

European Sustainable Phosphorus Platform

History, Scope & Achievements

Ludwig Hermann

IWAMA
Workshop on Nutrient Reduction & Recovery
13–15.6.2018,
Kalmar, Sweden



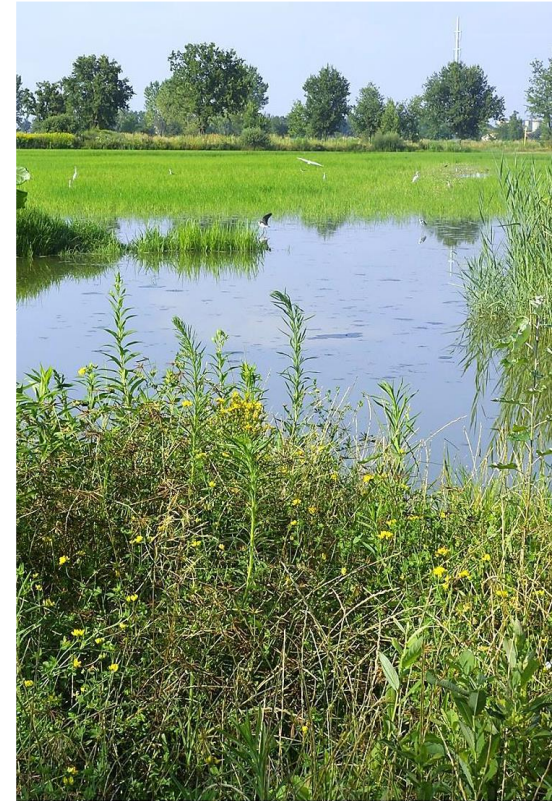
Knowledge grows



ESPC1, Brussels, 6.-7.03.2013

Conclusions: 7 key messages

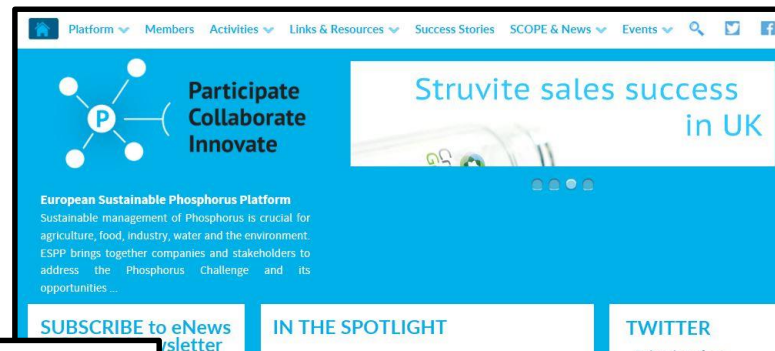
- ***Business development***
- ***Smart cooperation***
- ***Knowledge & research***
- ***Incentives for efficient use & recycling***
- ***Harmonisation of legislation***
- ***Developing EU policies***
- ***Raising awareness***



Launch of the European Sustainable Phosphorus Platform



European Sustainable Phosphorus Platform



Platform Members Activities Links & Resources Success Stories SCOPE & News Events

Participate Collaborate Innovate

Struvite sales success in UK

European Sustainable Phosphorus Platform
 Sustainable management of Phosphorus is crucial for agriculture, food, industry, water and the environment. ESPP brings together companies and stakeholders to address the Phosphorus Challenge and its opportunities ...

SUBSCRIBE to eNews
 Newsletter




European Sustainable Phosphorus Platform

SCOPE NEWSLETTER
 October 2017 n° 125

Innovation
BIG P Conference, Old Trafford, Manchester
 Challenges of tightening phosphorus discharge limits for big and small sewage works: technologies, economic costs, environmental costs, biosolids.

SYMPHOS: Phosphorus industry & phosphorus use innovation
 Summary of the 4th International Symposium on Innovation and Technology in the Phosphate Industry.

US Phosphorus RCN
 US P-RCN (Research Coordination Network) final meeting shows many publications and some outstanding questions.

North America Phosphorus Forum
 The Sustainable Phosphorus Alliance (North America) second stakeholder Forum, Washington DC, looked at phosphorus management today and tomorrow.

Newtrient's manure management technology catalogue
 US dairy company Newtrient launches online selection tool for manure nutrient recycling technologies and suppliers.

Recycled fertilisers

IN THE SPOTLIGHT

Everglades Foundation George Barley Water Prize - Stage 2 US\$ 80 000 prize

Now open for submissions - deadline to request materials = 15th July 2017

THE GEORGE BARLEY WATER PRIZE

Stage 2 of the Everglades Foundation George Barley Water Prize is **currently open for applications** for teams capable of testing their solution for two consecutive weeks processing c. 24 litres/hour (see exact specifications in application materials). Applicants will submit daily inflow and outflow samples from their technology. A total of \$80,000 will be awarded in November of this year to the top 3 teams in Stage 2. You can apply to stage 2 whether or not you applied to stage 1. **The deadline to request Stage 2 application materials is 15th July 2017 and the deadline to submit applications is 31 August 2017.** Beyond Stage 2, the Pilot Stage, the third stage of the George Barley Water Prize, will qualify 10 teams to compete at a Pilot location in Canada in early 2018, with awards totalling \$800,000. Finally, the Grand Prize will see the top 4 teams compete in Florida for the ultimate \$10 million award. Information www.barleyprize.com

TWITTER
 @phosphorusfacts
 7 Nov. Nutrient sustainability for food industry, led by ESPP at Sustainable Food and Beverage Conference, Coventry UK @wbcsd @eaAgriFood
 RT @vroumeas: #Wine is leading in the food industry to reduce their environmental impacts with immediate quality gains #AEC17 #circularecon...

NEWS

ESPP eNews no. 12 - June 2017
 June 15, 2017
 Newsletters about nutrient stewardship, European Sustainable Phosphorus Platform



ESPP: a coalition for action

- **Wide objective:**
Phosphorus stewardship
 - *global food security*
 - *circular economy*
 - *environmental protection*
 - *healthy diet and food safety*
- **Bring together:**
 - *water & waste industries,*
 - *mineral and organic fertilisers, chemicals,*
 - *P-recycling technology suppliers,*
 - *national & regional governments,*
 - *knowledge institutes ...*



Success story:

NutriTrade Baltic local fish

- Local fisherman incited to catch cyprinids
 - restore food web (algal grazing zooplankton)
 - remove nutrients from the sea
- Promote new markets for local fish products:
 - recipes, chefs, new processing routes & consumer products
- Biogas production from processing by-products
- Cost: c. 66 €/ kgP removed (not inc. sales)

Launched 2015. John Nurminen Foundation / NutriTrade
<http://nutritradebaltic.eu/pilots/pilot-fish/>



Example: communicating success stories

- **Actions:**
 - *vision & awareness*
 - *stakeholders & networking*
 - *dissemination*
 - *policy and regulation dialogue*



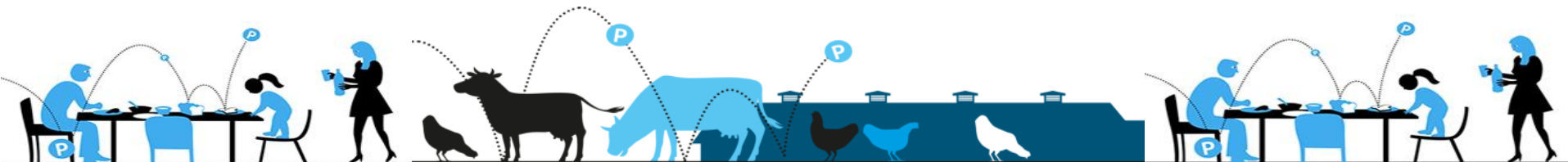
How ESPP functions

Legally established not-for-profit association

- statutes are public <https://www.phosphorusplatform.eu/platform/about-espp>
- EU Transparency Register no. 260483415852-40 <http://ec.europa.eu/transparencyregister/>

100% membership funded → key to credibility, independence

- 40+ paying members to date: companies, cities / regions / governments, R&D institutes, R&D projects
- in touch with reality
- payment by members = real commitment
- supports project dissemination but does not participate



How ESPP functions

Decision by consensus

Mediation rather than advocacy

- enable dialogue between stakeholders
- develop shared proposals for policy
- communicate with regulators

Example: Joint Statement on the EU Fertilisers Regulation proposal, between EU federations in the mineral fertilisers, organic fertilisers, soil improvers, digestate, animal by-products, limiting materials and wastewater industries, 20th November 2017 www.phosphorusplatform.eu/regulatory



Joint statement on the EU Fertilising Products Regulation
20th November 2017

Our organisations jointly underline the importance of addressing a number of **important outstanding issues in the proposed EU Fertilising Products Regulation**, including those indicated below. Not all of our organisations are directly concerned by all of the points listed, but we consider that they require attention to achieve a final regulatory text which is workable in implementation, which will facilitate innovation and development of the nutrient circular economy and nutrient stewardship, whilst ensuring the protection of farmers, consumers and the environment.

The signatories call the co-legislators to **conclude this important dossier rapidly**, because implementation is strongly awaited by industry and stakeholders to develop the Circular Economy, whilst **ensuring dialogue** with industry and operators to **ensure that the final text is functional**.

In this context, the European Parliament report adopted 24/10/17 and the Council discussions provide in many respects a good starting point for trilogue discussions.

We particularly underline the following issues:

Positive from the European Parliament as adopted

- Confirm the proposed "Mineral" (<1% organic carbon) and "Low-carbon" fertilisers definitions** both in Annex I (PFCs) and Annex III (labelling).
- Need to **resolve the exclusion of industry by-products**, which are not waste, as highlighted by the European Parliament⁸.
- Importance of developing **implementation guidance** and of ensuring **assessment of Regulation implementation**⁹.
- Favour the **co-existence of production lines for CE-marked and National fertilisers** on the same production sites by validating the production site if lines for the processing of input materials authorised are clearly separated from production lines for the processing of other input materials¹⁰.
- Confirm the objective to **accelerate and support the "STRUBIAS" process**¹¹.
- Polymers**, for controlled release fertilisers and for improving stability¹²: ensure that biodegradability criteria are feasible and agronomically appropriate.

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ESPP communications tools

→ available for other networks and R&I projects

• **Twitter**  [@phosphorusfacts](https://twitter.com/phosphorusfacts)

• **ESPP website** www.phosphorusplatform.eu

- events
- Members Pages,
- news
- R&D projects
- success stories
- regulatory

• **SCOPE Newsletter**

- science and innovation

• **eNews**

- monthly
- policy, practice

→ 45 000 email listing worldwide

Innovate

SUBSCRIBE to our eNews and SCOPE Newsletter

Email Address:

Country:

Subscribe

Read earlier **SCOPE** and **eNews** editions

ESPP eNews no. 19 - January 2018

Newsletter about nutrient stewardship - European Sustainable Phosphorus Platform (ESPP).

Please subscribe www.phosphorusplatform.eu/Subscribe
Link to www.phosphorusplatform.eu/eNews19
Download as PDF

Consultations open for input

STRUBIAS market report open for consultation

Standards needs for the circular economy

EU public consultation on pharmaceuticals

Livestock nutrient flows and impact assessments consultation

Call for data on manure processing

Apply for the Baltic Sea nutrients and carbon reuse challenge

Survey on sustainable development in the livestock sector

ESPC3 call for presentations & success stories

Third European Sustainable Phosphorus Conference, Helsinki, 11-12 June 2018

Policy

EU Fertilisers Regulation moves to trilogue

Agreement on tightening EU waste legislation

Business call for further action on Circular Economy

Netherlands phosphorus emission trading approved

Sustainable phosphorus

Sustainability in the Food and Beverage Industry - ENG Conference

Climate change impacts on agricultural phosphorus losses

Phosphorus recovery & recycling

Nordic waste and water phosphorus network

Pharmaceuticals not found in struvite-fertilised tomatoes

Market report on nutrient recovery systems

Biogas success stories recycling nutrients

What is middle?

Biochars show rich and varied phosphorus forms

Fertiliser effectiveness depends on soil chemistry and fertiliser placement

Recovered phosphates show good fertiliser performance

Agenda

Stay informed

ESPP Members



HELSINKI
11-13 June
2018

European Sustainable Phosphorus Conference

Consultations open for input

STRUBIAS market report open for consultation

The European Commission Joint Research Centre (JRC) circulated on 20th December 2017, for comment, a DRAFT "market study" (165 pages) for the 'STRUBIAS' recycled nutrient products (precipitated phosphate salts, ashes and processed ash products, biochars and pyrolysis products). This document provides the economic and market assessment necessary for future addition of these products to the (revised) EU Fertilisers Regulation annexes (as



Nutrient platforms and networks worldwide

Netherlands 2010 <http://www.nutrientplatform.org/>

Germany 2015 www.deutsche-phosphor-plattform.de

Switzerland 2017 Phosphornetzwerk <http://pxch.ch/index.html>

Baltic: ESPP works with Baltic Sea Action Group www.bsag.fi

Ireland, Czech Republic, Italy, Sweden in the making



North America Sustainable Phosphorus Alliance (SPA) 2017
(launched as NAPPS in 2015) <https://phosphorusalliance.org/>

Japan PCPR 2011 (Phosphorus Recycling Promotion Council)

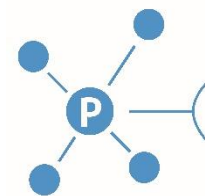


**Sustainable
Phosphorus
Alliance**

ESPP European Sustainable Phosphorus Platform 2013

Global Partnership for Nutrient Management (UNEP)

<http://www.unep.org/gpa/what-we-do/global-partnership-nutrient-management>



ESPC2, Berlin, 5.-6.03.2015 - TAKING P TO THE NEXT LEVEL

12 policy action proposals: 5 cont'd from 2013 (EU policies, rule harmonisation, knowledge & research, awareness, incentives) +

- **Circular Economy**
- **EU fertilising products regulation**
- **P-recycling from animal by-products**
- **Nitrates Directive**
- **National/regional objectives & action plans**
- **Reduce P-losses from agriculture and food waste**
- **Address European Institutions (EEA, EIP, JRC)**

Launch of the German Phosphorus Platform



European policies and ESPP actions

30 % of PM_{10} air particles in Milan result from livestock ammonia emissions



Phosphorus is the first (non morphological) cause of EU Water Framework Directive quality status failure



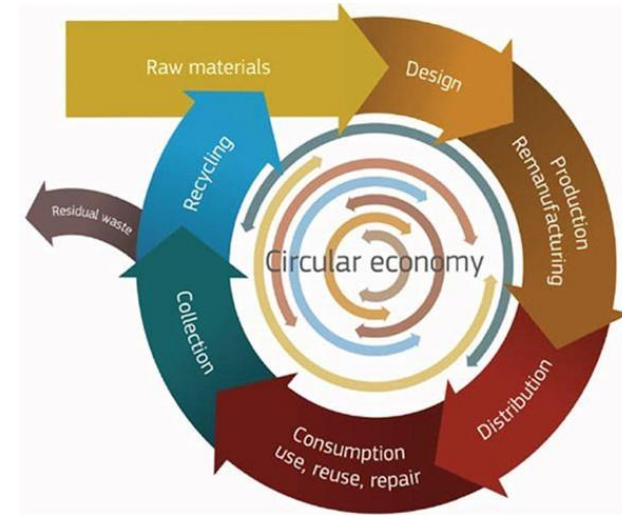
European policies driving nutrient recycling

2014 EU Consultative Communication on Sustainable Use of Phosphorus

Proposals include:

**increasing knowledge and research, P-recycling,
risk of soil contamination by mineral or recycled fertilisers**

see www.phosphorusplatform.eu/scope107



2015: EU Circular Economy Package Flagship initiative = new EU Fertilisers Regulation

ESPP in action.
*In responses to EU public consultation:
54% of respondents cited
bio-nutrients or
phosphorus*



European policies driving nutrient recycling

2015-2018 (ongoing) – Revision of EU Fertilisers Regulation

- Current Regulation = (virgin) mineral fertilisers only
- New = composts, digestates, soil improvers, biostimulants, recycled nutrients, end-of-waste
- Will open EU market for recycled nutrients & for recycling technologies
- Currently in Council - Parliament trilogue decision process
- Many issues remaining

STRUBIAS (ongoing)

- Definition of criteria for EU Fertilisers Regulation for
 - struvite and phosphate salts
 - ashes used directly as fertilisers
 - ashes chemically processed to produce fertilisers
 - biochars and pyrolysis products

ESPP in action.

ESPP amendments adopted
by European Parliament

- acceleration of STRUBIAS
- “low carbon” fertilisers category (with Fertilisers Europe, ECOFI)
- traceability
- widening input materials for food industry by-products, plant materials, animal by-products ...

see www.phosphorusplatform.eu/regulatory

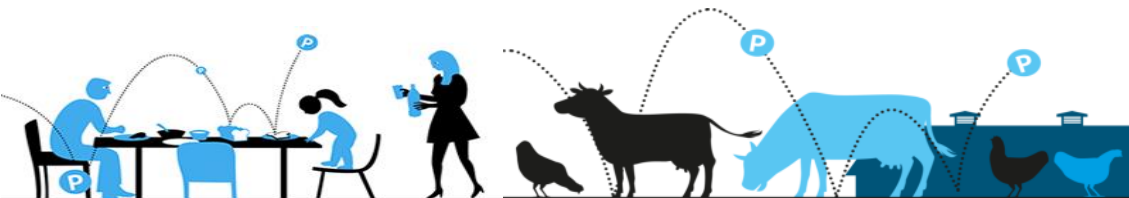


EUROPEAN COMMISSION

European Commission > DocsRoom > Document detail

Proposal for a Regulation on the making available on the market of CE marked fertilising products and amending Regulations (EC) No 1069/2009 and (EC) No 1107/2009

Document date: 17/03/2016 - Created by GROW.A.S.DIR - Publication date: 17/03/2016



European policies driving nutrient recycling

Nutrient loss abatement policies

- **Urban Waste Water Treatment Directive 1991/271**
- **Nitrates Directive 1991/676**
- **Water Framework Directive 2000/2000**
- **Groundwater Directive 2006/118:**
phosphorus on monitoring list 2014
- **National Emissions Ceilings Directive 2016 revision**
→ 19% ammonia emissions reduction by 2030

ESPP in action

2017 submissions to EU consultations on revisions of water protection policies





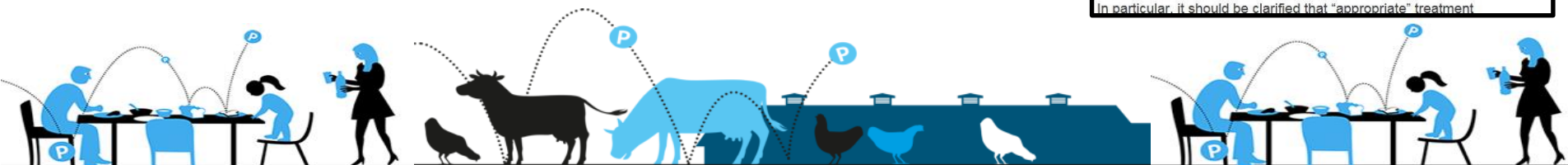
Feedback from:
European Sustainable P Platform (ESPP)

Transparency register number 260483415852-40

We consider that the UWWTD is a key piece of EU environment policy, and has largely contributed to reducing P levels in rivers and lakes, improving surface water quality, with considerable benefits for biodiversity and for users. Further work is however needed to reduce P emissions, both from municipal wastewater and from agricultural losses, because very many water bodies are still today not achieving P levels required for WFD Quality. In many ecosystems, eutrophication impacts occur even with very low P levels, accentuated by climate change and by the presence of legacy stocks of P in both soils and aquatic sediments.

We therefore consider that the UWWTD requirements should be fully maintained, and that – as at present - these should be extended and reinforced locally by catchment management plans under the WFD (Water Framework Directive) where this is necessary to achieve status objectives.

In particular, it should be clarified that "appropriate" treatment



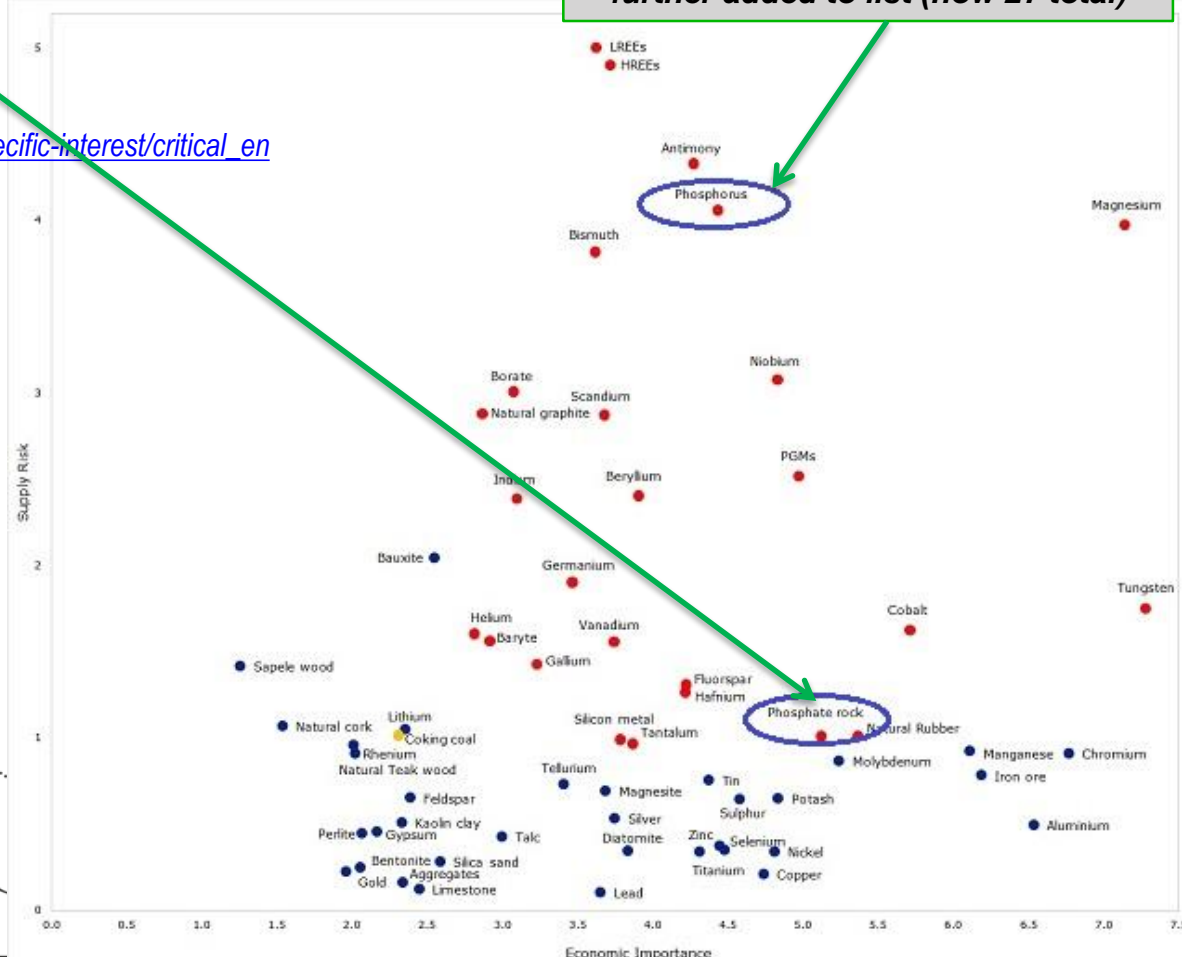
European policies driving nutrient recycling

EU List of Critical Raw Materials

- 2014 Phosphate rock added to EU list of 20 CRMs

see https://ec.europa.eu/growth/sectors/raw-materials/specific-interest/critical_en

ESPP in action.
2017 White Phosphorus (P₄) further added to list (now 27 total)



European policies driving nutrient recycling

Standards work underway

- 2017: CEN/SABE position on standards needs to support P-recovery
- CEN/CLC/BT/JWG 11 standards needs for sustainable chemicals for the circular economy
- ISO 275 sludge recovery, recycling, treatment and disposal
- standards to accompany EU Fertiliser Regulation Revision

online at www.phosphorusplatform.eu/regulatory

ESPP in action.

2017: CEN/SABE position on standards needs to support phosphorus recovery



CEN/SABE ENV Team
ENVIRONMENTAL monitoring strategy Team

Phosphorus recycling from wastewater treatment processes: available technologies, applicability and standardization needs –
Strategic Position Paper

Date: 2015-11-10

Reference: SABE ENV N 315

Action required: Final version

This Position Paper aims to provide a basis for recommendations to CEN/SABE for CEN/BT further to the conclusions of the CEN/SABE ENV Team (Environmental Monitoring Strategy Team) meeting of 25 March 2015 on “Phosphorus recycling¹ from wastewater treatment processes: available technologies, applicability and standardization needs”.



National policies driving nutrient recycling

Switzerland 2016 obligatory P-recovery from sewage sludge and animal waste ash (or separate storage pending recovery)

Germany 2017 new sludge ordinance (AbfKlärV) makes P-recovery obligatory for all sewage works > 50 000 p.e.

See ESPP eNews n° 7 <http://www.phosphorusplatform.eu/scope-in-print/news/1408-eneWS7>



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Principales nouveautés dans l'ordonnance sur le traitement des déchets

L'ordonnance sur le traitement des déchets (OTD) est soumise à une révision totale. Voici en résumé les principales modifications :

- Des exigences sont formulées pour la valorisation de certains déchets, laquelle n'était pas encore réglementée dans le droit fédéral. Il s'agit notamment des biodéchets (y compris réglementation relative aux possibles installations de traitement) et des déchets riches en phosphore.
- Un plan d'élimination des déchets est exigé pour tout projet de construction. Le maître d'ouvrage est tenu de déterminer les déchets dangereux pour la santé et pour l'environnement (p. ex. amiante, déchets de chantier contenant des biphenyles

Scope Newsletter n° 118

<http://www.phosphorusplatform.eu/scope118>



National policies driving nutrient recycling

Finland government 2017 objective to process 50% of manure and sewage sludge for nutrient recycling

HELCOM Recommendation 38/1 2017 (9 countries + EU) - requires

- “maximum recycling or recovery of phosphorus and other useful substances and compounds” from sewage sludges.
- biosolids to land only to crop needs
- P-recovery from ash if sewage sludge is incinerated
- annual reporting of % P recovered from waste water

See www.phosphorusplatform.eu/eNews9

<http://mmm.fi/en/recyclenutrients>



ESPC3, Helsinki, 11.-13.06.2018

Preliminary conclusions

- **Clear signs of moving forward: 300 participants, Baltic focus, practitioners, academia and policy makers well represented**
- **Strong presence of EU COM, DG Envi and DG Research**
- **Many agronomists in the audience**
- **Signs of developing market segmentation**
 - **Specialist companies**
 - **Fertiliser industry**
 - **Dedicated distribution network for premium products**
- **New technologies for rehabilitation of polluted water bodies**

Criteria by Mariana Mazzucato)



ESPC3 approach: Bottom-up

Use Economy as a tool

Target Society for a better life for all

Save the Biosphere the only resource providing our life supporting systems



(Source: Stockholm Resilience Institute)



Success Stories



2013

Source: Acqua e Sole



Success story:

EasyMining Ash2Phos® Pilot Plant Helsingborg

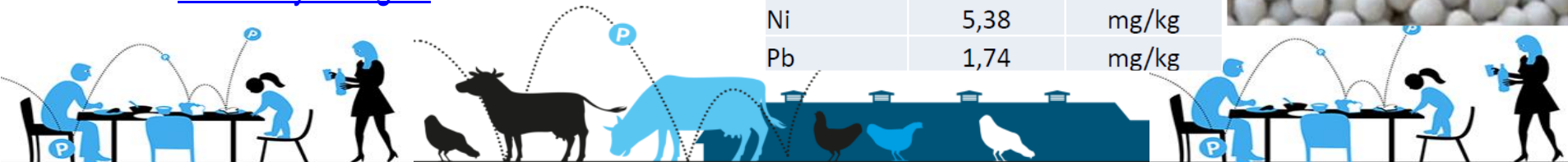
Precipitated Phosphate (PCP) from BIOFOS ash (DK)

- High purity, premium product
- Chemistry proven
 - PCP cake with 17% P at 63% dry matter (DM) content
- Use in organic farming or processing to CleanMap®
- Rapid filtration
- High dry matter content
- By-products
 - Ferric chloride
 - Aluminium chloride
 - Mineral substitute for clinker

www.easymining.se



| | | |
|----|--------|-------|
| P | 169000 | mg/kg |
| Ca | 355000 | mg/kg |
| F | 0,014 | % |
| Cd | <0.09 | mg/kg |
| Co | 1,19 | mg/kg |
| Cr | 14,6 | mg/kg |
| Cu | 29 | mg/kg |
| Hg | <0.2 | mg/kg |
| Ni | 5,38 | mg/kg |
| Pb | 1,74 | mg/kg |



Success story: NutriTrade Baltic local fish

- Local fisherman incited to catch cyprinids
 - restore food web (algal grazing zooplankton)
 - remove nutrients from the sea
- Promote new markets for local fish products:
 - recipes, chefs, new processing routes & consumer products
- Biogas production from processing by-products
- Cost: c. 66 €/ kgP removed (not inc. sales)

Launched 2015. John Nurminen Foundation / NutriTrade
<http://nutritradebaltic.eu/pilots/pilot-fish/>



Success story: Véolia Struvia

- Struvite recovery for small-medium sewage works operating biological P removal
- Compact footprint, limited height (3,5m)
- Turbomix struvite reactor, lamella settler & bag draining of struvite prills
- Helsingor Denmark 2016
 - 70 000 p.e. sewage works
 - 60 m³/day treats 100% of works digestate after centrifuge
 - produces 36 t/y struvite



<http://technomaps.veoliawatertechnologies.com/struvia/fr/>



Success story:

Suez Phosphogreen

- Struvite recovery from sewage
- Biological P removal sewage works with anaerobic sludge digestion
 - 2013 Aby wwtp, Aarhus, 84 000 p.e.
 - 2015, Herning, Denmark, 150 000 p.e.
 - 2017, Marselisborg, Denmark 200 000p.e.
- Advantages
 - struvite sale: 250€ - 300€ /tonne
 - reduced P-removal chemical costs
 - avoidance of nuisance deposits
 - reduced sludge volumes
 - reduced energy consumption for biological N removal



<https://www.suezwaterhandbook.com/degremont-R-technologies/sludge-treatment/recovery/recycle-phosphorus-from-effluent-to-produce-a-valuable-fertilizer-Phosphogreen>





Thank you!

Questions? info@phosphorusplatform.eu

Knowledge grows

