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Policy

CEN paper on standards needs for P-recycling from wastewater

The European Committee for Standardization (CEN) has adopted [recommendations](#) concerning standardisation needs to support the development of phosphorus recycling from waste waters. The paper outlines why phosphorus recycling is important, different recycling routes, obstacles to implementation and relevant standards activities (in particular CEN/TS 13714, CEN/TR 13097, CEN/TC 260, ISO/TC 275, ISO/TC 134 (more details SCOPE Newsletter [n°112](#)). CEN adopts 5 recommendations for standardisation in the short term: dialogue with the Circular Economy needs, mapping and analysis of existing standards, of public and private certification schemes and of legislative processes relevant to P-recovery where standards are needed, promotion of existing standards relevant to P-recycling (e.g. wastewater treatment, fertilisers, ...), possible inclusion of P management in these standards areas and promotion of risk assessment and good practice. CEN also specifies 6 areas where work is needed in the medium/long term, including P-bioavailability, technical characteristics and water content of recycled products, P-flow monitoring methods, good practices, contaminant levels and mitigation.

"Phosphorus recycling from wastewater treatment processes: available technologies, applicability and standardization needs", CEN Strategic Advisory Body on Environment (SABE), [6-pages](#), dated 10/11/2015, validated by CEN Technical Board, early 2017 www.phosphorusplatform.eu/regulatory

EU Critical Raw Materials list reassessment

A review of the EU Critical Raw Materials list is currently underway, contracted by the European Commission to a group of consultants led by TNO, Netherlands. ESPP has made input to the process at a closed meeting last year and in writing to non-public documents. Many of ESPP's questions raised concerning the 2014 Critical Raw Materials System Analysis (RMSA), see SCOPE Newsletter [n°109](#), remain valid. ESPP notes the difficulties resulting of considering "phosphate rock" rather than phosphorus (P) in all forms (organic, mineral ...), but this is inherent to the RMSA methodology. ESPP has pressed that white phosphorus (P₄) should also be separately assessed, because it is a vital raw material for a range of added-value chemicals and other industry sectors for which the EU is totally dependent on imports mainly from Vietnam and Kazakhstan (see SCOPE Newsletter [n°123](#)). Additionally, ESPP is trying to ensure that the RMSA for phosphate rock covers all economic sectors which are dependent on phosphorus (agricultural crops and livestock, food sector) not only direct users (fertiliser industry) and that it takes into account expected future geographical concentration of phosphate rock resources increasing demand (growing world population).

EU Tax Commissioner calls for tax shift to resources

Pierre Moscovici, EU Commissioner for taxation, has called on Member States to move forward the objective of shifting taxes from labour to the use of natural resources. Today, over half of European tax revenues weigh on jobs, and only 6% on resources and consumption (see ExTax in ESPP [eNews n°6](#)). In January this year a high level group led by Mario Monti proposed carbon taxation as a source to fund the EU

budget and replace Member States direct contributions. The [EU's European Semester annual country reports](#), published February 2017, confirm that most Member States are a long way from the objective of 10% of tax revenues from green taxes set in 2011, and the Commission recommends Member States to stop tax breaks on diesel or energy intensive industries and shift taxation burden from labour to green levies.

"EU tax commissioner calls for green tax shift" ENDS 20/1/2017 <http://www.endseurope.com/article/48312/eu-tax-commissioner-calls-for-green-tax-shift>
European Semester country reports, February 2017 https://ec.europa.eu/info/publications/2017-european-semester-communication-country-reports_en
European Commission "Greening the European Semester" http://ec.europa.eu/environment/integration/green_semester/index_en.htm

EU to assess chemicals policy – waste interface

The European Commission has published a [Roadmap](#) outlining how it will assess during 2017 the interface between chemicals policy and waste policy, to identify barriers to the circular economy. The Commission notes the absence of a framework to address hazardous chemicals in recycled materials, and the lack of clarity as to when a material is 'waste' or when a 'secondary raw material' incoherence in applying EU waste classification methodologies and impacts on recyclability of materials, with related difficulties in application of REACH (EU Chemical Regulation). The Commission intends to consult stakeholders, possibly launch additional studies to address specific cases and to make proposals to address issues identified.

European Commission Roadmap "Analysis of the interface between chemicals, products and waste legislation and identification of policy options" 27/1/2017 http://ec.europa.eu/smart-regulation/roadmaps/docs/plan_2016_116_cpw_en.pdf See also Technopolis report on barriers to the Circular Economy in ESPP [eNews N°6](#).

Weaknesses of EU soils policy

A [report](#) for the European Commission summarises soil protection instruments in the Member States, concluding that the absence of EU soil legislation is not effectively compensated by Member State policies. The 7th European Environment Programme mandate to the European Commission to develop a legislative proposal on soil policy is today not implemented. 671 national instruments were identified and assessed, of which around 2/3 derive from implementation of EU legislation and only 1/3 are nationally initiated. A number of EU instruments indirectly contribute to soil protection, included the Water Framework Directive and the Common Agricultural Policy (CAP). However, certain aspects are not addressed at all by European policies, including prevention of soil sealing or contaminants (addressed in water, not in soil). Future possibilities include strengthening soil standards under CAP Pillar 1 (direct payments) and Pillar 2 (Rural Development Funding), and opportunities through climate policy (soil organic carbon, improved use of nitrogen fertilisers).

"Updated Inventory and Assessment of Soil Protection Policy Instruments in EU Member States", Ecologic Institute for European Commission DG Environment, 8 Feb. 2017 http://ec.europa.eu/environment/soil/pdf/Soil_inventory_report.pdf

Ammonia emissions limits for livestock farms published

The European Commission has [published](#) the BAT BREF (Best Available Technologies) update for "intensive rearing of poultry or pigs", applicable to farms with more than 40 000 poultry or 2 000 production pigs (around 20 000 farms in Europe), see SCOPE Newsletter [n° 116](#). All new such farms must comply with the BAT specifications, and existing farms have four years to become compliant. For the first time, ammonia emissions limitations are now applicable to farms: with upper limits of 1.2 kgNH₃/y for fattening pigs, 5.6 kg for farrowing sows and 0.13 kg for poultry. The European Commission has indicated that the limits will only drive a significant reduction in ammonia emissions if Member States regulators fix limits at the lower levels of the ranges fixed for each type of production. The BAT requirements also limit animal phosphorus excretion for different categories of animals (e.g. max. 5.4 kg P₂O₅/fattening pig/year), specifies actions to take to improve diet P efficiency (e.g. use of phytase and of inorganic phosphate feed additives), proposes manure treatment systems, etc (detail in SCOPE Newsletter [n° 116](#)).

"New EU environmental standards for large poultry and pig farms" European Commission [17 Feb 2017](#) and Commission Implementing Decision (EU) 2017/302 of [15 February 2017](#) establishing best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council, for the intensive rearing of poultry or pigs (notified under document C(2017) 688)

EU consultation on Common Agricultural Policy (CAP)

The European Commission has launched the preparation of the Common Agricultural Policy (CAP) after 2020 with a [public consultation](#) open to 2nd May 2017. Key discussions will concern the “greening” of the CAP, such as the percentage of land area to be set aside as EFA (Ecological Focus Areas). The Commission’s Roadmap for the CAP sets as objectives to simplify and modernise the policy and funding, in order to contribute to the Commissions [ten priorities](#) for 2014-2019 and to the Sustainable Development Goals (SDGs).

European Commission Roadmap “Communication on Modernising and Simplifying the Common Agricultural Policy” 2/2/2017 http://ec.europa.eu/smart-regulation/roadmaps/docs/2017_agri_001_cap_modernisation_en.pdf - EU public consultation on the Common Agricultural Policy https://ec.europa.eu/agriculture/consultations/cap-modernising/2017_en

Sewage biosolids: “missing a golden opportunity”

Arne Haarr, chair of the EurEau working group on waste water resources, [says](#) that the EU would make a mistake in excluding sewage sludge from composts and digestates in the proposed EU Fertilisers Regulation revision, as proposed in the Commission’s draft text. Mr. Haarr says that using sewage sludge would recycle phosphorus, organic carbon, nitrogen and micronutrients back to agricultural soil. Refusing sewage biosolids in the Fertilisers Regulation will drive towards incineration, which is expensive and not shown to be sustainable. Quality systems such as Sweden’s REVAQ (see SCOPE Newsletter [n° 123](#)), operated in cooperation with farmers, the food industry and food retailers, have demonstrated that confidence can be built in safety and quality of sewage sludge recycling to agriculture. Mr Haarr wants the EU to develop traceability and quality requirements in the EU Fertilisers Regulation, to facilitate and encourage sewage biosolids recycling to fertiliser products.

<http://www.euractiv.com/section/sustainable-dev/opinion/using-sewage-to-make-europes-economy-truly-circular/>

Sewage treatment status in the EU

The European Commission has published its 8th implementation report on urban wastewater treatment (Urban Waste Water Treatment Directive UWWT compliance). The report is based on 2012 data from 25 Member States (Italy, Poland and Hungary failed to provide useable data). The report covers more than 19 000 towns and cities > 2 000 p.e. (person equivalent) for a total of 495 million p.e. Of these, 98% of wastewater is collected and treated (in sewage works or IAS = individual or other appropriate systems). Although trends over time show improving compliance, 21% of the wastewater collected was still not adequately treated to secondary (9%) or to applicable tertiary requirements = phosphorus removal (12%). Phosphorus removal is required in eutrophication ‘Sensitive Areas’ (to date, nearly 75% of the EU territory has been so designated, because at risk of surface water eutrophication) for agglomerations > 10 000 p.e. Around 18 billion € of EU Cohesion Policy funds have been invested in sewage treatment 2007-2013. Challenges identified by the Commission include low compliance in some EU-13 accession states and phosphorus removal. Compliance for P-removal was lowest in Bulgaria, Ireland, Romania, Slovenia, Spain*. ESPP note: compliance with the UWWT Directive does not necessarily mean that sewage treatment is sufficient to comply with Water Framework Directive quality objective obligations.

* no data for Croatia, Italy, Poland, Malta, Latvia. “Eighth Report on the Implementation Status and the Programmes for Implementation (as required by Article 17) of Council Directive 91/271/EEC concerning urban waste water treatment” COM(2016)105, 4 March 2016 <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52016DC0105>

Media

Pharmaceuticals in the environment

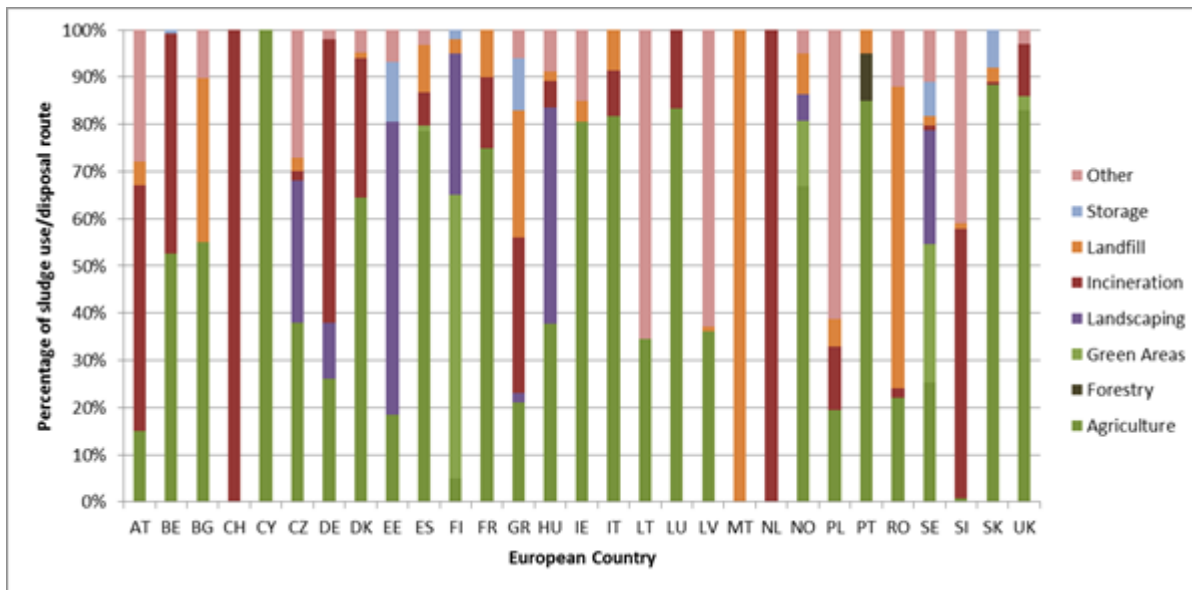
The HCWH (Health Care Without Harm) [conference on pharmaceuticals in the environment](#) brought together 60 participants to discuss current scientific data, national policies and industry actions. Maria Krautzberger, German Federal Environment Agency (UBA) underlined the need for more risk assessment information on pharmaceuticals in the environment, particularly veterinary pharmaceuticals. Helen Clatyon, DG Environment, recognised the Commission’s failure to deliver the pharmaceuticals strategy required (for 9/2015) by the Water Framework Directive. She indicated that a Roadmap should soon be finalised and opened to public consultation. Most of the presentations concerned pharmaceuticals in water, but agricultural application of biosolids, manures or re-used wastewater was identified as a possible contamination route of emerging concern by Sara Lockwood, Deloitte, with suggestions to define concentration limits for application, integrate into agricultural good practice and improve links with Circular Economy actions.

“Pharmaceuticals in the environment. Make ideas work”, HCWH (Health Care Without Harm) workshop, Brussels, 6 Sept. 2016. Slides and workshop summary: <https://noharm-europe.org/issues/europe/pharmaceuticals-environment-workshop>

Sewage sludge treatment in Europe: industry perspectives

EurEau, the European water and wastewater industry federation, has published a survey of how the industry sees sewage sludge management today and in the future. The answers, reflecting the vision of 22 national or regional water industry federations, do not

necessarily correspond exactly to official statistics. The respondents indicate that more than 50% of sewage sludge is used in agriculture, green areas or landscaping (Belgium, Cyprus, Czech Republic, Estonia, Finland, France, Hungary, Italy, Luxembourg, Norway, Portugal, Slovakia, Spain, Sweden and the UK) and whereas only three countries incinerate more than 50% (Germany, Netherlands, Slovenia). Most respondents however expect incineration to increase, phosphorus recovery to increase, and agricultural use to decrease or stay unchanged. The strongest driving forces for sewage sludge treatment are identified as hazardous substances risks, energy recovery and nutrient recovery. Digestion and composting are seen as the most utilised sludge treatment methods. Based on this survey and other sources (Eurostat, 2016; EurEau, 2016; Destatis, 2016) an [overview of sludge disposal routes across Europe](#) has been developed by C. Kabbe and W. Schipper, see below.



"Answers to the Sewage Sludge Questionnaire", EurEau 4.10.2016 www.eureau.org (under Positions/Reports – [direct link](#)) - Overview of sludge disposal routes in Europe http://p-rex.eu/uploads/media/Kabbe_Sludge_routes_Europe_and_DE.pdf

Catalogue of operating phosphorus recovery installations

Christian Kabbe has published a list of 70 sites worldwide where installations for phosphorus recovery from wastewater are operating, using different technologies: struvite or calcium phosphate precipitation, Ecophos P-recovery from ashes, Budenheim process, "slag" production, phosphoric acid recovery. Most sites identified are in the EU, with a few in Japan, the USA and Canada. C. Kabbe's objective is to maintain this list and update it, and to add information on installation capacities. Information or update input is therefore welcome.

"Overview of phosphorus recovery from the wastewater stream facilities operating or under construction", Feb 2017, Christian Kabbe - [P-REX](#) – Nurec4Org http://p-rex.eu/uploads/media/Kabbe_Tech_implementation_Table_20170208.pdf Contact christian.kabbe@kompetenz-wasser.de

Fraunhofer IGB wins Ivan Tolpe 2017 award

A global nutrient recovery technology, developed within the EU-funded research project BioEcoSim, with phosphorus, nitrogen and potassium recovery from pig manure, has been awarded the 2017 [Ivan Tolpe prize](#) for innovation in manure processing by VCM (Flemish coordination centre for manure processing). This project, proposed by Jennifer Bilbao, Fraunhofer IGB Germany, was selected from 6 projects from five countries in Europe. BioEcoSim www.bioecosim.eu (EU FP7, see SCOPE Newsletter [n°108](#), 2014), recovers energy, ammonium sulphate, phosphate and a biochar soil amendment from manures, using a process chain including solid-liquid separation, superheated steam drying, pyrolysis, phosphate precipitation, gas permeable membrane and pelletisation (see SCOPE Newsletter [n°100](#)). A BioEcoSim pilot plant (1.2 tonnes manure / day) is currently operational at Kupferzell (Germany). Three other projects were noted as runners up: ManureEcoMine project (EU FP7, see SCOPE [n°100](#), 2014), Nijhuis Water Technologies GENIAAL (SCOPE [n°124](#)) and [Kamplan](#) Netherlands. Kamplan's 'Total Circular Farm [Concept](#)' includes a membrane bioreactor (MBR) for biological nitrogen removal, with effluent by electrodialysis for potassium recuperation and reverse osmosis.

"German total concept for manure valorization wins Ivan Tolpe award 2017" http://www.vcm-mestverwerking.be/information/index_en.phtml?informationtreeid=439

Nordic bio-economy: 25 sustainability success stories

The Nordic Council of Ministers has published a report presenting [25 selected case studies](#). Selection criteria were: sustainable use of natural resources, technological innovation, environmental and societal benefits, business model innovation. Examples include

BioGreenFuture (Faroe Islands), whose project is to produce fish foods from seaweed, replacing providing proteins, oils, vitamins, minerals, binders, antibiotics, antioxidants, and colourings, and using residuals as fertilisers and for bioenergy. Cultivation of 500 tonnes of seaweed plants on < 1 km² is estimated to potentially extract 2.5 t/y of nitrogen and 0.15 t/y of phosphorus from eutrophied seawaters. Biomega, Norway, converts 36 000 t/y of fish processing waste to salmon oil, fish meal and peptides (by pre-digestion of proteins), all of human food-grade quality. Raisagro Finland are using phytase to reduce phosphorus requirements in fish diet (so reducing P discharges from fish production by 26%) and enabling the use of sustainable plant crops as fish food, rather than fish meal.

"Nordic Bioeconomy. 25 cases for sustainable change" ISBN 978-92-893-4775-4, Nordic Council of Ministers, Nordic Bioeconomy Panel and Sustania (Monday Morning) think tank, 2017 <http://dx.doi.org/10.6027/ANP2016-782>

Research

Update on biochar standards and regulation

An overview paper by Meyer et al. summarises current status and future perspectives for standardisation and legislation on biochars for use as fertilisers or soil amendments. The paper summarises voluntary biochar standards systems: IBI-BS International Biochar Initiative, EBC European Biochar Certificate, BQM British Biochar Quality Mandate. These standards cover aspects such as feedstock materials, organic carbon, ash content, contaminants, sampling and analysis procedures, and production control requirements. In some cases sustainability aspects are also taken into account such as production emissions, greenhouse gases, energy efficiency, sustainability of feedstock biomass production, etc. In terms of regulation, biochar is authorised for use in Switzerland and Italy, with detailed specifications for aspects such as production sustainability, biochar quality, contaminants and H/C_{org} ratio, labelling and user safety. Biochar is also authorised as a soil improver on a case-by-case basis in Austria, and charcoal is authorised in Germany. Developments under the EU Fertiliser Regulation revision (STRUBIAS process, ESPP proposed biochar criteria) and under REACH (EU chemical regulation) are discussed. A detailed table compares requirements for 40 different parameters under the different voluntary scheme, national legislations and proposals.

"Biochar standardization and legislation harmonization", S. Meyer et al., *J. Environmental Engineering and Landscape Management* 2017 <http://dx.doi.org/10.3846/16486897.2016.1254640>

Improving phosphorus nutrient use efficiency (NUE)

A presentation at the European Parliament summarises approaches to improving phosphate NUE (nutrient use efficiency). The authors consider that the use efficiency of today's mineral fertilisers is low in all soils, down to 20% in calcareous soils, despite their water solubility. Techniques summarised as potentially improving NUE include development of soil mycorrhizae (symbiotic fungi with plant roots), enclosing of fertiliser particles in membranes whose pores close at low temperatures (nutrients are only released at temperatures where plants can use them), associating mineral fertilisers with organic matter and organic forms of phosphorus, targeted application (placing fertiliser near seed or plant root zone) and precision nutrient application as a function of real-time crop status and nutrient need assessment. They note that recycled fertiliser products often offer higher NUE because they are slow-release (e.g. struvite) or combine organic and mineral materials. The authors underline that both use of recycled nutrient products and improved NUE can contribute to reduce cadmium input to soils from mineral fertilisers.

"Plant nutrition: new agronomic approaches and Circular Economy, towards a strong reduction of cadmium input in soils", European Parliament, Fertilisers Regulation Shadows meeting on fertilisers, 25 January 2017, C. Ciavatta, University of Bologna, Italy, and L. Leita, Council for Agricultural Research and Economics CREA Italy. Not published claudio.ciavatta@unibo.it

Contaminants in manure treatment

Antibiotics were [assessed](#) in manure used as input for the ManureEcoMine nutrient recovery pilot plant. Nine antibiotics were analysed and all nine were detected in the Netherlands (pig manure), but only six in Spain (mixture of pig and cow manure). Total concentrations (%DM) were however higher in Spain. Doxycycline was the highest concentration in both countries (>1000 µg/kg) followed by Lincosamin in Spain and Oxytetracycline in the Netherlands. These antibiotics were partially or not removed in anaerobic digestion and tended then to mostly end up in the solid fractions after solid-liquid or membrane retention. None of the nine antibiotics analysed was detectable in struvite precipitated from the liquor stream after membrane separation.

ManureEcoMine (Green fertilizer upcycling from manure: Technological, economic and environmental sustainability demonstration) report WP4 "Performance of the pilot including trace contaminants with comparison to the NL demonstration results" 30/10/2016
<http://www.manurecomine.ugent.be/sites/default/files/userfiles/1/D4.2-Demonstrative%20operation%20ES%20pilot%20plant.pdf>

Assessing sustainability of biomass and nutrient recycling

A [report](#) by the Netherlands National Institute for Public Health and the Environment (RIVM) examines sustainability assessment of biomass and nutrient recycling. Comparative LCAs of phosphorus recovery are summarised (Dansschutter, Afman and Korving, Remy and Jossa, Fooij). Struvite is considered as an example. The importance for recycled products of assessing possible risk from contaminants defining End-of-Waste criteria which ensure safety is emphasised. It is recommended to develop monitoring indicators, optimisation (taking into account alternative use and product scenarios) and safety assessment (covering content, origin, production process and use) based on test cases.

"Assessing sustainability of residual biomass applications. Finding the optimal solution for a circular economy", RIVM Report 2016-0135, Quik J. et al.
http://www.rivm.nl/en/Documents_and_publications/Scientific/Reports/2017/januari/Assessing_sustainability_of_residual_biomass_applications_Finding_the_optimal_solution_for_a_circular_economy

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