



Resolution on circular economy: Reuse of resources from sewage

For approval by the NSC Annual Business Meeting – 6th of November 2020 – Online

BACKGROUND:

The North Sea Commission's Marine Resources Group initially identified marine litter as a priority during the General Assembly of the CPMR in Helsinki (19th - 20th of October 2017). It resulted in the adoption of the amendment on marine litter to the CPMR's [Final Declaration](#).

Since then, the Marine Resources Group drafted a [resolution on marine litter](#) which was supported and adopted during the Annual Business meeting of the North Sea Commission in Fredrikstad, Norway (13th of June 2018).

Consequently, the CPMR (in cooperation with the MRG), has drafted [a declaration on marine litter and plastic waste](#) as well. It was adopted during the CPMR's Political Bureau in Pärnu, Estonia (21st of June 2018).

Vice-President of the CPMR, regional minister Cees Loggen from the Province of Noord-Holland, [addressed the G7 Environment Ministers' meeting on plastic pollution in the oceans](#), on May 5th 2019 in Metz.

The North Sea Region Strategy 2030 mentions all of the above as one of the most important topics under the "healthy marine environment" chapter as well as the chapter on "circular use of resources". Focus is not only needed on preventing waste ending up in our oceans but the need for circularity as well as better recycling and reuse of waste is crucial. The purpose of this resolution is therefore to express our profound concern and call for action for changes required in European regulations to promote innovations in circular economy.

1. Introduction

“There is only one planet Earth, yet by 2050, the world will be consuming as if there were three.”¹; with this statement the European Commission launched a new Circular Action Plan for a cleaner and more competitive Europe in March 2020. This resolution aims to accelerate the circular use of valuable resources from sewage water by proposing changes to and harmonisation of European legislation. The current legislation results in the loss of endless streams of raw materials that could be turned into biobased products in a time where we face climate change as result of increased CO₂-emissions and more and more waste.

Acceleration needed to achieve ambition

Although the world has made encouraging progress in implementing the 2030 Agenda for Sustainable Development, none of the European countries is on track for meeting the goals. As is described in the new North Sea Region Strategy 2030, it is of fundamental importance to reduce emissions and to prevent any more waste loads in our rivers and seas. The consequences of pollution by microplastics, nutrients and other residual flows are visible everywhere. It is a mission for the North Sea Commission to lead by example as strong maritime regions and implement the European Commission’s Circular Economy Action Plan. The North Sea Region a stronghold for accountable democratic institutions, the cradle of modern industrial development and one of the most coherent macro-regions in Europe.

Further explained: A blue mine of valuable materials

Sewage water is a largely untapped resource for the circular economy. Valuable substances are for instance phosphorous that can be used as biobased fertilizer, lipids as biofuel and cellulose for bio-chemicals and bio-composites. In addition, sewage water provides a source for the production of biodegradable bioplastics (PLA), a possible replacement for the oil-based polluting plastics that also affect marine life. A few examples to illustrate the potential of sewage water as a circular source:

- ✓ On the basis of a study by Kompetenz Wasser Berlin, the use of 1 ton of recovered cellulose as a high-quality raw material, across the entire chain provides a saving of -2.53 tonnes of CO₂ eq compared to the reference situation. Potentially 4 billion tons of cellulose can be recovered from sewage in Europe from sewage water, which corresponds to 10 billion tons of CO₂ eq. To put this in perspective: that corresponds to the CO₂ emissions of more than 4.7 million return flights Amsterdam-Sidney or the combustion of more than 22.4 billion litres of diesel!
- ✓ Example PHA information will follow
- ✓ Europe has 92% import dependency on phosphate rock (80% is used as fertiliser for

¹ <https://ec.europa.eu/environment/circular-economy/>

agriculture). Already since May 2014, phosphate rock is on the list of 20 most critical material of the European Commission. Sewage water contains enough phosphate to provide up to 26% of the European phosphate requirement ([appr. 113.000 ton in Northwest Europe alone](#)).

Important barriers that need attention

There are a couple of key issues that currently hampers the recovery and reuse of materials from sewage in Europe:

1. The **uncertainty and the legal implications** of reclassifying raw materials from sewage water as new materials and biobased products that can be brought to market. Despite the overarching European legal framework, Member States are still given considerable leeway regarding the reuse of raw materials from sewage. This leads to different interpretations of EU legislation. For instance a product that has received an end-of-waste status based on the Waste Framework Directive in the Netherlands, will still be considered waste in other Member States. This means that the transportation is subject to waste legislation and the plant where material goes to has to have a waste authorization. So despite the fact that products can be traded freely within the EU, a product recovered from waste cannot.
2. Another obstacle is **the lack of clarity and uniformity in procedures**. For example, in the Netherlands it can take several years to reach an end waste status, while in Belgium it is claimed that the processing time takes approximately 6 weeks and in Germany it is completely unclear when and to whom an application must be submitted.
3. Too much attention is still on economic feasibility during development and implementation. A certain scale is needed to achieve cost reduction and improve economic feasibility. A clear (financial) incentive for end-users and first movers could speed up time to market enormously.

What is needed?

Resources from sewage water are feedstock for biobased materials. Unclear end of waste procedures and limiting trade of a product with a national End of Waste status, resources are simply not an attractive alternative for markets at all. What is needed in Europe is clarity, uniformity and cross border acceptance. Harmonisation makes it possible to use raw materials for sewage water anywhere in Europe no matter where it was produced. Secondly, the markets can be encouraged to use biobased raw materials by making conventional materials more expensive or by providing incentives to the ones who are doing setting a good example. A positive example is legislation in Italy, which was recently changed. Sewage treatment plants are now rewarded if they recover resources from sewage water. This shows how legislation can treat sewage treatment plants as a resource and energy provider to facilitate a transition to circular economy.

RECOMMENDATION:

The North Sea Commission recognizes the need:

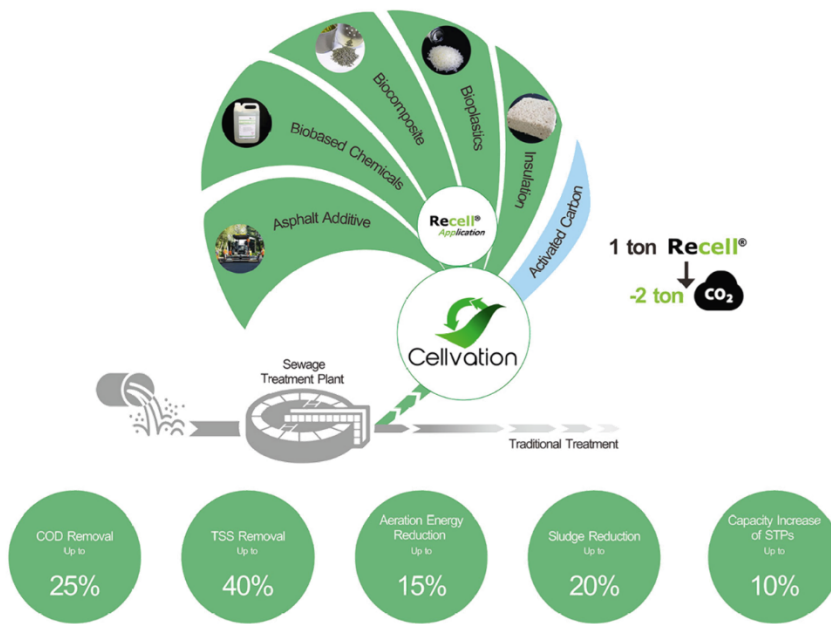
- to tap into the potential of recovered resources from sewage water to accelerate circularity in Europe
- to establish a level playing field in the EU for sewage treatment plants, technology providers and (future) customers of recovered resources.
- to establish a uniform definition in the rules for the quality of the end product instead of restrictions based on the source;
- to draw up a cross-border acceptance standard (within the EU)
- To set a maximum period for the assessment of end of waste files

The North Sea Commission calls for action:

- Change the definition of “waste” in a way that not all materials are waste after being used once. Waste valorisation is key. Define waste with new technologies and new products in mind, without making concessions to food safety and the environment.
- Use the review of the Urban Waste Water Regulation and the Sludge Regulation to make the recovery and reuse of resources from sewage water attractive, for example by fiscal measures or by making a certain percentage of recovery mandatory.
- Harmonize legislation:
 - The End of Waste process should be transparent and have clear deadlines
 - Provide national governments with a framework to assess the risks of recovered products
 - The End of Waste judgement is a right, not a favour

Factsheet Cellulose

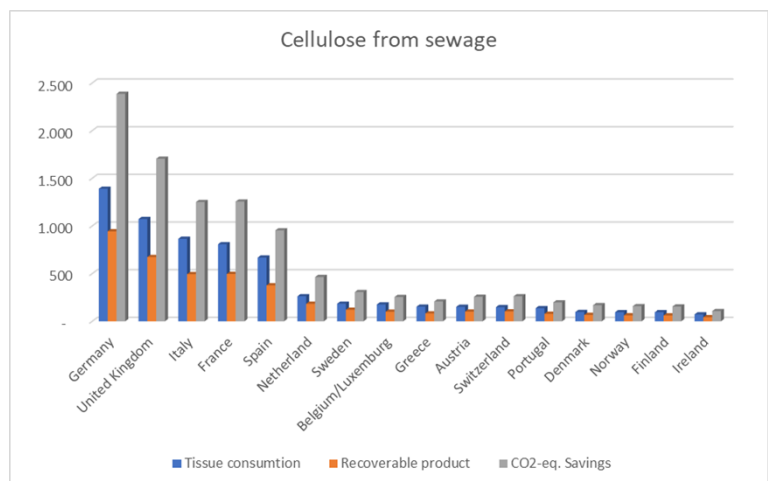
In Europe, approximately 6.4 million tonnes of tissue paper are sold annually, of which approximately 62% ends up in sewage treatment plants (STP). This cellulose (main resource for tissue paper) contributes for 15 to 20% of the total load of an STP. By removing that cellulose, the energy consumption at a STP is reduced, less sludge is produced and less chemicals are needed for eg. the dewatering of sludge. The graph below shows the savings on the treatment.



The cellulose from sewage water is of high quality and can be put to good use. A study conducted by Kometenz Wasser Berlin shows that per ton of ReCell that is recovered, a saving in the chain of 2.53 ton CO₂-eq is achieved.

A total of 3,987,000 tons of cellulose could potentially be recovered and reused in Europe, leading to a reduction in emissions of 10,087,000 tons CO₂-eq.

The graph shows the renewable potential per country in Europe and the environmental impact that recovery can have.



A striking example: Struvite

Struvite is one example of a resource from sewage water and can be applied as sustainable fertiliser of sustainable source of phosphorus. The earth's phosphorus resources are limited and recovery and reuse of phosphorus is essential. Water authorities in the Netherlands approached the Dutch government as early as 2013 to have struvite admitted as a fertiliser. In 2016 the formal proceedings to get an End-of-Waste status for struvite started. The struvite of the water authority of Amsterdam and surrounding area (Waternet) was chosen as the source of the raw material and the production of phosphate fertiliser, the customer was for ICL. After seven years, however, there is still no the end-of-waste status given. In the UK and Belgium, struvite from specific locations has an end of waste status. In Denmark there is a general end of waste status for struvite, whereas in Germany for one specific location struvite is "tolerated" (has no formal status but is not forbidden). This example shows that European legislation is implemented differently in the various member states. It also shows that product recovery is hindered by regulation instead of stimulated and that the process to acquire an End of Waste status takes a long time.

Interreg WOW! project in relation to the reuse of raw materials and emission reduction

WOW!, an acronym for Wider business Opportunities for raw materials from Waste water (sewage), is a European project (funded by INTERREG North West Europe) with the aim to contribute the transition toward circular use of resources from sewage water.

A consortium of 12 organisations from six European countries aims to develop value chains for three different raw materials from sewage: cellulose, PHA bioplastics and lipids. By providing physical examples of the potential of sewage water both supply and demand of these resources are targeted. In addition WOW! also works on national action plans and a European roadmap to show the potential of resources from sewage and to provide examples of current barriers.