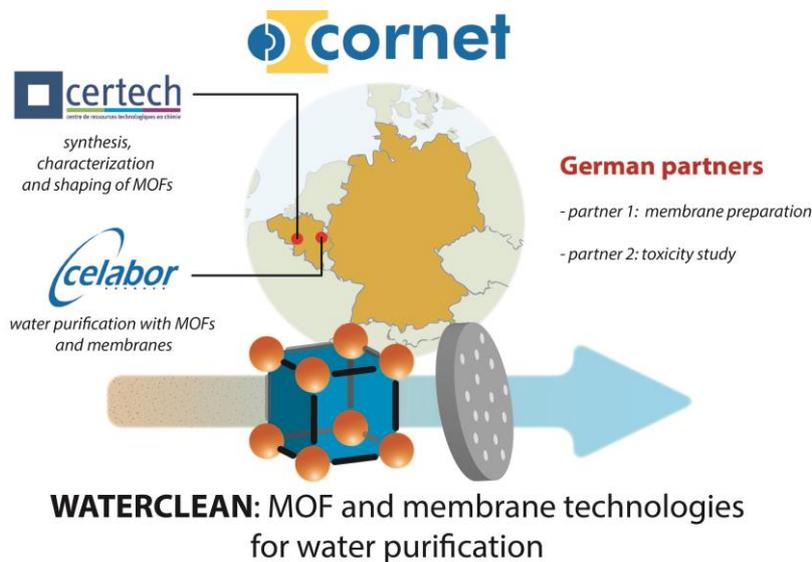


## WATERCLEAN: MOF and membrane technologies for water purification

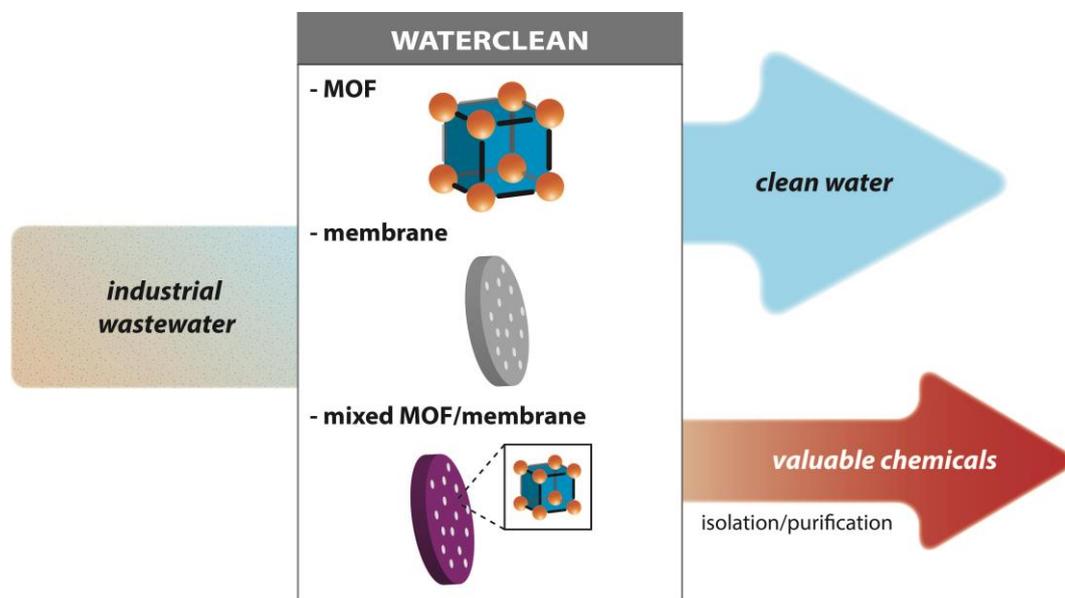
The objective of the project **WATERCLEAN** is to develop innovative technologies for the efficient last-stage purification of industrial wastewater, focusing on emerging and persistent contaminants. In particular, pollutants that are currently difficult or even not possible to remove with conventional technologies will be targeted. A special attention will be focused on the potential valorization of the recovered contaminants, as both investigated technologies will be selective and non-destructive. This collaborative project between partners from Belgium and Germany will be built within the framework of the **CORNET** program.



In this direction, two water treatment technologies will be explored: the first one based on a new family of crystalline adsorbents, namely **Metal-Organic Frameworks** (MOFs), and the second centered on **membrane filtration** processes. The main advantages of MOFs over conventional adsorbents are essentially linked to their high surface area, wide versatility, selectivity and tunability, allowing to tailor a MOF for a given contaminant. On the other hand, membrane filtration affords an efficient and continuous separation technology for the treatment of water essentially based on selective physical separation. **WATERCLEAN** ultimately aims at developing composite MOF/polymeric membranes to combine the best of both technologies.

In this project, **Certech** (Belgium), will identify, synthesize, characterize and shape the targeted MOFs. Especially, an efficient, scalable and cost-effective synthesis of MOFs will be implemented to enable their industrial application.

**A first partner from Germany** will develop polymeric membranes for the specific filtration of the targeted contaminants. **Celabor** (Belgium) will test and compare the efficiency of the MOFs and membranes in the purification of model and real pre-treated wastewater and evaluate the purification and valorization of valuable compounds (such as biocides, pesticides, medicines) for the industrial sector. Finally, **the second German partner** will perform toxicology studies of wastewater before and after this last-stage treatment to demonstrate the importance of the new technologies in terms of health and safety. From this, the development of mixed MOF/polymeric membranes will be explored through further collaboration between the Belgian and German partners.



Noteworthy, **Certech** and **Celabor** already possess expertise and equipment for the synthesis of MOFs and for the treatment and analysis of contaminated water, respectively.