Electro-coagulation offers great opportunities

for extensive re-use of water in the textile industry

However, serious bottlenecks for implementation exist, EU-funded Horizon2020 study reveals.

Future proofing the textile industry with respect to water use is becoming increasingly important. Customers are looking at sustainability, manufacturers are willing to invest, and technology is available. The EU funded ECWRTI project has established that a novel electro-coagulation process can achieve at least 70% re-use of wastewater. However, as the ECWRTI consortium reports in its recent whitepaper, local circumstances and regulatory aspects impede actual implementation. It advocates financial instruments and policy measures to support widespread adoption.

ECWRTI is an acronym for *Electro Coagulation for Water Recycling in the Textile Industry.* The past four years, the project has charted the prospects of the innovative EColoRO concept for extensive wastewater re-use. It was carried out by a consortium consisting of technology provider EColoRO, European textile companies INOTEX, Tintoria Pavese and Utexbel, the Belgian research institute VITO, and trade association EURATEX. ISPT, the Dutch Institute for Sustainable Process Technology, performed the overall coordination of the project.

Re-use potential of 70% and more

In a recently published whitepaper, the ECWRTI consortium disseminates its main findings. The EColoRO concept was tested at pilot scale at four sites, in three different countries, and on different kind of wastewaters. This established that at least 70% of the reclaimed wastewater can be reused in the textile manufacturing process. The ECWRTI project also included a cross-market analysis, a techno-economic feasibility study, an analysis of wastewater handling, an LCA analysis, an EU wide legal scan and Training and Education material for students and industry.

An important finding is that the business case of water re-use depends on parameters that are very specific for each individual textile plant and thus have to be evaluated case by case - there is no such thing as a 'typical' textile wastewater. The type of the freshwater source (groundwater, surface water, tap water), the processed volume of water, the pollution load of the wastewater, the required amount of energy and the discharge of the sludge and brine all contribute to the overall costs. The consortium notes that these costs are dependent on local governmental policy, while on the other hand costs-cutting pressure exist on textile manufactures as a result of buyers demands, external factors and international competitiveness.

A need for financial instruments and policy measures

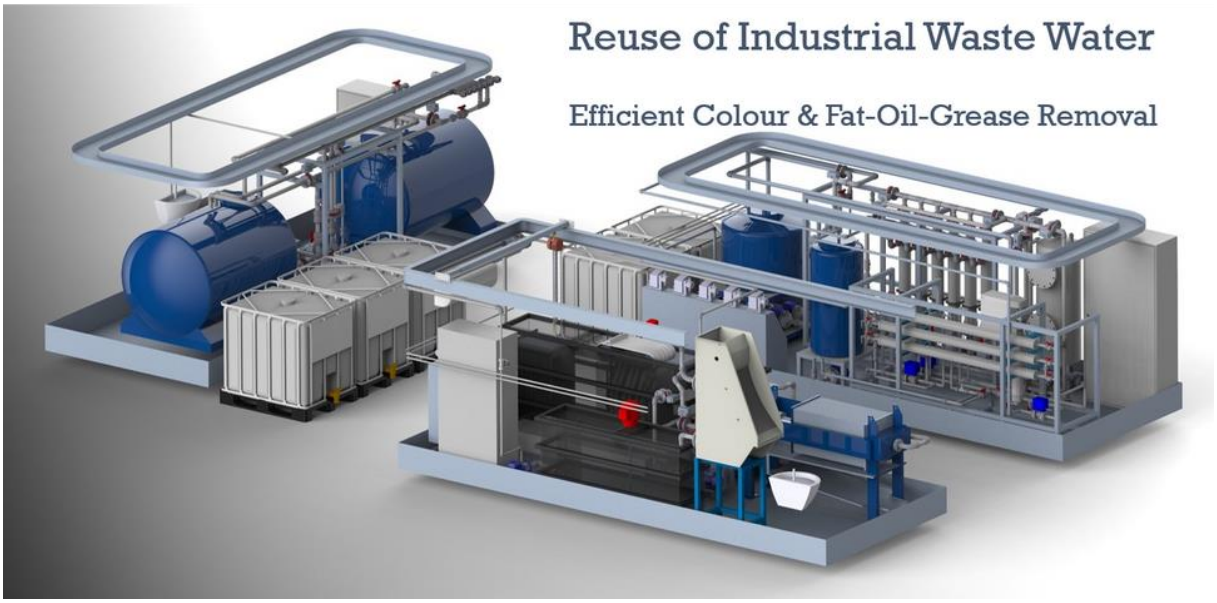
As the business case for the application of the EColoRO water re-use concept heavily depends on water and energy pricing and discharge policies (regarding cost as well as permits), the ECWRTI consortium advocates the implementation of financial instruments and policy measures to support widespread adoption.

In general, the consortium concludes, there is a clear interest of textile companies in adopting technologies for the re-use of water. In particular, experienced or forecasted water shortages are a

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No.642494

'natural' driver for this technological change. A mind-set of appreciation of water as a scarce good in general would be a further motivation for implementing water conservation strategies. The latter can be encouraged by providing financial instruments and organising national or regional workshops in combination with SDG 12 events.

Finally, the consortium expects that policy measures able to balance the additional costs for evaluating and testing innovative water-treatment technologies such as the EColoRo concept would significantly remove barriers. Measures supporting investment could complement and support widespread adoption in the sector.



The EColoRO process offers a solution to treat the wastewater of textile industries, containing a mix of colorants, chemicals, salts, metals and other organic and inorganic compounds. It is based upon the concept of electro coagulation, an additive-free process to remove the majority of all pollutants, colorants and chemicals. It starts with a low voltage electrolytic action releasing iron ions that coagulate and flocculate with the impurities present in the water. After a sedimentation or flotation step, the water is passed through ultrafiltration and reverse osmosis membranes, after which it can be re-used. Pollutants thus end up in sludge (from flocculation) and concentrated brine (from membrane filtration).

The ECWRTI project (an acronym for Electro Coagulation for Water Recycling in the Textile Industry) was carried out from June 2015 until May 2019. The total budget was € 4.800.000, including an EU contribution of € 3.700.000 as part of the Horizon 2020 Research and Innovation programme. The overall project coordination was performed by ISPT, Institute for Sustainable Process Technology, Amersfoort, the Netherlands. The technical management was with EColoRO BV, Leeuwarden, the Netherlands. Other consortium partners were Tintoria Pavese Spa (Pavia, Italy), VITO (Mol, Belgium), EURATEX (Brussels, Belgium), Utexbel (Ronse, Belgium), and INOTEX Ltd. (Dvůr Králové n.L., Czech Republic).

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No.642494