

CHALLENGES

Chemical Industry provides the highest potential for increasing eco-efficiency in industrial water management. E4Water addresses crucial process industry needs, to overcome bottle necks and barriers for an integrated and energy efficient water management.

AIM

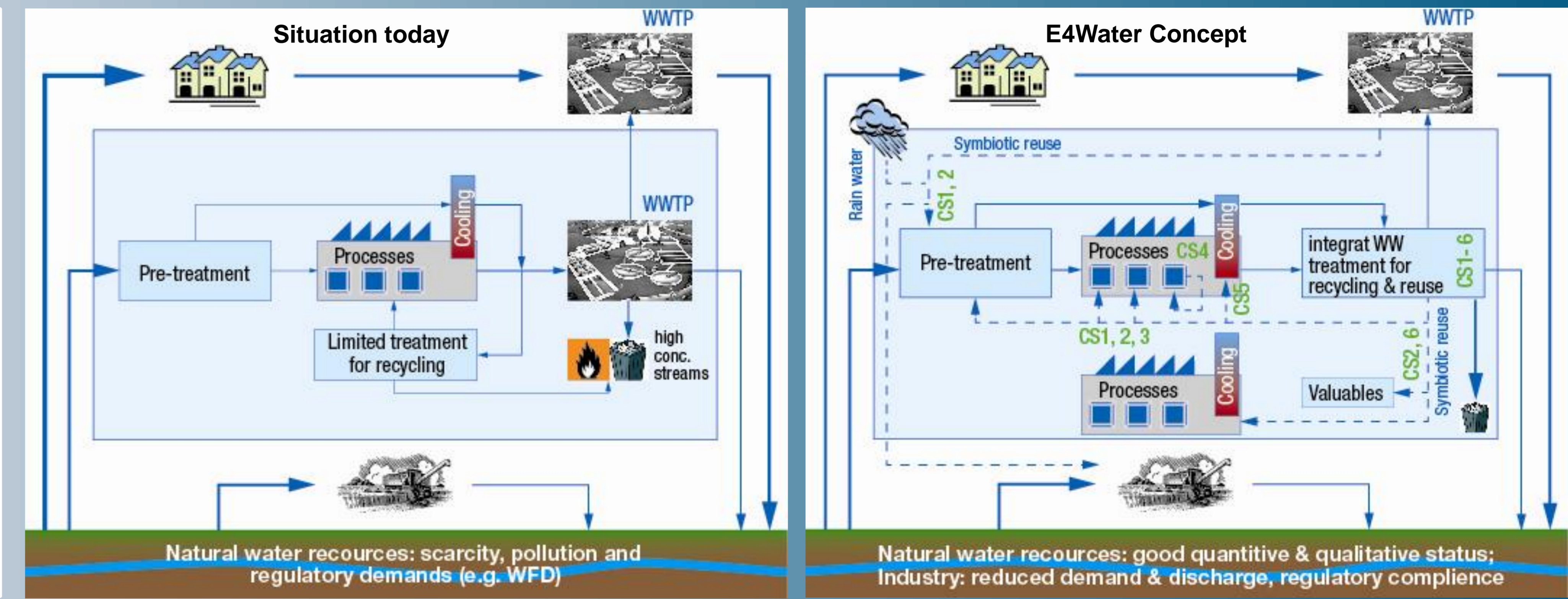
The main objective is to develop, test and validate new integrated approaches, methodologies and process technologies for a **more efficient and sustainable management of water in chemical industry** with cross-fertilization possibilities to other industrial sectors.

CONSORTIUM

E4water unites in its consortium large chemical industries, leading European water sector companies and innovative RTD centers and universities, active in the area of water management and also involved in the Water supply and sanitation Platform (WssTP) and the European Technology Platform for Sustainable Chemistry (SusChem) and collaborating with water authorities.

Concept of E4water:

- (1) developing and testing innovative materials, process technologies, tools and methodologies for an integrated water management,
- (2) providing an open innovation approach for testing E4Water developments with respect to other industries
- (3) implementing and validating the developments in **6 industrial case studies**, representing critical problems for the chemical industry and other process industries,
- (4) implementing improved tools for process efficiency optimization, linking water processes with production processes, and eco-efficiency assessment.



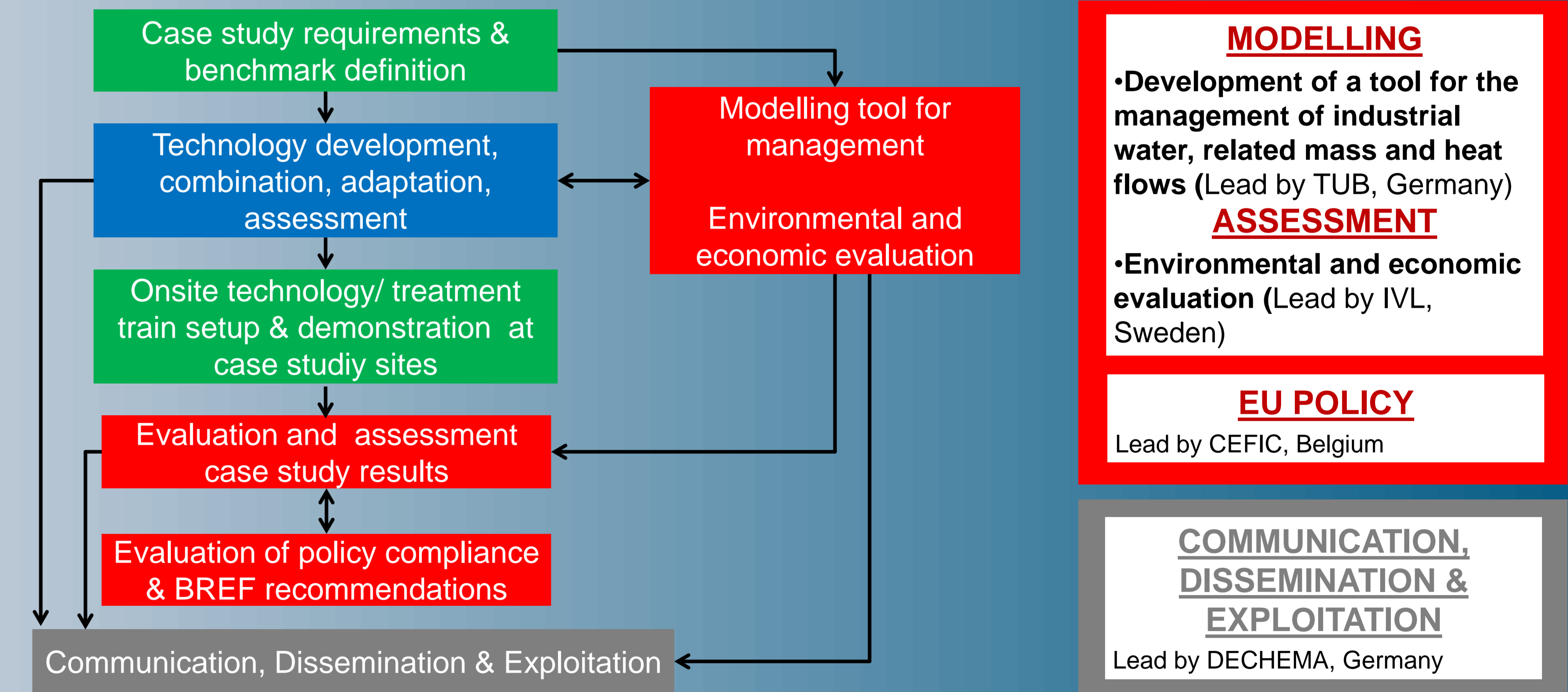
CONCEPT

INDUSTRIAL CASE STUDIES (CS)

- CS1: Mild desalination of water streams for optimum reuse in industry or agriculture at affordable costs (Lead by Dow, Netherlands)
- CS2: Enhance the water reuse by global management and synergy identification on a multi-company site (Lead by Solvic, Belgium)
- CS3: Ensure process continuation by closing the water loop and minimizing fresh water use (Lead by Solvin, Spain SL)
- CS4: Enhance in-process water loop closure by integrating biocidal with wastewater treatment technologies (Lead by PGB, N.V., Italy)
- CS5: Towards integrated water management system in petrochemical site (Lead by Total, France)
- CS6: Bioextraction technology in a symbiotic industrial wastewater treatment concept creating added value (Lead by CBD, Denmark)

TECHNOLOGY DEVELOPMENT

- Technological reduction and management of risks associated with advanced loop closure (Lead by VITO, Belgium)
- Optimization and debottlenecking of separation processes (Lead by UCM Spain)
- Mild and extensive demineralization technologies for process water production (Lead by TNO, Netherlands)
- Integration of processes to allow residual heat, nutrients and value products to be reused (Lead by DTU)



EXPECTED IMPACTS

THE SIX INDUSTRIAL CASE STUDY SITES ARE EXPECTED TO ACHIEVE THE FOLLOWING IMPACTS:

- Lead to a reduction in water and related energy usage, as well as in industrial waste water production. (Reduction of 20 – 40% in water use, 30 – 70% in waste water production, 15 – 40% in energy use)
- Enable industries to be fully compliant with the EU policies on water pollution and industrial emission. E4Water enables Chemical Industry to comply with the requirements in an economical efficient way (IED – 2010/75/EC; BAT's/ BREF; 2000/60/EC; 2006/118/EC)
- Generate direct economic benefits for the process industry (up to 60% are expected at the E4Water demonstration sites). The expected economical benefits in E4Water seem to be achievable in Chemical Industry and related sectors to a high degree.

PROJECT PARTNER

- DECHEMA - DECHEMA Society for Chemical Engineering and Biotechnology e.V. – Germany
 TNO – Netherlands Organisation for Applied Scientific Research - Netherlands
 UCM – Universidad Complutense de Madrid - Spain
 VITO – Flemish Institute for Technological Research N.V. - Belgium
 CEFIC – European Chemical Industry Council, AISBL - Belgium
 SOLVIC – Solvic NV - Belgium
 SOLVIN – Solvin Spain SL - Spain
 DOW – Dow Benelux B.V. - Netherlands
 PGB – Procter & Gamble Eurocor N.V. - Belgium
 TOTAL – Total Petrochemicals Research Feluy - Belgium
 ONDEO IS – Ondeo Industrial Solutions SA - France
 CBD – Cluster Biofuels Denmark/ Kalundborg Kommune - Denmark
 DTU – Technical University of Denmark - Denmark
 FHNW – University of Applied Sciences and Arts Northwestern Switzerland - Switzerland
 TUB – Technische Universität Berlin – Germany
 IVL – IVL Swedish Environmental Research Institute AB – Sweden
 EVIDES – Evides Industriewater BV - Netherlands
 CAMPDEN – Campden BRI - United Kingdom
 TUD – Delft University of Technology – Netherlands



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