



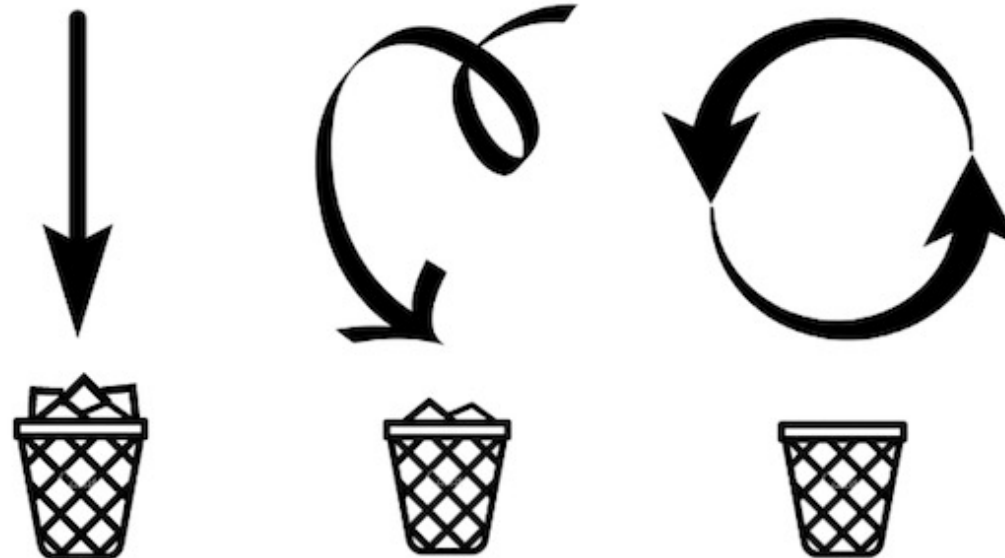
Innovation in removal of micropollutants

Upcycling wastewater and effluent of wwtps

LINEAR

RECYCLE

CIRCULAR



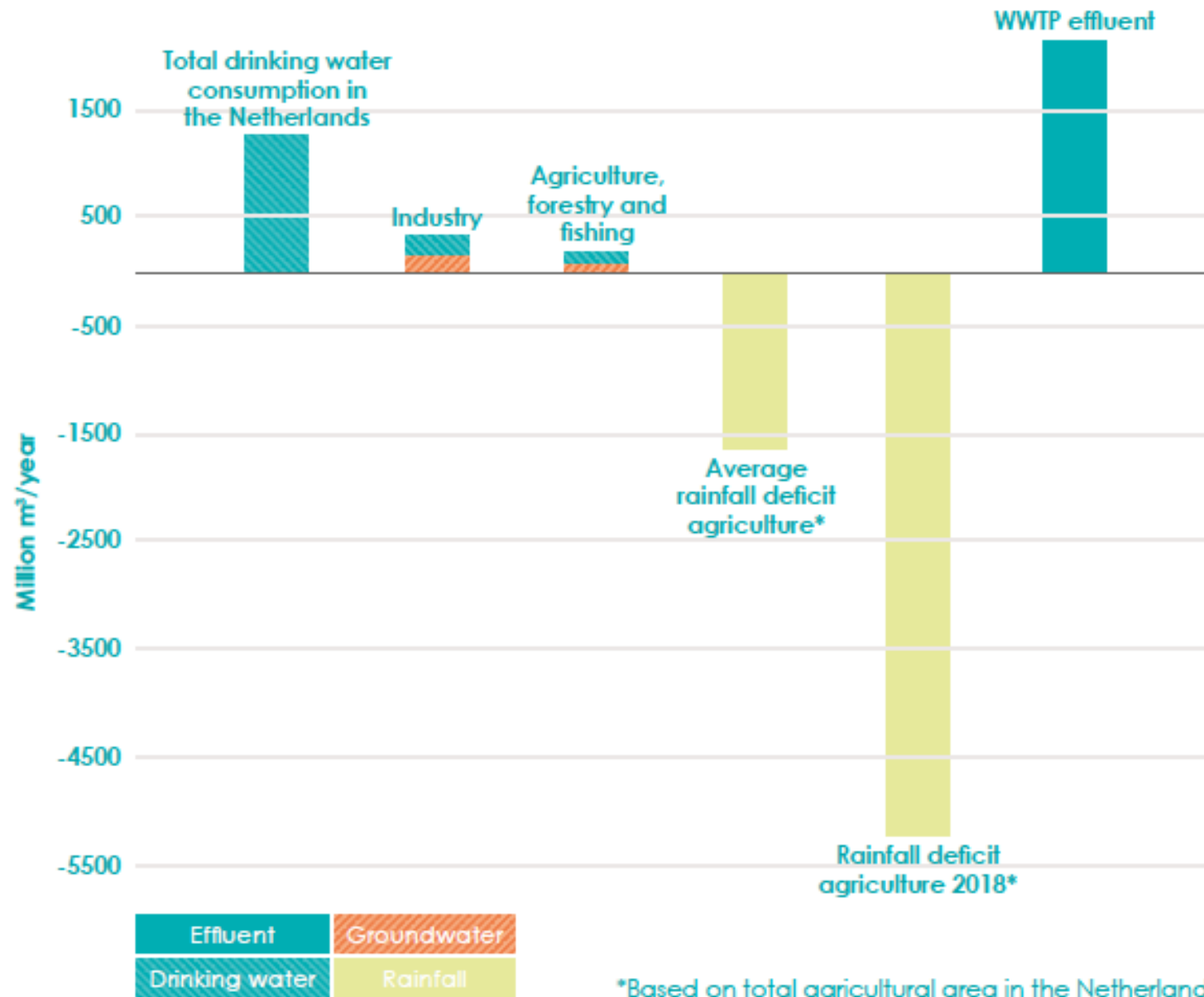
ENERGIE EN
Grondstoffen
FABRIEK

stowa

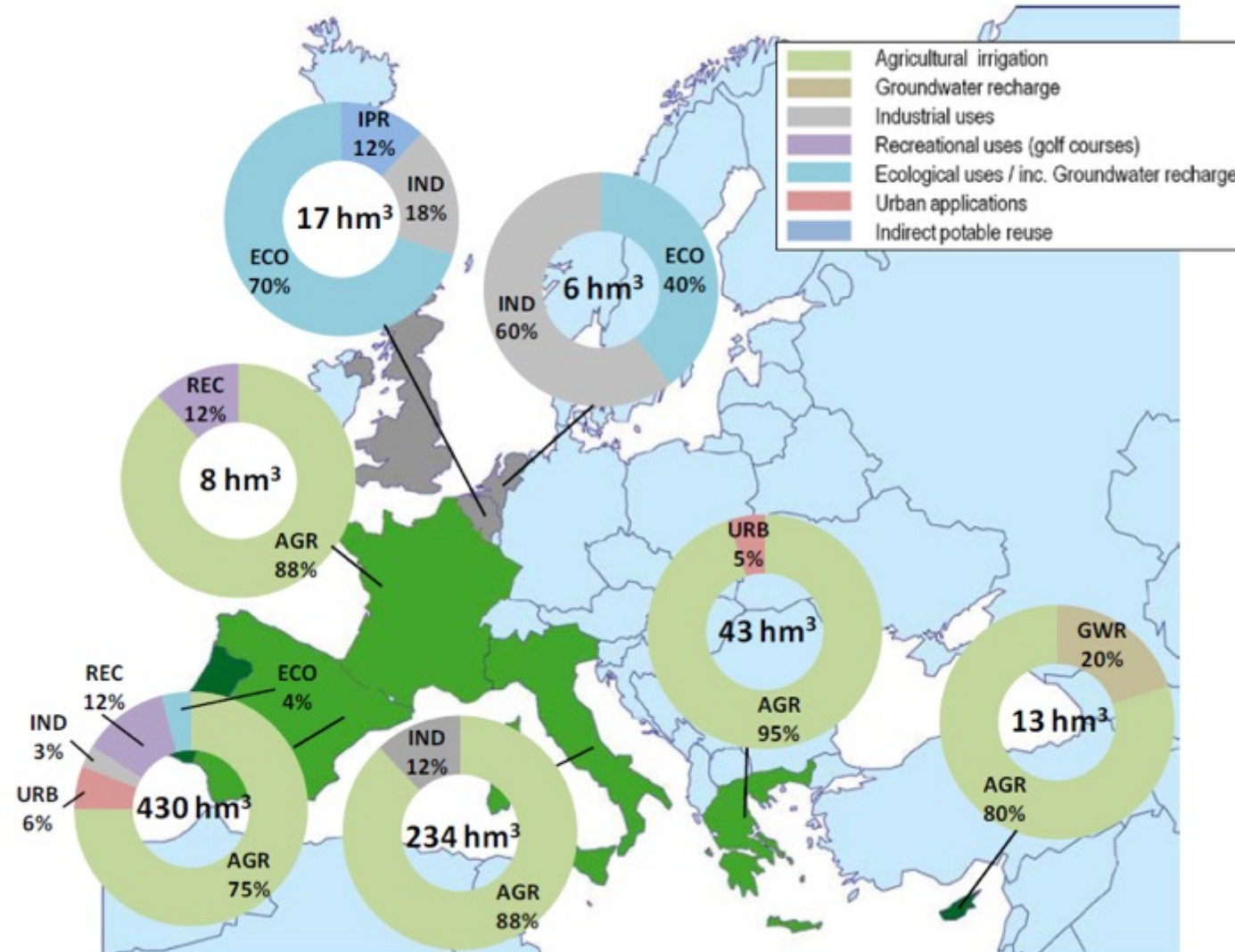


Rijkswaterstaat
Ministry of Infrastructure
and Water Management

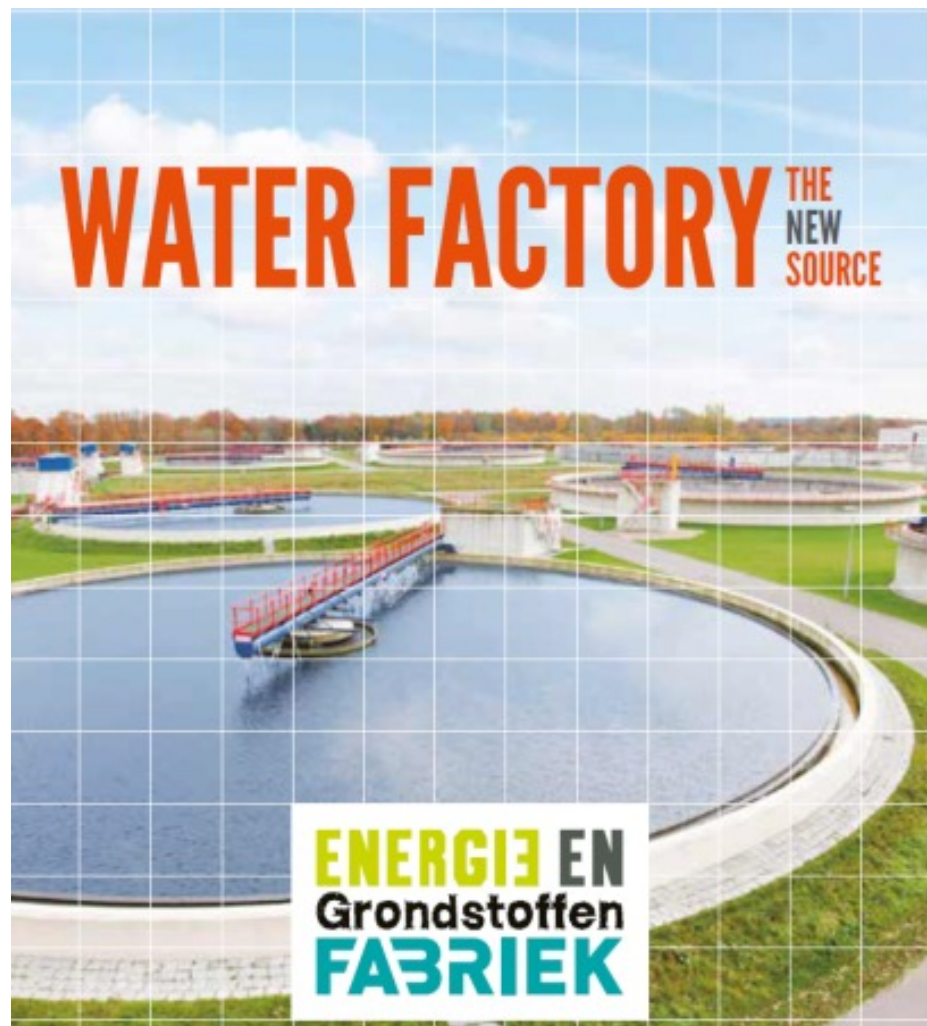
Significant effluent volume



Water reuse in Europe



Aquatech 2019:



Waste water as a new source?

- Significant volume
- Feasible: technical / financial
- WWTP is often nearby

www.waterfabriek.nl





WATER FACTORY



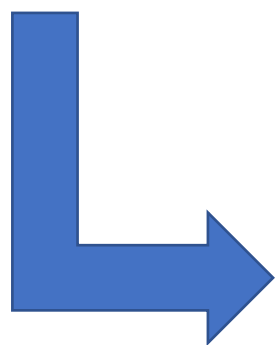
TRANSITION PLATFORM



Effluent reuse: a challenging transition!

Not just technical issues, but also:

- Governmental
- Institutional
- Legal
- Social/acceptance



Approach as a transition!

Several challenges for upcycling

1. Acceptation by end users
 - Is it safe? Spread of micropollutants?
2. Systems approach: effects on ground- and surface waters?
 - Accurate integrated models are needed
3. Temporary demands (agricultural use)
 - Feasible value cases are challenging
 - Underground aquifers?
4. Legal restrictions (End-of-Waste)
 - Effluent is still regarded as a waste material
 - Framework of standards is missing
5. Brine products from membrane processes
 - For large scale applications new solutions are needed



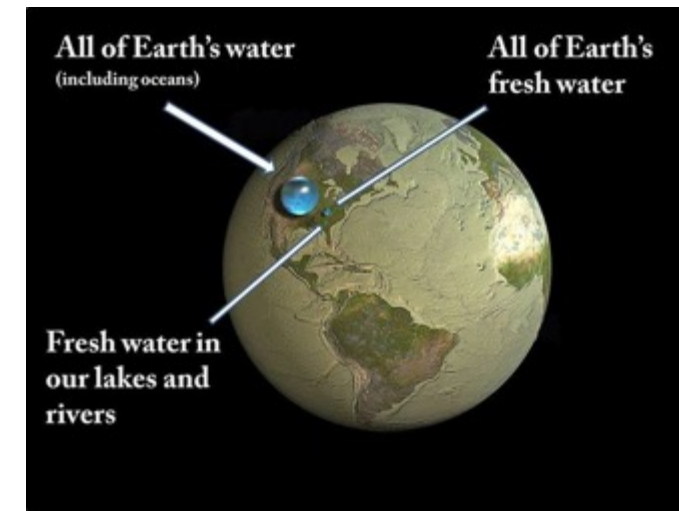
More than 15 Dutch cases / research projects

Reuse cases at wwtps:

- Oijen
- Helmond
- Terneuzen
- Epe
- Garmerwolde
- Emmen
- Waalwijk
- Bath
-

Research pilots/demo's

- WWTP Haaksbergen – agricultural use (sub-irrigation)
- Zoetwaterfabriek Groote Lucht
- WiCE Waterfabriek (KWR/STOWA) – [report](#)
- AquaConnect – [link](#)
- EffluentFit4Food - [link](#)
- **Capillary Nanofiltration wwtp Asten**
- **'Ge(o)zond Water' – wwtp Wervershoof**
- **Water Factory Wilp**
- **Ultimate Water Factory – drinking water**
-





PROGRAM

Upcycling wastewater and effluent of wwtps

Time	Presentation	Speaker
15.15	Nanofiltration and UV-treatment (wwtp Asten)	Rob van de Sande
15.30	Coagulation, keramic filtratie and O3 (wwtp Wervershoof)	Martin Spruijt
15.50	Physical-Chemical treatment of raw influent (wwtp Wilp)	Frans Visser
16.15	The Ultimate Water Factory	Jelle Roorda
16.30	Final questions & end of session	



Sheets next speakers....



Thank you for your attention!

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Rijkswaterstaat
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and Water Management

Tackling Micropollutants in Wastewater
Approaches on Implementation and Innovation in Europe and The Netherlands

November 3rd and 4th , 2021
Aquatech Amsterdam