

Briefing on water in a circular economy

1. Introduction

The European Commission recently recognised in its communication¹ on the circular economy that our economies have developed a ‘take-make-consume and dispose’ pattern of growth since the industrial revolution. This pattern is neither efficient nor sustainable. The Commission is therefore encouraging a shift towards a more circular economy which relies on “reuse, high quality recycling and a limited use of primary raw materials”. This movement is key to the development, growth and employment in Europe. However the communication is only focused on waste management and industry. EurEau, the voice of water services in Europe, emphasises that water is an important element of the circular economy and that it should be added to the scope of the Commission’s work.

The water industry has developed many solutions to resource recovery, resource efficiency, water reuse, resource protection, etc... This briefing shows how different actions and initiatives place already the water sector in the heart of the circular economy.

2. EurEau positions relative to the circular economy

Sludge management

Sludge is the major residual product of waste water treatment plants (WWTP). Treated sewage sludge is a source of nutrient and organic carbon which can be used as a fertiliser when it meets high quality criteria. The Sewage Sludge Directive (86/278/EEC) (SSD) already gives a special status to sewage sludge by creating a distinction from waste. The Directive had the positive effect of improving source control measures in order to ensure a good quality sludge. The SSD also helped to reduce the demand for fertilisers by improving the recycling rate of sludge. However, according to the report on the consultation for the revision of the SSD² published in 2010, only 39% of sewage sludge is recycled into agriculture in the EU.

Within waste policy, the current discussion on the ‘end-of-waste’ (‘EoW’) status is an opportunity for some high quality sludge based materials and products (including composted sludge) to be recognised as a useful fertiliser instead of ending in landfill. This status might currently be relevant to only a small proportion of sewage sludge production across Europe, but could be an incentive to improve the quality of recycled sludge, enhancing its image and acceptability. The ‘end-of-waste’ criteria should also focus on the output, through specification on final product quality rather than by prohibiting input materials as sludge³.

Including water in the circular economy package could facilitate the synergies between the Sewage Sludge Directive and the Waste Framework Directive and promote the use of sewage sludge as fertiliser.

¹ COM(2014)398: Towards a circular economy: A zero waste programme for Europe

² http://ec.europa.eu/environment/waste/sludge/pdf/part_i_report.pdf

³ EurEau (2012): EUREAU POSITION PAPER on how the revision of the Fertiliser Regulation should promote sustainable use of sludge in agriculture (<http://bit.ly/1zaZaS9>)

Phosphorus recovery

Phosphorus is one of the essential nutrients for plants, animals and humans and is therefore crucial for all life on the planet. The limited availability of phosphate rock as well as Europe's high dependency on imports made it part of the revised list of Critical Raw Materials in May 2014⁴. Several member states have already taken steps to encourage a more sustainable use of phosphorus while supporting its recycling. However at European level, existing EU legislation neither encourages a more efficient use of phosphorus nor sets objectives for recycled phosphorus. The current discussion on the revision of the Fertiliser Regulation might open the door to using recovered phosphorus from sewage sludge as a component of fertiliser products, although more data are needed before the Commission will be able to table a legislative proposal. Not including recovered phosphorus as base product for fertiliser at the European level will strongly limit market access compared to phosphate rocks.

Technologies are now available to produce different qualities of recovered phosphorus but its access to the market is limited because of its low quality waste image⁵. **Including water in the circular economy package and creating incentives to stimulate the use of recovered phosphorus could lead to fostering the implementation of sustainable facilities for phosphorus recovery from sewage sludge.**

Energy recovery

Wastewater is a source of energy through multiple pathways. Digestion of sludge at the wastewater treatment plants is producing biogas that can be used either for heating (building and process itself) or as biofuel for garbage trucks and buses⁶. Wastewater has also quite stable temperature. Some systems already shown the possibility to save energy by recovering energy from sewage using a heat exchanger⁷. Through the whole process of wastewater treatment it is possible to save and recycle energy either for a local use or to help heating neighbourhoods of the wastewater treatment plants.

Adding water to the circular economy package would be a **driver for the development and the implementation new solutions to optimise and recover energy** from sewers and wastewater treatment plants.

Water reuse

The recent consultation on water reuse⁸ organised by the European Commission is a sign that water reuse is of utmost interest at EU level. Water reuse is a technical solution to water scarcity in a lot of European regions and not only in the south of Europe. It is already practice in multiple sectors like agriculture, tourism and industry. It is a way to reduce costs and improve resource efficiency with a view to promoting a sustainable economy and enhancing job creation.

⁴ COM(2014) 297 final: On the review of the list of critical raw materials for the EU and the implementation of the Raw Materials Initiative

⁵ EurEau (2014): Phosphorus in Sewage Sludge (<http://bit.ly/1y4OihM>)

⁶ Veolia brochure on water and the circular economy. (<http://bit.ly/1LauK93>)

⁷ AgentschapNL & UVW - Wastewater management roadmap towards 2030 (<http://bit.ly/1tfHLrY>)

⁸ http://ec.europa.eu/environment/consultations/water_reuse_en.htm

However, the market and, often, the opinion of end-users on the quality of the reused water is a barrier to the implementation of existing solutions. In that sense, water reuse needs to be supported. **Including water in the circular economy package would help to present water reuse as a safe and high quality resource.**

3. Water in the circular economy: a concrete reality

EurEau members are already developing actions to make water and wastewater services more resource efficient. The Netherlands are currently designing the water services to be entirely integrated in the circular economy by 2030 where “the regional water authorities and municipalities will be converting waste into clean raw materials, clean energy and clean water”⁹. The scope is wide, taking into account for example bioplastic production from wastewater, energy production through green gas, heat recovery from sewers, wastewater use for irrigation and other innovative solutions.

This type of initiative is also supported in other countries. Nowadays, successful solutions are available. For example, the wastewater treatment plant of Brussels is operating the first industrial prototype for bioplastic production from municipal wastewater since 2011¹⁰. Aquafin, member of Belgaqua, is operating one of the first full scale process¹¹ to produce struvite, a phosphorus and nitrogen crystal, out of sewage sludge. The Wastewater treatment plant of Aarhus in Denmark is already producing struvite from the rejected water of their digester. This crystal is then sold in local supermarket as fertiliser. In Oslo (NO), the Bekkelaget wastewater treatment plant is producing biogas out of sewage sludge which is refined and used as biofuel for garbage truck and buses¹². Nosedo wastewater treatment plant, in Milan, Italy, is already heating and cooling its offices through heat exchange from the wastewater. They also have a project to heat and cool a residential area in their neighbourhood. Finally, examples of water reuse or energy saving through biogas production from sewage sludge treatment are more and more present in the municipal water services.

All these examples show that water is ready to be part of the circular economy. **Adding water to the scope of the Circular Economy Package would enhance the recovered products to have access to the market in order to make the actions of the water services in Europe a complete success.**

⁹ AgentschapNL & UVW - Wastewater management roadmap towards 2030 (<http://bit.ly/1ffHLrY>)

¹⁰ Aquiris - Bioplastic production in Brussels (<http://bit.ly/1D9jBj1>)

¹¹ Aquafin – Nuresys (<http://bit.ly/1CyfyvB>)

¹² Oslo Kommune – the sewage adventure (<http://bit.ly/1y4NaPz>)

About EurEau

EurEau is the voice of Europe's water sector. With a direct employment of around 500,000 people, the European water sector makes a significant contribution to the European economy.

EurEau represents drinking water and waste water service providers from 27 countries in Europe, from both the private and the public sector. Our members are the national associations of water services in Europe.

At EurEau we bring national water professionals together to agree European water industry positions regarding the management of water quality, resource efficiency and access to water for Europe's citizens and businesses.



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