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Agenda Workshop ARREAU

- Welcome (5 min.)
- Introduction to ARREAU by Kees Roest (15 min.)
- Circular Economy in the Nordics by Staffan Filipsson (15 min.)
- Cellulose recovery and recycling by Coos Wessels (15 min.)
- Discuss value chain of recovered resources (30 min.)
- Concluding remarks and AOB
EIP Water

Boosting opportunities
Innovating water

Accelerating Resource Recovery from the water cycle

Kees Roest, Christian Kabbe, Coos Wessels, Olaf van der Kolk, Staffan Filipsson, Hans Geerse and Theo van den Hoven

(KWR Watercycle Research Institute)
European Innovation Partnership on Water
EC instrument to boost innovation

• Launched in May 2012 to
  • Facilitate, support and speed up development and application/deployment of innovative solutions to water challenges
  • Create market opportunities for innovations

• High level governance and visibility

• Strategic Implementation Plan
EIP-Water

Cross-cutting issues
- Water governance
- Decision support systems and monitoring
- Financing for innovation

- Water-reuse and recycling
- Water and waste water treatment, including recovery of resources
- Water-energy nexus
- Flood and drought risk management
- Ecosystem services

Smart technology

Vision and objectives
Start Action Group April 2014

Members > 35

Objectives:

- Review current European initiatives and best practices
- Identify success factors and barriers for profitable value chains
- Support initiatives on resource recovery and upcycling (VALUE CHAINS)
Main deliverables

• Review of best practices on recovery of phosphorus and cellulose from wastewater and residuals from drinking water (www.eip-water.eu/arreau).
• A review of barriers and bottlenecks for the valorization of resources from the water cycle.
• Several workshops (e.g. at International Water Week Amsterdam and Struvite Recovery & Recycling Learning Alliance). WaterLink: 26 January 2017 in Leeuwarden (NL)
• Start discussion with EIB on supportive financial instruments.
European best practices on resource recovery from the water cycle

ARREAU review

http://www.eip-water.eu/ARREAU

Updates welcome
Current focus areas

EIP-Water

ARREAU Steering Group

Cross-cutting issues

Working Groups

- Drinking water resources
- Phosphorus from wastewater
- Cellulose from wastewater
- Other resources
Types of drinking water residuals

**Processing steps**

**Drinking water production**

- Softening
- De-ironing / removal manganese
- Coalulation (removal of very fines)
- De-coloring (removal of humics)
- Activated coal filtration

**Main residuals**

- Softening pellets
- Lime sludge
- Lime-Iron sludge
- High grade iron sludge
- Low-grade Al-/ or Fe-sludge
- Brine
- Activated coal sludge
Teaming up benefits ....
Recovery and upcycling of resources from water can be profitable

Shared Service Center Dutch Waterworks

- Calcium for glass and carpet industry
- Iron for bricks and S-control in biogas
- Struvite for fertilizer industry

IWA Award
September 2015
Recovery & upcycling of phosphorus

Phosphorus for fertilizer and basic chemicals market

www.p-rex.eu
Recovery and upcycling of cellulose
Recovery and upcycling of phosphorus and cellulose from wastewater

• Many local project initiatives
• Several positive business cases
  • Integral value chain assessment
• Partners: water utilities, tech providers, fertilizer companies, chemical industry, (organic) farmers
• Uncertainty about legislation
• Financial risks a key hurdle
  • European Investment Bank opportunity
Cross-cutting issues

- Need for policy support
  - Initiatives on Member State level (e.g. Switzerland)
  - EU wide policy development is needed.
- Governance *(building the value chain, defining responsibilities and benefits)*
- End user acceptance
- Finance

*Large scale demonstrations needed*
Thank you
www.eip-water.eu/arreau
Kees.Roest@kwrwater.nl
Interactive Discussion

Discuss value chain of recovered resources
How does the business case of the value chain look like?
• TASK: Define the perfect value chain (e.g. cellulose)
• Where is the ‘value’ in the value chain?
• What are the different interests of the different parties?
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• How should the stakeholders cooperate?
• Cost structure/Revenue stream
Thank you

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