

## “We find microplastics in human brains”

**By 2060, annual plastics production is expected to reach one billion tonnes according to OECD estimates. The United Nations is working on an international treaty to limit the pollution caused by plastic waste. In an interview, chemist and EASAC Environment Programme Director Michael Norton explains what can be done to tackle the huge amount of plastic.**

The 21st century will likely go down in history as the "plastic age". Drastic measures are needed to reduce the pollution caused by plastic waste, both in production and in recycling. The European Academies Science Advisory Council (EASAC), whose office has been based at the Austrian Academy of Sciences since the beginning of the year, has drawn up a list of recommendations for the negotiations on an international plastics treaty. In this interview, EASAC'S Environment Programme Director Michael Norton talks about the mix of measures needed to tackle plastic waste, political headwinds and his expectations for the plastics treaty.

### What is the EASAC Plastics Report about?

**Michael Norton:** In our 2020 report, we stated that plastics are useful materials. But if we use plastic indiscriminately everywhere, an enormous amount ends up as problematic waste in the environment. EASAC is working on approaches to reduce plastic waste. In this new Commentary, we propose solutions that provide food for thought for the ongoing UN negotiations on a plastics treaty. We need to think carefully about where the use of plastic is unavoidable and promote reuse and recycling. If recycling is not possible, the waste must be disposed of in the least polluting way. The report should present goals, possible obstacles and tools.

## Plastic waste is everywhere

### What makes plastics such a problem?

**Norton:** For many types of waste, such as paper or organic waste, there is a natural degradation pathway. It's different with plastic. The material breaks down into small pieces when exposed to ultraviolet sunlight, but the lifespan of the material is virtually unlimited. Larger pieces of plastic waste have obvious effects on living organisms, there are piles of photos of sea turtles fatally entangled in plastic debris or fish dying from swallowing pieces of plastic. People may not eat plastic bags, but micro- and nanoplastics are now everywhere. We find it in the fog on Mount Fuji in Japan, in the deep sea and even in Antarctica. The material enters the food chain and reaches humans, who also take it in through the air and drinking water.

### What are the health implications?

**Norton:** It is not possible to estimate how serious the problem is at the moment because there is no data yet. But we do find microplastics in human brains or in the placentas of pregnant women: There is no escape. We can understand the pathways of microplastics through the ecosystem, but the effects are not yet understood. In any case, we should follow the precautionary principle and try to control the spread before possible negative health effects are proven. The amount of plastic produced will triple by 2060 if we carry on as before. As scientists, we want to prevent this at all costs.

## Measures against plastic

### What specific proposals does EASAC recommend?

**Norton:** We need a systemic approach that can work on multiple front at the same time. Reducing production is crucial for non-recyclable plastic products. For example, the film packaging for many food and other products cannot be recycled economically. Collecting plastic for reuse, recycling and disposal is another important issue. Shops can be held accountable and should share responsibility for taking back plastic. Plastic coffee cups and similar disposable containers should be made reusable or at least recyclable. For obvious problem products like these, a system for reuse or disposal should be mandatory for retailers. There is also nothing wrong with using good old cups with coasters where possible.

### What could recycling look like?

**Norton:** We propose a hierarchy. Some products, such as PET (polyethylene terephthalate) plastic bottles, can be recycled easily and cleanly - old bottles can be turned into new ones. Packaging for fish, meat or sandwiches, on the other hand, is not homogeneous and is often contaminated - it can only be used to make simple products such as flower pots. Perhaps in the future we will be able to turn these materials into fertiliser or fuel. But from today's perspective, however, this is not economically viable. For plastic products that cannot be recycled at all, incineration with waste heat recovery is the best of the worst solutions. The more plastic we reuse or dispose of as cleanly as possible, the less waste will end up in the environment.

## Exporting plastic

### Where should the rich countries start?

**Norton:** The economics are certainly an issue. Today, huge quantities of plastic waste are still shipped to Malaysia, Turkey or African countries, where they are incinerated in an uncontrolled manner. The export of plastic must no longer be allowed to pass for recycling, as is unfortunately the case today. Instead, companies continue to invest in the expansion of plastic production and create incentives to further increase its use. For this to change, the entire system needs to change, starting with the producers of plastic resins. What colourants and additives are used has a huge impact on recyclability. We need to think about what we can do better at every step in the production and use of plastics.

### Is reducing production realistic?

**Norton:** Countries like Saudi Arabia or the US, whose huge plastics industries are based on cheap oil and gas, obviously don't want that. But perhaps customers will become more selective and ask themselves whether their cucumbers or broccoli really need to be plastic wrapped. Deposit systems for plastic containers would be one way of raising awareness. Ultimately, only governments can enforce such measures. The market will not do it, so we need a treaty to set the framework.

### When will the plastics treaty be finalised and what are the expectations?

**Norton:** The next round of negotiations in April is to create a working basis for further negotiations. A first draft of the agreement should then be presented before the end of the year. I don't have high hopes that there will be a majority in favour of reducing plastic production. The concept of "growth" is so deeply ingrained in political thinking that it is hardly possible to talk about reasonable limits. But we can still try to reduce the amount of plastic waste. Of course, individual countries can also commit to doing more. But the particular interests of the petrostates clearly limit the scope for the general agreement. The treaty should be as strict as possible.

**This interview was conducted by Markus Kessler.**