of a number of important resources have gone up considerably during the recent decade. Furthermore, raw materials and processed materials comprise approx. 53% of the total costs of industry. Therefore more efficient and effective use of these materials is an important step towards cutting costs and at the same time increasing businesses’ competitiveness and robustness towards fluctuating raw materials prices.⁴

Green transition in businesses

Danish businesses are doing ever more voluntary strategic environmental work and there is a trend toward businesses taking measures to boost resource-efficiency. For example, the number of businesses with certified environmental management system (ISO 14001) grew from around 300 in 1999 to more than 800 businesses in 2013.⁵
Environmental work yields growth and bottom-line benefits

The Danish glass manufacturer **Krone Vinduer** has optimised its use of aluminium by using new machinery and IT systems. At the same time, the business has established a system which allows it to recycle paint that is accidentally sprayed over the edge of the window frame. The result is a 15% reduction in waste disposal costs and a 6-10% saving on raw materials costs as a consequence of less wastage of resources. The investment will pay-back within a year.

**Duba-B8** manufactures office furniture. Duba-B8 has gone over to water-based lacquer and has therefore reduced waste generation by phasing out chemicals of concern in the lacquering process. Overall, the change has been a financial success, with investments paying back in less than a year.

**Front-Z** produces painted MDF boards. Previously, Front-Z engaged an external supplier to carve out its MDF boards, but now this process is taking place internally. The change means that Front-Z has become more flexible in its manufacturing and has minimised overall waste volumes from its manufacture of cupboard doors, because the carving process has now been optimised specifically to Front-Z’s production. The investment is estimated to have a pay-back period of two-three years.

**Plasmo** manufactures plastic components. Efficiency improvements were obtained during a LEAN project, the objective of which was to cut resource consumption in production and minimise wastage of resources. The improvements have led to savings in raw materials, energy, waste disposal, and staff. Overall, the transition and associated savings projects are estimated to have pay back after two-three years.
Environmental technology solutions are an important industry in Denmark. In 2013, production of green goods and services provided employment for around 58,000 people, sales of DKK 165 billion and exports of DKK 65 billion. Exports of environmental technology solutions which reduce expenditure on waste management and raw materials procurement are becoming increasingly important for a number of the largest Danish production companies. The amount of waste from businesses (industry, service, and building and construction) increased between 2002 and 2008 and fell between 2008 and 2012. The fluctuations in waste volumes reflect economic trends.

Waste from businesses (Million tonnes)

Waste amounts from businesses have been calculated as the sum of waste from industry, service, and building and construction. Soil has been deducted from volumes (2000-2009). The method for measuring waste was changed after 2009, and waste data from 2011 and later is therefore not directly comparable with data from 2000 to 2009. For construction and demolition waste, combined data for waste type and source for 2011 and 2012 has been used to provide a more correct picture. Sources: ISAG Waste Information System and Danish Waste Data System (ADS) extracted on 24 November 2014.
More for less

The Government’s objective is that Danish businesses become better at producing more for less; that is they contribute to higher resource efficiency.

In order to monitor developments, among other things the Government will use the following indicators:

- Waste volumes from specific sectors in relation to value added, goods procurement, production and turnover within the same sector

- Number of businesses with a certified environmental management system

In order to support the Government’s objective, the strategic environmental work of businesses needs to be boosted through support and sparring about the potential for resource-efficiency and a circular economy in the individual business. In addition, there is a need for greater collaboration between researchers and businesses on the development of environmental technology solutions. The Government will therefore prioritise the following initiatives:

Funding for green transition in production

- New loan options for businesses via the Danish Green Investment Fund, with a lending capacity of DKK 2 billion. The new options will allow businesses to apply for co-funding for green projects, including for resource-efficiency projects.

- Support for small and medium-sized enterprises from the Pool for Green Innovation from 2015 to 2018. Support will be given to businesses that are working to develop and sell green technologies, including developing technological solutions to enhance resource-efficiency.

- Support programmes for development and demonstration projects within future green technologies (MUDP, GUDP and EUDP, see above) which support e.g. the transition of businesses to resource-efficient production and other waste prevention.

- Programmes under the Fund for Green Business Development which promote green business models and green industrial symbioses.

- Support from the Fund for Green Business Development for new products, solutions and business models which promote green transition e.g. within the circular economy and the sharing economy.

Innovation and partnerships make for new solutions

- An innovation forum for green solutions and sustainable production, which, on the basis of technical discussions, will supply input to Government efforts to promote green transition in businesses.

- In the period between 2014 and 2016 an innovation centre for resource-efficient production and product design called Rethink Resources will establish a framework for researchers and businesses to work together to develop new commercial solutions within product design and manufacturing methods and to develop business models aimed at improving resource-productivity and closed-loop material flows.

- Through developing and communicating new knowledge, the partnership for the substitution of harmful chemicals will aim at supporting SMEs in minimising the health and environmental impacts of their production and products, and ultimately this will increase reuse and recycling of products.

- Green Entrepreneur House, an entrepreneurial community for promising entrepreneurs and businesses wanting to develop new green solutions or business models that promote green transition and the circular economy.
**Easier for businesses to achieve resource-efficiency and perform environmental management**
- A task force to identify any regulation barriers to increasing businesses’ resource-efficiency and suggest how to simplify legislation.

- A growth programme in which up to 1,000 small and medium-sized production companies will be given a ‘growth check’ with a view to achieving greater productivity and competitiveness, e.g. through increased automation, digitisation and resource-efficiency.

- Further development of environmental management systems, ecolabels and green accounts through the Green21 environmental portal and instigation of pilot projects with businesses on environmental profit and loss reporting.

- A pilot project on green transition aimed at job creation through engaging elderly staff on the way out of the labour market, as well as jobless academics, in partnerships between businesses, municipalities, trade unions, educational institutions and associations.

- Training programmes aimed at enhancing resource-efficiency and, thus, bolstering competitiveness and productivity in up to 100 businesses.

**Knowledge building and good examples show the way**
- Promote research into competitive and sustainable environmental technologies and solutions to challenges within the environment, water and exploitation of resources. Research efforts within these areas can contribute e.g. to improved resource-efficiency, including prevention and recycling of waste and residual products from households and other sectors.

- Enhance the knowledge of inspection authorities and businesses about resource-efficiency through campaign materials on resource-efficiency.

- Contribute to EU efforts within resource-efficiency in connection with environmental requirements for larger businesses in the EU through work on Best Available Techniques (BAT), as well as greater focus on resource-efficiency in the EU Ecodesign Directive and development of an environmental footprint methodology for products.

- Increase knowledge about the potential for resource-efficiency in selected sectors.

- Membership of the Ellen MacArthur Foundation’s CE100 initiative: Focus on communicating international knowledge and tools for the circular economy to small and medium-sized enterprises in Denmark.

- Develop new tools for the circular economy in collaboration with the Ellen MacArthur Foundation.
GOOD EXAMPLES

Business models designed to underpin waste prevention

Trendsales, DBA and other internet-based business platforms facilitate buying, selling and swapping second-hand goods.

minbildinbil.dk is an internet site through which individuals can rent out their cars to others.

Lithium Balance A/S is working with a business model in which batteries for electric cars can be sold on for other purposes, thus extending the life span of the batteries.

The furniture manufacturer MH Möbler will develop a business model which offers to upgrade customers’ sofas new coverings and cushions when the old upholstery is worn or becomes out of date.
Green consumption
– intelligent procurement practices

20 tonnes of materials per inhabitant

Our consumption of products and services in everyday life greatly influences the volumes of waste that we generate. Today, our consumption entails total material consumption of more than 20 tonnes\(^8\) and municipal waste of about 747 kg\(^9\) per inhabitant every year. This places Denmark as one of the highest per capita users of resources in the world and one of the largest producers of municipal waste. Each time we buy a consumer product at a value of DKK 1,000, we generate on average just below 9 kg of household waste.\(^{10}\)

When we buy new products, materials and energy will have been used to manufacture the product. Although this is not readily visible to us as we stand with the product in our hands, all products and services have hidden resource consumption which does not end up directly in the finished product. The extent of this hidden resource consumption depends on the product, although in most situations it amounts to more than ten-times the weight of the finished product.\(^{11}\)

Products on the shelves have rarely been designed to minimise and avoid waste. Products which, by design, can be repaired and reused and have a long life span can contribute to reducing waste from consumption. It can be difficult for individuals and procurers to make green choices and buy products that are less resource intensive. Ecolabels can help guide consumers into choosing products that place demands on low resource intensity, good efficiency during use, as well as quality and durability. Sometimes, however, these products are simply not available on the shelves. The availability of products helps shape consumption habits. However, consumers’ habits can also reward those businesses that prioritise green innovation and develop resource-efficient products.

Some businesses have business models that make it easier for consumers to help with waste prevention. For example, these businesses provide platforms which allow their customers to share, rent, lease, loan or reuse products instead of buying them. If the business rents out a product, and, thus, maintains ownership of that product, it could have greater incentive to ensure that the product has a long life span by design.

Retailers are key players between manufacturers and consumers and they therefore play an important role with regard to promoting resource-efficient consumption. Retailers have direct contact to a large network of suppliers, which means they hold opportunities to stimulate both supply and demand for more resource-efficient products and products with fewer substances of concern. Ecolabelled shops and sales of ecolabelled products can highlight resource-efficiency in the retail trade. So far, there are only three ecolabelled shops in Denmark.

Finally, with a total procurement volume of almost DKK 300 billion, the public sector is also a very important player. By demanding products designed for reuse/recycling, procuring services instead of goods, and by demanding products that are repairable and can be recirculated, public procurement can stimulate the market for green and resource-efficient products.

Green procurement and more ecolabelled products

Household waste volumes went up from 2000 to 2009 and from 2011 to 2012. Similarly, private consumption followed an upward trend until 2007 and has since fallen slightly. Household waste volumes per DKK 1 spent were at the same level in 2008 as in 2000, with a modest fall in 2009. Household waste volumes are not only affected by private consumption and the availability of goods that generate less waste.
Changes in consumption patterns and in price developments for resource-intensive goods also play a significant role in determining volumes of household waste.

There has been strong growth in the use of the two officially recognised ecolabels in Denmark; the EU Ecolabel (the flower) and the Nordic Ecolabel (the swan), in recent years. Today, these labels cover as many as 30 and 70 product areas, respectively, and in 2012 potential buyers could choose from among 8,000 different ecolabelled products. Knowledge about the labels in the Danish population is 35% for the EU Ecolabel and 90% for the Nordic Ecolabel. In 2012, revenues from products carrying the Nordic Ecolabel rounded DKK 5 billion in Denmark, corresponding to a rise of more than 40% over three years.

For several years now, Denmark has been working to promote green public procurement with special focus on ensuring knowledge sharing through the Forum on Sustainable Procurement, developing common, binding procurement targets in the Partnership for Green Public Procurement, and, generally making it as easy as possible to set out environmental and energy requirements in public procurement. Procurers can find specific inspiration for environmental requirements at a web portal on responsible procurement, Den Ansvarlige Indkøber (the responsible procurer). In 2013, the Government launched its Intelligent Public Procurement Strategy (Strategi for intelligente offentlige indkøb). An overarching principle in this Strategy is to realise a green transition through environmental and energy requirements in public procurement contracts, along with low total cost of ownership and promotion of innovation.

Making it easy to buy green

The Government’s objective is to make it easier for consumers to buy products and services that are less resource-intensive, that contain fewer substances of concern, and that generate less waste. This will be achieved e.g. by stimulating demand for green products and services as well as by supporting the use of more resource-efficient business models. In order to monitor developments, among other things the Government will use the following indicators:

- The development in household waste volumes relative to private consumption
- The number of ecolabelled products and knowledge about these

Household waste and private consumption (index 2000=100)

The amount of household waste and private consumption, and household waste per DKK consumption from 2000 to 2012. 2000 = 100. The method for measuring waste was changed after 2009, and waste data from 2011 and later is therefore not directly comparable with data from 2000 to 2009.

Private consumption covers ‘Final consumption expenditure, individual, national concept’ stated in 2005 prices. Sources: Statistics Denmark, ISAG Waste Information System, Danish Waste Data System (ADS) (data was extracted on 24 November 2014).
In order to support the Government’s objective, even more green products are needed, and products must be subject to continuous environmental improvement. Furthermore, it must be easy for individuals to make green choices and the public sector must lead the way in stipulating environmental requirements in its procurement. The Government will therefore prioritise the following initiatives:

**Easier for individuals to prevent waste**
- Guide to sharing schemes in Danish associations (housing associations, allotment gardens, etc.). This guide will make it easy to establish schemes for sharing e.g. garden machinery and tools that are only used occasionally by the individual association.
- Quick guide to green everyday choices (Miljøvejviseren – den nemme vej til en grøn hverdag), an official one-stop-shop that disseminates easy-to-understand knowledge and advice enabling consumers to make green decisions, e.g. through campaigns, tips, a knowledge bank, videos, and information about subsidy schemes.
- The Pool for Green Enthusiasts will grant subsidies for locally anchored projects and activities that help promote green transition and more efficient use of resources, as well as increase knowledge about how to realise a green transition in practice through new forms of collaboration and consumer patterns, e.g. through subsidising clothing libraries, exchange markets, as well as sewing and repair shops, etc.
- General efforts to spread the use of existing ecolabels to a still greater share of the market in order to promote sustainable consumption.
- Efforts to increase the number of ecolabelled shops and improve documentation of the environmental benefits of ecolabelling.

**Public procurement in support of the green transition**
- A green procurement task force, which will offer assistance to municipalities, regions, central government and public institutions etc. in their work on green procurement, e.g. of textiles, by disseminating knowledge about tools, experience and methodologies.
- Development of methodologies for calculating the total cost of ownership in connection with public procurement and disseminate these methodologies to public procurement officers.
- Preparation of a guide on how public procurement can underpin the circular economy and prevent waste, e.g. through requirements for the life span of products and for products that have been designed for disassembly and repair. Similarly, in 2015, the Forum on Sustainable Procurement will continue its focus on circular procurement.

**Consumer products that incorporate waste prevention**
- Contribute to the development and qualification of the EU’s methodology for calculating the environmental impacts of products and organisations, and contribute to the development of a new and cohesive green product policy in Europe.
- Consumer product efforts focussing on chemical substances in consumer products include surveys and risk assessments of substances of concern, especially to protect children.

**Picturing a future Denmark without waste**

The publication “Fremtidsbilleder af Danmark uden affald” (pictures of a future Denmark without waste) describes how we could be avoiding waste in not so distant a future:

Smart refrigerators that monitor the shelf life of food products, can suggest recipes, and are connected to your smart phone so that you can check your refrigerator on the fly and find out what you need to buy more of. Lending schemes and departments with second-hand clothes in all the larger clothing shops, enabling shoppers to renew their wardrobe at a low cost and without throwing away heaps of perfectly functional clothes.

Three trends will be gaining headway over the next decades:
- Products will be designed for easy repair, reuse and recycling.
- Consumption patterns will change so that individuals are more engaged in sharing, lending, exchanging and renting their white goods, cars, furniture, electronics etc.
- Several types of return systems will ensure more reuse and recycling.

“Fremtidsbilleder af Danmark uden affald” was authored by Sustainia, Mandag Morgen, in 2014.
Less food waste – please!

Perfectly good food products are being wasted.

Throwing out food is unnecessary wastage of resources; both with regard to the actual food that is wasted and with regard to the resources that went into producing it. "Avoidable food waste" is the part of total food waste that could have been avoided if the food had been eaten. Wasting food means wasting the energy, water, space, nutrients and pesticides that were used to produce the food.

There is avoidable food waste in all links of the ‘farm-to-fork’ value chain; from agriculture and fisheries over the food industry and trade, to the hospitality and food service sectors and private households. In primary production, food is wasted e.g. fruit and vegetables, when consumer demand leads to products such as apples and lettuces being discarded simply because they have the ‘wrong’ size. In the food industry, food is wasted e.g. because it is difficult to predict the next day’s demand at the individual supermarket. Furthermore, since consumers demand freshly made food, bread is often discarded at the bakery, even though it can be kept for several days.

Retailers throw out large quantities of edible food products because of labelling errors and because the shops are expected to offer a plethora of fresh products throughout the day. Furthermore, volume discounts offered by retailers often lure consumers into buying more food than they can eat. Consumers generally demand food that is as fresh and attractive as possible, and much food is therefore wasted, even though it is still good to eat.
GOOD EXAMPLES

Businesses reducing food waste

Unilever Food Solutions offers doggy bags/goodie bags to restaurants.

Scandic has run a campaign at all of its hotels to promote less food waste at hotel breakfast buffets.

Compass Group has developed a food waste programme called TRIM TRAX and has run a campaign at staff restaurants focusing on avoidable food waste.

Danish Crown is developing packaging that can extend the shelf-life of fresh meat.

Tulip Food Service provides advice to commercial kitchens and consumers on how to avoid food waste.

Danfoss offers monitoring and control equipment for the entire cold chain, from manufacturers to supermarkets or restaurants.

The Coop supermarket chain is measuring wastage percentages in 1,200 shops. It had a goal of reducing its avoidable food waste by 10% annually from 2013-2014.

The REMA 1000 discount supermarket chain abolished all volume discounts in 2008 and sells some of its vegetables by weight.

Take an active part in the fight against food waste

The non-profit association FødevareBanken (the food bank) collects surplus food from donors and delivers it to other non-profit organisations that help needy people.

Rub & Stub (lock, stock and barrel) is an eatery which uses surplus food in their daily food production donated by food companies.

Stop Spild af Mad (Stop Wasting Food) communicates about avoidable food waste and develops concrete tools for better utilisation of food products.
More than 700,000 tonnes of food wasted that could have been eaten

Recent studies in Denmark have revealed that avoidable food waste in households amounts to 260,000 tonnes per year. This corresponds to 24% of all waste in household rubbish bins. A household in a detached house on average throws away 105 kg of avoidable food annually, which corresponds to an overall resource consumption of 880 kg. Avoidable food waste per individual is 40% greater in apartment buildings than in single-family homes. Among other things, this is because it is difficult for small households to buy small or single-portion food products at supermarkets. The average family discards food worth more than DKK 3,000 during the course of a single year, corresponding to more than one month’s consumption of food.

In the service sector, annual avoidable food waste amounts to 227,000 tonnes, of which 163,000 tonnes comes from retail; 29,000 tonnes from hospitality sector; and 31,000 tonnes from food service sectors. Avoidable food waste from primary production amounts to 100,000 tonnes per year, while the food industry accounts for annual avoidable food waste of 133,000 tonnes.

Several initiatives to reduce avoidable food waste have been carried out in recent years. In 2011, 19 partners from all links in the food product value chain from ‘farm to fork’ signed a charter on reduction of avoidable food waste, obligating them to take action against avoidable food waste.

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**Avoidable food waste in the individual links of the ‘farm-to-fork’ value chain (tonnes per year)**

<table>
<thead>
<tr>
<th>Link</th>
<th>Avoidable Food Waste (tonnes per year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary production (x)</td>
<td>300,000</td>
</tr>
<tr>
<td>Food product industry (x)</td>
<td>150,000</td>
</tr>
<tr>
<td>Retail (y)</td>
<td>200,000</td>
</tr>
<tr>
<td>Hospitality sector (y)</td>
<td>250,000</td>
</tr>
<tr>
<td>Food service sectors (y)</td>
<td>100,000</td>
</tr>
<tr>
<td>Households (z)</td>
<td>50,000</td>
</tr>
</tbody>
</table>

The graph is based on figures from various sources: x) Klimaorienterede kostråd (climate-friendly dietary guidelines), the National Food Institute (DTU FOOD), 2012; Kortlægning af madaffald i servicesektoren (survey of food waste in the service sector), Danish EPA, 2014; z) Kortlægning af dagrenovation i Danmark (survey of domestic waste in Denmark), Danish EPA 2014.
The road to less food waste

It is the Government’s objective to have avoidable food waste reduced in all links of the food product value chain. The Government will use the following indicator to monitor developments:

- Developments in avoidable food waste from households, to be mapped every six years.

In order to support the Government’s objective, consumers will be encouraged to take action against avoidable food waste, and businesses will be encouraged to reduce their avoidable food waste and save money in the process. The Government will therefore prioritise the following initiatives:

- A partnership for reduction of avoidable food waste, which will foster voluntary and binding collaboration between all links in the food product value chain, relevant authorities, and stakeholder organisations. The partnership will identify barriers and common solutions; also for the public food service sector. Funding has been earmarked for nudging campaigns and specific technological and logistical development projects under the partnership.

- A team of ‘food waste hunters’ will offer their assistance in the public and private food service sectors.

- An innovation consortium on how to minimise avoidable food waste from potatoes and other vegetables is currently developing methods for assessing the quality of products in the individual links of the supply chain.

- Analysis of the wastage of resources and resource-efficiency in the fisheries and aquaculture sector, including identification of production practices in the aquaculture sector with a view to assessing the wastage of resources these practices entail. Furthermore, the Government will instigate an analysis of how the upcoming discard ban will influence growth potentials and added value potentials for Danish commercial fisheries and derived industries.

- Support the development of a global protocol for defining, measuring and reporting food waste. This work is being headed by the World Resources Institute and has been launched under the auspices of the Government’s Global Green Growth Forum (3GF).

- Reduce avoidable food waste from the private sector by working in the EU to exempt more food products from the regulations on shelf-life labelling as well as through national information work targeted at consumers.

- Participate in a network under the EU FUSIONS project, which is to promote harmonised monitoring of food waste, including a common definition, possible new measures, and a new common European food waste policy.
The construction sector – engaged in dialogue

Intelligent use of materials

Waste from the construction sector, excluding soil and stone, accounts for up to one-third of total waste volumes in Denmark. At the same time, building activities consume large amounts of materials and energy and therefore affect the climate; also in connection with the manufacture of materials and products.\textsuperscript{15, 16}

A major part of construction and demolition waste is used e.g. to replace stone and gravel. Today, only a minor part of this waste is being recycled or reused directly for its original purpose. This is a waste of good resources, and it also reduces the value of these materials.

It is especially problematic when construction products contain substances of concern such as PCBs. Substances of concern require special treatment that makes it expensive to renovate or demolish buildings. Furthermore, substances of concern pose a potential risk to the environment and human health, and they could also pose an obstacle to recycling building materials. Therefore, reuse and recycling of construction products must not be at the expense of safety and health.

The construction sector can prevent large volumes of waste if the sector uses resources more efficiently and effectively and steers clear of building materials containing substances of concern. Building and renovation of installations and buildings take place in a collaboration between different players, from manufacturers over architects, designers, and consultants to owners, contractors, and demolition firms. Collaboration is essential if resources are to be utilised optimally in the construction sector. With the right dialogue and knowledge, buildings and other construction works can be designed for easy disassembly, and building materials can be designed for reuse and without the use of substances of concern. There are also benefits to be gained from providing businesses with an overview of green solutions in building and construction.

From energy optimisation to resource optimisation

For a long time, there has been great interest in optimising the energy performance of buildings. This interest includes optimisation with regard to the production of materials and products, during construction of the building, and when the building has been put into operation and requires maintenance. The construction sector already has focus on not using and wasting more resources than necessary. However, there is potential to create greater awareness about the costs of different materials.

There is an emerging trend within sustainable building in the EU, which will have significance for the requirements placed on Danish businesses and, in particular, for the market potential of attractive solutions. Several activities are already underway in Denmark aimed at closing the resources cycle, creating better cohesion in the value chain, and preventing construction and demolition waste. The Danish construction sector is working with sustainability certification which also covers aspects of resource and chemicals consumption.
GOOD EXAMPLES

Upcycle House

Together with architects Lendager Arkiteker, the Realdania association has built Upcycle House, which is built extensively from refined, reusable materials. However, the reusable materials are not readily visible, and the house both looks and functions like any modern house made from good-quality materials.
Today, around 87% of construction and demolition waste is being recycled\(^\text{17}\). However, the rate of recycling for construction and demolition waste is expected to fall, as the Government has aimed at separating substances of concern from the waste. The initiatives under the Resources Strategy for Waste Management – Denmark without Waste and Denmark without Waste II – a Waste Prevention Strategy are to ensure that the rate of recycling increases again in the long term. The Government’s building policy strategy Towards a stronger construction sector in Denmark contains initiatives to promote sustainable building and construction in Denmark, including resource-efficiency and reuse of construction products.

### A more sustainable construction sector

It is Government’s objective to make it easier for the construction sector to act more resource-efficiently, to ensure that substances of concern are managed properly in terms of both human health and the environment, and to ensure better knowledge sharing throughout the sector. In order to monitor developments, among other things the Government will use the following indicators:

- The number of buildings in which the building materials are mapped before the buildings are demolished
- The volumes of construction and demolition waste that are used for new purposes (materials recovery)

The method for calculating waste data was changed after 2009, and waste data from 2011 and later is therefore not directly comparable with data from 2000 to 2009. Sources: ISAG Waste Information System 2011; Danish Waste Data System (ADS) extracted on 28 August 2014.
In the long term, the Government will work to promote specific indicators to measure the extent of reuse of specific construction products.

In order to support the Government’s objective, there is need for specific initiatives and instruments which can help make it easier to avoid waste of resources and prevent substances of concern in construction and demolition waste. The Government will therefore prioritise the following initiatives:

- A partnership for sustainable construction and waste prevention, which will foster voluntary and binding collaboration between all links in the building and construction value chain, relevant authorities, and stakeholder organisations. The partnership will identify barriers and common solutions; also for do-it-yourselfers. Funding has been earmarked for nudging campaigns, demonstration projects, and other specific solutions under the partnership.

- Tightened requirements for demolition of buildings and for the qualifications of demolition companies, so that there is certainty that demolitions are performed in a qualified manner, and that e.g. substances of concern are separated from waste, and managed correctly.

- Development of a voluntary sustainability class to supplement a number of the requirements currently stipulated in the building regulations.

- The Chemicals Initiative 2014-2017 will focus on resource cycles and will cover e.g. a new substitution partnership towards more sustainable use of chemicals in products and processes, including in buildings and building materials.

- An analysis of technologies available for identification and removal of materials and of substances of concern from buildings in connection with demolition. The analysis will look at which technologies are available in Denmark and internationally.

- The Fund for Green Business Development will co-fund partnerships for green transition within better recycling of construction waste. These partnerships are to encourage the building sector to demand more recyclable and reusable materials, call for new ways to build and demolish buildings, as well as develop viable business cases offering end-to-end solutions, including reuse and recycling.

- The environmental technology development and demonstration programme (MUDP) will support an initiative for eco-friendly and sustainable building and construction, including a number of activities to promote knowledge and networks, and to support the development of environmental technologies. Most of the funding is likely to go to technological development of products and solutions that have commercial potential.

- Follow-up activities on the basis of a preliminary analysis identifying needs and opportunities with a view to establishing a Danish environmental communication initiative about eco-friendly and sustainable building materials. This work can help qualify and improve the decision basis for buyers and consumers.

- Green Solution House, a knowledge and conference centre on the island of Bornholm, will serve to demonstrate how an existing hotel can be renovated and upgraded to be sustainable. The project is part of a platform for showcasing green solutions that already exist in the market and for developing new green solutions.

- Development of a lifecycle assessment (LCA) tool for buildings to guide project decision-makers to make green choices during the design and planning phase.

- A tool for calculating the overall economics of buildings (life-cycle costing, LCC) which includes the entire lifecycle of the building in the decision basis for construction-phase options.

- A task force on sustainable building materials, which is to work for EU-harmonisation of sustainable construction products under the Construction Products Regulation (CPR).

- An analysis of barriers to reuse construction products and an analysis of resource flows.

- A socio-economic analysis of the reuse of bricks.
Clothing and textiles – sustainable fashion is the way forward

Intensive production is a strain on the environment

The fashion and textiles industry is one of the most polluting and resource-consuming industries in the world. The industry’s large consumption of energy, water, chemicals and pesticides has detrimental effects on the environment and on occupational safety and health. Furthermore, a growing global population is causing the production of clothes to increase.

The environmental impact of the fashion and textiles industry is by far the greatest in the countries which manufacture the textiles. However, fashion designers and producers in Denmark are helping lead the way to greater reuse and recycling in the industry. The Danish fashion and textiles industry influences how the clothes are manufactured; what materials are used; where in the world they are produced, dyed and tanned; as well as how many chemicals they contain; etc. However, producers in Denmark have difficulties controlling compliance with environmental and occupational safety and health standards throughout a long and complicated production chain, from harvesting the cotton to applying the final button.

We buy clothes like never before

Denmark does not manufacture textiles anything like it did 20 years ago, however the fashion and textiles industry is still one of Denmark’s largest export industries. In 2012, industry exports amounted to around DKK 33 billion and the sector employs a total of around 10,000 people in design, development and sales of clothing and textiles. At the same time, the annual consumption of clothes and other textiles by households went up by 36% between 2003 and 2010. Denmark spends what corresponds to 16 kg of textiles per person every year, 50% of which is neither recycled nor reused but is most likely to end up at an incineration plant. There has been a growing interest in recent years in addressing the challenges with regard to sustainability in the fashion and textiles industry. The number of ecolabelled textile products has gone up from around 70 trade names in 2005 to almost 500 in 2014. Textiles carrying the EU Ecolabel (the flower) limit the consumption of chemicals, use more organic cotton, and contain a certain amount of recycled fibres within all material types wherever technically possible. Ecolabelled textiles still only make up a small proportion of total consumption. However, the positive trend suggests that supply and demand for less environmentally harmful textiles are generally on the rise.
The trend in the consumption of textiles by Danish households (DKK per household in fixed prices)

![Graph showing the trend in the consumption of textiles by Danish households (DKK per household in fixed prices).](image)


Number of textile products certified with the EU Ecolabel and the Nordic Ecolabel

![Graph showing the number of textile products certified with the EU Ecolabel and the Nordic Ecolabel.](image)

GOOD EXAMPLES
Initiatives to reduce the environmental impact of textiles

The non-profit organisation, Byttemarked, hosts second-hand swapping markets throughout Denmark at which people can swap clothes, shoes, books etc. These swapping markets are organised and run by volunteers.

The second-hand shop, Resecond, offers the opportunity to swap quality dresses with others for a fixed monthly subscription fee.

Ecolabelled textiles from Indian textile manufacturers constitute a focus area for the industry associations, the Danish Federation of Small and Medium-Sized Enterprises and Danish Fashion and Textile. The associations have received support for their efforts in this area from the Nordic Council of Ministers. Indian textile companies sell a substantial proportion of their production to textile and clothing companies in Scandinavia, and the spread of ecolabels will help spotlight social and environmental conditions in the supply chain; even if a particular link is located far from Denmark.

Each year, the Salvation Army receives between 7,000 and 8,000 tonnes of clothes in donations. The best clothes are sold at Salvation Army shops throughout Denmark. Other clothes are exported and some clothes end up as waste. The Salvation Army even has its own brand, Salvation Army Redesign, for second-hand clothes which have been transformed into new, fashionable children’s and adult’s clothes.
Textile consumption under control

The Government’s objective is to make it easier for textile businesses to reduce their environmental impact during the manufacturing phase and make it easier to reuse and recycle textiles, e.g. by reducing the use of substances of concern in textiles. In order to monitor developments, among other things the Government will use the following indicators:

- Consumption of clothes and textiles, including second-hand clothes

- Developments in the number of ecolabelled clothes and textiles

In order to support the Government’s objective, it must be easy for consumers to buy sustainable clothing, e.g. through more widespread use of existing ecolabels. Furthermore, synergies and strongholds must be exploited to achieve a more sustainable fashion and textile industry. The Government will therefore prioritise the following initiatives:

- A partnership to “prolong the life span of your clothes” will establish voluntary and binding collaboration between all players in the clothing value chain, relevant authorities, and stakeholder organisations. The partnership will identify barriers and common solutions, e.g. return systems, deposit schemes, and it will focus on textile materials, including wool, cotton and polyester. Funding has been earmarked for nudging campaigns, demonstration projects, and other specific solutions under the partnership.

- Subsidies for businesses that want to ecolabel their textiles. The subsidies will promote the use of ecolabels within textiles and make it easier for consumers to choose products that are environmentally correct.

- The Partnership for Green Public Procurement will work to adopt environmental targets for the procurement of textiles and textile services by members of the Partnership. The objective is to ensure that environmental requirements are included in procurement contracts.

- The Partnership for Chemicals in Textiles will work to reduce the use of chemicals of concern through knowledge-building and experience and best practice sharing.

- A common Nordic action plan for a sustainable and resource-efficient fashion and textile industry. This action plan is to outline the political direction as well as specific actions to be made within the areas of sustainable consumption and production, chemicals, as well as waste prevention and management.

- The LAUNCH Nordic innovation platform, which is a collaboration between a number of major Nordic businesses, governments and organisations, will identify and scale up innovative solutions to minimise the environmental impact of textile manufacturing in a global perspective.

- Implementation of an agreement between the Government and the textile industry about responsible textile and clothing manufacturing in Bangladesh. This agreement will focus on improving employee rights, safety and environmental standards as a follow-up to the collapse of a textile factory in Bangladesh.

- A study of microplastics, e.g. in textiles and cosmetics, which lead to the accumulation of plastic waste in the marine environment.

Second-hand is the new black

Danish vintage and second-hand shops have experienced a large increase in interest in buying second-hand goods. According to one estimate, revenues in the second-hand business went up by 10-15% in 2012 alone.

The four charity organisations, Danish Red Cross, The Salvation Army, DanChurchAid and Blue Cross Denmark had revenues at an estimated DKK 300 million in 2012. (Kristeligt Dagblad (newspaper), 2012). Online shops facilitating second-hand selling and buying have also seen advances. In 2010, Trendsales.dk sold children’s clothing for DKK 78 million and DBA (an internet marketplace) registered more than 1 million transactions with clothes. This corresponds to an estimated 600,000 kg of clothes traded via DBA.
Electrical and electronic equipment – longer life span and fewer substances of concern

We throw out things that actually work

Development is fast-paced in the area of electrical and electronic products, which means these products quickly become obsolete. Many people replace their electrical and electronic products because new models are available on the market, and not because the old product is broken. Many products are therefore thrown away even though they still work.

This is a waste of the product as well as of the energy and materials that went into manufacturing the product and extracting the raw materials. For example, it takes 26 kg of resources to produce one mobile phone weighing only around 100 g. Similarly, it takes 442 kg to produce one laptop computer.

Electrical and electronic equipment is often complex containing materials that have been ‘welded together’, which makes it difficult to repair and reuse the components. Furthermore, the content of substances of concern makes it difficult to recycle waste electrical and electronic equipment. The challenge of repairing and reuse can be solved early on in the design and product development phase. It is during this phase that decisions are made with regard to how the individual components are to be constructed, what they are made of and whether they are replaceable. Since electrical and electronic products are developed and produced for a global market, influencing product designs will require more than national regulation alone; it will require international regulation e.g. through the EU.

In 2005, the EU introduced ‘producer responsibility’ for electrical and electronic equipment, e.g. to promote ecodesign. However, the intended effect of producer responsibility and waste prevention through changes in product design has not generally been realised at European level. Producers primarily take back waste electrical and electronic equipment through the collective schemes, which means that the producers do not get their own products back as waste.

Longer life spans save resources

A British study shows that if the life spans of selected low-quality electrical and electronic products were extended up to the average life spans of the given products, material resources savings of 150,000 tonnes could be achieved annually in the United Kingdom alone. In terms of CO₂ emissions, this corresponds to a reduction of 750,000 tonnes CO₂ annually.

The study also shows that around one-third of electrical and electronic equipment handed in at recycling centres as waste is still functioning and represents a reuse value of around DKK 900 million. If similar figures apply for Danish recycling centres, around 18,000 tonnes of waste electrical and electronic equipment from Danish households could be directly reused rather than sent to recycling, as is the case today.
GOOD EXAMPLES

IT equipment brought to new life

Bluecity resells used smartphones, tablets and laptops nationwide. Consumers can sell their used products to Bluecity, which will then repair the products, prepare them for resale and delete all stored data on the products. The used products are then resold via Bluecity’s internet shop and physical shops throughout Denmark.

Tier1Asset, which has a similar business model, has been selling used IT equipment from private businesses on to other private businesses or individuals for the past ten years.
We buy a lot of gadgets

The amount of electrical and electronic equipment sold per inhabitant has gone up significantly over the past decades due to a fast-paced technological development involving an ever greater degree of digitization. Today, the annual average amount of electrical and electronic equipment sold per inhabitant in Denmark is around 20-25 kg. British studies show that households on average store unused laptops, tablets, television sets, digital cameras, and GPS equipment totalling a value of DKK 10,000 per household; equipment that could be used by others. The same trend is probably true for Denmark.

When electrical and electronic equipment becomes waste most of it is collected for recycling. Denmark collects around 75,000 tonnes waste electrical and electronic equipment annually from households, corresponding to 13-15 kg per inhabitant. The waste collected is recovered or recycled, focussing on managing substances of concern in the waste and exploiting valuable resources. This is a challenging task due to the complexity of the electrical and electronic products.

Longer life span means less resources spent

The Government’s objective is to make it easier to reuse and recycle electrical and electronic equipment and waste electrical and electronic equipment, so that products have longer life spans and can be a part of circular production models to a greater extent. There is currently no relevant and operational indicator for reuse of electrical and electronic equipment and prevention of waste electrical and electronic equipment. The Government will monitor the international work to develop indicators in this area.

In order to support the Government’s objective, work on reuse of electrical and electronic equipment will focus on acquiring more knowledge while, at the same time, working in an EU context to promote resource efficiency and reduce the number of substances of concern in new electrical and electronic equipment so that it is easier to reuse and recycle. The Government will therefore prioritise the following initiatives:

- An analysis of barriers and opportunities to promote reuse and repair of waste electrical and electronic equipment in collaboration with relevant stakeholders. On the basis of the analysis, different scenarios will be prepared for future organisation of the reuse sector, as well as proposals for benchmarks for monitoring developments within reuse and preparation for reuse.

- A survey of the potential for reuse and repair of waste electrical and electronic equipment delivered to recycling centres.

- Quantification of environmental benefits from reuse and repair of selected types of electrical and electronic equipment.

- Development of a common European standard for reuse of waste electrical and electronic equipment, which will ensure high-quality reused electrical and electronic equipment.

- Development and continuous revision of the Nordic Ecolabel and the EU Ecolabel for electrical and electronic equipment. This work is to include setting out requirements for durability, access to spare parts and repair.

- A voluntary agreement with the industry on the promotion of ecodesign of electrical and electronic equipment in relation to the producer responsibility.

- Promote resource-efficient products and ecodesign in the EU through a stronger requirement that the life span of products can be extended through repairs, software upgrades or replacement of broken components (the Ecodesign Directive).

- Work for a ban on hazardous substances in electrical and electronic equipment through an amendment to the EU RoHS Directive, including an assessment of brominated flame-retardants in electrical and electronic equipment.

- Information campaign about the content of mercury in energy-saving bulbs and alternatives to these, e.g. LED light bulbs, which also have a considerably longer life span.
Trends in the amount of EEE placed on the market and the amount of WEEE collected (kg per capita)

The trends in the amount of EEE sold and the amount of WEEE collected. Sources: Undgå affald, stop spild no. 02, 2014, and statistics from DPA-system [Danish Producer Responsibility System]. Reworked by the Danish EPA.
Packaging
– more than just pretty wrapping

Packaging designed to last

The most important function of packaging is to protect the product during transport and, if the product is food, ensure its durability. A cucumber will keep fresh for up to 14 days more if wrapped in 1.5 g packaging. In Denmark businesses have been active in minimising the amounts of packaging used, however there is still potential to reduce the total environmental impact of packaging.

The environmental impact of packaging often only represents a minor share of the total environmental impact of a product. Around 80% of the environmental impact of a product stems from the product itself; 10-15% stems from transport of the product; and 5-10% stems from its packaging. Nonetheless, packaging consumes resources, not only because of the material itself but because of the energy resources that went into producing the packaging, e.g. oil when producing plastic packaging.

When choosing packaging, it is therefore important that businesses look at the total environmental impact of their packaging. Businesses can use packaging that can be separated after use and, then, used anew, or they can use packaging without substances of concern. Often the ‘solution’ is to be found at the design phase and at the packaging manufacturers. Therefore, it is important that retailers have requirements for their packaging.

In Denmark, product standards, requirements for food safety, and incineration of household waste have meant that there has been a lack of focus on how packaging, in particular from households, can be reused or collected for recycling.

Every Dane consumes 160 kg of packaging a year

Throughout the 2000s, Danish consumption of packaging remained more or less constant, despite relatively high economic growth. From 2000 to 2007, Danish consumption of packaging went up by 2 percentage points, while economic growth was 19 percentage points. This suggests that packaging is becoming more and more effective because of the use of ever lighter materials such as paper, cardboard and plastic instead of glass. During the financial crisis in 2008-2009, the total consumption of packaging fell as a consequence of a drop in the amount of goods purchased. Figures for recent years, however, show that packaging consumption is on the rise again. In 2012, the total consumption of packaging in Denmark was around 895,000 tonnes, corresponding to around 160 kg per Dane. Around half of the total amount of packaging consumed ends at households before being thrown away, while the other half ends at businesses.
### Use the used packaging

**It is the Government’s objective to reduce the overall impact of packaging on the environment.** In order to monitor developments, among other things the Government will use the following indicators:

- The amount of packaging broken down by materials
- The proportion of packaging that is collected for recycling and recovery

In order to support the Government’s objective, businesses must focus on the environmental impact of their packaging choices. The Government will therefore prioritise the following initiatives:

- A partnership on plastic packaging, which will foster voluntary and binding collaboration between all links in the plastic packaging value chain, relevant authorities, and stakeholder organisations. The partnership will identify barriers and common solutions. Funding has been earmarked for campaigns and other specific solutions under the partnership.

- An inspection campaign targeted at selected types of packaging, with a view to sharpening the focus of businesses on the choices they make with regard to packaging for their products.

- Increased recycling and more closed-loop value chains for packaging waste from households and the service sector, e.g. through collaboration with relevant players, information campaigns, as well as subsidies for development and demonstration of environmental technology.
GOOD EXAMPLES

Initiatives reducing the overall environmental impact of packaging

Diary manufacturer Arla has a zero-waste programme, which includes a goal to reduce the consumption of packaging and to only use recyclable packaging for their products. Efforts have included reducing the size of the plastic screw cap on yogurt cartons.

In its efforts to use more green packaging, the Coop supermarket chain has reduced the amount of packaging used for their own brand of dish washer tabs simply by reducing the size of the box.

Many consumers bring their own shopping bag instead of buying a plastic bag each time they go to the supermarket. The supply of smart reusable bags that can easily be folded and kept in your hand bag has increased significantly in recent years and has made it easier to stop buying plastic bags.

The Furn X furniture manufacturer reuses 80-90% of its packaging. The cardboard boxes in which the furniture is supplied have been replaced by blankets which can be reused up to 100 times. Furn X has received positive feedback from customers, who avoid the hassle of getting rid of the packaging and only have to return the blankets.
The Government’s initiatives under the Waste Prevention Strategy

**Transition in Danish businesses**

1. New loan options for businesses via the Danish Green Investment Fund
2. Support for small and medium-sized enterprises from the Pool for Green Innovation
3. Support programmes for development and demonstration projects within future green solutions
4. Programmes under the Fund for Green Business Development which promote green business models and green industrial symbioses
5. Support from the Fund for Green Business Development for business models which promote green transition, including the sharing economy
6. An innovation forum for green solutions and sustainable production
7. An innovation centre for resource-efficient manufacturing and product design called Rethink Resources
8. The partnership for the substitution of harmful chemicals
9. Green Entrepreneur House to promote the circular economy
10. A task force to identify any regulation barriers to increasing resource-efficiency and to suggest how to simplify legislation
11. A growth programme in which up to 1,000 small and medium-sized production companies will be given a ‘growth check’ with a view to achieving greater productivity
12. Further development of environmental management systems, ecolabels and green accounts
13. A pilot project on green transition aimed at job creation
14. Training programmes aimed at enhancing resource-efficiency and, thus, bolstering competitiveness and productivity in up to 100 businesses
15. Promote research into environmental technologies within the environment, water and resources
16. Enhance the knowledge of inspection authorities and businesses through campaign materials on resource-efficiency
17. Contribute to EU efforts within resource-efficiency in connection with environmental requirements
18. Increase knowledge about the potential for resource-efficiency in selected sectors
19. Membership of the Ellen MacArthur Foundation’s CE100 initiative: Focus on communicating international knowledge and tools for the circular economy
20. Develop new tools for the circular economy in collaboration with the Ellen MacArthur Foundation

**Green consumption**

21. Guide to sharing schemes in Danish associations
22. Quick guide to green everyday choices (Miljøvejviseren – den nemme vej til en grøn hverdag), an official one-stop-shop
23. The Pool for Green Enthusiasts will grant subsidies for locally anchored projects and activities that help promote green transition and more efficient use of resources
24. General efforts to spread the use of existing ecolabels to a still greater share of the market in order to promote sustainable consumption
25. Efforts to increase the number of ecolabelled shops
26. Expand the “Mind the Trash” teaching material for schools about resource-efficiency and waste
27. A green procurement task force, which will offer assistance to municipalities, regions, central government and public institutions etc. in their work on green procurement, e.g. of textiles, by disseminating knowledge about tools, experience and methodologies
28. Development of methodologies for calculating the total cost of ownership in connection with public procurement
29. Preparation of a guide on how public procurement can underpin the circular economy and prevent waste, e.g. through requirements for the life span of products and for products that have been designed for disassembly and repair
30. Contribute to the development and qualification of the EU’s methodology for calculating environmental impacts
31. Consumer product efforts focussing on chemical substances in consumer products
Less food waste
32. A partnership for reduction of avoidable food waste with businesses and organisations
33. A team of ‘food waste hunters’ will offer their assistance in the public and private food service sectors
34. An innovation consortium on how to minimise avoidable food waste from potatoes and other vegetables
35. Analysis of the wastage of resources and resource-efficiency in the fisheries and aquaculture sector
36. Support the development of a global protocol for defining, measuring and reporting food waste
37. Reduce avoidable food waste by working to exempt more food products from the regulations on shelf-life labelling
38. Participate in a network under the EU FUSIONS project, which is to promote harmonised monitoring of food waste, including a common definition

The construction sector
39. A partnership for sustainable construction and waste prevention with businesses and organisations
40. Tightened requirements for demolition of buildings and for the qualifications of demolition companies
41. Development of a voluntary sustainability class
42. A substitution partnership for sustainable use of chemicals in products
43. An analysis of technologies for removal of substances of concern from buildings
44. Partnerships for green transition within better recycling of construction waste
45. A special initiative for ecofriendly and sustainable building and construction under MUDP (see above), which includes a number of activities to promote knowledge and networks, and to support the development of environmental technologies
46. Activities concerning communication about ecofriendly and sustainable building materials
47. A platform for showcasing green solutions that already exist in the market
48. Development of a lifecycle assessment (LCA) tool for buildings
49. A tool for calculating the overall economics of buildings (life-cycle costing, LCC)
50. A task force on sustainable building materials, which is to work for harmonised requirements for sustainable construction products under the Construction Products Regulation (CPR)
51. An analysis of barriers to reusing construction products and an analysis of resource flows
52. A socio-economic analysis of the reuse of bricks

Clothing and textiles
53. A partnership to “prolong the life span of your clothes” between businesses and organisations
54. Subsidies for businesses that want to ecolabel their textiles
55. Work to adopt environmental targets for public procurement of textiles and textile services
56. The Partnership for Chemicals in Textiles will work to reduce the use of chemicals of concern
57. A common Nordic action plan for a sustainable and resource-efficient fashion and textile industry
58. The LAUNCH Nordic innovation platform on the environmental impact of textiles
59. Implementation of an agreement about responsible textile manufacturing in Bangladesh
60. A study of microplastics, e.g. in textiles and cosmetics, which lead to the accumulation of plastic waste in the marine environment

Electrical and electronic equipment
61. An analysis of barriers and opportunities to promote reuse and repair of waste electrical and electronic equipment
62. A survey of the potential for reuse and repair of waste electrical electronic equipment delivered to recycling centres
63. Quantification of environmental benefits from reuse and repair of selected fractions from waste electrical and electronic equipment
64. Development of a common European standard for reuse of waste electrical and electronic equipment
65. Development and continuous revision of the Nordic Ecolabel and the EU Ecolabel for electrical and electronic equipment
66. A voluntary agreement with the industry on the promotion of ecodesign of electrical and electronic equipment
67. Promote resource-efficient products and ecodesign through the Ecodesign Directive
68. Work for a ban on hazardous substances in electrical and electronic equipment through an amendment to the EU RoHS Directive
69. Campaign about the content of mercury in energy-saving bulbs and about alternatives to these, e.g. LED

Packaging
70. A partnership on plastic packaging between businesses and organisations
71. An inspection campaign targeted at selected types of packaging
72. Information campaigns and subsidies for development and demonstration of environmental technologies to increase the rate of recycling and establish more closed-loop value chains for packaging waste
Notes

1. Brug mere – spild mindre (use more – waste less) http://www.brugmerespildmindre.dk/
2. Damvad: “Ressourceproduktivitet i dansk industri” (resource productivity in Danish industries), 2013
3. Eurostat 2014
4. The Government’s 2014 report on Danish growth and competitiveness
5. ISO
7. Niras: “Grøn omstilling – store danske eksportvirksomheders potentielle for at bidrage til grøn omstilling” (green transition – the potential of larger Danish export companies to deliver solutions for green transition), 2012
10. Calculated on the basis of the top five most waste-intensive types of consumption: food; beverages and tobacco; clothing and footwear; furniture, furnishings, household services, etc.; and other goods and services. Data from Statistics Denmark’s 2012 Household Budget Survey. Generated waste has been calculated as household waste minus garden waste. Data from the Danish Waste Data System (ADS – Affaldsdatasystemet)
13. “Kortlægning af madaffald i servicesektoren” (survey of food waste in the service sector), Danish EPA, in: Undgå affald, stop spild, no. 5, 2014
14. Klimaorintereerde kostråd (climate-friendly dietary guidelines), the National Food Institute (DTU FOOD), 2012
15. European Commission (2005), Communication from the Commission to the Council, the European Parliament, the European and Social Committee and the Committee of the Regions – Taking Sustainable use of resources forward – A thematic Strategy on the prevention and recycling of waste
17. In this context, recycling refers to materials recovery.
18. “Mindre affald og mere genanvendelse i tekstilbranchen” (less waste and more recycling in the textile industry), Danish EPA, in: Undgå affald, stop spild, no. 3, 2014
20. Environmental Project no. 1449, 2012: Miljørigtigt design af elektronisk udstyr (ecodesign of electrical and electronic equipment)
22. DPA-System, 2012
23. ECR Europe & Europen, 2009; Danish Packaging Manufacturers, 2014
24. Environmental Project no. 1364, 2011: Kortlægning af supermarkedskæderne betydning for emballagevalget (survey of the influence of major supermarket chains on choice of packaging)