European Commission

ROADMAP			
TITLE OF THE INITIATIVE	Strategy on Plastics in a Circular Economy		
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LIKELY TYPE OF INITIATIVE			
INDICATIVE PLANNING	*Insert hyperlink to forecast report*		
ADDITIONAL INFORMATION	*Insert link to the specific website for the initiative*		

This Roadmap aims to inform stakeholders about the Commission's work in order to allow them to provide feedback and to participate effectively in future consultation activities. Stakeholders are in particular invited to provide views on the Commission's understanding of the problem and possible solutions and to make available any relevant information that they may have. The Roadmap is provided for information purposes only and its content may change. This Roadmap does not prejudge the final decision of the Commission on whether this initiative will be pursued or on its final content.

A. Context, Problem definition and Subsidiarity Check

Context [max 10 lines]

The transition to a more circular economy, where the value of products, materials and resources is maintained in the economy for as long as possible, and the generation of waste minimised, is an essential contribution to the EU's efforts to develop a sustainable, low carbon, resource efficient and competitive economy. Such transition is the opportunity to capitalise on innovation, transforming our economy and generating new and sustainable competitive advantages for Europe. Plastics is one of the five specific priority areas addressed in the "*EU action plan for the Circular Economy* (COM (2015) 614 final)[1]. The Action Plan acknowledges that increasing plastic recycling is essential for the transition to a circular economy, setting out a clear commitment to preparing a strategy that address the challenges posed by plastics throughout the value chain and taking into account their entire life-cycle.

The elaboration of a Plastic Strategy, as proposed under the Circular Economy Action Plan, follows up on the Commission's "Green Paper on a European Strategy on Plastic Waste in the Environment" (COM/2013/0123 final)[2], which launched a broad reflection on possible responses to the public policy challenges posed by plastic waste and provided input to the ongoing review of EU waste legislation.

Recently adopted proposals to review the Waste Framework Directive (WFD) and the Packaging and Packaging waste Directive (PPWD)[3] already address issues such as separate collection of plastic waste and set recycling targets for municipal waste as well as specific recycling targets for plastic packaging. In addition, a legislative proposal to reduce the use of light-weight plastic carrier bags was adopted in 2015 (COM/2013/0761 final). The implementation of the existing acquis, notably the provisions on separate collection of plastic waste is key prerequisite to meet new and existing recycling targets .The plastics strategy intends to support and complement these legislative measures by looking beyond waste management and creating synergies with other relevant actions included in the Circular Economy Action Plan, such as on eco-design, parallel work on the interface between waste, chemicals and product policies, measures to boost markets for secondary raw materials, etc.

By aiming to address the whole lifecycle of plastic and plastic products, the strategy on plastics cuts across a wide range of EU policies - from climate action and the protection of the marine environment to research and innovation and industrial policy.

[1] http://eur-lex.europa.eu/resource.html?uri=cellar:8a8ef5e8-99a0-11e5-b3b7-01aa75ed71a1.0012.02/DOC_1&format=PDF
http://eur-lex.europa.eu/resource.html?uri=cellar:8a8ef5e8-99a0-11e5-b3b7-01aa75ed71a1.0012.02/DOC_2&format=PDF

[2] http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52013DC0123&from=EN

[3] http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52015PC0595 and http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52015PC0596

Problem the initiative aims to tackle [max 25 lines]

Plastic is an important material for our economy. Global plastics production has grown exponentially since the 1960s, reaching 311 million tonnes produced in 2014, which is twentyfold increase. It is expected to double again in the next 20 years; by 2050 we might arrive at a production level of 1.2 billion tonnes annually. The European plastics industry plays an important role in the EU economy, with 1.45 million employees and a turnover of 350 billion, (including converters and machine building producers). While plastics production at EU level remained stable in the last years its share on the global market is decreasing. Over 40% of plastics used in Europe are used in packaging, while 20% is used in construction and less than 10% by the automotive industry. Other applications include furniture, household appliances, electric and electronic goods and 4.2% is used in agriculture. While plastics can be acknowledged as driver of our economy, a number of environmental issues related to their production, use, and end-of-life need to be tackled, as developed below. In particular, externalities are not systematically factored into the prices either of the material itself or the final product. Packaging applications are particularly relevant as plastic packaging waste has a considerable littering potential and represents the largest single application.

Against this background, the new initiative on plastics, as proposed by the Circular Economy Action Plan, aims to address three broad and interrelated issues:

1) High dependence on fossil feedstock

Plastics have played an important role in reducing GHG emissions in many ways (e.g. through light-weight applications). However, more than 90% of plastics today are still produced from fossil fuel feedstock and plastics production gives rise to approximately 400 million tonnes of GHG emissions per year (2012) globally. In the long term, with projected continued growth in plastic demand, this dependence on fossil feedstock can create a problem in terms of security of supply and GHG footprint. If current trends continue unchanged, by 2050 the plastics sector could account for 20% of global oil consumption and 15% of the global annual carbon emissions. Even though increased reuse and recycling, and possibly also current digitalisations trends, should substantially contribute to lessen such dependence, there is still a need to explore the potential of innovative technologies and alternative, more sustainable feedstock, by which the plastics industry should in fact continue to contribute to the decarbonisation of the economy. To advance on this issue, a number of different dimensions may currently deserve further consideration.

1.1 Alternative feedstock: In the long-term, the decoupling of plastics production from fossil feedstock and a related overall reduction in life-cycle GHG impacts is necessary. In addition to the recycling of plastic waste, alternative feedstock such as biomass and CO2 are potentially available. Renewably sourced plastics currently represent one per cent of the total plastic produced annually. Its market is growing by about 20 per cent per year and their production capacity is projected to quadruple in the medium term4. It is estimated that 1 to 2 % of the global agricultural land5 would be necessary to cover 100% of today's plastic production. The use of residues and wastes6 as well as methane and CO2 from biogas or process plants, will reduce this need for land further. However the environmental impacts of alternative sourced plastics still need to be better assessed and compared with plastic production from fossil feedstock. Before making the case for increasing the share of agricultural land dedicated to biomass for plastics, it is necessary to consider cumulative impacts arising from production of food, materials, biofuels, chemicals and others in order to ensure sustainability, minimise the GHG footprint, and to preserve biodiversity.

1.2. Technical barriers to feedstock recycling: Whereas some technologies for processing alternative feedstock for plastic production are already well developed and at the demonstration stage, others still need to be further developed and tested at the industrial scale, such as feedstock recycling that aims at converting mixed plastic waste into virgin polymers that would otherwise be landfilled or incinerated. In some cases this could also be a way of addressing plastic recyclates containing substances of concern, for which no other viable recycling option can be found.

1.3. Incentives for feedstock diversification: There is no level playing field for the use of different feedstock

[4] European bioplastics – market data

[5] NOVA Institute 2014

[6] E.g. Agriculture, food industry waste and residues, waste water treatment , organic fraction of municipal solid waste

for plastic production. Despite the fact that mechanical or feedstock recycling could be viable and constitute more sustainable alternative waste management processes, compared to energy recovery process (e.g. incineration), financial incentives are still granted in favour of less resource-efficient solutions. This hampers investment in plastic recycling in Europe and the reuse of recycled plastics as a chemical feedstock.

2) Low rate of recycling and reuse of plastics

Reuse and recycling of end-of life plastics remains very low, in particular when compared to other material streams. In 2014, the EU generated about 25 million tonnes of plastic waste of which only 26% were collected for recycling. In the EU, landfilling and incineration rates of post-consumer plastic waste are very high and, while landfilling of plastics has decreased over the past 10 years, incineration has been growing. The problem has economic roots as market conditions for plastics recycling are not good (high fixed costs of recycling vs. low market price of virgin material). Many different elements lead to this situation and their relative importance may also vary, depending on the specific application (e.g. packaging, construction materials, WEEE, etc.): small quantities (e.g. per polymer type), difficulty to obtain economies of scale, important process losses - as on average only about half of what is collected for recycling is actually recycled - and quality issues (e.g. linked to presence of additives or due to mixing of different types of polymers). However, good data is missing on many of these issues, including on total plastic flows, export and imports and the composition of these flows.

2.1. **Weak incentives for a market for secondary plastic materials:** The economic incentives for manufacturers/converters to increase use of recycled materials in products and drive toward a more circular model are currently not very strong. In particular low oil and gas prices hamper the development of a market for secondary plastic materials as well as exports of plastics to third countries. The market is not structured in a way that would guarantee a constantly high flow of high quality plastic recyclates.

There is no supportive business environment in place pushing systematically plastic recyclers to provide higher quality and quantity of recycled plastics. While some voluntary industry-led quality standards for recycling practices and for recyclates exist, there are other parts of the industry where such standards are not well established. In the latter case, the expectations of plastic converters for fit-for-purpose recycled plastics, which are able to compete with the corresponding virgin materials, are often not fulfilled. Recycled plastics shall be demonstrated as safe. Moreover, collection of plastics, which makes up a large part of post-consumer waste, still does not generate sufficiently clean and homogenous streams that could enable recyclers to have the purity and scale that could result in improved material streams. Materials with significant recycling potential, for example clean plastic films are not at all collected in most Member States.

There are indications that uncertainties concerning the legal status and regulatory acceptance of plastic waste stifle investments in plastic recycling. This is notably the case for the PVC recyclers which are facing more costly waste management conditions for their plastic wastes which may be considered as hazardous, and for which the conditions for recovered plastics to cease to be waste and become a product remain uncertain and vary from one Member States to another. If recycled, the resulting material, after ceasing to be waste becomes subject to the strict conditions defined under the REACH legislation for placing chemicals on the market (including, as appropriate, authorisation and restrictions).

At present, there is no clear horizontal approach on how to deal with legacy substances in recycled materials, carefully weighting pros and cons of allowing recycling of certain materials versus elimination of the chemicals of concern these may contain, respecting the existing high level of protection of human health and the environment and taking into account the precautionary principle. No suitable assessment techniques, which take into account all relevant aspects (i.e. environmental footprint, risk assessment and socio-economic assessment) to determine the best overall outcome for society, have yet been agreed. The perception of the different operators on the market on the sourcing of recycled materials containing substances of concern, or even of the direct use of materials that have not ceased to be waste in production, varies depending on the materials and the operators and deserves consideration as it may play an important role in determining the viability of different alternative solution to the problem.

2.2. **Low recyclability of plastics:** Another key obstacle to circularity in the plastic value-chain stems from the fact that many plastic materials and plastic products are not optimized already at the stage of the design of materials and products as far as resource efficiency aspects, such as durability, recyclability, reusability or reparability. Plastics are mostly designed to be thrown away and not to be reused, or recycled. Design facilitating recycling seems to be a crucial lever to move plastic towards becoming circular.

The lack of cooperation/agreements across the production chain of plastic goods leads to failures in matching demand and supply needs. The question is to which extent such cooperation could be facilitated by the creation

of platforms involving all actors, with the aim to better engage them into the concept of the circular economy. Self-regulatory initiatives may be encouraged by building upon existing examples (e.g. Vinyl Plus voluntary scheme).

The preparation for re-use and the re-use of plastic products appears to be underdeveloped. Plastic products in applications such as packaging or single-use tableware are often not designed for re-use. Instead, plastic products are often designed to become obsolete after a very short use phase. Furthermore, for durability or functionality reasons, plastic materials in products and articles often cannot easily be dismantled from other parts or from the matrix in which they are incorporated. Plastics are sometimes also specifically elaborated as a composite material constituted by several plastic polymers or by a plastic polymer and another material. In the absence of a more sophisticated sorting technology or an agreed and efficient way of marking system, such mixed polymers may not be detected properly at the sorting stage. If such plastics then enter the recycling process, they can cause large losses for recycling as reflected overall in the low recycling rates.

The presence of certain additives and substances of concern may also impact recyclability of plastics as it remains uncertain how to effectively manage risks linked to the presence of substances of concern in these materials: the lack of traceability of these substances, their hazardousness, the absence of clear procedures to certify waste to product transition are the main issues hindering the use of recycled plastics.

For specific uses, such as for plastics used in construction, it may take a long time before chemical substances of concern are completely out of the loop. The presence of these "legacy" chemicals additives can contribute to the decision of diverting such waste to energy recovery and can result in only a fraction being recycled.

Another problem is lack of information about chemical composition of imported plastics and plastic products. It must however be recognized that often there are important trade-offs between different aspects of material efficiency. It is therefore important to take a value-chain specific approach that recognizes the most important bottlenecks for circularity in a given application and examines options, including for improvements at the design stage on how to resolve these.

For instance, sustainability of packaging materials has to be considered in relation with its functionality. Packaging can influence shelf-life of products, which is an element that needs to be balanced against the need of increasing the sustainability of the packaging material itself. For example, changing packaging of a food product can result in shorter shelf-life, which can contribute to increased food waste, thus displacing the environmental impact. Nevertheless, packaging typically has a short life-cycle and is then discarded, thus improving waste prevention and recyclability is key to improve sustainability. One way of improving recyclability could be for instance the use of compostable food packaging in combination with separate biowaste collection, This would ease biowaste recycling and divert a large part of packaging and food waste away from landfill or incineration. Over-packaging is currently not systematically discouraged and there is a lack of guidance regarding this aspect.

The use of plastics in agriculture and in particular in the fertilising products sector has developed to respond to a need to improve the sustainability of fertilisers, allowing slow-release features for coated fertilisers or improving soil properties with plastic mulches. However, none of these applications in agriculture have been thought to prevent their externalities such as soil pollution with plastic particles. In the case of plastic coatings of fertilisers, designing polymers enabling slow-release of nutrients from fertilisers over a growing and then disintegrating in the environment illustrates another trade-off that manufacturers shall consider (durability vs. degradability). For plastic mulches, collection and management of the materials after use shall be considered together with biodegradability of the materials in soil, considering also that complete biodegradability is mostly not attained.

Other product categories where better design may help to reduce externalities include e.g. single-use objects that are not packaging (e.g. disposable plastic cutlery-wares), construction plastics and plastics used in automotive and electric and electronic equipment. Furthermore, emerging innovative "plastic" materials, such as carbon fibre material which is produced in increasing quantities may lead to a better environmental footprint for the associated applications (due to the lightness of the material), but at the same time at the risk of making recycling more difficult.

3. Significant leakage of plastics into the environment

It has been estimated that globally, 8 to 10 million tonnes of plastic waste leak out of the waste management systems and end up in the environment, in particular in the oceans.. Plastic packaging is estimated to represent the highest share of such leakage, as its weight, size and low-value make it particularly prone to uncontrolled disposal. As regards marine litter, while land-based sources are predominant, sea-based sources such as shipping or fishing are also not negligible. This problem is global in nature, as the bulk of such plastic leakage takes place outside of the EU (in particular in fast-growing Asian economies) and collective efforts are needed to address it. In developed countries, new sources of plastic leakage, in the form of e.g. micro-plastics, are on the rise, posing new potential threats to both animal and human health. Micro-plastics – used intentionally in some

products or generated during the products' life cycle, for example through car tyre wear or from washing clothes – are of particular concern as their small size (less than 5 mm) increases their potential toxicity and increase risk of entering the food chain.

3.1. Negative impacts on marine-related bio-diversity, human health and economy: Marine litter has been identified as a significant threat to marine biodiversity and human health, but also to the marine related economy. Plastics are in large quantities subject to uncontrolled release into both the terrestrial and marine environment. Plastic littering is a significant factor in the high influx of plastic waste into rivers and ultimately to the marine environment.

The level of marine pollution with plastic debris, in particular with micro plastics, has been described as alarming. It is commonly estimated that on average, worldwide, 80% of plastic marine debris stems from land-based sources, with some regional differences. Together with littering and uncontrolled landfilling of plastic this phenomenon has a high pollution potential and is a waste of valuable resources.

The impacts of marine litter on marine life are manifest: recent research reveals that the number of species known to have been affected by either entanglement or ingestion of plastic debris has doubled since 1997. There is also growing awareness of the potential impacts on human health and of high social and economic costs. In some cases such costs have been quantified (€600 million per year for annual beach clean ups in the EU; approximately US$622 million a year for the tourism sector of the APEC region (Asia pacific Economic Community)). The potentially immense costs of (in some cases irreversible) degradation of marine and coastal ecosystems and harm to biodiversity are far from being fully monetized, but the case for action is clear.

EU and Member States have collectively committed to take action to achieve significant reductions of marine litter by 2025 (Rio+20 and SDGs). The 2014 Circular Economy Communication refers to an aspirational 30% reduction target for litter items found on beaches and for fishing gear found at sea. Unless baselines of litter quantities and items are established, it will not be possible to monitor progress in reducing marine litter.

Marine litter is a global challenge that would require closer international cooperation, in particular with developing countries. Without tackling the international hot spots of plastic marine pollution, no effective action can be taken on marine litter. Effectively addressing the International dimension of plastic marine pollution focusing on hot spots is still a challenge.

Microplastics have become a matter of raising concern, both in the marine and terrestrial environment. According to recent estimates[7] the quantities of microplastics are substantial: between 80,000 and 219,000 tonnes of microplastics from products could be entering European seas per year, while additional 68,500 to 275,000 tonnes come as larger plastic pieces, which will eventually fragment in microplastics if not removed in time from the beaches or the sea. In spite of data gaps and methodological uncertainties, several studies at national, regional and EU level[8] [9]agree that, by far, the largest source of microplastics from products in the marine environment is car tyre wear and converge to attributing approximately 3-4% of microplastics from products to cosmetics and 10-20% to paints, while there are other potentially important sources such as pellet spills, textiles and artificial turfs.

Their small size increases their potential toxicity, and makes their constituents available to organisms throughout the food-chain. Although the consequences of plastic build-up in the food chain are not fully known, human health concerns are being raised regarding the potentially high contamination of food chain with plastic additive.

A recent statement from the European Food Safety Authority (EFSA) reveals that, while there are many data gaps on the effects of microplastics for human risk assessment, experimental evidence indicates that microplastics have the potential to be transferred between trophic levels and that small microplastic and nanoplastics may penetrate deeply into organs[10]. The transfer of contaminants from the marine environment to sea- food and microplastics is therefore a matter of increasing concern[11].

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[7] http://ec.europa.eu/environment/marine/good-environmental-status/descriptor-10/pdf/MSFD%20Measures%20to%20Combat%20Marine%20Litter.pdf

[8] http://ec.europa.eu/environment/marine/good-environmental-status/descriptor-10/pdf/MSFD%20Measures%20to%20Combat%20Marine%20Litter.pdf

[9] See: http://ec.europa.eu/environment/marine/good-environmental-status/descriptor-10/pdf/MSFD%20Measures%20to%20Combat%20Marine%20Litter.pdf

[10] http://www.efsa.europa.eu/sites/default/files/scientific_output/files/main_documents/4501.pdf

Other reasons of concern are related to Persistent Organic Pollutants (POPs) released by microplastic particles, that may finally end up in seafood. Some microplastics are used intentionally in products (such as exfoliating components or industrial abrasives) while others are generated as a consequence of use, for example through washing clothes and are dispersed by the wind or via sewage or are generated from fragmentation of larger pieces (secondary microplastics). The use of non-biodegradable plastic polymers in agriculture (e.g. coated fertilisers or plastic mulches) is in the long-term contributing to the problem. Specifically in Europe with its generally high standards for waste water treatment, a considerable discharge of microplastic occurs to water bodies through effluents from waste water treatment. The spreading of sewage sludge containing plastic impurities may also lead to diffuse pollution of soils.

3.2. Lack of a clear sustainability framework for biodegradable plastics: Increasing market shares of plastics with biodegradable properties could be considered as positive development in certain specific circumstances, but could lead to exacerbate the misbehaviour of consumers and increase the existing leakage problem. Indeed, further use of biodegradable plastics should only be incentivised if there is a proven environmental added-value and if accompanied by clear information for users/consumers. Otherwise biodegradable plastics could potentially lead to the further release of micro-plastic both in soils and water.

Although no plastic is fully biodegradable (at least not in the aquatic environment), plastics might have a smaller impact on the environment if the materials was to biodegrade under certain conditions. Today, the market share of biodegradable plastics is still rather low and there is no commonly agreed definition about what is a biodegradable plastic in the broadest sense (biodegradable, compostable, home-compostable). The absence of appropriate standards is not allowing a clear-cut sorting between the plastics according to their capacity to degrade easily in the environment or under controlled conditions (industrial composting, home-composting). It should also be assessed when biodegradability could be an asset, and when not, as reuse and recycling remain the first options.

While a standard on home compostable plastic bags will be developed soon, in the absence of commonly agreed standards it is difficult to make full use of instruments such as green public procurement to favour more environmentally-friendly plastics. Moreover, Member States may take action to reduce the environmental footprint of plastics by banning non-biodegradable plastics for specific uses, which may lead, in the absence of European or internationally agreed standards, to trade barriers within the Internal Market.

More and more products made of plastics claim to be biodegradable or to be produced from recycled materials. However, in the absence of commonly agreed standards or methodologies it is also difficult to assess whether such claims are true and could therefore enable consumers to take informed decisions.

It is also necessary to bear in mind that currently automatic sorting of plastic waste does not seem to allow an operational differentiation between biodegradable and conventional plastics. This can easily lead to cross-contamination of waste streams and hamper plastic recycling.

There is also the particular issue of oxo-degradable plastic, which only breaks down into very small particles with high environmental impact. Such plastics pose therefore specific environmental risks.

3.3. **Low levels of consumers' awareness:** Finally, individual behaviour plays a major role in the significant leakage of plastic goods into the environment. In particular for low value plastic goods (e.g. plastic bags) there are currently very few incentives for the consumers to keep plastic wastes in controlled circuits and therefore uncontrolled disposal may occur despite the obvious environmental damages that it causes. The effectiveness of awareness raising and educational programmes as well as of extended producer responsibility schemes shall be carefully re-examined at EU level. Better information should enable consumers to take informed purchasing decisions for more sustainable plastic products.

Subsidiarity check [max 10 lines]

The EU's right to act is based on articles 114 and 191 of the Treaty on the Functioning of the European Union (TFEU).

The main problems addressed by this initiative cannot be addressed through exclusive action at the level of the Member States because of their trans-boundary nature (e.g. marine plastics pollution) and of potential ramifications for the internal market. In the absence of a strategic European dimension, uncoordinated or unilateral actions by the Member States (e.g. regarding to product design) would risk increasing market

fragmentation. While actions at national and local level can help address some the problems' drivers (e.g. ensuring good implementation of the waste management rules or using economic instruments to encourage more sustainable practices), a number of key obstacles to e.g. higher plastic reuse and recycling can potentially be removed at lower societal costs through EU action (e.g. by creating the right framework for economies of scale in recycling, improving cooperation and information flows across a trans-national value-chain, avoiding market fragmentation and ensuring a level playing fields for economic operators).

B. What does the initiative aim to achieve and how [max 25 lines]

The strategy aims at (1) improving the economics, quality and uptake of plastic recycling and reuse (2) reducing plastic leakage in the environment and (3) decoupling plastics production from fossil feedstock and reducing its life-cycle GHG impacts.

Pursuing these objectives should directly contribute to the implementation of the Circular Economy action plan, but also to the EU's jobs and growth agenda and the Energy Union's vision for a low carbon, energy efficient economy.

Indeed, the Strategy should seek to improve framework conditions for investments and innovations that enable the plastic and related industries and the entire value chain using plastics to become more circular, resource-efficient and reduce its carbon footprint, in line with the climate and energy goals of the EU. It will require innovation of the whole plastics system, built on a shared vision and enhanced cooperation between all stakeholders.

In preparation of the strategy, a number of different actions will be explored with a view to identifying those with the strongest EU-added value and highest impact in tackling the problems identified.

[Below there is a preliminary, non-exhaustive list of actions that are likely to be subject to further assessment in the context of this initiative:

- *Conduct a life cycle assessment (LCA) of the use of alternative feedstock for plastic production (biomass, waste, recycled plastics, CO_2) in comparison to using oil and gas, taking into consideration: (1) carbon footprint (2) resource efficiency performance, (3) sustainability including an analysis of cumulative impacts of the use of biomass for the production of biofuels;*
- *Further mobilise Horizon 2020 to support research and innovation throughout the plastics life-cycle, including: new feedstock (e.g. bio-waste), new materials, biodegradability, traceability of chemicals in plastics better sorting, recycling and re-use, technologies, reducing plastic leakage into the environment, promoting education and awareness throughout the plastic value chain or stimulating new business models.*
- *Stimulate private investments in plastic re use and recycling, such as feedstock recycling of mixed plastics, and the reuse of CO_2 for plastics production, by capitalising on the European Investment Plan and taking full advantage of Structural Funds.*
- *Review State Aid rules and/or related guidance documents with the objective to prevent a negative impact of publicly supported investments in waste management on mechanical and feedstock recycling.*
- *Promote the creation of a market for recycled plastics, by supporting the further development of industry-led quality standards for secondary plastic raw materials and a quality assurance scheme for plastic recyclers.*
- *Consider product-specific measures or guidance, in particular in the field of product design to increase durability, re-use, modularity, reparability and recyclability, enabling inter alia, preferential treatment schemes (e.g. differentiated fees within Extended Producer Responsibility schemes, bonus/malus system depending on the recyclability of the plastic materials, clear labelling of recycled plastics etc.) or the use of economic instruments and other incentives at national level.*
- *Consider measures supporting the use of plastics fulfilling agreed/harmonised biodegradability criteria where there is an environmental added value evidenced by a life cycle assessment. For example, consider the inclusion of relevant biodegradability criteria in product legislation, e.g. in Fertilisers Regulation for biodegradable mulch films, based on an impact assessment*
- *Support the development of industrial fora and platforms that would facilitate systemic innovation by enabling different actors of the production and downstream value chains to cooperate towards more circularity in the plastics economy[add measure tackling the problem of insufficient cooperation and exchange of information along the value chain]*
- *Raise the awareness and provide consumers with clear and correct information about recyclability and bio-degradability claims;*
- *In the context of on-going work on the interface between waste, chemical and product policy, explore actions that would help address barriers to re-use and recycling of plastics that are linked to chemical compositions (e.g. presence of legacy substances).*
- *Improve the development and implementation of Extended Producer Responsibility Schemes throughout the European Union;*

- *Based on the analysis of measures adopted by Member States to reduce marine litter and the progress of work on baselines, explore options for necessary additional measures per type of litter, on how to achieve the 30% reduction target for marine litter, including options to reduce the release of the items most commonly found on beaches and of fishing gears, and for setting the EU quantitative reduction target for marine litter by 2020 as required by the 7th EAP;*
- *Improve data gathering of both health and environmental effects and costs of leakages of plastic in the environment and an estimation of clean-up costs.*
- *Launch a study to determine of priority sources of microplastics, including product groups and options to reduce emissions of microplastics from each of those.*
- *Explore options to prevent and reduce the release of microplastics to the terrestrial and aquatic environment, including through innovations in sewage and storm water collection and waste water treatment, and consider imposing restrictions of the use of microplastics in cosmetics and other applications prone to leakage (e.g. detergents, paints, textiles, tyres);*
- *Ensure better implementation of existing waste legislation to avoid plastic waste influx into the aquatic environment, notably through separate collection of plastic waste, eradication of illegal landfills and elimination of landfilling of untreated/unsorted waste;*
- *Induce global action to combat marine pollution by using all possible international channels, including SDGs, UNEA, G7, regional marine conventions, Basel Convention, new neighbourhood policy, and development policy;*
- *Launch under the European Partnership Instrument concrete projects to facilitate technology transfer that aims to reduce marine littering internationally and promoted the collection and recycling of plastics from the environment; and streamline actions against marine litter supported by EU development aid;*
- *Develop a framework ensuring sustainable use of biodegradable plastics, and promote transparency on biodegradability claims;*
- *Develop and adopt EU-harmonised criteria for biodegradability ("in open-air conditions"), as well as for compostability and home-compostability that increase market transparency and help recyclers to develop appropriate sorting and waste management practices. This action could be followed up by a Standardisation request to develop European standards where needed;*
- *Assess possible incentives to reduce the use of oxo-degradable plastics;*
- *Improve the monitoring of plastic flows (import, export, composition)]*

C. Better regulation

Consultation strategy [max 10 lines]

The launch of stakeholder consultations related to this initiative will be announced in the consultation planning that can be found at http://ec.europa.eu/yourvoice/consultations/docs/planned-consultations_en.pdf.

Impact assessment [max 10 lines]

The strategy will set out actions in order to tackle the problems defined above. All the actions considered will be taken forward in line with the Better Regulation principles, including, where appropriate, through the preparation of Impact Assessments.

Evaluations and fitness checks [max 5 lines]

The impact assessment on the revision of waste legislation has assessed the economic and environmental benefits of plastic waste/plastic product related measures leading to more separate collection, more recycling and generally a higher availability of separately collected materials. The Fitness check of five waste stream Directives[12] also covered the Packaging and Packaging Waste Directive and evaluated, inter alia, ex-post the effectiveness, efficiency, relevance and coherence of provisions relating to plastic packaging waste.

A study form November 2010 on: "Plastic Waste in the Environment" is available and is still a pertinent source of information to address fundamental questions about the plastics economy.

Abundant further information, generated after 2010, is available from several sources such as industry, international organisations, NGOs and academic institutions.

The Commission is currently assessing the need to launch additional studies targeting on some the specific problems identified in this roadmap, with a view to gather additional information or assess potential solutions.

[12] ADD REF