

30<sup>th</sup> March 2015

- Frans Timmermans, European Commissioner for Better Regulation
- Jyrki Katainen, European Commissioner for Jobs, Growth, Investment and Competitiveness
- Karmenu Vella, European Commissioner for Environment
- Phil Hogan, European Commissioner for Agriculture & Rural Development

## Object: economic and job potential of circular economy for phosphorus

Dear Sirs,

The members of the European Sustainable Phosphorus Platform (industry, local government and utilities, science, stakeholders) wish to underline our **support for a coherent and ambitious European policy for a Circular Economy for nutrients**.

Phosphate rock is listed as an **EU Critical Raw Material** and the EU is 90% dependent on imports. Phosphorus is essential and non-substitutable for food production, for both crops and livestock, as well as for a range of **high value-added industry sectors** (fire safety, next generation batteries, catalysts ...).

Improving phosphorus use; reducing losses to surface waters and developing recycling can deliver:

- important **improvements in water quality**, coherent with Water Framework Directive objectives, and with economic benefits (leisure and tourism uses, treatment, real estate)
- reduced EU dependency on phosphate rock imports and trade balance benefits
- new jobs and economic growth in waste and water treatment, biorefineries and recycling
- **rural development and "greener" agriculture**, reducing nutrient losses, creating rural jobs and activities and societal integration in manure nutrient recycling.

Phosphorus sustainability is a globally recognised challenge (cf. China export barriers), linked to global food security, eutrophication dead zones and sanitation. Europe is a world frontrunner, in both technologies and societal processes to accompany change, supported by significant European Commission engagement to R&D actions and policy work on phosphorus recycling. A European market for phosphorus recycling will enable development of technologies and expertise with **export potential**.



We believe that the Commission's Circular Economy proposals can provide a further impetus to market implementation by **addressing current regulatory obstacles** and by establishing **support mechanisms compatible with competitiveness**. In particular:

- Carry through the currently proposed revision of the EU Fertilisers Regulation to enable an efficient market and ensure safety criteria for recycled nutrients (see proposals in annex)
- Adapt or harmonise interpretation of existing legislation, e.g. Waste, Animal By Products, Nitrates directives
- Define a coherent EU policy on phosphorus stewardship, to ensure coherence of different policies (agriculture, manure management, food, raw materials, data monitoring, RTD ...)
- Implement market-inciting economic tools: e.g. investment support, technology and competence valorisation, cost-transfer from value-loss practices (landfill, use losses) to job-creating recycling and stewardship activities

The European Sustainable Phosphorus Platform (ESPP) brings together, as members, companies, regional and national public organisations and knowledge institutes involved in phosphorus and nutrient management (in waste and water, recovery and recycling, chemicals, fertilisers, environment, agricultural supplies, farming and food) and works closely with concerned stakeholder NGOs and networks (environment, energy, recycling, farmers' organisations ...).

For further information, we refer you to the recommendations published following the **Second European Sustainable Phosphorus Conference**, Berlin, 5-6 March 2015 (supported by the European Commission) and to the ESPC **Outline Note on Phosphorus Stewardship and Employment** (both attached).

We are at your disposition, with our members, to discuss this further and to work with your services on specific proposals for implementing phosphorus stewardship into Europe's Circular Economy strategy.

Yours faithfully Arnoud Passenier, ESPP President.



# Annex to ESPP letter of 30th March 2015 concerning Circular Economy

## Support for the proposed revision of the European Fertiliser Directive

The European Sustainable Phosphorus Platform supports the currently proposed modification of the EU Fertiliser Regulation to take into account recycled nutrient fertiliser products and organic soil improvers (digestates, composts ...) because this will enable a European market for recycled nutrients, accelerating their development and commercialisation, facilitating innovation, and enabling job creation in a circular economy.

Integrating these products into the Fertilisers Regulation will ensure EU harmonisation of safety and quality criteria, so providing guarantees for farmers, food consumers and for the environment.

The currently proposed modification of the Fertiliser Regulation represents an important upgrading of EU legislation, strategic for the development of sustainability and employment in nutrient recycling, agriculture and fertilisers.

In particular, we wish to emphasise the need to address the following points, as detailed below

- 1) Authorise already in the proposed revision text of the Fertiliser Regulation, fertiliser production from incineration ashes, including sewage sludge mono-incineration ash.
- 2) Launch now, JRC work to define criteria for recovered "mineral" fertiliser products (including struvite)

Both the above innovations in recycling are already operational full scale in a number of member states, but their market deployment is hindered by regulatory complexity and the absence of a harmonised EU market.

#### 1) Fertiliser production from sewage sludge mono-incineration ashes and other ashes.

There is a significant potential for developing the use of incineration ashes as a fertiliser production raw material. Such use is already operational on an industrial scale in one fertiliser factory (NL), is being considered by others (in other MS), and is likely to accelerate with expected regulation obliging P-recovery from sludge mono-incineration ash in e.g. Germany, Switzerland.

We propose that incineration ashes (in particular ash form sewage sludge mono-incineration, food waste, animal wastes and biomass incineration, but excluding ash from municipal solid refuse and hazardous chemicals wastes), be already (in the Fertiliser Regulation revision) included in the list of "eligible wastes" (which can be used in production of CE fertilising products). The "recovery rules" for ashes can be fixed by simply referring to the conditions specified in the Waste Incineration Directive 2000/76/EC art. 6 (850°C, TOC in ash <3%)

Ashes, subject to the above "recovery rules" have no risk of containing most organic contaminants: pathogens, pharmaceuticals, organic chemicals, hormones .... Ashes may contain 'mineral' contaminants (heavy metals), but these are clearly limited in the (proposed modified) Fertiliser



Regulation safety and quality criteria for each product category. Specific limits and monitoring should be defined for 'incineration specific' possible contaminants: dioxins, furans ...

We suggest that the possible use of ashes as a fertiliser in their own right (distinct to use as an eligible raw material for fertiliser manufacture) be considered separately, because the phosphorus will generally not be plant-available except in very specific conditions (maybe some acid soils).

#### 2) "Mineral" recovered fertiliser products recovered, in particular struvite.

We refer here to recycled nutrient (N, P and/or K) products, recovered as mineral chemicals (as opposed to organic materials), from sewage (in municipal waste water treatment works), from manures or from similar waste stream (e.g. struvite, K- struvite = magnesium potassium phosphate, brushite = DCP ...)

In order to integrate these products into the revised Fertiliser Regulation, criteria for eligibility (waste streams, recovery process, product specifications) must be defined.

We request that JRC be mandated rapidly to work with Member States and stakeholders to elaborate these criteria, in order to not lose time in establishing a harmonised European market for these products. This will enable continuing development of this industry, reassure investors and not put at risk the acquired know-how (and jobs), clarify safety criteria and so ensure confidence for producers, fertiliser distributor, farmers and consumers.

Concerning recovered struvite, we underline that this substance is:

- Registered under REACH
- Not Classified
- Already today produced full-scale (and used as a fertiliser or fertiliser ingredient) at 17 sites in the EU (11 companies, 6 different Member States) with approximately another 15 projects underway
- Production today is from sewage (10 sites) or food industry waste streams (7 sites), with projects also concerning manure
- Authorised as a fertiliser by specific legislation in one MS, authorised by case-by-case product validation or self-declared End-of-Waste in several others



## Estimating potential economic benefits and job creation of P-recycling and Pstewardship

This outline estimate does not claim to be accurate or economically demonstrated because, at present, no coherent data have been collected and no targeted studies are available. Its objective is to solicit further input and comments.

The figures given are estimations only, based on experience of practitioners and comparison to studies carried out on similar environmental employment sectors, and not based on detailed economic or societal analysis.

We suggest that a full study should be commissioned and carried out by professional analysts, including collection and assessment of data including consultation of both industry and scientists / experts, in order to develop reliable figures.

# Estimating potential economic benefits and job creation of P-recycling and Pstewardship

EU imports of P2O5 =  $3.4 \text{ million tonnes}^1$ Price per tonne P2O5 = approximately 600 $\notin$ tonne P2O5

## → Cost of EU P imports = 2 billion $\in$ per year<sup>2</sup>

The market value of recovered phosphate is only a (usually small) part of the economic return from phosphorus stewardship (alongside synergies such as reduced wastewater treatment plant operating cost, reduced landfill costs, improved agronomic management, energy recovery, pollution control ...)<sup>3</sup>.

We estimate the environmental expenditure on P-stewardship to be c. 3x the market value of the imported P2O5 -> 6 billion €/year.

Using the employment ratios derived by the EU Commission ECORYS 2012 study<sup>4</sup>, this indicates:

#### → 66 000 jobs non-delocalisable, permanent jobs

Job losses in 'replaced' industries in the EU are estimated to be small, as in most sectors jobs would be maintained alongside the additional created employment (eg. distribution of recycled P products alongside that of mineral fertilisers, P-recovery as an additional step to existing waste or water treatment<sup>5</sup> ...

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<sup>&</sup>lt;sup>1</sup> The same figure is estimated by Rosemarin 2010 cited by CIWEM 2012 : <u>http://www.ciwem.org/knowledge-networks/panels/wastewater-management/phosphorus-wastewater's-role-in-stewardship-of-a-vital-resource.aspx</u> <sup>2</sup> Same figure is given by P-REX 2012

<sup>&</sup>lt;sup>3</sup> Molinos-Senante et al., "Economic Feasibility Study for Phosphorus Recovery Processes", Ambio n°40, pages 408-416, 2011 conclude that the market value of recovered phosphate (as struvite) from municipal wastewater is  $2000 \notin$  sewage works, compared to  $10\ 000 \notin$  operational costs savings and  $170\ 000 \notin$  shadow environmental benefits (reduced phosphorus discharges)

<sup>&</sup>lt;sup>4</sup> CRI (Copenhagen Resources Institute) analytical paper for the Danish Ministry of the Environment, "Recylcing and Sustainable Materials Management", January 2012: "The number of Jobs dependent on the Environment and Resource Efficiency Improvements", ECORYS for EU Commission DG Environment, ENV.G. 1/FRA/2006/0073, April 2012, Tables 10 and 11 pages 28-30. Using ECORYS 2012 updated figures for EPE (environmental protection expenditure) and employment in three areas (wastewater, waste, recycling) : EPE = 201 billion €/year, employment = 2 204 000 jobs, ratio = 11 000 jobs / billion €. <sup>5</sup> "Implementation of these and other technologies would require new treatment facilities, new logistics systems for collection of waste and manure, new arable practises etc. All these new activities will create new jobs. In some cases these new jobs will substitute existing jobs as current technologies are phased out, and in other cases it will result in a net surplus of jobs. For example, most phosphorus in waste from households currently ends up in landfills. Diverting the waste from landfills to



This is in synergy with a range of other benefits from P-recycling and P-stewardship:

- Phosphate and fertiliser industry employment liable to be lost if phosphate processing moves out of Europe (example of Thermphos, Netherlands, 2012). Approx. 20 fertiliser and phosphate plants in Europe with approx. 300 jobs each x factor of 3 to include indirect jobs (total N and P fertilisers)
  = 18 000 jobs
- **Bioindustry, biofuels and bioresources production**. Phosphorus is a key resource, requiring recycling as an essential requisite for biofuels and biomaterials production. P-recycling technology development and P-management experience is thus essential to bio-industry development. <sup>6</sup>
- Biogas renewable energy production from sewage sludge and manures: P-recovery valuable to avoid deposit problems. Deposit avoidance in one sewage works = 300 000 €/year cost savings per works (source Thames Water UK). 1000 sewage works
  = 0.3 billion €
- Thermal energy production from sewage sludge and manures (drying, incineration or gasification, P-recycling as fertiliser). 500 dewatering plants, 100 energy plants (5% of total EU flows) = 3.8 billion € investment = 9000 job-years. Once operational: approx. 5000 direct jobs, x2 to include indirect jobs = 10 000 jobs.
- P-recycling activities: the specific agronomic properties of recovered phosphate fertilisers (slowrelease) and agronomic advisory services to farmers for P-stewardship will improve farm efficiency, reduce soil erosion and provide added-value of foods integrating the circular economy, making local economies more resilient and creating non-delocalisable employment
- Phosphorus recycling can be developed in synergy to nutrient removal in waste water treatment, in particular facilitating biological nutrient removal: UK spending on nutrient removal in sewage works = 1.4 billion UK£, total required to reach EU Urban Waste Water Treatment Directive 1991/271 conformity<sup>7</sup>
  EU = 150 billion €
- EP-recovery facilitates eutrophication reduction: total US economic costs for freshwater eutrophication = c 3 billion US\$/year <sup>8</sup> Estimate Europe similar:
  3 billion €
- Food waste = UK£ 12 billion<sup>9</sup> estimate
  EU = 120 billion €
- Export of competence and technology: R&D, stewardship/ policy / collaboration platforms, engineering and recycling installation construction: estimated 500, 500, 1000 jobs in respectively. If the EU becomes international front-runner in P-recycling, these figures could be increased and the jobs will be sustained:
  - = 2000 jobs

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phosphorus recovery facilities will create extra jobs (Friends of the earth 2010). Furthermore, phosphorus is mined outside Europe. Job losses in the phosphorous mining industry will not influence the number of jobs in EU. Therefore an increase in phosphorus efficiency and recycling within Europe will have a net effect on the job creation in EU. <sup>6</sup> US National Academy of Sciences "Sustainable Development of Algal Biofuels in the United States", 2012 <u>http://www8.nationalacademies.org/onpinews/newsitem.aspx?RecordID=13437</u>

 <sup>&</sup>lt;sup>7</sup> ACHS 2009: <u>http://archive.defra.gov.uk/environment/quality/chemicals/achs/documents/phosphates-review.pdf</u>
 <sup>8</sup> "Eutrophication of US freshwaters: analysis of potential economic damages", Environmental Science & Technology, 43(1), pages 12-19, 2009

pages 12-19, 2009 <sup>99</sup> WRAP, May 2012: http://www.publications.parliament.uk/pa/cm201012/cmselect/cmenvaud/879/879vw20.htm



# **ESPP** policy action proposals from **ESPC2**

Stakeholders wishing to contribute to defining and implementing these proposals can join the European Sustainable Phosphorus Platform www.phosphorusplatform.eu and/or national nutrient platforms (where established: Netherlands, Flanders, Germany, or underway: UK, France, Norway, Baltic ...).

Phosphorus (P) is a non-renewable resource, nonsubstitutable for agriculture and food production and directly linked to global food security, as well as being important in a range of other industrial and technical uses.

The world's mineral phosphate reserves are finite, so that although there is debate about their extent and extractability and about their geographical concentration, the need for phosphorus stewardship will endure, generating new jobs and business opportunities.

At the same time, P losses pose major environmental issues. Phosphorus is the principal contributor to surface water quality failure (eutrophication) in much of Europe, whilst Europe's population eats around twice as much P as is required for health and globally the P footprint of human diets continues to increase.

These issues have synergies with other challenges, including sustainable biosolids management, nitrogen and micro-nutrients, soil organic carbon, soil erosion, water treatment, food waste, contaminants and food safety, global food security.

Improving the efficiency of P processing and use, in industry, agriculture, livestock production, food processing and diet, and developing P reuse or recovery-recycling can save money, contribute to reducing nutrient pollution, and create jobs in the circular economy.

1. Make phosphorus a flagship for stewardship, reuse and recycling in the new EU Commission's **Circular Economy proposals** in 2015, to develop innovation and sustainable local jobs

2. Carry through the revision of the EU Fertiliser Regulation to take in recycled phosphates, composts, digestates, etc., with clear definitions and criteria for each product category (agronomic functions, quality, safety, labelling ...)

3. Facilitate **phosphorus recycling from animal by-products**, subject to stringent safety criteria (adaptation of the Animal By Products Directive and inclusion in revised EU Fertiliser Regulation) 4. Exonerate recycled P & N products from **Nitrates Directive limits for manure in a "processed form",** if they are non-organic with agronomic properties comparable to mineral fertilisers (see SCOPE 100)

5. Develop policies, in particular education and consumer information, to encourage diets with lower P footprints

6. Reduce phosphorus losses in **food waste** by reducing food wastage and reusing or recycling nutrients from non-avoidable food waste (e.g. separate collection, (co-) composting or digestion)

7. Implement in appropriate European institutions (EEA, Eurostat, JRC ...) reporting coherent **data** monitoring of phosphorus and nitrogen mass-flows, concentrations and sinks, at regional and national levels

8. Define **national/regional objectives and action plans for phosphorus efficiency, reuse and/or recycling.** In particular, **fix targets for phosphorus reuse and recycling from sewage** / sewage biosolids

9. Assess both phosphorus-in-general (P) and other specific forms of phosphorus as **EU Critical Raw Materials**, in addition to phosphate rock

10. Establish **coherent policies across Europe to reduce phosphorus losses from agriculture**, based on soil P status and crop needs, including precision nutrient management, buffers along watercourses, soil erosion mitigation ...

11. Define, through an inclusive stakeholder consultation methodology, an **EU Research**, **Innovation and Integration Agenda** for phosphorus sustainability, covering research, demonstration, implementation, information, skills and training. This should input to Horizon 2020 and the EIPs on Raw Materials, Water and Sustainable Agriculture.

12. Harmonise EU regulatory frameworks and policies to facilitate P stewardship: in addition to those above: e.g. water, sewage and biosolids, soil, bio-resources, consumer and health, international, rural development ...