



Nutrient R&D projects

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1 Nutrient recycling R&D projects presenting in Basel

AgroCycle	<p>A blueprint and EU policy-forming protocol for the recycling and valorisation of agri-food waste The AgroCycle project will convert low value agricultural waste into highly valuable products, achieving a 10% increase in waste recycling and valorisation by 2020. This will be achieved by developing a detailed and holistic understanding of the waste streams and piloting a key number of waste utilisation/valorisation pathways. It will bring technologies and systems from TRL4 to TRL7 within the 3 years of the project. A post-project commercialisation plan will bring commercially promising technologies/systems to TRL8 and TRL9, ensuring AgroCycle will have an enduring impact by achieving sustainable use of AWCB both inside and outside the agricultural sector, leading to the realisation of a Circular Economy. agrocycle@ucd.ie, tom.curran@ucd.ie, Barbara.Bremner@uhi.ac.uk Prof. Shane Ward and Ger Hanley</p>
ALGAECAN	<p>Adding sustainability to the fruit and vegetable processing industry through solar-powered algal wastewater treatment The LIFE ALGAECAN project will demonstrate the feasibility of applying solar-powered algal treatment to the effluents generated by the fruit and vegetable processing industry (FVPI) as a way of reducing the environmental impact of this sector at the same time that valuable algae-based market products are generated. This technology will be suitable for being replicated, transferred or mainstreamed anywhere. The ALGAECAN project proposes a sustainable treatment model of high loaded and salty effluents that combines cost-effective heterotrophic algae cultivation with spray drying of the collected microalgae to obtain a product of commercial interest as raw material for the production of biofertilisers, animal feed, bioplastics or biodiesel. jesmar@cartif.es Jesús Martín</p>
ASHES	<p>Recycling of nutrients from residues of thermo-chemical processing of bagasse/sugar cane straw The project ASHES is a German-Brazilian collaborative research project and is focused on the recycling of nutrients from residues of thermo-chemical processing of by-products of sugar cane industry (bagasse/straw) in Brazil. The challenge of the project is to increase the energy efficiency of thermal conversion (combustion/gasification) and to enable the recycling of process ashes to close material cycles by gaining adequate and competitive fertilizers as well as (functional) fillers in (bio-)polymer compounds. For this purpose, phosphorus salts are recovered from bagasse, straw, filtercake and vinasse with leaching and precipitation. The AshDec process was used to increase the availability of phosphorus for plant uptake in the ashes. Additives like sewage sludge and chicken manure were also tested. Different fertilizer formulations are granulated/pelletized and tested regarding their storage/handling characteristics. The fertilizing effects are evaluated in plant growth tests and compared with common extraction methods and the new promising diffusive gradients in thin films (DGT)-method. The results of the agronomic investigation of various ashes based products should provide targeted and integrated recommendations for the thermal conversion of bagasse/straw to secondary fertilizers in line with the so-called Next Generation fertilizer strategy. ASHES-partners are Fraunhofer UMSICHT (coordinator), Karlsruhe Institute of Technology (KIT), Bundesanstalt für Materialforschung und -prüfung (BAM), Fraunhofer IGB, Forschungszentrum Jülich (FZJ), CUTEC Institute, the Brazilian Center for Research in Energy and Materials (CNPEM), Federal Institute of Goiás (IFG), Laboratório Nacional Agropecuario (LANAGRO) and the Universidade Federal de Goiás (UFG), as well as the companies Tecnar and Outotec. martin.meiller@umsicht.fraunhofer.de Martin Meiller</p>
BONUS PROMISE	<p>Phosphorus Recycling of Mixed Substances Phosphorus recycling from mixed agricultural and municipal wastes to prevent Baltic Sea nutrient input and eutrophication, assessing possible impacts of contaminants (e.g. xenobiotics and pathogens in manures). Agriculture is the largest contributor to the non-point phosphorus load in the Baltic Sea region, and recycling of P from urban and agricultural organic wastes is the only way to conserve the resource and to prevent eutrophication. To produce safe recycled fertilisers, however, handling and treatment procedures need to be improved and implemented, since P-rich materials may contain significant amounts of organic</p>



	<p>contaminants, heavy metals and pathogens. Mono-incineration together with successive processing may be a way to ensure a full recovery of P in a safe fertiliser product. A shining example of cutting-edge solutions to protect water bodies could be demonstrated in the Baltic Sea region through efficient handling and treatment procedures combined with environmentally sound agricultural practices. BONUS PROMISE will convey backbone data on potentially hazardous contaminants in organic and recycled phosphorus fertilisers, assess strategies for P fertilisation that fully acknowledge food safety and food security, establish agro-technological transfer regions and thus pave the way for a fundamental adoption of advanced fertiliser practices in the Baltic Sea region.</p> <p>kari.ylivainio@luke.fi Kari Ylivainio</p>
DECISIVE	<p>A DECentralized management Scheme for Innovative Valorization of urban biowaste</p> <p>The DECISIVE project proposes to change the present urban metabolism for organic matter (foods, plants, etc.), energy and biowaste to a more circular economy and to assess the impacts of these changes on the whole waste management cycle. Thus, the challenge will be to shift from a urban “grey box”, implying mainly goods importation and extra-urban waste management, to a cooperative organization of intra- and peri-urban networks enabling circular local and decentralised valorization of biowaste, through energy and bioproducts production. Such a new waste management paradigm is expected to increase the sustainability of urban development by: (1) promoting citizens awareness about waste costs and values; (2) promoting renewable energy production and use in the city; (3) developing an industrial ecology approach that can promote the integration between urban and peri-urban areas, by providing valuable agronomic by-products for urban agriculture development and so improving the balance of organic products and waste in the city; (4) developing new business opportunities and jobs. In order to achieve these objectives, the project DECISIVE will develop and demonstrate eco-innovative solutions, addressed to waste operators and public services, consisting in: (1) a decision support tool to plan, design and assess efficient decentralised management networks for biowaste in urban areas; (2) eco-designed micro-scale anaerobic digestion and solid-state fermentation processes.</p> <p>mth@envs.au.dk Marianne Thomsen</p>
DOP	<p>Demonstrative model of circular economy process in a high quality dairy industry</p> <p>The project includes integrated nutrient management from fodder production to manure treatment by anaerobic digestion using digestate as substitute of fertilisers reducing environmental impacts. The project will evaluate and demonstrate a new model, and apply it to the production of Grana Padano DOP (Denominazione di Origine Protetta/Protected Designation of Origin) and Parmigiano Reggiano DOP. The project will integrate all the phases along production chains (from livestock rearing to production), in order to re-use all of the waste products/materials generated. This not only promotes a circular economy and greater resource efficiency, but also reduces PM10, ammonia, NOx and CO2 emissions. In turn, the re-use of digestate as fertiliser will decrease ammonia emissions and increase soil organic content, thus contributing to the Soil Thematic Strategy.</p> <p>info@lifedop.eu, stefano_giuliana.dimporzano@gmail.com Giuliana D’Imporzano and Stefano Garimberti</p>
ENRICH	<p>Enhanced Nitrogen and phosphorus Recovery from wastewater and Integration in the value Chain</p> <p>The goal of the ENRICH proposal is to contribute to circular economy through the recovery of nutrients from Waste Water Treatment Plants (WWTPs) and its valorisation in agriculture (either direct use on crops or through the fertilizer industry). ENRICH will tackle this value chain by developing a new treatment train that will be designed, built and operated in an urban WWTP. The products obtained will be mixed in order to find optimal mixtures and the agronomic properties of these products will be validated at full-scale through field tests in order to ensure the viability of the products obtained.</p> <p>Moreover, a business model of the whole value chain will be defined, involving several partners from different sectors, in order to ensure the replicability in other case studies or other EU regions.</p> <p>slopezp@cetaqua.com, raquel.gonzalez@llevante.com Sílvia López Palau</p>
IMPROVE-P	<p>Improved Phosphorus Resource efficiency in Organic agriculture Via recycling and Enhanced biological mobilization</p> <p>The IMPROVE-P project assessed phosphorus recycling in organic farming, taking into account potential for urban nutrient recycling and risk assessment of possible contaminants as well as life cycle analysis and acceptance in the organic sector. The different options have been evaluated from an agronomical and ecological point of view in the frame of this project. The information is summarized in a video tutorial: www.youtube.com/watch?v=LBKmgw5LjLA</p> <p>kurt.moeller@uni-hohenheim.de, julia.cooper@ncl.ac.uk, else.buenemann@fibl.org Kurt Möller</p>
INCOVER	<p>Innovative Eco-Technologies for Resource Recovery from Wastewater</p> <p>Taking into account the current global water scarcity and the expensive operation and maintenance cost of wastewater treatment, the INCOVER project concept has been designed to move wastewater treatment from being primarily a sanitation technology towards a bio-product recovery industry and a recycled water supplier. INCOVER aim is to develop innovative and sustainable added-value technologies for a resource recovery-based treatment of wastewater, using smart operation monitoring and control methodologies. At demonstration scale, three added-value plants treating wastewater will be implemented and optimized to recover energy and added-value products including fertilisers.</p> <p>incover-contact@oieau.fr, babi.uku@isleutilities.com, jaalvarez@aimen.es, serene.hanania@iclei.org</p> <p>Babi Uku, Juan Antonio Álvarez Rodríguez and Serene Hanania</p>



Newfert	<p>Nutrient recovery from biobased Waste for fertiliser production</p> <p>The NEWFERT (New Fertilisers) project is designed in order to recover nitrogen, phosphorus and potassium (NPK) nutrients from biobased waste for fertiliser production, bringing together 6 partners from 4 European Union member countries (Spain, Germany, France and Austria). Partners represent Member States throughout Europe, so that the project has a clear European dimension that will allow an easier pooling of competences and a wider and faster impact on the industrial fertiliser production. Realising the biobased economy potential in Europe, NEWFERT project involves the design and development of different enabling technologies to allow the re-use and valorisation from biowaste making them suitable as secondary raw material in the fertiliser industry: a new brand of cost-effective, eco-friendly and healthy advanced fertilisers. Furthermore, NEWFERT targets highly plant available combination of specific organic and mineral components and sets up ranges of their concentration in NPK fertilisers. Two main ways for nutrients recovery will be developed within the project: (1) Design new process to recover nutrients from solid biowaste modifying existing industrial processes, development of new chemical nutrients extraction technologies and scale-up of the integrated system. And (2) Involving different technologies of nutrients recovery from liquid biowaste: (a) chemical acidification, separation, struvite crystallisation, and (b) bioelectrochemical system. NEWFERT aims to decrease raw material dependency, prevent resource depletion and reduce the environmental impact increasing significantly the fertiliser industry sustainability.</p> <p>CKabbe@p-rex.eu, ralf.hermann@proman.pro, jbl@fertiberia.es, amorp@unileon.es, garrido@dragemate.com, marie-line.daumer@irstea.fr Christian Kabbe and Javier Branas</p>
Nurec4org	<p>Nutrient recycles for organic farming</p> <p>The Nurec4org project launched in 2017 will support the uptake of recycled nutrient products in organic farming in Germany. It is led by Kompetenzzentrum Wasser Berlin (KWB) and Bioland (Germany's biggest organic farmers' association) and funded by DBU, Germany's largest environmental foundation. Actions will include studying the market potential for recycled phosphorus products in organic farming and potential supply availability, looking at acceptance criteria for organic farmers and consumers, testing agronomic value and evaluation environment, health and life cycle factors. The objective is to provide both evidence and stakeholder consensus to support regulatory acceptance of recycled phosphates in organic agriculture. Partners: KWB, Bioland, IASP.</p> <p>CKabbe@p-rex.eu Christian Kabbe</p>
Phorwärts	<p>LCA study to compare fertilizer production from rock phosphate with phosphorus recovery from the wastewater stream</p> <p>Phosphorus is essential for life and an indispensable component of many fertilisers. The European and national legislation calls for the recovery of phosphorus from the wastewater stream in the medium term. Due to the lack of reliable data it has remained unanswered so far to what extent P-recovery can be considered appropriate in ecological and economic terms. By means of the LCA methodology, the PHORWÄRTS project compares conventional fertiliser production from rock phosphate with selected methods of phosphorus recovery from the wastewater path. Since the informative value of the parameter toxicity is rather limited in conventional LCAs, the project PHORWÄRTS additionally provides a comparative contaminant risk assessment for the fertilizer application for different fertilizers. In this context, the contamination with heavy metals and organic pollutants is spotlighted. This comparison will be completed by a cost estimate of the various production methods.</p> <p>Fabian.Kraus@kompetenz-wasser.de Fabian Kraus</p>
Phos4You	<p>PHOSphorus Recovery from waste water FOR YOUr life</p> <p>The Phos4You project will include building demonstration phosphorus recovery installations at sewage treatment sites, innovative phosphorus recovery technologies, new recycled phosphorus products for fertilisers, working on a standard to assess recycled fertiliser quality and addressing social acceptance of recycled nutrient products. Phos4You partners are Lippeverband (lead), Université de Liège, IRSTEA, Cork Institute of Technology, FHNW, Universiteit Gent, Glasgow Caledonian University, University of the Highlands and Islands, Veolia Environnement, Emschergenossenschaft, NV HVC – SNB, Scottish Water.</p> <p>Ploteau.Marie-Edith@eglv.de Marie-Edith Ploteau</p>
QUB Phosphorus from wastewater	<p>Phosphorus sustainability in Ireland and innovative technologies to recover phosphorus from wastewaters</p> <p>The successful adoption of emerging technologies for the recovery of phosphorus is driven by efficiency, economic viability, purity and/or bioavailability of the recovered product and legislation. The overall aim of this EPA funded project is to investigate phosphorus sustainability within the wastewater sector in Ireland and develop innovative technologies to recover P from wastewaters.</p> <p>k.macintosh@qub.ac.uk, J.McGrath@qub.ac.uk dr. Katrina Macintosh</p>
RAVITA	<p>RAVITA nutrient recovery – innovation for direct nutrient recovery from wastewater</p> <p>RAVITA DEMO project contains the building project of the demonstration plant for phosphoric acid production. In the RAVITA process, phosphorus is not recovered from sludge streams but it is recovered in the very end of the wastewater treatment process by post precipitation. Because phosphorus is taken directly from the wastewater, it can be recovered in clearly larger quantities than using other methods. The amount of recovered phosphorus can also be regulated if necessary. The end product phosphoric acid contains very little organic impurities or heavy metals. The phosphorus recovery process can be combined with nitrogen recovery by using recycled phosphoric acid in stripping process. Thus the end product is ammonium phosphate. One of the most central advantages of the RAVITA method is that it can be applied to technically different kinds of treatment plants and</p>



	<p>treatment plants of different sizes. mari.heinonen@hsy.fi Mari Heinonen</p>
RichWater	<p>First application and market introduction of combined wastewater treatment and reuse technology for agricultural purposes RichWater is a Fast Track to Innovation project whose main result is to develop a commercial system thoroughly demonstrated and tested in its operational environment. RichWater system is composed of a low-cost and energy-efficient MBR (to produce pathogen-free and nutrient rich irrigation water), a mixing module (for tailor-made mixing with freshwater and additional fertilizers), the fertigation unit and a monitoring / control module including soil sensors to guarantee demand-driven and case sensitive fertigation. By combining these developed modules a complete and turn-key system for safe wastewater reuse in agriculture is available. The technology is intended to reuse local community wastewater for irrigation purposes. The aim is to create a win-win situation between two sectors (the wastewater treatment and the agricultural sector) by turning public wastewater into a valuable end-product. A detailed life cycle assessment and business plan will help to precisely assess the ecologic, technological and economic benefits enabling an effective market strategy. rcasielles@bioazul.com, alorenzo@bioazul.com Rafael Casielles, Antonia Lorenzo</p>
Run4Life	<p>Recovery and Utilisation of Nutrients for Low Impact Fertiliser The Run4Life project will develop an alternative strategy for improving nutrient recovery rates and material qualities, based on a decentralised treatment of segregated black water (BW), kitchen waste and grey water combining existing WWT with innovative ultra-low water flushing vacuum toilets for concentrating black water hyper-thermophilic anaerobic digestion as one-step process for fertilisers production and bio-electrochemical systems for nitrogen recovery. It is foreseen up to 100% nutrient (NPK) recovery (2 and >15 times current phosphorus and nitrogen recovery rates) and >90% water reuse. Obtained products will be >90% reused thanks to prospective end-users in the consortium and a new Business model based on a cooperative financial scheme. Run4Life impacts will be evaluated on safety and security (Risk Assessment), from an environmental point of view (Life Cycle Assessment and Environmental Technical Verification), on the economy (Benefit Cost Analysis) and considering Social Risk Perception. Active measures will be developed with the support of a Stakeholders and Exploitation Panel for achieving institutional, legal and social acceptance. Different parts of Run4Life will be large scale demonstrated at 4 demo-sites in Belgium, Spain, Netherlands and Sweden, adapting the concept to different scenarios (market, society, legislation). Performance tests will be carried out with obtained products (compared to commercial fertilisers) with close collaboration with fertiliser companies. Process will be optimised by on-line monitoring key performance indicators (nutrient concentration, pathogens, micropollutants). The information obtained in the 4 demo-sites will be used for process simulation to conceive a unified Run4Life model which will be applied in a fifth demo-site in Czech Republic, allowing new business opportunities and providing data for critical raw material policies. beatriz.delcastillo@fcc.es, emartinezd@fcc.es, FRogalla@fcc.es, ESantosS@fcc.es, nicolas.morales.pereira@fcc.es Eva Martínez Díaz and Frank Rogalla</p>
SABANA	<p>Sustainable Algae Biorefinery for Agriculture and Aquaculture The general objective of the SABANA project is to demonstrate the technical, environmental and social feasibility of producing valuable products for agriculture and aquaculture by using only marine water and wastewater as nutrients source. The key advantages of SABANA project are: the sustainability of the process, using marine water and recovering nutrients from wastewaters while minimizing the energy consumption, and the socioeconomic benefits, due to the relevance of the target bioproducts for two major pillars in food production as agriculture and aquaculture. Bioproducts capable of increasing the yield of crops and fish production are highly demanded, whereas recovery of nutrients is a priority issue in the EU. Instead of considering wastewater as an inevitably useless and problematic residue of our society, SABANA acknowledges its potential as an opportunity for economically relevant sectors. facien@ual.es, giuliana.dimporzano@unimi.it, jvazquezp@fcc.es, zouhayr.arbib@fcc.es, i.pozo@clever-ic.com Francisco Gabriel Acien Fernandez</p>
SMART-Plant	<p>Scale-up of low-carbon footprint material recovery techniques in existing wastewater treatment plants SMART-Plant will scale-up in real environment eco-innovative and energy-efficient solutions to renovate existing wastewater treatment plants and close the circular value chain by applying low-carbon techniques to recover materials that are otherwise lost. 7+2 pilot systems will be optimized for > 2 years in real environment in 5 municipal water treatment plants, including also 2 post-processing facilities. The systems will be automated with the aim of optimizing wastewater treatment, resource recovery, energy-efficiency and reduction of greenhouse emissions. A comprehensive SMART portfolio comprising biopolymers, cellulose, fertilisers and intermediates will be recovered and processed up to the final commercializable end-products. The integration of resource recovery assets to system wide asset management programs will be evaluated in each site following the resource recovery paradigm for the wastewater treatment plant of the future, enabled through SMART-Plant solutions. The project will prove the feasibility of circular management of urban wastewater and environmental sustainability of the systems, to be demonstrated through Life Cycle Assessment and Life Cycle Costing approaches to prove the global benefit of the scaled-up water solutions. Dynamic modelling and superstructure framework for decision support will be developed and validated to identify the optimum SMART-Plant system integration options for recovered resources and technologies. Global market deployment will be achieved as right fit solution for water utilities and relevant industrial stakeholders, considering the strategic implications of the resource recovery paradigm in case of both public and private water management. New public-private partnership models will be explored connecting the water sector to the chemical industry and its downstream segments such as the construction and agricultural sector, thus generating new</p>



	<p>opportunities for funding, as well as potential public-private competition. malamis.simos@gmail.com, f.fatone@univpm.it, malamis.simos@gmail.com, Christian.Remy@kompetenz-wasser.de, smart-plant@ateneo.univr.it, peter.vale@severntrent.co.uk, smart-plant@univpm.it Prof Francesco Fatone, Simos Malamis, Christian Remy and Peter Vale</p>			
SYSTEMIC	<p>Large scale demonstration projects for recovery of nutrients from manure and sewage sludge The SYSTEMIC project, 2017-2021, is a public private partnership that will demonstrate new approaches for the valorisation of biowaste into green energy, mineral fertilisers and organic soil improvers. Biowaste, which includes animal manure, sewage sludge and food waste, forms an enormous resource of valuable nutrients. The project will include five demonstration-scale nutrient recovery installations, operating in combination with large anaerobic digesters and field testing of the recovered nutrient fertiliser products to demonstrate agronomic value, business case and environmental benefits. The five demonstration plants are Groot Zevent (NL), AMPower (BE), Acqua&Sole (IT), GNS (DE), and RIKA biofuels (UK). Nutrients will be recovered by ammonia stripping (product ammonium sulphate), reverse osmosis (nitrogen and nitrogen-potassium concentrates), phosphate extraction and precipitation (calcium phosphate), and in organic digestate residuals, alongside production of purified irrigation water and biogas. The SYSTEMIC partners are: Wageningen Environmental Research NL (lead), AM Power BE, Groot-Zevent Vergisting NL, AcquaSole IT, RIKA Biofuels UK, GNS DE, A-Farmers Ltd FI, ICL Europe NL, Nijhuis Water Technology NL, Proman Management AU, Ghent University BE, Milano University IT, VCM BE, European Biogas Association BE, RISE BE. oscar.schoumans@wur.nl, systemic@wur.nl Oscar Schoumans</p>			
The Resource Container	<p>Finland Resource Container project for phosphorus, nitrogen and carbon recovery from wastewater VTT has designed a Resource Container concept that consists of physico-chemical methods used or under development in the industrial sector. They will be combined in such a manner that the focus of substance extraction will be specifically on the products (nutrients, bio-carbon and clean water), rather than on their disposal. The operating model does not include biological treatment, and can therefore be flexibly implemented in various scales locally or as a seasonal solution. hanna.kyllonen@vtt.fi, Mona.arnold@vtt.fi Kyllonen Hanna</p>			
Water2 Return	<p>REcovery and REcycling of nutrients TURNing wasteWATER into added-value products for a circular economy in agriculture The objective of the Water2REturn project is a full-scale demonstration process for integrated nutrients recovery (up to 90-95%) from wastewater from the slaughterhouse industry using biochemical and physical technologies and a positive balance in energy footprint. The project will not only produce a nitrates and phosphate concentrate available for use as organic fertiliser in agriculture, but its novelty rests on the use of an innovative fermentative process designed for sludge valorisation which results in a hydrolysed sludge (with a multiplied Biomethane Potential) and biostimulants products, with low development costs and high added value in plant nutrition and agriculture. This process is complemented by proven technologies such as biological aeration systems, membrane technologies, anaerobic processes for bio-methane production and algal technologies, all combined in a zero-waste-emission and an integrated monitoring control tool that will improve the quality of data on nutrient flows. The project will close the loop by demonstrating the benefits associated with nutrients recycling through the implementation of different business models for each final product. This will be done with a systemic and replicable approach that considers economic, governance and social acceptance aspects through the whole chain of water and targets essentially two market demands: 1) Demand for more efficient and sustainable production methods in the meat industry; and 2) Demand for new recycled products as a nutrient source for agriculture. The project represents a first market application of a viable, cross-sectoral and integrated solution for slaughterhouse wastewater treatment (water savings: 20-40% in the meat industry) with energy production (and low-energy demanding) and recovery of nutrients with high market value (recovery rates: 90-95%), resulting in 4 relevant outcomes, including (1) production of 1 technological system (easy to operate, versatile and compact) to treat wastewater → novel combination of technologies and processes in cascade maximising the extraction of valuable products, and (2) production of 3 agronomic products (APs) ready to commercialise at EU and international level: one fertiliser and two biostimulants. pzapata@bioazul.com, alorenzo@bioazul.com Ms. Pilar Zapata Aranda</p>			
3R2020+	<p>From waste to resource by recycling The aim is to investigate innovative technologies to recycle different waste flows with no commercial value. In particular, the project will allow to obtain: (1) green-diesel, (2) PHA, hydrogen, caproic and D-lactic acids, (3) metals and (4) struvite and ammoniac sulphate as fertilizers, coming from (1) LDPE, (2) digestate and biogas, (3) incineration ashes and slags and (4) sewage sludge, respectively. gortizv@urbaser.com, calvarezz@urbaser.com, efernandez@urbaser.com Gema Ortiz</p>			

2 Other EU funded nutrient recycling R&D projects

 AgriMax	<p>Agri and food waste valorisation co-ops based on flexible multi-feedstocks biorefinery processing technologies for new high added value applications</p>	<p>http://www.agrimax-project.eu</p>	<p>gianluca.belotti@iris.cat, emma.needham@biovale.org</p>	<p>Gianluca Belotti and Emma Needham</p>
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Anadry	Dry anaerobic digestion as an alternative management & treatment solution for sewage sludge	http://www.life-anadry.eu/index.php/en	laura.pastor@dam-aguas.es	Laura Pastor-Alcañiz
ANSWER	Advanced Nutrient Solutions With Electrochemical Recovery	http://www.life-answer.eu	icirizas@mahou-sanmiguel.com	Juan Francisco Ciriza
BioRaEE	Nutrients, energy and livelihood from biogas plants to rural areas	http://www.syke.fi/biokaasulaitoksestaravinteita	Heidi.rintamaki@ymparisto.fi	Heidi Rintamäki
CHROMIC	Efficient mineral processing and Hydrometallurgical Recovery of by-product Metals from low-grade metal containing secondary raw materials	http://www.chromic.eu	Liesbeth.horckmans@vito.be	Liesbeth Horckmans
CIRCWASTE	Towards circular economy in Finland	http://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=search.dspPage&n_proj_id=6098	tuuli.myllymaa@ymparisto.fi	Tuuli Myllymaa
Clamber	Biorefinery of organic waste	http://ipex.castillalamancha.es/perfil/exportadores-inversores/notasdeprensa/portal/clamber-project?language=en	jmgomez@bpeninsular.com	José María Gómez Palacios
DRAINUSE	Re-utilisation of drainage solution from soilless culture in protected agriculture. From open to close system	http://www.drainuse.eu	vicente@cebas.csic.es	Vicente Martínez
ECOGRANULAR WATER	Demonstration project for groundwater treatment with an innovative system based in aerobic granular technology	http://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=search.dspPage&n_proj_id=6276	jgarcia@dipgra.es	Francisco Javier García Martínez
Electro-Sludge	Innovative Electro Dewatering system for the maximisation of the urban sludge Dry Solid content	http://www.electrosludge.eu	giancarlo.ferrari@astautomat.ion.it	Giancarlo Ferrari
FERTINNOW A	Transfer of INNOvative techniques for sustainable WATER use in FERTigated crops	http://www.fertinnowa.com	jennifer.bilbao@igb.fraunhofer.de	Jennifer Bilbao
FORCE	Cities Cooperating for Circular Economy	http://cordis.europa.eu/project/rcn/207269_en.html	ergp.msc@cbs.dk , sds.marktg@cbs.dk	Sönlich Dahl Sönichsen, City of Copenhagen
HTC4WASTE	Up-scaling, demonstration and first market application of Loritus' patented hydrothermal carbonisation as an eco-efficient and cost-effective organic waste processing technology	http://cordis.europa.eu/project/rcn/201671_en.html	?	?
iCirBus-4Industries	Innovative Circular Businesses on Energy, Water, fertiliser & Construction Industries towards a Greener Regional Economy	http://www.icirbus.eu/	mmartin@intromac.com	Manuel Martín Castizo
In-BRIEF	Integrated business model for turning Bio-waste and sewage sludge into renewable energy and agri-urban fertilisers	http://www.lifeinbrief.eu/?lang=en	msanchez@aimme.es	Manuel Sanchez
InnoPellet	Self-supporting biofuel sludge pellet producing system for small and medium sized sewage plants	http://cordis.europa.eu/project/rcn/201671_en.html	info@innowaste.eu	?
INNOQUA	Innovative Ecological on-site Sanitation System for Water and Resource Savings	http://cordis.europa.eu/project/rcn/203388_en.html	glauco.donida@r2msolution.com	?
LEMNA	Duckweed technology for improving nutrient management and resource efficiency in pig production systems	http://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=search.dspPage&n_proj_id=5755	info@ainia.es	Andrés Pascual
NEWEST	New urban wastewater treatment based on natural coagulants to avoid	http://ec.europa.eu/environment/life	jfcabeza@servyeco.com	Jose Cabeza



	phosphorus pollution allowing mud's agrivallorization	/project/Projects/index.cfm?fuseaction=search.dspPage&n_proj_id=6188		
Omzet Amersfoort	Energy and resources from wastewater factory	https://www.omzempuntamersfoort.nl/english	hvanveldhuizen@valleiveluwe.nl	Henry van Veldhuizen
PHOSave	Innovative solution for phosphate recovery from exhausted extinguishing powders	http://www.phosave.com	m.michelotti@phosave.com	M. Michelotti
REPAIR	REsource Management in Peri-urban AREas: Going Beyond Urban Metabolism	http://h2020repair.eu/repair	A.Wandl@tudelft.nl , repair-bk@tudelft.nl	?
SALTgae	Algae to treat saline wastewater	http://www.saltgae.eu	info@saltgae.eu	Miguel Herrero
SATURN	Solar-Assisted Treatment of Urine with Recovery of Nutrients	?	sebastiaan.derese@ugent.be	Sebastiaan Derese
SCREEN	Solutions for CRITICAL Raw materials - a European Expert Network	http://www.screen.eu	contact@screen.eu	Stephane Bourg
Sharebox	Secure sharing of information about recyclable materials between companies	http://www.sharebox-project.eu	albert.torres@iris.cat	Mr. Albert Torres
Smart Fertirrigation	Integrated pig manure digestate processing for direct injection of organic liquid fertiliser into irrigation systems	http://www.smartfertirrigation.eu/en	life@copiso.com	Andrés Garcia Martinez
Sto3Re	Synergic TPAD and O3 process in WWTPs for Resource Efficient waste management	http://lifesto3re.com/category/news/?lang=en	jgberlanga@grupogimeno.com	?
Teholanta	Efficient and sustainable use of poultry manure	https://www.luke.fi/en/producers-initiative-give-rise-to-the-teholanta-power-manure-project	sari.luostarinen@luke.fi	Sari Luostarinen
TURKISTEHO	Enhanced use of fur animal manure	https://www.luke.fi/en/projects/turkis-teho	sari.luostarinen@luke.fi	Sari Luostarinen
VicInAqua	Integrated aquaculture based on sustainable water recirculating system for the Victoria Lake Basin	http://www.vicinaqua.eu	info@aquabt.com , Ephraim.Gukelberger@hs-karlsruhe.de	Ephraim Gukelberger
WETWINE	Transnational cooperation project for promoting the conservation and protection of the natural heritage in the wine sector in the South West of Europe	http://www.wetwine.eu	rpena@aimen.es , jaalvarez@aimen.es , alfonso.ribas.alvarez@xunta.gal	Rocio Pena & Juan A Alvarez (AIMEN), Alfonso Rivas (INGACAL)
YEAST	Recycling brewer's spent YEAST in innovative industrial applications	http://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=search.dspPage&n_proj_id=6265	pgutierrez@bdbiotech.com	Pablo Gutiérrez Gómez
ZERO BRINE	Re-designing the value and supply chain of water and minerals: a circular economy approach for the recovery of resources from saline impaired effluent (brine) generated by process industries	http://cordis.europa.eu/project/rcn/210177_en.html	?	?

3 Other non-EU funded nutrient recycling R&D projects

BiofuelCellAPP	Agro-industrial wastewater purification and nutrients recovery. Towards Microbial electrochemical systems scaling-up and field APPLICATIONS	https://www.researchgate.net/project/BioFuelCellAPP	andrea.schievano@unimi.it	Dr. Andrea Schievano
Ecosec mobile struvite reactor	?	http://www.ecosec.fr	b.clouet@ecosec.fr , q.legros@ecosec.fr	?



I-PHYC	Industrial Phycology	http://www.i-phyc.com	info@i-phyc.com , dan@i-phyc.com , lucie@i-phyc.com	?
Netherlands Micronutrients from batteries	Micronutrient recovery from recycled batteries	http://brimstonefertilizers.com/?Brimstone Fertilizers Winning van essenti%C3%ABle nutri%C3%ABnten uit re ststromen	ate@n-xt.com , Ate@lukro.net , marcel.vanculemborg@zetadec.com	Ate Ludwig & Marcel van Culemborg
Sludge P recycling Norway	Increasing availability of phosphorus in the sludge coming from WWTPs (Norway)	?	pau@cowi.com	Bjarne Paulsrud
Redmedite	Phospahte recovery from WWTP final effluent/ permanent binding of dissolved heavy metals	http://www.redmediatech.com	Chris.drayson@redmediatech.com	Chris Drayson
OCAPI	Optimisation of CARbon, nitrogen and Phosphorus cycles in the city	http://www.leesu.u-pec.fr/OCAPI-presentation	fabien.esculier@ponts.org	Fabien Esculier
PFeWTR	Phosphorus capture, recycling and utilization for sustainable agriculture and a clean environment using iron desalination residuals (Fe-WTR)	?	litaori@telhai.ac.il , Irisz@migal.org.il	Iggy M. Litaor
Rec Alkaline	Alkaline battery micronutrient recycling	http://www.recalcalkaline.fi/en	tatu@recalkaline.fi , jarmo@recalkaline.fi	Jarmo Pudas
PProduct	Potential of sewage sludge phosphorus in plant production	?	kari.ylivainio@luke.fi	Kari Ylivainio
UPM and Yara recycled fertilisers	UPM and Yara to co-develop recycled fertilisers	http://www.upm.com/About-us/Newsroom/Releases/Pages/UPM-and-Yara-to-co-develop-recycled-fertilisers-001-Thu-10-Nov-2016-10-03.aspx	koen.van.keer@yara.com , Gauthier.Boels@yara.com	Koen Verkeer
Phos4Life	Process for phosphorus recovery process from sewage sludge incineration ash	http://www.klaerschlammm.zh.ch	leo.morf@bd.zh.ch	Leo Morf
Helsinki wastewater nutrient recovery	New innovative methods for nutrient recovery and harvesting in wastewater treatment plants	?	mari.heinonen@hsy.fi	Mari Heinonen
UK food system phosphorus	The role of phosphorus in the resilience and sustainability of the UK food system	?	p.withers@bangor.ac.uk	Paul Withers
RAVINNELAS KURI	Tool for planning regional nutrient recycling	https://www.luke.fi/en/projects/ravinnelaskuri	sari.luostarinen@luke.fi	Sari Luostarinen
SAVE	Agricultural application of phosphogypsum	http://blogs.helsinki.fi/save-kipsihanke	seija.luomanpera@yara.com , Gauthier.Boels@yara.com	Seija Luomanperä
Ferti-Mine	From waste to fertilizer - phosphorus and carbon waste mining as nutrient recycling strategy for the future	https://forschung.boku.ac.at/fis/suchen.projekt_uebersicht?sprache_in=en&ansicht_in=&menue_id_in=300&id_in=10302	walter.wenzel@boku.ac.at , christoph.pfeifer@boku.ac.at	Walter Wenzel & Prof. Dr. Christoph Pfeifer

