European Sustainable Phosphorus Platform

Interreg Baltic Sea Region

EUROPEAN REGIONAL DEVELOPMENT FUND

EUROPEAN UNION

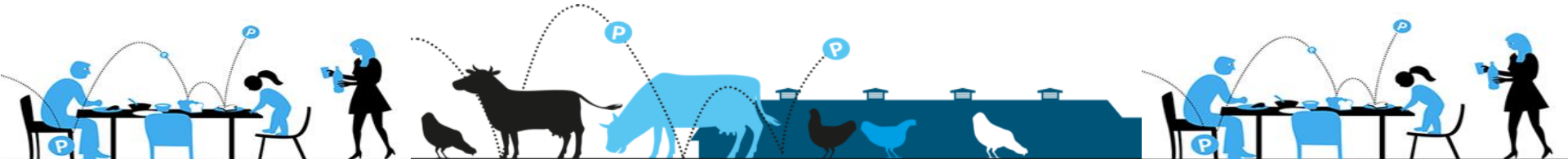
IWAMA Interactive Water Management

European Sustainable Phosphorus Platform

History, Scope & Achievements

Ludwig Hermann

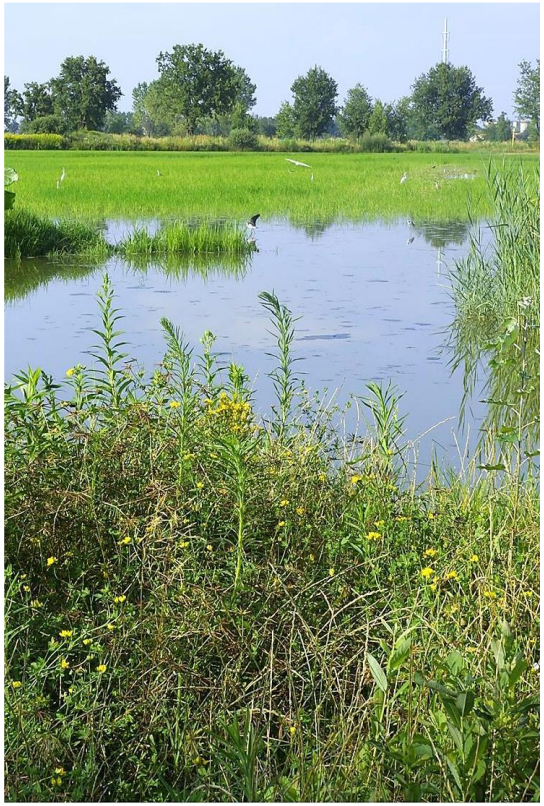
IWAMA
Workshop on Nutrient Reduction & Recovery
13–15.6.2018,
Kalmar, Sweden



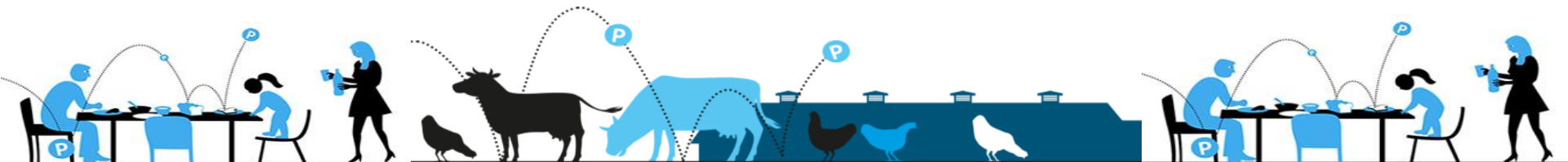
ESPC1, Brussels, 6.-7.03.2013

Conclusions: 7 key messages

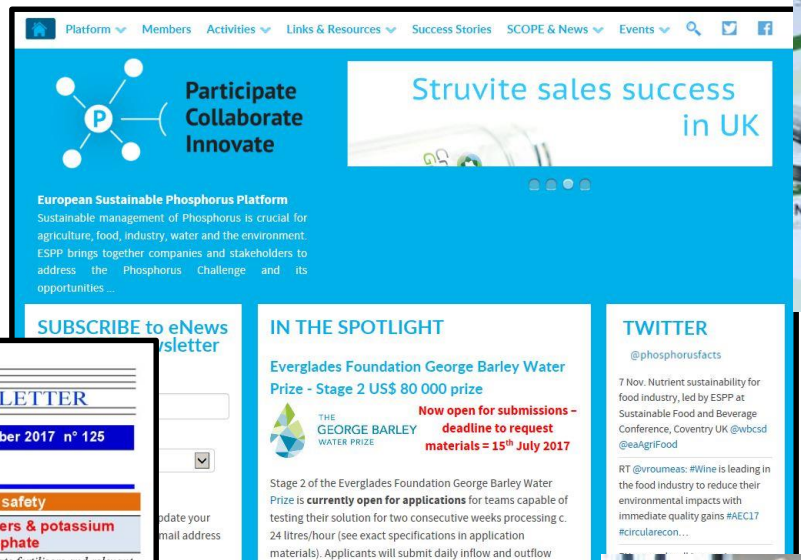
- Business development
- Smart cooperation
- Knowledge & research
- Incentives for efficient use & recycling
- Harmonisation of legislation
- Developing EU policies
- Raising awareness



Launch of the European Sustainable Phosphorus Platform



European Sustainable Phosphorus Platform



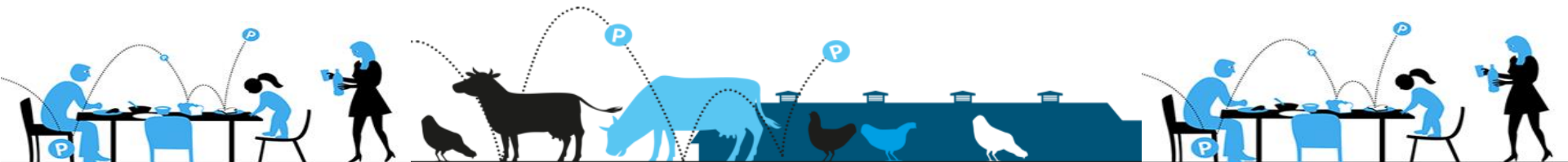
ESPP: a coalition for action

- **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 …*

Example: communicating success stories

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



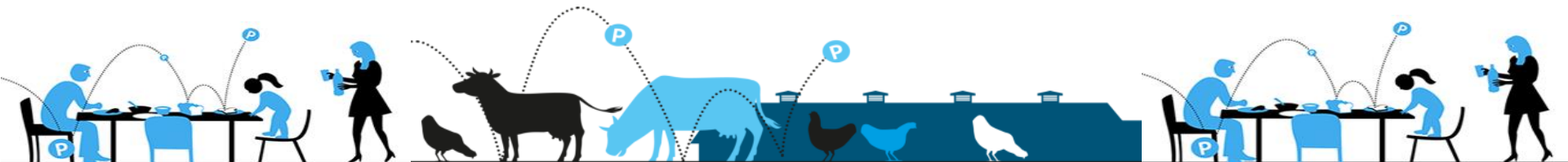
How ESPP functions

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

A. **Confirm the proposed "Mineral" (<1% organic carbon) and "Low-carbon" fertilisers definitions**[i] both in Annex I (PFCs) and Annex III (labelling).

B. Need to **resolve the exclusion of industry by-products**, which are not waste, as highlighted by the European Parliament[ii].

C. Importance of developing **implementation guidance** and of ensuring **assessment of Regulation implementation**[iii].

D. 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 materials[iv].

E. Confirm the objective to **accelerate and support the "STRUBIAS" process**[v].

F. **Polymers,** for controlled release fertilisers and for improving stability[vi]: ensure that biodegradability criteria are feasible and agronomically appropriate.

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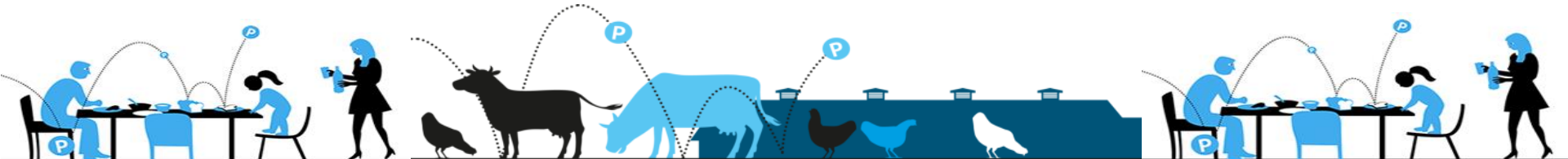
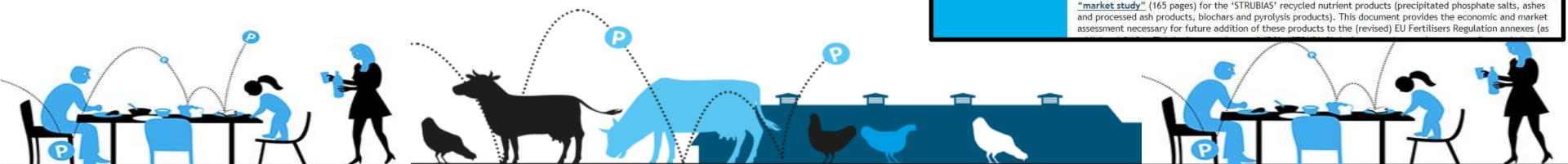


ESPP communications tools

→ available for other networks and R&I projects

- **Twitter** @phosphorusfacts
- **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

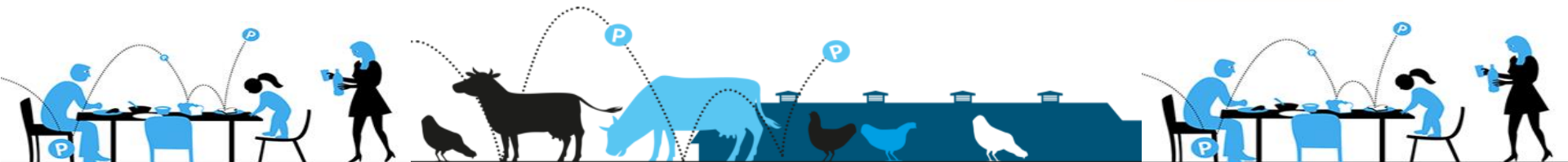


Nutrient platforms and networks worldwide

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)

ESPP European Sustainable Phosphorus Platform 2013
Global Partnership for Nutrient Management (UNEP)
http://www.unep.org/gpa/what-we-do/global-partnership-nutrient-management

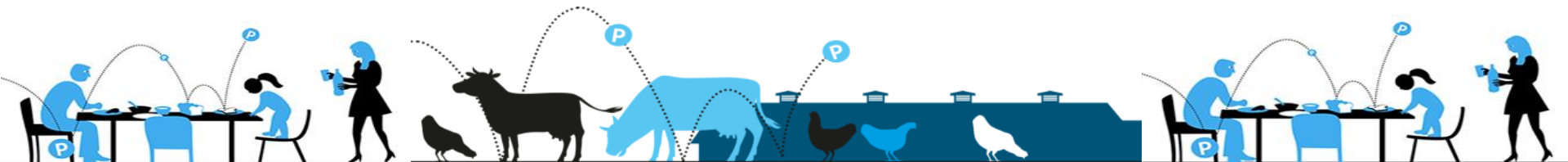


ESPC2, Berlin, 5.-6.03.2015 - TAKING P TO THE NEXT LEVEL

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

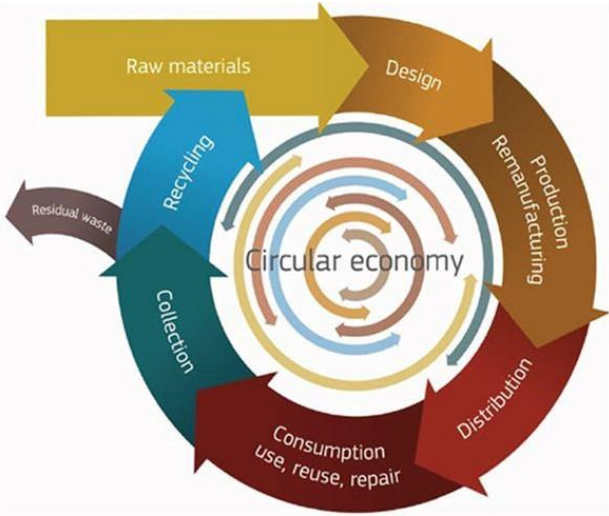
30 % of PM_{10} air particles In Milan result from livestock ammonia emissions

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

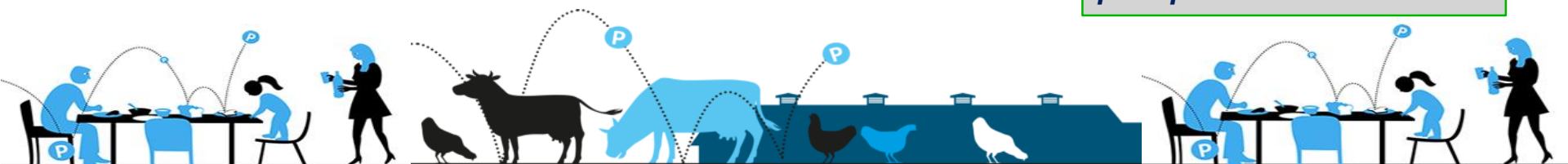
Proposals include:
increasing knowledge and research, P-recycling,
risk of soil contamination by mineral or recycled fertilisers
see www.phosphorusplatform.eu/scope107



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

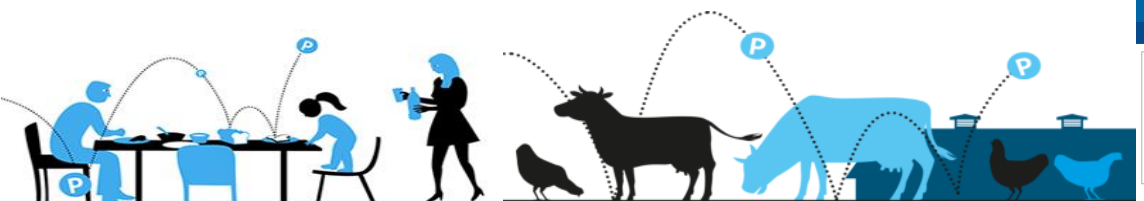
- *Will open EU market for recycled nutrients & for recycling technologies*
- *Currently in Council - Parliament trilogue decision process*
- *Many issues remaining*

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

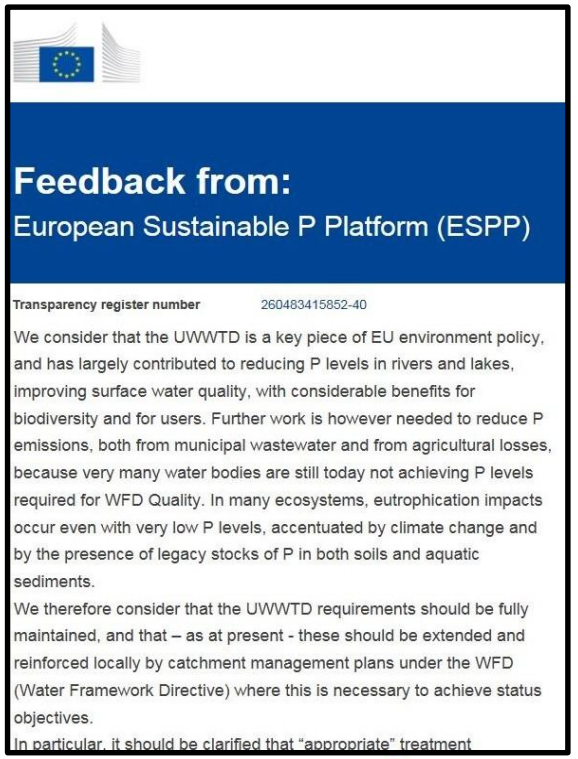


European policies driving nutrient recycling

ESPP in action
2017 submissions to EU consultations on revisions of water protection policies

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



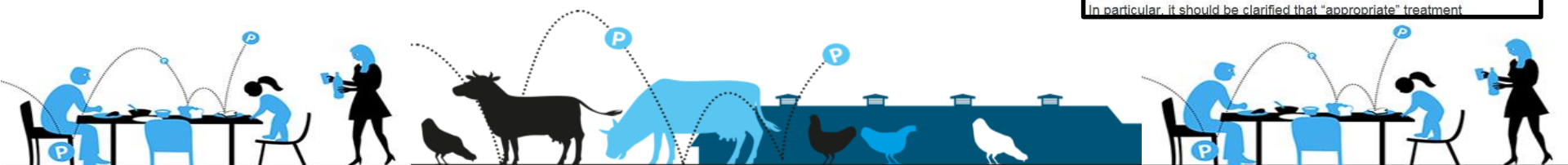
Feedback from:
European Sustainable P Platform (ESPP)

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



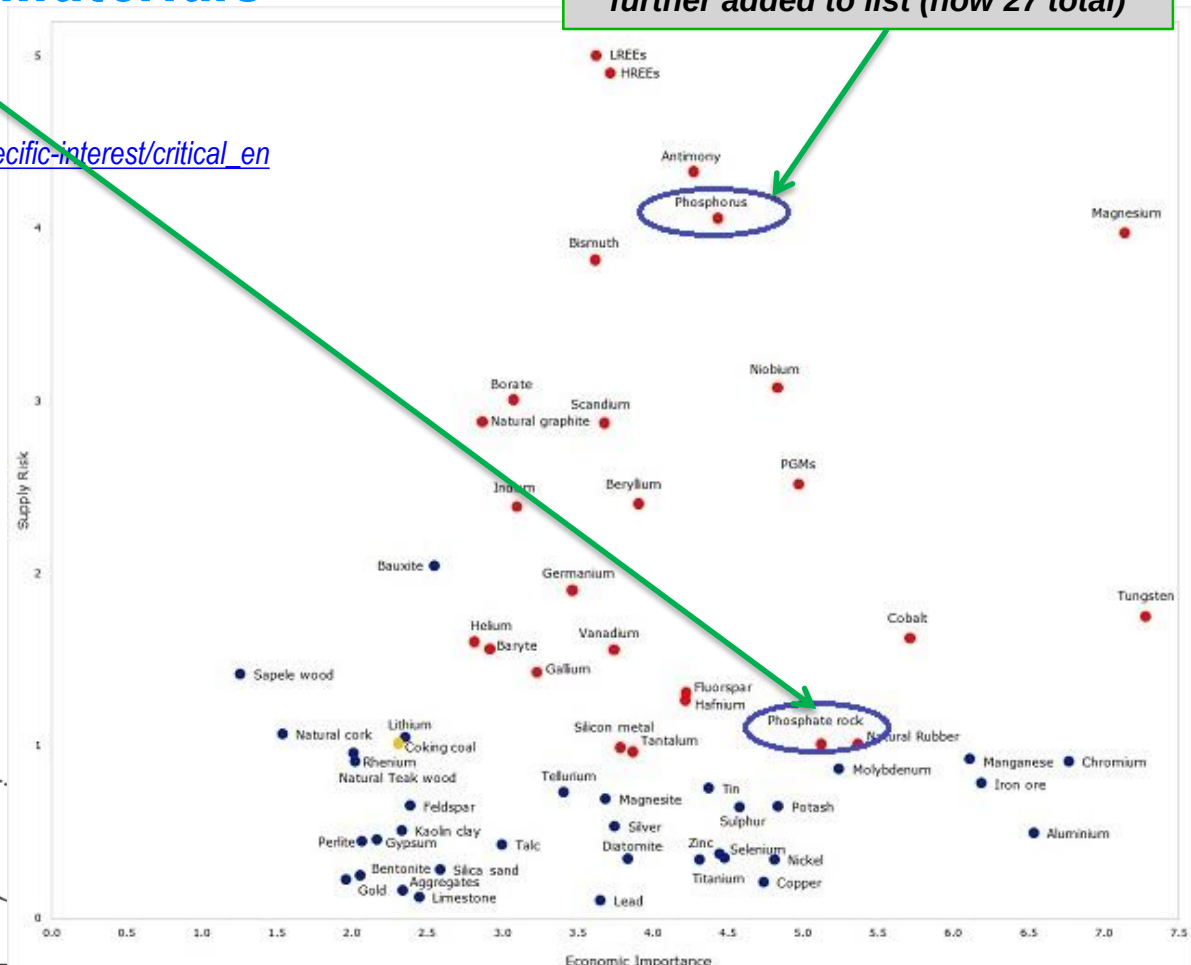
European policies driving nutrient recycling

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*

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

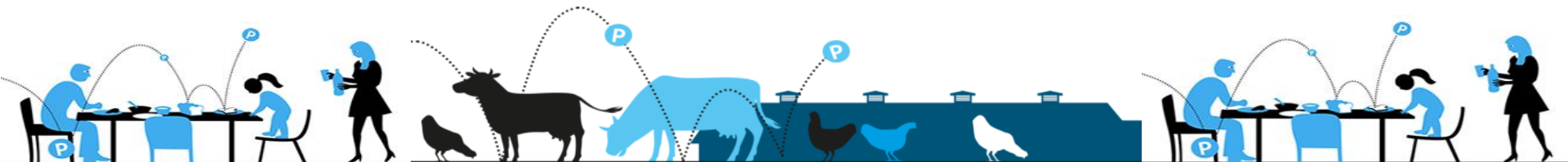
Date: 2015-11-10

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 recycling [1]from wastewater treatment processes: available technologies, applicability and standardization needs".

online at *www.phosphorusplatform.eu/regulatory*



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*

Scope Newsletter n° 118
http://www.phosphorusplatform.eu/scope118

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 règlementation 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 biphényles

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

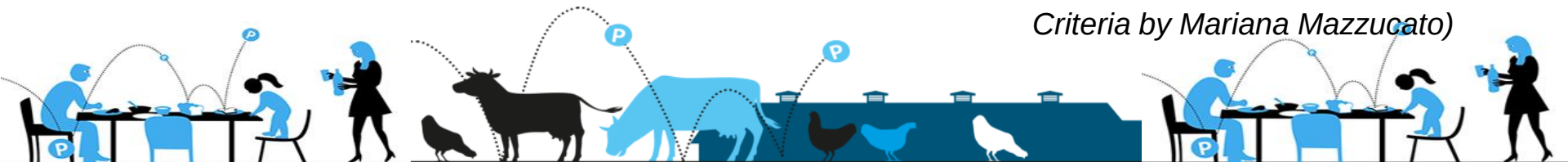
http://mmm.fi/en/recyclenutrients

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)



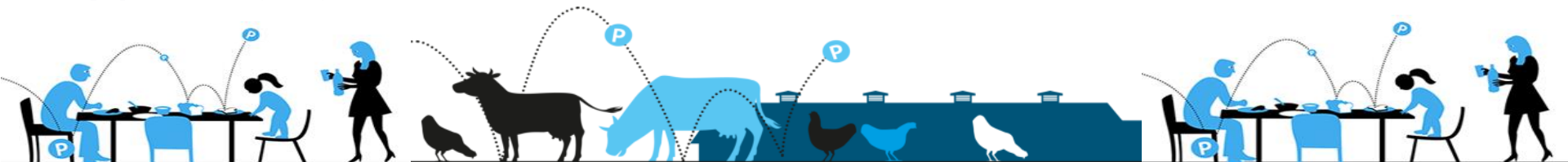
ESPC3 approach: Bottom-up

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

Source: Acqua e Sole

Success story:

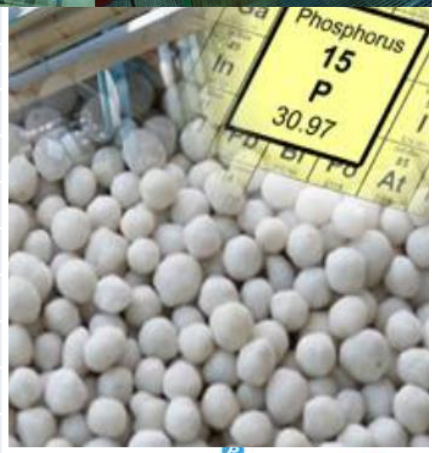
EasyMining Ash2Phos® Pilot Plant Helsingborg

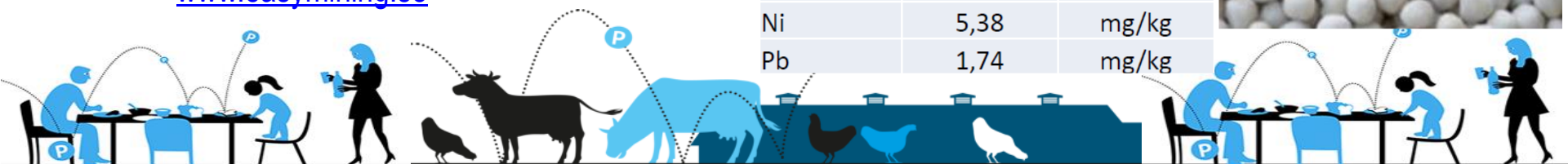
Precipitated Phosphate (PCP) from BIOFOS ash (DK)

- 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/

JOHN NURMISEN SÄÄTIÖ

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

Kanton Zürich Baudirektion Amt für Abfall, Wasser, Energie und Luft
Thames Water
University of Applied Sciences and Arts Northwestern Switzerland
OSTARA
SYSTEMIC Circular solutions for biowaste
BSAG Baltic Sea Action Group
ecophos
SCIENCE CAMPUS PHOSPHORUS RESEARCH ROSTOCK
Hitz Hitachi Zosen
SMART-Plant
Biomasa Peninsular
Budenheim
Outotec
DIE 48ER
fertilizers europe
SEDE VEOLIA
DEUTSCHE PHOSPHOR PLATTFORM
PRAYON
NUTRIENT PLATFORM NL
CLARIANT
SEVERN TRENT WATER
EGLV DE LIPPE VERBAND
CETAQUA WATER TECHNOLOGY CENTER
kemira
HIE Highlands and Islands Enterprise Iomairt na Gàidhealtachd 's nan Eilean
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QUEEN'S UNIVERSITY BELFAST
AICL
Fraunhofer IGB
suez environnement
Timac AGRO International
PRO MAN
RUN4LIFE
incopa
ITALPOLLINA
EasyMining
Italmatch Chemicals
YARA
Knowledge grows

Thank you!

Questions? info@phosphorusplatform.eu