

PUBLIC CONSULTATION - EVALUATION OF THE SEWAGE SLUDGE DIRECTIVE 86/278/EEC

SUMMARY

EasyMining, dedicated to closing nutrient cycles, welcomes the initiative to update the Sewage Sludge Directive (SSD). A sustainable SSD in-line with the Circular Economy Action Plan adopted by the European Parliament, should fulfil the following three criteria:

- reduce the exploitation of virgin resources,
- real detoxification, i.e. removal and not dilution of contaminants, and
- enable recovery & recycling of products with a quality and function suitable for their applications.

The above criteria will assure that depts are not passed on to future generations.

A new SSD fulfilling the above criteria would lead to an alignment with the Circular Economy Action Plan and the goals set out in the Green Deal Package and the Farm-to-Fork Strategy (e.g. a zero pollution ambition for a toxic free environment, non-toxic material cycles, measures to close the nutrient loop, preserving and restoring ecosystems and biodiversity, healthy and environmentally friendly food systems and mobilising industry for a clean and circular economy).

To be aligned with these criteria, the new SSD needs:

- a high demand on **recovery of phosphorus, at least 80%**, to close the cycle of this Critical Raw Material and reduce the dependency of imported mined phosphorus
- demands on **detoxification** of the sewage sludge (or recovered raw material containing phosphorus, e.g. ash) of low quality that cannot be used in farming, to take out unwanted substances and minimize risks for health and the environment
- End of Waste criteria to bridge of the gap between the recovered phosphorus and the recycled phosphorus products to be able **to reach the market** with a clear level of playing field and high quality demands

PHOSPHORUS RECOVERY

To decrease the dependency of virgin mined phosphorus and to facilitate a circular economy it is crucial to establish a new legislation with high demand on recovery of phosphorus, proposing at least 80% phosphorus recovery, a level that is technically viable already today.

A new circular legislation for sustainable sludge handling needs to focus on the recovery of phosphorus. Phosphorus is an essential element for life and a key nutrient. Phosphate rock is the primary raw material for production of phosphate fertilisers, animal feed phosphates as well as a wide range of other important uses (from electronics to fire safety), but mineable phosphate

rock is a limited, non-renewable resource that will not last forever. Today, the EU is largely (92%) dependent on imports as most mines are located outside Europe. Because of the limited availability of this resource, the EU included phosphate rock and phosphorus on the list of Critical Raw Materials (CRMs).

With the problem of mineable phosphate rock being non-renewable, the insufficiency of domestic deposits to guarantee food security for Europeans and the vital importance of phosphorus in our society, recycling of phosphorus will be an inevitable part to secure the wellbeing of our future society.

Nitrogen is also an important nutrient that need recovery targets in a new sustainable SSD. To not hinder recovery of phosphorus from sewage sludge ash, that should be the main target, nitrogen should be recovered from waste water rich in nitrogen. High concentrations of nitrogen enables cost efficient recovery and recycling. E.g. EasyMining has developed a chemical process that recovers more than 98% of the ammonium nitrate from reject water in WWTPs without CO₂ emissions. This process enable an efficient production of a nitrogen product that can be used as a fertiliser.

DETOXIFICATION

Sewage sludge of low quality that cannot be used in farming need detoxification and efficient recovery of phosphorus to secure a non-toxic material cycle. To be able to determine what sewage sludge needs detoxification, a fitness check for established (old) quality requirements is needed according to up-to-date scientific knowledge.

Incineration is the leading technology for substantial detoxification of sewage sludge by destruction of organic pollutants, pathogens and plastics. Mono-incineration leads to a sterile mineral concentrate – the ash - that is rich in phosphorus (~7-11%). Sludge ash, without further processing, cannot be properly used as a fertilizer due to a too high metal and heavy metal content and a too low plant availability of the phosphorus. Therefore and also given its heterogeneity, sludge ash is normally landfilled today. To not waste any more phosphorus, these landfills should be handled as storage for future landfill-mining of phosphorus. These storages will be important future raw material for innovations recovering phosphorus and detoxifying the ash from unwanted substances.

By using innovative chemical processing, phosphorus can be efficiently recovered from incinerated sewage sludge. E.g. EasyMining recovers a Precipitated Calcium Phosphate (PCP, over 90% recovery rate of phosphorus) that is pure thanks to the incineration step before and efficient detoxification step in the process (low amounts of unwanted substances, no organic contaminants or pathogens and have the same solubility in citric acid as commercial mono-calcium phosphate). Using the PCP as feed phosphate or in fertilisers will contribute to substituting virgin materials, prolonging the life time of explored mines, lowering toxic contaminants like Cd and providing the chance of saving significant amounts of CO₂ emissions.

CLEAR MARKET AND QUALITY DEMANDS

For the recovered phosphorus to be part of the circular economy and contribute to a sustainable sewage sludge legislation, the regulations for the downstream market, e.g.

fertilisers and feed phosphates, need to be transformed from linear to circular focusing on quality and not on the origin of materials. Recovered and recycled products need to be accepted on the market with clear End of Waste criteria to make secondary phosphorus competitive on the market to be able to close the phosphorus loop.

In order for new innovative technologies to reach the market producing clean recycled phosphorus products derived from sewage sludge suitable for applications as e.g. fertilisers or feed phosphates, there is a need for clear “end of waste” criteria. Foremost, these recycled products need to be accepted on the market with no legislative hindrance if the application quality demands are fulfilled e.g. fertilisers and feed phosphates regulations. E.g., there is a total ban on using recovered nutrients from materials “derived from domestic and industrial waste water” and “solid urban waste” in animal feed (Annex III, Regulation 767/2009). This is excluding safe and pure materials of higher quality compared to approved ones on the market today. It clearly prevents existing nutrient value chains to improve in quality.

Another important action to facilitate the recovery and recycling of phosphorus would be to create a quota system for blending in recovered phosphorus in fertilisers and feed phosphates. With clear EoW criteria, legislations focusing on high quality instead of origin and a quota system, the market for recovered phosphorus would be created ensuring safety of the products and function suitable for their applications. Consequently, this is an opportunity to target more efficient and even higher nutrient use, enabling the goals set out in the Green Deal Package and the Farm-to-Fork Strategy.

ABOUT US

EasyMining is passionate about inventing new technologies that use intelligent chemical solutions to close nutrient cycles and to detoxify waste flows. Our objective is to improve existing or even to create new circular material flows efficiently and commercially viable. EasyMining has developed and patented several chemical processes and holds a great know-how in chemistry, resource efficiency, circular business models and industrial symbiosis.