European Federation
of National Associations of
Water Services

EUREAU

Consultative Communication on the Sustainable Use of Phosphorus – EUREAU's contribution

Name of the organization responding to the consultation:

EUREAU – European Federation of National Associations of Water Services

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Q1 – Do you consider that the security of supply issues for the EU in relation to the distribution of phosphate rock are a matter of concern? If so, what should be done to engage with producing countries in order to tackle these issues?

This is a relevant question, on which EUREAU has no position.

Q2 – Is the supply and demand picture presented here accurate? What could the EU do to encourage the mitigation of supply risks through i.e. the promotion of sustainable mining or the use of new mining technologies?

This is a relevant question, on which EUREAU has no position.

Q3 – Do you consider that the information on the worldwide supply and demand of phosphate rock and fertiliser is sufficiently available, transparent and reliable? If not, what would be the best way to obtain more transparent and reliable information at EU and global level?

This is a relevant question, on which EUREAU has no position.

Q4 – How should we handle the risk of soil contamination linked to phosphorus use in the EU?

Whilst this question seems to be targeted at the quality of mined phosphate rock, we would note that the approach adopted in the sewage sludge directive, that sets maximum permitted concentrations of metals, has been very successful, and we would recommend such an approach. However, it is very important that any standards should be based upon sound scientific evidence for protection of the environment (soil and water) and human health. Such limits would then be suitable for any material – which might include sewage sludge– for application to soils. Other materials that as well should be taken in mind are industrial wastewater sludge, compost and manure.

The entry of phosphate in water and soil is carried out mainly by the entries from agriculture. The local use and need of fertilizers in agriculture should therefore be in balance to prevent pollution of soil and water.

Prerequisite for this would be a labeling requirement for fertilizer and uniform minimum standards in the European fertilizer law.

Q5 – Which technologies have the greatest overall potential to improve the sustainable use of phosphorus? What are the costs and benefits?

It is not clear whether the potential to use phosphorus more sustainably is actually a matter of different technologies – certainly any approach that reduces wastage and facilitates effective recycling is to be endorsed. Our view is that many of the barriers are of policy, regulation and perception rather than being appropriate for a technological 'fix'. Several routes for phosphorus recovery from wastewater are technically possible but their economical benefits should be evaluated from case to case depending on local circumstances (see Q 11below). Technologies that facilitate the recycling of used phosphorus have the greatest potential to improve the sustainable use of phosphorus and to close the phosphorus loop. The whole Life Cycle Analysis for phosphorus needs to be taken into account - a significant proportion of phosphorus is lost from human excreta. It is estimated that only 10% of the 3 million tonnes of phosphorus excreted by the global human population each year are returned to agricultural soils[1].

The wastewater industry points out that according to the current state of the art benefits and costs of recovering phosphate from wastewater, sewage sludge ash or sewage sludge are disproportionate to each other and not very economic. Having also in view the required high-tech and energy-intensive extraction of phosphorus from the ash, a cost-benefit analysis should be performed initially.

Q6 – What should the EU promote in terms of further research and innovation into the sustainable use of phosphorus?

Promote better technologies for waste water treatment, sludge treatment, processing of sludge, so that more phosphorus can be recycled and reused as phosphorus fertilizer. Also legislation must be developed to create and ensure market for recycled phosphorus.

The EU should review the barriers to the successful recycling of phosphorus. Much of this appear to be regulatory or political in nature, for instance the description of sewage sludge as 'waste' is both unhelpful and tends to promote alternative management approaches that involve 'disposal' rather than recycling. Whatever research and innovation is carried out must be set in an holistic context – for instance recommending recovery from 'sewage' must be seen in the wider context of sanitation and UWWTD compliance – and recommended solutions must be cost-beneficial.

Incineration can involve the recovery of phosphates but economical benefits should be evaluated from case to case depending on local circumstances e.g. the market.

[1] Soil Association (2010), 'A rock and a hard place – Peak phosphorus and the threat to our food security'

Q7 – Do you consider that the available information on the efficiency of phosphorus use and the use of recycled phosphorus in agriculture is adequate? If not, what further statistical information might be necessary?

There is a need for better statistics on the use of recycled phosphorus. Current statistics, even poor, focus only on the bulk amount of treated sludge recycled to land. Better data on the amount of phosphorus amended to agricultural land would raise the focus, and could increase the value of recycled phosphorus.

Q8 – How could the European Innovation Partnership on "agricultural productivity and sustainability" help to take forward the sustainable use of phosphorus?

New, innovative agricultural solutions should aim at whole chain solutions, favoring solutions where productivity is assessed in relation to LCA.

Q9 – What could be done to ensure better management and increased processing of manure in areas of over-supply and to encourage greater use of processed manure outside of these areas?

In some cases and regions, this challenge is similar to challenges facing the water sector, where land available for sewage sludge application are in a far distance from where the large amounts of sludge and manure are produced. Co-digestion plants for biogas production are sometimes hindered by inappropriate legislation, for both biogas and biogas residues. Legislation should encourage cooperation between sectors, and obstacles for such cooperation should be removed. Furthermore, legislation is necessary for creating a market and a level playing field for secondary phosphates.

Q10 – What could be done to improve the recovery of phosphorus from food waste andother biodegradable waste?

At an administrative level, to redefine what constitutes a "waste" will enable greater P recovery. See also answer on Q9 above.

Q11a) – Should some form of recovery of phosphorus from waste water treatment be made mandatory or encouraged?

Waste water treatment technologies and requirements vary widely across Europe, reflecting various natural as well as man-made conditions. For example, the content and concentration of the wastewater entering the treatment plant reflects the usage pattern and availability of water. This is then central for choosing the best technology for treating the wastewater in order to comply with the discharge permits. As an example, chemical phosphorus precipitation is key element of the good phosphorus removal in several European countries, most typically in northern Europe. Here, most waste water treatment plants are designed, built and operated for using chemical phosphorus removal. Iron or aluminum based chemicals have for many decades proven cost-efficiency, as well as known technology. In other regions, biologically based methods have proven to be an efficient way to meet the discharge permits. The variety in wastewater treatment technologies affects the chemical form, stability and availability of the phosphorus removed from the water to the solid phase.

Recovery of phosphorus is a highly recommendable target, however, protection of water courses is the main reason for the waste water treatment, and should not be compromised. On the other hand, recovery of phosphorus should not lead to extortionate costs. In case all existing waste water treatment plants should be renovated, recovery could hardly be economically sensible solution.

Waste water and sludge treatment are an entity which should be looked upon as a whole. For the recovery of phosphorus, all parts of the treatment system should be considered. Also, the recovered phosphorus must be suitable for markets, which means that the quality in terms of impurities and phosphorus availability has to be appropriate as well as usability of the product. In case phosphorus is recovered, sustainable solutions for the recycling or disposal of other by-products has to be developed as well.

Current technologies for phosphorus recovery are not yet mature for extensive use. Much research and development has been done in this field, but available technologies still have some limitations and issues that need attention before these techniques can be fully applied for common use.

We also want to emphasize that these technologies needs to be tested in local circumstances to be able to judge the feasibility. Local waste water quality, climate conditions and treatment technology or other local factors might have unpredictable impacts.

At the moment it is essential to concentrate on the research and development work on phosphorus recovery. Possibilities to recover phosphorus coming from chemical precipitation is interesting from this perspective.

Although recovery of phosphorus is a highly interesting issue for waste water utilities, mandatory requirements for phosphorus recovery is not reasonable in the current situation. More research should be encouraged in order to develop better and more cost-effective solutions. Most importantly: legislation must be developed in order to create market and to

build market confidence for recycled phosphorus. Market opportunities for recycled phosphates are essential for closing the cycle.

The transparency of the data and uses for phosphorus in the EU should be created. It should also be working on a minimization strategy for the use of phosphates in agriculture and food.

Q11b) – What could be done to make sewage sludge and biodegradable waste more available and acceptable to arable farming?

A coherent framework for acceptable and sustainable use of sewage sludge in agriculture is needed. The current situation with outdated sewage sludge directive has resulted in unstable and doubtful conditions for the recycling of sewage sludge. In that respect, we would like to point at the ongoing evaluation of the current Sludge Directive (86/278/EEC), conducted by a group of consultants on behalf of the European Commission, that aims to assess the effectiveness, efficiency, coherence and relevance of the directive and to identify excessive burdens, overlaps, gaps, inconsistencies and/or obsolete measures that may have appeared over time.

The latest study from the JRC "Occurrence and levels of selected compounds in European Sewage Sludge Samples"– has useful information and conclusion should be taken to the practise. A high level statement from the European Commission based on scientific facts supporting the use of sewage sludge in agriculture could be helpful.

There is also need to conclude the research results concerning plant availability of phosphorus in sewage sludge. Need for standardized and acknowledged methods to estimate how much phosphorus is really available for plants in different sewage sludge based products have been recognized as well.

Waste water operators are responsible to control the quality of sewage sludge and to develop treatment of sludge in a way that end-product is interesting for farmers. Various digested, composted, thermally or chemically treated sewage sludge based products are already available. Since sewage sludge treatment facilities are typically long lasting investments it is feasible to evaluate how already existing products could be best utilized in the agriculture.