

# WARM

## White Ammonia and N-recovery Research Meeting

Wednesday 7<sup>th</sup> June 2023 – Brussels & hybrid

### Programme

8h30 Registration

9h30 Welcome, housekeeping, objectives of this research meeting  
**Conclusions of ESPP N-recovery workshop (19<sup>th</sup> January)**, Olivier Bastin (ESPP)  
**Summary of SCOPE Newsletter n°147 “Selection of N-Recovery science”**, Chris Thornton (ESPP)

10h00 **Policy context**  
**Integrated Nutrient Management Action Plan (INMAP)**, Jeanne De Jaeger (DG ENV)

10h15 **Funding opportunities**  
**Horizon Europe**, Bertrand Vallet (DG RTD)  
**LIFE**, Federico De Filippi (CINEA)

10h45 - 11h15: break – posters – stands – networking

11h15 **Parallel sessions (list of speakers at p.2)** – moderator/rapporteur

1. Membrane & electro dialysis ammonia recovery – Céline Vaneekhaute (University of Laval), Olivier Bastin (ESPP)
2. Ion exchange and adsorbents for ammonia capture in liquids – Chris Thornton (ESPP), Willem Schipper (industry consultant)
3. Biological routes for N-recovery: growing algae, monocellular protein – Daniel El Chami (Timac Agro Italia), Ludwig Hermann (ESPP) – *hybridised*

12h45 - 14h00: lunch

14h00 **Parallel sessions (list of speakers at p.2)**, moderator/rapporteur

4. Routes to concentrated or solid recovered N products – Olivier Bastin (ESPP), Laia Llenas Arguelaguet (BETA Technology Centre) – *hybridised*
5. N recovery from urine, manure, aquaculture – Robert Van Spingelen (ESPP), Andrea Turolla (Politecnico di Milano)
6. Different routes for nitrogen recycling – Robert Reinhardt (Algen), Elena Ficara (Politecnico di Milano)

15h30 - 16h00: break – posters – stands – networking

16h00 **Report from parallel sessions**

16h25 **The INMS Nitrogen Measures Database**, Will Brownlie (UKCEH) - *online*

16h30 **What research is needed? Industry perspective**  
Panel: Antoine Hoxha (Fertilizers Europe), Sagnotti Giulia (ACEA), Anna Lundbom (EasyMining), Marc Spiller (University of Antwerp), Willem Schipper (industry consultant)

17h00 **Closing discussion: what research is needed?**

17h30 Conclusion and close

## Speakers for WARM Parallel Sessions

### Parallel session 1: Membrane and electro dialysis processes

- Membrane-based concept to recover ammonia from industrial liquid side streams – *Hannah Kyllonen, VTT*
- Recovery and concentration of nutrients for hydroponics from centrate with electro dialysis and upstream nitrification in a membrane bioreactor – *Anna Hofmann, Fraunhofer Institute for Environmental, Safety, and Energy Technology UMSICHT*
- DetriCon's LIFE INFUSION pilot results – *Wouter Naessens, DetriCon*
- Membrane-enhanced stripping for ammonium recovery from pig slurry liquid fraction – *Xialei You Chen, Leitai Technological Center*
- Recovery of ammonia by membrane chemo-sorption from concentrated and dilute streams – *Lex van Dijk, Colubris Cleantech BV*
- Chemical-free ammonium recovery from reject water using bipolar membrane electro dialysis (BPMED) – *Gladys Mutahi, TUDelft*

### Parallel session 2: Ion exchange and adsorbents for ammonia capture in liquids

- Ionic liquid-based sorbents for NH<sub>3</sub> capture and recovery – *Jose Francisco Palomar Herrero, Universidad Autónoma de Madrid*
- Ammonia removal and recovery from municipal wastewater – *Hacer Sakar, Cranfield University*
- Geopolymers for ammonium removal and recovery: state of the art and perspectives - *Daniela Pinto, Università degli Studi di Bari*
- Application of nitrogen recovery to produce Smart bio-based fertiliser – *Alicia Gonzalez Miguez, Cetaqua - WALNUT Project*
- Ion exchange for N-removal after a high-loaded municipal waste water treatment plant – *Elisabeth Vaudevire, PWNT*

### Parallel sessions 3: Biological routes for N-recovery: growing algae, monocellular protein (hybrid)

- Microalgae-based ammonium recovery from wastewaters and digestates – *Robert Reinhardt, Algen*
- Microalgae-based bioremediation as an alternative to conventional activated sludge processes – *Elena Ficara, Politecnico di Milano*
- Large scale algal treatment of municipal wastewater – *David Fernando, Aqualia*
- MicroAlgae 4.0: Green microalgae for urban wastewater remediation and nitrogen recovery – *Josué Gonzalez-Camejo, Università Politecnica delle Marche*
- Biological recovery of N from wastewater using duckweed – *Reindert Devlamynck, Inagro*
- Hydroponic cultivation of plants based on N-rich waste streams – *Øyvind M. Jakobsen, CIRIS*
- Results update from SABANA projects – *Francisco Gabriel Acien Fernandez, European Algae Biomass Association (EABA)*

### Parallel session 4: Routes to concentrated or solid recovered N products (hybrid)

- Freeze concentration as potential technology to concentrate diluted ammonium salt solutions – *Nagore Guerra Gorostegi, BETA Technological Center*
- Nitrogen recovery in the LIFE RE-FERTILIZE project (Aqua2N) – *Anna Lundbom, EasyMining*
- Recovering nitrogen from wastewater as a concentrated liquid using (bio)electroconcentration – *Veera Koskue, University of Melbourne*
- Regenerative NO<sub>x</sub> Removal from Industrial Sources – Status and Outlook – *Alexander Krajete, Krajete*
- Possible routes and challenges for small-scale N-recovery to products adapted to industry or farmer use – *Willem Schipper (industry consultant) and Céline Vaneekhaute (University of Laval)*

### Parallel session 5: N recovery from urine, manure, aquaculture

- Nitrogen recovery from urine in research and practice – *Kai Udert, Eawag*
- Life cycle assessment of bio-based fertilizers from fisheries and aquaculture sidestreams – *Jan Landert, Research Institute of Organic Agriculture FiBL*
- Life Cycle Analysis (LCA) of the NPHarvest process, and of struvite precipitation + ammonia stripping – *Juho Kaljunen, Aalto University*
- Optimization of ammonia recovery from urine and digestate using transmembrane chemical absorption – *Mathieu Sperandio, Institut national des sciences appliquées de Toulouse*
- Revolutionizing Agriculture: Urine Recycling as a Green Solution for NPK Fertilizer Production – *David de Chambrier, VunaNexus*
- N recovery as part of the SYNECO solution for recycling manure nutrients in Malta – *Henning Lyngsø Foged, Organe Institut*

### Parallel session 6: Different routes for nitrogen recycling

- How can we possibly resolve the planet's nitrogen dilemma? – *Wim Moerman, Akwadok*
- Practical results of N-recovery from municipal wastewater – *Gertjan Buffinga, Byosis*
- SYREN - Acidifying slurry to minimise ammonia emission – *Morten Toft, BioCover*
- Treating and Recovering Nitrogen from digested sludge – two cases from the Netherlands – *Herman Evenblij, Royal HaskoningDHV*