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## Events

### CRU Phosphates 2020

Registration is now open for the 13<sup>th</sup> CRU Phosphates Conference, 8-10 March 2020 Paris. This is the world's leading phosphate industry meeting, with over 400 industry participants from 40 countries expected, covering supply, market trends and industry processes and technologies for phosphate rock, fertilisers, animal feed and industrial phosphorus applications. The conference includes outlook presentations by executives of the world's leading phosphates companies; supply, demand and market trends; new phosphate processing technologies and operating experience. See summary of the 12<sup>th</sup> CRU Phosphates Conference (Florida, 2019) in ESPP eNews [n°33](#). 10% registration fee discount for ESPP members.

*CRU Phosphates 2020, 8-10 March Paris - <https://events.crugroup.com/phosphates>*

### European biosolids conference

ESPP will moderate the resource recovery session at the AquaEnviro “European Biosolids & Organic Resources Conference”, Manchester (Old Trafford Stadium) UK, 19-20 November. This is Europe's main conference on sewage sludge management with over 280 participants last year (2018). The water industry is focussed on maximising energy recovery from sewage sludges, whilst retaining the option of agricultural valorisation for treated biosolids. The use of thermal hydrolysis as a pre-treatment in so-called Advanced Anaerobic Digestion (AAD) is increasingly common, but the return liquors from these processes present a number of challenges, particularly in terms of ammonia load (operating experience from Severn Trent and Thames Water sites will be presented). Sessions include biosolids to land, ammonia management, biogas, resource recovery ...

*European Biosolids & Organic Resources Conference, Manchester UK, 21-22 November <http://european-biosolids.com/>*

**Save the date: 4th European Sustainable Phosphorus Conference, Vienna, 15-17 June 2020**

[www.phosphorusplatform.eu/espc4](http://www.phosphorusplatform.eu/espc4)

See more upcoming events at [www.phosphorusplatform.eu/upcoming-events](http://www.phosphorusplatform.eu/upcoming-events)

## Calls for papers

### Call for papers ESPC4

The **call for abstracts and posters is now open (closes 31/12/2019)** for the 4<sup>th</sup> European Sustainable Phosphorus Conference, Vienna, 15-17 June 2020. Abstracts are invited for presentations at the six parallel sessions, for plenary success story mini-presentations, for posters or for stands. The parallel session themes are: economy (of phosphorus sustainability and nutrient recycling), enhanced efficiency fertilisers, sustainable phosphorus removal from waste streams, R&D cooperation and platforms, taking R&D developments through to the market and phosphorus sustainability perspectives. Proposed success story mini-presentations (3 minutes, plenary) should present your company, local authority (city, region ...) or stakeholder successes in implementing phosphorus recycling or phosphorus management. Posters and stands can address any subject related to nutrient sustainability.

Full details [www.phosphorusplatform.eu/espc4](http://www.phosphorusplatform.eu/espc4)

### Call for texts: phosphorus stewardship and climate change

ESPP (European Sustainable Phosphorus Platform) and the Sustainable Phosphorus Alliance (North America) are preparing a special SCOPE Newsletter edition on “Nutrients and Climate Change”. This will consist of selected short texts presenting expert perspectives on how climate change will impact nutrient emissions and eutrophication as well as actions to mitigate this.

Proposed texts are invited from researchers, companies, stakeholders and any interested party. Around twenty texts will be selected for publication by an editorial committee chaired by Jessica Stubenrauch, Beatrice Garske (FNK Leipzig & University of Rostock), Anders Nättorp (FHNW Switzerland) and Jim Elser (University of Montana). The SCOPE Newsletter is circulated worldwide to 41 000 companies, stakeholders, regulators and media interested in nutrient management, with a detected opening rate of 12-14%, and is published on the ESPP website [www.phosphorusplatform.eu](http://www.phosphorusplatform.eu) **Submit your text to be included!**

Send us your ideas for action for on nutrients and climate change to appear with the world's leading experts.

Maximum 600 words. Deadline 31.01.2020 latest.

Call details and instructions here: <https://phosphorusplatform.eu/callfortexts>

### Call for consultants: EIP-AGRI

The European Commission funded innovation platform “EIP-AGRI” has published a call for consultants/experts to coordinate (including drafting documents) or facilitate events on the following themes: resource management and sustainable soil management, farm resilience capacity and digitisation. Deadline for submission is 9<sup>th</sup> December 2019.

EIP call for coordinating experts / event facilitators: <https://ec.europa.eu/eip/agriculture/en/news/call-interest-would-you-contribute-eip-agri-0>

## Study on EU “restrictions” for composts and digestates

### DG ENVI study on contaminants in composts and digestates

A study commissioned by the European Commission (DG Environment) assesses risks related to contaminants in composts and digestates, and proposes possible “Risk Management” measures (restrictions using the EU Chemical Regulation REACH). ESPP submitted an Access to Information procedure for this document in June 2019, and has now been informed that it is published [here](#) (see ESPP eNews [n°35](#)).

It should be noted that although both compost and digestate are now exempt from REACH registration (see ESPP eNews [n°34](#)), EU-wide restrictions (effectively including bans) can nonetheless be implemented using REACH.

Four possible “Risk Reduction” measures are proposed: EU limits on contaminants in all composts and digestates; ban on use of sewage sludge and/or mechanically separated household organic waste MBT in composts and digestates; specific restrictions where composts or digestates are used as growing media; obligation for two-stage anaerobic digestion of sewage sludge. The study appears to suggest that any restrictions for sewage sludge being used in compost or digestate should also be applied to all sewage sludge going to agricultural land.

Legal options discussed include restrictions on all composts and digestates (using REACH), modifications of the EU Fertilising Products Regulation annexes (would only impact CE-Mark composts and digestates), modification of the EU Sewage Sludge Directive or EU Waste Water Treatment Directive. It is ESPP's understanding that a restriction under REACH could, for example, prevent the placing on the market in Europe (that is sale or use at no cost by any party other than the producer, other than under “waste” regulation) of any compost or digestate containing contaminants above specified limits and/or containing excluded input materials.

“European Commission. Digestate and compost as fertilisers: Risk assessment and risk management options. Final Report”, Ramboll – Peter Fisk – WOOD (referred to in the tender as the “AMEC” study), ref. 40039CL00313, 8th February 2019 <https://etendering.ted.europa.eu/cft/cft-document.html?docId=57674>

## ESPP new member

### PhosAgro joins ESPP

Russia-based leading phosphate fertiliser producer, PhosAgro, has become a member of ESPP. PhosAgro is the largest phosphate-based fertiliser producer and one of the leading animal feed phosphate producers in the European continent, and one of the world's leading integrated phosphate rock and fertiliser producers. PhosAgro's main products include phosphate rock, 39 grades of fertilizers, feed phosphates, ammonia, and sodium tripolyphosphate. These products are used by customers in more than 100 countries across the world. PhosAgro is the first fertiliser company not producing in the EU to become a member of ESPP, conform to ESPP's statutes which specify that the association's activities are related to Europe and admit as members any organisation with activities related to phosphorus sustainability. PhosAgro's 2025 strategy prioritise sustainable development and high standards in social, environmental and corporate governance performance. PhosAgro's low-cadmium phosphate-based fertilizers stand out for their high efficiency and their environmental safety. PhosAgro is the first Russian company selected by the UN Food and Agriculture Organisation (FAO) to implement a global soil protection initiative.

PhosAgro website [www.phosagro.ru](http://www.phosagro.ru)

## Phosphorus recycling

### Global compendium of P-recovery technologies

The Global Water Research Consortium has produced a 40-page report summarising technologies currently available worldwide for phosphorus recovery from municipal sewage, summarising how the different technologies integrate into sewage works operation and sludge processing systems. It describes each process, how it functions, the technology readiness level, compatibility with German phosphorus recovery legislation requirements, limitations of application regarding sewage works type and sludge and other information relevant to implementation. Processes considered include P-recovery of dissolved phosphate from liquors by struvite precipitation, HAP (hydroxyapatite) precipitation, calcium silicate hydrate adsorption; release of further phosphorus from sludge to increase recovery potential from liquors (lysis: Cambi, Pondus; bio-acidification: Ostara Wasstrip, Veolia Phosforce). A total of over 20 such technologies are listed. Processes recovering phosphorus directly from sewage sludge considered are: Budenheim Extraphos, pyrolysis, EuPhoRe, Kubota, Mephrec/P.KON. Considered processes taking sewage sludge incineration ash as input material are: Glatt SeraPlant, Ecophos, Remondis Tetraphos, Phos4Life/ZAR Zurich, EasyMining Ash2Phos/CleanMap, Metawater alkali leaching Japan, AshDec.

Global Water Research Consortium <http://globalwaterresearchcoalition.net> "Global Compendium on Phosphorus Recovery from Sewage/Sludge/Ash", Technical Report, March 2019  
<https://www.researchgate.net/publication/331982837> Global Compendium on Phosphorus Recovery from Sewage/Sludge/Ash

## Communications

### SPA blog on farm phosphorus traps

The Sustainable Phosphorus Alliance, North America, has published another of its online thematic blog series, summarising the potential of phosphorus traps for removing dissolved phosphorus in run-off from fields or subcatchments with legacy phosphorus losses, that is sites where phosphorus losses will remain elevated "for decades" because of accumulated phosphorus in soils. Traps are buried tanks containing materials which adsorb soluble phosphorus from collected runoff. Identified criteria for installation are indicated as: convergence of tile drainage or surface water at a site with vertical height above outflow (hydraulic push through adsorbent), at least 0.2 mgP<sub>soluble</sub>/l, design to cope with peak flow rates (at many sites, 90% of P is lost in 5% of flow events) and so sufficient space (e.g. 40 tons of adsorbent for 4000 l/minute for a poultry farm). Adsorbent materials are often iron-containing by-products (such as steel slag) but these will not be recyclable, but research into regeneration is underway.

SPA blog "A tool for trapping dissolved phosphorus", C. Penn, 10/2019 <https://phosphorusalliance.org/2019/09/05/chad-penn/> and "Review. A Review of Phosphorus Removal Structures: How to Assess and Compare Their Performance", C. Penn et al. *Water* 2017, 9, 583; <http://dx.doi.org/10.3390/w9080583>

### EU circularity rate

An update from Eurostat indicates that the "circularity rate" in the EU reached 11.7% in 2016, slowly progressing up from 8.4% in 2004. The "circularity rate" covers all materials fed into the economy, and is much lower than the "recycling rate" (around 55% in the EU) which considers only wastes. The circularity rate varies from 1.3% in Greece to 29% in The Netherlands, not only because of recycling but also because of higher imports of materials (including fossil fuels) or higher rates of materials extraction (mining), both of which lead to lower circularity rate.

"What goes around comes around – EU circularity rate", Eurostat, 18<sup>th</sup> September 2019 <https://ec.europa.eu/eurostat/web/products-eurostat-news/-/DDN-20190918-2>

## JRC: raw materials and Sustainable Development Goals

A European Commission (JRC) Science for Policy publication looks at how raw materials use interacts with Sustainable Development Goals (SDGs), noting that raw materials are necessary for sustainability objectives (e.g. for production of energy-saving technologies) but that their extraction has significant impacts. The role of forestry is underlined, providing raw materials, as well as ecosystem and climate services, on condition of sustainable forest management. The role of phosphate and potash, in SDG2 ("Zero Hunger") is noted, by their contribution to agricultural productivity. The importance of EU Raw Materials policies, and also policies for the Circular Economy and minerals conflicts are underlined, as is the need for monitoring.

*"Future supply of raw materials must not repeat the sustainability problems of the past", European Commission (JRC), Mancini et al., 2<sup>nd</sup> October 2019 <https://ec.europa.eu/jrc/en/news/future-supply-raw-materials-must-not-repeat-sustainability-problems-past>*

## Business models for resource recovery in developing countries

An 800 page report from the IWMI (International Water Management Institute) presents business models for energy, nutrient and water reuse in low- and middle-income countries. The report underlines the potential to combine closing nutrient recycling loops, develop a circular economy, recover waste and water treatment costs and develop viable businesses, whilst ensuring the key public service of sanitation. Decentralised solutions may help address the non-availability of funding necessary to establish or upgrade large scale installations. Examples presented adding "night soil" (faeces) in composting of municipal solid waste to improve the nutrient value of the product, using low-cost technology and enabling sale to farmers (Sri Lanka), composting livestock waste (Mexico), public toilet faeces to nutrient-rich compost (Rwanda), faecal sludge use on farm (India), provision of sanitation and processing faeces and urine to organic fertiliser for agriculture (Burkina Faso).

*"Resource recovery from waste. Business models for energy, nutrient and water reuse in low- and middle-income countries", M. Otoo & P. Drechsel, ed., Routledge, ISBN 978-1-315-78086-3, 2018 <http://www.iwmi.cgiar.org/Publications/Books/PDF/resource-recovery-from-waste.pdf>*

## FAO guidelines on estimating livestock nutrient flows and impacts

The UN Food and Agriculture Organisation (FAO) has published LEAP guidelines (Livestock Environmental Assessment and Performance Partnership) on how to assess and account nitrogen and phosphorus flows and life cycle assessment (LCA) for livestock production and supply chains. FAO underlines the importance of these nutrients for the sustainability of agriculture, citing planetary boundaries and that phosphorus is a non-renewable, non-substitutable, finite resource. The aim is to enable identification opportunities to improve nutrient management, improve nutrient efficiency and reduce impacts. ESPP participated in the document development process, underlining the importance of evaluating recycling flows, and the final document does clearly address not only inputs, outputs and losses but also specifically nutrient recycling.

*"Nutrient flow and associated environmental impacts in livestock supply chains. Guidelines for assessment", Food and Agricultural Organization of the United Nations 2018, 196 pages, ISBN 978-92-5-130901-8 <http://www.fao.org/partnerships/leap/publications/guidelines/en/>*

## Science and research

### Journal special issue and blog on phosphorus

The Journal of Environmental Quality has published (open access) a special issue on phosphorus with 23 papers, mainly on phosphorus in agriculture and catchment management. The papers are mostly reviews and opinion summaries, rather than new research. A summary (Johnston & Poulton) of 175 years of long-term field experiments at Rothamsted, UK, and at other sites shows the clear link between plant available phosphorus in soil (soil P higher than the critical level related to soil phosphorus buffering capacity) and crop yield, with high fertiliser efficiency when soil P is near the critical level and inputs are slightly higher than offtakes (90 – 55% P-use efficiency). Other papers show the challenges of phosphorus loss mitigation strategies: no single solution or measure fits all, uncertainty of results, time delays. The situation in the Chesapeake Bay is illustrative (Kleinman, Fanelli et al.), despite the management plan, dissolved P is increasing in some tributaries and challenges include legacy P, artificial drainage and livestock density. Several papers present data on P behavior in agricultural catchments, showing that agriculture increases labile P in soils compared to natural vegetation (Neidhardt, Acthen et al.), that agricultural soil P losses occur in both drains and surface runoff (Macrae, Ali et al.) and that high P losses occur with drought and with rainfall events because of resuspension of legacy P in sediments (Bieroza, Bergström et al.). A review of studies (Nash, McDowell et al.) shows that recent fertiliser application can contribute 30 – 80% of P-runoff from grassland, but that this can be reduced to <10% by good management practices. A series of blogs are published to promote the content of this science special issue to a wider audience.

*Journal of Environmental Quality special issue on phosphorus, JEQ Volume 48 Issue 5, September-October 2019*

<https://dl.sciencesocieties.org/publications/jeq/tocs/48/5#h1-SPECIAL%20SECTION:%20CELEBRATING%20THE%20350TH%20ANNIVERSARY%20OF%20DISCOVERING%20PHOSPHORUS%E2%80%94%2094FOR%20BETTER%20OR%20WORSE>

*Blogs on phosphorus: "The discovery and general uses of phosphorus", "Why is phosphorus needed on farms", "What are sources of phosphorus for crops", "What are the challenges regarding phosphorus use", "Ten things we can do to manage phosphorus better"*

<https://soilsmatter.wordpress.com/author/soilsmatter2011/> and web story <https://www.soils.org/discover-soils/story/reduce-reuse-recycle-the-future-of-phosphorus>

## EU Critical Raw Materials project on phosphate rock reserves

The EU-funded Expert Network on Critical Raw Materials ([SCRREEN](#)) has published a “Report on the Future Use of Critical Raw Materials”. This includes a useful breakdown of use of phosphate rock (2016, worldwide, provided by IFA, [International Fertilizer Association](#)), indicating that >80% goes to fertilisers, 7% to animal feeds, <5% to detergents and <1% to human food additives (5-6% other industrial uses). The report underlines that unlike for example fossil fuels, phosphorus cannot be replaced in agriculture because it is essential for plants and animals (although the report does misleadingly add “with current scientific understanding”). The report indicates that world demand for phosphate rock is likely to grow considerably, with increasing world population and in parts of the world increasing animal products in diets, leading to conclude a possible “inelastic supply gap at market in the decade of 2020-2030” and that “current phosphate rock reserves will be depleted in approximately 70 to 140 years”. No mention is made of the environmental impacts of phosphorus use (eutrophication).

*SCRREEN (Solutions for CRITICAL Raw materials – a European Expert Network, Horizon 2020, 2016-2020) “Report on the Future Use of Critical Raw Materials”, L. Tercero Espinoza et al., <http://screen.eu/results/> and deliverable D2.3 <http://screen.eu/wp-content/uploads/2019/09/SCRREEN-D2.3-Report-on-the-future-use-of-critical-raw-materials-2.pdf>*

## Clean Water Cluster Event

The Horizon 2020 cluster event, Girona, 22<sup>nd</sup> October 2019, brought together 12 R&D projects in the field of clean water with themes including phosphorus removal, groundwater nitrates and antimicrobial resistance.

**Stefan Peiffer, University of Bayreuth**, presented the recently started **P-TRAP project** (<https://h2020-p-trap.eu/>) that targets diffuse phosphorus input to surface waters. The project will focus on immobilization of phosphorus in artificially drained agricultural areas as well as long-term stabilization of phosphorus in lake sediments, using iron-containing by-products from drinking water treatment. Also, vivianite and phosphorus-containing Fe(III)oxides recovered from phosphorus “traps” in agricultural runoff will be evaluated as a fertilizer in collaboration with Spanish company Fertiberia.

**Sara Johansson, University of Girona**, presented her work on phosphorus and potassium recovery from digested sludge liquors developed within the recently finished TreatRec project (<https://treatrec.eu/>). Published results show that anammox as a nitrogen removal step before struvite precipitation enables the formation of potassium struvite (magnesium potassium phosphate ( $MgKPO_4 \cdot 6H_2O$ )). Granular partial nitrification-anammox sludge can also function as a biological crystallizer and form hydroxyapatite.

**Philipp Kehrein, Delft University**, presented his work in the **Super-W project** (<https://www.superw.ugent.be/>) to identify bottlenecks hindering implementation of treatment and recovery technologies in wastewater treatment plants. His recommendation is that WWTPs increase efforts in value chain development for recovered resources e.g. work with market actors for recovered products.

**Daniela Buzica and Anna Marczak, European Commission DG Environment**, participated via video link and presented current development in EU water policy. Water and sludge reuse are two of the topics that are being considered in the evaluation of the Urban Waste Water Treatment Directive.

*“Clean Water”, Horizon 2020 MSCA-ITN cluster event for Horizon 2020 Marie Skłodowska-Curie (MSC) Innovative Training Networks (ITN) projects, Girona, Spain, 22nd October 2019. Jointly organised by the Research Executive Agency (REA) and the Catalan Institute for Water Research (ICRA) [https://ec.europa.eu/info/horizon-2020-msca-itn-cluster-event-clean-water\\_en](https://ec.europa.eu/info/horizon-2020-msca-itn-cluster-event-clean-water_en)*

## Iron phosphate for P-removal from sediments and runoff

WETSUS Netherlands and other partners have received a subsidy from the Dutch scientific organisation NOW (Idea Generator Call) for research into stimulating iron phosphate precipitation, as vivianite (iron II phosphate) from freshwater sediments and waters with high phosphorus loadings. The objective is to remove phosphorus contributing to eutrophication in a potentially recoverable form, because vivianite is magnetic, and because it is easier to separate phosphorus from iron II than from iron III phosphate (so potentially enabling recovery as phosphate salts).

*“Subsidy for vivianite research”, WETSUS News September 2019 <https://www.wetsus.nl> › home › wetsus-news › wetsus-news-september-2019*

## New fertilisers

Weeks & Hettiarachchi (in the JEQ special issue indicated above) provide a review of new fertiliser technologies, and of their results in use. New fertiliser approaches presented are (1) controlled release fertilisers, using coatings, pH modifiers, scaffolds (loading onto materials such as layered double hydroxides LDH, nano-particles, graphene oxides), organic and organo-mineral matrices and inherent slow-release chemicals (2) “blockers”, intended to inhibit fixation of P onto anions in soils (i.e. calcium, iron, aluminium in soils), including maleic-itaconic polymers and humic substances (from decomposition of organic materials) and (3) inducers, intended to stimulate uptake by crops of poorly available soil P, including oxide nano-particles of anatase (titanium), magnetite ( $Fe_2O_3$ ), zinc and copper. The authors conclude that in many cases field results do not reflect positive claims from pot trials, mechanisms are complex (impacts on soil chemistry, crop P uptake, soil microbes) and that considerable more work is needed to identify economically and environmentally viable products. The paper does not consider that use of microbes as biostimulants to improve P uptake.

*“A Review of the Latest in Phosphorus Fertilizer Technology: Possibilities and Pragmatism”, J. Weeks & G. Hettiarachchi, J. Environ. Qual. (JEAQ) 48:1300–1313 (2019) <http://dx.doi.org/10.2134/jeq2019.02.0067>*

## ESPP members



## Stay informed

SCOPE newsletter: [www.phosphorusplatform.eu/SCOPEnewsletter](http://www.phosphorusplatform.eu/SCOPEnewsletter)

eNews newsletter: [www.phosphorusplatform.eu/eNewshome](http://www.phosphorusplatform.eu/eNewshome)

If you do not already receive SCOPE and eNews (same emailing list), subscribe at [www.phosphorusplatform.eu/subscribe](http://www.phosphorusplatform.eu/subscribe)

LinkedIn group: [www.linkedin.com/groups/4783093](http://www.linkedin.com/groups/4783093) (or search for ESPP)

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

Slideshare presentations: [www.slideshare.net/NutrientPlatform](http://www.slideshare.net/NutrientPlatform)