



WATER SMART INDUSTRIAL SYMBIOSIS

# Online seminar Nutrient recovery

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## Ultimate (June 2020 – May 2024)

# Industry water-utility symbiosis for a smarter water society

- Promotion, establishment and extension of **Water Smart Industrial Symbioses**
- Development and demonstration of **innovative technologies** for symbioses
- **Assessment** of the technologies and development of **digital «support tools»**
- Development of **new business models** towards marketability

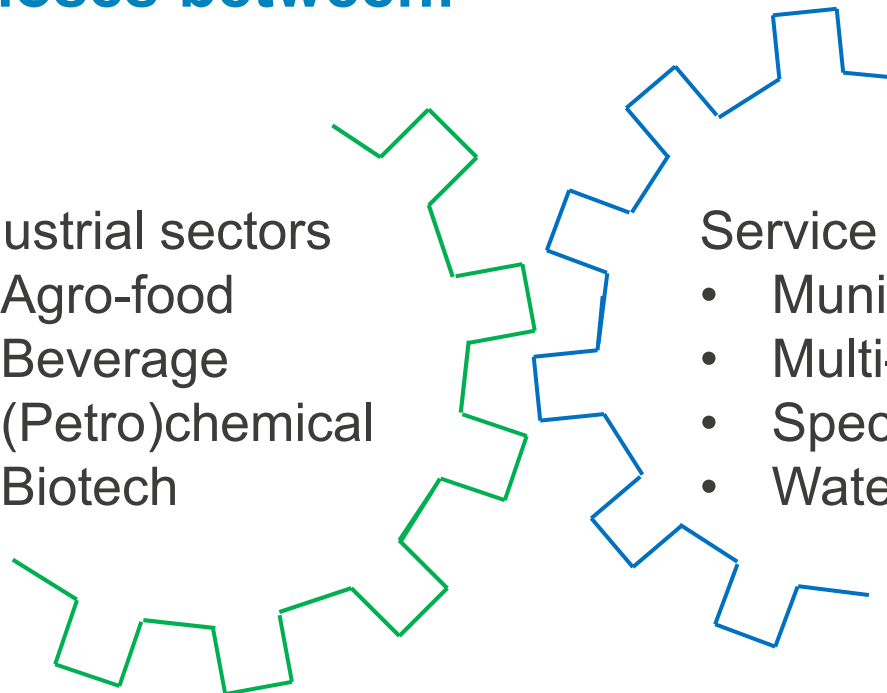
## 9 Symbioses between:

### Industrial sectors

- Agro-food
- Beverage
- (Petro)chemical
- Biotech

### Service providers

- Municipal utility
- Multi-industry utility
- Specialized SME
- Water services provider





Coordinator: **KWR**

9 Case Studies

27 Partners

37 Technologies



The project leading to this application has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869318



# 3 Cross-cutting Technology Groups: 9 Topics



UNIVERSITÀ  
POLITECNICA  
DELLE MARCHE



F. Fatone



C. Bruni



S. Radini

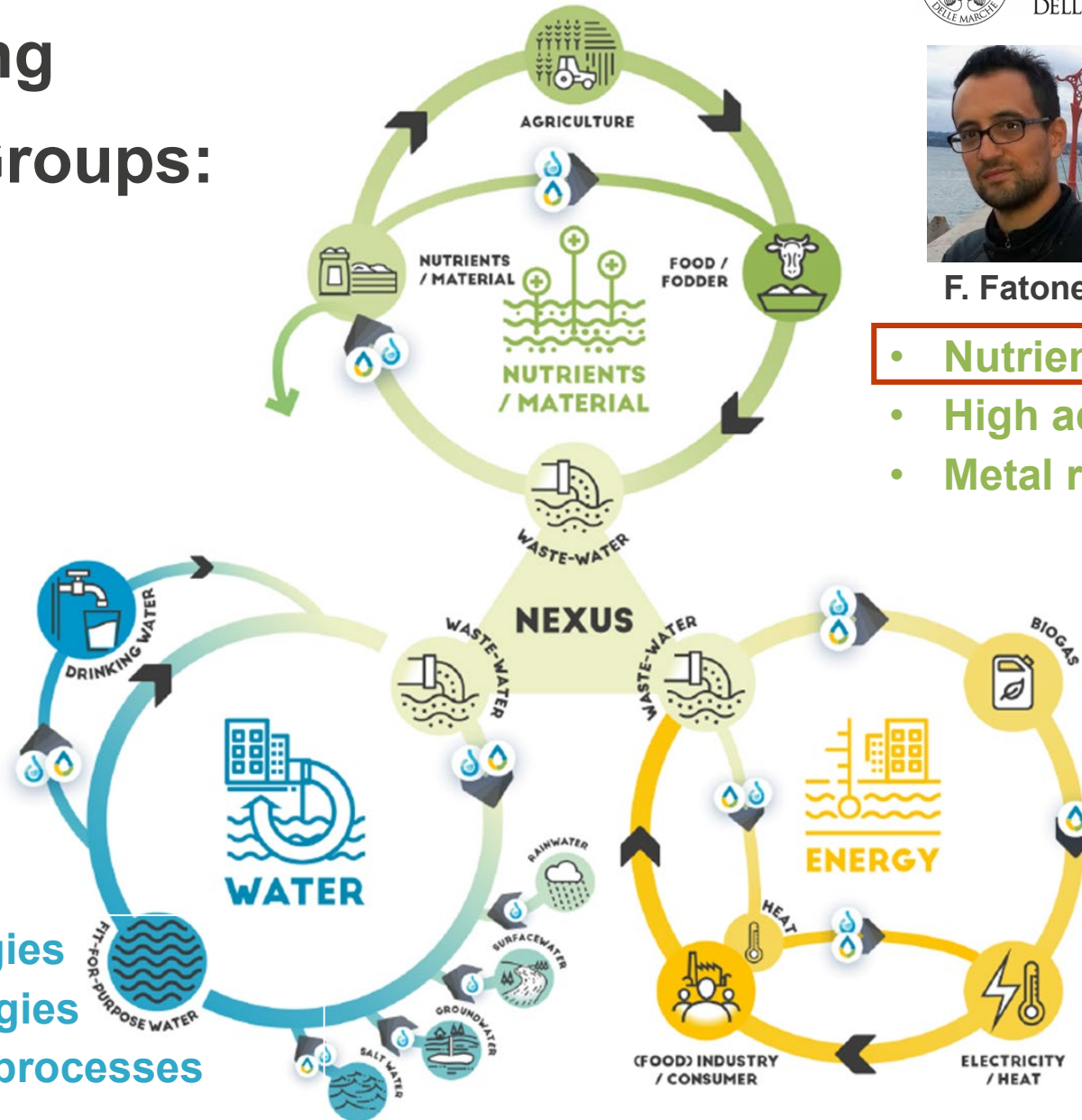
- Nutrient recovery
- High added value products
- Metal recovery



S. Casas

eurecat  
Centre Tecnològic de Catalunya

- Membrane technologies
- Adsorption technologies
- Advances oxidation processes



A. Kleyböcker

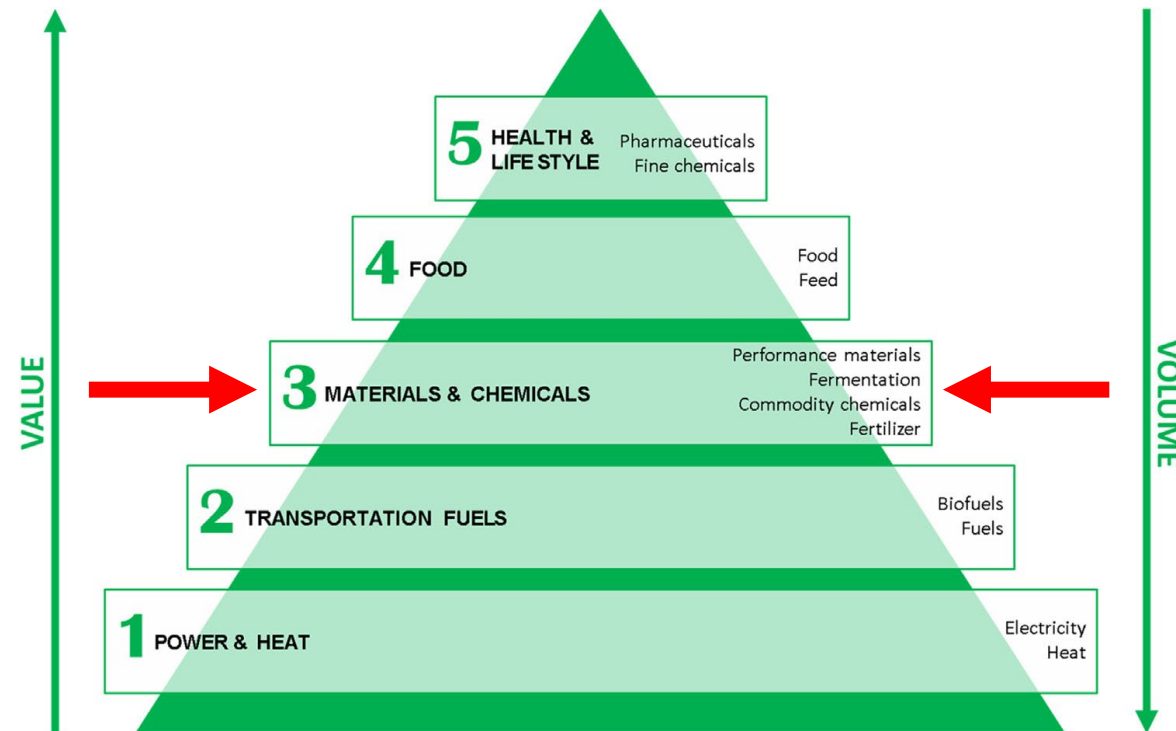
KOMPETENZZENTRUM  
Wasser Berlin

- Biogas technologies
- Heat Recovery
- Digitalization





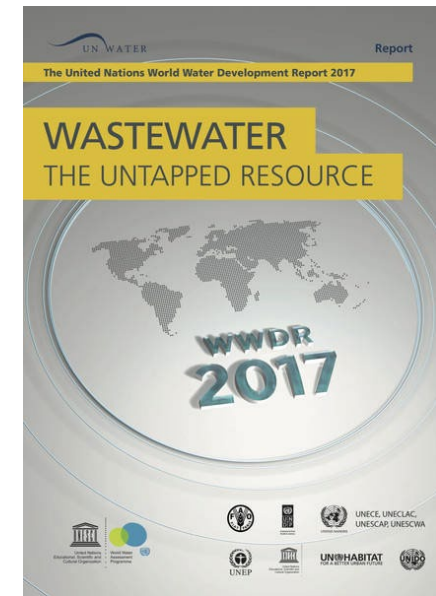
# Water Resource Recovery Facilities must recognize the value of the materials they recover





# Water in the CEAP: still untapped resource?

*“Furthermore, the Commission will develop an **Integrated Nutrient Management Plan**, with a view to ensuring more sustainable application of nutrients and stimulating the markets for recovered nutrients. The Commission will also consider **reviewing directives on wastewater treatment and sewage sludge** and will assess **natural means of nutrient removal such as algae**”*





# Policy and barriers

European policies, regulations and directives

Circular Economy Package

Proposed new Common Agricultural Policies (CAP)

New Fertilising Products Regulation (FPR)

## Remaining barriers

**No (apparent) willingness of customers to accept a premium for sustainability**

**Possible customer reluctance if sewage-originated raw materials are declared**

**Public procurement focusing on low cost instead of closed loops**

**Except for Fertilising Products Regulation, harmonized European regulatory framework missing**





# More direct Support Needed

**Governance of Water-Energy-Food-Carbon nexus** by quantified evidence and metrics

Targeted Circular Economy Directives with **clear targets** comparable to energy directives (REDII)

Simplification and harmonization of End-of-Waste

More **harmonisation of regulation** in the EU

Free trade of secondary resources for recycling with tracing and tracking system and obligatory, proven recycling

**Cross-sector collaboration and industrial symbiosis** encouraged by ad-hoc regulatory

framework that supports **long-term binding agreements** with industry and stable **public-private partnerships**

*Adapted from IWA Resource Recovery Conference and SMART-Plant final event – Venice (Italy) 2019*





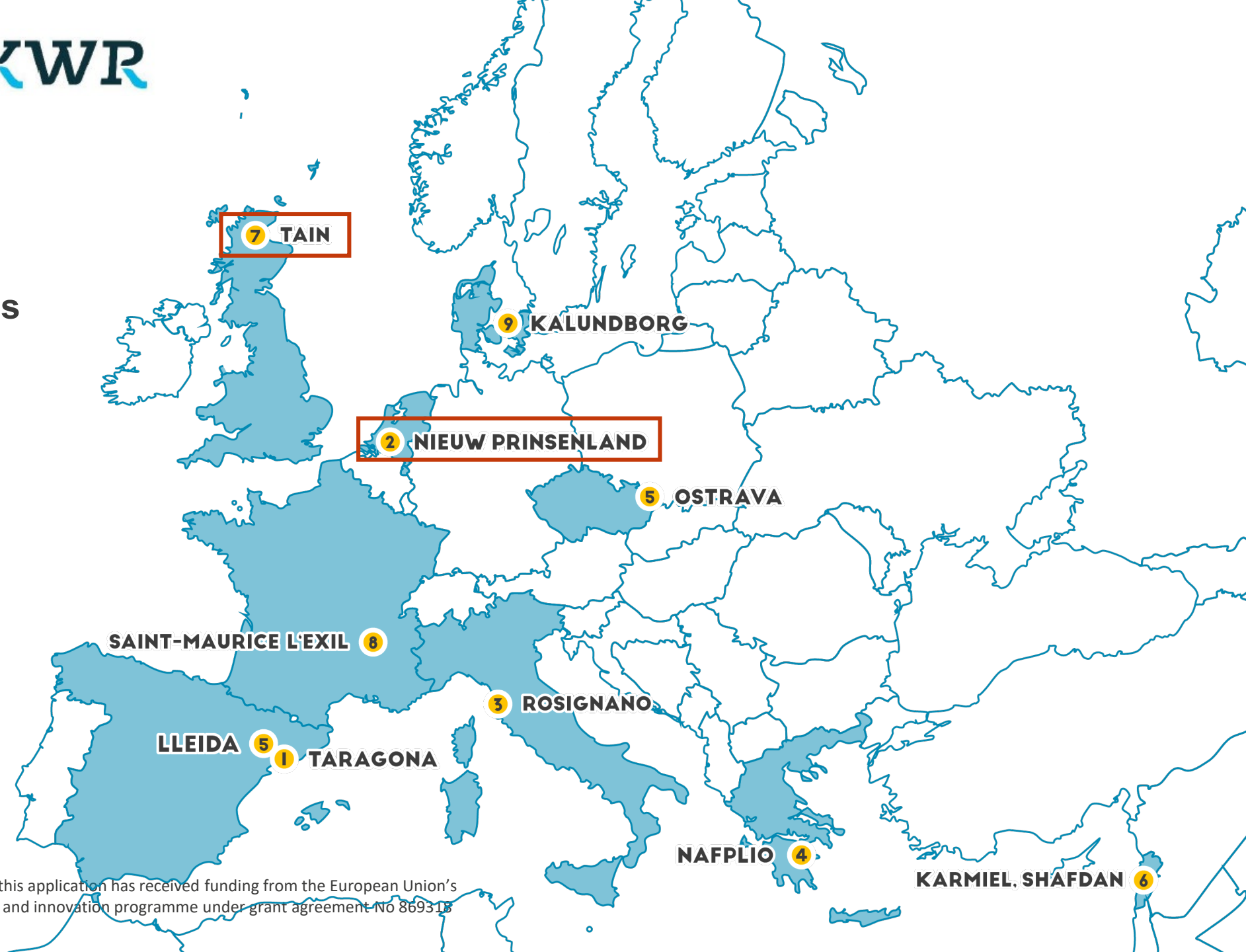


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# Agenda

- 15:15**     **Nutrient recovery in CS2:** KWR expertise in Nutrient recovery and conceptual presentation of Nutrient recovery in CS2  
*Tavishi Guleria and Nienke Koeman (KWR)*
- 15:30**     **Nutrient recovery in CS7 Tain:** Recovery of ammonia from distillery wastewater by IEX/packed columns after AnMBR  
*Mark Pidou (Cranfield University)*
- 15:45**     **Smart Plant:** bio-based fertilizer recovery from wastewater and sewage sludge  
*Sergio Ponsa (Beta/UVIC)*
- 16:05**     **Next Gen:** Full-scale nutrient recovery via struvite and ammonium sulfate production at a municipal wastewater treatment plant  
*Jonas Schneider (NextGen)*
- 16:25**     **Run4Life:** current results and exploitation pathways  
*Nicolas Morales (AQUALIA)*
- 16:45**     **Conclusions** and future interactions with ULTIMATE  
*Francesco Fatone (UNIVPM)*
- 17:00**     **End**