de Neve (1)

Reporting format interactive sessions ESPC2013

1. **Bottlenecks: what constrains your (joint) goal?**

- Economical feasability of taking measures to increase P efficiency
+ Environmental costs not included in food prices
- in some cases lack of soil analyses/knowledge of soil fertility status

2. **Opportunities: on which aspects should be focussed to overcome the constraints?**

- More attention to soil quality (will also increase P uptake efficiency)
- Land ownership or net: determines willingness to invest
- Acidification of slurries (to reduce N losses and increase P availability)

3. **Actions for stakeholders within 'triple helix': what should be done by businesses, knowledge institutes, public parties and NGOs, but also by different sectors?**

- Use of catch crops to increase P removal from P saturated soils (now catch crops are only considered in view of reducing NO_3^- leaching)

4. **Actions on national level: what can be done at member state level?**

5. **Actions on EU level: what can be done at European level?**

More frequent soil analyses needed, perhaps to be implemented in legislation.

1

Reporting format interactive sessions ESPC2013

1. Bottlenecks: what constrains your (joint) goal?

2. Opportunities: on which aspects should be focussed to overcome the constraints?

→ varieties with increased P use efficiency.
" " better mycorrhizal colonization

plant breeding (including attention for Mycorrhiza)
enhance mycorrhiza ars, e.g. by increasing general soil quality
~~more attention for ~~

3. Actions for stakeholders within 'triple helix': what should be done by businesses, knowledge institutes, public parties and NGOs, but also by different sectors?

- Improved flow of information from researchers to farmers. Much is known about many of the problems and potential solutions, but the information does not reach the farmer
- Do more research initiated by farmers, bottom-up.
- Plant breeders should pay more attention to P efficiency of crops.

4. Actions on national level: what can be done at member state level?

5. Actions on EU level: what can be done at European level?

Reporting format interactive sessions ESPC2013

1. **Bottlenecks: what constrains your (joint) goal?**

- **Lack of knowledge in soil science by farmers: how soil (knowledge institute) is reacting. Biochemical balance. Role of the plants for the bio-availability.**
- **Composition and nature of the organic P matters for the plant availability.**
- **Uncertainty created by the lack of policy's visions and support to recycling**
- **Economic viability of recycling P activities and contribution to job creation.**
- **REACH constraints (e.g. struvite)**
- **Political will/legal obligation : how to encourage/force recycling**
- **Price will be By-products/heavy metals valued from the phosphate ores(e.g. uranium): if need for uranium decreases, the price of phosphate production might increase**
- **Nitrate Directive: limitation of manure to be spread: even when incinerated it is still counted as far as the source is animal origin: ashes is real mineral.**
- **Sludgesproduction is increasing without incentive to recycling activities or use itself due to legal constraints (e.g. drinking water). End-of-pipe legal solutionis not the task of Water suppliers industry.**
- **Copper and zinc limits in EoW criteria and other limits set up by other regulation: too conservative.**
- **Not on 1st list of raw material**
- **Contradiction between nitrates directive and soil management measures (organic matter content).**
- **Economic reality of existing experiences: the market would rule out economically non viable opportunity. RTD shall involve some market analysis dimension.**

2. **Opportunities: on which aspects should be focussed to overcome the constraints?**

- **Research on soil science is ongoing. Memorandum of Understanding amongst farmers communities to**
- **Facilitating P-platform meeting**
- **SME funding for innovative process.**
- **Development of purification technologies.**
- **Large funding capacities (e.g. Life, ...) but complicated access.**
- **Taking the research out of the real world.**
- **Setting up targets on recycling of organic wastes**
- **Obligation for recycling of solid wastes**
- **Bio-based economy policy developments**

- **Life cycle approach to safeguard the safety of sewage sludge recycling.**
- **Upgrade use of end-P-products (e.g. food grade animal bone waste)**
- **10-20 % recycled P in the end-products (on the basis of bio-fuel models)/tax**
- **Business orientated technology development: what is not viable today can become thanks to innovative technology**
- **Revise Fertilisers Regulation and simplify the access to the market included**
- **Incentivise the farmers to use the P-recycled**
- **To identify hot-spots and address them at regional level**

3. **Actions forstakeholders within 'triple helix': what should be done by businesses, knowledge institutes, public parties and NGOs, but also by different sectors?**

- **Every stakeholders involved in the helix needs to exchange views via a P-platform**
- **Technologies, costs, inter-connection of industries**
- **Transfer of technology (e.g. for processing technologies, purification)**
- **Financing implementation of technology**
- **Labelling of sources as 'greener' because it is coming from the recycling loop.**
- **NGOs claiming for new ideas, room for innovative solutions**

4. **Actions on national level: what can be done at member state level?**
    - **Stopping landfilling of sewage sludge and incinerate**

5. **Actions on EU level: what can be done at European level?**
    - **Workable EoW criteria, REACH exemption**
    - **Green paper as driver for MS as a starting point**
    - **Innovation partnership on sustainable agriculture**
    - **Processed manure**
    - **Business orientated research funding**
    - **Scope for pilot projects on manure, to support field demo, up-scaling technology**
    - **"Validation" of the products**
    - **EU incentives to be implemented: definition for urban target**

- **Integration of the triple-helix for any new research projects**
- **Monitoring of the implemented measures (counting of flows) - ESTAT**

T3

PT Recycling From organic waste

Reporting format interactive sessions ESPC2013

Goal: Increase the P-recycling From organic waste

1. **Bottlenecks: what constrains your (joint) goal?**

   No EUROPEAN Standards for products from organic waste

   - ~~We~~ Need for EoW-criteria for products From organic waste ; Need for an EU-Fertiliser and soil improver regulation

2. **Opportunities: on which aspects should be focussed to overcome the constraints?**

   - Better implementation of waste legislation
   - Setting recycling targets for biowaste
   - Setting reduction targets for residual waste
   - Setting separate collection targets for biowaste

3. **Actions for stakeholders within 'triple helix': what should be done by businesses, knowledge institutes, public parties and NGOs, but also by different sectors?**

   Creating public awarness on the potential OF P-Recycling from organic waste

   adapting and implementing legislation on waste and products and their use (Fertiliser Regulation)

4. **Actions on national level: what can be done at member state level?**

   implementing landfill taxes

   Implementing separate collection on biowaste

   to promote recycling on biowaste each country should choose its own mix of instruments (Examples: landFill tax, landfill ban, incineration tax, obligation of separate collection)

5. **Actions on EU level: what can be done at European level?**

   Setting EoW criteria for compost and digestate from biowaste

   Recycling / Separate collection targets for biowaste

   Reduction targets for residual waste

   EU Regulation on fertilisers and soil improvers

T3

RT Recycling from organic waste

Reporting format interactive sessions ESPC2013

Goal: Increase P-Recycling from bio-waste

Promotion of incineration of biomass in the renewable energy law

1. **Bottlenecks: what constrains your (joint) goal?**

No Drivers in legislation
- Biowaste Directive
Restrictive legislative at national level
- over supply of nutrient Phosphate in some countries
No Quality Criteria for products from organic waste
- Information lack, how to implement Recycling of organic waste

2. **Opportunities: on which aspects should be focussed to overcome the constraints?**

legislative approaches:
landfill ban / taxes
Recycling targets
Low criteria
Fertiliser Regulation
EU Biowaste Directive including bioproducts waste (Sludges)
EU Product standard setting
Resource efficiency strategy

3. **Actions for stakeholders within 'triple helix': what should be done by businesses, knowledge institutes, public parties and NGOs, but also by different sectors?**

legal regulation on recycling targets
clear waste (bio-waste) policy
Public awareness campaigns
Share of information on technologies
Networking in the recycling chain
Increasing P-availability by increasing recycling of organic waste

4. **Actions on national level: what can be done at member state level?**

Obligation for separate collection
Ban on landfilling
Recycling targets
landfill tax
Stimulate recycled Power mineral, raw P

5. **Actions on EU level: what can be done at European level?**

Setting Recycling (seperate collection targets
Fertiliser Regulation (soil improver + organic fertiliser)
End of waste for compost and digestate
EU BIOWASTE REGULATION !!!
Translate EU legislation to national level: Action, example at Europ

manure recycling – session 2 — 0486/067.336 Frederik Accor

T4

European Sustainable Phosphorus Conference 2013

Reporting format interactive sessions ESPC2013

1. **Bottlenecks: what constrains your (joint) goal?**

① transnational marketing of technologies (eg. odor emissions) is difficult.

② current EU legislation says: products ≤ manure stay manure and cannot be considered as "mineral fertilizer"

2. **Opportunities: on which aspects should be focussed to overcome the constraints?**

① develop tests that are accepted transnationally + determining models

② matching supply of nutrients & demand → optimal use of available supply

③ to increase the level of energy production (↔ every input into current techniques)

3. **Actions for stakeholders within 'triple helix': what should be done by businesses, knowledge institutes, public parties and NGOs, but also by different sectors?**

↳ to learn from the finalized Eurotiv projects on this matter

4. **Actions on national level: what can be done at member state level?**

- LCA of current technologies applied.
- lobbying to have funding possibilities in the Horizon 2020 programme

5. **Actions on EU level: what can be done at European level?**

- collaboration between member states / focus on ~~(1/2 tbc)~~ 10 techniques to develop with a product that can compete with mineral fertilizers + defending together this product
- to benchmark techniques applied in ≠ member states
- to change the nitrates directive: to modify the ~~170~~ kg N/ha norm

Session 1

Markets:
challenge = local distribution

European Sustainable Phosphorus Conference 2013

Recycling from manure

0486/067.336
Frederik Ascoe

Reporting format interactive sessions ESPC2013

1. **Bottlenecks: what constrains your (joint) goal?**
   - Policy is needed also for markets
   - variation in composition of the manure + end-products
   - there is no market pull yet for recycled products.
   - policy (national/EU) is often limiting innovation
2. **Opportunities: on which aspects should be focussed to overcome the constraints?**
   - Recycle N, P, K, & energy
   - to create market pull
   - policy recommendations (national + EU level)
   - exchange on national quality systems.
3. **Actions for stakeholders within 'triple helix': what should be done by businesses, knowledge institutes, public parties and NGOs, but also by different sectors?**
   - business: market pull / specific needs
   - end-users: define their technical requirements for the products.
4. **Actions on national level: what can be done at member state level?**
   Development of techniques, monitoring
   P-strategy on national level. Not only manure policy
   - develop P-strategy
5. **Actions on EU level: what can be done at European level?**
   Max level P-
   Standardisation
   exchange of knowledge on EU level.
   Transversal element / supply level playing field, — no differences between member states (eg. P-fertilization norms)

T5

Reporting format interactive sessions ESPC2013

1. **Bottlenecks: what constrains your (joint) goal?**

- Price: renewed P is still more expensive than rock/H_3PO_4 from Marox
- Lack of data to convince regulator that it is safe/certification
- WWTP are too small for to handle the administrative & marketing issues
- What is the best place to recover P (ashes? sludge?) & what is the best application to create a high value product

2. **Opportunities: on which aspects should be focussed to overcome the constraints?**

- Take into account safety aspects: we need to assure safe recovery
- Combined initiatives - decentralized WWT
- Demonstration projects - create value chain

3. **Actions for stakeholders within 'triple helix': what should be done by businesses, knowledge institutes, public parties and NGOs, but also by different sectors?**

- create "interface" between fertilizer & producer (WWT) market "platform"
- agreed solution/legislation to (re) organize incineration business in order to recycle P in ashes

4. **Actions on national level: what can be done at member state level?**

Motivation, stimulation, funding?

5. **Actions on EU level: what can be done at European level?**

Legislation

TS

Reporting format interactive sessions ESPC2013

1. **Bottlenecks: what constrains your (joint) goal?**

- lack of policy drive, long term commitment
- economic incentive?
- waste → product?
- "push" comes from the supply side → needs to be demand driven

2. **Opportunities: on which aspects should be focussed to overcome the constraints?**

- establish market demand.
- use recycled P as a co-product for granulation in trad. fert. prod.
  i.e.: fertilizer industry should clarify its specific demand.
- ~~a~~ a good business case is to combine activities → more integration

3. **Actions for stakeholders within 'triple helix': what should be done by businesses, knowledge institutes, public parties and NGOs, but also by different sectors?**

- fert. & bus. should clarify demand
- demonstration plants ---→ legislation; business case.
- Research: - decentralized sanitation, source separation, concentrate
  - direct recovery from wastewater, less concentrated.

4. **Actions on national level: what can be done at member state level?**

- demo-level
- convince national EU-members to speed process.

5. **Actions on EU level: what can be done at European level?**

- you want to export. + EU = net importer + you need an optimal distribution across Europe.

↳ - legislative-level

- for EU members without centralized waste system for the moment → they could be supported to follow a different development route.

Table 06/I

European Sustainable Phosphorus Conference 2013

Reporting format interactive sessions ESPC2013

1. Bottlenecks: what constrains your (joint) goal?

- recycling from sludge: concerns (public) about contaminations (organic (micro) pollutants / pathogens / metals), problems about quality characterisation
- from sludge/ash: availability of technologies, costs
- general: gap between supplier (water facilities) / consumers (agriculture)

2. Opportunities: on which aspects should be focussed to overcome the constraints?

- usage of ash, MAP ... of defined quality as raw materials in fertilizer industry
- ~~examples for promising~~ technologies (e.g. Ecophos: recycling from fly-ash)
- number / variety of sources: bone + meat ash / manure / sludge / ash
- estimation: 5'000 - 10'000 t/year could be economic to start with

3. Actions for stakeholders within 'triple helix': what should be done by businesses, knowledge institutes, public parties and NGOs, but also by different sectors?

- gap between research + practise need to put research results into pratise
- need for communication between parties

4. Actions on national level: what can be done at member state level?

- Finland: - monitoring / quality control system for sludges
  - action to become self-sufficient
  - take action for baltic sea
- UK: - focus on effluent concentration
- DE: - P Recycling Ordinance

5. Actions on EU level: what can be done at European level?

- Put P on list of strategic resource
- Harmonization of legislative requirements (fertilizer, sludge)
- requirements for source control
- EU P Platform

Christian Kabbe

Reporting format interactive sessions ESPC2013

1. **Bottlenecks: what constrains your (joint) goal?**

- technological maturity (perception is that the technologies are still between emerging and full-scale technologies)
- costs (now it is more expensive to recycle than to landfill)
- precipitation technology: chemical precipitation => make recycling more complicated
- legislation / quantity
- stability is difficult to guarantee
- water sector is risk averse

2. **Opportunities: on which aspects should be focussed to overcome the constraints?**

- contact between fertilising industry + wwtps => communication of requirements
- convincing of agricultural sector about quality
- looking at whole wwtp-system (recycling costs)
- alternative raw material for P-acid production
- ~~maybe export~~ - if Cd standard is lowered to 20 mg/kg, than primary P has to be treated

3. **Actions for stakeholders within 'triple helix': what should be done by businesses, knowledge institutes, public parties and NGOs, but also by different sectors?**

- Communication has to be improved
- dialogue between producers and demand / market
- quality criteria, standardisation
- logistics, distribution (from production to demand site)
- ~~full scale~~ application by farmers (e.g. 60 t were sold to farmers near Berlin)
- cooperation ~~waste water company~~ + fertiliser companies (since wwtp companies are not specialised on this marketing)

4. **Actions on national level: what can be done at member state level?**

- definition of requirements / quality standards for secondary P-fertilizer
- ↑ standardisation national
- ~~have a kind of~~ have in beginning the conventional system still available to reduce the risk (you can still "go back") (because of risk-adversity)

5. **Actions on EU level: what can be done at European level?**

- platform: improve coordination
- Standardisation
- European P-balance (distribute P to regions with P-demand)
- innovation risk fund

Reporting format interactive sessions ESPC2013

1. **Bottlenecks: what constrains your (joint) goal?**

Lack of integration between disciplines and sectors, lack of studies on the macro scale.
Lack of research on different scales, context dependencies. Lack of common framework and indicators to enable comparability of different studies and scales.
General data Availability and Uncertainty.
Limitation of current methods for economic and environmental assessment (e.g. LCA is context dependent)
future scenarios - integration
Unforeseen emerging problems or environmental impacts might occur
Time-dependency: lack of knowledge on the dynamics of fertilizer capacity of secondary phosphorus (availability/capacity)
Constraints on the technological sides, such as efficiency in P recovery, efficiency, availability in soils.

2. **Opportunities: on which aspects should be focussed to overcome the constraints?**

Research opportunities to address indicators and decision support tools (LCAs , MFAs, virtual P, P footprint etc).
Integration across scale (knowledge exchange from the local to the regional, EU & global level)
On the EU level, we need more integration on the macro level (i.e. cross-regional, multi sectoral perspectives)
Common research framework including dynamic modelling for scenario analysis.

3. **Actions for stakeholders within 'triple helix': what should be done by businesses, knowledge institutes, public parties and NGOs, but also by different sectors?**

Use the ESPplatform as a way to put the sustainable P research agenda forward and to integrate stakeholders in the research process.
Businesses: share research demand and questions
Knowledge institutes: sharp and SMART goals which are of interest for businesses
Policy: regulation, clear goal, investing in longterm research

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4. Actions on national level: what can be done at member state level?

National MFA studies, networks with national stakeholders of the public & private sector.
Lobby to the Horizon 2020 process.

5. Actions on EU level: what can be done at European level?

Sustainable funding for integrated P research in particular at the macro scale.
Set up policy and environmental goals (green paper) to inform research.

meer info @
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table (9)

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1. **Bottlenecks: what constrains your (joint) goal?**

bottlenecks
- fragmented market | no stable return
- each approach specific challenges (struvite, ash, ...
- E-Europe: demand
- W-Europe: recovery
- not enough volumes
- regulations
- fertilisers / product ⇒ REACH
- quality issues
- different legislation per country ⇒ - constant quality - different SW bans = different problems - controlled slow release
- not political issue yet

is there market yet?
yes and no

need for short term action?
1) scarcity?
2) geopolitical / security of supply
3) environmental
4) technical
5) costs

2. **Opportunities: on which aspects should be focussed to overcome the constraints?**

Prevention! efficient use of nutrients

① transparant legislation
- organic fertiliser
- mineral fertiliser

/ EU vs national ⇒ 1 legislation

② reduce costs @ waste water treatment
- higher performance waste water installation
- deliver product for the market

3. **Actions for stakeholders within 'triple helix': what should be done by businesses, knowledge institutes, public parties and NGOs, but also by different sectors?**

③ stop dilution of P ⇒ consider P as a resource: which best available technology per waste stream?

① Legislation
- national
- European

② quality
- to market
- environmental
- product issue
- meet customers demands

③ quantity
- low quantity

⇓

cost ↑ of optimizing transport cost ↑

4. **Actions on national level: what can be done at member state level?**

* bring some governments together to work out an EU proposal

5. **Actions on EU level: what can be done at European level?**

* demonstrator - dissemination projects
* develop risk assessment of the input whether from imported phosphate rock or from secundary resource
* stimulate cooperation / partnerships = economy of scale
* high capital investments short ~~term subsidies~~

more info : jorn.verbeeck@ovam.be table (9)

European Sustainable Phosphorus Conference 2013

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1. **Bottlenecks: what constrains your (joint) goal?**

(A) legislation : national vs EU, mineral vs organic fertilisers
(B) quality : impurities = the higher the application the higher quality
(C) demand / offer - match : which specifications need to be taken expend into account
(D) getting prices right = primary P too cheap
(E) consumer awareness ⇔ producers' responsibility

2. **Opportunities: on which aspects should be focussed to overcome the constraints?**

(F) BAT ? difficulty to do LT-investments when BAT is not yet clear
(G) P-recycling get profitable without government subsidies ?

3. **Actions for stakeholders within 'triple helix': what should be done by businesses, knowledge institutes, public parties and NGOs, but also by different sectors?**

(A) producer = when do you control your quality ?
input / output / compare impact < mining recycling

(B) technology = composting
incineration
algae
...

→ enough knowledge for investors to make a choice where to invest best for the long term

(C) more matchmaking between
4. **Actions on national level: what can be done at member state level?**

sellers
universities
buyers

⇔ how to bridge the 'valley of death' move from value → business

more R&D
demonstrators
pilots
dissemination needed

5. **Actions on EU level: what can be done at European level?**

(A) a coherent EU framework to work with the same criteria within the different MS.
- harmonising legislation
- EoWs (manure, compost, ...)
- guidelines o/l usage

(B) better networking between MS

(C) create more awareness that via recycling waste can be turned into a resource.
+ what is the future challenge we need to cope with ?

topic point 10
SCHOLZ
Rauch 1

Reporting format interactive sessions ESPC2013

sustainable

Consensus: Europe should take the lead in technology development, be a forerunner

1. **Bottlenecks: what constrains your (joint) goal?**

Awareness is given
From technology innovation to socially accepted technology implementation

2. **Opportunities: on which aspects should be focussed to overcome the constraints?**

We need something such as a transdisciplinary study group including key stakeholders

3. **Actions for stakeholders within 'triple helix': what should be done by businesses, knowledge institutes, public parties and NGOs, but also by different sectors?**

Innovation platform - European

4. **Actions on national level: what can be done at member state level?**

Innovation platforms

5. **Actions on EU level: what can be done at European level?**

topreprint-10
SCHOLZ
Round2

Reporting format interactive sessions ESPC2013

1. **Bottlenecks: what constrains your (joint) goal?**

- Transparency on demand and supply is a must.
- If we look at the future of P demand from agriculture, the way how the P-residues in soil are accessed differ between countries. This has to be harmonized.
- Third, the quality of the pollutents must / should

2. **Opportunities: on which aspects should be focussed to overcome the constraints?**

3. **Actions for stakeholders within 'triple helix': what should be done by businesses, knowledge institutes, public parties and NGOs, but also by different sectors?**

There has been consensus that companies must provide information about the pollutents included in fertilizer, in a uniform way allover the world.

There has been no consensus about wheller companies should be oblidged to provide access to the reserves they have.

4. **Actions on national level: what can be done at member state level?**

5. **Actions on EU level: what can be done at European level?**

Table 11 : Raw Phosphorus

European Sustainable Phosphorus Conference 2013

Reporting format interactive sessions ESPC2013

1. Bottlenecks: what constrains your (joint) goal?

* Regimes change & may be unreliable
* Lack of data on reserves etc.
* Too strict (environmental) legislation
* Demand competition from emerging economies

2. Opportunities: on which aspects should be focussed to overcome the constraints?

* Diversification of sources and suppliers of phosphate & fertilizers
* Decadmiation technology & other technologies aimed at purification of phosphate rock

3. Actions for stakeholders within 'triple helix': what should be done by businesses, knowledge institutes, public parties and NGOs, but also by different sectors?

* Research : develop reliable data on reserves etc.; technologies ; trade-offs between environment / supply security ; information sharing ; decadmiation
* Business : develop profitable business cases

4. Actions on national level: what can be done at member state level?

* Increasing cooperation among EU MS : overcome national interest → focus on common goal
* Support development of technologies through subsidies

5. Actions on EU level: what can be done at European level?

* Diversification
* Strategic partnerships
* Investigate which European firms have stakes in foreign mines

TABLE 12
LCA

Reporting format interactive sessions ESPC2013

1. **Bottlenecks: what constrains your (joint) goal?**
   - OUTDATED DATA ON MINERAL FERTILIZER PRODUCTION
   - DIFFERENT SYSTEM BOUNDARIES
   - POSITIVE SIDE-EFFECTS ARE NOT ADEQUATELY ACCOUNTED (OTHER NUTRIENT, ORGANIC CARBON, ...)
2. **Opportunities: on which aspects should be focussed to overcome the constraints?**
   - USE EXISTING LINKS TO THE FERTILIZER INDUSTRY
   - DEFINE DIFFERENT LEVELS OF LCA: (1) FERTILIZER P (2) PURE P
   - EXTEND IMPACT ASSESSMENT TO ACCOUNT FOR HUMUS, NPK, C-SEQUESTRATION
3. **Actions for stakeholders within 'triple helix': what should be done by businesses, knowledge institutes, public parties and NGOs, but also by different sectors?**
   - CONTRIBUTE TO LCA STUDIES WITH PRIMARY DATA
   - SUPPORT BUSINESSES TO JOIN AND CONTRIBUTE
4. **Actions on national level: what can be done at member state level?**
5. **Actions on EU level: what can be done at European level?**
   - EXCHANGE ON LCA STUDIES WITH TRANSPARENT METHODOLOGY
   - PROMOTE LCA STANDARDS + COMMON METHODS IN EU

TABLE 12

LCA

Reporting format interactive sessions ESPC2013

1. **Bottlenecks: what constrains your (joint) goal?**
   - WHO DEFINES + VARIABLES COMMON LCA METHOD
   - BIOAVAILABILITY OF P PRODUCTS? TIME-FRAME?
   - SENSITIVITY + UNCERTAINTY IS NOT COMMUNICATED
   - OUTDATED ENVIRONMENTAL DATA FOR P MINING
2. **Opportunities: on which aspects should be focussed to overcome the constraints?**
   - INVOLVE MINING INDUSTRY
   - BUILD ON JRC GUIDELINES AND WBCSD DRAFT FOR CHEMICAL INDUSTRY
   - REPORT ON SENSITIVITY + UNCERTAINTY
   - COMPLEMENT WITH MFA FOR STRATEGIC
3. **Actions for stakeholders within 'triple helix': what should be done by businesses, knowledge institutes, public parties and NGOs, but also by different sectors?**
   - INVOLVE MINING INDUSTRY
4. **Actions on national level: what can be done at member state level?**
5. **Actions on EU level: what can be done at European level?**

→ ESTABLISH LCA TASK GROUP IN EU P-PLATFORM!

Workshop 13 Abankers view

European Sustainable Phosphorus Conference 2013

Reporting format interactive sessions ESPC2013

1. **Bottlenecks: what constrains your (joint) goal?**

dispersed supply
projects are too small to be economically viable
lack of a market for recycled P above P-rock prices

2. **Opportunities: on which aspects should be focussed to overcome the constraints?**

Cooperation between different waste stream companies to optimise P-recovery processes and make them bigger, large scale

3. **Actions for stakeholders within 'triple helix': what should be done by businesses, knowledge institutes, public parties and NGOs, but also by different sectors?**

Create a sense of urgency
- awareness, transparancy, information

4. **Actions on national level: what can be done at member state level?**

better coordinate existing demonstration plant
share expertise info etc.

5. **Actions on EU level: what can be done at European level?**

from a national approach to a European approach is needed, harmonization of legislation
focus on fewer solutions, today subsidies are dispersed too much over too many ideas

14

Reporting format interactive sessions ESPC2013

1. Bottlenecks: what constrains your (joint) goal?

* Lack of leadership in trying to monitor how stable supply is
* Little discussion on relationship between food & fertilizer use
* Market is not functioning properly

2. Opportunities: on which aspects should be focussed to overcome the constraints?

* Strengthen cooperation with supplier countries on the basis of win-win

3. Actions for stakeholders within 'triple helix': what should be done by businesses, knowledge institutes, public parties and NGOs, but also by different sectors?

Exchange of knowledge
- developing countries: how to use P fertilizer efficiently / soil / fertilizer management / avoid erosion / food security / global chains / environmental impact of secondary phosphate

4. Actions on national level: what can be done at member state level?

* Create awareness
* Legislation
* Dialogue on options

5. Actions on EU level: what can be done at European level?

* Diversification of supply
* Change biofuel / bioenergy policies accordingly
* Push for global tax
* Transform behavior of consumer
* Transform CAP → use recycled phosphate

14

European Sustainable Phosphorus Conference 2013

Reporting format interactive sessions ESPC2013

Goal:

Sustainable and efficient nutrient management by the use of organic and human waste for alternative fertilizer in agricultural production in developing countries.

This in order to:

1. Offer solutions for the enormous sanitation, waste and food-security problems urban poor in developing countries are facing.

2. Start developing the enormous business opportunities that are represented by these countries for European and Dutch businesses with innovative solutions in water, sanitation, agro-food and waste.

3. Secure the long-term competitive position of the European Agro-Food Industry, which is threatened by phosphorus scarcity.

1. Bottlenecks: what constrains your (joint) goal?

a. There are no 'plug and play' solutions for the re use of human waste yet.
b. It is difficult to compete with chemical fertilizer, which is still subsidized in many countries.
c. It will require adaptation of national legislative frameworks, such as the prohibition of reusing human waste in agriculture.
d. Municipal governments in developing countries do not have access to the required expertise and products in terms of technological, financial, logistical and human resources to cope with this situation.
e. Expectation of the public in developing countries is focused an easy life-style (people want flush toilets)
f. Our current assumptions of developing countries prevent us from seeing the opportunities

2. Opportunities: on which aspects should be focussed to overcome the constraints?

a. Old practices can be combined with new scientific knowledge and innovative technologies. Before the introduction of fossil fertilizers, the use of animal and human excreta as fertilizers was a pure necessity. Today, we have in-depth knowledge about the cause of pathogenic infections, which we have to match with a better understanding about the requirements of nowadays local agricultural production.
b. Not only chemical fertilizer but also certification for sustainable food production is also subsidized and makes it able to provide a competing product. Certification can also be the channel through which alternative sustainable forms of food production can be up scaled.
c. Local legislation and environmental conditions in developing countries offer unique pilot opportunities for European technologies.
d. The decentralized infrastructure in developing countries offers unique technological opportunities. Often the sanitation systems do not involve sewers, which makes it possible to re-use nutrients very efficient and to produce a product with an extremely high nutrient value. In combination with a high population density in urbanized areas, this offers enormous potential for up scaling.
e. Food security is an urgent issue in developing countries. They have to explore all options to meet the growing demand
f. learning from mistakes in Europe: mix waste systems (landfills, sewer networks).

3. Actions for stakeholders within 'triple helix': what should be done by businesses, knowledge institutes, public parties and NGOs, but also by different sectors?

- Agri-Food sector; invest in the development of alternative fertilizers, to secure your long-term competitive position.
- Private businesses offering solutions; invest in translating your innovative technologies for implementation in the developing world and expand your market.
- NGO's: campaign for transparency of proliferation of essential research results and data, keep global interest on the political agenda, provide expertise and local know how to businesses to easy.
- Knowledge and research institutes; set up innovative research
    - on safe and sustainable use of human waste and;
    - nutrient requirements of food crops under different geological and climatical situations (incl. seasonal variations)
- Public parties; change legislations and support investments to secure the European your long-term competitive position and solve the waste and food-security problems urban poor in developing countries are facing.
- All; make use of the best lessons learned. Engage all stakeholders involved in the chain from sanitation facility to food production (production, capture, collection & transport, treatment and re use).
- All; set up businesses, no projects. A sustainable business requires a long term

strategy for all stakeholders (Financial, Institutional, Environmental, Technical and Social).

4. Actions on national level: what can be done at member state level?

Target new policies and financial support to support businesses in making sustainable investments in human waste reuse for alternative fertilizers.

5. Actions on EU level: what can be done at European level?

- In order to support global use of secondary phosphorus, the EU may to legally allow it in Europe, and thereby
- Allowing import of agricultural produce grown with secondary P reuse from developing countries.
- Introducing a sustainable food production certification (including requirement: renewable fertilizer policy)
- Start the dialogue with local governments to reduce or abandon subsidy of chemical fertilizer, specially for non-essential agricultural crops (such as cacao and other export crops) and allow the use human waste in agriculture
- Provide research and development funds for pilot and demonstration projects in developing countries
- Closing the Loop is not about Europe, but about the global loops
- Introducing P-foodprint reporting per country and sector

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Panel 15: Lessons from the Neman River Basin: a Baltic Sea case study

Kristina Narvidiene, Lithuania
Sofie Vander Plaetse, Belgium
Aija Jantunen, Finland
Aliaksandr, Belarus
Zanda Kruklite, Latvia
Rasmus Larsen, Sweden

1. **Bottlenecks: what constrains your (joint) goal?**

- Foreign (often Danish) joint ventures in Neman River Basin, not using good env techs, but water flush techs and manure lagoons. People complaining and meat exported, not for own consumption. Expect to see expansion of industry – open question how to address env issues. Environmental permits in DK an Belarus very different – driving export of env pollution. Manure lagoons are allowed in some countries (Belarus, Lavia etc)
- Countries with low animal density depends on import of P – situation very different from NL, Be. Must look for ways to transport P + produce closer to where food is consumed. Aim to reduce transport because of costs.
- Much attention to manure separation and biogas etc, but in some countries (eg Latvia) there is not need for this; enough land can use manure around farms. Latvia had crazy support system as inspired by Germany (subsidies electricy price.
- Biogas investors more interested in maize than manure, owing to subsidy. Need right level of subsidy. Then could be spread locally, but when maize silage brought from long. Subsidies motivate 'economy of scale' – e.g. in biogas for energy.
- Then it does not fit into an agricultural-food system. Joint ventures don't use proper techs eg for spreading of manure, or taking samples in soil to know where spread, etc

2. **Opportunities: on which aspects should be focussed to overcome the constraints?**

3. **Actions for stakeholders within 'triple helix': what should be done by businesses, knowledge institutes, public parties and NGOs, but also by different sectors?**

4. **Actions on national level: what can be done at member state level?**

- Adjust subsidies to motivate manure processing at small scale so that business is not going down the wrong road with too large scale that
- Aim at technologies that serve as 'local fertiliser producers' rather than
- Strengthening of environmental regulations in 'host' countries

5. **Actions on EU level: what can be done at European level?**

- If EU directives ("end of waste") re-categorise manure not as waste but as resource then can be allowed to transport across borders to deficient countries

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1. **Bottlenecks: what constrains your (joint) goal?**
   - P is often fixed in biomass or precipitates and not recoverable.
   - Sludge as fertilizer ~~for~~ is a problem because of micropollutants, metals, availability.
   - high value products are required
   - regulation stimulate removal not recovery
2. **Opportunities: on which aspects should be focussed to overcome the constraints?**
   - combine the value of P with other values (P, organics, N)
   - new technology ⇒ new business
   - solve other problems at the same time (for instance operational problems)
3. **Actions for stakeholders within 'triple helix': what should be done by businesses, knowledge institutes, public parties and NGOs, but also by different sectors?**
   - initiate research on
     - improving P release from waste/biomass/ FePO4
     - new P product
     - P raw materials compatible to existing industry
     - design for recover
   - develop "new school" businesses
   - promote game changing research.
4. **Actions on national level: what can be done at member state level?**
   - create awareness about P recovery
   - make venture capital available
   - ~~develop new school~~
5. **Actions on EU level: what can be done at European level?**
   - awareness for P recovery.
   - make venture capital available for new technology.
   - create technology playgrounds for demonstration of new technology.

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16 Technology development

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1. Bottlenecks: what constrains your (joint) goal?
   - limited applicability of recovery technologies.
   - quality of products.
   - we are optimizing existing system → need for disruptive technology.
   - regulations.
2. Opportunities: on which aspects should be focussed to overcome the constraints?
   - recovery of valuable resource.
   - new technology → new business
   - other sources than waste water → industry manure.
   - legislation can create opportunities.
3. Actions for stakeholders within 'triple helix': what should be done by businesses, knowledge institutes, public parties and NGOs, but also by different sectors?
4. Actions on national level: what can be done at member state level?
5. Actions on EU level: what can be done at European level?

⇒
- realize showcases and demo's.
- need for interaction between research & stakeholders
- create a driving force:
  - through awareness
  - legislation.

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1. Bottlenecks: what constrains your (joint) goal?

Security of legal framework
Return on investments
No overlapping of stakeholders' interests
Shared risks

WWTP
Fertilizer

2. Opportunities: on which aspects should be focussed to overcome the constraints?

3. Actions for stakeholders within 'triple helix': what should be done by businesses, knowledge institutes, public parties and NGOs, but also by different sectors?

Turn policy focus away from price only
Bring stakeholders from politics production and WWTP together
Raise awareness for EU supply security

2 independence

4. Actions on national level: what can be done at member state level?

1)
2) as below

Legislation is a must

5. Actions on EU level: what can be done at European level?

1) Mandatory admixture of recycled P
2) Mandatory recycling if feedstock is rich in P

T10

Dr. OHTAKE introduced JAPAN's experience and good practice in P recovery and recycling.

↓

We discussed on the similarity and difference in approaches between EU and JAPAN.

↓

Important points to learn from JAPAN's exprience are

1). It is not necessary to compare the price of recovered P with that of imported rock P. This is because WWTPs and companies can reduce waste disposal costs by recycling.

2) SMEs in the fertilyzer industry are important end-users of recovered P on a local production for local consumption basis.

3) Fertilizer control laws need to be tailored to P-recycling society. This can be solved internationally (through international collaborations). Both EU and JAPAN have similar problems on Fertilizer control law that is out of date

4) "Take action without delay" and "Try everything possible" are important approaches, because it could be slow work to implement P recycling in our society.

5) Industry is a key player to move toward P-recycling society.

6) The quality of recovered P from industrial wastewater is often high and suited to the use for fertilisers. This is particularly true in the food and fermentation industries.

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2nd Roundtable discussion 19

Phosphorus efficiency at farm gate : joint managment of livestock and crops sector

1 bottleneck : what constrains your goal ?

- Concentration of livestock sector has generated complex situation to manage the "P" surplus and in Baltic area there is region with lower level of P in the soil.
- Proposal as more balance livestock sector will not solve the PB as the food demand is increasing drastically and is outside the management at farm gate;
- Crops farmers are aware of the value of "P" in fertilization but are constrains by equipment cost to use more fresh manure;
- Content of "N" in fresh manure limit also the land available to spray the fresh manure of the field
- The perception of manure by the society is very negative and may be translated in prohibition in the farming practices for commercial purposes (marketing practices "vegetable produce without manure/slush")

2 Opportunities on which aspects should be focused to overcome the constrains

- Technics to dry fresh manure are developing and make much less costly the transport, increase the harmonization of the organic origin "P" product which can meet the expectative of the crops producers;
- Improve the concept of efficiency use of "P" : cost production, resource efficiency, Energy efficiency.... Which give much more marge of maneuver to develop local solution

3 – Actions for stakeholders within the 'triple helix':

- Need more study on business development to build facilities which dry manure;
- Development of storage capacity and standardization for equipement to improve the way to spray dry organic "P";
- More positive communication on manure as a valuable product;
- Develop better the demand from the crops farmers in order to incentive the demande

4 – actions at national level

- Invest in infrastructure, storage at farm gate;μ
- Not over regulate on "N" Directive of water framework directive which limit local-regional solution

4 – Actions at EU level

- 2nd pilar may incentive to put in direct contact livestock farmer and crops producers to manage the manure;
- Fertilizer regulation should facilitate the use of recycling "P" fertilizer,

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1st Roundtable discussion 19

Phosphorus efficiency at farm gate : joint managment of livestock and crops sector

1 bottleneck : what constrains your goal ?

- Fresh manure management is not easy due to climate constrains (short windows to spray on the field) which generate uncertainty on your real need,
- The low level of "P" content in comparison to mineral fertilizer which mean you sprau more water than nutrient content,
- Due to large part of water the cost of transport between area of surplus and lake of "P" is not competitive and not necessarily environmental friendly,
- Fresh manure contains not only P but also N and then limit your potential of spray due to the "N" directive

2 Opportunities on which aspects should be focused to overcome the constrains

- Technics to dry fresh manure are developing and make much less costly the transport, increase the harmonization of the organic origin "P" product;
- Cereals areas are more and more specialized and need "P" fertilizer to keep good soil fertility. Market driver would develop opportunities for organic "P" treated;
- Quality of mineral "P" is going down (issue of contaminants like heavy metal, uranium…) will give an opportunity to develop local sources;

3 – Actions for stakeholders within the 'triple helix':

- Need more study on business development to build facilities which dry manure;
- Development of storage capacity and standardization for equipement to improve the way to spray dry organic "P";
- Develop cooperation between farmers (livestock producers to build these facilities) and crop farmers to use costly equipments;
- Need a clear classification that organic "P" and manure are not waste but a good quality product in the farming process;

4 – actions at national level

- Develop synergie on commodities transports because region in surplus of "P" are importing feed from regions where "P" fertilizer is lacking. It would decrease the cost of transport;
- National authorities have also to balance the fact that farmers are providing a public services to the society and develop solution to internalize the cost ;

4 – Actions at EU level

- Future fertilizer regulation should facilitate the use of organic "P" and clearly distinguish from the waste directive even if come from digestate;
- Develop a comprehensive approach on the use of organic "P" in comparison the mineral "P"
- No directive on organic "P" which will stop potential market

T20

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1. Bottlenecks: what constrains your (joint) goal?

- In some countries sludge disposal to land is not possible.
- Circumstances need to be right for other countries to adopt similar approach to Sweden.
- Pressure may not be there.
- Some groups may not support sludge to land.

2. Opportunities: on which aspects should be focussed to overcome the constraints?

- need to raise awareness of the issue
- get relevant groups together

3. Actions for stakeholders within 'triple helix': what should be done by businesses, knowledge institutes, public parties and NGOs, but also by different sectors?

Transparency of information
Raise awareness of environmental impact.
- Reliable registration process which is too expensive

4. Actions on national level: what can be done at member state level?

- Need to publicise the issue & change people's behaviour

5. Actions on EU level: what can be done at European level?

- More EU level source control legislation to prevent substances used in products & by households.

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1. **Bottlenecks: what constrains your (joint) goal?**

- Plant availability of P
- Contaminants
- Economics
- Regulations
- Public acceptance
- infrastructure

→ different per each country.

2. **Opportunities: on which aspects should be focussed to overcome the constraints?**

- Sludge with good quality (by certification system (like Revaq) has a future (from WWTPs with a

→ it will clear the whole society, all stakeholders involved

3. **Actions for stakeholders within 'triple helix': what should be done by businesses, knowledge institutes, public parties and NGOs, but also by different sectors?**

- Awareness raising by campaigns to restrict certain pollutants in the wastewaters (eg Cadmium in artist paints)
- Sectoral responsibility raising
- Making reports available of the products and studies

4. **Actions on national level: what can be done at member state level?**

- Incentives or taxes on the discharge of certain chemicals

5. **Actions on EU level: what can be done at European level?**

- Set up a certification system to obtain good sludges (cf. Revaq in Sweden)
- Limit values on EU-level
- Restriction of certain products; like REACH in a better way
- Trans. Transparency on data of P-resources on a global level