



Newsletter – April 2018

RRfW programme news

RRfW is seeking submissions to a Research Topic in Frontiers journal

RRfW is coordinating a Research Topic on resource recovery from waste, in collaboration with scientific publishing platform Frontiers and its associated family of journals. We strongly encourage participation from across the research community to raise visibility and drive momentum in the resource recovery from waste area.



The Research Topic aims to bring together research works falling under, but not limited to, the following areas: Waste streams; RRfW technologies; “Whole system” design and improvement; Methodological approaches to resource/waste value appraisal; and Waste management/use associated impacts.

As distinct from special issues in other journals, Research Topics in Frontiers act to bring together articles published in any one of the participating Frontiers journals via a dedicated webpage. Submitted papers should fit within the scope of the selected journal specialty as well as within the resource recovery from waste Research Topic. Further details on how Research Topics work and participating journals can be found in our [Research Topic blog](#).

Abstract submissions are due by 14 May, with manuscripts to be submitted by 15 October and publication expected by the end of the year. If you are interested in contributing to this Research Topic, please [contact us](#) to receive a direct email with the full call for participation details.

Industry survey - let us know your views on resource recovery in the UK

RRfW wants to hear views from companies and professional bodies in order to develop a vision for delivering resource recovery in the UK as part of a circular economy. In particular, we are interested in:



- What the future waste and resource management landscape should look like.
- Key drivers and barriers for resource recovery and circular economy.
- Actions needed from industry, government, and academia to increase resource recovery.

Responses are sought from companies active in sectors such as “traditional” waste management and reprocessing, extractive industries, manufacturing, bioenergy as well as those working in consultancy, insurance, investment and others.

The results will add to recommendations to government such as for the Resource and Waste Strategy and the National Infrastructure Plan; recommend how industry can adopt more resource efficient, circular economy practices; and shape academic research to ensure practical relevance.

Participation is anonymous, takes 12-15 minutes and the survey will be open until 4 May 2018. [Find out more via our blog](#) or [go straight to the survey](#); please share with any relevant contacts so we can receive as wide a response as possible. Any questions or comments can be directed to [Anne Velenturf](#).

Policy engagement leads to policy & practice notes and Ministerial briefing event

Resource efficiency is likely to be high on the political agenda in the coming years as pressures from inefficient resource use have increasingly negative consequences socially, economically and environmentally. To address this, Dr Rachel Marshall has been working in collaboration with the project and RRfW coordination teams, reviewing and consolidating the policy relevant outputs from the RRfW programme.

Coming out of this work, a policy & practice note has been developed on making the most of industrial wastes, focused on metals from Anthropogenic Ores (to be released shortly). A second policy & practice note is in development on optimising resource recovery from organic waste stream. A complete overview of policy recommendations from Resource Recovery from Waste projects will be published and discussed with decision makers. In addition, a Ministerial briefing event on 'A Strategy to Valuing Resources and Wastes' is planned in London on 19 June 2018, co-organised with Policy Connect All-Party Parliamentary Sustainable Resources Group in London (further details to be announced shortly).

The above work has been possible due to a NERC Policy Impact award earlier in the year and will be followed up with support from a HEIF Impact Acceleration Account award via Lancaster University. These awards have been used to turbo boost the RRfW programme's policy work. For further information or if you wish to contribute to the discussion please contact [Rachel Marshall](#).

RRfW meetings

Microbial Electrochemical Technology for Resource Recovery Conference

Hilton Hotel Newcastle Gateshead



A free to attend end-of-project conference is planned for the [RRfW MeteoRR project](#) on 9-10 May, in Newcastle. The conference

will celebrate the successes of the project and will provide a networking opportunity for academic, government and industrial partners to explore new research collaborations.

MeteoRR's research has focussed on the use of bioelectrochemical systems (BES) to drive the recovery of valuable metals from industrial wastewater and to synthesise useful compounds from carbon dioxide. During the two days conference, we will review the main outcomes of our research on using BES to recover valuable metals such as copper and zinc from wastewater, the production of functional bio-nanominerals, technology scale up and Life Cycle Sustainability Assessment. We also have industrial partners and renowned international researchers contributing an overview of the development of new renewable energy technologies for achieving energy sustainable water infrastructures, CO2 reduction technologies and the production of valuable organics and fuels from waste.

Confirmed Keynote speakers include:

- Bruce Logan, Penn State Engineering
- Piet Lens, IHE Delft Institute for Water Education
- Angela Murray & Iryna Mikheenko, Birmingham University
- Adam Jarvis, Newcastle University
- Devin Sapsford, Cardiff University
- Korneel Rabaey, Centre for Microbial Ecology and Technology, Ghent

The programme also includes industry contributions from whisky distillery firm Chivas Brothers and TATA Steel. A special policy focused session will be held on the second day looking at 'Life Cycle Sustainability and Policy Analyses of Plausible Systems for Resource Recovery from Waste', led by Jhuma Sadhukan, Surrey University.

Further details are available via the event's [registration webpage](#); including the [full agenda](#). **Registration closes on 30 April.**

How can policy and regulation support resource recovery from waste?

Four places are available for the final RRfW knowledge exchange workshop in Leeds on 27 April 2018, which is looking at vanadium recovery from steel slag landfills.



Understanding how change in the governance of waste and resource management can be achieved is vital to promote resource recovery and increase resource efficiency as part of the transition towards the circular economy. To address this, RRfW has been hosting a series of free one-day workshops to promote knowledge exchange between academia, government and industry, of which this is the last one.

Each workshop has focused on a different technology area and the outcomes will be used to formulate policy recommendations for governmental bodies throughout the UK, as well as to shape our ongoing research.

Workshop spaces are limited and will be allocated on a first come, first serve basis. Find out more and register for the workshop via our [event webpage](#). **Registration closes on 20 April.**

Save the date: RRfW final conference 16th January 2019

The date for the final RRfW annual conference has been set as 16th January 2019. The meeting will be held in central London, at a venue close to parliament. The meeting will look to celebrate the achievements of the programme, examine the implications of this work on the policy landscape and look ahead to the next steps necessary to realise resource recovery in the UK as part of a circular economy. Further details to be announced as they are confirmed.

Publications

RRfW Coordination Team

A pre-print paper has been released by RRfW on co-producing a vision and approach for the transition towards a circular economy, looking particularly at perspectives from government partners. Reflecting insights from RRfW's government engagement, this article presents a positive outlook for changing the UK economy and society. Four themes and an approach are proposed, including recommendations for regulatory instruments and a stable policy framework. [The article is open access and available online](#). For further RRfW publications, please see our [publications page](#).

CVORR

CVORR has a paper currently [in press in Waste Management](#) on post-consumer plastic packaging waste in England - assessing the yield of multiple collection-recycling schemes. The study found that the contribution of kerbside collection scheme dominates over bring-sites/banks and household waste recycling centres. Overall, only a mere 16% of the plastics collected are finally sent to reprocessors and a recycling rate of approximately

23% was calculated.

A [second CVORR paper out in Waste Management](#) examines the technical properties of biomass and solid recovered fuel co-fired with coal, looking at the impact on multi-dimensional resource recovery value. This case study uses a systematic and flexible approach to conceptualising multi-dimensional aspects looking at the interconnections between the four domains of value (environmental, economic, technical and social) and the implications on overall value delivered through the use and recovery of waste resources.

Waste plastics are a hot topic, given the burden they pose to the marine and terrestrial environment. CVORR has a [new study in the Journal of Hazardous Materials](#) giving an overview of chemical additives present in plastics, including their migration, release, fate and environmental impact during their use, disposal and recycling. It concludes that inappropriate use, disposal and recycling may lead to undesirable release of potentially toxic substances and that sound recycling of plastics is the best waste management and sustainable option.

B3

The B3 team has released a [study in Microbial Biotechnology](#) on the biorefining of platinum group metals from model waste solutions, generating catalytically active bimetallic nanoparticles. A two-step biosynthesis 'pre-seeds' metallic deposits onto bacterial cells benignly; chemical reduction of subsequent metal from acidic solution via the seeds then makes bioscaffolding nanoparticles. The generated catalyst was used in the hydrogenation of soybean oil and found to have a similar selectivity to using a commercial metal catalyst.

MeteoRR

A new [MeteoRR paper in Bioresource Technology](#) looks at the life cycle, techno-economic and dynamic simulation assessment of bioelectrochemical systems, using the case of formic acid synthesis. The life cycle benefits - avoiding fossil-based formic acid production and electricity for wastewater treatment - outweighed the costs of operation and assemblage of bioelectrochemical system.

In addition, they also have a paper out on the applicability of a PEDOT coated electrode for amperometric quantification of short chain carboxylic acids ([open access abstract](#)), and a book chapter on bioelectrochemical systems for biofuel (Electricity, Hydrogen, and Methane) and valuable chemical production ([Chapter 11, Green Chemistry for Sustainable Biofuel Production](#)).

The MeteoRR paper "Biosynthesis and Characterization of Copper Nanoparticles Using *Shewanella oneidensis*: Application for Click Chemistry" that was reported in the January newsletter is [now available](#). The paper demonstrates a novel, green biosynthesis method for the production of copper nanoparticles using the metal-reducing bacterium, *Shewanella oneidensis*.

R3AW

A new R3AW paper looks at the long-term leaching behaviour of basic oxygen furnace (BOF) steelmaking

slag. There were several distinct leaching stages observed over time, associated with different phases controlling the solution chemistry. The implications of the results on the storage and reuse of BOF slag is discussed, especially in relation to leaching of vanadium. The open-access paper is published in the journal of [Environmental Science and Pollution Research](#).

INSPIRE

The INSPIRE project has two new papers out. The first [paper in Chemosphere](#) demonstrates the selective recovery of copper from acid mine drainage using a novel copper uptake and release mechanism, a process they term 'Precision Mining'. The second paper, a technical note in the International Journal of Geomechanics, presents a method to estimate wall thickness in slurry wall design based on decoupling the advective and dispersive components of contaminant fluxes through the wall ([open access abstract](#)).

All project journal publications are now listed on the RRfW project pages: [AVAnD](#), [B3](#), [CVORR](#), [INSPIRE](#), [MeteoRR](#), and [R3AW](#). You can also find further publications and presentation on our [Researchgate](#).

Other news

Where is the End-of-Waste?

RRfW hosted a specialist session on End-of-Waste at the [European Biosolids and Organic Resources Conference](#) organised by Aqua Enviro in November 2017. The question of 'where is the End-of-Waste?' is becoming increasingly important as RRfW projects start to work towards commercialisation of new technologies and applications that can recover resources from wastes such as industrial landfills, bioenergy residues and wastewater. The session aimed to clarify how to best achieve End-of-Waste in practice, especially as the Environment Agency's Definition of Waste panel had been closed for new applications for a considerable time. What lessons could be learnt from the regulator and companies active in this space?

Reflections drawn from this session have now been put together in a [blog article](#) sharing the main findings, written by Dr. Anne Velenturf (Leeds University), David Tomkins (AquaEnviro), Dr. Rachel Marshall and Dr. Alfonso Jose Lag Brotons (Lancaster University). The article is hosted on the [Organics Recycling Group website](#).

Definition of waste assessment service to open June 2018

The Environment Agency plans to reopen its Definition of Waste Service from June 2018. This means that, in England, if you produce a product from waste you will be able to ask for the Environment Agency's opinion on the waste status of your material, in order to determine whether it has achieved end-of-waste or by-product status, or whether risks remain such that it must still be used and regulated as a waste.

Once the service is available you will need to submit a proposal, providing all the required information and paying an interim charge of £750. They will then check you have provided the right information and provide a

cost estimate to do the full assessment – this will be based on £125 per hour plus VAT. Once an agreement is in place, they will do the full assessment and give you their opinion on the waste status of your material.

If you are operating in other parts of the UK, contact your environmental regulator to find out what services they provide. Even if your material is no longer classed as waste, you will still need to comply with all relevant product legislation, for example the registration, evaluation, authorisation and restriction of chemicals (REACH) regulations or groundwater authorisations.

Further details of the proposed service are [available here](#). Before contacting the Definition of Waste service, it is recommended to do a self-assessment using the following free tools:

- [IsItWaste](#) tool: to assess whether your waste derived material can be classed as non-waste so is outside of waste controls
- [Definition of Waste Service checklist](#): providing information you need to support your definition of waste assessment.

Funding calls

UKRI Future Leaders Fellowship scheme

The UKRI Future Leaders Fellowship scheme aims to develop, retain, attract and sustain research and innovation talent in the UK. Providing up to seven years of funding, for at least 550 early-career researchers and innovators, the scheme will tackle difficult and novel challenges. UKRI Future Leaders Fellowships can be held at any UK-based organisation currently registered as eligible to apply to the research councils or Innovate UK. Companies or other privately owned research organisations are encouraged to host UKRI Future Leaders Fellowships if they can provide an innovation and/or research environment of international standing.

There will be six calls for the Future Leaders Fellowships, with two calls taking place each year over the next three years. Applications can be submitted in any area of research or innovation covered by the Research Councils and Innovate UK. The submission deadline for the first call is 3 July 2018, with a mandatory Expression of Interest required by 7 June. For further information visit the [Future Leaders Fellowships call page](#).

Cut-off dates for NERC highlight topic and strategic research ideas

NERC is seeking ideas for research challenges that should be priorities for strategic research investment through strategic programme areas and highlight topics. NERC would welcome ideas from both researchers and those who use environmental science research.

Ideas for new highlight topics should be submitted by 15 May 2018. Ideas for new strategic programme areas should be submitted by 6 September 2018. [Further details are available on the NERC website](#).

NERC Innovation Placements

NERC invites academic researchers (at post-doctoral level or above) to apply for an Innovation Placement, duration between 3-12 months, working within a non-academic host organisation such as a private business, third-sector organisation or public body

The objectives of the Innovation Placements scheme are to: initiate collaborations or deliver a step-change in existing collaborative activity between academics and non-academic partner (host) organisation; to engage with and meet the business needs of private, public, policy and third-sector users of environmental evidence; and generate evidence/case studies of how non-academic organisations have/could use environmental science research to add value to their operations through the innovative use of new tools, data or expertise. Call closes on 4 July 2018. [Further details are available on the NERC website.](#)

Sustainable solid waste management grants, Environmental Research and Education Foundation, US

The Environmental Research and Education Foundation invites applications for its sustainable solid waste management grants. These support research that increases sustainable solid waste management practices. This includes: waste minimisation; recycling; waste conversion to energy, biofuels, chemicals or other useful products; strategies to promote diversion to higher and better uses; and landfilling.

Institutions worldwide may apply. Grants are typically in the range of USD 15,000 to USD 500,000 each, with an average amount of USD 160,000, for two years. Next deadline for pre-proposals is 1 June, some topics may require approval prior to submission (2 weeks). [Further details are available on the funder's website.](#)

Events listing

RRfW Knowledge exchange workshop - Vanadium recovery from steel slag landfills - [Leeds 27 April 2018.](#)
Registration closes on 20 April.

Microbial Electrochemical Technology for Resource Recovery, [Newcastle University, 9-10 May](#) This is a celebratory conference for the end of the MeteoRR project. [Full agenda.](#) **Registration closes on 30 April.**

Pint of Science 'From ancient footprints to mini microbes'. [Manchester, 14 May 2018](#) Speakers include Dr Richard Kimber, who works on the MeteoRR project.

Use of bio-based feedstocks to establish new value chains. IBioIC and Zero Waste Scotland. [Glasgow, 23 May 2018.](#)

Liquid Fuels & Energy supply from CO2 Reduction (LifesCO2R) biannual meeting. Cardiff, 5 June 2018. Project meeting, if you are interested in attending, please contact [Ana Suárez-Suárez](#) (Research Project

Manager) in first instance.

RRfW Ministerial briefing event: A Strategy to Valuing Resources and Wastes. London, 19 June 2018.

Further details to be announced shortly.

Goldschmidt 2018. [Boston USA, 12-17 August 2018.](#)

4th EU-ISMET - International Society for Microbial Electrochemistry and Technology, 4th European Meeting. [Newcastle 12-14 September 2018.](#)

RRfW final annual conference. London, 16 January 2019. Further details to be announced.

Keep up to date with forthcoming meetings via our [Events page](#).



Any news, events or funding calls to include in our next newsletter in July 2018? Email

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