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DEPARTMENT OF INSTITUTIONAL RELATIONS
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Strategy on Plastics in a Circular Economy

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EXECUTIVE SUMMARY

SUEZ welcomes the Commission's focus on plastics as a priority area identified in the *EU Action Plan for the Circular Economy*. The consultation on the Commission's *Green Paper on a European Strategy on Plastic Waste in the Environment* (to which SUEZ responded) was an important first step in the formulation of a strategy addressing the use and disposal of plastics. We share the position of the Commission with respect to these initiatives as they are "an essential contribution to the EU's efforts to develop a sustainable, low carbon, resource efficient and competitive economy".

SUEZ is involved in all aspects of the plastic value chain. SUEZ also provides recycled plastic pellets that are used in producing new plastics which completes the circular cycle, and has an active research and innovation platform, working with actors up and down the supply chain to improve product design and sustainable management of this material. SUEZ is also on the Steering Board of the Ellen MacArthur Foundation's Project MainStream, and leads its initiative on plastics.

We are pleased to respond to the Commission's invitation to provide views and contribute in a constructive way to the development of the future Strategy on Plastics. Our memorandum address four topics: prevention, production, recycling and leakage.

SUEZ proposes a set of recommendations which are summarized below, and are detailed in the ensuing paragraphs:

- I. **High dependence on virgin fossil feedstock should be reduced but further research is needed on alternative feedstock.**
- II. **Caution is needed with respect to biodegradable plastics.**
- III. **Strong political policy and support is needed to increase the low rate of recycling and reuse of plastics.**
- IV. **Introduce a specific pillar on Prevention, in the Strategy on Plastics.**
- V. **Measures and action needed to be taken at EU level to reduce leakage of microplastics into the environment.**

1. High dependence on virgin fossil feedstock should be reduced but further research is needed on alternative feedstock

Decoupling plastics from fossil feedstock would allow the plastic packaging industry to complement its contributions to resource productivity during use with a low-carbon production process, enabling it to effectively participate in the low-carbon economy. **Creating an effective after-use economy is key to decoupling** because it would, along with dematerialisation levers, reduce the need for virgin feedstock.

Another central part of this effort would be the development of renewably sourced materials to provide the virgin feedstock that would still be required to compensate for remaining cycle losses, despite the increased recycling and reuse.

Bio-sourced plastics can be processed out of second-generation feedstock such as straw, starches and cellulose fibers (via the sugar route) or even out of kitchen waste (via the volatile fatty acids route). However, the majority of running production technologies for bio-based plastics available today are based on the processing of first generation carbohydrate-rich crops such as grains, corn, potatoes, sugar beet/sugar cane or vegetable oils (e.g., soybean oil, castor oil, palm oil). It is important to note that many different types of bioplastics exist, each with different environmental strengths and weaknesses, so not all bioplastics can be treated as equal. Using first generation bio-sourced crops requires applying regenerative agricultural principles and taking the impacts of the agricultural processes, including land use and biodiversity, into account.

Innovators claim that production of non-fossil based plastics is already cost-competitive with current fossil-based plastics for certain applications and could qualify as carbon negative materials. **However, most often, the production of bio-sourced plastics are more costly and time consuming and do not necessarily qualify as carbon negative materials in all cases.**

2. Caution is needed with respect to biodegradable plastics

Bio-sourced plastics are often misunderstood with **biodegradability**. Not all bio-sourced plastics are biodegradable and if they are, different levels of biodegradability exist. Biodegradability also exists for some fossil sourced plastics depending on the polymer composition (for example, Polycaprolactones (PCL)).

However, one should be cautious about biodegradable plastics for the following reasons:

- **Conditions of biodegradability:** The biodegradability process occurs in specific conditions of temperature and humidity. The European standard EN 13432, published by the International Organization for Standardization, defines how quickly and to what extent a plastic must be degraded under the tightly controlled and aggressive conditions (at or above 60 °C) of an industrial composting unit for it to be considered biodegradable. This standard applies only to industrial composting units and does not set out a standard for home composting. Most bioplastics (e.g. PH) only biodegrade quickly (around 12 weeks) in **aerobic industrial composting units**. These materials do not biodegrade quickly in ordinary compost piles or in the soil/water. Starch-based bioplastics are an exception, and will biodegrade in normal composting conditions. **It is important to note that a bioplastic which is declared "100% biodegradable" is in fact 0% degraded in an anaerobic digestion plant.**
- **Time of degradation:** Many years are required for plastics to biodegrade resulting nevertheless in waste pollution in the meantime. With respect to biodegradable plastics in Waste Water Treatment Plants, the plastic does not biodegrade in the time that the sludge is present in the plant. If chemicals are used, it will only break down the plastic into smaller pieces.
- **Biodegradable plastics do not serve the circular economy:** They are not recyclable and do not necessarily reduce the carbon footprint of plastics.
- **Biodegradable plastics hinder recycling:** Biodegradable plastics pollute the flow of recyclable plastics. Biodegradable plastics mixed with recyclable plastics **will reduce the mechanical properties of the recyclates**. To avoid that, there would need to be a separate collection of biodegradable plastics which does not exist at the moment.
- **Additives and pigments contained in biodegradable plastics:** Biodegradable polymers contain the plastic molecule itself and also a numbers of additives which gives special properties (Anti-oxidant, anti UV, demolding agents, pigments...). Even if the base molecule can degrade, other additives could be released in the soil and in the oceans.

SUEZ notes the discussion on biodegradable plastics in the Roadmap, but questions its inclusion under Theme 3 concerning "Significant leakage", rather than also under Theme 1 concerning alternatives to virgin feedstock. In particular, Item 3.2 (sustainability framework for biodegradable plastics) is more relevant to the production of plastics from renewable sources, than to leakage into the environment *per se*. As presently worded, its inclusion under Theme 3 implies that leakage into the environment is tolerated provided the material biodegrades, which of course is not the message the Commission intends to convey.

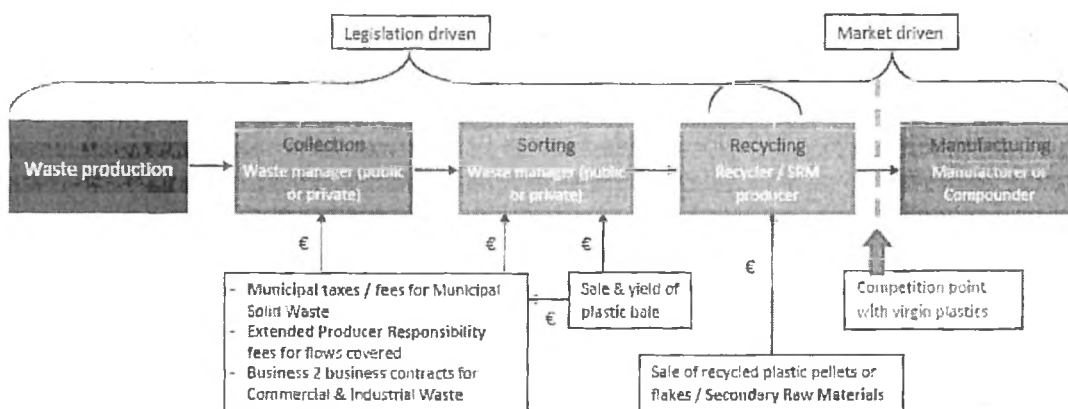
SUEZ's position on biodegradable plastics in the current recyclables stream is that it should be avoided at all costs. However, SUEZ can see the justification for biodegradable plastics (particularly bio-sourced plastics) being used for compost as long as it is processed industrially. It should be noted that bio-sourced plastics that are biodegradable will require separate collection streams (example: brown bag for household organic waste) to be put in place and concerted efforts from consumers to separate their waste correctly. This demands increased levels of public educational initiatives.

3. Strong political and policy support is needed to increase the low rate of recycling and reuse of plastics

1. How can the economic incentives and market conditions be improved for the reuse and recycling of plastics in Europe?

The market for recycled materials answers two different logics, one driven by legislation, and the other driven by the market and that competes with virgin plastics. Issues of unfair competition arise at the junction when an industry driven by legislation enters in competition with an industry driven by market forces.

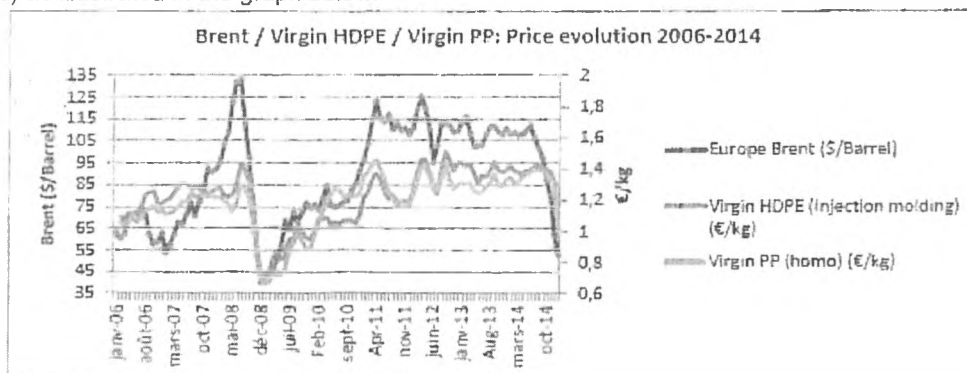
Plastic recycling: Legislation and Market driven competing logics



Sources: See footnote number 3

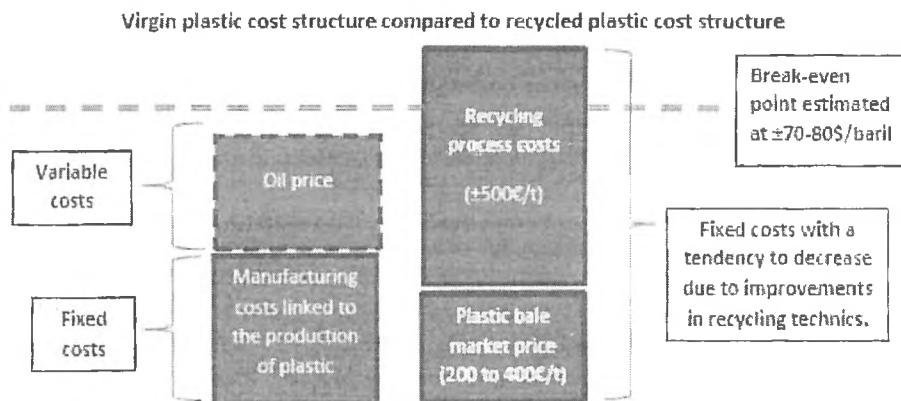
This point is a key issue. The market price of the recycled plastic typically follows the virgin plastic price as these compete for the same demand; even though the price for virgin plastics and recycled plastics follow completely different supply chains, costs and processing trajectories. A discount is typically applied to recycled plastics compared to virgin plastics with percentages depending on polymers, for example: recycled HDPE is usual sold at a maximum value of 80% of the virgin HDPE price, and recycled PP at a maximum value of 90% of the virgin PP price.

The price driver is the virgin plastics which is intimately linked to the evolutions of oil price (except rare short term exceptions) as illustrated in the graph below.



Source: See footnote number 3

However, contrary to the virgin plastics, the recycled plastics cost structure is not correlated with crude oil (see below)¹.



Source: See footnote number 3

Given this structural difference in the cost structures of virgin and recycled plastics that compete on the same market, **corrective measures need to be taken to cover this cost gap by supporting demand for recycled plastics.**

2. What are the barriers to the market uptake of reused and recycled plastics and which incentives are needed to create a market and demand for recycled plastic materials?

Market forces have tried to answer this issue through voluntary agreements, or through contracts that work by giving "tunnel prices" in which risks are shared by both parties in a price tunnel (agreed maximum and minimum price) acceptable for both parties. But the variations are too important to be covered in this way. Voluntary agreements do not hold due to competition from companies not in the voluntary agreement and the "tunnel price" based contracts are only viable in small ranges and low volatility, becoming obsolete as the oil price is subject to strong variations.

The need to synchronize demand-side with supply-side measures cannot be over-stated. Even at current levels of recycling, **25% of the recycled materials produced have to be exported** because of the lack of markets in the EU. This increasing mismatch between the dynamics of supply and the dynamics of demand has drawn the European recycling sector into a state of crisis: plant closures, bankruptcies etc.

EU, Member State and local actions are necessary to cover the cost difference and stimulate demand for recycled plastics, supporting a sector that produces local, non-delocalizable jobs and environmental benefits.

The measures considered here along the whole value chain are diverse in their nature and in the level of complexity to implement; but all have a role to play. In the context of a paradigm shift and in the absence of a carbon tax, such measures seem absolutely necessary. The classic tools such as landfill taxes and *Pay-as-You-Throw* have limits in terms of efficiency, as shown in Member States where recycling is not progressing anymore (e.g. Belgium), and need to be complemented by tools that give more value to recycled material, translating its environmental and social benefits into economic value. The measures proposed include:

- **Legislation promoting minimal recycled plastic content in certain packaging should be introduced.** California did so by imposing a minimum of 25% post-consumer recycled content². There is thus no reason that this could not be done at European level for certain packaging. This type of legislation would drive the demand market that is so desperately needed today.
 - **The ban from China of certain plastics ("National Sword") which will take effect January 2018, makes finding measures to increase the demand for recycled plastics all the more**

¹ Graphic Sources: Infomine, EIA, ZACKS, EDF, The Wall Street Journal, WRAP Materials Pricing Report, PIEWEB.

² The California Rigid Plastic Packaging Container Law 1991, amended last in 2013.

important. This recently announced ban has already tremendously affected recycled plastics prices and offtakes: as an example, prices for low quality LDPE films were down by 150€ per ton in September. Concerning the effects of the ban in the short term, incineration will not be able to handle the surplus of recycled plastics (high calorific value) as they need to maintain a steady calorific value in order to protect the machinery. Landfill can also only accept a certain quantity. Finally, it will be difficult to stock these plastics at waste management sites due to overcapacity issues. It should be noted that China's imports of waste plastics have been around 8 million tons per year.

- **Upgraded product policies (Ecodesign and Ecolabel Directives notably)**, and voluntary agreements on incorporation of recycled materials into products. Products should be designed with recycling in mind to prevent waste and to be easily reused, dismantled and recycled.
- **Leverage the Extended Producer Responsibility schemes** to favor Ecodesign and recyclability through bonus-malus systems (e.g. Eco-folio and Eco-emballages (now Citeo) in France) and to develop selective collection.
- **More ambitious Green Public Procurement** through a binding target included in mandatory National Action Plans and supported by harmonized and upgraded green criteria, as well as supportive training of civil servants. For example, France recently voted a law requiring for 25% of recycled paper in public procurement by 2017 and 40% by 2020.
- **Carbon incentives schemes** can provide the much needed support for the recycling industry. Around 7% of European plastic consumption (48M tons/year) is recycled plastics (which equals 3,4M tons)³. It should be noted that only 5% of plastics is recycled worldwide which means that the figures in most emerging economies are even lower. Multiplying this recycling rate of 7% by 3, up to 20% would bring major positive externalities leading to 9,6M tons of plastics recycled (some industry players have achieved higher rates: e.g. 25% recycled content as a voluntary measure). Benefits of an increased recycling rate (of 20%) would include the following:
 - ✓ 15,4M tons of avoided CO2 (1,6 tons of avoided CO2 per ton of recycled plastic⁴)
 - Equivalent to 616M€ (at a price of 40€ tons of CO2), and
 - 64 €/ton of support for the 9,6M tons of recycled plastics.
 - ✓ Local job creation in the EU (non-delocalizable).
 - ✓ Reduction of 120M barrels of oil imports into the EU which results in an improvement of EU commercial balance.
 - ✓ Supports the survival of the recycling industry before the CO2 market reaches 40 €/ton.
- Drafting guidelines for the Member States on adequate **fiscal incentives**: reduced VAT on recycled materials, tax shelters, capital allowances...
- Measures to ensure **funding of circular projects**: support funds such as Orplast⁵, Investment Plan for Europe (Juncker Plan); European Structural & Investment Funds and European Banks subject to circular conditionality.
- Measures to **leverage and consolidate the Internal Market**: EU Electronic Data Interchange for Waste shipments and harmonizing the registration process for the establishment of traders.

Within this framework some comparative LCA would be useful in order to compare the relevance of the potential options in order to aim at the optimal environmental benefit.

Wherever possible, market forces should be allowed to shape business decisions and regulation should be as light as possible. However, in the case of the circular economy it is clear that structural market flaws lead to market

³ 7% of 48M tons = 3,4 M tons of recycled plastic actually consumed in industry at the end. Plastic recycling rate given in EU statistics (26% in 2012 for example) are biased as they count mainly source separate collection, or sorting operations, and not effective use in an industrial process. This explains the big difference. Also these 2 statistics do not use the same base, as the recycling rate is counted on the waste generated, while the 7% reflects the % of total plastic consumed coming from recycled plastics.

⁴ 1,6 tons avoided / ton of recycled plastic consumed: Source: ADEME, PET (+ or – depending on polymer, PET serves as middle reference).

⁵ <http://www.entreprises.gouv.fr/conseil-national-industrie/lancement-du-dispositif-orplast>

signals, and especially price signals, that are simply not strong enough for businesses to deliver on their own, the outcomes the Commission is aiming for. Market forces alone have not been sufficient and we need a long term and ambitious policy framework to provide legal certainty which will thereby encourage investments by waste management companies in more efficient resource management techniques, in line with the waste hierarchy.

For SUEZ, the priority should be to require recycling of certain polymers and promote energy recovery when recycling is not technically or economically reasonable.

4. Introduce a specific pillar on Prevention, in the Strategy on Plastics

SUEZ agrees with the three headline issues identified by the Commission as the principal pillars of the Strategy on Plastics. However, despite the importance the Commission attaches to the waste hierarchy, *waste prevention* is conspicuously absent from the Commission's aims and objectives as stated in Section B of the Roadmap.

We propose that the Strategy leads with the theme of *Prevention of plastic waste*. The Commission has recognized the importance of waste prevention in the Roadmap, referring to Directive (EU) 2015/720 on reducing the consumption of lightweight plastic bags. The commission's review of measures to prevent the entry of microplastics (including a potential ban on microbeads in cosmetics) also falls under this theme. The adoption of *Prevention* as the first pillar of the Strategy will provide the Commission with a focus for the consideration of policy initiatives that do not fall under any of the three proposed themes. These might include, for example:

- Measures to promote more efficient production and product design. For example, the Austrian "Zero Pellet Loss" initiative aims to reduce pellet losses during production and conversion.
- Fiscal and regulatory measures such as a levy on single use carrier bags and a ban on microbeads.
- Awareness-raising campaigns aimed at consumers and industrial workers, highlighting the negative impact of single use products and the promotion of multi-use products.
- Sharing of best practices between municipalities, consumers and industrial stakeholders.
- Measures to prevent litter.

Adopting this recommendation will bring the Strategy on Plastics in line with other EU initiatives, for example on food waste reduction, where waste prevention rightly forms the cornerstone of the Commission's approach.

5. Measures and action needed to be taken at EU level to reduce leakage of microplastics into the environment

Microplastics are commonly defined as particles or fibers with a diameter < 5 mm consisting of polymers from diverse sources: cosmetics, personal care products, textile fibers etc. Tiny plastic particles washed off products such as synthetic clothes and car tires could contribute up to 30% of the 'plastic soup' polluting the world's oceans and – in many developed countries – are a bigger source of marine plastic pollution than plastic waste⁶. Disintegration of macroplastics would have a significant contribution to this type of pollution.

Waste Water Treatment Plants (WWTP) are currently not designed for the retention of microplastics during wastewater treatment, so that a part of these end up in the natural environment. Nevertheless, WWTP are able to eliminate around 85% of microplastics. However, by implementing main flow advanced filtration treatment such as membrane ultrafiltration techniques, more than 95% of microplastics could be eliminated. Studies are taking place in Member States to analyze the amounts of microplastics in these plants and in subsequent rivers and oceans, but these studies follow different protocols and sampling techniques. It should be noted that microfibrils found after the treatment process in WWTP are not only plastic based. Microplastics are concentrated in sludge

⁶ Source IUCN Report: Primary microplastics in the oceans: a global evaluation of sources (2017).

during the treatment process which, in some countries, is in turn used as compost for agricultural farming. No research so far that has been mandated by the EU to analyze this.

Microplastics and macroplastics are also swept into the stormwater drain, and into the waterbodies. Commonly, during strong rainfalls there is an overflow of polluted rainwater into waterbodies. Efficient stormwater systems could prevent, beside flooding, pollution runoff.

Marine litter, including microplastics, is a global challenge in the marine environment that needs holistic solutions involving many stakeholders, also taking into account the polluter pays principle.

Solutions should be found, such as source control actions to reduce marine litter and product-oriented actions at European level, especially related to microplastics⁷.

- more research into the sources of microplastics,
- legislation to ban and substitute microplastics in personal care and cosmetic products and detergents,
- use of eco-labelling and information on microplastics in products,
- legislation to avoid non-degradable wet wipes in waste water, and
- Innovative research for improved technologies, e.g. for laundry washing and textile finishing.

In addition, more investments are needed in Waste Water Treatment Plants (WWTP) for equipment and R&D. There should also be stormwater management regulation through water quality requirements in order to reduce microplastics and macroplastics runoff and improve receiving waterbodies quality.

Conclusion: The Plastic Strategy put forward by the Commission is a crucial step in the right direction. Directives and legislation is required to ensure progress is made whilst ensuring an adequate match between the dynamics of supply and the dynamics of demand. Recycling faces both technical and economic limits, that only innovation can overcome. Some waste flows cannot be recycled in acceptable economic and technical conditions and will have to be either transformed into energy or landfilled according to the hierarchy established by the Waste Framework Directive.

SUEZ in short:

We are at the dawn of the resource revolution. In a world facing high demographic growth, runaway urbanisation and the shortage of natural resources, securing, optimising and renewing resources is essential to our future. SUEZ (Paris: SEV, Brussels: SUEB) supplies drinking water to 92 million people, delivers waste water treatment services to 65 million, collects waste produced by almost 50 million, recovers 14 million tons of waste each year and produces 5.138 GWh of local and renewable energy. With 80,990 employees, SUEZ, which is present on all five continents, is a key player in the sustainable management of resources. SUEZ generated total revenues of €15.3 billion in 2016.

⁷ Source : EurEau