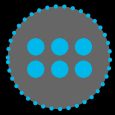


KWR - 27 NOVEMBER 2019

# BRIDGING SCIENCE TO PRACTICE

TOWARDS  
A WATER-WISE  
WORLD

KWR



OUR RESEARCH

# KWR RESEARCH AGENDA 2017-2023

KWR generates knowledge to assist the water sector in becoming water-wise in our urban society.



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OUR RESEARCH

# HEALTH

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- Emerging contaminants
- Safe innovation and the water sector
- Biological activity
- Microbial safety



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## HEALTH

# MICROBIAL SAFETY

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Developing knowledge and tools for microbiologically safe drinking water systems.

- Tools for evaluation and optimization of water systems (QMRA)
- Measures for pathogen control and/or removal





## HEALTH

# EMERGING CONTAMINANTS

Responding to potential threats of emerging contaminants to human and environmental health.

- Data-driven prioritization of drinking water relevant chemicals
- Watch list of polar organic compounds (PMOC)
- Risk assessment strategies
- Research on illicit drugs





OUR RESEARCH

# ENABLING TECHNOLOGIES

- New materials and technologies
- Hydrogenomics
- Future-proof networks
- Innovative water treatment technologies
- Hydroinformatics

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ENABLING TECHNOLOGIES

# INNOVATIVE WATER TREATMENT TECHNOLOGIES

Achieving more efficient and effective water treatment.

- Decentralized Reverse Osmosis (RO) with minimal pre-treatment
- Recovery of RO remineralization salts from Ion Exchange Processes (IEX)
- Advanced Oxidation Processes (AOP) for degradation of organic micro-pollutants
- Biodegradation of organic micro-pollutants in sand filtration (SF) and Activated Carbon Filtration (ACF)





LOOKING AHEAD

# HYDROINFORMATICS

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Developing water-wise concepts for resilient water systems under uncertainty.

- Methodological framework
- System-level metrics and long term scenarios
- Innovative technologies and intervention strategies
- A hydroinformatic toolbox





OUR RESEARCH

# SUSTAINABILITY

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- Sustainable use of freshwater resources
- Climate change and resilience
- Sustainable energy
- Sustainable resources

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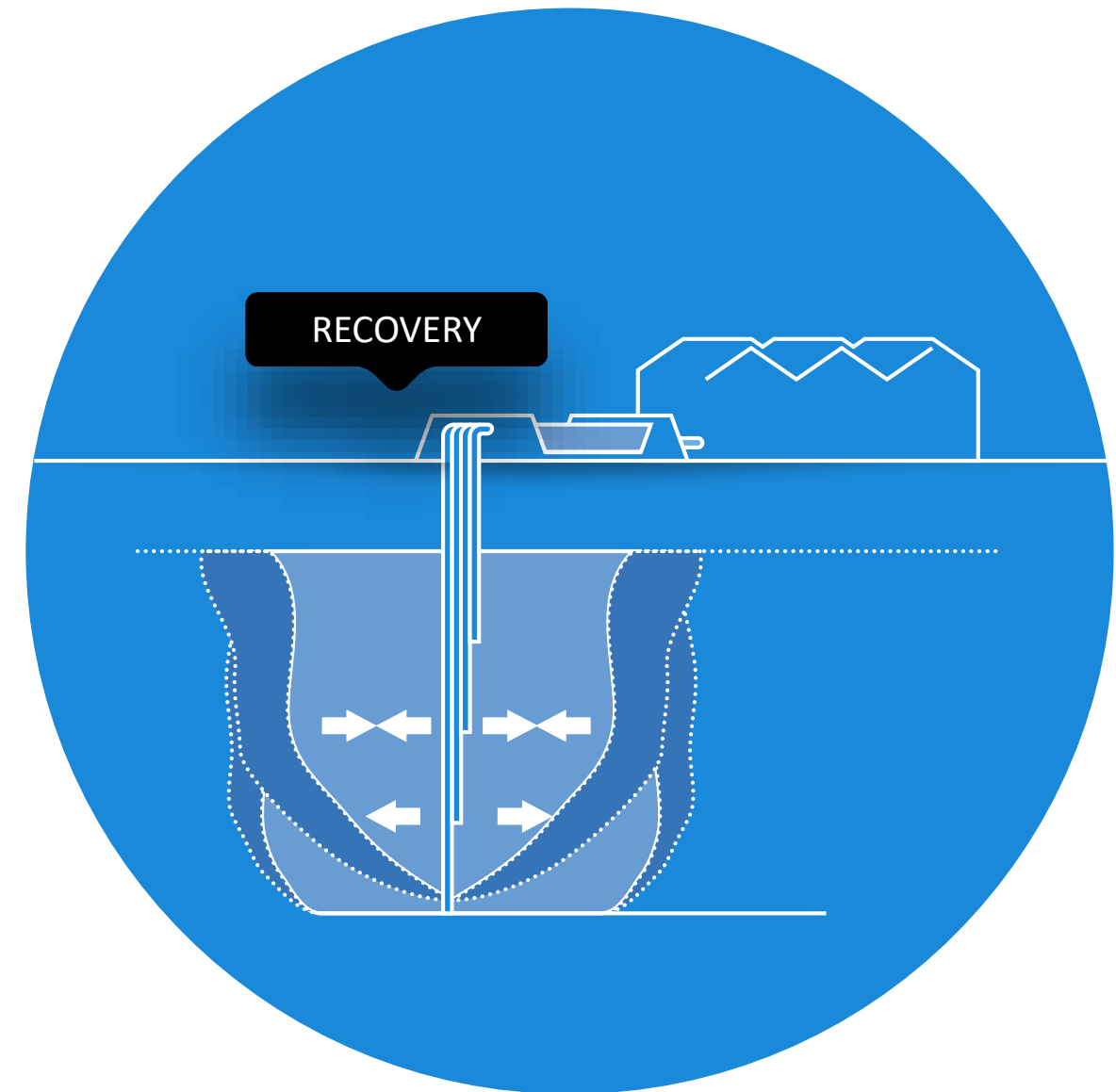


## SUSTAINABILITY

# SUSTAINABLE USE OF FRESHWATER RESOURCES

Enabling robust and sustainable freshwater supply for drinking water production, agriculture, industry and nature.

- Selective intake of surface water during high flow periods with dune infiltration for drinking water production
- Rainwater harvesting and subsurface storage from greenhouse roofs for year-round water supply in a saline coastal environment
- Near-well subsurface water treatment for sustainable removal of iron and organic micropollutants from groundwater
- Evaluation of groundwater quality development using hydrogeochemical analysis and modelling



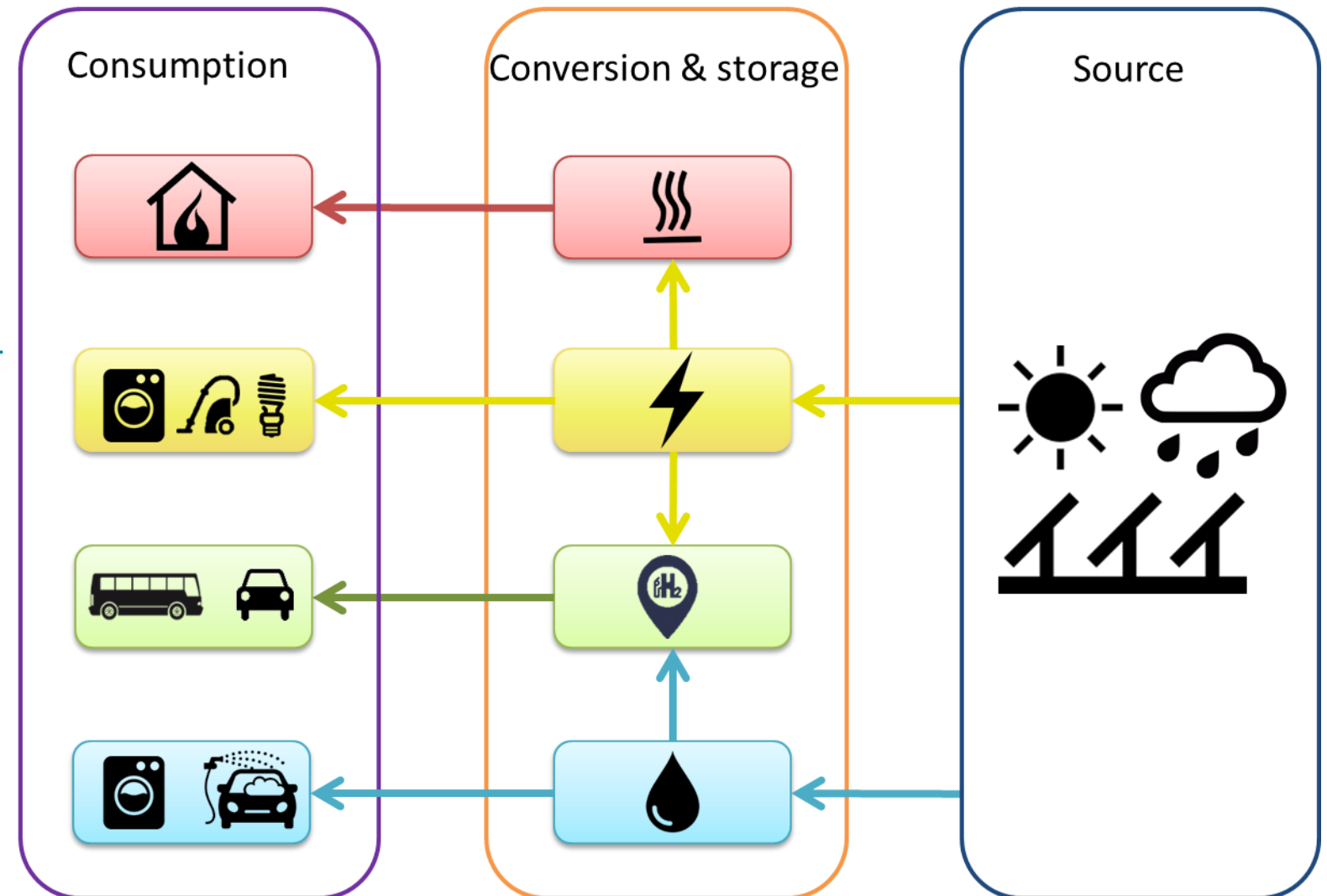


## SUSTAINABILITY

# POWER TO X

From concept to realization:

- Local sources of renewable energy and water
- Local use of both
- Storage of energy: heat and hydrogen





KWR RESEARCH PROGRAM

# SOCIETY

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- Citizen science and public participation
- Stakeholder involvement & governance
- Valorisation



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## SOCIETY

# CITIZEN SCIENCE AND PUBLIC PARTICIPATION

Involving citizens in the transition to a water-wise society.

- Citizen science
- Citizen and consumer perceptions
- Engagement in water reuse and the Circular Economy (NextGen)





OUR RESEARCH

# LOOKING AHEAD

- Futures studies and response strategies

KWR

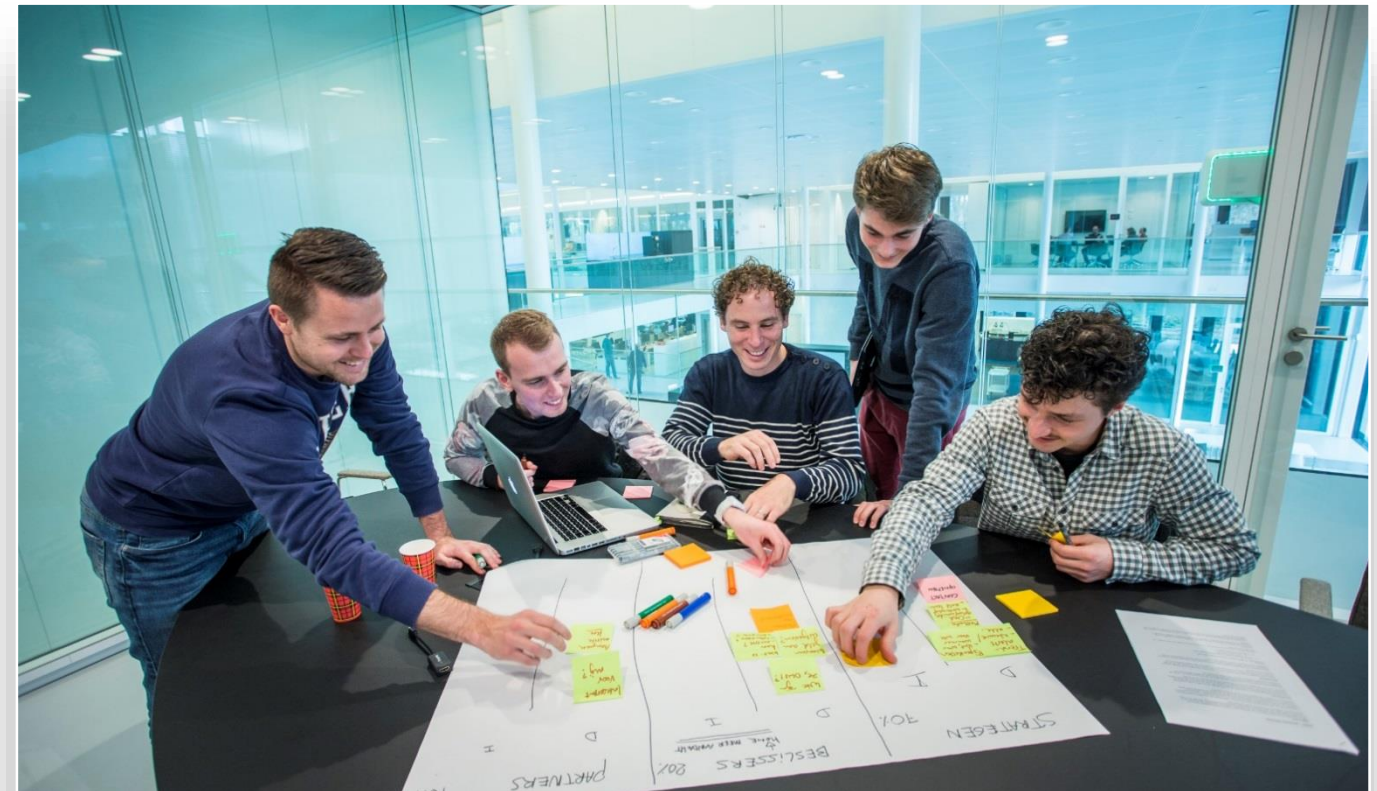


LOOKING AHEAD

# FUTURES STUDIES AND RESPONSE STRATEGIES

Helping the water sector and researchers keep alert and respond to future trends, challenges and opportunities.

- Horizon scanning and trend alerts
- Impact studies
- Scenario planning (Future Map, BINGO, Scenario Builder)
- Learning alliances: Dutch Water Sector Intelligence (DWSI)



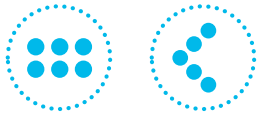


KNOWLEDGE AND INNOVATION MODEL

# WORKING TOGETHER

KNOWLEDGE BASE  
REFERENCE PROJECTS  
PRODUCTS  
NETWORKS

KWR



KNOWLEDGE BASE - THE NETHERLANDS AND BELGIUM

# JOINT RESEARCH PROGRAMME WATER COMPANIES (BTO)

Building knowledge base needed to provide drinking water of world class quality

- Dutch utilities, branche association Vewin and De Watergroep (BE)
- KWR: Coordinator, principal implementer
- 50 years of collective research, institutional memory for the drinking water sector

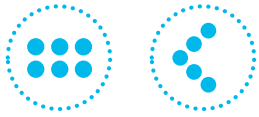
6.4

MILLION  
EURO/YEAR

>60

RESEARCH  
PROJECTS/YEAR





KNOWLEDGE BASE - EUROPE

# KWR PROJECTS HORIZON 2020 (1/3)

1

MILLION  
EURO/YEAR



## NextGen

Towards the next generation of water systems and services for the circular economy.



## Fireware4Water

Creating the ecosystem for next generation of internet services linked to smart city initiatives.



## STOP-IT

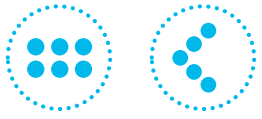
Physical and cyber protection of critical water infrastructures.



## POWER

Sharing water knowledge and experience between cities.

KWR

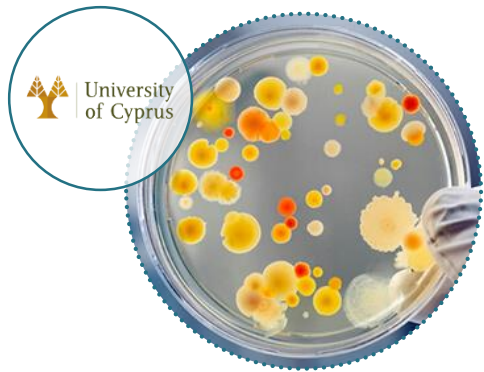


KNOWLEDGE BASE - EUROPE

# KWR PROJECTS HORIZON 2020 (2/3)

1

MILLION  
EURO/YEAR



## ANSWER

Antibiotics and mobile resistance elements in wastewater reuse applications.



## SPECTORS

Unlock the market potential of civilian drone technology through sensor innovations for remote sensing and remote monitoring.



## AQUARIUS

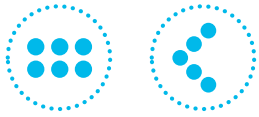
Proposing disruptive improvements in laser based water sensing.



## WatQual

Water quality in drinking water distribution systems.

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KNOWLEDGE BASE - EUROPE

# KWR PROJECTS HORIZON 2020 (3/3)

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1

MILLION  
EURO/YEAR



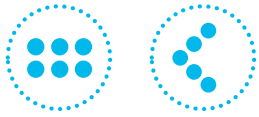
## HeatStore

Underground Thermal Energy Storage facilitates the low-carbon transition of the heating and cooling sector.



## REWATCH

Water reuse in the petrochemical industry.



REFERENCE PROJECTS - THE NETHERLANDS

# DUTCH WATER TECHNOLOGY (TKI)

Demand-driven projects with public-sector end-users.

- Since 2013
- Private businesses & research organisations
- KWR: Coordinator, principal implementor public-sector end-users projects, Secretary of the Water Technology Board (Jos Boere)

2.5

MILLION  
EURO/YEAR

>75

RESEARCH  
PROJECTS



RESOURCE  
EFFICIENCY



SMART  
WATER SYSTEMS

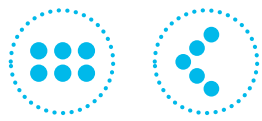


SUSTAINABLE  
CITIES



TOPSECTOR  
WATER &  
MARITIEM

**KWR**



## REFERENCE PROJECTS - INTERNATIONAL

# WATERSHARE

Global expertise for local water challenges.

- Since 2012
- KWR: Coordinator, founding member
- Sharing and reviewing knowledge from research and practice in Communities of Practice
- Encapsulating the knowledge into tools
- Tackling the water sector's challenges on:

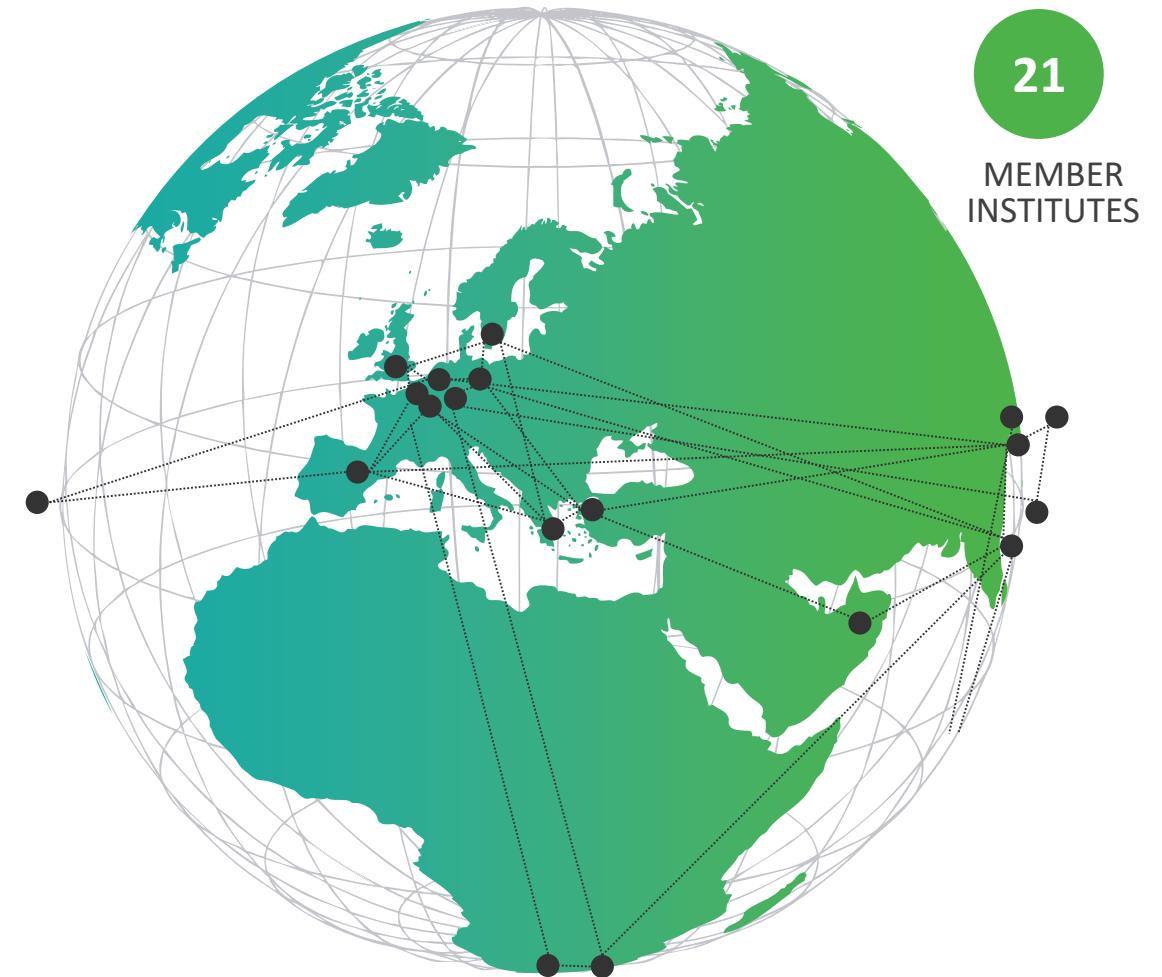
Resilient  
Urban Water  
Management

Subsurface  
Water  
Solutions

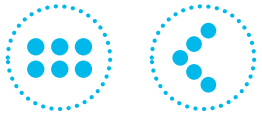
Emerging  
Substances

Future-Proof  
Water Infra-  
structures

Resource  
Recovery and  
Upcycling



watershare® KWR



PRODUCTS – INTERNATIONAL

# ALLIED WATERS

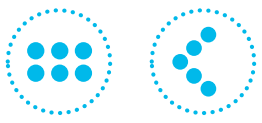
Commercialising game-changing innovations in the water cycle that are driving the circular economy.

- Since 2015
- Public-private partnership (PPP): prominent scientific institutes & ambitious business enterprises
- KWR: Founding father, research partner
- SALutions Collab: commercialisation of Subsurface Water Solutions (Freshmaker®, Freshkeeper®, ASR-Coastal)



ALLIED WATERS®

**KWR**

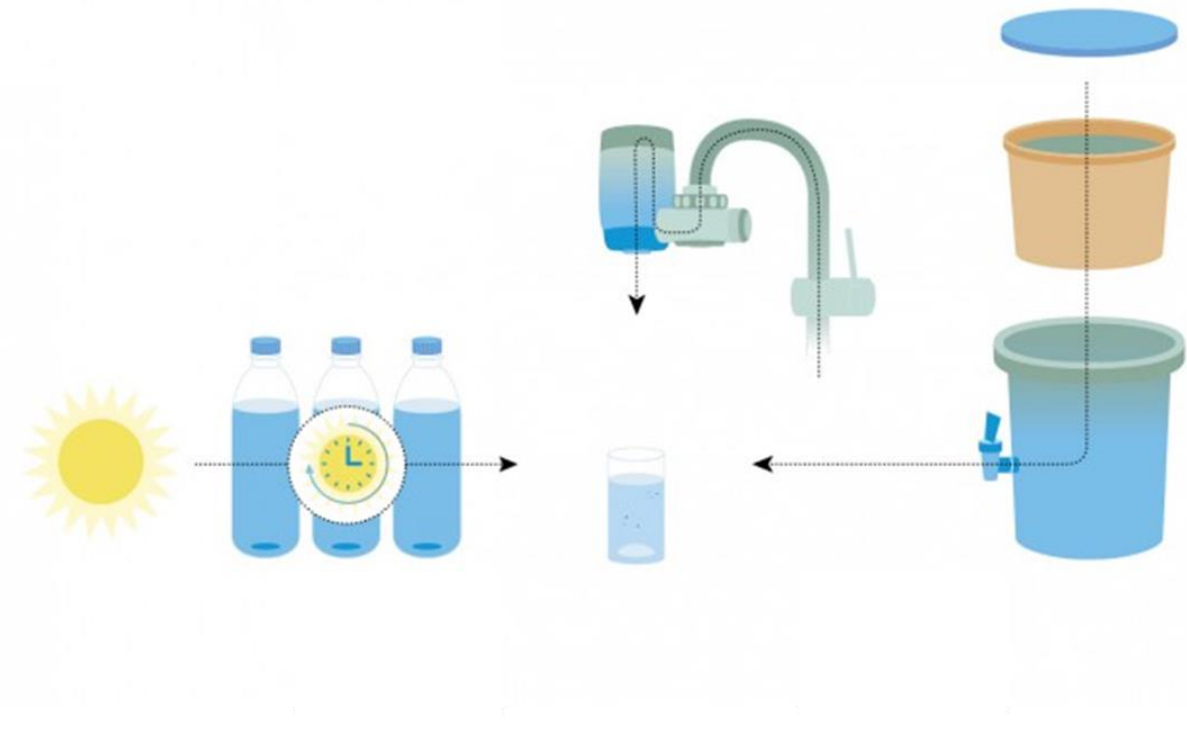


NETWORKS - INTERNATIONAL

# WHO COLLABORATING CENTRE

KWR is a WHO Collaborating Centre on Water Quality and Health.

- Testlab for the Household Water Treatment Verification Scheme
- Testlab for the WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation
- Providing technical support to water quality guidelines and supporting documents
- Strengthening technical capacity of national water quality laboratories
- Providing expertise on water-related aspects of antimicrobial resistance
- Supporting dissemination of WHO guidance to the water sector



WHO Collaborating Centre on  
Water Quality and Health

**KWR**



ABOUT KWR

# KWR

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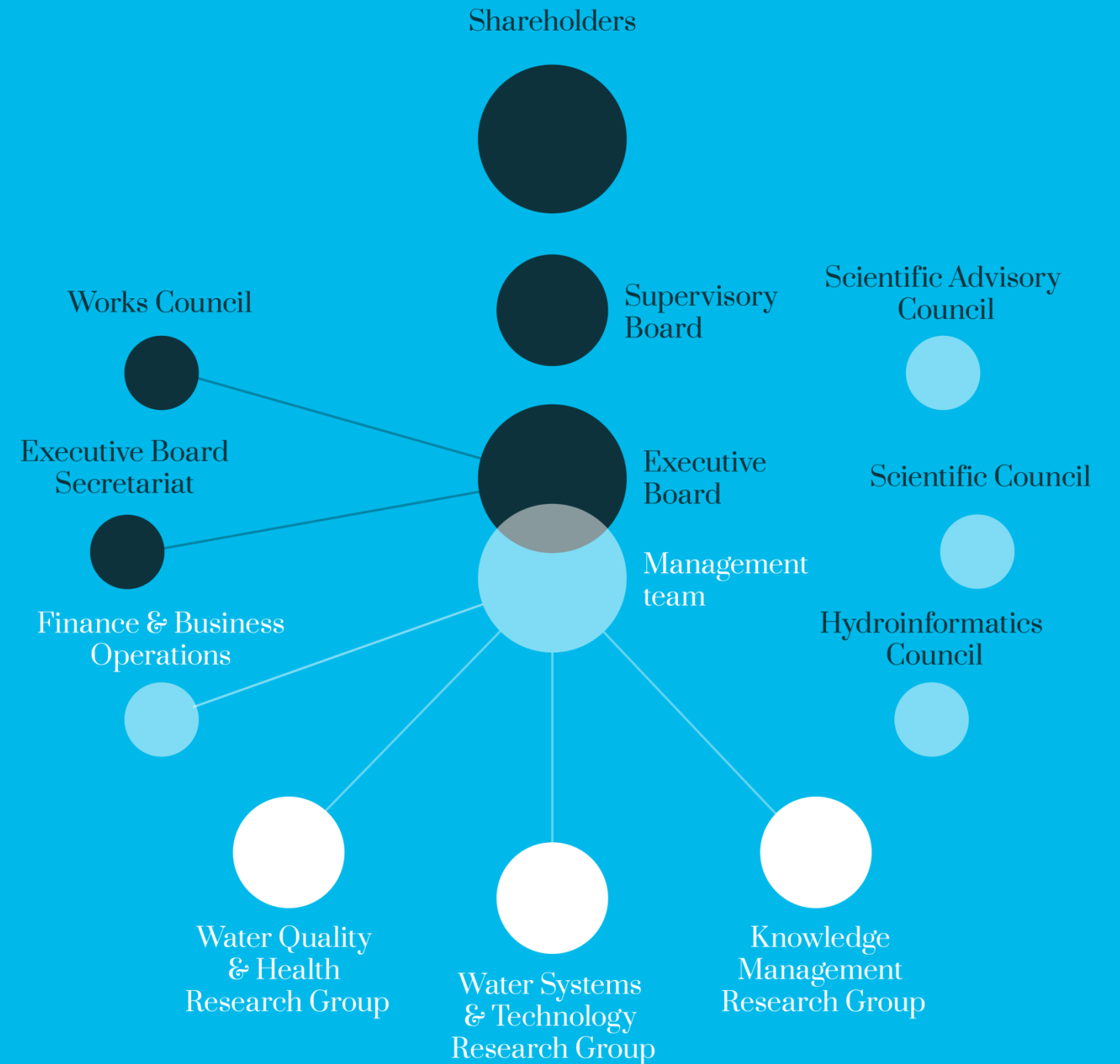
THE  
KNOWLEDGE  
ENTERPRISE

KWR



# ORGANISATION

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ABOUT KWR

# SHAREHOLDERS

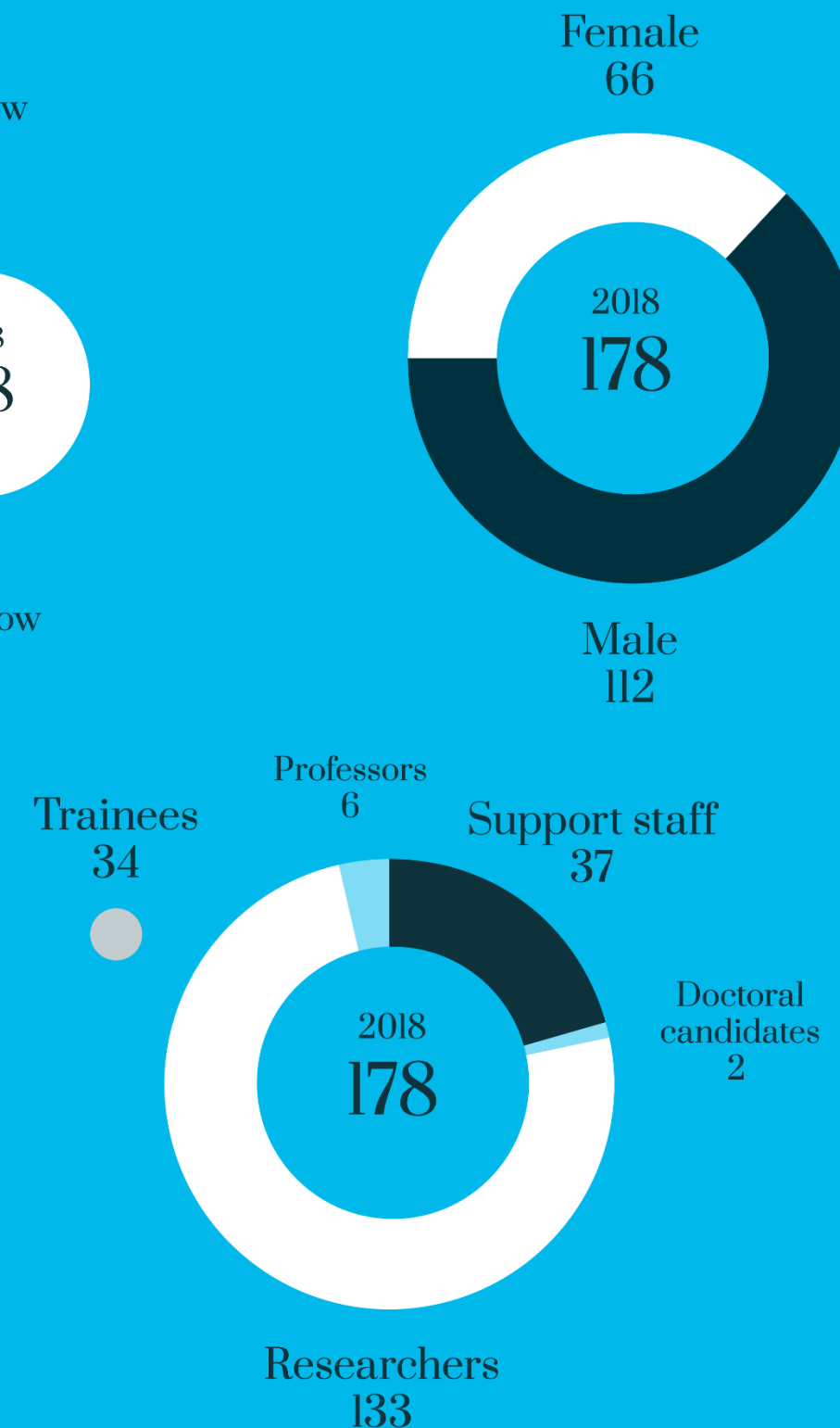
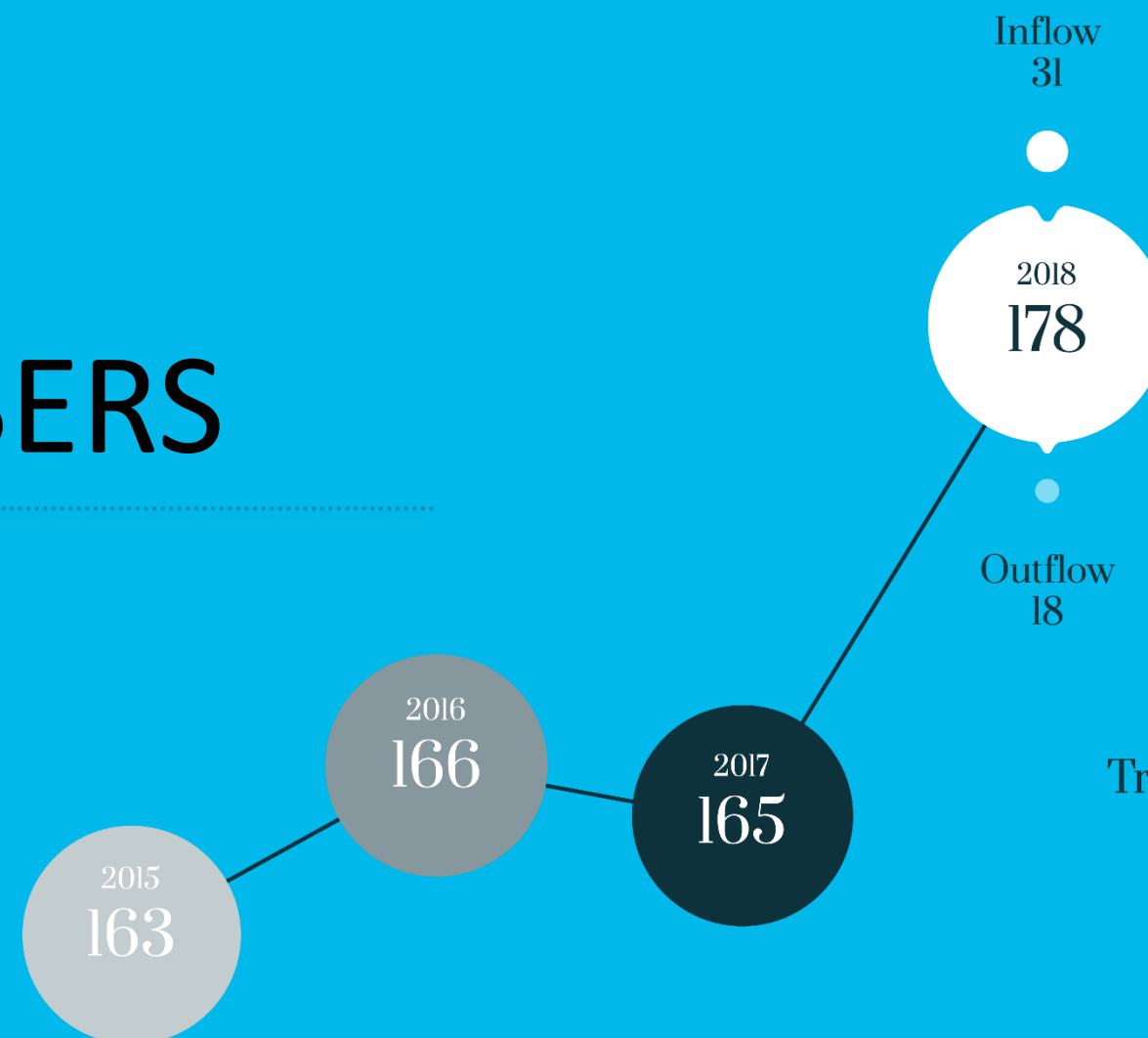
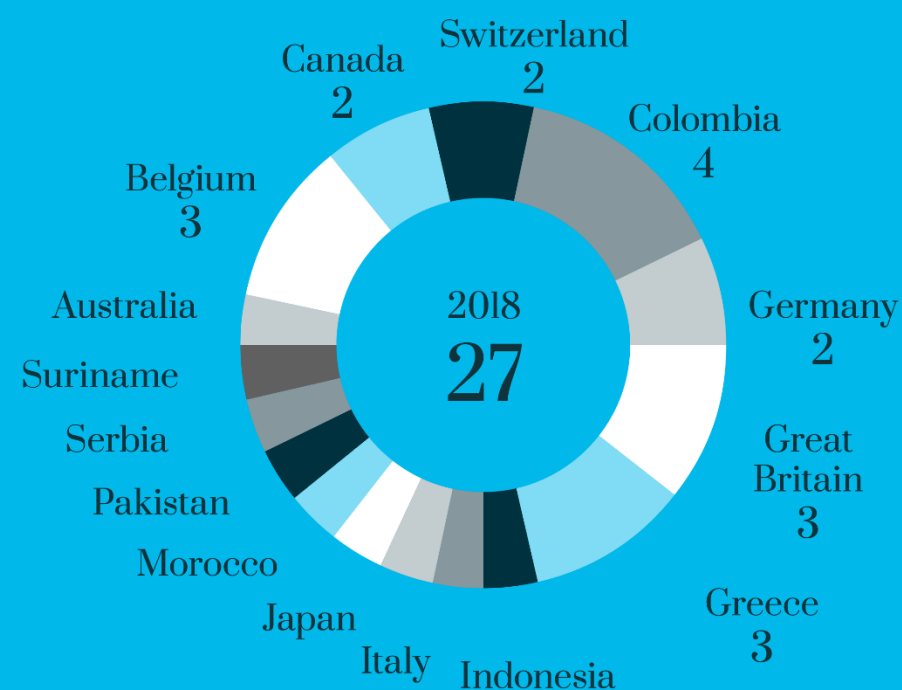


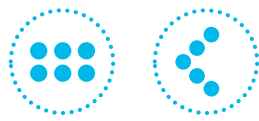
\* Participant in Shareholder Watertransportmaatschappij Rijn-Kennemerland (WRK)



ABOUT KWR

# STAFF MEMBERS





## NETWORKS – INTERNATIONAL

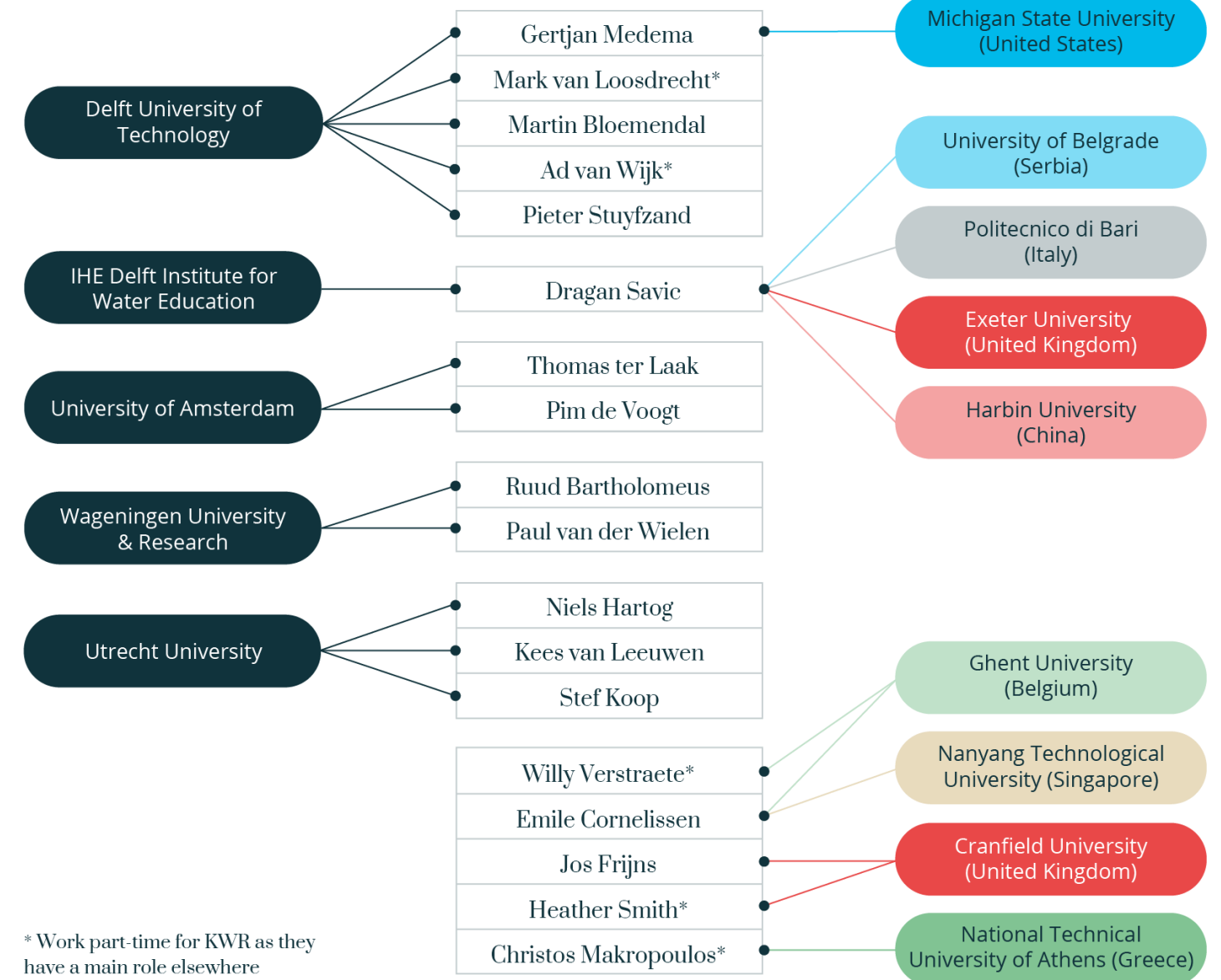
# AFFILIATIONS WITH UNIVERSITIES

KWR's scientists are affiliated with renowned universities and renowned professors over key universities are affiliated with KWR.

Their PhD and MSc students often do (part of) their research at KWR.

Universities in  
the Netherlands

Researchers

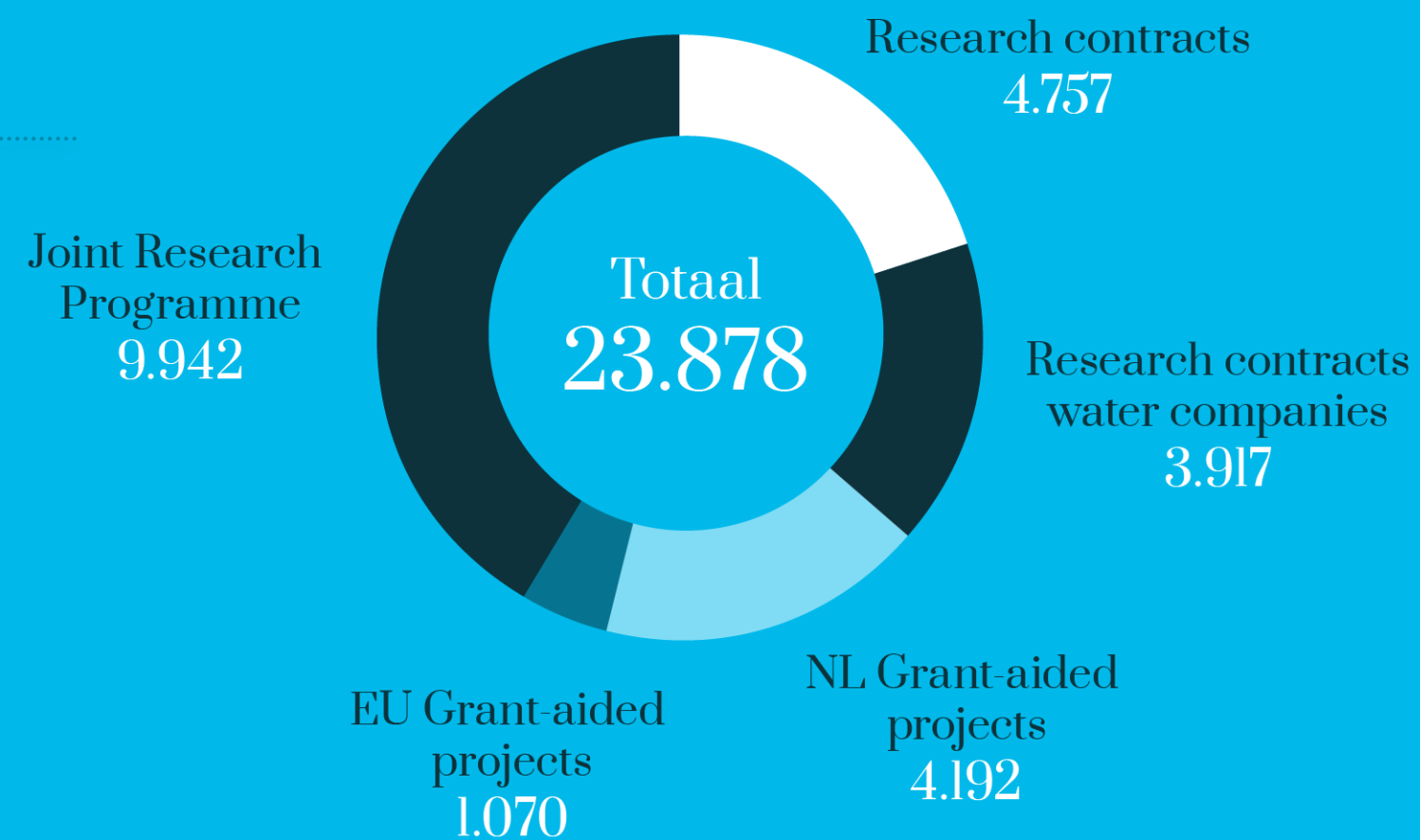
Universities  
worldwide**KWR**



ABOUT KWR

# REVENUES 2018

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ABOUT KWR

[KWRWATER.NL/  
EN/](https://kwrwater.nl/en/)



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