The Swedish strategy for recycling of wastewater resources and EU's waste and recycling hierarchy

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Swedish Water&Wastewater Association

• Sweden should have fresh drinking water, clean lakes and seas and access to long-term sustainable water services.





Inflow of non-wanted pollutants to the urban water and nutrient cycles



Sludge use in Sweden 2000-2016





- Från Revaqverk som används inom jordbruk
- Jordbruksanvändning (totalt)
- Från Revaqverk (godkänt slam totalt)
- Total slamproduktion i Sverige

65-70% of P from WWTP is not circulated today – not sustainable. The Federation of Swedish Farmers – has set a goal on 80% P-circulation.

Purpose of the Swedish network for the reuse of wastewater resources



- Starting from local conditions, and as sustainable recycling as possible and based on the EU waste and recycling hierarchy
- For sludge that can not be reused on arable land due to lack of suitable farmland in reasonable distance / low quality of the sludge, we want to encourage the:

Development, testing and full-scale operation in Sweden of different solutions where phosphorus and preferably other nutrients, biochar and other raw materials can be efficiently and sustainably recycled from sewage and returned to arable land.

- In parallel, **Revaq's** work will continue
- We want to gather all those who want to contribute to the reuse of resources in urban wastewater.

Nutrients - ETIN (Everything That Is Needed)



B, Ca, Cl, Co, Cr, Cu, F, Fe, H, I, K, Mg, Mn, Mo, N, Ni, Na, O, P, S, Si, Se och Zn



Opportunity to store coal/biochar in the soil? Approximately 10-20,000 tonnes of coal per year



Svenskt Vatten



The EU hierarchy of waste and recycling management



Starting point in EU recycling/waste hierarchy:

• Prio 1 -Recycling of organic matter and nutrients on farmland through Revaq

When that is not possible, no suitable farmland at reasonable distances or that the sludge does not meet **Revaq's** requirements:

- Prio 2 At least phosphorus is recycled
- Prio 3 The sludge is used for landscaping
- Prio 4 Incineration only (some) energy recovered
- Disposal (not allowed in Sweden)

Control at source work is the basis for the cycle work (different levels)



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REVAQ Certification system - Aims



- be a driving force to further improvement of the incoming wastewater control at source / the "upstream work".
- an open and transparent information about how sludge is being produced and it's composition.
- to secure that the sludge production is done in a responsible way and the quality of sludge fulfil the requirements.



Focus areas in REVAQ



- Long term goal:
 - Incoming waste water should have a level of metal and organic compounds which does not exceed that from water closets.
- Upstream local control at source
 - Reduction of Cadmium
 - 60 metals and elements mapping, monitoring => prio elements to be reduced
 - Organic substances (PRIO-guide phase-out substances, ca 2500 + SIN-list), mapping, reduction via control at source co-operation with connected industries.



Focus areas in REVAQ cont.





- Traceability in GIS-maps
- Salmonella-free
- Third party audit

Almost 5 million persons (50% of Swedes) connected to a Revaq wastewater treatment plant

Control at source Strategies for Revaq and Strategies for Revaq and Strategies Strategies for Revaq and Strategies Strategies for Revaq and Strate

 Local – WWTP working together with local stakeholders, the municipality, connected industries and services

 National – Swedish Water&Wastewater Association working in contact with national stakeholders, authorities and the Government

• EU-wide – Swedish Water working together with EurEau (the Association for the European Water Companies) and the EU institutions

Conclusions Swedish Strategy using the EU recycling/waste hierarchy:



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PRODUCT (NON-WASTE) PREVENTION WASTE PREPARING FOR RE-USE RECYCLING RECOVERY DISPOSAL

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