

**Everglades Foundation George Barley Water Prize - Stage 2 US\$ 80 000 prize
Now open for submissions – deadline to request materials = 15th July 2017**

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.**



THE
GEORGE BARLEY
WATER PRIZE

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

Policy	1
<i>United Nations highlights resource recovery from wastewater</i>	<i>1</i>
<i>Ontario actions for phosphorus recycling</i>	<i>2</i>
<i>HELCOM manure nutrients and nutrient bookkeeping</i>	<i>2</i>
Innovation and implementation	2
<i>AnMBR water reuse EU Innovation Deal selected</i>	<i>2</i>
<i>Digestate certification success story Sweden</i>	<i>2</i>
<i>Agricultural application of phosphogypsum</i>	<i>3</i>
<i>Fraunhofer IGB ePHOS® electrochemical nutrient recovery</i>	<i>3</i>
<i>Colsen's sixth struvite phosphorus recovery installation underway</i>	<i>3</i>
<i>UK phosphorus removal innovation</i>	<i>4</i>
<i>Berner's recycled fertiliser from organic wastes</i>	<i>4</i>
<i>K-struvite application in building material</i>	<i>5</i>
<i>Nutrient Recovery 2.0</i>	<i>5</i>
Research	5
<i>R3 Water sewage resource recovery and pharmaceuticals treatment</i>	<i>5</i>
<i>Enzyme feed additives reduce poultry phosphorus needs</i>	<i>5</i>
<i>Nano hydroxyapatite shows no chronic toxicity in rats</i>	<i>5</i>
<i>German science academies propose monitoring of primary phosphorus resources</i>	<i>6</i>
<i>Extended anaerobic treatment of sewage improves toxicity removal</i>	<i>6</i>
Media	6
<i>France, Italy: a tasteful love for shit</i>	<i>6</i>
Events	7
ESPP Members	9

Policy

United Nations highlights resource recovery from wastewater

The 2017 UN World Water Development report underlines the important circular economy potential of wastewater and the synergies with improving sanitation. Over 80% of the world's wastewater is today discharged into the environment untreated, and 2.4 billion people do not have advanced wastewater treatment. The UN estimates that every dollar spent on sanitation brings societal benefits (health, environment) of 5.5 dollar. The report notes the potentials for water reuse after treatment, recovery of energy (e.g. via biogas or other sludge processing) and for recovery of phosphorus and nitrogen. Examples of P-recovery as struvite (Ostara) or from sewage sludge

incineration ash (Ashtec) and of energy recovery (Outotec) are cited. Water, phosphorus and energy recovery are considered as opportunities to improve the economic sustainability of sewage treatment.

United Nations World Water Assessment Programme (WWAP) 2017 UN World Water Development Report, Wastewater: The Untapped Resource <http://www.unesco.org/new/en/natural-sciences/environment/water/wwap/wwdr/2017-wastewater-the-untapped-resource>

Ontario actions for phosphorus recycling

The province of Ontario, Canada, June 2016, passed the "Waste Free Ontario Act" ([Bill 151](#)). This will implement the Resource Recovery and Circular Economy Act [2016](#) and the Waste Diversion Transition Act [2016](#). The new Act is supported by a Waste Free Ontario Strategy which states that "waste is seen as a resource that can be recovered, reused and reintegrated into the economy to achieve a circular economy" and sets two goals: a zero waste Ontario and zero greenhouse gas emissions from the waste sector. The initiatives underway include organic food waste, excess soil, biosolids, etc. with a goal of resource recovery and waste reduction coupled with a focus on waste generator responsibility, and making it cheaper to recycle waste than to send waste to landfills. Phosphorus efficiency and recovery are part of the initiatives to support both the Waste Free Ontario Act and the Great Lakes Protection Act [2015](#). Initiatives underway in Ontario, include a provincial preliminary phosphorus flow study, and (with Guelph University and Ontario Greenhouse Vegetable Growers' Association) an assessment of options for nutrient capture and water reuse from smaller commercial greenhouses. Ontario is also a partner of the Everglades Foundation's George Barley Water Prize for technologies to remove and recover phosphorus from surface waters, in which the top 10 proposed technologies will be tested in cold weather conditions in Ontario.

See: http://www.downloads.ene.gov.on.ca/envision/env_reg/er/documents/2016/012-9356.pdf

HELCOM manure nutrients and nutrient bookkeeping

HELCOM, the Baltic Marine Environment Protection Commission - Helsinki Commission, is working on coordinating different national standards on manure nutrient content and on farm nutrient bookkeeping. Workshops on the two questions collated information on implementation of these two questions in the nine contracting countries. Farm nutrient bookkeeping (calculating nutrient inputs and offtakes) is obligatory only in Denmark, and in some cases in Sweden and Poland, despite its value in defining fertiliser planning. Obstacles to implementation include both absence of legal framework and inadequate data and uncertainties regarding standard values for nutrient contents of manures, crop uptake, nitrogen fixation and denitrification. Priority actions include development of data and of a shared methodology across the Baltic Region. The workshop on manure showed that methods of estimating nutrient content in manures were highly variable between different countries, and are based on varying assumptions and models. Again, the need to establish coherent calculation methods across the Baltic Region was identified.

"HELCOM Workshop on manure nutrient content in the Baltic Sea countries" 19-20 November 2015, Vantaa, Finland, <http://helcom.fi/helcom-at-work/events/events-2015/workshop-on-manure-nutrient-content-in-the-baltic-sea-countries> and "HELCOM Workshop on status of nutrient bookkeeping in the Baltic Sea countries" 28-29 April 2015, Oldenburg, Germany <http://helcom.fi/helcom-at-work/events/events-2015/workshop-on-status-of-nutrient-bookkeeping>

Innovation and implementation

AnMBR water reuse EU Innovation Deal selected

The European Commission, DG Research & Innovation, has announced that two Innovation Deals have been selected, following the European call published 26th May 2016. The objective of the Innovation Deals is to address regulatory barriers to R&D implementation through dialogue with regulators. ESPP and the European Biogas Association submitted a proposal addressing recycling of nutrients from manure processing but this was rejected as the Commission considered that scientific knowledge is not available to define what is "processed manure" under the Nitrates Directive. The two selected Innovation Deals concern electric vehicles and water reuse from municipal wastewater using anaerobic membrane bioreactor technology ([AnMBR](#)). The latter is presented by 14 national and regional authorities, research centres, innovation structures and stakeholders, including ESPP member SMART-plant (Horizon 2020 research project). The deal addresses barriers to water reuse and nutrient recovery from sewage, including cost recovery for water services, discharge requirements and end-user responsibility. **An ongoing open EU DG R&I call invites expressions of interest for further Innovation Deals relevant to the Circular Economy.**

Innovation Deal approved "Sustainable wastewater treatment using innovative anaerobic membrane bioreactors technology (AnMBR)" and Open Call to submit expressions of interest for Innovation Deals on the Circular Economy: EU Innovation Deals <https://ec.europa.eu/research/innovation-deals>

Digestate certification success story Sweden

Avfall Sverige, the Swedish Waste Management Association, has developed a quality assurance scheme for digestate from biogas production with the objective of ensuring return of nutrients and organic carbon to farmland. The certification system called Certified Re-use was launched in 1999. The certification system covers digestate produced by anaerobic digestion of organic material from the food and feed production chain, for example source separated food-waste, manure and energy crops. Sewage sludge is not accepted as a substrate for production of quality assured digestate under this scheme. Certified digestate is marketed as certified bio-fertiliser. Quality

control is ensured by SP Sweden (now RISE) and covers the following properties of the digestate: contaminants (metals and impurities >2 mm), nutrient content, organic matter, pH and dry matter content. Today, some 20 biogas plants have obtained certification for their digestate. The certification scheme is [presented](#) as a good practice success story of the European biogas industry.

"Success stories of the members of the European Biogas Association. Good practices and innovations in the biogas industry", EBA, January 2017 <http://european-biogas.eu/2017/02/27/latest-companies-catalogue-and-success-stories-now-available>

Agricultural application of phosphogypsum

Gypsum, mainly consisting of calcium sulphate with some 0.2 % phosphorus is the byproduct of phosphoric acid production from phosphate rock. At Yara's Siilinjärvi plant, Finland, some 1.3 million tons of gypsum is produced yearly. Because of the quality of Finland's phosphate rock resources (igneous deposits) and the phosphoric acid production process operated by Yara, contaminant levels in the gypsum are low (conform to Finland fertiliser regulations and to the proposed EU Fertiliser Regulation values for soil improvers). Following initial trials 2008-2013, the SAVE project 2016-2018 is testing the impact of gypsum application on 1 550 hectares in South West Finland. Gypsum is applied with 4 t/ha once per five years. To date, the gypsum application shows a reduction in field losses to water of -30% soluble phosphorus, -60% particulate phosphorus and -50% dissolved organic carbon.

SAVE <http://blogs.helsinki.fi/save-kipsihanke/?lang=en> Contact Seija Luomanperä seija.luomanpera@yara.com

Fraunhofer IGB ePHOS® electrochemical nutrient recovery

A 2 m³/hour [pilot unit](#) for electrochemical recovery of phosphorus from waste waters has been presented at [IFAT](#) (the global waste and water treatment show) and is ready for market deployment. ePHOS® is a patented electrochemical process, requiring no chemical input, using a sacrificial magnesium anode to produce magnesium phosphates such as struvite (magnesium ammonium phosphate) or K-struvite (potassium magnesium phosphate), which can be used as fertilisers. Energy consumption is stated as 1,5 kWh/m³ wastewater. Fraunhofer IGB indicate that the process can recover up to 98% of soluble phosphorus from sewage sludge dewatering liquors, food or industrial wastewaters. The technology has been licensed to [OVIVO](#) the water treatment technology company, for the North American market. First commercial installation will be in operation in 2017 treating sewage sludge dewatering liquors for the recovery of struvite as fertiliser.

"New process for eco-friendly phosphorus recovery. IFAT 2016: fertilizer from wastewater", Fraunhofer IGB, June 2016

<https://www.fraunhofer.de/en/press/research-news/2016/June/ifat2016-fertilizer-from-wastewater.html>



Colsen's sixth struvite phosphorus recovery installation underway

Netherlands sustainable technology company [Colsen](#) (water, energy and environment) are building their sixth [ANPHOS](#) struvite precipitation installation, due to be commissioned mid 2017. This will bring ANPHOS struvite production to a total of 2 500 tonnes/year. Colsen's five existing installations operate in the main wastewater stream of potato processing factories, with phosphorus concentrations of 50 – 130 mgP_{total}/l, for different companies in the Netherlands and in Italy. The recovered phosphate is precipitated by aeration and magnesium hydroxide addition then dewatered by filter press or centrifuge, and is a mixture of struvite (magnesium ammonium phosphate) and K-struvite (magnesium potassium phosphate). The new sixth installation is at the Waterschap Aa en Maas waterboard's municipal sewage treatment plant at Den Bosch, The Netherlands, capacity 342 000 p.e. which operates biological phosphorus removal and anaerobic sludge digestion. The struvite unit is installed downstream of the digestate dewatering. It will treat 100% of the centrate of the sewage work's sludge dewatering.

Colsen ANPHOS process <https://www.colsen.nl/products> and

<https://www.colsen.nl/system/resources/BAhbBlSHQgZmSSlwMjAxNi8wMS8yNy8xMy81My8zNy8zMTMvYW5waG9zX2VuX2ZseWVyLnBkZgY6BkVU/anphos-en-flyer.pdf>



UK phosphorus removal innovation

A dialogue meeting of 15 UK water industry and research experts, on innovation in sewage phosphorus removal, identified five key points, including the need to develop phosphorus recovery. Participants emphasised that the Water Framework Directive quality objectives result in phosphorus discharge limits which are site-context different and are in many cases significantly lower than the Urban Waste Water Treatment Directive limits of 1 or 2 mgP/l, but also in the need to work with farmers to reduce all phosphorus sources. Take-away points are (1) industry needs a range of new solutions to achieve these lower limits, in particular for smaller sewage works (2) catchment approaches and smarter permitting (3) holistic approach to wastewater treatment, e.g. metals input from chemical phosphorus removal (4) need to accelerate wastewater industry innovation despite the 20-year investment and asset cycle (5) phosphorus recovery to not lose a non-renewable resource, including in sewage works discharging into the sea and not subject to P discharge limits.

WWT Magazine round-table "Phosphorus removal and wastewater innovation", Birmingham, 30th January 2017. Participants were the Environment Agency, Ofwat, Thames, Severn Trent, Northern Ireland, Scottish, Yorkshire, Wessex, Welsh and South West Water companies, Tarmac, university experts.
<http://wwtonline.co.uk> March 2017 edition pages 14-16.

Berner's recycled fertiliser from organic wastes

Berner Oy (Finnish [company](#) with 500 employees and a range of agri-food and consumer products since 1883) with retail chain SOK (Kodin Terra, Prisma and S-rauta) and the Baltic Sea Action Group (BSAG) has launched a new garden fertiliser produced from previously unused agri-food industry side-streams, e.g. from cereal or sugar processing. The GreenCare Ympäristön Ystävä fertiliser is packaged as easy-to-handle, odourless granules, which bring both nutrients and organic matter to soil. 'Soilfood Inside' biostimulants are included to enhance plant nutrient uptake. Berner's has also signed the BSAG Baltic Sea Commitment to continue to explore new nutrient recycling opportunities.

"Berner's commitment brings innovative recycled fertiliser product for domestic gardeners" <http://www.bsag.fi/Commitment.html>



K-struvite application in building material

A published patent proposes a building material comprising K-struvite (magnesium potassium phosphate), syngenite ($K_2Ca(SO_4)_2 \cdot H_2O$), magnesium oxide and stucco (calcium sulphate hemihydrate). K-struvite is noted to offer good heat and abrasion resistance. The composite material can be reacted directly in building panel moulds and offers high structural integrity, lower weight density than other materials, and high fire resistance. The material is water resistant, without addition of waxes or silicones which are used to ensure water resistance in gypsum-based panels, but which are flammable. The K-struvite – syngenite combination can also be used to coat inorganic fibres to provide a weather-proof, fire resistant and abrasion resistant material.

"Struvite-K and Syngenite Composition for Use in Building Materials", US patent n° 20170008804 A1, R. Hauber et al., Certaineed Gypsum Inc., published 12th January 2017 <http://www.google.com/patents/US20170008804>

Nutrient Recovery 2.0

In WaterWorld, Christian Kabbe (Berlin Water Knowledge Centre) notes that 2016 saw several new struvite phosphorus recovery installations come online in sewage works in Europe, with planning for others being confirmed, but also saw the appearance of second-generation struvite/nutrient recovery installations. Sewage sludge hydrolysis processes (e.g. Ostara WASSTRIP, see SCOPE Newsletter [n° 124](#)) enables a significant increase in the percentage of sewage works inflow phosphorus recovered as struvite. Ostara now has two such WASSTRIP – PEARL struvite recovery combinations operating in Europe (Amersfoort, Madrid). Brunswick Steinhof sewage works (Germany) has now contracted construction of a combination of thermal sludge hydrolysis, NuReSys struvite recovery and ammonia stripping (nitrogen recovery). The paper also presents the ECOPHOS process (Dunkerque, see SCOPE Newsletter [n° 120](#)), the Budenheim Extraphos process (Mainz, see SCOPE Newsletter [n° 123](#)), ICL RECOPHOS (see SCOPE Newsletter [n° 112](#)), and Remondis Tetraphos as processes able to recover phosphorus from sewage sludge incineration ash or from sewage sludge in commercially valuable forms.

"Nutrient Recovery 2.0", C. Kabbe Waste and Wastewater International WaterWorld, November 2016, vol. 30 issue 6 <http://www.waterworld.com/articles/www/print/volume-30/issue-6.html>

Research

R₃Water sewage resource recovery and pharmaceuticals treatment

The EU FP7 funded R₃Water project (2014-2017) is pilot testing technologies to transition from conventional sewage treatment to recovery of nutrients, energy and water, with elimination of pharmaceutical contaminants. Research at the Hammarby Sjöstadverket centre (IVL, KTH), next to Sweden's largest sewage works (Henriksdal, South-East Stockholm) is looking at combining activated sludge processes with a membrane bioreactor and fluidic oscillation to improve resource recovery, reduce energy use and increase biogas production. Ozonation and activated carbon are being investigated to eliminate pharmaceuticals, in order to enable safe water reuse.

R₃Water (Demonstration of innovative solutions for Reuse of water, Recovery of valuable Substances and Resource efficiency in urban wastewater treatment) www.r3water.eu R₃Water Newsletter March 2017 http://www.teqma.com/wp-content/uploads/R3Water_Newsletter_03_2017_Final_web.pdf and final project conference, Brussels 30th May <http://r3water.eu/save-the-date-r3water-final-conference-on-water-in-the-circular-economy-innovations-for-urban-water-treatment>

Enzyme feed additives reduce poultry phosphorus needs

A trial by the company Canadian Bio-Systems has tested phytase enzyme and phytase (Bio-Phytase) with multi-carbohydrase (Superzyme-CS) enzymes in diets for 640 broiler chickens for 35 days. The phytase (tested at 500 - 1500 FTU/kg) improves availability of phosphorus present in plant materials in feed, in particular in grains. The carbohydrase (tested at 500 g/t feed) facilitates degradation of dietary fibre and non-starch polysaccharides (NSP). Diet phytase resulted in increased bodyweight gain, with the increase linearly correlated to higher phytase dose, even in diets with -15% lower phosphorus than standard broiler diet. The phytase plus multi-carbohydrase gave even better results. The enzymes also resulted in improved chicken body mineral density and percentage bone ash, with no impact on body fat or body mineral content. The company is now looking to develop the enzyme application to pig diets and to calves.

"Enzyme, phytase combo supports poultry production with less phosphorus: study", FEEDnavigator 15 Feb. 2017 <http://www.feednavigator.com/content/view/print/1369228> and "Effects of combination of phytase and Multi-Carbohydrase enzymes on growth performance and bone mineralization in broilers", abstract M96 in International Poultry Scientific Forum Jan. 30-31st 2017 <http://www.ippexpo.org/ipsf/docs/2017AbstractBook.pdf>

Nano hydroxyapatite shows no chronic toxicity in rats

Hydroxyapatite (HAP, a form of calcium phosphate) is the main constituent of human bones. Nano forms are already commercialised in e.g. medical applications, toothpastes (see SCOPE Newsletter [n° 118](#) and Pepla [2014](#)) in particular for bone restoration. A first chronic (long-term) toxicity of nano HAP has been published. The nano HAP was synthesised by precipitation and had a rod-like structure with particle size < 50 nm. 140 Wistar rats were fed for 78 weeks with concentrations of 0, 25, 50 and 100 mg/kg body weight nano HAP in feed,



plus one group at 100 mg/kg with an additional period of 22 weeks with 0 mg/kg. A range of clinical and behavioural parameters were observed, as well as histopathological parameters after sacrifice of the rats. No effects of the nano hydroxyapatite were observed in any of the groups of rats, that is no indications of toxicity or carcinogenicity. However, another study using fruit flies and rod-like nano HAP 80-90 nm particle size. The structure and of adult flies and behaviour of larvae was concentration-dependently impacted when nano HAP was included in fly larvae food, suggesting developmental and neuro-toxicity.

"Investigation of chronic toxicity of hydroxyapatite nanoparticles administered orally for one year in wistar rats", N.S. Remya et al., Materials Science and Engineering C 76 (2017) 518–527 <http://dx.doi.org/10.1016/j.msec.2017.03.076> and "A toxicity assessment of hydroxyapatite nanoparticles on development and behaviour of Drosophila melanogaster", S. Aurosman Pappus et al., J Nanopart Res (2017) 19:136 <http://dx.doi.org/10.1007/s11051-017-3824-8>

German science academies propose monitoring of primary phosphorus resources

In their advisory opinion to the German Federal Government concerning "Energy Systems of the Future (ESYS)" the key German national scientific academies (National Academy of Science and Engineering (acatech), German National Academy of Sciences Leopoldina, Union of the German Academies of Sciences and Humanities), propose to monitor primary phosphorus resources. Their position paper on "Raw materials for the energy systems of the future", 8th February 2017, bioenergy supply is addressed and so also the essential question of a future sustainable supply of phosphate for fertilisers. The academies have taken up the proposal of an international monitoring committee discussed by concerned scientists for several years now. It is proposed that this committee should be established under the auspices of an international science organization with governmental earth-science organisations involved, in order to avoid influence of national or economic interests.

German academies joint position paper (in German)

http://www.acatech.de/fileadmin/user_upload/Baumstruktur_nach_Website/Acatech/root/de/Publikationen/Kooperationspublikationen/ESYS_Stellungnahme_Rohstoffe_fuer_die_Energiewende.pdf (see page 73, right column and page 86 third option for action).

Extended anaerobic treatment of sewage improves toxicity removal

A 12 litre pilot plant at Koblenz municipal waste water treatment plant, Germany, was used to test reduction of toxicity and of micropollutants in different operating configurations. Removals of 31 common pharmaceuticals and micropollutants and 10 metabolites were tested (all of which principally partition to the water phase rather than to sludge), as well as ecotoxicity of effluent in vitro and on aquatic invertebrates and plants. The authors conclude that extended anaerobic treatment, including strictly anaerobic conditions (anoxic), combined with aerobic treatment, significantly improved removal of only some of the organic micropollutants, but did not significantly reduce overall ecotoxicity.

"Extended anaerobic conditions in the biological wastewater treatment: Higher reduction of toxicity compared to target organic micropollutants", J. Völker et al., Water Research 116 (2017) 220e230 <http://dx.doi.org/10.1016/j.watres.2017.03.030>

Media

France, Italy: a tasteful love for shit

Many would say they are Europe's leaders in fashion and taste. France and Italy are also now leaders in loving shit. Sofie Anaf's, "La Belle Bouse" (beautiful cowpat, but it sounds much sweeter in French) is a Lyon-based startup producing "100% locally sourced, organic and fabulously practical fertiliser" from cattle manure, in one-dose sachets bringing nitrogen, phosphorus and potassium to house or balcony plants. The product is "matured for 9 months like a great cheese". More technically, it is dried slowly which stabilises and kills bacteria. The manure is sourced from the Ain, Isère and Savoie counties. "In cities, plants suffer from surrounding aggressions: offer them the good country air they dream of" (in fact, the manure-based fertiliser has no smell). In Italy, Europe's other fashion capital just over the Alps, the "Museo della Merda" (The Shit Museum, also not as smooth on the tongue in English), in Castelbosco, Piacenza, Lombardy, is set on a dairy farm with 3 500 cows, producing daily 50 000 litres of milk and 150 tonnes of manure. The manure is converted to biogas and electricity (3 MW/h and heat used for farm and Museum buildings) and to fertiliser. The Museum, presents the use of dung in society from prehistory to today, including as a building material (the Museum's symbol is a dung beetle), for coffee filters, paper, and as a base for artistic creations. The Museum has developed Merdacotta®, a manure-based material used to produce flowerpots, vases and mugs. The aim is to "destabilise common perceptions" of manure: "you can't ignore shit".

The shit museum www.theshitmuseum.org and La Belle Bouse www.labellebouse.fr



Events

Up to date list of events: www.phosphorusplatform.eu/upcoming-events

- **Strippers and Scrubbers event - the fight for nitrogen recovery, recycling and removal**
27 April 2017, Leeds, United Kingdom - [Website](#) - [Email](#)
This one-day event will investigate the options for managing ammonium and seeks to bring together key stakeholders interested in advancing recovery, recycling and removal techniques.
- **SYMPHOS - International Symposium on Innovation and Technology in the Phosphate Industry**
8 - 10 May 2017, Ben Guerir, Morocco - [Website](#)
10th "Phosphates" event, the premier gathering for decision-makers for the fertilizer, feed and industrial phosphates industries, with 400 participants
- **Netherlands political seminar Circular with phosphate (in Dutch)**
12 May 2017, Amersfoort, Netherlands - [Website](#)
The Dutch Nutrient Platform and the European Sustainable Phosphorus Platform will give a presentation
- **Waste-to-Resources 2017 conference**
16 - 18 May 2017, Hanover, Germany - [Website](#)
Conference and exhibition on mechanical biological waste treatment (MBT/AWT), waste sorting and recycling technology
- **19th International Conference on Sustainable Agricultural and Food Systems**
14 - 15 May 2017, Amsterdam, Netherlands - [Website](#)
- **Sustainable Phosphorus Research Coordination Network (P RCN) workshop**
16-18 May 2017, Washington DC, USA - [Website](#) - [Registration](#)
- **Dresden Nexus Conference Water Soil and Waste**
17 - 19 May 2017, Hanover, Germany - [Website](#)
- **Phosphorus FORUM of the North America Sustainable Phosphorus Alliance (SPA)**
19 May 2017, Washington DC, USA - [Website](#) - [Registration](#) - [Email](#)
Organised by the former North American Partnership for Phosphorus Sustainability (NAPPS)
- **International interdisciplinary conference on land use and water quality (LuWQ2017)**
29 May - 1 June 2017, Den Haag, Netherlands - [Website](#)
- **R3Water final conference**
30 May 2017, Brussels, Belgium - [Website](#)
With a focus on "Water in the circular economy – innovations for urban water treatment"
- **Sustainable Foods Summit 2017**
1 - 2 June 2017, Amsterdam, Netherlands - [Website](#)
- **World Circular Economy Forum 2017**
5 - 6 June 2017, Helsinki, Finland - [Website](#)
- **WEF Nutrient Symposium 2017**
12 - 14 June 2017, Fort Lauderdale, Florida, USA - [Website](#)
- **Kick-off meeting SYSTEMIC EU research project**
13-14 June 2017, Wageningen, The Netherlands - [Registration](#)
Start meeting of this project focussing on largescale demonstration projects for recovery of nutrients from manure and sewage sludge
- **All Ireland Phosphorus Sustainability workshop and conference Microbial Resources for Agricultural and Food Security**
21 - 23 June 2017, Belfast, Ireland - [Website](#) - [Contact](#) - [Flyer](#)
Starts with a 1 day workshop on 'Irish phosphorus sustainability' to establish the need for an Irish nutrient platform, and First conference of the Ireland EPA funded project "Phosphorus from wastewater: Novel technologies for advanced treatment and reuse".
- **International conference Innovative solutions for sustainable management of nitrogen**
26 - 28 June 2017, Aarhus, Denmark - [Website](#)
- **International Fertiliser Society (IFS) Technical Conference 2017**
29 - 30 June 2017, Geological Society, London, United Kingdom - [Website](#)
- **PBSi 2017 - International Conference On Phosphorus, Boron and Silicon**
3 - 5 July 2017, Paris, France - [Website](#)



➤ **The BIG Phosphorus Conference and Exhibition – Removal & Recovery**

4 - 5 July 2017, Manchester United Football Stadium, United Kingdom - [Website](#)

The event is supported by the UKWIR National Phosphorus Trials steering group and the National Chemical Investigation Programme (CIP) Phosphorus Steering Group



➤ **SMART-Plant research project launch**

11 - 13 July 2017, Severn Trent Water, Coventry, United Kingdom - [Website](#)
Launch meeting of the EU funded SMART-Plant research project

➤ **2nd IWA Resource Recovery conference**

5 - 9 August 2017, New York, USA - [Website](#) - [Email](#)
2nd International Water Association conference on resource recovery from wastewater

➤ **17th International RAMIRAN conference 'Sustainable utilization of manures and residue resources in agriculture'**

4 - 6 September 2017, Wexford, Ireland - [Website](#) - [Email](#)

RAMIRAN (Recycling of Agricultural, Municipal and Industrial Residues in Agriculture Network) is a research and expertise network dealing with environmental issues relating to the use of livestock manure and other organic residues in agriculture.

➤ **ESPP meeting EU Fertiliser Regulation and STRUBIAS**

5 September 2017, Brussels, Belgium - [Registration](#)
Stakeholder meeting on EU Fertiliser Regulation developments and biochar, struvite and ash-products criteria

➤ **DPP-FORUM 2017 (in German)**

12 September 2017, Berlin, Germany - [Website](#)
National conference of the German Phosphorus Platform with a focus on how to get P-recycling to the market

➤ **European Waste Water Management Conference 2017**

3 - 4 October 2017, Leeds, United Kingdom - [Website](#)

➤ **IFDC and IFA workshop Phosphate Fertilizer Production Technology**

5 - 9 October 2017, Berlin, Germany - [Website](#)

➤ **NORDIWA - Nordic Waste Water Conference**

10 - 12 October 2017, Aarhus, Denmark - [Website](#)
Potential phosphorus session is planned, check for an update

➤ **Nutrient recycling R&D projects and technologies meeting and technology fair**

18 - 19 October 2017, Basel, Switzerland - [Registration](#)

18 Oct. - FHNW, DPP and Phos4You meeting "Sludge and phosphorus recycling in Switzerland and beyond (German, English translation)

19 Oct. - ESPP and Phos4You meeting EU (H2020, LIFE, InterReg) and national funded R&D projects on nutrient recycling (English, German translation)

➤ **Conference Managing Global Resources for a Secure Future**

22 - 25 October 2017, Tampa, Florida, USA - [Website](#)

➤ **World Resources Forum 2017 - Accelerating the resource revolution**

24 - 25 October 2017, Geneva, Switzerland - [Website](#)

➤ **European Biosolids & Organic Resources Conference & Exhibition**

20 - 21 November 2017, Leeds, United Kingdom - [Website](#)

Conference for the biosolids and biowaste industries

➤ **Conference Phosphorus a critical resource with a future (in German)**

22-23 November 2017, Stuttgart, Germany - [Website](#)

➤ **ManuREsource 2017 - International conference on manure management and valorisation**

27 - 28 November 2017, Eindhoven, Netherlands - [Website](#) - [Email](#)

In cooperation with the Dutch Nutrient Platform. A facultative field trip with exclusive site visits to local manure processing installations will be organised on 29 November 2017.

➤ **3rd International Conference on Global Food Security and Sustainability**

3 - 6 December 2017, Cape Town, South Africa - [Website](#)

➤ **Course Phosphorus Removal and Tertiary Treatment Processes**

7 December 2017, Wakefield, United Kingdom - [Website](#)

This course will review the design and operation of the main markets available for N and P removal technologies.





ESPP Members

