

## **Programme**

### **ESPP – BioRefine workshop on nutrient data monitoring to support decision making: (proposed project Data on Nutrients to Support Stewardship - DONUTSS)**

**Ghent, Belgium**

**Ghent University, site address Coupure Links 653 block E**

***Thursday 3rd Sept. 2015***

***scientists, researchers, data monitoring organisations***

***Thursday 3rd Sept. evening:***

***scientists – stakeholders networking dinner***

***Friday 4th Sept.***

***data users, data holders, industry, decision makers, stakeholders plus lead  
scientists from day 1***



WAGENINGEN UNIVERSITY  
WAGENINGEN UR



TECHNISCHE  
UNIVERSITÄT  
WIEN  
Vienna University of Technology

## Day 1 - Thursday 3<sup>rd</sup> September

*Participants: scientists, researchers, data monitoring organisations involved in nutrient Mass Flow Analysis (MFAs) for P, N, K, other nutrients, organic carbon and similar studies*

*Which data and quality do we have and what research or analysis is needed to enable more coherent and useable nutrient data generation and availability?*

### 9:00 Registration

#### **Welcome and opening**

9:30 Welcome by ESPP (European Sustainable Phosphorus Platform) and workshop objectives and organisation

9:40 Welcome from Ghent University and Biorefine (Erik Meers – Ghent University)

9:50 Participants each indicate shortly their name and organisation

#### **From nutrients flow analysis in Europe towards indicators and system optimization**

10:00 - 11:00 Short presentations and plenary discussion

- EU wide overview of P flows and data quality (Kimo van Dijk - Wageningen University)
- Intercomparison of national nutrient flow analysis (Michael Jedelhauser - Ludwig-Maximilian University Munich)
- From scientific MFA to routine monitoring schemes (Helmut Rechberger - TU Vienna)
- What data is available on nitrogen and what is missing for 'nutrient management'? (Gerard Velthof, Alterra – Wageningen UR)

11:00 Break

#### **Institutional nutrients monitoring and how nutrients data "could" feed current indicators**

11:30 – 12:30 Two short presentations and plenary discussion

- Data availability and quality (Johan Selenius *tbc* – Eurostat)
- Nutrient data, a crucial input to environmental assessments (Geertrui Louwagie *tbc* - European Environmental Agency)

12:30 Lunch (provided, at location)

#### **Parallel table discussion on data priorities in 5 specific sectors**

13h30 – 15h00 Table sessions: What data do we need? What data is available? Which data should be targeted as priority for action to improve?

Expert invited speakers will give very short (max. 5 minutes) presentations to provoke discussions. All tables will be expected to provide answers to specific questions related to data (quality challenges), not to generally discuss about broad topics.

- Inputs and trade, Production and processing
- Agricultural nutrient use and losses
- Diet, nutrient demand and food nutrient footprint
- Waste and wastewater
- Nutrient balances and indicators

15:00 Break

***Reporting of table discussions and plenary discussion***

15:20 – 17:00 Short reports of outcomes of each table discussion and plenary discussion

***Proposed DONUTSS project***

17:00 Proposed DONUTSS project – see attached (Ottavia Zoboli - TU Vienna)

17:15 – 17:45 Final discussion to summarize outcomes of the day, inputs to second day of the Workshop and to the proposed DONUTTS project

**Thursday 3 September evening  
Networking dinner: scientists & stakeholders**

## Day 2 - Friday 4 September 2015

*Participants: stakeholders: concerned industries, agriculture, sustainability indicator organisations, regulators, organisations using and holding nutrient data ... plus lead scientists from Day 1*

*Networking dinner: Day 2 participants are invited to the networking dinner, Thursday 3rd September evening, with Day 1 participants*

*What nutrient data is needed for decision support for industry and decision makers (agriculture, fertiliser industry, agri-food sustainability indicators, waste and water management, regulators ...)?  
What data is available today and how should it be completed and managed to provide information suitable for decision support? Which amounts of biomass or industrial by-products are available for recycling and which types and amount of nutrients are available in each of them? How to define collaborative systems to collect, monitor/update and disseminate this information?*

### 8:30 Registration

#### **Welcome and opening**

9:00 Welcome to invitees who did not take part to 1<sup>st</sup> day and introduction to DONUTSS and goals of the workshop (Chris Thornton - ESPP)

9:10 Welcome from Ghent University and Biorefine (Erik Meers – Ghent University)

9:20 Participants shortly each indicate their name and organisation

9:30 General policy context in relation to nutrient flows (Francesco Presicce – European Commission)

#### **Nutrient flow data and monitoring – Experiences and outlook**

9:45 Flanders nutrient flow study with focus on involvement of stakeholders and data acquisition (Joeri Coppens – Ghent University)

10:00 UK phosphorus flow study with focus on proposed indicators for decision makers (Cynthia Carliell-Marquet – University of Birmingham)

10:15 A national data system on P input and balance established by fertilizer industry (Philippe Eveillard – UNIFA). Note: K and Mg also considered, for N and S partial balance

10:30 Break

11:00 Nutrient data availability challenges for having comparable data, useable for decision making by industry or regulators at regional – national – EU levels (Kimo van Dijk – Wageningen University)

11:15 Report of outcomes of the first day of the workshop



11:30 Specific needs identified by the European Commission to support Circular Economy for nutrients/fertilisers (DG GROW – Eric Liégeois / Vincent Delvaux)

11:45 Panel discussion

12:30 Lunch

***What data do stakeholders need to support nutrient stewardship?***

13:30 Short stakeholder statements on data need by selected representatives from different sectors (agriculture, fertilizer / food and feed / water /etc., both industry and policy makers). Max 5 min. 3 slides each to express positions on the following 3 questions:

- Why do you need data on nutrients?
- Which data do you need?
- What is currently missing?

The following companies / organisations have been invited to respond (confirmations pending):

- EU organic fertiliser associations: ECOFI, EUROFEMA, ECN and EBA
- EU mineral fertiliser association: Fertilizers Europe
- Water industry: EUREAU
- Paper: CEPI
- Agriculture: COPA-COGECA / European Cattle Innovation Partnership (ECIP)
- Animal feeds: European Feed Manufacturers' Federation (FEFAC) / Agrifirm
- Animal by-products: EFPRA
- Food and food processing: a consumer food product / processing company
- Sustainability Indicators: The Sustainability Consortium , Field to Market
- European regulators: DG GROW (Innovation Fund, Critical Raw Materials policy) / ENCI / AGRI
- National regulators: Denmark / Germany / Flanders / Baltic-HELCOM
- Chemical industry: European Chemical Industry Council (CEFIC)

14:45 Plenary discussion following these statements and in particular to address questions of DG GROW as to how and what data to collect for EC needs/call

15:15 Conclusions for action – discussion of content of proposed DONUTSS project (Data on Nutrients to Support Stewardship) and how to take this forward

**16:00 Close of meeting.**



## Proposed action: **DONUTSS**

### **Data on Nutrients to Support Stewardship**



**Adequate, up-to-date data, in a useable form, is essential to define nutrient stewardship objectives, targets and actions, and to monitor their effectiveness.** Quality data can be used for the analysis of nutrient flows and stocks, circular economy development and critical raw material policies by policy makers, business and scientists. **This targets phosphorus (P), potassium (K), possibly other nutrients.** Existing work is already underway on nitrogen, e.g. INI <http://www.initrogen.org/europe> - there are links and experience transfer, but duplication should be avoided.

To date, around 20 phosphorus flow studies have been published in different countries and regions of Europe (see below). However, the methodologies used, sectors covered (agriculture, industry, households etc. ), spatial scales and time-horizons are very variable so that results cannot be compared. Many regions have no useable phosphorus flow data. Data for other nutrients is even more scarce and disjointed. Where data is available, it is not readily accessible to stakeholders and is **not orientated towards identifying points of possible effective action.** Data is rarely updated, so following results of system changes or of impacts of nutrient management actions is not possible.

The need for improved knowledge of phosphorus flows was the first **conclusion of the European Commission Consultative Communication on the Sustainable Use of Phosphorus** (Staff Working Document SWD(2014)263final): *“In terms of ascertaining the extent of phosphorus supply and demand, while the Communication represented a good starting point, the replies pointed to a need to increase the knowledge base. Information on flows and reserves should be more transparent and reliable and should cover more sources and geographical areas.”* Whilst the reserves information requires international action, the flows data can and should already be addressed in Europe.

Phosphate rock is on the EU list of **Critical Raw Materials** and an **MFA (materials flow analysis)** is currently underway. The stakeholders meeting already confirmed the considerable insufficiencies of information currently available to input to this MFA. Now is therefore the time to start to complete the information base in preparation for the next MFA exercise planned in three years' time (2017).

The **2<sup>nd</sup> European Sustainable Phosphorus Conference, Berlin, March 2015**, also confirmed the inadequacy of current nutrient flow data (see below), and the corresponding need for better data to support policy decisions and actions. Representatives of Eurostat, JRC and EEA underline the need for better data quality in the light of monitoring nutrient flow in society.

### **Proposed action**

To try to address the absence of such a data system today, **ESPP proposes to organize a workshop to bring together data flow researchers, data holders, stakeholders and competent institutions** (EC, EEA, JRC, Eurostat, and national organizations). Objectives would be to propose a shared overview of the current data situation and to define proposals for what is needed to support nutrient stewardship as well as to define possible steps to move towards establishing such a flow monitoring system. Results from earlier Scientific European Phosphorus Workshops in Bordeaux (2011) and Wageningen (2013) ([www.wageningenur.nl/sepw2013](http://www.wageningenur.nl/sepw2013)) will be incorporated.

This should be the **first step towards taking this forward to implementation** of coherent and action-targeted nutrient flow data collection, monitoring and publishing. Important in this is to define which organisations can take this on and how to fund it.

A lack of data quality is a worldwide problem. Therefore, if EU succeeds in setting up first a coherent system, this will generate the possibility of **exporting know-how to other parts of the world** that also face great challenges related to nutrients stewardship.

## ESPC2 proposals

The question of phosphorus flows data was discussed at the working table at the 2<sup>nd</sup> European Sustainable Phosphorus Conference, March 2015 and as a result the European Sustainable Phosphorus Platform suggests that:

- **Adequate, reliable, coherent and targeted data on nutrient flows is important to support improved nutrient management decisions in Europe**, and so to address issues of food quality, agricultural efficiency, nutrient losses to surface and ground water, and nutrient supply security;
- Data should be available at the **regional, national and European levels**, with coherent methods and presentation;
- Specific data systems are useful for certain **specific stakeholders and sectors**, e.g. municipal wastewater, agricultural biosolids use, etc.;
- Data should cover both quantities of **flows and quality** (nutrient concentration and form, in particular plant availability, feasibility or recovery);
- Data should be designed to **target identification of key management points** for possible actions for reducing losses, improving efficiency, recovery and recycling.

### Context: existing studies

In economy-wide accounting and analysis, multi-year schemes are already widespread to the extent that several countries have incorporated them into their statistical information systems. Several schemes have thus already been introduced at national scale to monitor material flows (e.g. wood, bulk materials, etc.). At the substance level, on the contrary, there is almost a complete lack of structured monitoring, despite the high relevance that several chemical elements have, either as potentially harmful for the environment or as resource for economic production.

The monitoring of phosphorus in agriculture has been implemented in European countries in the past two decades due to the concerns related to the surplus accumulated in soils and to its negative consequences for water ecology and quality. But even in this field there are still many challenges related to data transparency and consistency and to the comparability among Member States.

The relevance of phosphorus for European countries has however another important dimension, since it is a crucial resource with potential insecure supply in the future and it was recently added to the list of Critical Raw Materials by the European Commission. It is therefore necessary to track the flows, stocks, losses and concentrations of phosphorus throughout its whole life cycle, by improving and extending its assessment and monitoring beyond the agricultural sector.

In the past 10 years, European researchers have performed several studies to assess P flows through the entire society. As summarized by van Dijk et al. (under review), P Flow Analysis (PFA) studies have been conducted for the EU-15 (Ott and Rechberger, 2012), and at the national level for several European countries including Austria (Egle et al., 2014; Seyhan, 2006), Belgium (Flanders) (Coppens et al., 2013), Denmark (submitted, personal communication Manfred Klinglmair, DTU), Finland (Antikainen et al., 2008; Antikainen et al., 2005; Saikku et al., 2007), France (Senthilkumar et al., 2012a; Senthilkumar et al., 2012b), Germany (Gethke, 2012), Netherlands (de Buck et al., 2012; Smit et al., 2010), Norway (submitted, personal communication Helen Hamilton, NTNU), Sweden (Linderholm et al., 2012), Switzerland (Binder et al., 2009; Lamprecht et al., 2011), Turkey (Seyhan, 2006; Seyhan, 2009), and United Kingdom (Cooper and Carliell-Marquet, 2013). Compared to more traditional agricultural P balance assessments, PFA studies show how P is used, reused and lost through different societal compartments. In most cases these analyses are static, i.e. they depict a snapshot of the situation during a defined or average base year. Consequently, these studies fail to

capture spatial and temporal changes, as well as feedbacks and dynamic mechanisms within society. Furthermore, often they do not address thoroughly the quality of their input data and the consequences on the robustness of their results. Lastly, most of these studies in the last years have most exclusively focused on P, whereas it would be probably more appropriate to also consider simultaneously the other relevant macro and micro nutrients (e.g. potassium, copper and zinc) as well as the contaminants associated with different management strategies.

In parallel to the academic and scientific interest, several regulators and stakeholders from different industrial sectors have recognized the importance of better quantifying, understanding and monitoring specific P flows, and have implemented highly valuable data collection schemes. These initiatives are however still highly fragmented and a shared, common strategy may help identifying synergies, optimizing efforts and ensuring broader distribution, use and impact of the information.

## Proposed workshop outline

### *Targeted participants*

- **stakeholders from the private sector** (fertilizers companies, farmers associations, waste and wastewater management, etc.), which often do already hold very valuable data and whose perspective is therefore crucial, since the modification and extension of current monitoring schemes strongly relies on their involvement and active participations;
- **representatives of institutions** involved in statistics and environmental indicators, which can provide insights of actual possibilities and limitations for implementing monitoring schemes;
- **representatives of national nutrient platforms**, given that nutrient flow data is the basis of defining actions
- **researchers** who have carried out nutrient flow analyses studies and who have experience with the data necessary to quantify flows and stocks (with respect to data availability, quality, relevance at different scales and for different purposes);

### *Themes to be discussed*

The first goal of the workshop is to identify major data gaps and problems and to discuss which specific strategies can solve these challenges, for example:

- monitoring is already in place but it is the lack of harmonization of the methodologies that hinders any international comparison (e.g. nutrient flows in feed, manure and waste);
- data on material flows exists, but without enough detail, clear definitions and information about nutrient concentration, the latter does however change in time because of changes in management (e.g. organic wastes);
- data are mainly available for the generation of a flow, but not for its management/disposal routes (e.g. management and endpoint of P in sewage sludge).

After identifying the priorities, for each of the proposed modifications or extensions of the current monitoring, the benefits will be discussed together with the obstacles and costs to understand their feasibility.

Since experts and participants of different nationalities will be present, an important aspect of the workshop will be the possibility of sharing specificities, weaknesses and strengths of the approaches implemented in different countries and to identify models that could be easily applicable elsewhere.

One last point to be discussed is the scale at which the initiative for such monitoring schemes should be launched. The data eventually need to be collected locally. But shall the initiative for their implementation be pushed by each Member State independently or would it be possible/worth having a common European strategy? Moreover, who should be in charge of coordinating, processing and publishing the data (national statistics, Eurostat, EEA)?



### ***Outcomes of the workshop and further steps***

The expected outcomes of the workshop are proposals for data system, in particular recommendations on what to collect, who will collect it, how to ensure harmonization, and how to fund it. It is important that the system should be lasting, but an initial 2-3 year “project” structure may be appropriate for the definition and establishment phase. Although it might be ambitious to expect detailed answers to these questions from a workshop, this shall at least concretely define priorities on what we want to achieve and which processes shall be set off in that direction.

### ***Proposed planning objectives***

- Workshop: 3-4 September 2015
- Finalisation of initial project and funding proposals: end 2015
- Initial project: defining data, collection, monitoring, etc. and initialling data collection where missing: 2016
- Presentation / global workshop major nutrient conferences in 2016, e.g. IPW8 (Rostock), SPS China 2016
- Proposal to EU institutions for permanent flows monitoring system: end 2016
- Implementation 2017 onwards

### **Project leaders for ESPP**

- **Ottavia Zoboli**  
Institute for Water Quality, Resource and Waste Management  
Vienna University of Technology  
Karlsplatz 13, 1040 Vienna, Austria  
Email: [zoboli@waterresources.at](mailto:zoboli@waterresources.at)
- **Kimo van Dijk**  
Department of Soil Quality  
Wageningen University and Research centre  
P.O. Box 47, 6700 AA, Wageningen, The Netherlands  
Email: [kimo.vandijk@wur.nl](mailto:kimo.vandijk@wur.nl)

