



The Norwegian Ministries

Strategy

Norwegian Plastics Strategy

Contents

1	A renewed Norwegian Plastics Strategy	4
2	Climate and environmental impacts of plastics	11
3	Stronger global commitments on marine plastic litter and plastic pollution	15
3.1	A new global agreement against marine plastic litter and plastic pollution	15
3.2	Strengthening existing frameworks and initiatives on marine plastic litter and plastic waste	20
4	A more circular plastics economy in Europe	23
5	A strengthened product policy framework for plastics in Norway	25
5.1	More sustainable products and value chains globally and nationally	25
5.2	Plastics consumption and composition of plastics in products	25
5.3	The importance of eco design for plastics in multi-material products	28
5.4	Non-toxic material cycles	28
5.5	Bio-based plastics, biodegradable plastics	29
5.6	Packaging and single-use plastic products	30
5.7	Important value chains that include plastics	36
5.8	Extended producer responsibility	41
5.9	The need for a stronger product policy framework in Norwegian legislation	41
5.10	Sustainable plastic consumption	42
6	Using the resources in plastic waste	47
6.1	The global perspective – stricter global waste regulations	47
6.2	Recycling of plastic waste in Norway	48
6.3	Export of plastic waste	51
7	Plastics in the agricultural sector	55
8	Plastics in the transport sector	59
9	Sea-based sources	63
9.1	Fisheries, shipping and aquaculture	63
9.2	Ports	70
10	Microplastics	75
10.1	Artificial turf pitches	77
10.2	Paint	78
10.3	Intentionally added microplastics in products	79
10.4	Other sources of microplastic emissions	79
11	Acute pollution, emergency response and climate adaptation	83
12	Littering and clean-up	87
12.1	Clean-up principles	87
12.2	What do we know about litter	88
12.3	Responsibility for clean-up	90
12.4	Sources of funding and clean-up operations	90
12.5	Actors and organisation	92
12.6	International collaboration on clean-up	95
13	Knowledge	97
13.1	Monitoring and Assessment	99
13.2	Research, development, and innovation	102

Summary

Plastic is a remarkably useful material, primarily because of its durability, but it is this durability that makes plastic a serious environmental concern when it is discarded or ends up in the environment. Plastic litter and plastic pollution are one of the fastest growing global environmental problems of our time, with major consequences for oceans and seas, nature, wildlife, and human well-being.

The Norwegian Government's vision is a more sustainable plastics value chain globally, regionally, and nationally. This strategy will assist in implementing the UN Environment Assembly's 2017 «zero vision» to end all discharge of plastic litter into the ocean in the long term. This strategy brings together the Norwegian Government's plastics policy and describes most of the measures that have been implemented or are being implemented to reduce plastic litter and plastic pollution. It takes a comprehensive approach including measures targeting plastic across its entire lifecycle.

On a global level, it is vital to get in place a new legally binding global agreement on plastic pollution to realise this vision. A key element in a global agreement must be that all countries have an obligation to implement a national strategy to eliminate all discharge of plastic litter into the ocean and to manage the environmental problems caused by plastic pollution.

At the regional level, it is especially important to support the EU's efforts for an improved product policy framework and its implementation in Norway. As an EEA country, and as an integral part of the EU's Single Market, most of Norway's plastic policy must be developed in collaboration with the EU. Norway benefits from common European rules and regulations, and actively participates in this work. We will also continue to actively engage in our Regional Seas conventions and other relevant fora.

At the national level, it is important to promote more sustainable plastic products, sustainable consumption, to reduce the quantity of plastic waste that cannot be reused and recycled, and to prevent plastic waste from being discarded in nature.

This plastics strategy includes measures for more sustainable plastic value chains and measures to ensure that hazardous substances are removed from the cycle, which will increase recycling of plastic waste and ensure safe new products. Various chemical substances are added to plastics to give it the desired properties. Some are substances of very high concern and other are hazardous substances that may cause harm to human health and the environment. A more circular plastics economy must be non-toxic, in order to prevent the spreading of hazardous substances that can cause harm to human health and to the environment. Norway's plastics strategy assumes that the same limit value must be set for hazardous substances in secondary plastic raw materials and the products that are made from these, as required for products produced by primary raw materials.

The strategy follows established principles in Norway's environment policy and is a further development of the government's plastic strategy set out in Report to the Storting 45 (2016-2017) Waste as a Resource. This includes the principle that those responsible for pollution must bear the costs of measures to prevent and reduce plastic pollution. It is often difficult to identify the origin of discarded plastic waste. To bring about lasting changes, measures must be put in place early in the lifecycle of plastic products. At the same time, we must ensure that plastic waste is more properly managed and work to ensure that plastic waste is not discarded in nature. These challenges cannot be solved by a single country alone; international cooperation is needed to effect the necessary changes.

Targeted measures are needed for various value chains and sectors to reduce plastic pollution from both land-based and sea-based sources. Single-use plastic products are a particularly large source of littering, as well as being a poor use of resources. Norway's plastics strategy promotes measures against the loss of fishing gear, both commercial and recreational, against plastic pollution from aquaculture and shipping, and addresses challenges regarding the port reception facilities for the delivery of waste from ships. Challenges relating to plastic pollution from the transport and agricultural sectors are also discussed.

This strategy also addresses the question of alternatives to plastic made of primary raw materials, such as bio-based plastic, and the concept of biodegradable plastic. This is a complex area, and more knowledge is needed. It is important that bio-based plastic replacements and new alternative plastics should reduce the overall environmental impact of plastic, and not create new problems.

Plastic packaging is the largest category of both new plastics put on the market and of the plastic waste generated in Norway and Europe. Reducing the environmental impact of plastic packaging and making use of the resources in this plastic waste is a high priority for both Norway and Europe. The targets for recycling in the EU waste regulations, which also apply in Norway through the EEA agreement, are already high, and will continue to increase incrementally until 2030. Recycling plastics is challenging, but there is potential to go beyond today's levels.

As a signatory of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, Norway has made strides in strengthening control of the global trade in plastic waste. Norway is working to strengthen the Basel Convention's mandate on plastic waste, and to raise the global standards for environmentally sound management of plastic waste. Norway is also working to strengthen measures against environmental crime, which includes tightening controls on illegal exports of electronic and electrical products. These products contain a lot of plastic material, in addition to hazardous substances that can cause harm to human health and to the environment. Illegally exported waste is often not managed in an environmentally sound manner, e.g. it is as openly burnt or dumped in nature.

Microplastics are found in all environmental compartments, in the air, lakes, oceans, ice, soil, and in living organisms. Consequences for ecosystems and food security caused by microplastics are uncertain but can be serious. Measures are needed to prevent and reduce microplastic emissions from a range of different sources. Significant sources in Norway include wear and tear of tyres, artificial turf pitches, paint, textiles and intentionally added microplastics to products. Microplastics are also formed from the decomposition of larger pieces of plastic, so measures against littering are also important in reducing microplastic pollution. Microplastics can spread hazardous substances, invasive alien species, bacteria, and viruses. Collaboration with the EU is a central part of efforts to address microplastic pollution.

More extreme rainfalls, winds and flooding can increase the emission risk of plastic litter and microplastics. Many measures to reduce the harm caused by climate change will also contribute to reducing the growing risks of acute plastic pollution. This strategy describes in more detail several aspects relevant to acute plastic pollution, as well as experience gained from accidents spreading plastic pellets in more detail.

More knowledge is still needed on many aspects of plastic pollution. This strategy highlights the monitoring and assessment of plastic pollution that is currently carried out nationally and internationally.

This strategy shows that to be successful, measures and collaboration between all relevant actors, both nationally and internationally, across the entire plastic lifecycle must be implemented.

1 A renewed Norwegian Plastics Strategy

Vision

The Norwegian Government's vision is a more sustainable plastics value chain globally, regionally and nationally.

On a global level, it is vital that we establish a new legally binding global agreement against plastic pollution to realise this vision.

On a regional level, it is important to support the EU's work of creating a stronger product framework, implementing this in Norway and actively engage in our Regional Seas conventions.

At the national level, it is important to promote sustainable plastic products, sustainable consumption, to reduce the quantity of plastic waste that cannot be reused and recycled, and to prevent plastic waste from being discarded in nature.

Plastic is a remarkably useful material, primarily because of its durability. However, this makes plastic a serious environmental concern when it ends up in the environment. It can take centuries for plastic in the sea to degrade. Ocean currents transport plastic waste over great distances, and it can be found a long way from its source - even ending up in remote areas with little human activity, such as the Arctic.

Plastic can be used in many ways, helping us to tackle a range of issues. Using light, strong plastic materials in vehicles and aircraft lowers greenhouse gas emissions. Advanced insulation materials reduce energy consumption. Plastic packaging keeps food clean and fresh and reduces food waste. In the health sector, plastics are invaluable in the running of hospitals, patient treatment and infection control. Plastic fishing gear is durable, efficient and is long lasting.

At the same time, the current patterns of plastic consumption and production create significant environmental challenges. Plastic pollution has become a permanent and extensive problem, with disturbing amounts of plastic litter in the ocean, in the air, in soil and in freshwater resources.

The Norwegian Government's vision is a more sustainable plastics value chain globally, regionally, and nationally. To bring about changes that provide persistent improvements, it is important to implement measures early in the life cycle of plastic products. The strategy is to promote more sustainable plastic products, more sustainable consumption of plastics and reduced quantities of plastic waste that are not utilised for recycling, in addition to preventing plastic waste "from going astray". This strategy follows established principles of environmental management and is a further development of the government's plastic strategy set out in Report to the Storting 45 (2016-2017) *Waste as a Resource*.

Plastic materials and plastic products are global commodities, and plastic litter ending up in the environment and the oceans is a major and growing global environmental problem. Plastic follows ocean currents and crosses national borders. Cooperation on all government levels is required to reduce the global climate and environmental impacts caused by plastics.

Key principles



Science-based approach

Decisions affecting the environment should be based on the best available knowledge. A science-based approach to policymaking will ensure better decisions and democratic processes.



Precautionary principle

Where there is a risk of harm or irreversible damage to the environment, interventions should not be delayed even if extensive scientific knowledge is lacking.



Polluter pays

Polluter pays principle states that those who produce the pollution should bear the cost of managing it and to prevent damage to human health or the environment.

Guiding principles

Measures to reduce

plastic pollution must not cause other environmental problems.

Measures to remove

hazardous substances from the life-cycle in order to improve recycling and ensure safe products shall be in place.

Goals and commitments



National goals

Pollution

should not cause harm to human health or the environment



The growth in waste

generation should be lower than the growth of the economy



Recycling

should increase



Eliminate the use

and releases of prioritized hazardous substances



Other targets and commitments

Discharge of waste

and microplastics to the ocean should be avoided



The levels of litter on beaches

and in coastal areas should be reduced, by clean-up efforts



Increased levels of household waste

should be re-used or recovered

↑ **55 %** **60 %** **65 %**
2025 **2030** **2035**



Increased levels of recycled material

in plastic packing

↑ **50 %** **55 %**
2025 **2030**

Particularly relevant UN goals and targets



Sustainable Development Goal 14.1

by 2025, prevent and significantly reduce marine pollution of all kinds, particularly from land-based activities, including marine debris and nutrient pollution



Sustainable development goal 12

Responsible production and consumption



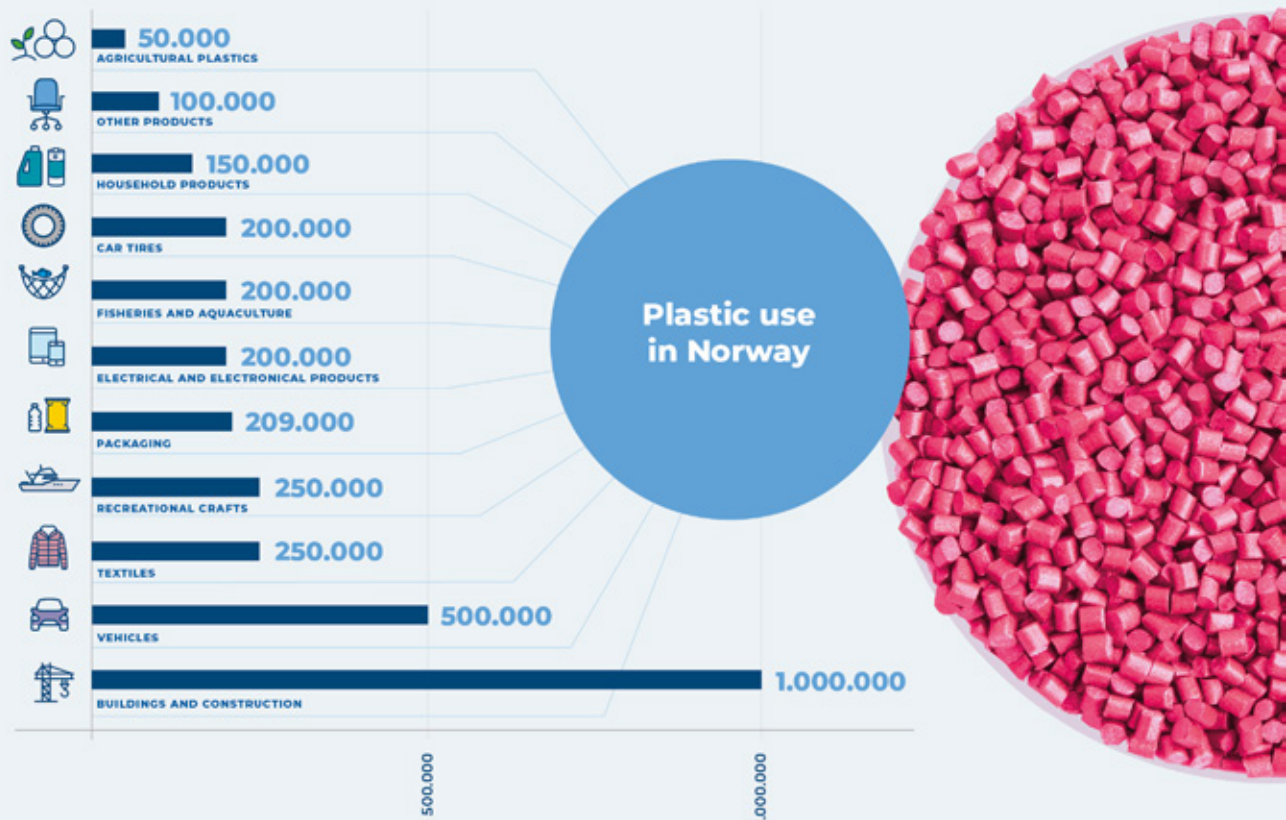
Eliminate all discharge of plastic litter into the oceans (Resolution 3/7 UNEA-3)

Norway is working for a new legally binding global agreement against marine plastic litter and plastic pollution under the auspices of the UN Environment Assembly. Norway believes that a central obligation in a new agreement is that all countries should prepare national plastic management plans. This strategy is Norway's example of such a plastics management plan. This strategy forms the basis for measures for plastics throughout the life cycle in Norway, but also refers to areas where there is a need for regional and global measures.

As an EEA country that is an integral part of the EU's Single Market, Norway has a limited ability to implement separate national measures. Therefore, product policy for plastics must include a combination of general measures and instruments in Norway, and cooperation with the EU on the development of sustainable plastic products. Hazardous substances in products are also regulated through the EU's Registration, Evaluation, Authorisation and Restriction of Chemicals Regulations (REACH). Therefore, direct product requirements and REACH regulations will be a significant result of EU regulatory developments, and it is important that Norway actively contributes to these efforts.

Plastics in Norway

In Norway, we have a small and specialised industry producing plastic raw materials and plastic products. There are approximately 200 small and medium-sized companies that produce plastic pipes, packaging, furniture, construction materials, automotive parts and equipemnt for the aquaculture insustry, among other things¹. Only a small share of plastic products produced in Norway is consumed in Norway.



¹ Mepex (2020): The material flow of plastics in Norway – what do we know?

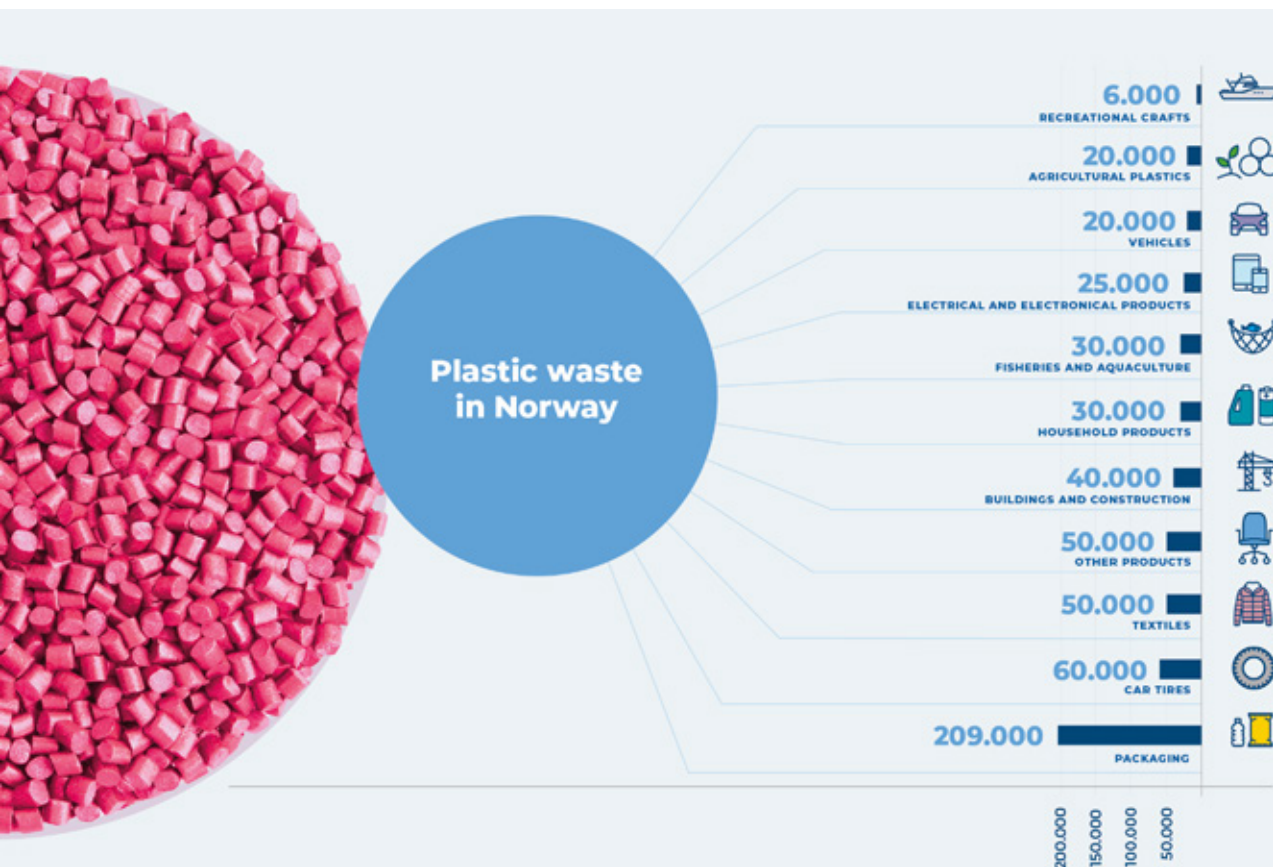
The plastics we use in Norway are primarily imported from worldwide producers, especially from Asia.

Statistics of annual Norwegian plastic use are not compiled, although Norwegian plastic use is probably in line with the European average, with plastic for packaging, construction, vehicles, and electronics being the largest categories. Norway, however, probably uses more plastics in the marine sector.

There is considerable uncertainty regarding figures for the use of plastics and for plastic waste in Norway. However, it is estimated that the total volume of plastics already in use is approximately 3.1 million tonnes². The bulk of this is found in building and construction products, plastic in vehicles and other products.

It is estimated that approximately 540,000 tonnes of plastics in use become waste, annually³. The time it takes to use a product before it is discarded can vary. Plastic packaging is used and discarded faster than plastic pipes in buildings. Plastic packaging thus represents the largest share of plastic waste annually, followed by tyres and textiles.

Plastic packaging represents a large share of discarded plastic waste in nature, both in Norway and globally. Therefore, there are major environmental and climate benefits to be gained from collecting and recycling plastic packaging. Plastic packaging that is not recycled is generally sent for incineration as a means of energy production. This is also referred to as energy recovery.



² Source: Mepex (2020): The material flow of plastics in Norway – what do we know?

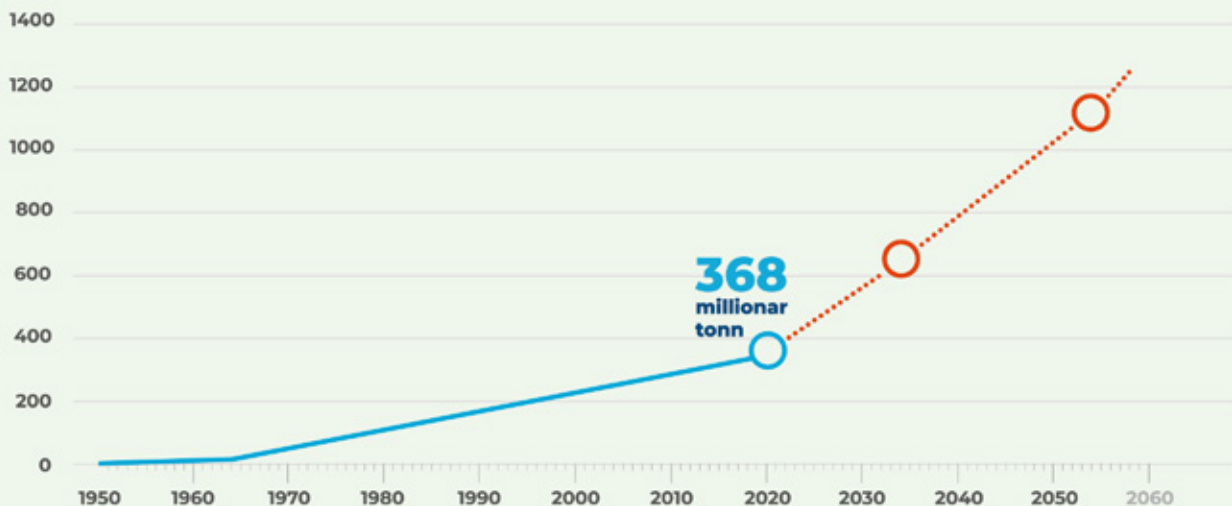
³ Source: Mepex (2020): The material flow of plastics in Norway – what do we know?

Global development trends for plastics

Developments in the global plastics economy have a major influence on the opportunities for reducing the climate and environmental footprints of plastics in Norway. Raw materials are often extracted and sold on the global market without the socio-economic costs of environmental problems priced in, and this is a significant reason for the lack of sustainability in the global plastics economy. The price of primary plastic raw material influences the use of secondary raw materials. Over the past 50 years, the role and significance of plastics as a material in the global economy has increased significantly. Global production of plastics has increased twenty-fold since the 1960s and now totals 368 million tonnes⁴. Production is expected to double over the next 20 years. The significance of plastics in the global fossil fuels economy will increase in correlation with the growth in plastic production. In 30 years, a fifth of the world's oil is estimated to be used in the production of plastics.⁵

The quantities of plastic waste are expected to grow significantly, both in Norway and globally. It has been calculated that, by 2040, the global amount of plastic waste will double, leakage of waste into the ocean will triple, and the amount of plastic in the sea will almost quadruple, if business-as-usual continues.⁶

Estimated growth in global plastics production



R. Geyer, J.R. Jambeck, and K.L. Law (2017): "Production, Use, and Fate of All Plastics Ever Made," *Science Advances* 3, no. 7; World Economic Forum (2016) *The New Plastics Economy—Rethinking the Future of Plastics* (Ellen MacArthur Foundation, McKinsey & Company); Plastics Europe (2020): *Plastics - The facts*. Adapted by MoCE and Konsis.

4 Plastics Europe (2020) *Plastics – the Facts 2020 Publications* (plasticseurope.org)

5 World Economic Forum, Ellen MacArthur Foundation and McKinsey & Company (2016) *The New Plastics Economy — Rethinking the future of plastics* <http://www.ellenmacarthurfoundation.org/publications>

6 Pew Charitable Trusts & SystemIQ (2020); *Breaking the plastic wave - A comprehensive assessment of pathways toward stopping ocean plastic pollution*. *Breaking the Plastic Wave Top Findings | The Pew Charitable Trusts* (pewtrusts.org)

The need for knowledge and cooperation

We require more knowledge regarding the plastics that are put onto the Norwegian market, and the extent to which these plastics can be recycled. We need to know how much and what types of plastics are being used, the quality of the plastics and what additives they contain. Currently, there is little to no such information available. We also require a better overview of the quantities of plastics in circulation in our society. To reach the goal of increasing the proportion of recycled plastics used in new products, more knowledge is required. There is also a need for cooperation with all relevant actors throughout the life cycle of plastics. Both private and public actors must take their share of the responsibility.

The Norwegian Government will

- work to strengthen knowledge on plastics in circulation in our society and regarding plastic products on the market in Norway
- establish a contact forum for cooperation between actors in plastic industries (Norwegian plastics industry, importers, distributors, Norwegian waste actors) under the auspices of the Norwegian Environment Agency

Expected growth in the amount of global plastic waste



Pew Charitable Trusts & SystemIQ (2020): Breaking the plastic wave - A comprehensive assessment of pathways toward stopping ocean plastic pollution. Adapted by MoCE and Konsis.



We are facing three global environmental crises - climate change, loss of biodiversity and pollution.

"The accumulation of plastic litter in the ocean is a common concern of human kind owing to its far-reaching environmental, social and economic impacts"

UN Environment Programme 2016

Photo: Adobe Stock

2 Climate and environmental impacts of plastics

The UN Environment Programme's (UNEP) report "Making Peace with Nature"⁷ makes it clear that we are facing three global environmental crises – climate change, loss of biodiversity and pollution. The High-Level Panel for a Sustainable Ocean Economy also highlights that plastic litter contributes to all the stressors impacting the world's oceans. There is no agreed risk framework for calculating the impacts of plastic pollution and it is important to adopt a precautionary approach. In 2016, UNEP named plastic pollution a "common concern of humankind". An updated global assessment report will be presented by UNEP in 2021, and it is expected to highlight the increasing risks caused by plastic litter and plastic pollution.

Globally, 6.3 billion tonnes of plastic waste have been produced to date, of which only 9 % is recovered, 12 % is incinerated, and 79 % ends up on landfills or discarded in nature.⁸ In 2015, it was estimated that 4.8-12.7 million tonnes of plastic waste end up in the ocean each year from land-based sources alone. In addition, plastic waste also originates from sea-based sources.⁹

Plastic litter can have harmful effects, both direct and indirect, on various ecosystems. It can also cause cumulative effects in conjunction with other environmental challenges such as climate change, biodiversity loss and pollution.

Marine species can get entangled in larger pieces of plastic waste, and plastic that resembles food can end up being eaten by marine mammals, birds, and other species. Small plastic pieces can spread hazardous substances in nature as well as affect marine habitats. Researchers have also found that marine plastic litter can affect ecosystems like coral reefs and act as a vector for the spreading of invasive alien species and pathogens that can cause diseases. Furthermore, lost or abandoned plastic fishing gear is a major threat to marine life. Larger plastic objects gradually break down into microplastics, and microplastic and nano plastic particles can also spread hazardous substances.

Plastic litter can have large socio-economic consequences and can weaken ecosystem services. The UN Environment Program has calculated that plastic waste causes a loss of natural capital equivalent to USD 75 billion, and that direct costs associated with the loss of marine ecosystems amount to approximately USD 13 billion a year.¹⁰ Plastic litter can also impact, both directly and indirectly, those sectors that depend on healthy, clean oceans, such as commercial fishing and aquaculture. Plastic litter in the ocean can also pose a safety risk, e.g. for the shipping industry. Tourism industries are negatively affected if the natural areas visited by tourists are blighted by litter. Large accumulations of plastic litter in the environment have a negative effect on the mental health and human wellbeing.

7 United Nations Environment Programme (2021). *Making Peace with Nature: A scientific blueprint to tackle the climate, biodiversity and pollution emergencies*. [MPN.pdf \(unep.org\)](https://www.unep.org/making-peace-with-nature)

8 Geyer et.al (2017): "Production, use, and fate of all plastics ever made". *Science Advances* 19 Jul 2017. [Production, use, and fate of all plastics ever made | Science Advances \(sciencemag.org\)](https://www.science.org/doi/10.1126/sciadv.aag7321)

9 Jambeck, J. & Geyer, R. et al (2015): "Plastic waste inputs from land into the ocean". *Science* Feb 2015. [Plastic waste inputs from land into the ocean | Science \(sciencemag.org\)](https://www.sciencemag.org/doi/10.1126/science.1260013)

10 United Nations Environment Programme. (2014). *Valuing Plastics: The Business Case for Measuring, Managing and Disclosing Plastic Use in the Consumer Goods Industry* <https://wedocs.unep.org/handle/20.500.11822/9238>

There are activities throughout the life cycle of plastics that result in greenhouse gas emissions. It is estimated that the plastic sector's share of the carbon budget may increase from 1 % in 2014 to 15 % in 2050 if production increases as expected in the coming decades.¹¹ Greenhouse gas emissions are produced during the extraction and transport of oil and gas, as well as during the refining and production of raw materials and products. There are also greenhouse gas emissions caused by the management of plastic waste and plastic waste discarded in nature. Norway has measures which aim to reduce the amount of greenhouse gas emissions from Norwegian territory as part of its international climate commitments. Reference is also made to chapter 1.2 on «Norway's Climate policy and a circular economy» in Norway's strategy for the circular economy.

The spreading of microplastics is a particularly challenging global problem, due to the insurmountable number of sources, pathways, and impacts. This makes implementing effective measures difficult.

Many countries currently lack an overview of their own sources of marine plastic litter and plastic pollution. Even fewer countries have an overview of the footprint of their own plastic consumption and what impact this may have in a global perspective and for other countries. Several countries recognise that their plastic consumption impacts other countries and want to establish a better understanding of these impacts.

As a basis for policy development in Norway, the Norwegian Environment Agency has prepared a basis of knowledge for identifying sources of marine litter and the dispersion of microplastics. This formed the basis for the assessment of means and measures both for marine litter and microplastics prepared in 2016. In 2020, the Norwegian Environment Agency provided updated assessments for means and measures. These form an important basis for the development of this plastics strategy.¹²

Plastics have significant global climate and environmental consequences. Because plastics and plastic additives are so integrated into a large proportion of what we produce and use, a systematic and comprehensive approach is needed to reduce their environmental impact. By addressing the entire life cycle of a plastic product, and implementing measures higher in the value chain, more efficient and lasting improvements can be achieved.

11 World Economic Forum, Ellen MacArthur Foundation and McKinsey & Company, *The New Plastics Economy — Rethinking the future of plastics* (2016, <http://www.ellenmacarthurfoundation.org/publications>)

12 Norwegian Environment Agency (2020) *Vurdering av tiltak for å forebygge marin forsøpling* ("Assessment of measures to prevent marine litter")

Norwegian Environment Agency (2020) *Tiltak- og virkemiddelvurdering mot mikroplast* ("Measure and policy assessment against microplastics").

[Vurdering av tiltak for å forebygge marin forsøpling](http://www.environmentagency.no) ("Assessment of measures to prevent marine litter") - Norwegian Environment Agency (environmentagency.no)

Plastic pollution and plastic litter

Plastics discarded in nature is unsightly and can cause damage and nuisance to the environment. From a legal point of view, plastic waste discarded in nature can be considered littering and/or pollution.

Under the Norwegian Pollution Control Act, pollution is defined as the introduction of solids, liquids or gases to air, water or ground which cause or may cause damage or nuisance to the environment. The pollution and littering provisions in the Pollution Control Act are to be considered parallel provisions, with a partially overlapping scope of work. This means that discarded plastic in nature can be both littering and pollution, and thus the regulations for littering and pollution both apply simultaneously.

The purpose of measures against plastic litter and plastic pollution is to reduce environmental impacts. Whether discarded plastic waste is considered litter, pollution or both, is important when it comes to deciding which regulatory framework applies and which authority is responsible for issuing orders for clean-up.

For example, plastic litter that is solely unsightly would not be counted as pollution. Microplastics that occur from use, e.g. from wear and tear of tyres, have more in common with polluting emissions and thus are not considered litter. The EU uses both “plastic pollution” and “marine litter” when referring to the challenges in this area.



Plastic bird nests, Runde. Photo: NTB, Klaus Steinkamp



Norway promotes a legally binding global agreement on plastic pollution, taking a comprehensive approach and including obligations by all countries to put in place measures for both land-based and sea-based sources, covering the whole life cycle of plastic products.

3 Stronger global commitments on marine plastic litter and plastic pollution

No single country can solve the challenges related to marine plastic litter and plastic pollution alone. Norway has promoted the need for stronger global obligations to be implemented on the international agenda since 2014.

Norway's ambition is to be a leading maritime nation. This includes efforts to prevent and reduce marine plastic litter and plastic pollution. Sustainable Development Goal 14, «life below water», includes targets on marine pollution and plastic litter. The United Nations Ocean Conference in 2017, the “Our Ocean” conference series, hosted in Oslo in 2019, directed attention to this problem along with other international ocean conferences. As a follow-up to these international events, Norway has contributed to making reduction of marine plastic litter one of the goals of the High-Level Panel for a Sustainable Ocean Economy. Furthermore, Norway has taken the initiative to establish a development programme against marine litter and plastic pollution, as well as the World Bank's Blue Economy Program, PROBLUE, which also targets marine litter.

3.1 A new global agreement against marine plastic litter and plastic pollution

Since 2014, Norway has taken a leading role in international efforts, under the auspices of the UN Environment Programme, to promote the need for a new global agreement to combat marine plastic litter and microplastics. An important breakthrough took place in 2017 when the world's ministers of environment agreed that the long-term goal is to stop all discharge of plastic litter into the ocean, referred to as the “zero vision”. At their meeting in Reykjavik in 2019, the Nordic ministers of environment jointly called for a new global agreement on plastic litter and plastic pollution.

Nordic report on the elements of a new global agreement

The Nordic Council of Ministers for the Environment and Climate commissioned a report on possible elements and approaches to a new global agreement in 2019.¹³

The report was launched in 2020 by all Nordic ministers of environment at a virtual event and is a contribution to the global discussion about how plastic pollution can be reduced.

The report assesses the scope and possible goals for a new agreement, in addition to new tools to develop requirements for producers, proposals for regulations and market-based measures throughout the life cycle of plastics.

It describes a possible structure for an agreement with different approaches to traditional elements of international environmental agreements such as national action plans, systems for reporting and environmental monitoring, in addition to funding and capacity building.

Although some existing multilateral agreements have relevant provisions, and several voluntary initiatives and non-binding agreements have been implemented recently, the levels of plastic pollution are still growing. There is a need to raise the level of ambitions, including more binding measures and cooperation, better coordination, and opportunities for measuring global progress. An important purpose is to leave behind the current fragmented approach and establish a clear relationship with various other international initiatives and international agreements.

Recently, several countries and regions have spoken in favour of proceeding with the proposal for a new global agreement. WWF is an important proponent of mobilising support for an agreement from other countries and regions. In the autumn of 2020, many key private sector actors from around the world met to support a call for a new global agreement. 45 companies have signed the petition, which clearly expresses the need for harmonised frameworks for the private sector.

Following Norway's initiative, the third session of the UN's Environment Assembly (UNEA 3) established an expert group tasked with examining the global measures that would be the most effective in reducing marine plastic pollution.¹⁴ This expert group finished its work in 2020. The report was submitted to the fifth session of UNEA (UNEA 5). It encourages all countries to consider several identified measures, including a new global agreement, and emphasises the seriousness of the problem and the urgency to set in place effective measures. Due to the outbreak of the COVID-19 pandemic, delegates could not meet in person and the opening of the meeting was thus held virtually in February 2021. Several countries are now working for the resumed fifth session of UNEA to decide to launch negotiations for a global agreement. Norway holds the Presidency for the fifth session of the UN Environment Assembly and is actively working on this matter.

Since 2014, the international discussion on measures to reduce marine litter and the spread of microplastics in the ocean has evolved quickly. Internationally, there is now a consensus that, to succeed in stopping all input of plastic waste to the ocean, a comprehensive approach across the entire life cycle of a plastic product is necessary. The prevention and reduction of pollution from both sea-based and land-based sources must be reinforced. Today, discussions have moved towards emphasising preventive measures higher in the plastic value chain and making incentive structures more sustainable.

13 Raubenheimer, K & Urho, Niko (2020): *Possible elements of a new global agreement to prevent plastic pollution*. Nordic Council of Ministers <https://pub.norden.org/temanord2020-535/temanord2020-535.pdf>

14 UNEA 3/7 <https://wedocs.unep.org/bitstream/handle/20.500.11822/22773/K1800210%20-%20UNEP-EA-3-RES-7%20-%20Advance.pdf?sequence=15&isAllowed=y>

More secondary raw materials need to replace primary production, products need to be improved and consumption patterns must be changed. The EU is a driving force for such an approach in international cooperation on plastics. The Nordic Council of Ministers for the Environment and Climate commissioned a report on what elements a new global agreement may need to contain to reduce global plastic pollution. The report clearly emphasised that such an agreement must contain a framework that supports national requirements for better products and a more sustainable material flow for plastics.

Norway believes that a legally binding global agreement on plastic pollution must have a broad approach and must include obligations for all countries to implement measures for both land-based and sea-based sources of pollution and cover the entire life cycle of plastic products. Such an agreement must also contain the tools to support countries wishing to implement ambitious policies against plastic litter and plastic pollution.

Norway's view is that the agreement should contain the following elements:

1. A common global goal that guides a joint global effort and a reporting regime based on national reporting, following the model of existing environmental agreements.
2. Provisions ensuring that countries must take a comprehensive approach to reduce plastic pollution, with measures across the whole life cycle of plastics and covering all sources. Examples of such provisions may include requirements to prepare national strategies for plastics, the development of principle criteria for sustainable plastic products, requirements for environmentally sound waste management, including increased recycling of plastic waste, and measures against microplastics.
3. Reinforced transfer of knowledge regarding sources, pathways and impacts of marine litter and plastic pollution, continued development of data and methodology for measuring the degree of progress as a basis for measures.
4. A programme for sharing the best available knowledge on and support for measures and tools, technical solutions, and cooperation with the private sector.
5. Increased coordination between existing global agreements, regional agreements, voluntary initiatives, platforms etc., including the contributions of the private sector and civil society.

The agreement should promote preventive measures and support reduced plastic waste generation, a higher recycling rate and measures for more sustainable plastic products. An important goal of a new agreement must be to place national governments in a better position to set requirements for the products placed on their markets, and to make manufacturers and other market players responsible for a larger part of the costs of reducing greenhouse gas emissions and other environmental consequences of plastics. A new agreement must also include common functions that make it possible for countries to have an overview of developments – whether measures work, whether new knowledge is acquired, and whether more needs to be done. Norway believes that a legally binding global agreement is the solution that can best meet these goals.

A new global agreement will ensure a framework for binding cooperation where the ambition increases over time and will establish a permanent meeting place and a system for measuring results. Such an agreement can be further developed over time, and countries should have considerable flexibility in terms of implementation of the obligations in the agreement.

The Nordic Council of Ministers for the Environment and Climate is actively contributing to global discussions on the scope of a new agreement with various knowledge products. Based on the report of elements of a new global agreement, there has been given an account of funding and on how to strengthen knowledge-based global policy development. Additional contributions are being assessed and from 2021-2024, the work on a new global agreement will continue to be a key priority for Nordic cooperation during the initiative, “The Nordic Countries as a driving force in the work against marine litter”.

A more circular global economy – the GACERE alliance

At the fifth session of UNEA in February 2021, the European Commission, in collaboration with UNEP and the UN’s Industrial Development Organisation (UNIDO), launched the Global Alliance on Circular Economy and Resource Efficiency (GACERE). The objective of this alliance is to promote a global restructuring towards a circular economy in order to improve the distribution of resources and to promote sustainable production and consumption patterns. Norway has joined this alliance and advocates that it should also work to promote a circular economy for plastics by preventing waste generation, promoting better resource efficiency and more circular plastic products. This alliance will also highlight how a circular economy can help in reducing greenhouse gas emissions, loss of biodiversity and pollution. The transition to a more circular economy is considered an important contribution to strengthened sustainability and value creation and to achieving the Sustainable Development Goals.



*Beach cleaning in Mumbai during Minister of Climate and Environment Sveinung Rotevatn's visit in February 2019.
Photo: Snorre Tønset*

The Nordic countries as a driving force in the work against marine litter and plastic pollution

As part of the Nordic countries' vision for 2030, the Nordic Council of Ministers established the initiative "The Nordic Countries as a driving force in the efforts against marine litter and plastic pollution". The initiative runs from 2021 until 2024 and has three main goals. The first main goal is to strengthen knowledge and cooperation regarding measures in the Nordic countries, including clean-up operations and cooperation with the private sector. The second goal is to actively contribute with knowledge and be involved in regional cooperation with the EU, OSPAR¹⁵, HELCOM¹⁶ and with global processes under the auspices of the UN Environmental Assembly. The third and most important main goal is to continue to lead the call for a new agreement. The initiative is led by Norway and managed by Swedish environment authorities.

The Development Programme to Combat Marine Litter and Microplastics

In 2018, the Norwegian Government launched a new Development Programme to Combat Marine Litter and Microplastics. The programme is tasked with achieving UN Sustainable Development Goal (SDG) 14.1, to prevent and significantly reduce marine pollution of all kinds, and to follow up UNEP's zero vision to eliminate all discharge of plastic litter to the ocean in the long term, through specific measures. The Norwegian Government will spend NOK 1.6 billion in the period 2019-2024 and supports the prioritisation of establishing stronger global commitments on marine litter and microplastics.

In 2020, NOK 238 million was granted by the development programme to 32 projects that are being implemented in cooperation with multilateral organisations including the UN and the World Bank, civil society organisations, research institutions and local partners. A range of various measures are being supported, such as measures to improve waste management, and research to increase our understanding of marine litter. The main effort is directed at the populous and rapidly growing economies in Asia, where the problem is the greatest. Additional support is being given to preventative measures in coastal African countries and small island states that are hard hit by these challenges.

Norway was the driving force behind the World Bank's Blue Economy Program, PROBLUE, established in 2018. The overarching goal of PROBLUE is to work for a sustainable development of the ocean economy and clean and productive oceans. The fund is based on four pillars which emphasise the importance of cooperation between different areas and a comprehensive approach to contribute to the overarching goal. Marine pollution is one of these pillars, and PROBLUE has set a goal to use its own funds to redeem additional funds in other parts of the World Bank. This is how, the fund has become an important source of finance for projects working against marine littering and plastic pollution.

¹⁵ Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR) <https://www.ospar.org/convention/text>

¹⁶ The Baltic Marine Environment Protection Commission (HELCOM) [HELCOM](https://www.helcom.fi/)

The Norwegian Government will

- work to ensure that the UN Environment Assembly votes to establish a negotiating committee for a legally binding agreement against marine plastic litter and plastic pollution
- work for an ambitious, legally binding agreement, and moreover ensure Norwegian influence in the structuring of such an agreement
- cooperate with other ambitious countries and the EU in the work for a new global agreement
- contribute to the Global Alliance on Circular Economy and Resource Efficiency (GACERE) and promote a more circular global economy for plastics
- continue a clear Nordic leadership role in the work for a global agreement through Nordic cooperation and the initiative “The Nordic countries as a driving force in the work against marine litter”, during the Norwegian Chairmanship in 2022

3.2 Strengthening existing frameworks and initiatives on marine plastic litter and plastic waste

The UN Environment Assembly’s 2017 decision encourages all actors to strengthen existing agreements’ efforts on marine plastic litter. Norway contributes to the follow-up of the International Maritime Organisation’s (IMO) action plan to prevent plastic waste from ships; see chapter 9. Norway also takes part in the Regional Seas convention for North-East Atlantic OSPAR, as part of Nordic cooperation and in environmental cooperation led by the Arctic Council. Norway is supporting efforts that promote collaboration between various administrative levels and organisations. Specifically, we have strengthened the work under the Basel Convention regarding stricter rules for the export and import of plastic waste, discussed in more detail in Chapter 9.6.

Norway participates in initiatives regarding marine litter under the G7 and G20. These are important political platforms for cooperation with key countries, and to highlight the need for a strengthened global framework, as these initiatives will not necessarily be sufficient.

In addition, Norway has initiated bilateral cooperation with countries including Russia, China, India, and South Africa to develop knowledge and bolster a comprehensive approach to plastics management in these countries. Through the EEA Agreement, Norway is supporting projects against marine litter and microplastics in several European countries, including countries in Eastern Europe.

Norway also participates in the Global Partnership on Marine Litter (GPML) which is an important forum for sharing knowledge and information on work directed at marine litter.

Many regional marine environmental agreements play an important role in monitoring the presence of marine litter and have their own action plans related to marine litter and marine pollution. These will also be important contributions towards stronger global commitments.

Norway is a party to the OSPAR agreement, the main goal of which is to protect the marine environment of the North-East Atlantic. OSPAR will prepare a new action plan against marine litter and it is Norway's ambition that the plan will focus on areas where OSPAR has a comparative advantage. OSPAR is also in the process of developing a new strategy tackling marine litter, in which Norway has actively engaged. An action plan against marine litter has also been adopted by the Arctic Council.

The Norwegian Government will

- further develop and strengthen the Basel Convention's mandate regarding plastic waste
- actively contribute to the implementation of the Arctic Council's action plan against marine litter
- continue to actively participate in relevant global initiatives under the G7 and G20
- contribute to OSPAR's new action plan against marine litter and microplastics, focusing on areas where OSPAR has a comparative advantage, and ensuring that this plan contributes to other international efforts



EU's work for a more circular economy for plastics will give better plastic products and requirements for recycled content in new plastic products.

4 A more circular plastics economy in Europe

The EU's plastics policy is rooted in the Strategy for Plastics in a Circular Economy from 2018 and the Circular Economy Action Plan from 2020.

The EU's policy on plastics promotes a more circular plastics economy and introduces measures throughout the entire plastic value chain. The EU directive on the reduction of the impact of certain plastic products on the environment is based on resource efficiency considerations, prevention of marine litter and the need for changes in consumption patterns. New requirements will be established regarding the contents of secondary raw materials in products, waste-reduction measures in areas such as packaging, building materials, and vehicles, and restrictions on intentionally added microplastics to products. A forthcoming framework will ensure that bio-based and biodegradable plastics are used sustainably. The EU is supporting a global agreement on plastic pollution, which must support a more circular global plastic economy.

The most important new measure in the EU's Circular Economy Action Plan from March 2020 is also important for the value chain for plastics. The action plan announced the development of a strengthened product policy framework with a common set of requirements that can ensure that products on the European market are more sustainable and "stand the test of circularity". It is especially important that products are developed with the purpose of being long-lasting and repairable, reusable, possible to sort and recycled (eco-design), and that the share of recycled materials in products is increased. According to the European Commission, as much as 80 % of a product's climate and environmental footprint is determined in the design phase. The eco design regulations will be expanded to additional product groups and product properties. In addition, there are new value chain-based regulations being prepared in seven selected product areas: electronics and IT, batteries and vehicles, packaging, plastics, textiles, construction and building materials, and food, beverages, and nutrients. Since the use of plastics in products of all kinds is so widespread, these regulations will also significantly affect plastic as a material.

The action plan places great emphasis on strengthening the demand side of the circular economy through new consumer rights and binding green procurement criteria for public procurers. A more circular economy for plastic is expected to be developed within a sustainable framework and will support the goal of a pollution-free Europe and a non-toxic environment, in accordance with the European Green Deal. In parallel with the Circular Economy Action Plan, the EU's work on an ambitious chemicals policy continues. Non-toxic material cycles must be achieved by replacing substances in products that are hazardous to health and to the environment, to avoid that recycled materials and new products contain these substances.

EU countries taxed on plastic packaging waste

On 1st January 2021, the EU introduced a tax on plastic packaging waste, known as Plastics own resource. The tax is set at EUR 800 per tonne of plastic packaging that cannot be recycled or used in recycling. This tax is aimed at stimulating Europe's transition to a circular economy and the implementation of the EU's plastics strategy. The tax is a part of the economic package that will help the European economy recover after the COVID-19 pandemic. The funds raised through the tax will go to a shared EU recovery fund. The sizes of fund contributions are based on Eurostat's calculations of the amount of plastic packaging that is not recycled in each EU country. Each country is free to decide how this tax will be structured.



Through a strengthened product framework, the EU will develop products that last longer, that can easily be recycled, repaired, and reused. Access to product and market information from digital product passes or digital marked places promotes the trade in goods and services with more circular properties and empowers consumers.

5 A strengthened product policy framework for plastics in Norway

5.1 More sustainable products and value chains globally and nationally

Creating a more sustainable global plastics economy will require major restructuring. Currently, there are no global instruments in place that address measures for more sustainable plastic products.

There is growing international recognition that a new global agreement against plastic pollution needs to promote more sustainable value chains for plastics, including more sustainable plastic products, through a strengthened product policy framework. How this will be developed within the framework of a global agreement is a central question. The EU's broad approach, based on general sustainability criteria for products that meet new regulations for eco design, prioritised value chains and other instruments, is an important contribution in this context.

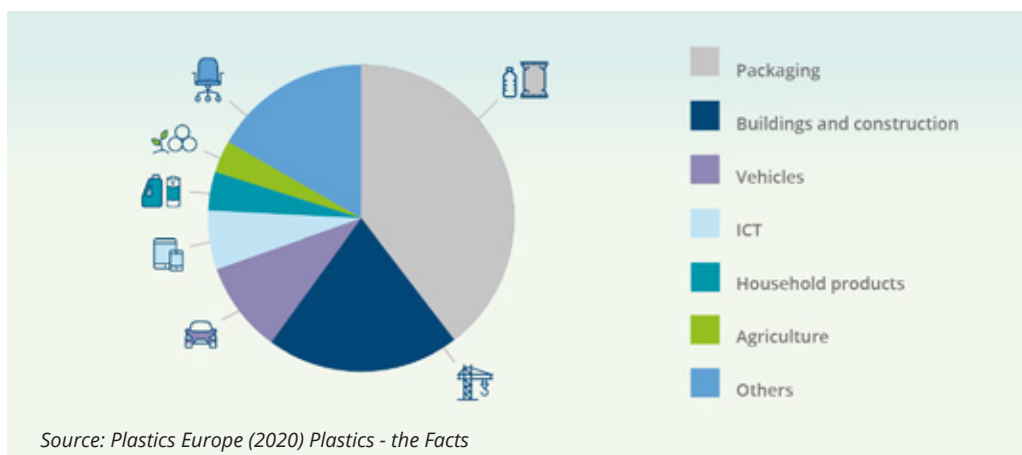
A more circular plastic economy requires more sustainable plastic products and more recycling from plastic waste. The Norwegian Government is strengthening its policies in both these areas.

5.2 Plastics consumption and composition of plastics in products

It is estimated that more than 3 million tonnes of plastic are in use in Norway, of which long-life plastic products, such as building materials and vehicles, make up a large part.¹⁷ The total amount of plastic waste produced annually in Norway is estimated to be approximately 0.5 million tonnes, and this amount is likely to increase in the future. In 2019, there were 240,000 tonnes of plastic packaging on the market in Norway; this is double the amount in 2009.¹⁸

17 Mepex (2020) *The material flow of plastics in Norway - what do we know?*
[Materialstrømmen-til-plast-i-Norge-Hva-vet-vi-1.pdf \(dl8y9d78cbd9m.cloudfront.net\)](#)

18 Norwegian Environment Agency (2021): *Miljøstatus.no "Plastavfall"* ("Plastic waste")
[Plastavfall \(https://www.environment.no/\)](https://www.environment.no/)



Plastic is not just plastic

Plastic is an umbrella term for materials consisting of synthetic polymers, the most common of which are polyethylene (PE), polypropylene (PP), polystyrene (PS), polyethylene terephthalate (PET), polyvinyl chloride (PVC) and polyurethane (PU). Plastic materials can be made of a range of different polymers, from both renewable and fossil resources. Through the application of different additives, plastic has properties making it strong, lightweight, malleable, hard, or soft. Plastic materials come in a range of different colours and shapes. Most importantly, plastic is made to last. This makes plastic a much sought-after material in our modern society. However, these properties are also the reason why plastic waste can cause major damage to the environment.

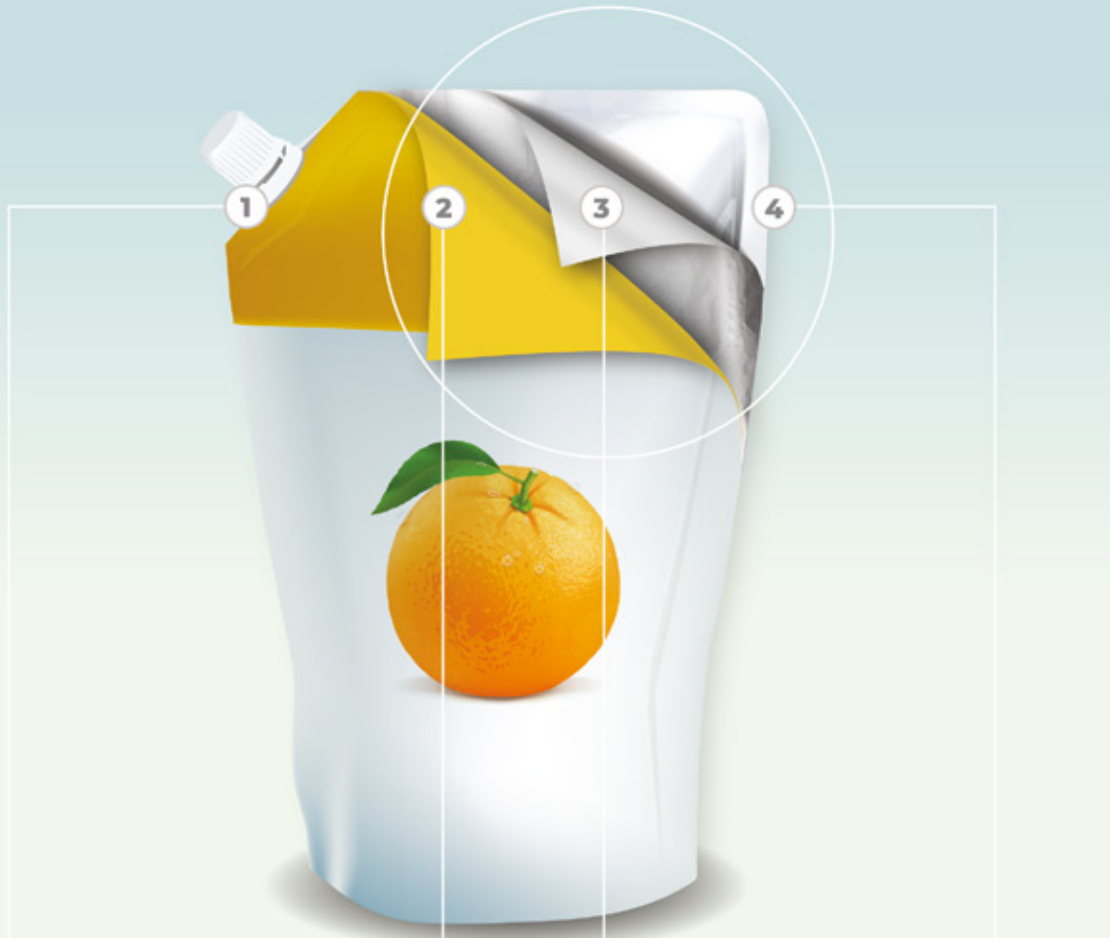
Additives can leak from plastic products into the air, water, or soil, or through skin contact. Humans can be exposed to substances of very high concern and other hazardous substances present in plastic in single-use and reusable products, synthetic textiles, furniture, electric and electronic products, food packaging, construction materials, vehicles and so on. Hazardous substances from plastics can also be found in dust, and in plastic waste that ends up in nature, and when plastic is broken down into microplastic. Hazardous substances from other sources can amass in microplastics in nature. Marine plastic litter is a particularly serious problem in and of itself, as well as being a source of hazardous substances.

For more information on the functions and potential effects of common plastic additives, see the appendix in the report from the Norwegian Institute for Water Research: Sea-based sources of microplastics to the Norwegian marine environment from 2021.

According to figures from Plastics Europe from 2020¹⁹, plastics for packaging remains by far the largest category for plastic materials consumed on the European market, making up approximately 40 % of the total 51 million tonnes of plastics used in 2019. The next major category is plastics included in multi-material products, with the largest end-use markets being building and construction (approx. 20 %), automotive industry (approx. 10 %) and electronics (approx. 6 %).

¹⁹ Plastics Europe (2019), *Plastic – the facts 2019* Publications (plasticseurope.org)

Multi-material products



1.

Cap made by
e.g. a sort of PET



2.

A strong outer layer
with prints - made by
a type of Polyethylene
terephthalate OET



3.

Middle layer protecting
the content against light
and humidity, made by
aluminium or PET



4.

Inner layer of plastics that
maintains high quality of
the content while ensuring
flexibility and durability,
type Polyethylene PE

5.3 The importance of eco design for plastics in multi-material products

Plastics waste cannot be efficiently transformed into new, usable products without being sorted according to plastic types. Furthermore, additives in plastics may be a barrier to recycling, and it is important to ensure that recycling of plastics does not become a source of spreading hazardous substances. A lot can be gained from designing products that reduce resource consumption and are designed to be recycled from the outset. Sustainable product design is thus a top priority, especially for multi-material products containing plastic. Norway actively supports the EU's eco design efforts under a widening of the scope of Ecodesign Directive. The European Commission's proposal for amended regulations will be put forward in the fourth quarter of 2021.

The Norwegian Government will

- actively participate in the EU's eco design efforts under a widening of the scope of the Ecodesign Directive with regulations for prioritised value chains, and a basis in expanded sustainability properties

5.4 Non-toxic material cycles

Several properties of chemical substances form a barrier for a non-toxic material cycle. Additives in plastic, such as stabilisers, softeners, plasticisers, flame retardants and dyes may have hazardous properties and can cause harm to human health and the environment. Phthalates, bisphenols, halogenated compounds, and metals are examples of this. Such materials degrade slowly in the environment and can amass in food chains. They can be carcinogenic, cause infertility, cause birth defects or affect the hormonal balance.

Several thousand chemical substances can be used in plastics, but the content of various plastic products is generally not well known. Today, we lack sufficient knowledge about the hazardous substances present in plastics, and about their potential harmful impacts both when the plastic is in use and when it becomes waste. We also lack knowledge about the impacts of plastic polymers on human health and the environment.

The chemical composition of plastic determines its recyclability, both because it is important to prevent hazardous substances from ending up in new products, and to ensure that the recycled plastic does not contain substances that could be a barrier to recycling. Lack of knowledge about the contents of products, and subsequently the waste streams, makes it much more difficult to extract plastics that contain hazardous substances and are thus not suitable for recycling, both in households and in waste facilities. This also includes plastic waste that contains substances that are no longer permitted.

Reducing the use of hazardous substances will contribute to safer recycling. In turn, this ensures a greater potential for developing new material flows and products based on secondary raw materials which are of an appropriate quality and where a market can be established. To achieve this, regulations for chemicals, products and waste must all work well together. Collaboration with the EU on this is central for Norway. To ensure non-toxic material cycles, it is thus important to ensure that plastic does not include known hazardous

substances. At the same time, we must increase our levels of knowledge of which substances are added to plastics. Documentation systems on material flows must be put in place. Furthermore, there is a need to identify the substances present in different waste streams. This also applies to the management of hazardous and contaminated waste, where relevant.

Both Norway and the EU have strict chemicals regulations in place and are actively working to phase out hazardous substances in the EU and on a global level. The EU's Chemicals Strategy for Sustainability, presented in 2020, includes measures to secure phasing out hazardous substances from products, which will be done in part by reorienting efforts toward regulating entire groups of substances rather than individual substances. To tackle the challenges related to hazardous substances, the EU is developing methods to trace and minimise the content of such substances in recycled materials and products. Examples include the EU's SCIP database²⁰ which contains information about hazardous substances in products, as well as the European Committee for Standardisation's development of standards for identifying hazardous substances used in plastic materials that will be recycled. Along with the other Nordic countries, Norway is also an important proponent for stronger global chemicals regulations and promotes an ambitious global framework.

The Norwegian Government will

- identify substances in plastics that need to be phased out and contribute to the work of regulating these under the EU chemicals regulations and on a global level.
- increase knowledge of substances in plastics that can cause harm to human health and to the environment through cooperation at a European level
- highlight the research on additives in plastics as a new issue that requires global attention under Norway's presidency in the Nordic Council of Ministers for the Environment and Climate in 2022
- set the same limit value for substances of very high concern and other hazardous substances in plastic products produced from primary and secondary raw materials, to increase recycling and offer safe products

5.5 Bio-based plastics, biodegradable plastics

Many different types of plastic exist today. A distinction can be made between plastics made from fossil-based raw materials and those made from biological raw materials (bio-based plastics). Another distinction can be made between plastics that are biodegradable, and those that are not. All these types of plastics can have negative environmental impacts. Biodegradable plastic can also reduce the quality of recycled plastic raw material if it is sorted together with conventional plastic. At the same time, bio-based and biodegradable plastics can be a more sustainable alternative to plastics made from fossil-based resources. These types of plastics represent both new possibilities and new challenges, which must be assessed more closely.

The European Commission has announced a "policy framework" on the sourcing, labelling and use of bio-based and biodegradable plastics in 2021. For plastic carrier bags, the EU has started a process to create a labelling scheme for biodegradable plastics under the Plastic Bags Directive. Norway is of the opinion that an overarching concern should be that regulations and

²⁰ SCIP: database for information on Substances of Concern In articles as such or in complex objects (Products) [SCIP – ECHA \(europa.eu\)](https://ec.europa.eu/scip/)

possible incentives for such plastics are targeted so that positive effects are ensured, overall. Furthermore, Norway will work for changes to the degradability standards, which are currently not representative of Norwegian waste treatment and the Norwegian climate.

Bio-based plastic is produced with biological raw materials, e.g., agricultural crops. The use of biological raw materials for plastics must be considered in a comprehensive context for the sustainable use of biomass to ensure positive effects for the climate and the environment. The connection between food production and direct and indirect changes to land use have been key topics in the development of biofuel policies and are also relevant for bio-based plastics. Some types of bio-based plastics are classed as biodegradable.

Biodegradable plastics are designed to break down in a biological process under certain conditions, with the aid of bacteria, fungi, algae or enzymes. Such plastics are made up of biological raw materials, fossil-based raw materials, or both. Plastic being marketed as biodegradable is not a solution to plastic litter, especially in a cold Norwegian climate. Waste treatment plants are not adapted for biodegradable plastics and the contents of such plastics can reduce the quality of recovered plastic raw materials.

Oxo-degradable plastics contain additives that make them break down into small pieces and spread microplastics. All oxo-degradable plastic products are banned in Norway as of 3rd July 2021. The European Commission has announced a “policy framework” to address the sourcing, labelling and use of bio-based and biodegradable plastics in 2021. The goal is to promote solutions with real environmental benefits and a sustainable plastic economy, and to provide consumers with credible information.²¹

Composite plastics are materials where plastic has been combined with other substances that are insoluble in plastic. Among other things, they are used to make wind turbine blades, recreational crafts (boats, kayaks etc.), hulls, fishing gear, skis and poles, and in the aerospace industry. The volume and size of composite plastic products, and the fact that they are found in hard-to-reach places, makes it expensive to treat them when they become waste. It is currently not profitable to recycle such products, but new future market opportunities are being explored for actors who develop solutions, such as Ecofiber in Sandnes.

5.6 Packaging and single-use plastic products

Plastic packaging

Plastic packaging is the largest category of both new plastics put on the market and of the plastic waste that accumulates in Norway and Europe. The EU’s Plastics Strategy aims to make all new plastic packaging suitable for cost-efficient recycling or reuse by 2030, which is a goal Norway supports. The EU’s process of revising the harmonised requirements for new packaging will be an important part of this work.²² Food product packaging represents a large proportion of plastic packaging. It is important to promote recycling or the reuse of such packaging, while simultaneously ensuring food safety. There are many actors working to find new solutions for this.

²¹ EU (retrieved 2021), [Bio-based, biodegradable and compostable plastics \(europa.eu\)](https://european-council.europa.eu/media/e3000420/1/16190_en.pdf)

²² Norwegian Government (2020) [Roadmap - a review of packaging requirements - regjeringen.no](https://www.regjeringen.no/en/dep/oljeforum/press/roadmap-2020-2022)

Reducing the environmental impact of plastic packaging and making better use of the resources in plastic waste is a high priority both for the EU and Norway. According to the EU's Circular Economy Action Plan, the amount of packaging waste is constantly growing. In 2019, packaging waste in Norway amounted to about 165 kg per inhabitant, of which just under a third was plastic packaging.²³ In 2019, the amount of waste from plastic packaging was around 240,000 tonnes, which is double the amount in 2009. Preliminary figures from 2020 indicate a further increase. Plastic packaging has a short lifespan, and it is estimated that the annual amount of plastic packaging waste corresponds with the amount of new plastic packaging put onto the market in the same year. There is considerable recycling potential for plastic packaging. However, this depends on the implementation of measures that increase the demand for recycled plastic.

EU rules on packaging regulations, which are part of Norwegian law, were revised in 2018. The revision occurred as part of the amendments to waste regulations to follow the EU's first circular economy action plan. The main change introduced was stricter requirements for recycling of packaging waste. A proposal for implementation of the revised packaging regulations was subject to public consultation in Norway the spring of 2021. Regarding plastic packaging (including polystyrene/Styrofoam), we propose to set the minimum requirements of plastic packaging recycling at a level that allows us to meet the requirements in the Directive on Packaging and Packaging Waste, which are 50 % of packaging recycled by 2025 and 55 % by 2030. The Norwegian Environment Agency have started establishing a packaging register based on the model of the electrical and electronic product register. This can contribute to improved conditions for competitiveness and avoid free riders in these schemes. Extended producer responsibility schemes for packaging are one of the schemes reviewed as part of the evaluation discussed in chapter 5.8, which assesses whether these schemes are in accordance with the minimum requirements in the Waste Framework Directive. The European Commission is now further revising the Directive on Packaging and Packaging Waste to promote reuse and recycling, avoiding excessive packaging and a reduction of the packaging waste amounts.²⁴ It is expected that the European Commission will present its proposal for regulations in the fourth quarter of 2021. It is a priority for Norway to strengthen the market for circular solutions, prevent further littering and to accommodate for the use of new technology for handling packaging waste.

Sustainable packaging to increase circularity and reduced food waste

Green Dot Norway has established the FuturePack project, which has developed new knowledge and technologies for the production and recycling of both fossil and bio-based raw materials, with the aim of producing more sustainable plastic packaging. Norner Research AS, the food research institute Nofima, research environments from the Paper and Fibre Institute (RISE PFI), the Norwegian Institute for Sustainability Research (NORSUS) and NTNU IKP have all participated in this project, as well as several industrial actors.

In the ReducePack project, the food industry has set goals to reduce plastic use and the impact plastic use has on the environment. At the same time, packaging must protect food quality and contribute to avoiding food waste. The project leader, BAMA, works alongside Norsk Kylling, Grilstad and Mills. Nofima, Lund University and NORSUS are research partners.

SalMar, representing the seafood industry, has established the SeaPack project. In collaboration with Nofima, among others, this project's new findings have contributed to increased knowledge of material consumption and possibilities for reducing plastic use in packaging. The results of this project will allow the participating organisations to put in place new, sustainable packaging solutions.

²³ Norwegian Environment Agency (2021): Emballasjeavfall ("Packaging waste") [Emballasjeavfall \(environmentagency.no\)](https://www.environmentagency.no)

²⁴ Norwegian Government (2020) [Roadmap - a review of packaging requirements - regjeringen.no](https://www.regjeringen.no)

Single-use plastic products

Today we use several single-use plastic products, both packaging and other products. A report from 2018 estimated that Norwegians annually use around 525 million straws, 455 million pieces of disposable cutlery, 600 million wet wipes and over 105 million drinking cups, including lids.²⁵ Some of these products, which have only been used once, end up discarded in nature or on the streets, instead of being put into the waste management system. Where adequate reuse solutions exist, this is also a poor use of resources. Reuse solutions result in less littering and reduce the demand for extraction of raw materials. Two good examples of alternatives to single-use products are agreements for customers to bring their own reusable coffee cups to cafés and petrol stations, and canteens with washing facilities providing reusable cutlery.

At the same time, some products must be single use by their very nature, such as sanitary towels and tampons packed in plastic. Important considerations such as food safety and durability also mean that some disposable plastic items will always be needed, such as food packaging which also helps to reduce food waste. It is important that we ensure proper waste management of these items, and that plastic components are replaced with other materials or reusable products in cases where it is possible and appropriate. Targeted measures against plastic products that often end up in nature during use, such as plastic cartridge cases, are also important. However, there are many situations where single-use plastic products are the best option, such as in medical treatments, nursing and infection control, while in other cases no replacements exist that are both suitable and have a smaller environmental impact than plastics. In cases like this, reducing consumption will not be the goal, but it will nevertheless still be important to ensure environmentally sound waste management. Single-use items made from other materials also pose environmental risks, and there is a need for full life cycle assessments for different products to ensure that we do not replace one environmental problem with another. There is also a need to increase our knowledge of the environmental and climate impacts of single-use packaging compared to reusable packaging.

The Norwegian Government has several ongoing processes aiming at reducing the environmental impact of disposable plastic items and promoting the development of a more circular economy. It is important to increase the use of recycled plastic content in new products, and to ensure better waste management of such products. From 3rd July 2021, certain single-use plastic products will be banned, including plastic cotton swabs, plastic straws, and disposable plastic cutlery.²⁶ The ban covers products where reusable alternatives or single-use items made by other materials than plastic with a lower environmental impact exist. In Norway alone, this ban could lead to a reduction of 1.9 billion single-use items being used each year - an annual reduction of 3,600 tonnes. Labelling requirements will also be introduced, stating that sanitary towels, tampons, tobacco products with filters and wet wipes all contain plastic, and thus should not be thrown in the toilet or discarded in nature. Both the ban on single-use plastic items and labelling requirement will be regulated under the Norwegian Product Regulations and thereby satisfy Norway's obligations under the Directive on the reduction of the impact of certain plastic products on the environment, EU 2019/904 (Directive on single-use plastics).²⁷

²⁵ Mepex (2019) *Reduced Littering of Single-Use Plastics*, NEA – SUP Report

<https://www.miljodirektoratet.no/publikasjoner/2019/mai-2019/reduced-littering-of-single-use-plastics/>

²⁶ Norwegian Product Regulations § 2b-3 state that the following single-use products are prohibited: cutlery, plates, straws, balloon sticks, mixing sticks and cotton swabs in plastic, food containers, drinking cups and beverage packaging made of Styrofoam, as well as disposable products made of oxo-degradable plastic.

²⁷ The EU's Directive on single-use plastics (EU 2019/904) contains a number of different provisions that together regulate 86 % of the disposable plastic found on European beaches. Approximately 27 % of this is fishing gear.

Extended producer responsibility for certain single-use plastic products

The Norwegian Environment Agency has been tasked with reviewing and considering improvements to the extended producer responsibility (EPR) schemes in Norway. As part of this assignment, the Agency will more closely examine new requirements for extended producer responsibility. The directive on single-use plastics imposes requirements for extended producer responsibility and includes responsibility for covering expenses associated with litter clean-up. The Norwegian Environment Agency will examine extended producer responsibility for the following three product groups:

- fast food and take-away food containers, including lids, flexible wrapping for fast food, beverage containers smaller than 3 litres, cups for beverages including lids and plastic carrier bags.
- wet wipes and balloons
- filtered tobacco products and filters for tobacco products

The Norwegian government is also considering other measures to reduce the consumption of single-use plastic items. In 2019, the Norwegian Ministry of Climate and Environment challenged the private sector to propose voluntary measures to reduce consumption and the environmental impacts of single-use plastic items. A working group composed of the Confederation of Norwegian Enterprise (NHO), the Federation of Norwegian Industries, the Enterprise Federation of Norway, the grocery wholesaler group Norgesgruppen ASA, the Norwegian Confederation of Trade Unions, WWF and Keep Norway Beautiful submitted its report to the Minister of Climate and Environment in April 2020.²⁸ The group has set out voluntary measures to reduce the environmental consequences of single-use plastic products and proposed a possible agreement on plastic products. Afterwards, the Norwegian Environment Agency, assigned by the Norwegian Ministry of Climate and Environment, acquired knowledge aimed at reducing consumption of the product groups covered by the by the Directive on single-use plastics.²⁹

The Ministry of Climate and Environment will continue the work of reducing consumption and will encourage the private sector to develop a Norwegian “plastic pact”. Reducing the consumption of certain single-use plastic products will be an important part of such a pact. The same applies to measures to effective awareness-raising.

In Norway, there are specific local sources of pollution caused by single-use plastic products that are not covered by the Directive on single-use plastics including cartridge cases and tobacco snuff. Norway will consider additional measures to address these products. Norway has provided input to the EU about considering including agricultural plastics in the regulations when evaluating the directive by 3 July 2027.

²⁸ [Regjeringen.no](https://www.regjeringen.no) (2020) Miljøavtale om plastprodukter (“Environmental agreement on plastic products”) - [regjeringen.no](https://www.regjeringen.no)

²⁹ Letter from the Norwegian Environment Agency to the Norwegian Ministry of Climate and Environment, 08.01.2021 «Mulige tiltak for å redusere forbruk av engangs matbeholdere og drikkebegre i plast» (“Possible measures for reducing the consumption of single-use plastic food and drink containers”).

Examples of measures initiated by the business community

- The Ministry of Climate and the Environment set up a working group with the industry to assess voluntary measures to reduce consumption. The working group commissioned Østfold Research (NORSUS) to prepare a substitution tool for single-use products. The tool is intended to support decision-making in the private sector, so that a comprehensive environmental and economic assessment of other alternatives can be made.
- Plastløftet (“the Plastics Pledge”) is an initiative set up by a number of companies to increase the use of recycled plastics, avoid unnecessary use of plastics and to increase recycling. Companies who have committed to this pledge must also report their measures and results to Green Dot Norway. The Plastics Pledge is intended to contribute to the achievement of the EU’s recycling target for plastic packaging.

Specific information regarding beverage containers

Beverage packaging is covered by a number of provisions in The Directive on single-use plastics, as well as by packaging regulations. The Directive on single-use plastics contains requirements for separate collection, material design (level of content of recycled plastics and that caps and lids remain attached to the containers during the products’ intended use stage), extension of extended producer responsibility and efforts to raise awareness. Norway’s return schemes for bottles and beverage containers have produced good results. 91 % of plastic bottles that were put on the market by Infinitum’s members in 2020 were recycled through Infinitum’s return system. Plastic beverage bottles, with other beverage containers, are subject to extended producer responsibility under the Norwegian Waste Regulations. At the same time, an environmental tax is calculated according to the amount of bottles and cans returned, which is waived completely when a return rate of 95 % is reached. Cumulatively, this forms a strong economic incentive for the collection of beverage containers. In addition, all single-use beverage packaging is taxed if not reused in its original form.

Specific information regarding plastic carrier bags

It has been estimated that, in 2020, approximately 781 million plastic carrier bags were available on the market in Norway, corresponding to around 145 bags per inhabitant.³⁰ A large proportion of these were used as bin liners to contain and transport waste from households, while others were discarded as residual waste or sorted with other plastic packaging.

Plastic carrier bags are regulated in a separate directive, which alters the packaging and packaging waste directive. The objective of this directive is to permanently reduce the use of plastic carrier bags. In accordance with this directive, member states will implement targeted national measures to reduce the consumption of lightweight plastic carrier bags. In Norway, plastic carrier bags still have an important function in waste management, as bin liners. Even though plastic carrier bags pose a litter problem in Norway, it is not as big a problem as it is in many other countries. Norway fulfils its obligations under the directive in that, in practice, a fee is charged for 80-90 % of plastic carrier bags in Norway through

³⁰ Mepex, on behalf of the Norwegian Retailers’ Environment Fund (coming 2021) *Plastic Bag Report 2020*

a scheme run by the Norwegian Retailers' Environment Fund. This solution was suggested by the industry itself, and it involves a scheme where members of the fund pay a fee per plastic carrier bag. These funds will be earmarked for environmental measures to reduce plastic waste, increase plastic recycling, and reduce the consumption of plastic carrier bags. In 2020, the fund distributed NOK 105 million to 123 projects with the aim of reducing the environmental problems caused by plastics. Plastic carrier bag regulations also include an obligation for reporting. It is proposed that this reporting duty be imposed on producer responsibility organisations (PROs) for plastic packaging and therefore not as an obligation for the Norwegian Retailers' Environment Fund. The proposal has been presented for public consultation together with the proposed changes under the revised Directive on Packaging and Packaging Waste. Similarly, plastic bags are one of the focus areas in the Norwegian Environment Agency's extended producer responsibility assignment, as discussed in chapter 5.8.

Development in plastic carrier bag use

The Norwegian Retailers' Environment Fund set a target of reducing plastic carrier bag use by 20 % by 2020, compared to 2015. The Norwegian Retailers' Environment Fund's own figures indicate that the average use of plastic carrier bags went down by 5.3 % annually in the period 2015-2019, while there was an increase in use of 5.2 % from 2019 to 2020. This increase must be seen in the context of the infection control measures and travel restrictions put in place during the COVID-19 pandemic. The Norwegian Retailers' Environment Fund expects that the use of plastic carrier bags will resume to its previous downward trend once society reopens again. The board of the Norwegian Retailers' Environment Fund has recently adopted a new target of reducing the use of plastic carrier bags by 50 % from 2016 to 2025.

Single-use items and the COVID-19 pandemic

The COVID-19 pandemic has led to a large increase in the use of single-use items such as face masks, disposable wipes, packaging, single-use plastic items for hygiene, and because of increased online shopping, takeaways etc. UN reports show that plastic waste generation has increased globally, while global recycling and recovery has decreased drastically during the pandemic.

Researchers say that, in 2020, as many as 1.5 billion face masks could have ended up in the ocean. Single-use face masks are often made of different types of plastic and it is challenging to recycle them, both because of the composition of the product, and because of contamination and infection control. Discarded face masks can now be found everywhere in urban areas, and even in nature. Even in places with adequate waste bins, many face masks are often found discarded in the street. People are often reluctant to touch other used face masks, and often dispose of their own masks on top of the waste bins where they can easily be blown away. Using high-quality reusable face masks and keeping used face masks sealed for disposal at home are two simple measures.

The Norwegian Government will

- expand existing extended producer responsibility and introduce new schemes for specific single-use plastic products
- actively contribute to the EU's revision of the Directive on Packaging and Packaging Waste, especially for plastic packaging
- introduce requirements for the share of secondary raw materials in plastic bottles and consider methods that will allow incorporation of secondary raw material into other plastic products
- introduce labelling requirements that ensure environmentally sound waste management of certain single-use plastics
- cooperate with the private sector to draft a pact for the purpose of reducing the environmental impacts of certain plastic products with a special emphasis on consumption reduction

5.7 Important value chains that include plastics

The EU's Circular Economy Action Plan announces comprehensive new regulations and initiatives for prioritised value chains (key value chains) in Europe. The proposal for a new Batteries Regulation from December 2020 is the first example of a new generation of regulations for prioritised value chains for a circular economy in the EU. The proposal covers all stages in the life cycle of batteries and a range of different measures that, added together, will ensure a more sustainable value chain with increased resource efficiency and higher environmental standards. The broad approach in the Batteries Regulation can act as a template for new regulations in other prioritised value chains. Many other announced initiatives, strategies and regulations that will be presented in 2021 and 2022 are of significance to plastics, including plastics in buildings, vehicles, electronics, and textiles.

Plastics in buildings

The building and construction sector represents approximately 20 % of the plastic consumption in Europe.³¹ It is estimated that the amount of plastic used in building and construction products amounts to 1 million tonnes annually, which represents 32 % of all Norwegian plastics consumption.³² This sector generates around 40,000 tonnes of plastic waste annually, which represents 7 % of all plastic waste generated in Norway. Approximately 20 % of this is recycled. Mepex emphasises that there is insufficient knowledge regarding the amounts and types of plastics used in this sector, and more knowledge is needed.

Plastics are used in pipes, sealing, insulation, surface coating and in electrical installations, among other things. There are several advantages to using plastics in buildings. For instance, plastic-based insulation can reduce energy consumption, and plastic coating can prevent water damage. Nevertheless, we must find solutions that ensure that a larger part of the used plastic is recycled and reused in building material, when possible. Currently, there are few incentives for sorting and collecting plastic packaging and other types of

³¹ *Plastics Europe (2020) Plastics – the Facts 2020 Publications* (plasticseurope.org)

³² Mepex (2020) *The material flow of plastics in Norway - what do we know?*

[Materialstrømmen-til-plast-i-Norge-Hva-vet-vi_-1.pdf](https://dl8y9d78cbd9m.cloudfront.net/Materialstrømmen-til-plast-i-Norge-Hva-vet-vi_-1.pdf) (dl8y9d78cbd9m.cloudfront.net)

plastics, e.g. pipes from the building and construction sector. In principle, waste sorting favours heavy types of waste, or waste with a positive value. Nowadays, few 'heavy' plastic types are recycled, such as soft vinyl, even though some vinyl manufacturing companies voluntarily take back used vinyl. Polystyrene, which is used for insulation, packaging etc, is a common source of litter. Some plastic waste, such as hard and soft PVC and certain insulation products, can contain pollutants that should not be included in new products. In many cases, this is safeguarded by regulations relating to environmental impact assessments for demolition and rehabilitation, but sound control routines are required.

Currently, there is a requirement that 60 % of construction waste must be sorted. Under the EEA Agreement, Norway is obliged to achieve a target of 70 % recycling of such waste.

The European Commission is currently working on a revision of the Construction Product Regulation to promote low-emission materials and reuse of building materials. To increase the use of recycled plastics, the EU's Circular Economy Action Plan will propose minimum requirements for the use of recycled raw materials in building materials.

Plastics in vehicles

The automotive industry is important in Europe, and during the past few years the use of plastic in cars has increased. Plastic can make cars lighter, which also reduces fuel consumption. The automotive industry accounts for approximately 10 % of Europe's plastics consumption.³³

Norway does not produce cars, but an increased use of plastic makes recycling vehicles much more difficult. Norwegian recycling plants must ensure the safe management of plastics that may contain hazardous substances. More plastics in vehicles can make recycling less cost effective, as the price of metals today is much higher than the price of plastic. The European Commission will present a proposal for revised regulations on scrapped vehicles in 2022 including inter alia incentives for circular design and easier waste management. Measures considered includes requirements for the use of recycled materials in new cars, increased levels of recycling and extended producer responsibility. Measures to reduce the export of old cars from Europe are also being considered.

Plastics in electronics

Electronic and electrical products (EE products) account for approximately 6 % of European plastic consumption.³⁴ Mepex's assessment estimates similar levels for EE products in Norway. Mepex also estimates that approximately 25,000 tonnes of plastic waste are generated by EE products every year, and that approximately half of this waste is recycled. Plastics in EE products often contain hazardous substances or substances expected to be listed as such in the future. International regulations through the EU and multilateral environmental agreements are thus key. Sorting plastics from e-waste will ensure that unwanted plastic fractions are taken out of circulation before recycling, such as plastics that contain persistent organic pollutants. Today, technology exists for sorting plastics from e-waste into cleaner fractions, and this is done in several recycling plants in Norway. This is not always profitable but is financed through the extended producer responsibility scheme for EE products.

³³ *Plastics Europe (2020) Plastics – the Facts 2020 Publications* ([plasticseurope.org](https://www.plasticseurope.org))

³⁴ *Plastics Europe (2020) Plastics – the Facts 2020 Publications* ([plasticseurope.org](https://www.plasticseurope.org))

The Norwegian government is also committed to stopping the illegal export of e-waste. This has been carefully reviewed in the Report to the Storting 19 (2019-2020) on environmental crime and is also discussed in chapter 6.

Under the auspices of the Nordic Council of Ministers, the project “Toxic-free and circular economy for plastics in electric and electronic goods” has been initiated. The project began in December 2020 and is being implemented by PlanMiljø. This project examines how the design of electrical and electronic goods can be improved to reduce the amounts of hazardous substances in plastics and to remove these from circulation. The project will also explore possibilities in existing and future regulations and consider measures to encourage consumers and procurers to choose toxic-free plastic products.

Plastics in textiles

Synthetic textiles are another product group containing substantial amounts of plastic. Mepex estimates that 250,000 tonnes of plastics in textiles are currently in use Norway, and that 25,000 tonnes of plastic waste are generated from textiles every year. This presents challenges both for recycling and with regards to the release of microplastics. In 2018, 65 % of textiles produced globally were made of oil/plastic.³⁵ Much of these textiles generate microplastics through the use and washing of clothes. Norwegians have a high consumption of textiles. It is estimated that we annually consume approximately 15 kg of clothing and household textiles per person.³⁶ A large part of these textiles are discarded as residual waste, creating a barrier to recycling. Textiles we buy are also often of a low quality, making repairs, reuse and recycling more challenging.



Microfibers in blue jeans. Jeans are made from both cotton and synthetic textiles. Microplastics, like these fibres, may be released from use and washing of synthetic textiles.

35 Ingun G. Klepp and Tone S. Tobiassen (2020) *Lettkledd: Velkledd med lite miljøbelastning* (“Lightly clothed: well dressed with little environmental impact”). Solum Bokvennen

36 Østfoldforskning (2020) *Kartlegging av brukte tekstiler og tekstilavfall i Norge* (“Mapping used textiles and textile waste in Norway”) - Norsus. <https://norsus.no/en/publikasjon/kartlegging-av-brukte-tekstiler-og-tekstilavfall-i-norge/>

The use of plastics in textiles is widespread, and the release of microplastics to the environment from production facilities, as well as wear and tear of textiles, are documented environmental problems. It is estimated that up to 1017 tonnes of microplastic come from textiles in Norway annually.³⁷ As mentioned, textiles are a priority in the EU's Circular Economy Action Plan from 2020. The European Commission has announced a strategy for textiles in the circular economy aiming to increase competitiveness in the industry, promoting sustainable textiles, addressing «fast fashion» and promoting higher levels of reuse and recycling. A central element is the proposal for a new framework for sustainable products and the extension of the Ecodesign Directive to include textiles. The textile industry is global, and Norway's own textile industry is small. The Norwegian Government is looking to closely collaborate with the EU for a more sustainable textile industry.

To prevent and reduce the release of microplastic from textiles, measures can be applied to various steps in the value chain, either by the manufacturer choosing other materials, changes in end-user consumption habits, or by measures to prevent release into water from wear and washing. Norway supports the development of new regulations to reduce release of microplastics from washing machines, under the EU's Ecodesign Directive. See also chapter 10 on microplastics.

The EU's Waste Framework Directive requires separate collection of textiles by 2025. This is one of the measures the Norwegian Environment Agency has examined in its assessment of means and measures to increase the rate of recycling of municipal waste. To increase the recycling of textiles in Norway, sorting plants for textiles must be established. There is also a need for the development of technology that can recycle various textile fibres.

To achieve a more sustainable textiles industry, products must be designed and produced with sustainability in mind. Measures targeting the production phase of textiles are the most effective and for this International rules and standards are needed, both at the European and global level.

Microplastics from laundry

Early on, Norway identified textiles as a source of release of microplastic, and that it was important consider this in greater detail under the EU/EEA Ecodesign regulations. In 2018, Norway and several EU countries sent a letter to the European Commission, requesting that the EU expedite the establishment of eco design regulation requirements, specifically stating that washing machines must have a filter for capturing microplastics. In 2019, the Commission announced that such requirements would be presented within six years. The EU's new strategy for a circular economy proposes expanding the Ecodesign Directive to promote circular products. The EU's announced strategy for textiles in 2021 is also expected to contribute to reducing microplastic emissions.

³⁷ Mepex (2021) *Norwegian land-based sources of microplastics*
[Norwegian land-based sources of microplastics - Norwegian Environment Agency \(environmentagency.no\)](https://www.environmentagency.no)

Expanded polystyrene

Items made from expanded polystyrene (EPS), including fish crates, food containers, flotation components and building materials, are easily fragmented into smaller pieces. Measured in number of units, EPS is the most common plastic waste found on Norwegian beaches. When broken into small pieces, EPS is light, easily infiltrates vegetation, and like plastic pellets and cellular glass aggregate, it is difficult to clean up.

If EPS waste can be linked back to a responsible party, the relevant municipality can issue clean-up orders. For instance, orders can be issued to remove discarded floating docks.

Generally, EPS waste not handled correctly can also be considered pollution, as it can cause harm or cause nuisance to the environment. The Pollution Control Act states that no one must have or do anything that could pose a risk of pollution. Those responsible must implement measures to prevent the various forms of pollution, for instance the spreading of small EPS pieces from floating docks. If pollution has occurred, those responsible must put in place measures to stop, remove, or limit the effects.

Ban against certain EPS products

A ban against certain single-use plastic items, including EPS drinking cups and food packaging, came into force on 3rd July 2021. Extended producer responsibility schemes for plastic products in fisheries and aquaculture will also include EPS products.

The Norwegian Environment Agency will improve the guidance given to municipalities regarding littering, including measures to address EPS. The Norwegian Environment Agency will map out the sources of EPS litter in greater detail and will propose additional measures to prevent it.

The Norwegian Government will

- consider how the textile industry and consumers can be challenged to reduce consumption of textiles and the resulting environmental impacts
- implement separate collection of textile waste
- support the EU's work on their textile strategy, focusing on the production of toxic-free textiles including measures against microplastics, new requirements for collection systems taking into consideration new technological solutions, and cooperation between actors in the value chain
- follow the work on revising the EU's Construction Products Regulation, focusing on increased reuse, and recycling of building materials
- consider stronger requirements for sorting construction waste
- support the EU's work on sustainable electronic products, including changes to the Ecodesign Directive
- strengthen knowledge regarding sources of EPS litter, and consider new measures to reduce such litter

5.8 Extended producer responsibility

Extended producer responsibility is one of several necessary tools needed to achieve a more sustainable value chain. It can contribute to environmentally sound waste management and a high rate of recycling. Extended producer responsibility can give producers an incentive to design durable and recyclable products that are easier and cheaper to manage and recycle, and that are produced from recycled raw materials. Because of the EU's ambitious recycling goals and the new approach of comprehensive value-chain based regulation, extended producer responsibility will become an even more crucial component of the circular economy in Europe. The Norwegian Government will support the development of regulations based on the basic sustainability aspects of products.

Norway has established schemes for Extended producer responsibility, several of which are relevant to plastics: discarded electrical and electronic products, scrapped vehicles, collection, and recycling of discarded tyres, return systems for beverage containers and packaging waste. These schemes evolved since the 1990s. The purpose of the current schemes is to promote separate sorting, collection, and treatment of waste to prevent pollution and other environmental problems from waste.

The need for a review and further development of extended producer responsibility schemes as an instrument in Norway has been identified. The Norwegian Environment Agency has been tasked with reviewing the extended producer responsibility schemes with the purpose of updating and streamlining them, especially considering the new ambitious goals for recycling and resource efficiency through regulatory developments in the EU.

The Norwegian Government will

- strengthen schemes for extended producer responsibility in Norway

5.9 The need for a stronger product policy framework in Norwegian legislation

In its national strategy for a circular economy, the Norwegian Government has explained how the EU's strengthened product framework renews EU legislation and challenges current Norwegian environmental legislation. Increased emphasis on eco design and improved sustainability across the whole value chain of a product mean that new requirements are set for product sustainability properties, going beyond the direct environmentally harmful properties of the product. This includes content of secondary raw material, service life, possibility of repair, etc. Addressing these product properties is especially relevant for plastic. Norwegian pollution regulations focus on pollution, waste, and products containing hazardous substances and do not to a large extent, consider resource concerns and product properties that are not directly harmful to human health and the environment. Therefore, the Norwegian Government sees the need to review current Norwegian legislation to ensure a legal basis for requirements for products throughout their life cycle, concurrently with the development of a reinforced European product policy framework.

5.10 Sustainable plastic consumption

A more sustainable plastic value chain depends on the development of more sustainable products and replacing primary raw material with recycled material. It also depends on changes in plastic consumption patterns, and on strengthening the market demand for more sustainable products and recycled materials to be used in new products.

Plastic is found in all kinds of products, and changes in consumption patterns and habits are possible for everyone, not just in industry and business, but also by private consumers and in the public sector. Plastic products make up a large part of our everyday lives. Having a considerable interaction with consumers, the wholesale and retail traders have identified their important role and responsibility for providing more sustainable product ranges, for conveying environmental information to customers and for developing sustainable business models. Industry actors have decided to include circular economy considerations in their collective agreements, and is taking responsibility for changes to consumption practices at the workplace bringing out practical results. Some industrial companies are now demanding secondary raw materials and want to develop and streamline the markets for recycled plastics. Beverage containers produced from 100 % recycled plastics are already on the market. Importers and distributors on the Norwegian control their own product ranges and can, by making demands on their suppliers, strengthen the markets for more sustainable plastic products, as well as for materials or services that can replace plastic. Specific sectors, like the IT sector, consume huge amounts of materials, energy, and plastic materials. They have independently taken the initiative to green their sector.

The Norwegian Government will strengthen the tools for making circular choices in the market, to facilitate access to relevant market information, strengthen consumer rights and increase the rate of green and innovative public procurement. The use of public policy instruments can and should facilitate, support, and promote circular consumption patterns. Yet it cannot replace the market power that consumers, public procurers and commercial market participants have at their disposal. All consumers, both private consumers, public procurers and all parts of the manufacturing and service industries, play an important role in increasing the demand for more sustainable plastic products and solutions. Everyone is responsible for improving their own resource efficiency, reducing their overall footprint and preventing and reducing plastic waste.

What can you do to reduce plastic litter in nature?

- Always dispose of plastic waste in bins – at home and elsewhere. Never in nature.
- Always dispose of chewing gum, nappies, sanitary towels, tampons, contact lenses and cotton bud sticks in the waste bin, and not in the toilet.
- Recycle your plastic bottles and carry a reusable cup and your own drinking bottle with you.
- When in nature – at sea or in the mountains – carry your waste to the nearest bin and make sure the wind does not get hold of plastic bags, plastic bottles, or other single-use packaging that you have with you.
- If you are on a fishing trip, always make sure that you don't leave behind any fishing gear when you leave.
- If you play football, your team could look into how the club deals with the rubber granules that are used on artificial turf pitches. These must not get stuck in football boots, be tracked home, or end up in streams and rivers.
- When at the supermarket, consider whether you need a plastic bag. Could you use a tote bag or backpack instead?
- Take part in your local nature and beach clean-up initiatives.

Private consumption has significantly increased in recent times and making sustainable choices will be important steps towards a circular economy. A more circular economy requires products to be used for a longer time. Key factors for consumers are access to repair services and their own knowledge regarding repairs, and the cost/benefit factor of repairs. Consumer rights such as longer product return time limits can also be important. This can result in more products being repaired, instead of simply being thrown away. Other ways of organising consumption, such as renting or borrowing instead of buying, are also useful. Digital platforms are already in place to facilitate the sharing economy.

Norwegian consumer policy and regulations are largely determined by the European consumer policy. The EU is now highlighting the importance of consumer rights regulations and consumer policy, both in the green transition and in the post-pandemic recovery. This will be significant for the strengthening of the role of consumers in the circular economy in Norway. In 2021, the EU Commission will present several proposals for new regulations, seeing various regulatory instruments in context.

The starting point for consumers is expressed in the Circular Economy Action Plan - that consumption patterns must be changed to reduce the climate footprint generated by consumption.

The EU is now working for the EU's environmental labelling scheme, Ecolabel, to be a contribution to the broader framework for sustainable production and consumption. According to the EU Circular Economy Action Plan, it is noted that the review of the Ecodesign Directive will build on criteria and rules in line with the EU Ecolabel. This to achieve a more standardized methodology for assessing the product environmental footprint. Information about the environmental aspects of goods and services allows consumers to choose products with the lowest possible environmental impact. By demanding resource efficient and environmentally friendly products, consumers can influence business and industries to take greater environmental considerations in production and when importing goods and services. For instance, information can be conveyed through websites, product testing, marketing, education regarding consumer topics in school and through labelling.

Today, there are many different labelling and certification schemes, including the Nordic Swan Ecolabel, EU Ecolabel, the Ø Label/Debio, and the Eco-Lighthouse certification scheme. Labelling schemes not only provide information to consumers but are also an important stimulant for producers and importers. The official ecolabels in Norway - the Swan Ecolabel and the EU Ecolabel - are managed by the Ecolabelling foundation.

In the EU, work is underway to prepare a standardised methodology for documenting the environmental footprint of products (Product Environmental Footprint, PEF), to provide consumers and companies with reliable and comparable environmental information. This is done on the basis that there are more than 450 ecolabels worldwide, of which more than 100 labels are active in the EU, and that a standardised methodology will help to reduce greenwashing. The PEF methodology is based on life cycle analyses and builds on existing international standards, including the EU Ecolabel.

The Norwegian Consumer Council's label guide

There are over 100 different labels to be found in a normal Norwegian supermarket. The Norwegian Consumer Council has put together a guide of the most common labels, to make it easier to find your way around the different labels. The label guide shows who is behind the label, as well as the criteria for control, openness and costs of use. The labels are divided into different sections like health, environment, food, ethics, and more.³⁸

The goal of the Nordic Swan Ecolabel is to reduce the overall environmental impact caused by consumption. In their assessments, the Nordic Swan ecolabel considers a product's entire life cycle from raw materials to production, use, recycling, and waste generation. The requirements are formulated so that measures do not have a negative impact on other stages of the life cycle or cause other environmental problems. Thus, the Nordic Swan ecolabel stimulates a circular economy in the lifecycle of a product or service. The requirements support efficient and sustainable resource use and reduce waste generation. Strict regulations stating which chemicals and substances that can and cannot be used makes it easier to recycle these materials.

The Norwegian Government wishes to highlight the value of the Nordic Swan ecolabel as a tool for achieving a circular economy, as well as strengthening the Ecolabelling foundation.

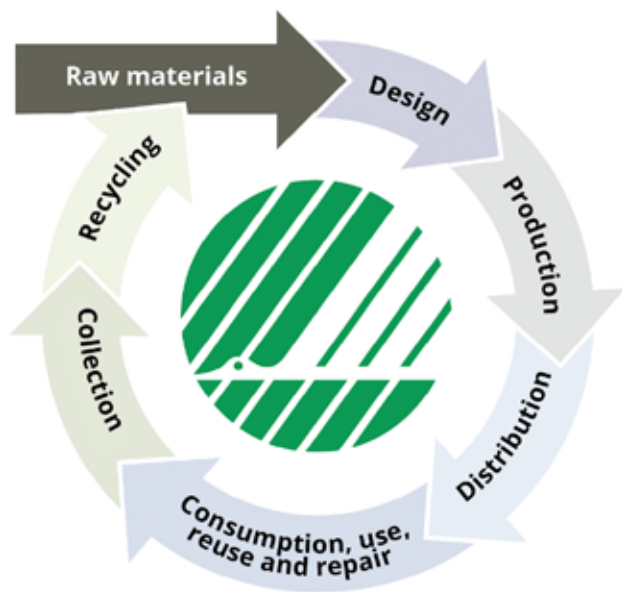
How does the Nordic Swan ecolabel contribute to a circular economy?

- requires renewable and recycled raw materials to be used where environmental benefits can be gained
- enforces strict regulations for the chemicals that are used in materials and in end products
- enforces requirements for the function, quality, and lifetime of products
- requires that products can be disassembled and repaired
- enforces requirements for reduced consumption of resources and energy
- enforces requirements for appropriate waste management to maintain functioning material cycles establishes requirements for reuse and redesign

The public sector is a major consumer of goods and services, but also a property manager, an investor in transport infrastructure and a major player in many market segments. The Norwegian government, counties, and municipalities spend approximately NOK 595 billion on goods, services, building and construction works annually. Sustainable public procurement regulations for plastic products, alternatives to plastics and other solutions that make the use of plastic products redundant, is a tool to allow public agencies to shift their plastics consumption to more sustainable levels. This can also promote innovative solutions in the private sector.

The new Public Procurement Act that entered into force in 2017 requires that national, regional and municipal authorities and other public bodies to "adapt their procurement practices to reduce harmful environmental impacts and promote climate friendly solutions where relevant". This environmental provision gives public entities obligations both at the operational level and regarding their overall procurement portfolios. This allows for flexibility in implementing this legislation.

³⁸ <https://www.forbrukerradet.no/merkeoversikten/>



The aim of the Swan label is to reduce the total environmental impact from consumption

This legislation is overarching and must be supplemented with more specific measures in public procurement practice. Both public procurers and private suppliers need guidance and predictable conditions, so that adjustments can be made in the long run. Clear priority areas, as well as assessment of public needs, will provide better long-term results. In Report to the Storting 22 (2018-2019), *Smartere innkjøp – effektive og profesjonelle offentlige anskaffelser* (“Smarter purchases – efficient and professional public procurements”), the Norwegian Government announced an action plan to increase climate and environmentally friendly public procurements and green innovation. Particular emphasis will be given to the transport sector, low and zero-emissions solutions, the building and construction sector, circular economy, plastics, food and food waste, and hazardous substances. The Norwegian Agency for Public and Financial Management (DFØ) has also prepared a professional purchase guide for plastics. DFØ’s guidelines for “green and circular procurement of furniture” will also contribute to achieving more reuse of furniture and fixtures in the public sector. These are cost effective measures which will also reduce the amount of plastic waste from the relevant sources.



An estimated 2 billion people lack access to basic waste management services worldwide. As a result, a lot of plastic waste disappears from the plastics value chain, as it is not being collected. Environmentally sound management of waste is essential to ensure that the resources in plastic waste are taken advantage of.

Photo: Ingeborg Mork-Knutsen

6 Using the resources in plastic waste

6.1 The global perspective – stricter global waste regulations

The Basel Convention, being the global environmental agreement on waste, is a key regulatory framework for the export and import of waste. A central principle of the convention is environmentally sound waste management. It is estimated that almost two billion people around the world lack access to basic waste management. As a result, large amounts of plastic waste are not collected, and disappear from the plastics value chain. Environmentally sound waste management is essential to ensure that the resources in plastic waste are used. Norway also actively supports efforts to raise global standards for environmentally sound management of plastic waste under the Basel Convention.

In 2019, following a Norwegian proposal, the Basel Convention adopted new and stricter rules for the global trade in plastic waste, motivated by the hitherto unregulated trade in plastic waste resulting in major health and environmental problems, especially in developing countries lacking sufficient waste management systems.

To engage businesses and other actors in efforts addressing plastic waste, Norway has taken the initiative for, and is leading, a global partnership on plastic waste under the Basel Convention. The main goals of the partnership is to improve plastics management on a global level, both in the design of goods and services and in waste management. The partnership will also conduct outreach activities and implement pilot projects, mainly in developing countries. So far, 23 projects have received support from the partnership, inter alia on waste collection and improved recycling in developing countries in Africa and South East Asia.



Plastic waste is being shipped across borders. Norway supports efforts to raise global standards for environmentally sound management of plastic waste under the Basel Convention. Photo: NTB, Grønt Punkt

6.2 Recycling of plastic waste in Norway

Targets and achievements

Norway has several quantified targets for recycling of municipal waste that includes plastic waste. In accordance with the Waste Framework Directive, 50 % of all municipal waste should have been recycled in 2020. This number will be increased to 55 % in 2025, 60 % in 2030, and 65 % in 2035. This is the overall target for all municipal waste, including plastic waste. The EU packaging and packaging waste directive has its own targets for the recycling of plastic packaging. The target is currently that 22.5 % of plastic packaging waste must be recycled. This will increase to 50 % in 2025 and to 55 % in 2030.

In 2019, approximately 240,000 tonnes of plastic packaging were put on the Norwegian market, based on the Norwegian Environment Agency's collection of reports from producer responsibility organisations (PROs) for packaging, and return systems for beverage packaging.

Figures from 2019 show that 33 % of plastic packaging waste was recycled, while the remaining shares were used for waste-to-energy. Preliminary figures for 2020 indicate a steady increase in the amount of plastic packaging put on the market, but the amount of plastic packaging waste recycled seems to have declined. We expect the amount of plastic packaging recycled to increase by 2025, partly due to the implementation of the changes to the EU packaging and packaging waste directive. Approximately 81 % of plastic beverage bottles were recycled in 2019. A high rate of recycling is expected for plastic beverage bottles and packaging because of the tax scheme for beverage packaging and separate collection requirements for plastic beverage packaging in the EU plastic products directive. Figures from the EU indicate that plastic packaging makes up around 40 % of all new plastic put onto the market, as well as up to 60 % of all plastic waste. In 2019, 41 % of Norway's municipal waste, went to recycling.

Parts of the municipal waste are not suitable for reuse or recycling. A suitable solution for these parts is incineration with energy recovery. Some 26 % of the total amount of waste

Waste Hierarchy



generated in Norway is incinerated with energy recovery each year. Incineration reduces the total amount of waste to one tenth and energy can be recovered and reused. Incineration at high temperatures also reduce the level of hazardous substances in the waste.

Technical and environmental challenges related to plastic recycling

Plastic as a material has a high technical potential for recycling, however only a small proportion is currently recycled for use in new raw materials and products. This is due to several factors. Plastic is a chemical product, and to obtain safe, usable products based on recycled raw materials, the recycled content must be clean and homogenous (consisting of the same type of plastic). This requires sorting and/or a separate collection of plastic waste for recycling. This is a challenge when waste is mixed, as in household waste. Different types of plastic in a single product are another challenge (e.g., different types of plastic in a bottle, cap, and label). The market for secondary plastic raw materials is still at a nascent stage. Production of new primary plastics is cheap, and today's economic incentives do not favour plastic recycling or the use of secondary raw materials to replace primary plastics. It is necessary to alter this balance to create more sustainable value chains for plastic products.

A particular challenge is the addition of chemical substances to plastic; see chapter 5.4. Hazardous substances that are listed to be phased out must not be returned to the value chains through recycling.

Another challenge is the efficiency of sorting and collection systems. Technological solutions for sorting, recycling, and using of secondary raw materials need to be further developed.

There is considerable uncertainty related to new and immature technologies, such as chemical recovery of plastics for new materials or for fuels. It is uncertain whether this can be considered environmentally sound management of waste, and more testing and development of such technologies is necessary.



Haraldrud recovery plant is one of two recycling plants in Oslo. This plant processes mostly municipal waste totalling 100 000 tonnes per annum. Photo by Erlend Aas.

New measures

The European Commission is revising the Directive on packaging and packaging waste to further promote reuse and recycling, to avoid excessive packaging and reduce the amount of packaging waste.³⁹ Norway promotes strengthening of the market for circular solutions, prevention of litter, and accommodation of the use of new technologies for managing packaging waste. For Norway, it is important that new regulations are not locked to certain given technologies or to manual processing that can be automated. The Norwegian Government will consider new measures to address agricultural plastics.

The Norwegian Environment Agency has conducted a public consultation on a new proposal for mandatory sorting of biological waste and plastic waste (including plastic packaging and agricultural plastics) from municipal waste. This proposal requires municipalities to sort at least 70 % of plastic waste from households by 2035. It may also be necessary to strengthen the infrastructure for secondary raw materials. The Norwegian Environment Agency has also conducted a public consultation on a proposal for a new regulation to implement the targets for recycling in the EU packaging directive and packaging waste. These changes mean that the amount of plastic packaging waste recycled must increase to 50 % by 2025 and to 55 % by 2030.⁴⁰

The Norwegian Government assesses whether the measures addressing plastic waste are sufficient to achieve the recycling targets, both generally and for plastics specifically. A report written in preparation of the Norwegian Waste Strategy from 2013 assessed the potential for recycling different types of plastic waste. This assessment showed a particular potential for more recycling of plastic packaging waste, but also plastics from household waste and furniture, agriculture, WEEE, waste from building and construction, discarded vehicles, fishing gear and equipment from the aquaculture industry, but it also found that the potential of recycling varies between sources and sectors.

The Norwegian Ministry of Climate and Environment has requested and received an analysis from the Norwegian Environment Agency on measures needed to reach the binding recycling targets for municipal waste in the EU Waste Framework Directive. Several of the assessed measures could result in increased reuse, waste prevention and various types of plastic items being recycled. Several of the measures are considered profitable. The assessment is based on available, yet somewhat uncertain, data. The Ministry of Climate and Environment will assess these measures when considering our target of 65 % preparation for reuse and recycling by 2035.

Assessment of means and measures on strengthening preparations for reuse and recycling of municipal waste

The Norwegian Ministry of Climate and Environment has requested and received an analysis from the Norwegian Environment Agency on the measures needed to reach the binding recycling targets on municipal waste, including plastics. Several of the 22 initiatives assessed by the Norwegian Environment Agency could result in a reduction of the amount of plastic waste through increased repair and reuse and could contribute towards an increased preparation for reuse and recycling of plastic waste.

Three of the measures can result in increased reuse of plastic furniture and fixtures. The assessment shows that introducing a system where you pay a fee for the residual waste you generate, as well as better sorting of residual waste, may increase the recycling rate for plastic waste. Waste treatment plants can also invest in technology to fuse different types of plastic, thus improving recycling.

³⁹ Norwegian Government (2020), [Roadmap - a review of packaging requirements](#)

⁴⁰ Norwegian Environment Agency (2021), [Forslag til endringer i regelverk for emballasje \("Proposal for amendments to packaging regulations"\)](#)

It is crucial to increase our use of recycled plastics, which will make the recycling process profitable. The quality of recycled plastic must be better and more stable than it is today. Plastic packaging used in Norway is primarily recycled in Europe, but the current capacity for treating all plastic waste in Europe is too low.

The Norwegian Government will give priority to strengthening conditions for recycling plastic packaging generated in Norway. This will require a more stringent extended producer responsibility scheme for plastic packaging, combined with other means and measures creating better incentives for efficient and profitable use of the resources in plastic waste. To achieve a strengthened market and more demand for recycled plastic, product design regulation will be crucial, such as EU's process of revising the harmonised requirements for packaging waste and EU's work on requirements on recycled plastic in new plastic products. The policy mix must be appropriate for fulfilling Norway's obligations under the EU Waste Framework Directive, the Directive on Packaging and Packaging Waste, and the Directive on Single-Use Plastic Products. There is also a need to further develop data and statistics on plastic products and plastic waste.

Two plants for advanced post-sorting (central sorting) of residual waste are in operation in Norway; one in Eastern Norway (ROAF) and another in the Stavanger region (IVAR). These plants sort a wide range of different waste, and plastic is sorted by polymers. At least two other sorting plants are being planned in Norway, including Østfold Avfallssortering in Fredrikstad and Sesam Avfallsressurs in Trondheim.

Norwegian Retailers' Environment Fund – aiming for a 50 % recycling rate of plastic waste

On behalf of the Norwegian Retailers' Environment Fund, Mepex and Norner have looked into how a 50 % rate of recycling of plastic can be achieved by 2025. The study includes a mapping of the Norwegian plastics industry, estimates of the quantities of recycled raw material in use today and the potential for increase in use of recycled raw materials. In addition, the study includes the total amount of plastic in use today and current plastic waste streams. The report outlines a scenario for plastic waste management in the future, with a proposal of a number of regional facilities for general sorting and one national facility for more detailed sorting of plastic waste, in combination with a national recycling plant.

The Norwegian Government will

- develop regulations that promote the use of technologies and digitalisation to support more sustainable production, consumption, and waste management for plastics
- increase recycling of plastic packaging incrementally to 50 % by 2025, increasing to 55 % by 2030
- further develop the overall statistics and data for the plastic recycling in light of changing conditions and regulatory frameworks for plastic waste in Europe
- implement requirements of sorting plastic waste in households and businesses

6.3 Export of plastic waste

In 2019, following a Norwegian proposal, the Basel Convention adopted new and stricter rules for the global trade in plastic waste. This was motivated by the hitherto unregulated trade in plastic waste resulting in major health and environmental problems, especially in developing countries lacking sufficient waste management systems. Much of this waste is mismanaged, and there is a considerable risk that it will end up in the ocean.

These new rules came into effect on 1st January 2021. Several countries have implemented new and more stringent rules for the export and import of plastic waste. The new rules mean that export of plastic waste that is mixed and unsuited for recycling from one country to another is dependent on the consent of the authorities both in the exporting and importing country. Documentation must be provided to prove that the recipient of the waste shipment will ensure environmentally sound management of the waste at destination. This documentation makes the waste traceable and ensures that it will not be discarded or lost en route. If anything goes wrong, the exporter can be ordered to take back the waste shipment. Many developing countries need support to build capacity to comply with these new rules. In 2020, supported by the Norwegian development aid programme on marine plastic litter, the Secretariat of Basel Convention, Interpol and the UN Office on Drugs and Crime (UNODC) strengthened international cooperation and contributed to building national capacity for enforcing these new rules.

Plastic waste which is sorted, clean and destined for recycling, can be exported without prior consent. The regulations include detailed criteria about which types of waste require consent, and which types can be shipped without prior informed consent. One impact of the new rules is making sorting of plastic waste destined for recycling more profitable and in turn facilitating the increased use of recycled plastic materials and a more circular economy for plastics on a global scale.

Norway has implemented these rules by endorsing the changes in the EU waste shipment regulations, to which Norway already adheres. The EU has introduced a ban on export to non-OECD countries. This is stricter than the new rules under the Basel Convention. Norway will follow the same practice.



Young men burning the plastics in cables at the Agbogbloshie landfill on 12 June 2018. Photo by NTB, Gioia Forster/dpa

Norway is actively engaged in the ongoing revision of the EU's waste shipment regulations, with a particular emphasis on stronger control and enforcement of illegal trade in waste, putting stronger emphasis on the environmental standards in receiving countries in further development of regulations and practices.

Electrical and electronic waste (e-waste or WEEE) contains components with a high market value and is an attractive source of illegal trade and export. A significant proportion of this waste contains plastics, often subject to open burning, dumping or similar treatment in the importing country. Switzerland and Ghana have submitted a proposal to extend the Basel Convention's rules on prior informed consent to include transboundary movement of e-waste. The Norwegian Government's measures against illegal export of e-waste – both on a national and international level – is therefore important in the work to prevent plastic pollution. Report to the Storting 19 (2019-2020) *Environmental Crime* presents six e-waste measures, with which the Norwegian Government proposes to:

- specify regulations avoiding any doubt that removal of waste delivered in return schemes at retailers' or municipal reception facilities is considered is an illegal or criminal act
- clarify the obligations of those operating e-waste return schemes to prevent illicit removal of e-waste, and to prevent pollution from e-waste management
- consider strengthening inspection and reporting standards for those actors covered by e-waste regulations, including for illicit removal from e-waste return schemes and other illegal treatment of e-waste in Norway
- strengthen inspection measures to prevent the illegal export of e-waste in cooperation with Norwegian Customs and other relevant agencies, including a review of inspection routines and the development of joint guidelines
- contribute to the revision of the EU's waste shipment regulations, with a view to simplify the rules and improve enforcement
- prioritise efforts to strengthen inspection measures for e-waste shipments

The Norwegian Government will

- continue and strengthen the work under the Basel Convention on the global trade of plastic waste, to raise environmental standards and involve the private sector and other actors in preventing pollution and littering caused by plastic waste
- support the proposal by Switzerland and Ghana on stricter controls of imported and exported e-waste
- follow up the implementation of new rules for the export and import of plastic waste in Norway and contribute to EU revisions of the waste shipment regulations



Plastics has many uses with positive benefits in agriculture but are often used for a single season only and are heavily exposed to weather. Hence, there is a risk of littering from agricultural plastics.

Photo: Adobe Stock

7 Plastics in the agricultural sector

Although the agricultural sector is not currently the largest user of plastics, experts warn that an increased use of plastic materials in agriculture, both in emerging economies and at a global level, will contribute to plastic pollution. In Europe, the largest source of intentionally added microplastic is estimated to be fertilisers and pesticides encapsulated in plastic.⁴¹ Plastics are useful in agriculture in many ways, yet these plastics products are often used for a single season only and are heavily exposed to weather. There is therefore a risk of littering associated with plastics used in agriculture. Plastic film and similar items are found discarded in nature and along water bodies. Sound management of this plastic waste implies both a cost and higher workload, and there is thus a high risk that agricultural plastics will end up in nature or burned.⁴²

Globally, the use of biodegradable plastic is rising, for example as a ground cover designed to be ploughed into the soil after use. Biodegradable plastic is in use in Norwegian agriculture, but likely on a smaller scale. There is considerable uncertainty associated with the actual decomposition of such plastics,^{43,44} especially in a cold Norwegian climate. The degradability of biodegradable plastics in soil and different waste streams is currently being studied in projects such as DGRADE, led by the Norwegian Institute of Bioeconomy Research (NIBIO).



Plastic bags from hay bales easily end up in nature. Photo by NTB, Vidar Ruud

41 ECHA (2020): [Microplastics_Annex XV_Restriction report \(europa.eu\)](#) and [Microplastics_Annex XV_Report_Annexes \(europa.eu\)](#).

42 World Bank Group, *Agricultural pollution – Plastics* World Bank Document

43 *Mepex&Eunomia (2019) Bio-based and Biodegradable Plastics*
<https://www.miljodirektoratet.no/publikasjoner/2019/januar-2019/bio-based-and-biodegradable-plastics/>

44 SAPEA, Science Advice for Policy by European Academies. (2020). *Biodegradability of plastics in the open environment*
<https://www.sapea.info/topics/biodegradability-of-plastics>

NIBIO is currently doing research on using wool as a replacement for plastics in horticulture.⁴⁵ When used as a ground cover, wool can prevent weeds and snails, and retain water during dry periods. The European Commission has announced a policy framework to regulate sourcing, labelling and use of bio-based and biodegradable plastics in 2021. Norway will support this process, with an overall objective to ensure that any regulation and measures for such plastics have positive effects, respecting different waste management systems and conditions in countries with cool climates.

According to Green Dot Norway, 13,875 tonnes of agricultural plastic was put on the market in 2020, of which 95 % was recycled. The reported collection rate is approximately 86 %. Currently, Green Dot Norway manages a voluntary return scheme for recycling of agricultural plastics.⁴⁶ This scheme was previously tied to an agreement with the Norwegian Ministry of Climate and Environment but is now an independent return scheme. The scheme is financed by importers and manufacturers paying a charge per kilo of new plastic that is put on the market. Farmers can deliver agricultural plastics free of charge to some 100 collection points nationwide that have agreements with Green Dot Norway. The Norwegian agricultural collective Felleskjøpet also runs a pilot project where hay bales plastic bags are collected when delivering other goods. This scheme continues and was expanded in 2021.⁴⁷

Using biowaste or compost as agricultural fertiliser is a good way to reuse resources, but such fertiliser can contain plastics that may be difficult to remove before it ends up in the soil.

The proposal for a new chapter to the Norwegian Waste Regulations on sorting of biological waste and plastic waste, involves new requirements for the sorting and return of agricultural plastics for recycling.⁴⁸ The obligations in this proposal are aimed at enterprises that use agricultural plastics; in other words, primarily farmers. These regulations are intended to secure that collection and recycling of agricultural plastics will continue at the same level or at a higher level in the future.

The Norwegian Government will

- implement new requirements for sorting and recycling of agricultural plastics
- assess the need for initiatives aimed at biodegradable plastics in agriculture
- promote innovation and information on measures for plastics in biowaste where decomposed organic materials or compost is used as fertiliser

45 Nibio (2021) Nedklassifisert ull kan erstatte plast i hagebruk ("Downgraded wool could replace plastic in horticulture") - Nibio

46 <https://www.grontpunkt.no/gjenvinning/plastemballasje-naeringsliv-landbruk/landbruk/>

47 Felleskjøpet Agricultural Collective <https://www.felleskjopet.no/pilotprosjekt-innhenting-av-landbruksplast/>

48 In this proposal, agricultural plastics are defined as: "Plastic waste in the form of wrap (silage wrap), polypropylene sacks (fertiliser and seed sacks), fibre nets and foil covers, hard plastic packaging and similar plastic materials used for agricultural purposes."



The transportation sector is a source of both plastic litter and emissions of microplastics to the environment. Wear and tear of car tyres is estimated to be the largest source of microplastics in both the EU and in Norway, and to make up some 5-10 % of all microplastics in the ocean on a global level.

8 Plastics in the transport sector

The transport sector is a source of both litter and emissions of microplastics in the environment. Wear and tear from car tyres is considered the major source of the spread of microplastics in both the EU and Norway. At the global level, it is estimated to make up 5-10 % of marine plastic litter⁴⁹. Tyre wear and tear and road dust make up approximately 40 % of the total emissions of microplastics from land-based sources. In Norway microplastics are spread by water runoff, winds and snow. Plastic waste litter can come from building and construction activities, packaging, ports, roads, and fairways marking, waste from rock blasting and from road users. The building and construction industry also uses and handles large amounts of plastics such as packaging, cables, pipes, barrier tapes, foils, and similar items, entailing a high risk of pollution. Operation and maintenance of transport infrastructure also contributes. Plastic in explosives from rock blasting end up in then environment when surplus masses are used for backfilling in the sea and on land. Other significant sources of microplastics from the transport sector are abrasion and paint sanding from ships and bridges. Plastic pollution also comes from maritime transport, as mentioned in chapter 9, on sea-based sources.

In March 2021, the Norwegian government presented the National Transport Plan, which also describes how the transport sector contributes to plastic pollution.

Under the auspices of the Nordic Council of Ministers and Norwegian leadership, a report has been prepared on the emissions of microplastics from tyre wear.⁵⁰ Measures to reduce emissions from tyre wear are also mentioned in the Norwegian Environment Agency's assessment of means and measures on microplastics.⁵¹

Transport operating companies⁵², along with the Norwegian Environment Agency, have gathered knowledge about the sources of plastic pollution in the transportation sector, and possible measures to reduce this pollution. These companies will continue to build knowledge of pollution sources and effective measures. This includes more knowledge and use of methods and materials that could prevent and reduce plastic pollution to the greatest extent possible.

Measures to reduce the emissions of microplastics from road and tyre abrasion, including road cleaning, capturing runoff water in catch pits, and methods for limiting pollution from snow clearing. These are all relevant measures to be used wherever appropriate.

49 Open University Nederland (2019) "Wear and Tear of Tyres in the Global Environment: Size Distribution, Emission, Pathways and Health Effects" SETAC, Helsinki (PDF) [Wear and Tear of Tyres in the Global Environment: Size Distribution, Emission, Pathways and Health Effects \(researchgate.net\)](https://www.researchgate.net/publication/338111111)

50 Nordic Council of Ministers (2021): *Reducing the Release of Microplastic from Tyre Wear: Nordic Efforts Reducing the Release of Microplastic from Tyre Wear: Nordic Efforts | Nordic cooperation (norden.org)*

51 Norwegian Environment Agency (2020): *Oppdatert tiltak- og virkemiddelvurdering mot mikroplast. Vurdering av tiltak for å forebygge marin forurensning ("Updated measure and policy assessment against microplastics. Assessment of measures to prevent marine litter") - Norwegian Environment Agency (environmentagency.no)*

52 Report to the Storting 20: *National Transport Plan 2022-2033 (2020-2021)* <https://www.regjeringen.no/en/dokumenter/national-transport-plan-2022-2033/id2863430/?ch=1>

Regulating the wear of car tyres as a source of pollution is challenging. Norway relies on cooperation with the EU in the design and manufacture of more durable tyres. EU regulations on tyre labelling that involves fuel efficiency and several other factors entered into force on 1 May 2021. These regulations allow the labelling scheme to be expanded to include the emission of microplastics, once a suitable testing method for measuring tyre abrasion is available. Norwegian transport authorities are following this work with a view to national implementation. See also chapter 10 addressing microplastics.

Transport operating companies will, within their areas of responsibility, strengthen preventive measures to reduce the discharge of plastic waste and microplastics to the environment, and plastic waste clean-up measures.⁵³ Measures and requirements for prevention and clean-up connected to construction, operations and maintenance will also be strengthened. The Norwegian Coastal Administration stipulates in their contracts that contractors must collect all visible plastic immediately after blasting, and that the coastal zone in the vicinity of any construction sites is cleared at the end of each operation. The contractor must also ensure that, upon ending an operation, there should be less plastic litter in the environment than before the operation started. The Norwegian Public Roads Administration is also actively working to find alternative products. The Rogfast project's plastic accounting scheme will also be assessed for further use by transport operating companies. The companies can also set requirements for reducing plastic use through their own tenders and contracts.

Blasted rock masses may contain fibre-reinforced plastics and plastic ignition systems. Today, alternative fibre reinforcements and ignition systems that do not contain plastics exist and contribute to reducing plastic pollution. Clean-up of discarded plastic waste can be difficult, and much harm may already have been caused to the environment. Depositing blasted masses into the sea is subject to a permit issued by the County Governor. The Norwegian Environment Agency has prepared guidelines on the requirements for blasting and backfilling projects to reduce plastic pollution. These guidelines also include which environmental requirements the municipality can enact in tender processes. Special requirements may be set for use of plastic-free solutions, for cleaning of blasted rock masses prior to final disposal, and extending the period of environmental monitoring of the affected areas.

⁵³ *Report to the Storting 20: National Transport Plan 2022-2033 (2020-2021)* <https://www.regjeringen.no/en/dokumenter/national-transport-plan-2022-2033/id2863430/?ch=1>



Large quantities of reinforcing fibre and firing lines made of plastic ended up in the ocean following disposal of explosive masses following the construction of the Ryfast tunnel. The Norwegian Public Roads Administration has assumed their responsibility for clean-up that in 2021 has lasted for six years, and nobody knows when it will be completed. Disposal of this kind at the shores is now longer permitted. Photo: Naturvernforbundet

The Norwegian Government will

- require transport operating companies, within their areas of responsibility, to strengthen their work on clean-up of plastic waste and on preventive measures to reduce plastic waste and microplastic emissions into the environment
- develop knowledge and use of methods and materials that could prevent and reduce transport sector plastic pollution from the transportation sector as much as possible
- require the use of alternative methods that would not result in the emission of plastics from blasted rock masses into the environment
- further develop a cleaning regime for roads that are adapted to local and climatic conditions, and focus on the design and operation of cleaning measures and catch pits that microplastic particles are retained from road runoff, tunnel washing water and landfills
- actively cooperate with the EU to ensure that the new labelling scheme for tyres also addresses the dispersion of microplastics from tyres



Human activity at sea, such as commercial fishing, recreational fishing, aquaculture, and maritime transport are large sources of marine litter. In some areas even larger than marine litter from land-based sources.

9 Sea-based sources

Human activity at sea is a large source of marine litter. In some areas, both at the national and international level, sea-based sources constitute a more significant source of marine litter than land-based sources. Sea-based sources include discharge into the sea from ships, installations, and other sea-related activities, ranging from tidal zones to the open sea, ports, bays, and areas of brackish water. Norway has provided support to a comprehensive global assessment on the best available knowledge on all sea-based sources of marine litter, presented by GESAMP in 2021.⁵⁴ In Norway, the Norwegian Environment Agency has compiled the available knowledge of sea-based sources in their assessment of means and measures, published in 2020.

The most significant sea-based sources, both globally and in Norway, are fisheries, aquaculture and shipping. Fisheries and aquaculture alongside post-consumer related waste, are assessed to be the largest sources of plastic litter in the Norwegian environment, when measured by weight. Fisheries include both commercial and recreational fishing. In addition to fishing gear, ropes and other plastic objects from commercial fishing and aquaculture, other relevant sources include loss of cargo and illegal dumping from ships, loss of plastic items from ships and recreational crafts, as well as microplastics emissions from paint on ships, offshore installations, and wind turbines.

9.1 Fisheries, shipping and aquaculture

Fisheries and aquaculture, along with post-consumer waste, are the most significant sources of marine litter identified in Norway. Fishery-related waste is particularly pronounced along the northern parts of the coastline. Lost fishing gear⁵⁵ is also considered the largest global contribution to plastic litter from sea-based sources. On a global level, lost fishing gear has received widespread attention, as it is both a waste of resources and causes great suffering for fish, shellfish, seabirds and marine mammals. Ghost fishing is the term used to describe lost fishing gear that 'continue to fish'.



Lost fishing gear can cause great harm to fish and other marine species. Measures against lost and discarded fishing gear is highly prioritised by Norwegian fisheries authorities. Photo: Fiskeridirektoratet

⁵⁴ Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection

⁵⁵ Lost fishing gear is in this document used as a collective term for abandoned, lost or otherwise discarded fishing gear (ALDFG).

Animals caught in lost fishing gear becomes bait for other animals, which in turn also get caught. It becomes a perpetual death trap. Nets and fishpots pose a particular problem. Ghost fishing can negatively affect biodiversity and food security. Lost fishing gear is also plastic pollution and may in some cases be a safety concern for shipping and other sea-based traffic.

Lost fishing gear from fishing vessels is defined as pollution from ships and is covered by the International Convention for the Prevention of Pollution from Ships (MARPOL) under the United Nations International Maritime Organisation (IMO). In Norway, the responsibility for the environmental impact from ships lies with the Norwegian Ministry of Climate and Environment, with the Norwegian Maritime Authority as the executive authority.

Other plastic items and waste may also be lost or dumped from ships. The Norwegian National Authority for Investigation and Prosecution of Economic and Environmental Crime (Økokrim) stated in its risk assessment for 2020 that “increased shipping traffic along the coast is likely to increase the threat of marine litter and dumping of plastics in the ocean”, and that marine littering should be considered as a serious environmental crime. With a few exceptions, such as food waste, MARPOL Annex V prohibits all discharge of waste into the sea. MARPOL Annex V is implemented in Norwegian law. This prohibition also includes plastic items and fishing gear.

During the Norwegian Directorate of Fisheries’ annual clean-up expedition of lost fishing gear from the seabed along the Norwegian coast, fishing gear or equipment that has been tied together and dumped is sometimes found. This may derive from both foreign and Norwegian vessels.

The follow-up of MARPOL Annex V is conducted by the IMO’s Marine Environment Protection Committee (MEPC). In 2018, MEPC adopted a global action plan to address marine plastic litter from ships. The action plan addresses most of the issues related to plastic pollution from ships. This includes lost fishing gear, containers and other cargo, waste storage on board ships and delivery in port of both ship waste and marine plastic litter collected at sea. The easiest measures in the action plan, e.g. on information and guidance, are being followed up in the MEPC’s subcommittees.

Norway is contributing to the work on implementing mandatory requirements of reporting of lost fishing gear to the IMO, which would require an amendment of the regulations under Annex V. Norway stresses that such reporting requirements must be implemented and provide a real contribution to reducing the problem. There is also a need to clarify how the information obtained by mandatory reporting may be used. This can involve the identification of areas with a higher concentration of lost fishing gear, as a basis for safety assessments and clean-up efforts, as well as greater knowledge of what causes the loss of fishing gear. In this work, Norway uses experiences gained from national requirements and from requirements adopted by the Northeast Atlantic Fisheries Commission (NEAFC).

NEAFC has adopted rules for marking of fishing gear and reporting of lost fishing gear, in line with MARPOL regulations. Fishing vessels are required to attempt to retrieve lost fishing gear, and the loss must be reported to the relevant flag state if the retrieval attempt is unsuccessful. The flag state must then convey this information to the NEAFC Secretariat.

Most of the points in the IMO action plan depend on countries actively proposing measures for concrete follow-up at the MEPC meetings, and other countries approving these measures. This also illustrates the need to start negotiations on a new global, legally binding agreement that includes all sources, to ensure commitment and a comprehensive approach. Implementation must still take place in the various sectors and their respective global bodies, in this case, the IMO under the MEPC and the UN Food and Agriculture Organisation’s Committee on Fisheries (FAO COFI).

One of the larger initiatives to follow up the IMO Action Plan is the GloLitter Partnerships project. GloLitter Partnerships was established in 2019 by IMO in cooperation with Norway and FAO. Norway is contributing with approximately NOK 40 million to the project, which is administered by the IMO. The IMO is also working to link key organisations and the private sector to the project. It focuses on capacity building to strengthen the implementation of IMO and FAO regulations and guidelines, in addition to port reception facilities. The FAO contributed specifically to capacity building to prevent and reduce ghost fishing. The project supports the development of regulations and action plans in selected countries wishing to actively contribute and to partner with other countries in their region.

In 2019, Norway joined the Global Ghost Gear Initiative (GGGI), which also participates in GloLitter. GGGI is a global platform where governments, seafood companies and NGOs can cooperate to develop knowledge and methods to prevent and reduce lost fishing gear and ghost fishing. Norway contributes with funding to projects under the GGGI.

Together with the IMO and FAO, Norway has established the Joanna Toole GloLitter Partnerships Grant. Norway also supports a prize established by GGGI to honour Joanna Toole. Joanna Toole dedicated her life to preserving the marine environment and protecting animals from suffering, notably caused by lost fishing gear. Both prizes are awarded to projects addressing the problems caused by lost fishing gear. Joanna Toole co-founded GGGI and was an advocate for animal welfare, committed to address lost fishing gear and marine litter, most recently in her work for Ocean Conservancy and the FAO. She was the co-chair of the Global Partnership on Marine Litter (GPML) and facilitated the cooperation between the IMO, FAO and Norway, leading to, the establishment of the GloLitter Partnerships, among other things. In 2019, Toole sadly lost her life at the age of 36 in the Ethiopian plane crash, on her way to attend the UN Environment Assembly in Nairobi.

By 1st January 2025, extended producer responsibility schemes for fishing gear that contain plastic and is used in the commercial fishing and aquaculture sector, should be in place in the EU and Norway. As part of a larger assessment of extended producer responsibility schemes, the Norwegian Environment Agency also looks into how this extended producer responsibility scheme can best be organised. Many other measures, described in earlier chapters, are also key to reducing marine litter from sea-based sources. The EU will prepare underlying legal acts and guidance for the provisions of the Directive on single-use plastics, and for the extended producer responsibility scheme on fishing gear and aquaculture equipment. Norway will contribute to this work.

The Norwegian set of rules and schemes for the prevention and clean-up of lost fishing gear are internationally recognised. The Norwegian Marine Resources Act contains specific provisions stipulating that it is illegal to dump or abandon fishing gear at sea, and according to the Norwegian regulations on the exercise of fisheries at sea, those who lose or are forced to cut loose their gear are obligated to attempt to retrieve it. If retrieval is not successful and the gear cannot be found, it must be reported to the Norwegian Coast Guard. The location of the lost gear is entered into the Norwegian Directorate of Fisheries' mapping systems, which uses the information as a basis for running efficient clean-up operations. Another measure set in place is that, fishers can publish and access real time information on where fishing gear like nets and pots has been placed, and when these have been removed, through the interactive web portal BarentsWatch. This information can be downloaded also by others at sea, reducing the risk of losing fishing gear, by decreasing the risk of different fishing gear getting stuck or entangled.

The Norwegian Directorate of Fisheries has developed its own app for recreational fishing: the Fritidsfiske app (“The recreational fishing app”).⁵⁶ Using the app, those fishing recreationally can report both lost and found fishing gear. To reduce ghost fishing, there are now requirements for having escape vents in all lobster and crab pots used in recreational fishing. An escape vent is a hatch or opening that is fastened with a degradable cotton thread, which ensures that lost pots will open after a few months in the sea. Fish and shellfish can then escape the pot. Efforts are underway to implement requirement for escape vents also for pot fishing of other species.

Cleaning up lost fishing gear in Norway

The Norwegian Directorate of Fisheries has been conducting yearly clean-up expeditions of fishing grounds along the Norwegian coast since the 1980s. In 2020, some 100 tonnes of waste were collected. In total, several thousand tonnes of lost fishing gear have been collected, including around 680 kilometres of rope. This contributes to reducing ghost fishing and marine litter. Requirements for Norwegian fishermen to report their position in the event of lost fishing gear helps ensuring an accurate and effective clean-up. Retrieved fishing gear is delivered back to its owner for reuse, or are recycled if possible.

On 1 March 2021, The Norwegian Directorate of Fisheries presented an action plan for strengthened efforts to reduce marine litter and its impact from commercial fishing, recreational fishing and aquaculture. This action plan describes key figures, status of knowledge regarding sources and pathways, knowledge gaps, and an overview of different relevant actors. The action plan describes several specific measures to be implemented, and other measures that are proposed, in commercial fishing, recreational fishing and aquaculture in the coming years.



Plastic packaging film for wrapping seafood frozen on board large fishing vessels. If entangled during packaging, this plastic film is cut. Photo: Bo Eide

⁵⁶ Fiskeappen Fritidsfiskeappen (<https://www.fiskeridir.no>)

Some initiatives in the Norwegian Directorate of Fisheries' Action Plan

- establish a group for cooperation between fisheries authorities and recreational fishers for dialogue and measures to raise awareness of marine litter
- present a proposal for extending mandatory marking of pots and traps also for recreational fishing. Efforts will also continue in developing and implementing good methods for marking of different types of fishing gear, both for recreational and commercial fishing
- implement mandatory reporting of lost fishing gear in recreational fishing
- assess the legal aspects of lost fishing gear at sea, with the aim of streamlining processes involving the confiscation of such fishing gear
- work actively to disseminate knowledge and information and raise awareness in commercial and recreational fishing and in the aquaculture industry, and ensure that marine litter is a subject in the curricula for relevant educational programmes
- establish a group for cooperation between the fisheries authorities and the aquaculture industry for dialogue and measures to raise awareness of marine litter
- review the need for stronger regulations for scrapping and cutting of aquaculture equipment, and assess the need for registry and additional requirements for the storage of components
- establish instructions for clean-up of discontinued aquaculture activities
- prepare a complete overview of abandoned mussel farming facilities as a basis for clean-up
- identify measures to reduce the dispersion of microplastics from various feeding systems including plastic hoses in aquaculture.

Some of the marine litter from commercial fishing, recreational fishing, and aquaculture can be related to existing and available technological solutions and materials. Other causes may be that it is time-consuming or costly needed to appropriately manage the waste. In some cases, inadequate or missing routines, attitudes, and knowledge among commercial and recreational fishers and fish farmers can directly result in marine litter.

The Norwegian Directorate of Fisheries' action plan includes clean-up measures, prevention and research and development over a five-year period, from 2021 to 2026. There is a need for stronger coordination and cooperation between public agencies, business organisations and the industry actors in several areas.

The plan is to increase the attention on sharing information and knowledge, and on efforts to boost awareness among commercial and recreational fishers and in the aquaculture industry. Efforts will be made to include the subject of marine litter in all relevant vocation training programmes. It is also a goal to continue the Nordic cooperation addressing the issue of lost fishing gear.⁵⁷

Research and development looking into new methods and materials with the purpose to reduce littering, emissions of microplastics and the potential impacts of littering, such as ghost fishing, is a high priority. This includes topics such as fully biodegradable materials for use in fishing gear, aquaculture equipment, and escape vents in pots, which is relevant for both commercial and recreational fishing. Demands for efficiency and revenue in fisheries leads to different types of fishing gear being regularly replaced due to abrasion. Some types of fishing gear have a short service life, often as short as a single season, which can cause an increase plastic pollution. Plastics marketed as biodegradable, is thus far not biodegradable in Norwegian environmental conditions, and work is underway to develop alternatives that are truly biodegradable in the marine environment.

⁵⁷ Clean Nordic Oceans, cnogear.org

In some trawl fisheries, plastic wear mats are used under the trawl bag to protect it from wear and tear. Such mats are usually made of bundles of shorter plastic rope and are known as dolly rope. Over time, wear and tear will cause threads to come loose and fall off, contributing to littering. In Norway, dolly rope is primarily used in trawling for whitefish. The development of new solutions or alternatives to dolly ropes is well underway through the Norwegian research and development project Dsolve (see chapter 13.2). It is expected that a solution will be found for this problem. When good solutions are in place, the next step for Norway is to consider implementing them in the relevant parts of the trawler fleet.

Furthermore, work is being done nationally to simplify and edit the system for reporting lost fishing gear to make it easier for the original owners to retrieve their fishing gear.

In 2021, there is a plan to establish a group for cooperation between fisheries authorities, recreational fishers, and relevant organisations to share knowledge and work on raising awareness. Work on new requirements, which would allow recreational fishers to indicate their own lost gear using pots and traps, is continuing. A process has also been started to introduce mandatory reporting of lost fishing gear in recreational fishing, in line with commercial fishing. Information on lost fishing gear is displayed on a map in the Fritidsfiske ("Recreational fishing") app.

A quite new registration scheme for participation in lobster fishing, also for recreational fishers, has received positive feedback. The value of potential broader registration scheme for recreational fishing is being considered in the Directorate of Fisheries' action plan on marine litter. Another measure is a plan for further dialogue and knowledge exchange with fishing gear distributors. Knowledge will also be shared with tourist operators involved in fishing, notably on their responsibility to inform their customers that littering is prohibited in Norway.

Experience from clean-up operations shows the animal cruelty that can be caused by fishing pots without escape vents which are lost or not maintained. This is both unfortunate and unwanted, which is why maintenance requirements were enjoined in 2020. The buoys attached to fishing pots must be marked with the owner's contact details. Nevertheless, the use of unmarked pots does occur, usually in recreational fishing. Marking can also disappear over time. Pot fishing in these cases is illegal, and the pots can be seized by the police. However, due to several reasons the police often drop such cases. Thus, giving the Norwegian Directorate of Fisheries the authority to seize and destroy gear when the owner cannot be identified, directly without notifying the police, is under consideration.

Collaborative clean-up operations of lost fishing gear in marine national parks

Between 2019 and 2020, the Norwegian Institute of Marine Research and Green Bay AS, with support from the Norwegian Retailers' Environment Fund and a grant from the Norwegian Environment Agency, mapped and collected lost fishing gear in Raet National Park, which extends along the coast from Lyngør in Tvedestrand Municipality to Grimstad Municipality. It was estimated that there were as much as 10,000 items of fishing gear on the sea floor in the area, of which 25 % were actively catching fish. It is estimated that this leads to thousands of animals, such as crabs, fish and lobsters, getting stuck in lost fishing gear on the sea floor. Lost fishing gear, such as pots and traps, is a problem all along the Norwegian coast, but especially in the South. From 2021, the project was expanded to include a clean-up of ghost gear in the national parks of Jomfruland, Færder and Ytre Hvaler, also with support from the Norwegian Retailers' Environment Fund.

Norwegian aquaculture industries are subject to several laws and regulations. All relevant licences must be acquired before aquaculture activities can be started, including licenses under the Pollution Control Act.

If an activity ceases or is discontinued, the Pollution Control Act requires that the owner or user of the facility implements the necessary measures to counteract pollution. The authorities determine what measures are necessary, as well as having the authority to order the owner or user of the facility to provide a guarantee for coverage of future expenses and possible liability.

The Aquaculture Management Regulation's § 17 states that if operations in a location are discontinued, that location must be fully cleared within six months. In the early 2000s, many mussel farms were established in Norway, and the owners were not required to set aside funding to cover the costs for possible clean-up operations. This has resulted in problems. After many bankruptcies, the government has been forced to remove old mussel farm facilities for environmental and safety reasons. A specific requirement was introduced in 2018 which states that to get a permit, mussel and kelp cultivation facilities must have sufficient funds set aside to cover such clean-up costs.

In addition to an extended producer responsibility scheme, the following new measures will be implemented to reduce marine litter, especially for aquaculture, in accordance with the Norwegian Directorate of Fisheries' action plan for 2021-2026:

The Norwegian Directorate of Fisheries will gradually integrate marine litter into the supervision of aquaculture facilities. The Directorate of Fisheries will also carry out awareness-raising work in collaboration with relevant business- and environmental organisations, and run campaigns aimed at fish farmers to spread knowledge and raise awareness. Regulations related to the clean-up of moorings, chains and ropes in aquaculture facilities needs a review, including a clarification of the requirements set by the authorities. In several places along the coast, waste from aquaculture facilities has remained for a long time after operations have ceased. An instruction or template will be prepared for the handling and securing of documentation for clearing discontinued aquaculture facilities, along with a comprehensive overview of abandoned mussel farms. Complete clean-up costs must be clarified. Aquaculture equipment made of plastic, e.g. feeding hoses and nets, discharge microplastics into the environment during use. More knowledge is needed on the microplastics in aquaculture and its environmental impacts.

From 1 January 2022, the Norwegian Centre for Oil Spill Preparedness and Marine Environment (SOMM) will become a national centre against marine litter, subordinate to the Norwegian Ministry of Climate and Environment. In addition to tasks related to knowledge-raising on and organisation of clean-up efforts, it will especially focus on knowledge concerning prevention of marine litter from sea-based sources. This centre will also facilitate cooperation on prevention of marine litter from sea-based sources.

9.2 Ports

To prevent littering from ships, efficient port reception facilities systems must be put in place. The EU Directive on port reception facilities for delivery of waste and cargo residue by ships, often referred to as the Port Reception Facilities Directive, has been incorporated into Norwegian law in the Norwegian Pollution Control Act, and in the Norwegian Regulations on Environmental Safety for Ships and Mobile Offshore Units. The EU revised the Directive in 2019 and adopted a new directive that went into force on 28. June 2021. The changes mean that the regulations will be better harmonised with the MARPOL ship requirements. Furthermore, ports should facilitate reuse and recycling by receiving sorted waste.

A proposal by the Norwegian Environment Agency and the Norwegian Maritime Authority on how the revised directive will be implemented into Norwegian law, is now being considered.



Port reception facilities are an important measure to prevent illegal dumping of waste in the ocean. Photo: Adobe Stock

The directive, which is implemented in the pollution regulations, means that all ports must have reception facilities for waste and cargo residue from ships in port, depending on the size, location and needs of the ships visiting that port. Ports are required to prepare a waste management plan, and ships are required to report all waste for delivery.

The County Governor is responsible for ensuring that the regulations are adhered to at ports. There is a need to expand the County Governor's capacity to follow up the required waste management plans, pursuant to the Norwegian pollution regulations.

The EU's port reception facilities directive now allows for some ports to be exempt from the requirement of having an approved waste management plan. It specifies that small, non-commercial ports with rare or limited traffic from solely recreational boats can be exempted from the requirement of having a waste management plan if these ports are covered by municipal waste management systems. Norway believes this is a very useful specification since waste management plan requirements in such cases would not have been considered fit for purpose.

Ships calling at Norwegian ports must now pay a waste fee, either at each visit or as a seasonal or annual fee. The fee size is the same whether a ship delivers waste or not. This scheme, often referred to as a "No Special Fee" scheme, is intended to encourage waste deliveries at ports and prevent illegal dumping at sea. Currently, fishing vessels and recreational crafts are exempt from such fees. However, in many ports, have a drop-off fee on the amount of waste delivered.

The Fishing for Litter (FFL) scheme was started as a test scheme in Norway from 2016 to 2017. Participating fishing vessels can deliver marine litter retrieved from the sea free of charge at selected ports along the coast. The scheme was introduced as a two-year scheme under the Norwegian Environment Agency. It has since been renewed on a yearly basis through the grant scheme for initiatives against marine litter. As of 2021, eleven ports are included in the scheme. The administrative costs of FFL amount to some NOK 70,000 per port, although this varies considerably. FFL also includes a knowledge component, which covers the sorting and detailed registration of waste types and amounts, and preparation of reports based on this information. It also tests recycling and reuse opportunities. The Norwegian Environment Agency has proposed that FFL should be phased into the revised Port Reception Facilities Directive that Norway is required to introduce.

The revised Port Reception Facilities Directive proposes that fishing vessels are also included the «No Special Fee» scheme, where the price is the same regardless of whether waste is delivered to port or not. The fee will for all ships and vessels fund the operation of waste reception facilities in ports and the treatment of waste, including the treatment of litter retrieved at sea. Including this in the general waste fee ensures that fishing vessels can deliver waste to local ports, and it ensures less variation between ports in terms of waste reception facilities and costs.

Extended producer responsibility schemes for fisheries and aquaculture, which will be introduced from 2025, can also help fund waste management.

The revised EU port reception facilities directive also requires more frequent inspections of ships in Norway. The Norwegian Maritime Authority is responsible for ship inspections in Norway.

The Norwegian Government will

- implement extended producer responsibility schemes for fishing gear and aquaculture equipment containing plastics
- introduce requirements for reporting of lost fishing gear also for recreational fishers
- implement the revised EU Port Reception Facilities Directive and introduce a «No Special Fee» that also applies to fishing vessels and recreational crafts
- increase the capacity of county governors to enforce requirements for ports to have waste management plans
- increase inspections of ships in Norway to enforce the revised Port Reception Facilities Directive
- continue to support the follow-up of the IMO's Action Plan through GloLitter Partnerships, established by the IMO in collaboration with Norway and the FAO
- follow up priority measures under the action plan against plastic litter from ships under the IMO, both nationally and internationally, including requirements for reporting lost fishing gear to the IMO
- continue to be a driving force and contributor to global knowledge on sea-based sources of marine litter and microplastics
- continue to promote global cross-sectoral collaboration in this area, including between the various UN organisations for the environment (UNEP), ships (IMO) and fishing and aquaculture (FAO), and through the Global Partnership on Marine Litter (GPML)
- work to ensure that a global agreement on plastic litter and plastic pollution also addresses sea-based sources
- support international cooperation under the Global Ghost Gear Initiative (GGGI) to prevent lost fishing gear and its negative impacts
- strengthen Arctic and Norwegian-Russian cooperation to prevent marine litter from ships, including lost fishing gear
- ensure a greater focus on marine litter and microplastics during inspections of aquaculture facilities
- clean up and remove more abandoned mussel farms in the period 2021–2023
- follow up other initiatives presented in the Norwegian Directorate of Fisheries' action plan of March 2021 on marine litter from commercial fishing, recreational fishing and aquaculture



Microplastics is an emerging global challenge and a significant source of pollution. Emissions of microplastics is a transboundary issue that requires international cooperation, new knowledge, and more data collection to inform policy making.

Photo: Adobe Stock

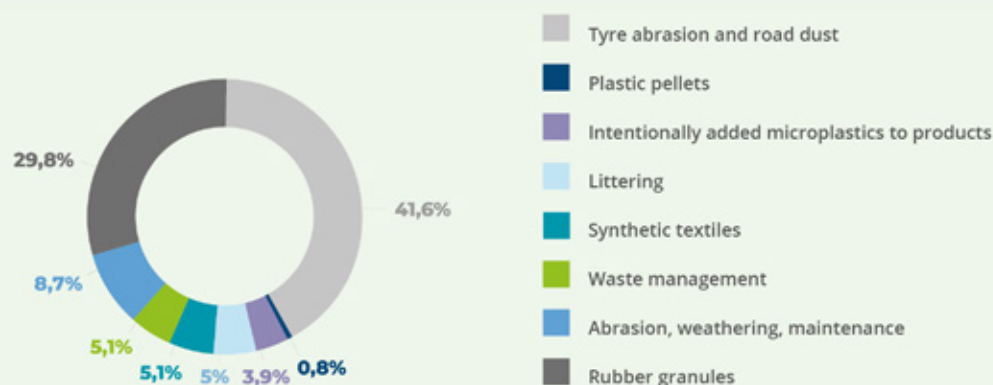
10 Microplastics

The term “microplastic” does not have an agreed definition but is most frequently used to describe pieces of plastic that are smaller than 5 millimetres. “Microplastics” refer to a very heterogenous mixture of particles that vary in size, shape, colour, specific density and chemical composition of polymers and additives such as plasticisers, stabilisers, dyes, biocides, and flame retardants. Microplastics can be intentionally added to different products such as cosmetics and paint, but can also be formed from larger plastic pieces which break down into smaller fragments from use and abrasion, exposure to UV radiation, weather and winds. Microplastics can also be broken down into nano plastic particles. These can probably be even more harmful. In the long run, there is a need for studies that differentiate between the different materials, sizes, and particle types of microplastics.

In 2016, the UN Environment Assembly declared microplastics an emerging global challenge constituting a significant source of pollution. Microplastics also constitutes a transboundary problem that requires international cooperation, new knowledge, and increased data collection to inform policy developments. Currently, there is no global environmental agreement that regulate microplastics. Norway is working to ensure that a global agreement on plastic litter and pollution also includes microplastics. Cooperation on measures addressing microplastics will also be included in the new 2021 - 2024 Nordic initiative “The Nordic countries as a driving force in the work against marine litter”.

In spring 2020, the Norwegian Environment Agency submitted an assessment of means and measures on microplastics, as well as an updated compilation of knowledge. On behalf of the Norwegian Environment Agency, Mepex and NIVA have recently made new estimates of national microplastic emissions. Tyre abrasion, road dust and rubber granules from artificial turf pitches are the largest land-based sources of microplastics, followed by paint, washing of synthetic textiles, intentionally added microplastics in various products, loss of plastic pellets and emissions from waste management. The estimates are relatively good for tyre abrasion, which constitutes the largest source, but otherwise there is uncertainty for most other sources when calculating national estimates. In total, the annual emission of microplastics from land-based sources in Norway is now estimated to be 19,000 tones, or 3.5 kg per person.

Microplastic emissions from land-based sources in Norway



The report from NIVA provides information of the composition and amount of plastic that is released into marine environments from sea-based sources. It also discusses distribution paths, final destinations, and the breakdown of microplastics. Today, we have insufficient information on the amount of microplastics that is released into the ocean from sea-based sources, and the data that exist is of a medium or low quality. Several knowledge and data gaps have been identified. This must be rectified to improve the basis for assessing sea-based sources in the future.

Many sea-based sources of microplastics are relevant to the Norwegian marine environment. These include shipping, ports and shipyards, fishing, aquaculture, and oil and gas offshore installations. Emissions from these sources can consist of abrasion of products made from plastic, plastic equipment and paint, and emissions in connection with the maintenance or demolition of offshore installations.

Sources of information are few and unreliable. Even though knowledge regarding microplastics has been considerably strengthened over the past few years, there are still significant gaps in our knowledge on sources, distribution, absorption by various organisms and the effects of this. We still do not fully understand how microplastics are transported, or where they end up. In the long term, it is expected that a large part of the microplastic in nature will end up in the marine environment, where it will sink to the bottom and end up in sediment. Microplastics are found in all sea areas, from the most populated coastal areas to remote areas in the Arctic and Antarctic regions. A Nordic report on the prevalence of microplastics in blue mussels and other mussel species in 100 different places in the Nordic region indicates that mussel species near urban areas have a high prevalence of microplastics. Fragments of microplastics make up 87 % of the reported findings, and microfibrils make up 13 %. There was an especially high prevalence of microplastics in mussel species in the Oslo Fjord.

Wastewater treatment plants are also a distribution route for microplastics. Research suggests that the largest wastewater treatment plant in Norway receives more than one billion tiny pieces of plastic every hour. Although the most advanced treatment plants can hold back 87 - 97 % of the larger microplastic particles, millions of microplastic particles are emitted with wastewater every hour. Microplastics that are taken out of water end up, among other places, in sewage sludge. Because sewage sludge is often used as fertilizer on green areas in Norway, those microplastics that are taken out of the water can still end up in nature. The types of microplastics found in this sludge depend on the source of the wastewater, the cleaning technologies at various wastewater treatment plants, variations in precipitation and the amount of surface water.

Despite limited data, these measurements show that both freshwater and land-based ecosystems are significant recipients and reservoirs for microplastics. Some studies have also looked closer at air as a method of transport, especially for materials such as textile fibres and tyre dust.

It can be challenging to find effective measures and regulations that prevent microplastic emissions, when the emissions occur through product wear and tear; for example, car tyres that get worn through use. Bans on specific products and preventive measures in the design or manufacturing phases of products should be developed at the EU/EEA level. The challenges caused by plastics have also underlined a skewed global distribution, and thus a global sharing of system solutions and comprehensive thinking is important.

Microplastics do not easily degrade, and thus tend to accumulate in the environment. A growing number of scientific publications have noted that microplastic emissions may lead to irreversible ecosystem damage. Since these particles are so small, they can easily be absorbed into organisms and food chains. Microplastics can also spread hazardous substances that can cause harm to human health and to the environment, both because hazardous substances were added to the plastic particles themselves during production, and because such substances can attach themselves to the surface of microplastics. Microorganisms can also be transported with plastic to places to which they do not belong. Plastics can form biofilms and facilitate the spreading of,

among other things, antimicrobial resistance. The spreading of microplastics can therefore act both as a vector and as a «hot spot» for hazardous substances, disease-causing microorganisms, and foreign invasive species. The role of microplastics in the development of antimicrobial resistance in the marine environment is something which we still know little about.

Over the past few years, compilations of knowledge regarding the effects of microplastics have been published. Most of these studies emphasise the lack of qualitative data, especially with regards to human uptake. The source data for effects is sparse, and the quality of many of the scientific studies is not good enough to be used in assessing the risk that microplastics pose to the environment and to human health. In 2018, the Norwegian Institute of Public Health determined that the very low levels of microplastics in Norwegian drinking water imply that it constitutes a minimal risk. At the same time, the World Health Organisation stated that even though there is likely only a small amount of microplastics in global drinking water, plastics will pose a great danger to marine ecosystems over the next hundred years if plastic pollution continues at its current rate. This will in turn make people more vulnerable. Furthermore, these studies have not included analyses of very small plastic particles, and publications generally use different methods to examine the presence of microplastics, which makes it very difficult to compare results. After analysis, small plastic particles were found both in fish fillet and fish livers. Most of the particles found in tissue were under 0.05 mm in size. Thus, method development must be prioritised, especially with regards to microplastic particles. This will allow for a much clearer understanding of how much microplastic can be found in amongst others food, and the risks associated with this.

10.1 Artificial turf pitches

In 2016, the Norwegian Environment Agency identified that rubber granules from artificial turf pitches constitute the second largest source of microplastic emissions in Norway. This was confirmed by an assessment in 2020⁵⁸. These pitches are made up of artificial turf to which small rubber granules are added which come from recycled car tyres.



Rubber granules on artificial football pitch. Haraløkka sports ground, Bøler, Oslo. Photo: NTB, Espen Bratlie

⁵⁸ Mepex (2021) *Norske landbaserte kilder til mikroplast* ("Norwegian land-based sources of microplastics")

This material lends itself well to sports fields surfaces since it keeps the surface soft, as well as withstanding frost. Microplastics are spread when players leave the pitch, and through snow-clearing and run-offs.

There are roughly 1700 artificial turf pitches in Norway, and the Norwegian Environment Agency has estimated that about 1500 to 3000 tonnes rubber granules are dispersed from these pitches each year.

In March 2021, the Norwegian Government established requirements for the design and operation of sports pitches that use loose microplastic as infill materials. These regulations entered into force on 1 July 2021. When all regulation measures are implemented, microplastic emissions from artificial turf pitches will be reduced by up to 90 %.

In 2019, the European Chemicals Agency (ECHA) proposed restrictions or bans on intentionally added microplastics in several products in accordance with the chemicals regulations REACH, including rubber granules used on artificial turf pitches. ECHA's final proposal was sent to the EU Commission in the spring of 2021, in which two alternative solutions were outlined. The first is that the restriction proposal should include a transitional period of six years, in the event of a ban on rubber granules in artificial turf pitches being adopted. If the EU ends up adopting the second solution, which involves risk-reducing measures and is more like Norway's national regulations, this transitional period will be three years. A new set of REACH regulations is expected to be adopted by the EU sometime in 2021/22. The government is following these developments closely.

Although there may eventually be a ban on rubber granules, the government believes it is important to act now. This will also contribute to innovation and the development of new substrate material.

10.2 Paint

Paint becomes a source of microplastics when outdoor paint flakes off, when paint residue is disposed of and ends up in wastewater, or when it is dumped in nature. The emission of microplastics from paint from land-based sources is estimated to 800 tonnes each year. The Norwegian Environment Agency also believes that there is a significant emission of paint from sea-based sources. This can come from sources such as ship paint, antifouling paint and wear and tear of paint on offshore installations. For the time being, there is no data to show the size of these emissions.

Recreational craft maintenance and general wear and tear can lead to microplastic emission from the anti-fouling paint on boat hulls. The exact amount of microplastics released from recreational crafts is uncertain, but it is estimated that approximately 58 tonnes of microplastics are released into the sea each year while boats are on the water, and 88 tonnes on land due to maintenance and washing. Releases from recreational craft maintenance are not currently thoroughly regulated when compared with similar types of emissions from shipyards and the washing of fish farming nets. The Norwegian Environment Agency has made a preliminary assessment of possible measures and instruments to reduce pollutions in Norwegian marinas, but there is still a need for more knowledge about the extent of the emissions and appropriate regulations. Therefore, in 2021, the Norwegian Environment Agency will obtain more updated information on active releases of microplastics and hazardous substances in larger marinas in Norway.

10.3 Intentionally added microplastics in products

Microplastics can also be intentionally added to products used in oil and gas industries, in laundry detergent, construction material, cleaning products, medicines, dietary supplements, body care products, and products used in the garden and in agriculture. In Europe, the largest source of intentionally added microplastics is thought to be fertilisers and pesticides, which are encapsulated in plastic. In Norway, polymer-reinforced fertilisers are estimated to be a significant source of microplastics from agriculture.⁵⁹

As referred to above, the European Chemicals Agency (ECHA) has proposed a wide-ranging ban on intentionally added microplastics in products. The ECHA has also proposed introduction of a labelling requirement to minimise microplastic emissions, or to provide information stating that the residue from the product may be a source of microplastic emissions. Reporting requirements are also being considered, to ensure better information and thereby gain more knowledge and improved risk analysis in the future. This ban will apply to Norway through the EEA Agreement, and will have an impact on several different products and areas of both industrial and private use. It is estimated that such a ban would reduce the amount of microplastics released into the environment in Europe by 500,000 tonnes over 20 years.

The proposal has been sent to the EU Commission and is expected to be adopted in 2021/2022. The ban will take effect at different times for different areas of use, depending on the proposed transition periods. This is to give the industry time to adopt suitable alternatives.

10.4 Other sources of microplastic emissions

Tyre abrasion is discussed in chapter 8, which covers plastic pollution from the transport sector, while plastic pollution from textiles is discussed in chapter 5. The disintegration of plastic litter is also a source of microplastics being spread into the environment. This is discussed in more detail in chapter 12.

Since 2016, the Norwegian Environment Agency has worked to have microplastics included as part of operator and chemicals supplier assessments, in connection with the work of replacing chemicals in offshore operations. Norway has also proposed that this should be a topic in the new Strategy of the OSPAR Commission.

The EU has announced that it is actively working to implement measures to reduce microplastic emissions from wear and use, and from other sources of secondary microplastics.⁶⁰ Several different measures are being considered including labelling, standardisation, certification, and regulatory measures designed to reduce emissions from sources such as textiles, tyres and plastic pellets. Microplastics has also been mentioned as a topic in ongoing work to revise the Urban Waste Water Directive and evaluate the Sewage Sludge Directive. The Norwegian Government wishes to be a driving force in this work in the EU and contribute with knowledge to these processes.

When environmental authorities grant updated emission permits, they use existing regulations as a basis to set relevant conditions for microplastic emissions in soil, air, fresh

⁵⁹ Mepex (2021) *Norske landbaserte kilder til mikroplast* ("Norwegian land-based sources of microplastics") [Norske landbaserte kilder til mikroplast - Norwegian Environment Agency \(environmentagency.no\)](#)

⁶⁰ Microplastics that are created through the wear and tear of plastic products are called secondary microplastics. Plastic waste on beaches and on the surface of the sea can also break down into smaller pieces and become microplastics.

water and the marine environment. During inspections, authorities ensure that companies have good routines for handling, storing, and clean-up of spills at site, to prevent the release of plastic pellets to the environment. The Norwegian Environment Agency is also making relevant information on methods and measures available to the municipalities and County Governors offices.

The most important measure is to stop the emission of microplastics at the source. A lot of microplastics is released into the sea in Norway due to insufficient wastewater treatment along the coast from Lindesnes and northwards.

Regulating discharge to public sewage systems

Municipalities are the pollution control authority for discharges to public sewage networks and can set requirements to ensure that regulations and discharge permit requirements for sewage systems are complied with to ensure that the operation of sewerage systems and associated infrastructure are not damaged. Municipalities can also set emission requirements for the treatment and use of sewage sludge. The emission requirements that can be set by municipalities therefore largely depend on the requirements of set regulations and permits for the discharge of wastewater and the use of sewage sludge. In the proposal for revised fertiliser regulations, put together by the Norwegian Agriculture Agency, the Norwegian Environment Agency and the Norwegian Food Safety Authority, limit values are proposed for the content of impurities, including the amount of plastics in sludge to be used. Before limit values and standardised measurement methods for microplastics in sludge is in place, municipalities have limited capacity to setting requirements for the content of microplastics in wastewater to be discharged to municipal sewage networks. Furthermore, the EU Commission's work to revise the Urban Waste Water Directive has an objective of reducing emissions of substances such as microplastics.

Environmental authorities' work regarding biofilm carriers

Biofilm carriers are small plastic "cleaning wheels" added to treatment plants to increase the amounts of microorganisms that clean the wastewater. The Norwegian Ministry of Climate and Environment has tasked the Norwegian Environment Agency to identify measures to ensure that biofilm carriers do not go astray. There are occasionally reports of releases of biofilm carriers from treatment plants, either by accident, due to exceptional operational situations such as a high level of runoff or extreme weather events. Environmental authorities have followed up by holding dialogue meetings and providing information to the County Governor and Norwegian Water Association. A new template for release permits states that when using biofilm carriers, measures must be in place to avoid spreading to the environment. The Norwegian Environment Agency has also developed informational material to serve as a basis for their assessment of measures. Nordic cooperation regarding biofilters is also being considered.

Another source of microplastic release is plastic raw materials in the form of pellets, flakes or powder that may be lost during packaging, storage, or transport. In terms of plastic pellets, deviations have been discovered in Norway, where plastic waste has been stored outdoors with insufficient security. OSPAR's Action Plan for Marine Litter assesses possible measures and costs for prevention and clean-up. On this basis, guidelines have been

prepared to prevent the release of plastic pellets.⁶¹ New figures from Mepex estimates that this is a relatively small source in Norway, but it can still have major environmental impacts and is challenging to clean up. Measures to prevent the emission of plastic pellets are thus very important.

Operation Clean Sweep

Operation Clean Sweep is a collaborative industry initiative to raise awareness of the problem and create measures against the emissions of pellets. This initiative was launched more than 20 years ago by raw material producers in the United States, but it has now been merged with corresponding European initiatives. Its purpose is to avoid and limit the emission of pellets from raw material production plants, plastics manufacturing industries, plastics recyclers and transporters. It now focuses on highlighting risk analysis across the whole value chain.

The Norwegian Government will

- implement the new requirements for artificial turf pitches in the pollution regulation
- contribute to and regulate the use of intentionally added microplastics in various products in accordance with forthcoming EU/EEA regulations
- take an active role in contributing to knowledge, in addition to being a driving force in the EU's work on new measures against secondary microplastics
- further cooperation on measures to reduce the emissions of plastic pellets under the 2021-2024 initiative, "The Nordic Countries as a driving force in the work against marine litter and plastic pollution"
- work to ensure that a global agreement on plastic litter and pollution also addresses the spreading of microplastics
- assess the need for regulating maintenance operations which can result in microplastic pollution in marinas, slips and storage places for maintenance of recreational crafts
- consider relevant measures nationally and internationally to adhere to OSPAR guidelines against plastic pellets discharge.
- follow-up the European Commission's work on various measures targeting other sources of secondary microplastics
- closely follow the EU's work and measures against the spread of plastic pellets
- work to reduce gaps in knowledge by increasing and sharing knowledge regarding the sources, pathways and impacts of microplastics both nationally and globally
- establish requirements, supervision, and guidance for enterprises causing microplastics emissions

⁶¹ OSPAR (2018) *Background document on pre-production Plastic Pellets, Action Plan for Marine Litter* | OSPAR Commission



On the night of 23 February 2020 the ship M7V Trans Carrier entered rough weather on their way from Rotterdam to Tananger in Norway. Some of the cargo was dislocated, causing damage to a container with plastic pellets. Some 13,2 tonnes of plastic pellets were discharged into the ocean and large quantities were found on beaches along the Oslo Fjord.

11 Acute pollution, emergency response and climate adaptation

The Pollution Control Act has a specific chapter that regulates how private individuals, municipalities and the state are to handle acute pollution and the risk of acute pollution. 'Acute pollution' refers to a significant amount of pollution which occurs suddenly, and which is not permitted by or pursuant to the Pollution Control Act.

Any party engaging in activities that may result in acute pollution is obligated to establish emergency response systems to act in the event of any such pollution. Municipalities shall have an emergency response systems in place in case of smaller incidents of acute pollution that result in harm within the municipality, and that are not covered by private emergency response systems. All Norwegian municipalities are participating in inter-municipal cooperation via the Inter-Municipal Committee against Acute Pollution (IUA). The state is responsible for ensuring that emergency response systems are in place to deal with larger incidents of acute pollution that are not covered by municipal or private emergency response systems. The Norwegian Coastal Administration is responsible for state emergency response systems against acute pollution. This includes, amongst others, to coordinate national, municipal and private emergency responses in a national emergency response system. This covers all acute pollution; at sea, in waters and on land, including acute plastic pollution. The Norwegian Coastal Administration's responsibility in the emergency response is primarily to prevent or reduce harm to the environment. The emergency response systems are scaled according to the results of environmental risk and emergency preparedness analyses.

Those responsible for causing acute pollution are obligated to implement measures to prevent or limit any damage and inconvenience caused. If they do not implement such measures, or the measures implemented are insufficient, the municipality must deal with the accident. The municipality's duty of action includes all discharges in the municipality that are not handled by those responsible for the pollution. When ordered to do so, private enterprises have a duty to assist in municipal responses. Other municipalities and the Norwegian Coastal Administration can also assist during municipal responses. In the event of major incidents or danger of major incidents, the Norwegian Coastal Administration can decide that the state will oversee the emergency response of the incident or parts of the incident. Private enterprises and municipalities have a duty to assist the state if such a state action is decided.

In the spring of 2020, large amounts of plastic pellets were discovered on beaches along the Oslo Fjord in Norway. Approximately 13.2 tonnes of microplastics had leaked out of a damaged container on board a cargo ship in the North Sea. Plastic pellets were found in many places along the coast of Skagerrak, as well as in Sweden. It took time before the relevant ship was identified as the source. The Norwegian Coastal Administration declared that this accident constituted serious acute pollution and declared a state-led action. The shipping company took responsibility and funded a clean-up operation that was coordinated by Oslofjordens Friluftsråd (Oslo Fjord Outdoor Recreation Council) under the leadership of the Norwegian Coastal Administration. Many volunteers also took part. Clean-up operations of microplastics are very challenging and it is estimated that some nine tonnes remain in the environment. Ocean currents have spread some of this remaining amounts of plastic pellets between the coastal areas and beaches of the countries along the Skagerrak and the North Sea.

The accident has offered important lessons and raised awareness regarding the risk of acute plastic pollution in Norway and the Nordic countries. This case has also led to increased awareness regarding the responsibility and preparedness of the Norwegian Coastal Administration and the municipalities, and regarding notification routines for such events in Norway.

Norway has taken the initiative to lead on Nordic cooperation against acute plastic pollution as part of the 2021-2024 initiative, "The Nordic Countries as a driving force in the work against marine litter and plastic pollution." Relevant activities include exchange of knowledge and experiences and a contact network between the countries at organisational and governmental levels regarding prevention, emergency response and clean-up. The spread of plastic pellets will be a key area of focus of the project in its initial phase, both for the North Sea, Skagerrak, and the Baltic Sea.

OSPAR regulations, the Nordic project and processes under the EU and the IMO is relevant in further follow-up, both nationally and in international cooperation.

More extreme weather events, increased precipitation, winds, and flooding may contribute to the dispersion of plastics and microplastics, including through the direct loss of items, leaching from soil and landfills, discharge through surface water systems, overflow in sewage systems, breakdown of infrastructure etc. More extreme weather conditions can also increase the risk of loss of fishing gear, parts of aquaculture facilities and ship cargo. Many measures to mitigate damage from climate change on other areas, may also reduce the increased risks of acute plastic pollution.

In Report to the Storting 20 (2019–2020) *Norway's integrated ocean management plans* it is stated that the risk of damage to the environment and to living marine resources posed by acute pollution must be kept at a low level, and that we must continuously seek to reduce this further. Furthermore, it is also stated that the high level of maritime transport safety will be maintained and strengthened. The state's preparedness for acute pollution must be dimensioned and adapted to meet the relevant environmental risk at any given time.

A reduction in Arctic sea ice is expected to increase the traffic of vessels along the coast. Increased traffic and extreme weather events due to climate change can both lead to a greater risk of accidents that lead to acute pollution, including plastic pollution.

In 2016, following a proposal by Norway, UNEA adopted a decision stating that marine litter and microplastics should be considered in national plans for climate adaptation.⁶² It is important that Norway follows up in its own relevant national, regional, and municipal plans and measures. Under the Norwegian Planning and Building Act, municipalities are responsible for risk assessment and adaptation to natural risks in regional and spatial planning as well as in construction case processing. Climate adaptation is an integral part of municipalities' area of responsibility. Municipalities must assess the current and future consequences of climate change, and this assessment must be considered along with all other considerations during planning processes. Municipalities are required to develop a comprehensive risk and vulnerability analysis. This will identify potential events that can happen, as well as their probability and assess how these events can affect local communities. There is a need to investigate to what extent the municipalities' existing emergency response systems against acute plastic pollution need adaptation to increased risk caused by climate change. Moreover, it must also be ensured that the danger of such pollution due to climate change has been sufficiently mapped.

Norway will also assess whether there is a basis for cooperation on acute pollution relating to plastic pollution in relevant fora, including under the OSPAR Commission and the IMO.

62 UNEA 2/11 <https://undocs.org/pdf?symbol=en/unesp/ea.2/res.11>



Removal of plastic pellets is very challenging. Hoovering using a reversed leaf blower is an effective method, albeit extremely time consuming. Here from clearing plastic pellets at Huseby Beach at Rygge by the Oslofjord. Photo: Gisle Oddstad, NTB, VG

The Norwegian Government will

- ensure that acute plastic pollution is part of the national emergency response system and that emergency response systems at sea, in water and waterways, and on land are adapted to increased risk resulting from climate change
- assess whether the risk of increased plastic pollution caused by climate change is satisfactorily mapped
- implement a Nordic cooperation project, run by the Nordic Council of Ministers from 2021 - 2023, to examine acute plastic pollution with a focus on knowledge, sharing experience, and a contact network between the countries on preventive measures, emergency response systems and clean-up



The large efforts by many volunteers to clean-up plastic litter is important, both to remove plastic litter in the environment, but also to improve our knowledge of the sources of litter, share knowledge and promote behavioural change to prevent and reduce littering.

Photo: Bo Eide

12 Littering and clean-up

12.1 Clean-up principles

The presence of marine litter in Norway's marine and coastal environments, and information regarding the sea-based sources, is described in the Government's Report to the Storting 20 (2019-2020) *Norway's integrated ocean management plans — Barents Sea-Lofoten area; the Norwegian Sea; and the North Sea and Skagerrak*. This report stated that the environmental targets for marine litter in the Norwegian sea areas have not been reached. Establishing national, quantitative targets for clean-up is however not considered expedient at this moment in time.

Important principles for clean-up, also adopted by the UN Environment Assembly, is that clean-up measures should be prioritised in areas where these are most needed with regards to vulnerable natural areas, human health, and livelihoods, and in those areas where these measures can be implemented most effectively. Clean-up should be prioritised as close to the source as possible and where occurrences are most frequent, and not at the high seas, given the magnitude of the problem. Clean-up efforts in the high seas is usually not recommended, except for lost fishing gear, for which clean-up is very important. Clean-up on land, in rivers and estuaries, and on the seabed near shore is advisable. It must be ensured that clean-up measures do not themselves cause harm to the environment. For example, birds must not be disturbed during the breeding season, and restrictions for nature reserves and other protected areas must be complied with. Clean-up measures may be particularly challenging in inaccessible areas along the outer exposed coast in Norway, and good HSE routines are important.

Registration of waste from cleared areas along the coast shows that waste has often been accumulated over many years. In some areas, the amount of waste is much lower when revisited a year after clean-up. In other areas that are more exposed to currents and wind, or that are heavily used, new waste continues to pollute the areas.



In the outer exposed coast in Norway, notably in the North, a lot of the litter originates from sea-based sources. Close to urban areas post-consumer waste is the largest source of litter. Photo: Bo Eide

The most important measure against marine litter is to prevent further input. However, cleaning up plastic waste before it can break down into smaller parts and be washed out into the sea, can also be prevention of plastic pollution.

Municipal action plans against marine litter and microplastics

Several municipalities in Norway have already started developing their own action plans against marine litter and microplastics. Much of the plastic waste found along our coast, especially in Southern Norway, comes from local sources. The municipalities themselves are best qualified to assess what additional measures they can implement to address their own and local sources. For instance, municipalities that host major sporting events or festivals on municipal grounds can decide what measures the organizers have to implement to prevent littering from these events. Municipalities can also utilise regulations for public procurement to reduce the use of single-use plastics. There are also several knowledge products and guidance available for municipalities, which can be used when developing action plans. With support from the Ministry of Climate and Environment, Keep Norway Beautiful has developed a method for monitoring and assessing. In 2020 the WWF, along with the cities of Oslo, Horten, Tromsø and the business association Samfunnsbedriftene, launched a network of Norwegian cities, towns and municipalities that want to be «plastic smart». Deloitte is a knowledge partner in the project, and the network is now working on methods and knowledge bases.

Oslo is one of the municipalities that has prepared an action plan for plastic pollution. The plan takes a comprehensive approach that aims to counteract plastic pollution and reduce the use of unnecessary single-use plastic items. It includes clean-up and management of plastic waste, consumption, procurement, and environmental management, microplastics and nano plastics, knowledge, data and cooperation. Oslo municipality has also urged the private sector to make more environmentally friendly choices to reduce plastic pollution and the unnecessary use of single-use plastic items in Oslo, and to cooperate in the clean-up of the inner Oslo Fjord. Several other municipalities have developed such action plans to tackle marine litter and plastic pollution.

12.2 What do we know about litter

All litter is unwanted, and this includes all types of waste that ends up in the environment. It is not just plastic litter that is damaging; metal waste such as wires, soda cans and disposable barbecues, as well as impregnated timber, and batteries, can also be harmful to the environment, animals, and humans. This strategy focuses on plastic litter and microplastics, which represent the largest proportion and the biggest environmental problem caused by littering. However, many of the measures discussed here are equally significant in tackling other waste fractions. Clean-up operations do not just remove plastic; they remove everything that can be harmful. When clean-up operations are registered in the national mapping tool Rydde, litter from all categories are registered, not just plastic.

Much of the knowledge we have regarding the prevalence and sources of marine litter in Norway comes from the registration of litter collected during volunteer clean-up operations. The registration of data following such operations has formed extensive Norwegian marine litter data sets, with data both from beaches, watercourses, and the seabed in shallow coastal areas. Furthermore, researchers have carried out several mapping studies along Norwegian beaches and watercourses in recent years, categorising marine litter according

to source - so-called «deep dive analyses». Such analyses can provide more detailed knowledge of the sources of litter and data from scientifically more representatively selected areas.

Available knowledge indicates that much of the litter found on Norwegian beaches can be linked to local sources. At the same time, there may also be significant amounts of litter transported long-distance from neighbouring countries and from further away, especially in areas directly affected by large coastal and ocean currents.

Available data indicates that discharge of new litter is a challenge. Even if it is difficult to estimate the age of plastic litter in the environment, findings from beach clean-up operations show that there are a significant amount of items that have only been there for a short time. The registration of lost and abandoned fishing gear shows that the fishing industry contributes extensively to marine litter. Even if the Norwegian Directorate of Fisheries retrieves large amounts of reported lost fishing gear each year, much lost fishing gear remains at sea. Recreational fishing is a large source of reported lost fishing gear, and it is also likely that there are many more unreported cases.

The registration of litter found along the Norwegian coast and on Svalbard show significant regional differences in source composition. In general, litter that can be linked to fishing, recreational fishing and aquaculture makes up a larger part of the litter in northern Norway and along the west coast, while post-consumer waste makes up a larger part of the litter found around the Oslo Fjord and in south-eastern parts of the country.

The registration of litter along watercourses shows that litter is also an inland problem. Overall, results indicate that private consumption, outdoor activities and building and construction activities are the main sources of inland littering. Moreover, waste dumping is a known problem along several watercourses, especially in areas that are accessible by motorised vehicles.

In 2020, a systematic study of beach litter was conducted based on clean-up operations, in from the water's edge to further up shore, in different areas along the Norwegian coast.⁶³ 10 tonnes of litter were collected from around 50 beaches, all of which was analysed. The size, weight, age, and country of origin of each item was registered according to different categories, sorted by each individual locality.

Sources differed largely by region. The findings correlate closely with data registered by volunteers in the Rydde app. Nationally, items from fisheries and aquaculture made up on average 46.2 % of the litter along the coast, while personal consumption items made up 14.9 % of the waste in populated areas. Plastics made up 73.5 % of the total amount of litter in terms of weight, and 91.5 % in numbers of quantity. Expanded polystyrene was the most common fraction by quantity. Items from fishing and aquaculture made up a major part of the weight. Rope made up most of the total amount by weight and was the fourth largest source by quantity.

Of the 10 % of items that could be traced back to a country of origin, 77 % came from Norway. Of the 5 % of waste whose age could be determined, 49 % was less than five years old. The majority was small pieces of plastic, of uncertain origin and age, but these facts show that the supply of new litter from Norwegian sources is still a problem.

There is less data on the scope and sources of discarded waste in freshwater and on land. In 2019, Keep Norway Beautiful conducted a study which registered information from a total of 987 "waste units", distributed between 11 watercourses and lakes across nine counties. The most common waste found was food packaging, followed by unidentifiable

⁶³ Mepex (2020) *A deep dive into our ocean plastic* [Mepex_sluttrapport.pdf](#)

plastic pieces, and then polystyrene. In areas accessible by motorised traffic, food containers and unidentifiable plastic pieces were the most common findings, followed by cigarettes and snuff packaging, cigarette butts and snuff. In areas less accessible by motorised vehicles, polystyrene was the most common type of waste, with plastic packaging and food containers in second and third place respectively. Generally, it was concluded that outdoor recreation is an important contributor to litter in freshwater and on land.

12.3 Responsibility for clean-up

Littering is prohibited in Norway. When the owner of the waste is known, they are responsible for clean-up, either directly or by outsourcing this work, based on the 'polluter pays' principle. In many cases, however, the composition of discarded plastic waste, especially in the sea and in coastal zones, tends to come from many different sources and often also breaks down into parts that cannot be traced. In some instances, it is possible to trace the litter back to the product group, but not to the producer. This can give an idea of how much a sector or industry contributes to littering, both on a national and local scale. As mentioned earlier, the Norwegian environmental authorities are now carrying out a broad review of extended producer responsibility schemes in Norway. For several of the new product groups, it is relevant to extend the producer responsibility to also include clean-up of plastic litter.

According to the Pollution Control Act § 35, municipalities shall provide waste bins at excursion spots and other heavily visited areas where waste is likely to occur and shall arrange for these to be emptied.

Municipalities are also responsible for reasonable litter clean up in these areas. The municipality's clean-up requirements under the Pollution Control Act are limited to what is stated in the Pollution Control Act § 35. The municipalities are obliged to demand a waste fee from its inhabitants to cover the costs of handling household waste. Municipalities are the local pollution control authority and with their local knowledge, best suited to investigate causes and who is responsible when illegal littering occurs. Municipalities are required to investigate cases of littering and assess pollution risks as well as the need to implement further measures. If those responsible are identified, the municipality may issue a clean-up order in accordance with the Pollution Control Act § 37.

12.4 Sources of funding and clean-up operations

Each municipality can determine whether to accept delivery of litter that has been cleaned up from areas for which the municipality is not responsible, free of charge. Several municipalities and waste management companies require payment for reception of such waste, while others do not. This can lead to a confusing situation for those involved in clean-up operations.

The Norwegian Environment Agency administers a grants scheme to support measures against marine litter. In 2021, NOK 70 million was granted to various clean-up and prevention measures. A portion of this was given to larger clean-up operations. This is also an important way to share knowledge and raise awareness. Administrating this scheme is time-consuming for the environmental authorities. With an increasing number of clean-up organisations, large financial contributions from private sources such as the Norwegian Retailers' Environment Fund and others, and overall development in the area within the field of clean-up, there is a need to consider revising the grant scheme.

Rydd Norge (Clean up Norway)

The Norwegian Retailers' Environment Fund has established the clean-up programme Rydd Norge (Clean Up Norway). It aims to clean up macro plastic litter along 40 % of the outer Norwegian coastline, as well as prioritised watercourses and areas of Svalbard, by 2023. The programme is divided into ten regional projects, which will be adapted to the conditions and the actors in each region. Areas to be cleaned, and relevant actors already involved in clean-up activities in these areas, should be mapped before starting the clean-up operation. The County Governor can advise in this mapping, as well as on considering areas with vulnerable nature. In several of the regions the County Governor is chairing a regional advisory group for the project. Management and implementation of the regional projects are subject to a call for tender, followed by a call for the actual clean-up operation. So far, clean-up operations have begun in the regions Nordland, Trøndelag and Vestland. After 2023, maintenance clean-up operations will be considered in all the areas. The Norwegian Retailers' Environment Fund has allocated a total of NOK 390 million to this programme in the period from 2021 - 2023.

Reimbursement of minor expenses for clean-up equipment, and for transport and delivery of cleared waste, has for many years been managed through a separate reimbursement scheme administrated by Keep Norway Beautiful, who must apply for funding for this reimbursement scheme from the Norwegian Environment Agency's grant scheme. This is a cumbersome process and ways to simplify the process should be examined.

To receive the reimbursement, those engaged in clean-up operations must first register their clean-up action in the Rydde map tool. This way, important information regarding clean-up operations is collected. One must also register with Rydde to apply for support funding for larger clean-up measures from the Environment Agency's grant scheme. It is important that all clean-up operations are registered in this portal, for better coordination and knowledge of the scope and sources of litter. Where there is capacity, more information about the litter composition should be registered, as citizen science like this is of great value. Another important function of the Rydde tool is that areas in need of clean-up can be easily reported using an app.

Diving clubs provide a large and important voluntary effort, including retrieving of lost fishing pots, and other types of waste, on the seabed. The Norwegian Diving Association has previously received funding from the Norwegian Savings Bank Foundation for retrieval of fishing pots and divided these funds between local diving clubs. Each club received a set amount per trap, financing equipment and fuel expenses, among other things. Information from these activities has been submitted to the Norwegian Institute of Marine Research for research purposes. Today, there are many sources of funding for clean-up operations. It is necessary to consider how both voluntary clean-up operations at sea (diving clubs) and on land can best be supported and facilitated.

In 2017, the Norwegian Ministry of Climate and Environment introduced a grant scheme for discarded recreational crafts. The scheme means that a «wreck deposit» (NOK 1,000 per wreck in 2021) will be given upon delivery of a discarded recreational crafts to a treatment facility. The scheme covers sports and leisure crafts up to 15 metres (49 feet), and smaller crafts such as windsurfs, kayaks and canoes. Municipalities and other actors who treat such leisure crafts can apply to the Norwegian Environment Agency for supplementary funds to cover the cost of treatment. The purpose of the scheme is to prevent old recreational crafts from remaining in nature and thus contributing to litter and local pollution. As of May 2021, 250 treatment facilities have been established for small, discarded crafts, and 74 facilities for discarded crafts over 15 feet. More than 36,600 discarded crafts have been delivered since the scheme was established in 2017. Over NOK 107 million has been provided to facilitate reception and treatment operations. The interest for this scheme remains high.

Clean-up operations related to fishing and aquaculture are addressed in chapter 9, which covers sea-based sources. Clean-up operations relating to acute pollution are addressed in chapter 11.

12.5 Actors and organisation

Keep Norway Beautiful

Keep Norway Beautiful started with a clean-up operation in 1969 and was relaunched as a campaign in 2004. In 2014, Keep Norway Beautiful was established as a non-profit organisation working with volunteers, businesses and municipalities on littering. Many of these actors are also members of the organisation. Keep Norway Beautiful invites the entire community to join clean-up efforts, both as a member organisation and by broader mobilisation through organising national clean-up campaigns. Keep Norway Beautiful is also involved in prevention work by raising awareness, mapping litter and identifying sources and causes of litter. The organisation is involved in measures against litter, in the preparation of action plans on plastic litter, and acts as an adviser for municipalities, on a voluntary basis.

Several years ago, Keep Norway Beautiful developed a web portal for the registration of information on clean-up efforts. These data are transferred to the map tool Rydde, and a new version is being developed by the Norwegian Centre for Oil Spill Preparedness and Marine Environment, in collaboration with Keep Norway Beautiful. Keep Norway Beautiful is responsible for client support to and citizen science from Rydde. Keep Norway Beautiful manages a reimbursement scheme providing reimbursement for expenses related to the transport and treatment of collected abandoned and ownerless marine litter. Keep Norway Beautiful also contributes to international cooperation with similar organisations. It receives core funding from the Norwegian Ministry of Climate and Environment.

The first large scale clean-up operation was arranged in 1969, in the shape of a campaign called Keep Norway Beautiful. The rate of clean-up activity has since increased, both through Keep Norway Beautiful's coordinated clean-up actions and with many other actions and actors. The array of actors and organisational structures vary between the different regions in Norway. Those involved include individual volunteers and associations, non-profit organisations, Outdoor Recreational Councils, Skjærgårdstjenesten (the Archipelago Service), municipalities, the waste management sector, commercial and semi-commercial actors, as well as government agencies such as the Norwegian Directorate of Fisheries, the Norwegian Nature Inspectorate, the County Governor's Offices, the Norwegian Coastal Administration, and the Norwegian Coast Guard.

In recent years, County Governors have had a role in as regional coordinators and will continue to contribute to the regional coordination of clean-up related work. The County Governor will ensure that rules to protect areas of vulnerable nature are respected and will contribute with advice on areas and knowledge about relevant actors. In some areas that have a long history of clean-up operations, activity is already being well coordinated by the Outdoor Recreational Council and the Archipelago Service. In the Oslo Fjord, and Bergen and surrounding areas, the Outdoor Recreational Council have a long-standing coordination experience. Nevertheless, the County Governor has important tasks in supporting this work.

The volunteers and the idealistic efforts are central and extremely valuable. In addition to following up their own responsibilities, it is also important that the authorities facilitate the voluntary and idealistic efforts in a good way. The authorities are also working to put in place schemes for easier follow-up where those responsible for littering or the product are known or identified.

In recent times, many funds have been made available for clean-up measures from different sources in Norway. The largest sources of funding are the Norwegian Environment Agency's grant schemes on marine litter and the Norwegian Retailers' Environment Fund. Many others, such as private foundations, businesses, and municipalities, support volunteer efforts and/or assignments for commercial clean-up actors. A market for clean-up has developed. Public resources must be used as efficient as possible to reduce marine litter both through prevention and through clean-up operations. It is also important that actors who wish to develop technology and solutions, and to create jobs in this field, follow the recommendations in the decisions of the UN Environment Assembly.

The Norwegian Centre for Oil Spill Preparedness and Marine Environment (SOMM) has been tasked by the Norwegian Ministry of Climate and Environment to develop an overview of various actors on a regional level and to work out ways to strengthen the organisation of the authorities' role. The assessment and proposals are some of the contributions that are currently being considered. Authorities cannot expect there to be voluntary clean-up operations, except for actions which receive public funding. However, many actors have expressed that the authorities must act in helping to improve the coordination of such clean-up actions.



To receive funding from the various funding and grant schemes administrated by the environmental authorities and the Norwegian Retailers' Environment Fund, different stakeholders must register their clean-up actions in the Rydde. This is also a way of gathering useful information from clean-up activities.

In May 2021, the Norwegian Ministry of Climate and Environment held a public meeting in which all relevant actors could express their views on what measures are needed from the government to strengthen the coordination and implementation of clean-up work, and to facilitate volunteering. The suggestions given will be included in further assessments of this area.

Transport and handling of litter from clean-up activities are challenging, especially since solutions and conditions vary greatly from region to region. In some areas, such as the Oslo Fjord, there is well established collaboration between all involved parties, including waste management companies and municipalities. In other areas, and especially in smaller municipalities, the process is not so straightforward. Several projects are now looking at possible measures to improve this, and some actors are calling for action at the national level. The Norwegian Ministry of Climate and Environment will assess additional development in this area.

From 1 January 2022, the Norwegian Centre for Oil Spill Preparedness and Marine Environment (SOMM) which is now under the Norwegian Ministry of Transport, will become a dedicated National Centre for Marine Litter, subordinate to the Norwegian Ministry of Climate and Environment. The Centre shall continue to be a centre of competence for clean-up of marine litter and for the prevention of discharges from sea-based sources. Among other things, the Centre will be the overall coordinator for the authorities engaged in clean-up of marine litter and facilitate clean-up work on a national level. The Centre will also assist County Governors and other coordinators at the regional level with information and other support as needed.

In early 2022, the Centre will call for, establish, and chair a national coordinating group for clean-up activities. Representatives from volunteer groups and from the private sector will be invited to take part. The digital tools Rydde and Rent Hav are of great importance, and the Centre shall continue to further develop and to use these tools in their further coordination work.

It is vital that all actors who gather litter data, upload this to Rydde and Rent Hav. The mapping tool Rydde will act as a simple solution to registering cleaned areas, also without having to establish a dedicated clean-up operation.

Rent Hav will be developed as an effective planning and coordination tool for clean-up operations. Users will be able to download information about cleaned areas, areas that require cleaning, available actors, transportation and waste reception facilities, protected areas and more. Rent Hav will be developed to guide clean-up actions depending on need and expertise. How to best coordinate clean-up operations must be tested and adjusted based on experiences gained on the way. For motivation and efficient use of resources, volunteers should be allowed to continue to clean-up in areas for which they feel responsible and ownership to. Keep Norway Beautiful's "adopt a beach" scheme is one example of this. By contributing to useful information exchange, the new centre aim to ensure that such concerns are well addressed.

On behalf of the Ministry of Climate and the Environment, SOMM has carried out a pilot project which, among other things, looked at the use of available governmental resources in this work. As part of this, SOMM and the Norwegian Coastal Administration completed a successful cooperative project where the Coastal Administration contributed with the transport of litter from exposed coastlines. The Norwegian Coastal Administration's potential contributions in this area will be further considered.

12.6 International collaboration on clean-up

Keep Norway Beautiful has established cooperation with clean-up organisations in the other Nordic countries and with Ocean Conservancy. Norway has supported this. Keep Norway Beautiful is also the current chair of the European network Clean Europe. Keep Norway Beautiful has been an important actor for Norway in this international cooperation. The Norwegian government contributed by promoting the organisation's cooperation projects, partly through the Nordic Council of Ministers. A clean-up network project will be established under the Arctic Council. In 2021, a Nordic project on experiences of cleaning up plastic pellets after acute spills will start.

In a long term perspective, it is relevant that the new national centre focussing on marine litter will be established from 1. January 2022, to contribute with Norwegian experience and knowledge about clean-up work to the Global Partnership on Marine Litter (GPML).

The Norwegian Government will

- give the Norwegian Centre for Oil Spill Preparedness and Marine Environment (SOMM), which from 1 January 2022 will become a dedicated centre for marine litter, tasks that will strengthen the coordination and facilitation of efficient and effective clean-up work in Norway
- facilitate volunteer work for clean-up operations, including by financial support to clean-up actions
- evaluate the grant scheme against marine litter and the reimbursement scheme for clean-up costs considering the development in clean-up work and the need for predictability for various actors
- assess the need and possible measures for facilitating the transport, delivery, and reception of cleared waste, including at the national level
- continue to support Keep Norway Beautiful in facilitating voluntary clean-up activities
- assess how voluntary clean-up operations on both land and sea can best be supported
- expand the Norwegian Directorate of Fisheries' local measures for retrieval of lost or abandoned fishing gear in coastal and fjord areas
- assess whether, and if so to what extent, the Norwegian Coastal Administration can contribute to the transport of litter after clean-up activities
- assess whether, and to what extent, the Norwegian Coast Guard can contribute through their ordinary activities, for instance, with information on areas in need of clean-up
- strengthen international clean-up collaboration, as part of a new Nordic initiative, under the action plan against marine litter under OSPAR, Norwegian-Russian environmental cooperation, and as part of the action plan against marine litter in the Arctic, among others



Measures to reduce marine litter and emissions of microplastics to the environment must be based on best available science and knowledge. There is a need to strengthen monitoring, research, and innovation to this end.

13 Knowledge

There is currently insufficient knowledge regarding the amount of different plastic products on the market in Norway, and of the consumption of plastics in the various sectors. More knowledge is also needed regarding how plastic ends up in nature, how plastic litter breaks down in nature, how macro-, micro-, and nano plastics and additives in plastics affect different organisms and ecosystems, and what this can mean for food security.

To counteract plastic pollution in the most effective manner, and to stimulate sustainable development and contribute to the fulfilment of the UN Sustainable Development Goals, measures and decisions must be based on the best available knowledge. Necessary knowledge must be acquired for those areas where it is missing and must be kept up to date. Knowledge-based tools are needed to map, monitor, and understand developments, and to be able to adjust measures to achieve our targets in the best possible way.

Knowledge of the sources, pathways and impacts of plastic pollution is constantly improving. However, there are still large knowledge gaps on this area, and on methods for measurements and analyses that can be used in monitoring, and to map impacts on ecosystems and human health. There is also insufficient knowledge regarding the level and effects of plastic pollution in air and soil. These knowledge needs have been highlighted by the UN Environment Assembly decisions.

Knowledge-based policy making relies on operational goals and targets for direction of means and measures. Relevant high-level goals and targets are mentioned in Chapter 1. National and international environmental goals for marine litter, and for microplastics in the marine environment were summarized in Report to the Storting 35 (2016–2017), and the updated the integrated ocean management plan for the Norwegian Sea in Report to the Storting 20 (2019-2020) on Norway's integrated ocean management plans — Barents Sea–Lofoten area, the Norwegian Sea, and the North Sea and Skagerrak. Since then, UNEP has developed targets and indicators for SDG 14.1. Further development of targets and indicators for marine litter and plastic pollution is also on the agenda in regional sea conventions and fora, including under the OSPAR and the Arctic Council. Norway participates in this work and believes it is important that such indicators are globally comparable.

There are currently no globally agreed methods or parameters for measuring and monitoring the presence of macro-, micro, and nano plastics in the environment. Establishing methods, parameters, and indicators for assessing environmental conditions and discharges into the environment is essential for good knowledge-based management. The lack of knowledge and indicators for monitoring emissions of plastics from different parts of the value chain or the lifespan of plastics is specifically challenging.

The UN Environment Assembly has agreed that the scientific and evidence-based approach must be strengthened to ensure a knowledge-based policy making and selection of measures. In 2021, UNEP will present the second global knowledge report on marine plastic litter and microplastics. Preliminary findings presented in 2020 pointed to the urgent need for stronger global commitments. New reports and knowledge products are constantly being presented by various global actors from civil society, academia, and the private sector. These are important contributions to the knowledge base. There is a need to gather this knowledge at an overarching level and view it in a larger context.

Norway believes that a systematic and global knowledge collaboration that can inform about measures and the development of instruments, is an important element that should be included in a new global agreement. We need to know the status at the global level, assess

trends in our development and whether we are on track to reach our global goals and targets. Moreover, it must be ensured that all countries can access the same information – at the same time. A report on behalf of the Nordic Council of Ministers for Climate and the Environment on strengthening the scientific and evidence base, including stronger global collaboration, as part of a new global agreement, was presented in April 2020.

The Norwegian Environment Agency delivered an updated knowledge status for Norway in 2020. Some of the findings are discussed in chapter 12.2. More knowledge is still required regarding the total amount of marine litter in Norway, and especially regarding addition of new litter, including the proportion of litter that has been transported over long distances. Increased knowledge and data on the amount of litter from different sources is essential to identify the most targeted and effective measures. There is also a need to measure the effect of various implemented measures, both preventive measures and clean-up measures.

Norway is part of a broad cooperation on knowledge strengthening and sharing on marine litter and microplastic in the High North. As part of Norwegian-Russian environmental cooperation, a joint marine litter project is established that includes both the knowledge sharing and a meeting place between authorities. As part of this cooperation, a joint Norwegian-Russian report will be presented in 2021 outlining knowledge status, knowledge activities, and management initiatives in both Norway and Russia. The report will provide the foundation for further development of this cooperation. Important cooperation on knowledge is taking place under the auspices of the Arctic Council through its Arctic Monitoring and Assessment Programme (AMAP), and its biodiversity group, Conservation of Arctic Flora and Fauna (CAFF). AMAP's recommendations on the design of monitoring programmes is especially important, and Norway bases the development of our national monitoring on these recommendations.

The UN Environment Program is an important knowledge provider and has developed several different products that governments, authorities and other actors can use in their work against marine plastic litter and plastic pollution. GRID-Arendal is a Norwegian organisation that receives support from the authorities for its communication and assessment work for UNEP and others. Their website, marinelitterhub.com, contains easily accessible useful information.

We currently know very little about how much plastic contributes to spreading of hazardous substances. New knowledge of marine plastic litter and microplastics as a source of long-range transboundary pollution will be essential to ensure the sound management of the Norwegian environment. It will also be an important contribution to knowledge in several international environmental agreements. Under the Stockholm Convention's Global Monitoring Plan of persistent organic pollutants (POPs), work is underway to gather existing knowledge of the mechanisms for long-range transboundary pollution, including marine plastic litter and microplastics as a vector for the spreading of hazardous substances. Microplastics have also been identified as a knowledge gap in the 2020 report on antibiotic resistance, published by the Norwegian Institute of Public Health. Further knowledge is also required regarding how plastic litter and microplastics can spread new, harmful and disease-carrying organisms between different countries and continents.

Plastic additives, such as plasticisers, colour pigments and flame retardants can seep out of plastics to varying degrees. In addition to their functional qualities, many of the additives contain unwanted harmful properties which impact both humans and the environment. There is a need for a better knowledge base for future regulation of additives in plastic, and both the EU and Norway are focusing on this.

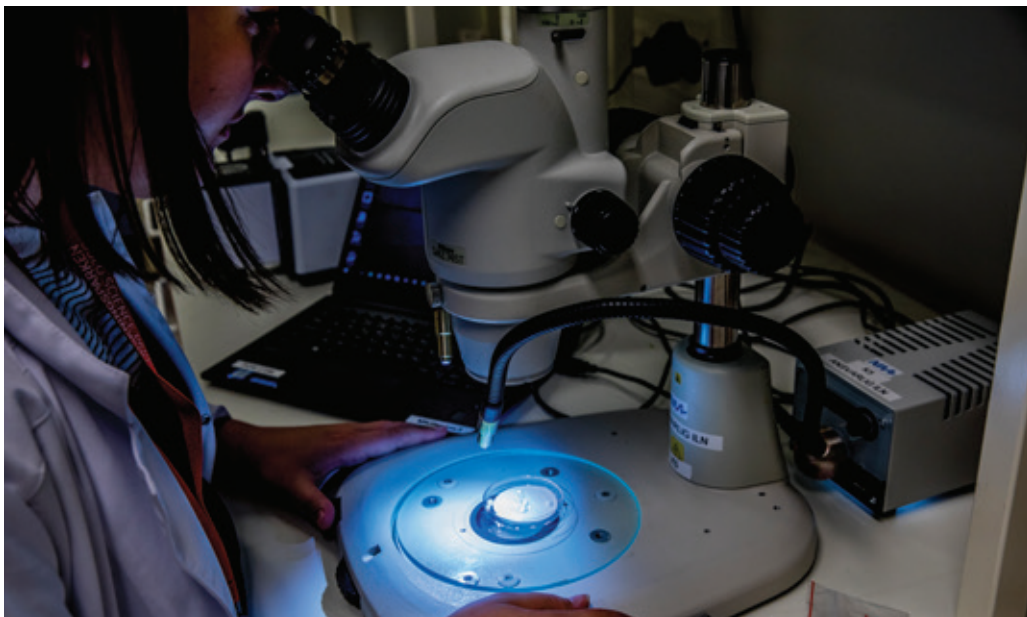
More information is required regarding the possibilities of replacing plastic with other materials, such as biodegradable natural fibres. This applies to areas of use, technology, and life cycle analyses.

Prioritised areas in need of greater knowledge are

- sources, pathways, and impacts of plastic pollution in the environment
- the amounts of plastic products on the market in Norway and the quality and recyclability of these plastics
- the quantities and types of plastics used, the quality of those plastics and the additives found in plastics
- plastic consumption across different industries in Norway
- improved waste and recycling statistics in Norway
- levels of content of additives and hazardous substances in plastics, how plastics can act as a vector for the transport of hazardous substances, and increased knowledge of how hazardous substances in plastics are absorbed by organisms
- how plastics can become part of a non-toxic material cycle and contribute to recycled plastics being used in the development of new, high-quality products
- the sources, pathways and impacts of microplastics, both nationally and globally, and studies that distinguish between the different materials, sizes, and particle types of microplastics
- use of biodegradable organic materials such as wood, wool, and chitin as alternatives to plastic

13.1 Monitoring and Assessment

A challenge of current plastic litter and microplastic monitoring, assessment and research is the use of different definitions, parameters, indicators and methods for sampling and measurement. To better interpret and compare research and monitoring results between countries and regions, as well as development over time, internationally harmonised and standardised methods, parameters, and indicators for environmental status are needed. In parallel with this harmonisation, there is also a need to improve methods, to make it possible to measure the amounts of small particles of microplastics and nano plastics, both in the environment and in different organisms.



*NIVA (Norwegian Institute for Water Research) assessing levels of microplastics in Norwegian drinking water.
Photo: NTB, Terje Bringedal*

Plastic as a pollutant presents new methodological challenges when compared to e.g. heavy metals or dioxins, since toxicity largely depends on particle size. Research shows that both uptake, accumulation, and effects vary depending on the size and shape of the plastic particles. Large and small microplastics, and plastics of different densities, accumulate in different areas of water and sediment.

To determine whether this development is headed in the right direction, and how quickly the situation may change, long-term systematic environmental monitoring is needed, on a national, regional, and global level.

Under the SDG 14.1, UNEP has developed a set of indicators to measure the development of environmental status to determine the progress on reaching the relevant targets. National registration of marine litter on beaches, the prevalence of plastics floating on the surface and in the water column, and marine litter on the ocean floor is recommended. Norway must assess how these indicators can be used most effectively in a Norwegian context. The indicators we use must also meet requirements for national monitoring, regional monitoring under OSPAR, the EU and others, and for a new global agreement.

The UN's Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP) has recommended guidelines for monitoring plastics in the marine environment. In 2020, UNEP presented a manual that describes these methods in greater detail, and states that countries can use different approaches and methods. The Arctic Council's Monitoring and Assessment Programme (AMAP) has presented proposals for joint guidelines for the monitoring and research of Arctic marine litter, which is also beneficial from a global perspective.

In the autumn of 2020, as part of the Marine Strategy Framework Directive, EU countries agreed threshold values and assessment methods for a beach to be classified as 'clean'.⁶⁴ The threshold was set to 20 objects over 2.5 cm in size per 100 metres of beach.

Norway and many other countries believe that implementing and reporting on joint global indicators should be an important component of a new global agreement, see chapter 3. Developments in environmental status, pathways, and leakages of litter into to the environment must be measured for it to be possible to assess whether sufficient measures to reduce plastic pollution have been implemented, and how these measures should be adjusted to reach the target.

Through OSPAR, Norway is required to monitor marine litter and report on indicators for beach litter, seabed litter and plastic particles in the stomach of the seabird northern fulmar. Litter is registered on seven different Norwegian beaches, two of which are located on Svalbard, in accordance with OSPAR protocols. The registration on these beaches is carried out by different actors. Volunteers also contribute through registering of data on marine litter that has been cleaned up, on the Rydde web portal.

Information is also gathered on litter, micro- and macro plastics in the environment through several mapping and monitoring programmes that do not have these issues as their primary focus. For instance, the MAREANO programme for mapping the seabed in Norwegian waters, also gathers information on visible macro plastics on the ocean floor, as well as on microplastics in sediment.

The research vessel Dr. Fridtjof Nansen, operated by the Norwegian Institute of Marine Research, also contributes through their monitoring and assessment programme on microplastics in inter alia seafood and registering macro- and microplastics in the marine environment in Africa and Asia. The EU project MEESO, coordinated by the Norwegian Institute of Marine Research, is also studying what happens to microplastics when fish is

64 Marine Strategy Framework Directive: MSFD, 2008/56/EC

processed into fish meal and fish oil. Work is carried out to develop a methodology and establish laboratory capacity at the Norwegian Institute for Marine Research for better monitoring of microplastics in seafood.

The registration of lost fishing gear contributes to knowledge of sources and volumes. In collaboration with the Russian research institution PINRO, the Norwegian Institute for Marine Research contributed to the registration of the presence of plastic in surface water, water column and on the seabed of the Barents Sea as part of an ecosystem cruise. The Norwegian Institute of Marine Research also participates in the International Bottom Trawling Survey in the North Sea, where marine litter is registered when it is pulled up as bycatch during fishing trawler studies.

Public research is another important tool that provides knowledge of the presence of litter, especially in beaches and coastal zones. Much of the knowledge of the presence and sources of marine litter in Norway comes from the registration of litter during volunteer clean-up operations. Data that was previously uploaded to the Keep Norway Beautiful database, has been transferred to the newly developed online solution, Rydde. Newer technologies, including satellite monitoring, can make data collection more cost effective in some areas.

From 2016 to 2019, several research and development projects were conducted for testing methods for monitoring of microplastics in marine environments, lakes, and rivers, on behalf of the Norwegian Environment Agency. In 2021, the Norwegian Environment Agency started an environmental monitoring programme for microplastics. The first phase of this monitoring programme lasts from 2021 to 2023 and will cover air, coastal waters, freshwater, and urban areas. The programme follows the guidelines of GESAMP and AMAP under the Arctic Council.

National microplastic monitoring programme

- Three-year phasing-in of monitoring that will provide knowledge on geographical differences in microplastic levels and assess the contributions by assumed important sources of microplastic pollution.
- The methodology is adapted to the guidelines by GESAMP and AMAP (Arctic Monitoring and Assessment Programme) under the Arctic Council.
- Cost effective collection of samples from other national monitoring programmes.
- Air samples: Birkenes and Ny-Ålesund.
- Marine samples: Sediment from soft bottoms, invertebrates living in sediments, and water samples.
- Urban samples: Sewage treatment plants and surface water.
- Samples from freshwater environments: Soft bottom sediments, sediments dwelling invertebrates and water samples.
- This phasing-in of the programme gives a snapshot of the current situation and can form a basis for building time trends.
- Upscaling of these monitoring efforts is necessary to be able to better respond to variations over time, and to include methodology for the smallest microplastic particles.



Monitoring sites for microplastics in 2021. The map is retrieved from Vannmiljø, source: The Norwegian Environment Agency.

Monitoring and assessment of marine litter and plastic pollution is essential to ensure the best possible foundation for knowledge-based measures. A central criterion is that this monitoring also must be well suited for reporting on international obligations, not least UN Sustainable Development Goals target 14.1 and OSPAR monitoring. It is essential to ensure data series continuity, which is important for demonstration changing trends and for understanding cause and effect. Data collected by several research and knowledge projects and mapping programmes can be relevant and useful for environmental monitoring. It is necessary to assess how these data can be shared and utilised in the most effective way possible, and whether there are areas that require supplementation. Environmental monitoring of marine litter and plastic pollution in Norway will be further developed in accordance with both national needs and international obligations.

Data on marine litter and on clean-up should, as far as possible, be registered in the map-based network tools Rent Hav and Rydde. Data on microplastics in water will be stored in the Norwegian Environment Agency's water environment database.

13.2 Research, development, and innovation

In Norway, a lot of high-level research is currently conducted on plastics, their life cycles, and plastic pollution, and much of this is part of international cooperation. Nationally, the Research Council of Norway is the biggest source of research funding.

The Norwegian Research Council is part of an ongoing four-year collaboration with the Norwegian Retailers' Environment Fund to announce donations of NOK 20 million to research on the environment and society. The Research Council has strengthened its commitment to a circular economy, where plastics are one of several important focus areas. The Research Council's strategy, Empowering ideas for a better world, aims to invest in research and innovation to achieve a "circular economy with sustainable production, services and consumption systems".

The UN General Assembly has decided that the 2021-2030 is the UN Decade of Ocean Science for Sustainable Development. The Decade of Ocean Science is intended to stimulate and coordinate more research on a national and global level, as a contribution to reach the UN Sustainable Development Goals relevant to oceans. The Norwegian Research Council houses the Ocean Secretariat, which has been tasked with national coordination and follow-up of the UN Decade of Ocean Science. This work is also relevant for obtaining new knowledge about plastic pollution in the ocean.

The Norwegian Research Council's thematic priorities under marine resources and the environment (MARINFORSK) includes the amounts, sources, and composition of marine litter, including plastic litter and microplastics, as well as the impact this has on marine ecosystems. The Norwegian Fram Centre's «Plastic in the Arctic» project also contributes to increased research activity in this field.

Horizon Europe is the EU's ninth framework programme for research and innovation, with a total budget of EUR 95.5 billion for the period 2021-2027. Norwegian actors can apply for funding on the same level as private enterprises, public enterprises, and research institutions in EU member states. Innovation and interdisciplinary research will be emphasised to a greater extent than in the previous framework programme, Horizon 2020. Of Horizon Europe's total budget, the aim is that 35 % will go to research within climate and sustainable development. Within both framework programs, cross-cutting themes include oceans, circular economy, pollution, and nature-based solutions.

There are several interesting research initiatives in which Norway participates related to measures to reduce plastic pollution. One example of a project funded by the predecessor of Horizon Europe – Horizon 2020 – is the EU project EUROqCHARM. This project focuses on establishment of standardised methods of monitoring and assessing macro-, micro-, and nano plastics in the environment. The project is led by NIVA and has 14 key participants from Europe, including Norway. The project covers important areas in need of more knowledge. Standardised methods are important, as they allow environmental monitoring data to be compared between different countries and regions. It is an important basis for plastic pollution regulations to be put in place.

The European research collaboration, Joint Programming Initiative on Healthy and Productive Seas and Oceans (JPI Oceans), which was established in 2011 as a Norwegian initiative, also includes research on plastic pollution. Ten microplastic projects have so far been financed by JPI Oceans with a total of 17 Norwegian actors involved, of which seven involved Norwegian participation. Norwegian participation is funded by the Norwegian Research Council.

The FACTS project (Fluxes and Fate of Microplastics in Northern European Waters), made up of partners from Denmark, Germany, Italy, and Norway, examines microplastic concentrations, including particles from car tyre wear, measured from the river Elbe through to the North Sea, Skagerrak, the Norwegian Sea, and the Barents Sea to the Arctic. Water, sediment, air, and fish samples are taken. Data is compared with a dispersion model of the transport of plastic particles. Fish analyses will also be part of the Norwegian Institute of Marine Research's efforts to establish measurement methods and assess microplastic levels in seafood.

Dsolve is a centre for research driven innovation, which studies biodegradable plastics for use in fisheries and aquaculture. It was established in 2020 as an eight-year initiative, supported by the Norwegian Research Council. Dsolve is led by the Arctic University of Norway (UiT). Four national and four international research institutes, 14 industry partners from the fisheries and aquaculture industries, fishing gear and equipment suppliers, and two fishing industry organisations are participating. The Norwegian Environment Agency, the Norwegian Directorate of Fisheries and the Norwegian Seafood Research Fund participate in Dsolve's advisory group. The aim of the centre's research is to reduce the amount of plastic waste produced by fisheries and aquaculture by replacing the plastic used in these sectors with truly biodegradable materials. The project also considers alternatives for plastic wear mats such as dolly ropes used in bottom trawling; see chapter 9 on sea-based sources. The aim of Dsolve is to put Norway at the forefront of research, development, and the use of smart biodegradable materials to reduce the global problem of marine litter from fishing and aquaculture.

Innovation is important in developing new, more sustainable plastic solutions. Innovative solutions need not be complicated. Simple, good ideas and ways of thinking can also produce effective solutions.

The Green Platform Initiative is the Norwegian Government's new measure for a coordinated, strengthened, and targeted effort for green transformation. The Green Platform Initiative is a shared competitive arena for green projects in Innovation Norway, the Norwegian Research Council and Siva (The Industrial Development Corporation of Norway), as well as Enova. The platform is built on established grant schemes with well-defined support criteria. Relevant schemes include Innovation Norway's environmental technology scheme, Innovation Clusters program and innovation contracts, the Research Council's Innovation Project for the Industrial Sector and Siva's Catapult scheme. Funding can be applied for by green projects in research and innovation, from very basic research to solutions ready to be presented to the market, including projects on plastics. The target groups are the industry sector and research institutes. NOK 1 billion has been set aside over three years for the Green Platform Initiative. In 2021, NOK 333 million will be granted to the Initiative.

Through its environment technology scheme, Innovation Norway has supported several projects aimed at recycling and reuse of plastic.

An example of a project that has received support is Oceanize, which recycles old ropes and other plastic waste from the seafood and agricultural industries. Using a portable grinder, marine waste was collected from Stathelle in the south to Aust-Finnmark in the north. Among other things, around 17,000 tonnes of discarded equipment from maritime industries were collected. This waste was converted into plastic granules which was resold and used to make new products. Another project supported by Innovation Norway is Arges, which produces plastic feed hoses for the aquaculture industry. Arges has developed a system in which discarded hoses are collected and shredded into small pieces, before being transported to factories where they are cleaned and turned into granules. These granules are used in completely new products for e.g. the telecommunications industry. A final example is Spilltech, which has developed equipment that collects marine litter in the areas around ports. Spilltech now markets these products to several countries in Europe.

There are also many private alternatives, including the Norwegian Retailers' Environment Fund and other private foundations which support innovation projects.

The Norwegian Government will

- contribute to method development and standardisation for mapping and monitoring of microplastics in the environment and organisms
- further develop the monitoring of macroplastics and microplastics in the Norwegian environment
- put into place the first phase of a monitoring programme on microplastics in the air, coastal waters, freshwater, and urban areas
- contribute to the further development of good and compatible regional monitoring systems for macroplastics and microplastics in water, sediments, and biota, in accordance with OSPAR
- assess possible indicators and parameters for control and mapping in several places along the plastic product value chain
- work to strengthen the sharing of global knowledge as part of a potential new global agreement on marine litter, which includes a global system for reporting and monitoring plastic emissions and plastic pollution in nature
- participate in the Horizon Europe research programme and contribute to research on plastic pollution, preventative measures, and research into a circular economy for plastics
- increase knowledge of the amounts of hazardous substances in plastics, how plastics can act as a vector for the transport of hazardous substances and disease-carrying microorganisms, and how these are absorbed by organisms
- strengthen knowledge of how plastics can become part of non-toxic material cycles, and contribute to use of recycled plastics in the development of new, high-quality products

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