

## **Towards toxic-free plastic and more sustainable recycling**

Green week 2014 – 4.4 Making plastic fit for the circular economy

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### **More sustainable recycling**

The 7th Environment Action Program has a long-term vision for 2050, of people living well within the planet's ecological limits. Prosperity and a healthy environment stem from an innovative, circular economy where nothing is wasted and where natural resources are managed sustainably. In addition, the program sets out a long-term vision of a non-toxic environment, where attention is given to products containing chemicals that constitute a health risk for humans or the environment. The Products we use today and tomorrow will become waste in the future. There is therefore a clear need for a close link between the work for increased resource efficiency and for a non-toxic environment. Instruments for increased recycling of plastic waste should aim both at quantity and quality, and hence sustainable non-toxic resource cycles.

### **A high recycling rate makes sense**

Recycling of plastic reduces greenhouse gas emissions and use of energy over the life cycle, and leads to increased resource efficiency. Reduced littering of plastic waste on land and in the marine environment is a positive side effect of a better infrastructure for the collection of plastic waste.

At the same time, it is important to ensure that hazardous substances are not part of the resource cycle. Data from monitoring demonstrates that we are accumulating many hazardous substances in our bodies. Even in the Arctic, far away from the sources of pollution, humans and wildlife have worryingly high levels of some hazardous substances. Recycling of plastic may in itself lead to more exposure to these substances.

### **Some types of plastic waste contain hazardous substances**

Both the Commission Green Book on plastic waste and the Parliament report on the same issue, points to the problem that plastic may contain hazardous substances thereby prevent the safe recycling of plastic waste.

Our knowledge shows that the most important substances found in plastic waste are heavy metals, softeners, flame retardants and chlorinated paraffin. These substances are often found in plastic waste from electrical and electronic equipment, end of life vehicles and construction and demolition waste.

### **Potential for increased recycling of plastic waste from different sectors**

Recycling of plastic waste has so far mainly concentrated on plastic waste from packaging. Plastic waste from packaging means large quantities of plastic with a low content of hazardous substances. In other words, we have so far picked the low hanging fruits. In addition we recycle plastic waste from electrical and electronic equipment and end of life vehicles. Not all of the plastic from these sources is suitable for recycling due to their content of hazardous substances. Norway is currently examining the potential for increased recycling of other types of plastic waste as well. This plastic waste is in many cases more complex and does to a larger extent contain hazardous substances. Nevertheless, we have identified a potential in Norway for increased recycling of plastic waste from different product groups and sectors. Compared with our level of recycling in 2010, we have found a higher recycling potential for turning plastic waste into a sustainable, non-toxic resource cycle:

#### **Estimated potential for more plastic recycling in Norway:**

- An additional amount of plastic packaging waste of 39 000 tons extra per year by 2020, with almost 2/3 from households and the rest from commercial sectors. This would lead to a rise in the total recycling rate for plastic packaging from 36 % in 2010 to 63 % in 2020.
- The total potential of other types of plastic waste is estimated to almost 35 000 tons. This potential includes:
  - non-packaging plastic articles from households (5 000 tons, 28 % recycling in 2020)
  - non-packaging plastic from the agriculture sector including ensilage films (3 000 tons, 66 % recycling in 2020)
  - plastic waste from fishing equipment, ropes and equipment from the aquaculture industry (5 000 tons, 55 % recycling in 2020)
  - plastic from WEEE (9 000 tons, 27 % recycling in 2020) and end-of-life vehicles (5 000 tons, 31 % recycling in 2020)
  - some types of plastic furniture (3 000 tons) and construction and demolition waste (5 000 tons)

Source: The Norwegian Waste strategy, August 2013 (our waste management plan).

Total recycling in 2020 could be over 60 % for plastic packaging waste, and over 55 % for non-packaging plastic waste from agriculture and fishing/aquaculture sector. The potential recycling rate might be below 30 % for non-packaging plastic articles from households, electronics, end of life vehicles and construction and demolition waste due to their higher content of hazardous waste.

If we are able to achieve this potential, we will recycle 155 000 tons or 47 % of the Norwegian plastic waste per year in 2020. Given the content of hazardous substances and the complexity of the plastic waste, further development and increased use of identification and sorting technology is crucial.

However, energy recovery of plastic containing hazardous substances is a viable solution for both the environment and economy.

In the Norwegian waste strategy (our waste management plan); we have explored measures and instruments to achieve the potential we have found. We are considering higher recycling targets for our EPR system for plastic packaging, and also whether to establish EPR systems for other plastic articles from households, non-packaging agricultural plastic and end-of-life equipment from fisheries and aquaculture. These measures are still under review, and will only be implemented if we find that the socio-economic advantages outweigh the disadvantages.

With a population of just 5.1 million people, these figures mean that we can recycle 30 kg plastic waste per Norwegian. If - as an example - all inhabitants in the EU were to recycle the same amount of plastic waste (492 million people), the entire EU would recycle 15 million tons of plastic waste each year. This represents a huge economic potential, and the greenhouse gas emissions would be reduced by roughly 30 million tons if the environmental effects over the life cycle for recycling are compared to energy recovery.

### **Green growth - Nordic initiatives**

The Nordic Council of Ministers has stated that green growth is a key priority for Nordic co-operation in the coming years. The waste sector is one of eight priority areas.

The Nordic Waste Group, a working group under the Nordic Council of Ministers, has initiated six projects which aim to increase recycling of plastic and textile waste.

The three plastic projects will make recommendations on how to increase the volumes of plastic collected for recycling, how to get sufficient quality on the input and how to secure that plastic with hazardous substances are not recycled. Sorting technology and communication throughout the entire value chain are important elements. Plastic packaging from households is the main focus area. When it comes to identifying hazardous substances and sorting technology, WEEE-plastic is used as an example.

The results will be presented at a Workshop in Copenhagen on 9th of October 2014. There will also be a discussion on further actions, based on the proposals. Please contact; [post@sigla.no](mailto:post@sigla.no) if you want to participate at the workshop. For more information, you can visit the stand "Green Growth the Nordic Way". We hope the results from these projects will be useful for the Commission, as well as for other countries.

The Nordic Waste Group and the Working Group on Environment and Finance are cooperating on a project that considers the use of economic instruments to increase recycling of plastic waste.

### **The way forward lies in innovation**

The best way to reduce the level of hazardous substances is to stop using them. However, less hazardous alternatives may be hard to find, and today we are not able to stop using hazardous substances altogether. Furthermore, many plastic products are old or produced in areas with less stringent regulations. Hazardous substances will therefore remain on the market for a long time after they were used in production, and will inevitably become waste in the future. Hence, it is impossible to achieve completely non-toxic plastic waste. If plastic wastes containing hazardous substances are not separated before recycling, the recycling may lead to prolonged exposure to these substances.

The Norwegian Environment Agency believes that the way forward lies in innovation combined with good regulation. Innovation gives opportunities for green economic growth and increased resource efficiency in a sustainable way. Innovation will also promote non-toxic and resource efficient material cycles. Future legislation should give strong incentives to:

1. innovative plastic without hazardous substances,
2. innovative product design (design for recycling) to encourage high quality recycling of plastic waste,
3. increased use of identification and sorting technology to ensure that plastic containing hazardous substances are not part of the resource cycle.

Points 1 and 2 Innovative plastic and product design without hazardous substances will contribute to improvements in the environmental performance of products over their life-cycle. Assessments of the environmental effects over the life cycle from production to waste handling should be done for as many environmental effects as possible (not only for emissions of greenhouse gases). This approach will give the best overall environmental results. Plastic in the future should be made more sustainable with less hazardous substances. But it is very important to ensure that use of bio-based plastic is done in a sustainable way, and that they do not give negative effects on use of land, food situation, bio-diversity or other areas.

Point 3 Sensor-based identification and sorting technology can be used to sort plastic waste in clean types of plastic (for example PE, PET, PP) and to separate plastic containing the most serious hazardous substances. Increased use and development of this technology is crucial to ensure high quality recycling of plastic in an environmental and cost effective way. Increased collection will give larger volumes for sorting and recycling, and thus a better basis for large sorting plants with advanced identification and sorting technologies. High quality is essential to promote green growth through increased recycling and use of re-granulate in new products. The reputation of products based on recycled plastic might be undermined if it turns out that they contain hazardous substances.

As EU Commissioner Janez Potočnik says; "let's keep the fantastic and get rid of the drastic". It will be necessary with measures both on the product and waste side in order to achieve this vision.

### **Most important inputs for the further work**

In conclusion, I would like to summarize the most important inputs for the further work:

First, the transition to a circular economy requires both a quantitative and qualitative approach, and alignment between the EU chemicals, product and waste policies. It is important to secure a common understanding of how the respective regulations work together.

Furthermore, there should be a close dialogue between policy makers in the product and chemical area, and in the waste area both at EU level and in each country. In addition, it is important with a constructive dialogue between authorities, the waste sector, recycling industry, researchers, designers etc. on how to achieve high quality and resource efficient recycling of plastic waste.

Finally, the reviewed targets in the waste regulation should be set at the correct level to ensure large volumes to recycling, in a resource efficient and non-toxic way. In addition there should be some provisions which ensure use of identification and sorting technology at plastic waste sorting plants, and hence high quality and sustainable recycling of plastic waste streams that do not contain hazardous substances.

In short, we want to recycle as much plastic as can be recycled in a safe and cost-effective way. But we do not want to recycle large volumes of hazardous substances!