REDUCE AND REFUSE, RECYCLE AND REPLACE

A PLASTICS ROADMAP FOR FINLAND 2.0

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Foreword

The Plastics Roadmap for Finland, a programme of measures for promoting a circular economy for plastics, was completed in October 2018, based on the proposal of the working group appointed by the Ministry of the Environment. It was the first national programme with a cross-sectoral approach to promoting a sustainable circular economy for plastics, or any other material, for that matter.

The goal of the roadmap was to initiate concrete measures to boost a circular plastics economy and establish close cooperation among players in the field to get a broad-based transition towards a circular economy under way. The work was inspired, on the one hand, by the problems arising from the steeply increasing consumption of plastics, including littering and environmental damage, the single-use of plastics and low rate of recycling, and on the other hand, the positive qualities of plastics in terms of the environment.

The Plastics Roadmap is a strategic project of the ministries, and its implementation is also a requirement in the Government Programme of Prime Minister **Sanna Marin**.

Now that the Roadmap's implementation has made good progress, it is time to specify its goals and add to its measures.

The Ministry of the Environment launched a process to update the Plastics Roadmap in late 2021. The goal was to increase the programme's impact and ensure the adequate scope of its measures. Regarding further measures, special attention was focused on the viability of the value chains of the circular plastics economy and related development needs.

The Plastics Roadmap has involved and will continue to involve important EU and national legislation and other goals external to the programme. The programme work will support the achievement of these goals and expand them where necessary, taking into account the different stages of the circular plastics economy. Efforts will also be made to prepare for new EU initiatives concerning the recyclability of products, the use of recycled plastics, bio-based and biodegradable plastics, as well as restrictions on microplastics, for example. With its national Plastics Roadmap, Finland also supports the negotiations for a global plastics treaty. The negotiations were launched in February 2022 on the mandate of the UN Environmental Assembly, and are scheduled to be completed by the end of 2024.

Updates to the Plastics Roadmap are also made in preparation of the potential launch of an important set of projects under the EU's LIFE programme for strategic environmental initiatives. If the projects are launched, they will contribute to substantial, long-term investments in the implementation of

the Plastics Roadmap and the development of a circular plastics economy in Finland.

The most recent update to the Plastics Roadmap was carried out by the cooperation network that was set up by the Ministry of the Environment to promote the implementation of the Plastics Roadmap and develop any required further measures. The network has received support from an expert secretariat in charge of writing the programme. A mid-term review was conducted to support the updating efforts. The results and recommendations of the various research projects that have supported the implementation of the Plastics Roadmap were also taken into account in the updates.

Our goal is to ensure the breakthrough of a circular plastics economy in Finland by 2030.

Leena Ylä-Mononen Jyrki Alkio

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GOALS OF THE PLASTICS ROADMAP

The goal of the Plastics Roadmap is to reduce littering and other environmental damage caused by plastics, avoid the unnecessary consumption and improve the recycling of plastics and replace conventional fossil-based plastics with other materials and solutions. These goals have been further specified in this updated version of the roadmap to ensure greater attention to sustainable product development, reuse, recyclability of products and the increased use of recycled plastics.

The original Plastics Roadmap (2018) did not establish a schedule for implementation. The goal was to draw up a programme that would continue to be implemented in the following term of government. This was achieved, but it has also become evident that the transition to a circular plastics economy requires measures spanning a longer period.

What is more, no goal was defined for the implementation of the original Plastics Roadmap. Now that goal is more clearly in sight.

The goal of the Plastics Roadmap is to ensure the breakthrough of a circular plastics economy in Finland by 2030:

1. By reducing environmental littering and other environmental damage caused by plastics

2. By avoiding unnecessary consumption and promoting reuse (the latter is a new goal)

3. By enhancing plastics recycling and improving the recyclability of plastic products (the latter is a new goal)

4. By replacing virgin plastics made of fossil raw materials with

- recycled plastics (new)

- or sustainably produced renewable materials.

This requires us to move towards the following goals by 2030:

➔ A substantial reduction compared with 2022 in the amount of plastic litter in the marine environment and in a number of other key areas in terms of littering [1]

➔ Avoided consumption amounting to 30% and a substantial increase in reuse achieved in several key product groups compared with 2022[2]

➔ A recycling rate of 60% in plastic packaging3 and a notable initiation of recycling in other plastic products

- Fully recyclable or reusable plastic packaging, a considerable improvement in recyclability and reuse in many other plastic products[4]

- Recycled plastics accounting for an average share of 30% in new products in several product groups5

- Frontrunner position in sustainably produced, recyclable products made of renewable raw materials and in plastic-free materials for specific purposes

The quantitative goals of the Plastics Roadmap more concretely depict the impacts sought through the roadmap work. They are indicative and will be defined in greater detail along the way, as more information is obtained and external goals are further specified.

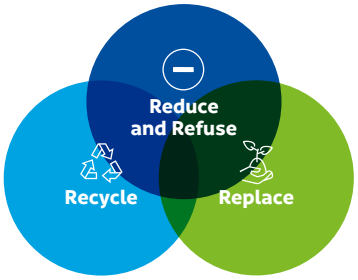
The external goals related to the Plastics Roadmap's goals are described in the following section and in Appendix 1.

The availability of information from existing reports and any separate surveys will be taken into account in the monitoring of goals. Indicators describing the goals will be developed during the Plastics Roadmap project.

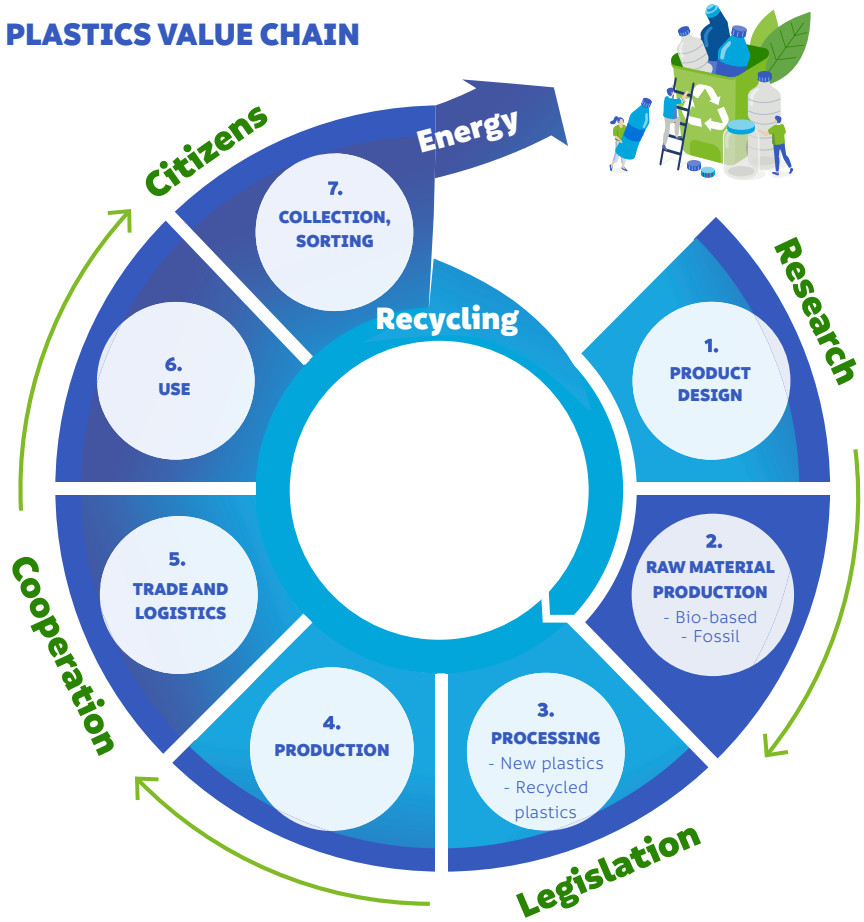
Plastics Roadmap for Finland

The Roadmap paves the way for a sustainable circular plastics economy.

- Compiles measures which help us to
  - reduce the harmful impacts of plastics
  - **avoid** unnecessary consumption
  - **enhance** plastics recycling
  - **find** alternative materials
- Coordinated by the Ministry of the Environment; implemented by a wide cooperation network.



PLASTICS VALUE CHAIN



MEASURES

Reduce littering, avoid unnecessary consumption

Significantly increase the recovery of plastic waste

Introduce diverse and adequate recycling solutions for recovered plastics

Considerably improve the recyclability of plastic products and the use of recycled plastic

Invest in solutions that replace plastics

Plastics used in construction and demolition, and in agriculture and horticulture

International cooperation

Enhance research knowledge of the negative health and environmental impacts of plastics and solutions to these

Cross-cutting measures

CIRCULAR PLASTICS ECONOMY IN FINLAND

42 %
Recycling rate for plastic packaging in 2019

92 %
Return rate for plastic deposit bottles in 2020

74,5 kt
collected plastic waste in 2019*

*excl. plastics used in construction and industry

TARGETS SET BY THE EU

Recycling rate for plastic packaging

50 % in 2025

55 % in 2030

All plastic packaging must be recyclable by 2030

EXTERNAL GOALS RELATED TO THE PLASTICS ROADMAP

A sustainable circular plastics economy involves numerous goals arising from various acts, commitments and programmes. At the EU level, these include the waste directives, the directive on single-use plastics (SUPD), circular economy programmes, the plastics strategy, the marine strategy, the chemicals strategy and regulation on chemicals, legislation on food contact material and the regulation on the use of recycled plastic in food packaging, as well as the Member States' contribution partly being based on the rate of plastics recycling. At the national level, the circular plastics economy is steered, for example by the Waste Act and waste decrees, voluntary Green Deal commitments, the programme of measures of Finland's marine strategy and the national waste management plan. Plastics-related goals are also included in several pending EU initiatives.

These diverse goals jointly define the operating environment for the circular plastics economy and pave the way for the achievement of the goals laid out in the Plastics Roadmap.

A summary of the main external goals related to the Plastics Roadmap are listed in Appendix 1.

Reduce littering, avoid unnecessary consumption

Plastics-related challenges interest people and receive a great deal of attention and coverage in public. Communication along with campaigns and initiatives targeting citizens are an important part of the solution to the plastics challenge. Good examples of successful campaigns include the Roska päivässä (‘a piece of litter a day’) movement, plogging, which means picking up litter while jogging, as well as the annual Clean Beach events. The ‘I love muovi – Anna muoville arvoisensa elämä’ campaign (‘I love plastic – Give plastic the life it deserves’) broadcast by the Finnish Broadcasting Company YLE in 2019, articles published in the Helsingin Sanomat daily and YouTube videos6 have given visibility to the theme.

Companies and the public sector also play a key role in reducing unsustainable consumption, such as single use and excessive packaging. Green deal agreements are one way to set ambitious goals that can be monitored and to define measures for achieving such goals.

The Directive (EU) 2019/904 on the reduction of the impact of certain plastic products on the environment calls for an ambitious reduction in the consumption of certain plastic single-use food containers and plastic cups for beverages. The measures for consumption reduction specified in the SUP directive will primarily be carried out through a green deal agreement between key businesses and the Ministry of the Environment. The agreement includes common goals and measures required to achieve them. The updated national waste management plan defines the goals and measures for consumption reduction, which comply with the SUP directive and are binding on the central government. Other public actors are also encouraged to adopt these goals and

measures. If required, goals and measures for reducing the consumption can be regulated through a decree based on legislation.

In addition to voluntary measures, prohibitions or other regulation can be adopted if required. The Waste Act includes a prohibition on littering, the violation of which may result in a fine of EUR 100, for example. The SUP directive also includes direct prohibitions of certain single-use plastic products, such as cutlery. In addition, the directive specifies marking requirements for certain single-use plastic products that easily end up in nature. The SUP directive expands the producers' responsibility for the costs caused by product-related littering and waste management

Sustainable product design plays a key role in reducing littering and unnecessary consumption. It can help reduce the probability of products ending up in nature, increase the service life of products, optimise material use, as well as ensure recyclability and, for example, the availability of electronic devices containing plastic. The European Commission will present initiatives concerning sustainable product design and biodegradable and compostable materials in 2022.

MEASURES:

- Citizens and other parties are encouraged to widely promote acts and campaigns for reducing single use and littering.

- Cities and municipalities, companies, event organisers and other parties are inspired to adopt solutions that reduce littering and unnecessary consumption, such as improving waste collection and related guidelines, restricting smoking on public beaches and ensuring anti-littering and good recycling practices on construction sites, for example.

- The collection of waste generated by certain single-use plastic products will be ensured and the costs from removing litter and from awareness raising measures aimed at preventing littering will be handled as required by the SUP directive.

➔ A green deal agreement for single-use plastic food containers and cups for beverages (jointly referred to as portion packages)7 will be adopted, with the following commitments:

- Replace single-use plastic portion packages with reusable or plastic-free single-use portion packages and collect a separate fee for their use from consumers.
- Use single-use portion packages containing little plastic in which plastic has been replaced with other materials or the amount of plastic has been reduced.
- Develop new solutions, operating models and packaging materials that can be used to replace single-use plastic portion packages and prevent littering related to them.
- Educate company personnel and inform consumers about the environmental impacts of single-use plastic portion packages and alternative solutions for reducing their consumption and environmental impacts of consumption.
- Report on the measures adopted and the results achieved, as well as assess the impacts of the agreement.
- Set ambitious quantitative goals for 2024–2026 for reducing the overall amount of plastic in single-use portion packages made entirely or partly from plastic that have been placed on the Finnish market compared to the 2022 level, ensuring that the overall amount of other materials in portion packages made partly of plastic does not increase.

➔ Stop the use of single-use plastic dishes in public-sector events and facilities and replace single-use dishes with reusable dishes in accordance with the updated national waste management plan.

➔ Optimise and reduce the consumption of plastic films in an environmentally sustainable manner in the construction supply chain (see Promote the circular plastics economy in construction).

➔ Assess ways to reduce plastic emissions with the help of environmental permits and better management of the transfer routes.

➔ Identify and adopt measures for reducing microplastic emissions (for example, textiles).

➔ Promote the sustainable design of products containing plastic, including anti-littering, extended service life and sustainable material choices.

IMPLEMENTERS AND PARTNERS:

Ministry of the Environment and other ministries, cooperation networks including WWF Finland and the Martha organisation, other organisations, Plastics panel, media, Finnish Food and Drink Industries' Federation, Finnish Commerce Federation, Finnish Hospitality Association MaRa, Finnish Packaging Association, Finnish Grocery Trade Association, Confederation of Finnish Construction Industries RT, packaging producer responsibility organisations, Association of Finnish Local and Regional Authorities and municipal networks8, as well as individual cities and municipalities and other parties.

TIMELINE:

- The amount of plastic litter in the marine environment will decline 30 per cent by 2027, compared with the level in 2015.
- The consumption of single-use plastic portion packages (food packaging and cups for beverages) will be reduced from the 2022 level by 2026.
- The consumption of plastic films in the construction supply chain will be reduced from the 2023/2024 level by 2027

INDICATORS IN USE (FROM REPORTINGS):

- The amount of plastic litter in the marine and coastal environment (Litter monitoring in the Finnish marine area).
- Reduction in the amount (tonnes) of plastic contained in single-use plastic portion packages.
- No increase in the overall amount (tonnes) of material other than plastic in single-use plastic portion packages compared to the 2022 level.
- The trend in the relative consumption of plastic films in construction supply chains (percentage).

OTHER POSSIBLE INDICATORS (SEPARATE SURVEYS):

- The amount of plastic litter collected (repeated campaigns).
- The impact and reach of anti-littering campaigns.
- The share of single-use plastic litter (SUPD) in municipal waste collection in public areas.
- Litter monitoring in national parks and at spectator events (the number of people in relation to the amount of litter in litter bins and in nature).
- The number of reusable applications and companies providing them in specific product groups (for example, takeaway sales).

Significantly increase the recovery of plastic waste

Plastics should be recovered far more effectively after their use. The bulk of plastic waste comes from packages, of which 42% are recycled in Finland (2019). The recovery of packaging plastic has developed well, but challenges arise from the adequacy of recycling capacity and the creation of recycling value chains for different types of plastic waste.

The EU's new common obligations concerning the recycling and separate collection of packaging waste were implemented in national legislation in 2021. The amendment to the Waste Act (714/2021) entered into force on 19 July 2021. The new Government decree on waste (978/2021) and the new Government decree on packaging waste (1029/2021) entered into force on 1 December 2021. As a result, the recycling targets for plastic packaging became stricter (2025: 50 per cent, 2030: 55 per cent) and the requirements concerning separate collection were expanded (further details in Appendix 1).

The calculation of recycling rate also changed in accordance with the EU Waste Framework Directive. Previously, the rate of recycling was calculated on the basis of separately collected plastic waste. As of 2020, it is based on the real recycling rate, that is, the recycling of plastic waste for new products or materials. Any contaminants and non-recyclable plastic waste are omitted from the calculations.

In addition to the development of collection systems, to promote the recycling of packages and other plastic items we need communication and ways of inspiring consumers and businesses to reduce the consumption of plastics, reuse plastic products, sort and recycle plastic waste, and use products made of recycled plastic. A common marking system, for example a pictogram on the product and the waste receptacle, would make sorting

easier. Digital watermarks are also being developed for sorting plants. The Waste Act and decree on packaging waste require that producer responsibility fees be determined so that they encourage the production of sustainability, reusability and recyclability of products.

Consumers order products and packages that contain plastic from outside the EU. The composition of such products and packages, as well as the increased use of biodegradable plastics can influence the viability of collection systems. In connection with the amendment to the Waste Act, provisions were issued so that producer responsibility obligations now also apply to products that come under the scope of producer responsibility but are sold by distance sellers outside Finland. In the future, supervision related to this will call for increased cooperation between authorities both in Finland and internationally. Regarding biodegradable plastics, the Commission will introduce a new policy initiative in 2022.

Textiles also contain a substantial amount of plastics. The Commission published the first EU textile strategy in March 20229, and the regional collection of textile waste will be launched in Finland at the beginning of 2023. The first textile waste recycling plant started up in late 2021. The collection of waste fishing gear containing plastic will begin with the implementation of the SUP directive.

MEASURES:

- Design the collection systems to be user-friendly and efficient. Launch experiments to investigate alternatives for implementing the separate collection of different types of plastic waste. Study the possibility of collecting plastic packaging waste and other plastic waste in the same container for recycling.

- Raise awareness among consumers and companies and offer advice on recycling plastics.

- Assess and ensure adequate recovery (collection) of plastics to achieve the recycling targets and meet the needs for recycled plastic.

- Develop technologies related to the recovery of plastic waste. Assess the impact of biodegradable plastics on collection and recycling systems.

- Explore the possibilities to negotiate a voluntary green deal agreement concerning the value chain for the utilisation of municipal waste as energy. Such an agreement would increase the separate collection and recycling of recyclable municipal waste (for example plastics) that currently ends up in incineration, as well as reduce the emissions from waste incineration plants.

➔ Develop the separate collection and sorting plants of plastic films and set quantitative goals for the rate and amount of separate collection for 2027.

➔ Follow developments in textile waste recycling and opportunities for the recycling of textile plastics.

➔ Improve and encourage the collection and recycling of waste fishing gear[10].

IMPLEMENTERS AND PARTNERS:

Ministry of the Environment, municipalities, Suomen Kiertovoima and waste treatment plants, packaging producer responsibility organisations, Finnish Plastics Industries Federation, Confederation of Finnish Construction Industries, VTT Technical Research Centre of Finland Ltd, Martha organisation, WWF Finland, other organisations and operators in the sector.

TIMELINE:

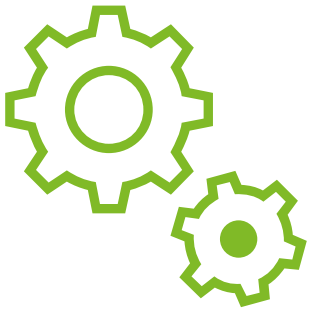
Regarding the amendments to the Waste Act, as indicated in the schedule of implementation (see Appendix 1, target 3).

INDICATORS IN USE (FROM REPORTINGS):

- Rate of recovery or recycling of plastic packaging (rate of recycling reported since 2020).
- In construction, the trend in the amount of separately collected plastic films compared with the base level in 2023/2024.

OTHER POSSIBLE INDICATORS (SEPARATE SURVEYS):

- Rate of recovery or recycling of non-packaging plastics.
- The general public's opinion about the sufficiency of plastics collection points (a barometer, for example).



Introduce diverse and adequate recycling solutions for recovered plastics

Plastics recycling is a process with multiple stages, including the collection, transport, sorting, processing, and ultimately the production of new products from secondary raw material. The appropriate recycling process is selected based on the source of origin, type and amount of plastic waste, as well as the requirements for new products. It is worth noting that not all waste plastics are suitable for recycling. In some cases, their controlled use for energy is a better option.

There are many solutions to processing plastic waste, from mechanical to chemical recycling. Besides solutions suited to large volumes, small-scale solutions are needed as well. In all recycling and utilisation solutions, it is important to pay attention to the management of harmful substances and to the safety of secondary raw materials and products. Mechanical recycling is best suited to uncontaminated plastic waste that is in good condition. In turn, chemical processing can be used for poor-quality plastic that is not suitable for mechanical recycling. The suitability of chemical recycling technologies varies depending on the plastic waste fractions and impurities, and the purity of the waste fraction affects the yield of recycled plastic and the amount used for energy. According to the EU's prioritisation, the utilisation of plastic waste for energy is not considered to be recycling. New biotechnological methods can offer new opportunities for plastics recycling.

Mechanical recycling accounts for the bulk of plastics recycling in Europe, and chemical processes still play a minor role[11]. However, chemical treatment of plastic waste is emerging as the main method in the development of plastics recycling solutions and value networks, as it produces recycled plastic of

good quality that is suitable for food packaging and demanding technical applications, for example. Many international petrochemical companies are now introducing relatively similar chemical recycling solutions that are based on the use of pyrolysis to liquefy waste plastic to pyrolysis oil, which is then put through cleaning and processing at a plastics plant to achieve plastic that is as good as new. Plants for the chemical recycling of plastics are already operating in Europe, and new plants are being established.[12] For now, the chemical part of products still often ends up as fuel instead of being utilised as material.

In Finland, new plant capacity for mechanical plastics recycling will be introduced in the next few years, while the adoption of chemical recycling will continue to increase. To enhance plastics recycling, the need for new sorting plants can also be assessed[13]. In addition to other factors, investments will most likely be influenced by the relatively small size of the Finnish recycling market[14].

The introduction of new recycling solutions depends heavily on the sufficiency of suitable waste plastic and the kinds of markets available for recycled plastic and other products obtained from waste plastic processing. For the recycling markets to operate smoothly, we need financial commitment to new solutions and cooperation between different parties so that traditional one-way value chains can be made part of the circular economy. Public operators can play an important part in enabling new cooperation models and business operations.

The financial instrument for sustainable growth (RRF) has introduced new financing opportunities for investments in plastics recycling plants in Finland. Provided that the criteria for funding are met, investment funding can also be sought from the Climate Fund established in 2020. Other potential financial instruments include the European Regional Development Fund (ERDF) and its circular economy theme, as well as the circular economy investment programme of Finnish Industry Investment Ltd. The Nordic Investment Bank (NIB) has contributed substantially to investments in the circular economy [15], and funding for large investments (in excess of EUR 20 million) can also be sought directly from the European Investment Bank.

MEASURES:

- Promote recycling solutions suitable for various waste and secondary plastics materials and their value chains.

- Launch projects to strengthen cooperation among operators and improve sorting and process competence required for recycling in companies and research institutions.

- Support research in the mechanical and chemical recycling of plastics as well as related development and investments in production. Recognise the risks related to different materials.

➔ Develop and assess methods for mass balance calculation to determine the rate of recycling in the chemical recycling of plastics.

➔ Develop and test cleaning, recycling and processing technologies for plastic waste, as well as the quality assurance of the collection and pre-processing of recycled plastic intended to come into contact with food in order to improve the quality and safety of recycled plastic.

➔ Ensure the adequacy of recycling capacity and the possibility of using secondary material to more extensively replace virgin plastic.

➔ Establish one or two full-sized plastics recycling plants and chemical recycling units in connection with existing chemical industry.

IMPLEMENTERS AND PARTNERS:

Ministry of Economic Affairs and Employment, other ministries, VTT Technical Research Centre of Finland Ltd, Business Finland, Plastics Industries Federation, packaging producer responsibility organisations, companies in the sector and other operators.

TIMELINE:

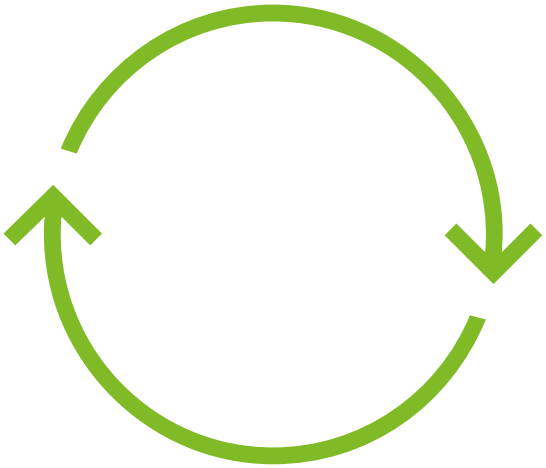
The plant investments required for the achievement of the recycling targets for plastic packaging will be carried out in Finland by 2025.

INDICATORS IN USE (FROM REPORTINGS):

- Rate of recovery or recycling of plastic packaging (since2020).
- Amount of exported plastic waste[16].

OTHER POSSIBLE INDICATORS (SEPARATE SURVEYS):

- Sufficiency of recycling capacity for separately collected plastics in Finland.
- Type of separately collected plastic waste.



Considerably improve the recyclability of plastic products and the use of recycled plastic

One of the key goals of the EU's plastics strategy adopted in 2018 is to ensure that all plastic packaging in the EU market is reusable or easy to recycle by 2030.

Methods for ensuring recyclability and reusability will be defined in connection with the revision of the EU's packaging and packaging waste directive. The Commission will launch an initiative on the revision in summer 2022. The initiative can also include goals and obligations concerning the use of recycled plastic in packaging.

The SUP directive already sets a requirement for the use of recycled plastic. According to it, in 2025, recycled plastic must account for at least 25 per cent of all the single-use plastic PET beverage bottles placed on the market. In 2030, this figure must be 30 per cent of all the single-use plastic bottles placed on the market.

The European Plastics Pact17 has set its targets for the reusability and recyclability of plastic packaging for 2025. By then, recycled plastic should account for an average of 30 per cent (by weight) of the new products and packages made by the plastics user companies that have signed the Pact.

Plastics Europe, a trade association of plastics producers, strives to ensure a recycled plastics content of 30 per cent in packaging by 2030.

Economic instruments can also be used in efforts to boost the use of recycled plastic (see Cross-cutting measures).

Potential purposes for recycled plastic include packages, as well as construction products and textiles. In some cases, the recycling of synthetic textile fibres and plastics can be combined. When using recycled material, attention must also be paid to additives and their impact on the end product's use.

The options for using recycled plastic in contact with food are still very limited for other than PET plastic. A revision of the EU regulation on recycled plastic used as food contact material is under preparation. Once in force, the revised act will clarify the regulation on the safety of recycled plastics used in food packaging. The EU's legislation on food contact materials is being revised as part of the Farm to Fork strategy and the chemicals strategy, the goal being to improve the safety of food products. This is sought especially by reducing the use of hazardous chemicals and supporting innovative and sustainable packaging solutions.

High-performance composite plastics, used in many places such as wind power stations, electric vehicles and tanks, are the most problematic in terms of recycling. Such plastics are being produced and used increasingly. Special attention must be paid to their recyclability and to the development of recycling systems.[18]

Product design is key to the quality and safety of plastics in the future. The criteria for chemicals defined in the context of the EU Safe and Sustainable by Design initiative prevent hazardous chemicals from ending up in material cycles. To ensure the safety of secondary materials, it remains necessary to advance the replacement of the most hazardous chemicals and develop solutions and methods for identifying and phasing out hazardous substances and eliminating them from the material cycle.

MEASURES:

- Find methods for ensuring recyclability in the design of plastic products and composites in accordance with the principles of sustainable and safe product design.

- Assess claims concerning the recyclability and other environmental properties of products and increase related guidance.

- Identify product groups that can be produced with a specific share of secondary plastics[19]. Strengthen research and innovation in secondary raw materials. Invest in the development of applications for recycled plastic and in increased opportunities for their use. Survey the impacts of use and life after use.

- Ensure the safety and acceptability of the use of recycled plastic, for example by improving the identification of hazardous substances. This can be done, for example, with the help of information in the SCIP database, maintained by the European Chemicals Agency (for substances of concern in products).[20]

- Continue the preparations of end of waste (EoW) criteria to support the use and quality assurance of recycled plastic either nationally or in connection with the preparatory work launched by the Commission in 2022.

- If no harmonised EoW regulation is issued for plastic waste, prepare national legislation.

- Assess the possibility of developing regulatory guidance to encourage the production of high-quality secondary plastics.

- Increase the use of recycled materials in the production of plastic film for the needs of the construction supply chain and the construction sector, as well as the use of plastic film made of recycled material in the construction supply chain.

- Study the use of recycled plastics in textiles and for other applicable purposes.

- Increase cooperation among the various participants in the plastics value chain, including product designers and plastics producers and recyclers, for example by establishing a competence network and trialling a service supporting the creation of value chains.

- Explore the establishment of an industry cluster to support the production and use of secondary plastic.

IMPLEMENTERS AND PARTNERS:

Ministry of the Environment, Ministry of Economic Affairs and Employment, Ministry of Agriculture and Forestry and other ministries, Plastics Industries Federation, Finnish Packaging Association, Finnish Food and Drinks Industries' Federation, operators and research institutions in the construction sector and other sectors that use plastics.

TIMELINE:

- Schedule for measures of the green deal agreement on construction plastics.
- Survey on the use of recycled plastic and the mixing requirements completed at the beginning of 2023.
- Schedule for processing and implementing the revision of the packaging and packaging waste directive (Q2 2022).

INDICATORS IN USE (FROM REPORTINGS):

- Recovery rate for plastic films in construction and the construction supply chain / green deal agreement on construction plastics.
- Other possible indicators (separate surveys):
- Recovery rate for plastic packaging.
- Recyclability and reuse of plastic packaging.
- Recyclability and reuse of other plastics products.

Invest in solutions that replace plastics

Bio-based materials that replace fossil plastics are an important sector and innovation opportunity for Finnish research, product development and production. There is a global need for safe, bio-based, recyclable – and in some cases, fully biodegradable – products that replace plastic. Finland is home to solid biomaterial expertise and raw materials that offer promising opportunities for solutions replacing traditional plastics.

To meet the expectations on alternative materials and solutions, we need close cooperation and investments in research, innovation and scaling of production so that promising ideas make it to the market. Fully plastic-free materials and solutions are becoming increasingly important especially in products that risk ending up in nature. Various composites combining plastic and bio-based materials may be used to increasingly replace plastics in the future, especially in products with a long life cycle, provided that appropriate recycling solutions can be found for them.

Meanwhile, there is a need to assess the sufficiency and usability of replacement materials and their raw materials, as well as the relationships between these, along with their qualities and impacts in terms of the environment, health and safety, recyclability and waste management. The assessment methods for bio-based materials must be developed to account for climate impacts from changes in land use and the impacts on biodiversity, for example. In support of this, internationally approved assessment and concept templates must be drawn up to enable comparisons between different materials and to develop standardisation. Comparable data on materials and product life cycle impacts must be made better available to product manufacturers and consumers.

The EU's policy framework for bio-based, biodegradable and compostable plastics, currently under preparation, aims to develop the life-cycle assessment of these materials, identify purposes suitable for biodegradable

and compostable materials, as well as reduce any uncertainty and confusion related to these materials. The Commission plans to publish the related initiative in the summer of 2022.

The communication published by the Commission in late 2021 concerning the Sustainable Carbon Cycles policy framework[21] aims to support the achievement of the EU's climate neutrality target by 2050. The communication concerns both carbon farming (sequestering carbon in organic matter and the soil) and industrial processes. Among other things, it includes the goal of introducing non-fossil carbon sources (bio-based, recycled, CCU) in the production of plastic products and chemicals[22].

MEASURES:

- Support the development of new value networks for solutions, materials and technologies that replace plastics, as well as for related business models.

- Develop assessment methods and strengthen the knowledge base concerning the environmental, climate and health impacts of plastics and alternative materials and solutions.

- Ensure the recyclability, overall environmental and climate sustainability, as well as safety of products in the development of materials and solutions replacing plastics.

- Develop instruments for optimising the functional performance of materials, with due consideration to environmental, climate and circular economy impacts. Determine the principles for mixing materials so that their recyclability can be ensured.

- Assess the need for a broad-based knowledge network in sustainable material solutions, with the task of increasing companies' materials competence, strengthening recycling value chains and research, disseminating information about solutions that replace traditional plastics, developing standardisation and making the network a part of key international forums in the field.

IMPLEMENTERS AND PARTNERS:

Ministry of Economic Affairs and Employment, Ministry of Agriculture and Forestry, Ministry of the Environment, Business Finland, Finnish Industry Investment, Finnish Climate Fund, VTT Technical Research Centre of Finland Ltd, Natural Resources Institute Finland, Finnish Environment Institute, Finnish Innovation Fund Sitra, Plastics Industries Federation, Muovipoli (NPC), Finnish Forest Industries and other trade associations, Academy of Finland.

TIMELINE:

- The national implementation of the SUP directive will take place in 2022.
- A survey of the knowledge network for sustainable material solutions will be conducted by the end of 2023.
- Structural requirements concerning the recyclability of composite materials will be drawn up by 2023.

INDICATORS IN USE (FROM REPORTINGS):

- Reports concerning product development and new business (e.g. by Business Finland).
- Other possible indicators (separate surveys):
- The emergence of new business, the number of start-ups and turnover in the field at large.
- The climate and environmental benefit achievable (or achieved) with alternative materials and solutions.

Accelerating the circular plastics economy in construction

Roughly one fifth of all plastic is used for construction (buildings and infrastructure). It is one of the main uses of plastics. However, the recovery and recycling of plastics used in construction is not yet particularly widespread, and most of the plastic waste generated in construction is utilised as energy.

A circular plastics economy requires construction projects to be planned in a way that makes the sustainable use and circular economy of plastics possible. In addition, the identification of plastics used in construction should be improved, as should construction site practices, separate collection, recycling systems and, ultimately, the utilisation of plastic waste.

To enhance the recycling of construction plastics, the Ministry of the Environment and industry and business operators have concluded a green deal agreement on construction plastics[23]. The green deal encompasses the entire construction value chain, and its implementation and further measures aim for a broad transition to plastics recycling and circular economy in the construction sector. The goal of the green deal agreement on sustainable demolition concluded between RAKLI and the Ministry of the Environment is to promote functioning markets for plastics and other demolition materials generated in renovation and demolition projects, as well as their reuse and recycling.

Large-volume construction products offer significant potential uses for recycled plastic. Restrictions apply to the use of recycled plastics in construction. However, they can be used in plastic films for packaging and in non-pressurised pipes, for example. The use of recycled plastics in

construction products may be included in the future revision of the EU's Construction Products Regulation. The Commission intends to present an initiative on the matter in the spring of 2022.

MEASURES:

➔ Measures in the green deal agreement on construction plastics 2020–2027:

- Develop plastics competence in the construction sector and in the supply chain of construction.
- Reduce unnecessary packaging of construction products and adopt new packaging solutions and plastic films made of recycled materials.
- Increase the separate collection of plastic films on building and infrastructure construction sites and introduce new separate collection solutions in construction projects and contracts.
- Develop and adopt new recycling technologies and improve the preparation phase for the recycling of separately collected plastic films.
- Increase the use of recycled plastic films in plastic film production so that recycled raw materials account for 40 per cent of all the raw materials used in production by the end of 2027.
- Promote the circular construction economy through public procurement.

➔ Accelerate the implementation of the green deal agreement on construction plastics during the agreement period and set up new ambitious quantitative goals for the years 2024/2025–2027 for the separate collection of plastic films, the preparation of separately collected plastic films for reuse and recycling, the share of plastics made of recycled materials and the reduction of consumption of plastic films in the construction projects, contracts and construction supply chain companies that are part of the commitments made to the agreement.

➔ As part of the green deal agreement on construction plastics, explore the material recovery potential of construction plastics other than plastic films and their possible inclusion in the agreement.

➔ Investigate the amount and quality of construction plastics from demolition and improve their recyclability.

IMPLEMENTERS AND PARTNERS:

Ministry of the Environment, Association of Finnish Local and Regional Authorities, Confederation of Finnish Construction Industries, RAKLI, Plastics Industries Federation, Chemical Industry Federation, Finnish Hardware Association RASI, Finnish Electrotechnical Trade Association, Association of Finnish Technical Traders, Finnish Environmental Industries YTP, Motiva, Housing Finance and Development Centre ARA, Senate Properties, KEINO Competence Centre for Sustainable and Innovative Public Procurement, research institutions, Muovipoli and other companies, municipalities and organisations.

TIMELINE:

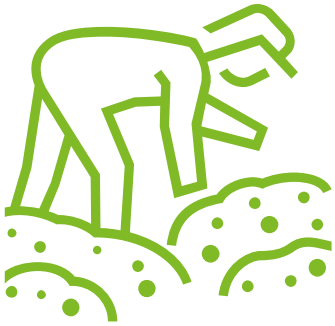
- The additional targets for construction plastics will be specified during the green deal period (2020–2027).

INDICATORS (FROM REPORTINGS):

- The share of recycled plastic films of the raw materials used in the production of construction plastic films for the use of the construction sector and construction supply chain.

- Monitoring of the quantitative targets set for the period 2024/2025–2027 for the separate collection of plastic films, the preparation of separately collected plastic films for reuse and recycling, the share of plastics made of recycled materials and the reduction of consumption of plastic films in the construction projects, contracts and construction supply chain companies that are part of the commitments made to the agreement.

- The recyclabilityof construction plastics other than plastic films.



Promote the recycling and replacement of plastics in agriculture and horticulture

In agriculture and horticulture, relatively large amounts of plastics are used, for example in greenhouses and for mulch, silage storage and seedling cultivation. Plastic sacks, canisters and containers are used for fertilisers and pesticides, for example. Plastics are also used as auxiliary agents in some fertilisers.

The main problem in the recycling of agricultural and horticultural plastics and the provision of recycling services is the separation of different types of plastics and the impurities accumulated, for example in plastic used for silage. In terms of the environment, a particular problem is the degradation of plastics used for multi-annual mulch in the Finnish climate and the resulting microplastic litter.

Plastics packaging used in agriculture and horticulture comes under the scope of producer responsibility. There are reception terminals established by producers where plastic packaging waste can be delivered free of charge. However, producer responsibility only applies to the packaging of products professionally placed on the market, while plastics used to pack feed for own farm use are excluded from the responsibility. Moreover, producer responsibility does not apply to other plastics, such as those used for mulch.

As a rule, farmers using plastics excluded from producer responsibility in their business must themselves organise recycling or waste management for the plastics in cooperation with companies in the field. Cooperation networks and paid collection services are already available for plastics recovery from farms.

Instructions for the recycling of plastics used in agriculture and horticulture are available in the handbook (in Finnish) published on the Finnish Food Authority's website[24].

At present, producer responsibility for packaging does not apply to producers with a turnover less than one million euros. Proposals have been made to abolish this limit[25]. Such a change would have at least some effect on the producer responsibility for agricultural packaging, but packaging for own use would still be excluded from producer responsibility.

Sweden has introduced a reception system for some agricultural plastics, which the sector has voluntarily expanded to certain plastics used in agriculture and horticulture that would otherwise be excluded from producer responsibility[26]. In addition to packaging under the scope of producer responsibility, the system receives a number of other types of plastic waste generated in agriculture and horticulture, such as plastic sacks and films for silage and horticulture. The costs for operations are covered with fees on plastics that are paid in product prices.

Fruit and vegetable farms already use some biodegradable mulch and especially for annual plants, different kinds of biodegradable films are replacing the use of plastic for covering the soil. Not all of the solutions that are called biodegradable are 100% so, but bio-based alternatives for them exist, and new ones are being developed.

Microplastics used in agriculture and horticulture have attracted increasing attention in recent years. Research in the field, including the MicrAgri project in Finland and the EU's Papillons project, provide information on microplastics emissions and opportunities for their restriction. The European Commission will be presenting an initiative on the restriction of added microplastics, which will also apply to fertilisers used in agriculture and horticulture27. Following the SUP directive's entry into force, oxo-plastics that degrade into microplastics when exposed to sunlight and heat are no longer used for mulch in the EU.

MEASURES:

- Identify cost-effective solutions and appropriate policy instruments to boost the recycling of agricultural plastics. Increase regional cooperation with parties not affected by producer responsibility.

- Assess opportunities to expand producer responsibility or to establish voluntary measures and goals for the sector, for example through green deal agreement, to cover a wider range of plastics. This would encourage the development of plastics recovery, recycling and reuse.

- Develop alternative materials and solutions for agricultural plastics.

➔ Increase information about the soil impacts of plastics, as well as communication and training material on the topic.

➔ Determine the worst sources of microplastics in agriculture and horticulture and find solutions for their mitigation.

IMPLEMENTERS AND PARTNERS:

Ministry of Agriculture and Forestry, Ministry of the Environment, Central Union of Agricultural Producers and Forest owners, Central Union of Swedish-speaking Agricultural Producers in Finland, Finnish Food Authority, Finnish Glasshouse Growers' Association, Central Organisation for Finnish Horticulture, Finnish Association of Landscape Industries, Plastics Industries Federation, companies, research institutions.

TIMELINE:

- Identify the measures required to reduce environmental emissions from microplastics in agriculture and horticulture by the summer of 2023.

INDICATORS IN USE (FROM REPORTINGS):

- The amount of plastic waste in agriculture and horticulture and the recycling rate of plastic packaging.

- Other possible indicators (separate surveys):

- Microplastics in the soil and their sources: estimates of emissions and accumulations.

Promote solutions to the plastics challenge in international cooperation

Finland's Plastics Roadmap contributes to the steering and implementation of international, EU and regional initiatives. It also draws attention to the best practices and strengthens Finland's visibility in nationally important questions.

The EU's new circular economy action plan (2020)[28] contains many of the previously mentioned initiatives related to the measures of the Plastics Roadmap. The action plan also calls for efforts to reach a global, legally binding plastics agreement.

Finland has long been actively involved in international cooperation within the UN Environmental Assembly (UNEA) aimed at solving the marine litter and microplastics problem. The UNEA's long-term policy goal is to prevent emissions of plastic litter into the marine environment. In 2019, Finland and the other Nordic countries announced their policy goal to develop a global intergovernmental agreement to prevent plastic pollution. In March 2022, the UNEA adopted a resolution to start negotiations on an international plastics agreement. The UNEA established an intergovernmental committee with the mandate to prepare a legally binding instrument covering the entire life cycle of plastics and applicable to plastic pollution in all environments by the end of 2024.

Efforts carried out under the UN Basel Convention support the appropriate transfer of plastic waste and the environmentally sound management of plastic waste. Among other things, the Convention bans the export of hazardous and mixed plastic waste outside the EU and OECD. The partnership

programme supporting restrictions on the transfer of plastic waste aims to reduce the generation of plastic waste and improve plastic waste management in collaboration with countries and operators.

In addition to global cooperation, Finland strives to reduce the environmental impacts of plastic through close regional cooperation. In 2017–2018, the Nordic countries ran a joint plastics programme that focused on reducing plastic litter on a wide front and proposed measures to mitigate the problem. The Nordic Council of Ministers has since funded several projects related to, for example the marine environment The Council also funded an extensive four-year initiative aimed at building a knowledge base to help find international and regional solutions to the prevention of plastics-based pollution. In the spring of 2021, the Arctic Council approved its action plan concerning marine litter, the implementation of which is now being launched. The Baltic Marine Environment Protection Commission (HELCOM) has agreed on cooperation around the Baltic Sea to reduce marine litter. The updated Baltic Sea Action Plan was adopted in the autumn of 2021.

MEASURES:

- Actively promote the achievement of a binding global agreement covering the entire life cycle of plastics. Such an agreement will support countries' national measures to prevent plastics pollution.

- Promote further measures at the EU level to strengthen a sustainable circular plastics economy, including the recyclability of products containing plastic and the safe and sustainable use of secondary plastic in products.

- Implement the EU marine strategy, the national marine program and the regional action plans and projects in Nordic, Baltic Sea and Arctic cooperation.

- Disseminate information about Finnish solutions and operating models important to Finland.

IMPLEMENTERS AND PARTNERS:

Ministry of the Environment, Ministry of Economic Affairs and Employment, other ministries, operators in the sector.

TIMELINE:

- An agreement on the international plastics agreement will be achieved in intergovernmental negotiations by the end of 2024.
- The timelines for the Commission's initiatives (work programme).
- The timelines of regional action plans.

INDICATORS IN USE (FROM REPORTINGS):

- Monitoring of the EU plastics strategy and circular economy action plan.
- Monitoring of the implementation of regional action plans.

OTHER POSSIBLE INDICATORS:

- Finland and Finnish actors actively participate in the negotiations on an international plastics agreement. Substantive discussions on a new global plastics agreement are carried out in broad-based stakeholder cooperation.
- The new global plastics agreement is approved at the intergovernmental conference in 2025, and it achieves broad endorsement.
- The new global plastics agreement covers the whole life cycle of plastics and plastic products and includes a common binding objective, as well as a reporting and monitoring mechanism for the agreement.

Export expertise and solutions

Plastics pollution is a common problem all around the world. As much as 80–90 per cent of marine plastic litter, which has awoken the world to the plastics challenge, is generated on land and by various sources, ranging from industry to consumption.

Resolving this problem requires local and regional changes in the operating models, better waste management, reduced use of and substitutes for plastics, and perhaps also efforts to recover plastics from waterways and oceans. Humanitarian impacts must always be considered as well, to ensure that the solutions do not further weaken the situation of people in a vulnerable position, whose livelihood may have been based on waste collection, for example.

Finland has a great deal of expertise and companies that can contribute to making this change happen. Business Finland boosts the development and export of Finnish solutions[29]. Examples of expertise and solutions exports include VTT's waste treatment projects in India (Until Mumbai, Mithi River) Indonesia.30 The Ministry for Foreign Affairs has several financial instruments which support the business of Finnish companies in developing countries.

Regional cooperation also provides Finnish companies and experts with opportunities to boost waste management and material recycling[31].

MEASURES:

- Strengthen the ability of Finnish companies to develop solutions to the plastics challenge and promote their export. Companies can develop the recovery of plastic waste, substitute materials, recycling solutions or assessment and monitoring methods, for example.

➔ Share best practices in waste management and the circular economy related to the authorities' work, for example, and promote the circular economy approach.

IMPLEMENTERS AND PARTNERS:

Business Finland, Ministry for Foreign Affairs, Ministry of Economic Affairs and Employment, Ministry of the Environment, Finnish Environment Institute, WWF Finland, Finnfund.

TIMELINE:

- Business Finland's Bio Circular Finland programme will end in 2022.

INDICATORS IN USE (FROM REPORTINGS):

- The development of Finnish companies' exports in the area (Business Finland's programme monitoring).

Enhancing research knowledge of the negative health and environmental impacts of plastics and solutions to these

Our knowledge about the environmental impacts of plastic litter, microplastics and the harmful substances in plastics continues to increase, but it is still fragmented and there are gaps in even the basics. In addition, we lack sufficient information about the potentially harmful substances in recycled plastic and their impacts. The availability of research-based knowledge concerning the health impacts of microplastics and the related risks has improved in recent years, but it is still difficult to interpret the results in terms of risk assessment.

More information and risk identification are required to support decision making. Surveys that have already been identified as necessary should be carried out. These include surveys of the harmful substances in plastics pointed out in, for example the national chemicals programme and the Baltic Sea monitoring programme. At the EU level, a great deal of work is carried out related to chemicals legislation, for example. In addition, the European Food Safety Authority (EFSA) assesses the impact of microplastics on the human body, especially from exposure through food.

The European Chemicals Agency has explored different options for restricting the addition of microplastics to products and has submitted a related proposal to the Commission. The Commission plans to issue a legislative

proposal on the matter in 2022. The Commission is also seeking ways to restrict microplastics emissions from the wear and tear of products containing plastics, such as textiles and car tyres. An initiative related to this will also be presented in 2022.

Research on these questions will span several years and require international cooperation. To succeed in international research cooperation and in obtaining research funding, Finland also needs to conduct research on its own. The EU has already increased its investments in research on plastics as part of the current funding for the Framework Programme for Research and Innovation (Horizon 2020) and has adopted a long-term research strategy for plastics to steer financing.

The EU's LIFE programme funds projects related to the environment, nature conservation and climate action. Finland has applied for LIFE programme funding for a project package to boost the implementation of the Plastics Roadmap (PlastLIFE). If implemented, the project would make a substantial contribution in terms of funding and the participants' input to the circular plastics economy and the implementation of the Plastics Roadmap.

Collecting information about the environmental and health impacts of plastics and identifying research needs have been key measures in the efforts to build up our knowledge about the harmful effects of plastics and solutions to them. Information must also be made available and effectively communicated to users.

MEASURES:

- Increase research and research cooperation, as well as risk assessments concerning the environmental and health impacts of plastics in accordance with the identified research needs.
- Regularly publish summaries of the state of research on the environmental and health impacts of plastics (thematic reviews, for example).
- Combine competence in different fields more actively and extensively in research projects.
- Improve the communication about and availability of research-based knowledge to users.
- Identify approaches to reducing the emissions and harmful impacts of microplastics and increase research on them.
- Develop the monitoring of marine littering and related indicators.
- Assess the impacts on species and ecosystems.

➔ Develop technologies and techniques suitable for the identification of different components in plastic waste, the identification and analytics of harmful substances contained in plastics, and the elimination of harmful substances in plastics recycling.

IMPLEMENTERS AND PARTNERS:

Academy of Finland, Strategic Research Council, ministries and the Prime Minister's Office, universities, Finnish Institute for Health and Welfare, Finnish Environment Institute, VTT Technical Research Centre of Finland Ltd, Natural Resources Institute Finland, Business Finland, Finnish Safety and Chemicals Agency; cooperation with key international operators, such as the EU Chemicals Agency.

TIMELINE:

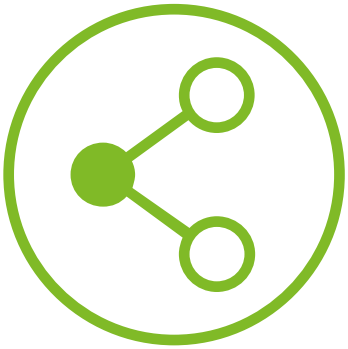
- The Finnish Environment Institute's website for plastics research will be launched in the spring of 2022.
- Decisions in the final round of applications for the PlastLIFE project will be made in the spring of 2022 (application submitted in April).

INDICATORS IN USE (FROM REPORTINGS):

The marine strategy's datasets concerning macro and micro litter and related reports every six years; trends in littering in the Baltic Sea area and the Arctic region.

OTHER POSSIBLE INDICATORS (SEPARATE SURVEYS):

- The microplastics load and its impacts on water bodies and the soil.
- Finns' exposure to microplastics.
- Microplastics emissions and the adoption of measures reducing exposure.
- The number of published research concerning the environmental and health impacts of plastics, as well as the comprehensiveness of the topic.



Cross-cutting measures

The Plastics Roadmap, an action plan for a sustainable circular plastics economy, includes its own goals. However, it also involves a wide range of external goals, such as legislation on plastic packaging and waste, producer responsibility, construction and demolition, single-use plastic products, the reduction of littering, and the marine strategy. The requirements and development needs in these legislative packages contribute to the framework of the Plastics Roadmap, and they have been taken into account in the measures specified in the Roadmap.

However, plastics-related legislation must also be assessed as a whole. This is so especially because the achievement of each goal is often influenced by the development of the value chain's other parts. In other words, to boost the circular plastics economy, we must identify the connections between different sets of measures, and this is one of the key tasks of the Plastics Roadmap. Communication that is of interest to a wide audience and that supports networking and stakeholder cooperation plays an important part in implementation.

The implementation of the Plastics Roadmap and related legislation can be accelerated and complemented with funding for trial and pilot projects supporting development measures, as well as with economic instruments.

To boost the implementation of the Plastics Roadmap, a EUR 1 million support programme for trial and pilot projects was launched for the period 2021–2022. The deadline for funding applications was in 2021. The programme attracted great interest, and significant projects have been launched thanks to it. However, only a limited number of potential projects could be financed through the project. By continuing the programme and by broadening its scope of application, the implementation of the Plastics Roadmap and its new measures could be enhanced significantly. This calls for additional resources.

Economic instruments can also be used to help promote the circular plastics economy. Examples of financial instruments include producer responsibility systems, any requirements to use recycled materials, as well as product pricing based on refunds, fees or taxes. Opportunities for the use of financial instruments have not yet been extensively assessed in the implementation of the Plastics Roadmap. There has previously been talk about a tax on plastics, which can be used to support the reduced consumption of traditional (virgin) fossil plastic, the increased use of recycled plastic or the use of substitute bio-based materials.

In the long term, the Plastics Roadmap must also be linked more closely to climate issues. A more detailed assessment is required of the impacts of the Plastics Roadmap's measures in terms of the 2035 climate neutrality goals.

MEASURES:

- Assess the development of plastics use, the effectiveness of the goals linked to the Plastics Roadmap, as well as their achievement. Also assess the effectiveness in terms of the climate.

- Assess the connections between the Plastics Roadmap measures and identify any related development needs to improve the mutual effectiveness of the measures.

- Ensure communication and interaction in the cooperation network and with partners. Organise an annual Plastics forum that interests and engages stakeholders widely.

- Enhance communication related to the measures and establish a voluntary communications team for the cooperation network, where representatives of the different operators plan the content of communication. The communications team spurs the network's joint communication in addition to each party's own communication.

- To the extent possible, continue the Plastics Roadmap support programme for trial and pilot projects.

- Examine the employment of financial guidance to accelerate the Plastics Roadmap's implementation and the execution of its various goals.

- Implementers: Ministry of the Environment, Ministry of Finance, Ministry of Economic Affairs and Employment, other members of the cooperation network.

TIMELINE:

- Surveys will be carried out in 2022–2023. The next programme assessment for the Plastics Roadmap will be conducted at the end of 2025.

POSSIBLE INDICATORS (SEPARATE SURVEYS):

The monitoring results for the Plastics Roadmap and the results of the next programme assessment.

Implementation and monitoring

The implementation of the Plastics Roadmap will continue immediately with the support of the Plastics Roadmap cooperation network set up by the Ministry of the Environment, as well as by other operators in the field. The Roadmap presents the key implementers and cooperation partners for each set of measures. In addition, the operators' own networks and many international partners also take part in the Plastics Roadmap's implementation.

The Government and Parliament play a key role in implementing the roadmap, along with the designated implementers and partners. The circular plastics economy is getting off the ground, but to achieve the goals set for it, measures spanning several government terms are still needed. Decisions concerning State funding are made as part of the General Government Fiscal Plan and the Budget.

The Ministry of the Environment monitors the Plastics Roadmap's goals and measures in cooperation with the implementers. As implementation progresses, indicators for the programme's effectiveness, as well as their availability, will be developed.

The next checkpoint for the Roadmap's implementation is at the end of 2025. All being well, the long-term implementation project for the Plastics Roadmap (PlastLIFE) will have started by then, and its first mid-term review will be approaching.

We encourage everyone to get involved in implementing the Plastics Roadmap and to ambitiously boost the circular plastics economy jointly with partners in the plastics challenge.

APPENDIX 1: EXTERNAL GOALS RELATED TO THE MAIN GOALS OF THE PLASTICS ROADMAP

Goal 1: Reduce environmental littering and other environmental damage caused by plastics.

- Ban on littering and duty to clean/ Waste Act and waste decrees.
- Organisation of waste management /Waste Act and waste decrees.
- Goals concerning the reduction of marine littering[32] / marine strategy (2022–2027).
- The measures for reducing litter required by the directive on single-use plastics (SUPD) / the Government decree on certain plastic products (771/2021) and the draft Government proposal on the implementation of the SUPD (23 December 2021) (amendments to the Waste Act and the Act on Environmental Protection in Maritime Transport).
- Plastics and their replacement in fertilisers / EU Regulation on fertilising products and REACH.
- Restriction on microplastics & Measures to reduce the release of microplastics in the environment / Future Commission initiatives (Q4 2022).

Goal 2: Avoid unnecessary consumption.

- Packaging criteria, including the avoidance of unnecessary packaging / Waste Act and Waste Decree.
- Ambitious and permanent reduction in the consumption of single-use plastic food packaging and beverage containers (packets) in accordance with Article 4 of the SUPD. The quantitative reduction goals will be set as part of the implementation of the SUPD / Green Deal on packets.
- In the construction supply chain, ambitious quantitative goals will be set for the optimisation of plastic films and a sustainable consumption reduction in the period 2024/2025–2027 / as part of the implementation of the Green Deal on construction plastics (2020–2027).
- The consumption of plastic packaging and single-use SUPD products will decline 20% by 2025 / European Plastics Pact)33.
- The material efficiency of food packaging will be improved / the food industry's material efficiency commitment 2022–202634.
- Sustainable product design – product durability, reparability, ease of

maintenance, reusability, recyclability / EU initiative on sustainable products (COM (2022) 140) and ecodesign regulation (COM 2022) 142).

Goal 3: Enhance plastics recycling and improve recyclability.

- A recycling rate of 50 per cent for plastic packaging in 2025 and 55 per cent in 2030 / EU packaging and packaging waste directive, the new Waste Act and the new Waste Decree issued under it (1029/2021).
- The separate collection of plastic packaging will be expanded to residential properties with five apartments in urban areas (1 July 2023) and with similar restrictions to non-residential properties (as of 1 July 2022)35, the number of regional collection points for plastics will increase / Waste Act, Waste Decree (978/2021) and the decree on packaging waste (1029/2021).
- Food contact materials / Update to the EU's legislation on food contact material, draft legislation completed in 2023.
- Use of recycled plastic in food contact material / Revision of the EU regulation on recycled plastic used as food contact material, to take effect in 2023.
- EU Member States' contribution partly based on the rate of plastics recycling; EUR 0.80 per kg of non-recycled plastic packaging waste / applied since 1 January 2021.
- In construction projects, contracts and the construction supply chain, ambitious quantitative goals will be set for the separate collection, reuse and recycling of plastic films and for the shares of plastics made of recycled materials in the period 2024/2025–2027 / as part of the implementation of the Green Deal on construction plastics (2020–2027).
- The capacity of plastics recovery, sorting and recycling will be increased 25 percentage points by 2025 / European Plastics Pact.
- All the plastic packages and single-use plastic products placed on the market are either reusable or at least recyclable in 2025 / European Plastics Pact.
- All the plastic packages placed on the EU market are 100% recyclable in 2030 / the EU's plastics strategy (2018).
- The recyclability of plastic packaging will be improved / The EU's future proposed amendment to the packaging directive (2022).
- Safe and sustainable plastics recycling will be promoted in the product design phase, including the definition of criteria for chemicals / the EU's Safe and Sustainable-by-Design initiative and initiatives related to the EU's chemicals strategy.

- The use of the most hazardous chemicals will be restricted /EU chemicals legislation and REACH.

- It must be possible to sort plastic packaging, including mixed packaging, with existing flows of recycled material, without contaminating them harmfully; other product design requirements for plastic packaging / the EU's taxonomy for sustainable finance, draft criteria.

Goal 4: Replace virgin plastics made of fossil raw materials.

a) With recycled plastics

- The share of recycled plastic must be at least 25 per cent of the amount of plastic PET beverage bottles placed on the market in 2025 and 30 per cent of all single-use plastic bottles in 2030 / implementation of the SUP directive.

- The share of recycled plastic of the raw materials used in the construction supply chain and the production of construction plastic films is 40 per cent in 2027 / Green Deal on constructions plastics (2020–2027).

- A possible mixing obligation concerning recycled plastic in packages / Future proposed amendment to the EU packaging directive (Q2 2022).

- A possible requirement concerning the share of recycled plastic in construction products / Proposed revision of the EU's Construction Products Regulation (COM (2022) 144).

- In 2025, recycled plastic accounts for an average of 30 per cent (by weight) of the new products and packages made by the plastics user companies that have signed the European Plastics Pact / European Plastics Pact.

- Mechanically or chemically recycled, bio-based or CCU (Carbon Capture and Utilisation) raw material accounts for at least 85 per cent of raw materials / draft criteria for the EU's taxonomy for sustainable finance (March 2022).

- Refer to the Sustainable Carbon Cycles proposal in the following section.

b) Or with sustainably produced renewable materials

- At least 20 per cent of the carbon used in chemical and plastic products should be from non-fossil sources by 2030 / Communication from the Commission on the Sustainable Carbon Cycles policy framework (COM (2021) 800 final, 15 December 2021).

- Recycled, bio-based or CCU raw material accounts for at least 95 per cent of the raw material in plastic packaging / compare the draft criteria for the taxonomy above.

- Dependence on non-renewable raw materials, especially fossil materials, will be reduced, and competitive, innovative bioeconomy solutions will be created for global problems / The Finnish Bioeconomy Strategy, Publications of the Finnish Government 2022:5.

- Policy framework for bio-based, biodegradable and compostable plastics / future Commission initiative (Q2 2022).

APPENDIX 2: PROJECTS SUPPORTING THE PLASTICS ROADMAP

Note: The names of the projects have been translated into English, but some of the projects and the materials produced in them are in Finnish.

Research and development projects funded by the Ministry of the Environment

- From plastic waste into products: Actors visions of the development of the recycled plastics market. Reports of the Finnish Environment Institute 2/2022.
- Harmful environmental and health impacts of plastics. Finnish Environment Institute and Finnish Institute for Health and Welfare. Reports of the Finnish Environment Institute 17/2022.
- Materials and solutions replacing traditional plastic. Natural Resources Institute Finland and VTT Technical Research Centre of Finland Ltd. Luonnonvara- ja biotalouden tutkimus (Natural resources and bioeconomy research) 28/2022.
- Means to reduce the consumption of single-use plastic products. Reports of the Finnish Environment Institute 32/2021.
- Preparations of the End of Waste (EoW) criteria for mechanical plastics recycling. Finnish Environment Institute SYKE. Draft decree. 2022.

Projects of the Finnish Environment Institute

- Sources of litter in the Finnish marine area. Reports of the Finnish Environment Institute 09/2020. RoskatPois! project. (2017–2020). Finnish Environment Institute, Natural Resources Institute Finland, Finnish Transport and Communications Agency. European Maritime and Fisheries Fund.
- Plastic Waste Pathways into the Baltic Sea (BLASTIC). 2016–2018. Keep Sweden Tidy, FeeLatvia, Keep the Archipelago Tidy Association, SEIT Stockholm, Finnish Environment Institute. Central Baltic Interreg 2014–2020.
- Degradation of new biodegradable plastic materials in the Baltic Sea marine environment and assessment of associated environmental risk (UBINAM). 2017–2019.
- Impacts of MicroPlastics on AgrosystemS and Stream Environments (Impasse). Finnish Environment Institute and several other research institutions from various countries.

- Microplastics in Finnish waters – assessment of potential threats (MIF). 2016–2020. Finnish Environment Institute, University of Eastern Finland. Academy of Finland.

- Abandoned and lost fishing gear in the Finnish marine area (Kapyysi). 2018–2020. Finnish Environment Institute, Finnish Fishermen's Association (SAKL). Funded by the European Maritime and Fisheries Fund.

- Plastics in the nesting material of seabirds (MUPPE) 2021–2023. Funded by Ålandsbanken.

Projects of Natural Resources Institute Finland

- FanpLESStic-sea Baltic Sea Region project aimed at decreasing and removing microplastics in the Baltic Sea. 2019–2021. The project involves HELCOM and several research institutions from countries around the Baltic Sea. (EU INTERREG).

- HerääPahvi! 2018–2021. Tampere University of Applied Sciences, Natural Resources Institute Finland, Design Forum Finland. (ESF).

- RELOVED. Refining and lowering side-streams, venturing new business, deepening knowledge. 2021–.

Projects funded by the Academy of Finland and the Strategic Research Council

- Sustainable food packaging, PackageHeroes. Natural Resources Institute Finland, LUT University, VTT Technical Research Centre of Finland Ltd and Åbo Akademi.

- ValueBioMat. Bio-oils based polymeric composites; value chain from syntheses to additive manufacturing. Aalto University, Natural Resources Institute Finland, University of Lapland, VTT Technical Research Centre of Finland Ltd.

- EnzyFunc. Sustainable and enzyme assisted and detachable coatings for cellulose-based materials, improving hydrophobicity and recycling.

- From macro to micro: the fate of weathered plastics and plastic additives in the northern Baltic Sea food web (PLASTER). Finnish Environment Institute, University of Turku, Finnish Museum of Natural History, University of Eastern Finland, University of Jyväskylä, Heriot-Watt University, University of Basel and others.

EU-funded projects coordinated by VTT Technical Research Centre of Finland

- Plast2Recycle. 2019–2022. Improving experimental R&I resources for plastics recycling. (ERDF).
- Pyroplast. 2021–2023. Pilot platform for the pyrolytic recycling of challenging plastic waste at Bioruukki. (ERDF).
- Primus. 2022–2025. (EU/Horizon 2020).
- TREASoURcE. 2022–2026. Recycling of plastics, batteries and bio-based sidestreams and waste streams in the Nordic Countries and the Baltic Sea area. (EU/Horizon 2020).
- VTT is also involved in EU-funded projects such as Electro (2022–2026) and Plastics2Olefins (2022–2027).

Projects funded by Business Finland

- ALL-in for Plastics Recycling (PLASTin). Development of systemic recycling concepts and recycling solutions for challenging plastics. 2020–2022. LUT University, VTT Technical Research Centre of Finland Ltd, Finnish Environment Institute, Tampere University, Arcada, Neste, Fortum, Borealis, Kuusakoski, Griffin, BMH, Rosk'n Roll, Muovipoli, Finnish Plastics Recycling, CLIC Innovation.
- 4Recycling. Recycling of plastic packaging and construction plastics, bio-based materials in composites. CLIC Innovation and others.
- MoPo, Multitechnological recycling of Polystyrene. 2022. VTT Technical Research Centre of Finland Ltd, Aalto University, FinnFoam, CH-polymers, Lassila and Tikanoja, Helsinki Region Environmental Services HSY, PS Processing, Finnish Plastics Recycling, PHJK-Pohjanmaan Hyötyjätekuljetus.
- Sustainable Plastics Industry Transformation (SPIRIT). 2022–2025. Coordinated by Borealis Polymers.

Projects funded by the Ministry of Agriculture and Forestry (Development Fund for Agriculture and Forestry, MAKERA)

- MicrAgri. Microplastics in agricultural land – Emissions, impacts and reduction. Ending in 2022. Finnish Environment Institute, Natural Resources Institute Finland, Finnish Food Authority.

Trial and pilot projects related to the Plastics Roadmap funded by the Ministry of the Environment (2021–2022):

- Muovin tarina – roskasta tuotteeksi ('The path of plastic – From litter to product', City of Espoo.
- Collection and utilisation of composite plastic waste (Kimura), Finnish Plastics Industries Federation.
- Research and piloting of the recyclability of construction plastics (RAMPO), Muovipoli.
- Logistically optimised multicompartment collection, Rosk'n Roll.
- Pilot project for reusable takeaway coffee cups in Helsinki, Kamu Collective.
- Promoting the use of recycled plastic in rotational casting, Favorit Tuote.

Endnotes

1 In the marine environment (programme of measures of Finland's marine strategy), public urban areas (SUPD), national parks etc.; the target level and comparison year may differ depending on the area.

2 E.g. in single-use plastic portion packs (SUPD, to be determined and agreed as part of the green deal on single-use plastic portion packs), in food packaging (material efficiency commitment of the food and packaging industry), construction plastics (to be determined and agreed as part of the green deal on construction plastics) etc.; the target level and comparison year may differ depending on the product group.

3 The target set in legislation (waste act) is 55% in 2030, including plastic films used in construction.

4 All plastic packaging (the EU's plastics strategy, European Plastics Pact); other key product groups such as construction plastics, plastics for agriculture and horticulture, textiles etc.

5 Single-use plastic bottles (SUPD), other plastic packaging (European Plastics Pact and Plastics Europe), construction products etc.

6 See e.g. Roni Back's video of trying to live without touching plastics for 24 hours: https://youtu.be/9TZXO_HWaF8.

7 The agreement is available in Finnish at https://www.sitoumus2050.fi/web/sitoumus2050/muoviset-annospakkaukset#/.

8 Municipal networks also include Hinku (carbon neutrality), FISU (material efficiency), Circwaste (frontrunners in the circular economy) and Luontokunnat (biodiversity and sustainable use of nature).

9 COM (2022) 141.

10 E.g. in connection with the Ämpäristöteko ('Bucket Action') campaign.

11 Mechanical 3 million tonnes per year and chemical 400,000 tonnes per year (Plastics Industries Federation).

12 Plants for the chemical recycling of plastics operate, for example, in Skive and Esbjerg in Denmark, and a new one is to be set up in North Sea Port, Vlissingen, the Netherlands. In Belgium, the plant in Geel liquefies plastic waste thermochemically. Many other plant are also under construction and dozens are in the planning phase in Europe and elsewhere in the world. LG Chem, from South Korea, estimates that the global production of pyrolysis oil will amount to 3.3 million tonnes in 2030.

13 The need for sorting capacity is ca. 100,000 tonnes per year, if the PRF plant in Riihimäki is decommissioned (Plastics Industries Federation).

14 Around 1% of the EU market (Plastics Industries Federation).

15 https://www.nib.int/releases/nib-finances-stockholms-new-and-innovative-waste-recycling

16 Plastic waste to be recovered or disposed elsewhere; the export of mixed plastic waste outside the EU and OECD is restricted by the Basel Convention.

17 The European Plastics Pact (2020) is a voluntary commitment signed by 150 of the sector's key companies and organisations from 21 European countries. Fifteen national governments are also represented.

18 This is supported by, for example, the trial project for the collection and utilisation of composite plastics waste (Kimura) and related further measures.

19 The survey on the development of mandatory requirements, funded by the Ministry of the Environment, is related to this.

20 TUKES SCIP webpage (in Finnish): https://tukes.fi/kemikaalit/reach/luvanvaraiset-aineet/erityista-huolta-aiheuttavat-aineet/scip-ilmoitus-esineista.

21 COM (2021) 800 final.

22 Taking into account the targets for biodiversity and the circular economy and the policy framework for bio-based, biodegradable and compostable plastics.

23 Available on the Sitoumus 2050 site: https://sitoumus2050.fi/rakentamisen-muovit#/.

24 https://www.ruokavirasto.fi/muoviopas/

25 In the government proposal regarding the implementation of the SUP directive. The change would bring a considerable number of small producers under the scope of producer responsibility. To limit the number of companies to which producer responsibility applies, as well as the administrative burden on small companies, instead of assigning producer responsibility to the product packager or the importer of a packaged product, the responsibility can in some cases be assigned to the packaging producer or importer. Provisions can also be issued on simplified producer responsibility obligations for small producers.

26 Svensk Ensilageplast Retur (SvepRetur): https://svepretur.se/en/.

27 The EU Regulation on fertilising products (1009/2019) includes provisions on the replacement of plastics. Criteria for biodegradability and testing methods are to be included in the Regulation. If such criteria can be set up, the microplastics restriction under preparation at the ECHA would only apply to products governed by national legislation. If not, the ECHA's microplastics restriction will likely apply also to fertilising products indicated in the fertiliser regulation.

28 The EU's first circular economy action plan was released in 2015. Based on it, the Commission drew up the EU's plastics strategy (2018), for example.

29 In 2017–2021, BF granted around EUR 144 million of RDI financing to companies and research institutions working to find solutions to the global plastics challenge, mainly through the Bio & Circular Finland programme. The Top 20 recipients of corporate financing for the plastics challenge represent key Finnish companies and industries. The Top 5 research organisations that have received funding are VTT, Tampere University, Aalto University, LUT University and Åbo Akademi. VTT has received considerably more funding than the other research organisations. BF also funds universities of applied sciences.

30 https://www.vttresearch.com/en/news-and-ideas/project-fearing-no-challenges-develops-new-solutions-collecting-floating-plastic; https://www.vttresearch.com/en/news-and-ideas/plastic-waste-rivers-recycling-jakarta-indonesia-target-study

31 https://um.fi/regional-cooperation

32 Goals monitored: The amount of plastic waste in the marine environment declines at least 30% from the 2015 level by 2025, the amount of cigarette ends found on urban beaches in Finland decreases substantially, waste reception is efficient and user-friendly in all ports, and wastewater treatment plants remove a notable share of microplastics. Guidelines are issued on good site practices and the appropriate organisation of waste management on construction sites, the waste management of abandoned fibreglass boats is boosted and the microplastics load is reduced (artificial grass, road traffic, storm sewage and wastewater, emission sources of plastic pellets, dumping of snow into the sea).

33 The European Plastics Pact (2020) is a voluntary commitment signed by 150 of the sector's key companies and organisations from 21 European countries. Fourteen national governments are also represented.

34 In the previous commitment period 2019–2021, the commitment was signed by 17 food industry companies (20% of the industry's turnover). In 2020, these companies reduced food waste by 5.7 million kilograms and the use of plastics by more than 600,000 kilograms.

35 Property-specific plastics collection is based on a cooperation agreement between municipalities and packaging producer responsibility organisations referred to in section 49 subsections a–c of the Waste Act.

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