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FRESH4Cs

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Test and evaluation of the demonstrated technological solutions

Output 8

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FRESH4Cs O8

The FRESH4Cs project is an Interreg 2 Seas project that, due to the increasing issue of fresh water scarcity in coastal areas, investigated alternative and sustainable water sources across the United Kingdom, Belgium and the Netherlands. Five partners: Felixstowe Hydrocycle (FHC), Aquaduin, Vlaamse Landmaatschappij (VLM), Dow and Lamb Weston/Meijer (LWM), were responsible for executing the demonstration cases. These cases were grouped into three approaches: water distribution, (above and underground) water storage and water treatment. For this, two water types were chosen as sources: surface freshwater surplus; due to precipitation and treated wastewater. The profile of the water source, that is, its composition, was seen as an essential factor for a successful case, as well as the receiving water body profile, when applicable. For this reason, the water quality of the related streams were monitored prior to and after each demonstration case. This was concluded to be fundamental for assessing if the water quality was suitable for a specific case and if it complied with the specific legislation; the latter can vary per country and also be site specific. All three approaches were proven to produce possible alternatives for freshwater availability. The water distribution system managed to take the surplus surface freshwater, during rainy seasons, through a pipeline and combine it with above ground water storage (reservoirs). Water was also successfully stored underground by using two infiltration technologies: the managed aquifer recharge system and creek ridge infiltration; although a larger scale system seems necessary in order to be financially viable. Water treatment was explored with a willow field, which was assessed as suitable for treating reverse osmosis effluent, especially regarding the removal of biologically degraded compounds and nitrogen. Partners have then proven that the tested techniques work in the right circumstances and actively contribute to increasing freshwater availability in coastal regions. However, the water source is a critical influencing factor on the eventual feasibility of the cases; it will lead to extra costs if extra treatment steps are required, and can even make an alternative unsuitable. The achieved results are summarized in Table A1, in which it is shown that four demo cases were considered to be successful in providing a fresh water alternative, but that still requires a pre-treatment of the water source. It is worth noting that not all demonstration cases could be realized within the duration of the FRESH4Cs project, due to various reasons, but some are still planned to be used to produce a freshwater alternative in the future.

Table A1 - FRESH4Cs demo cases overview

Freshwater alternative	**FHC**	**Aquaduin**	**VLM**	**Dow**	**LWM**
Type	Distribution + Storage	Treatment	Storage	Storage	Storage
Specific	Basin	Willow field	Surface water	CRI	Surface storage
	MAR	-	CRI	-	CRI
Next steps	Pre-treatment prior to infiltration (MAR)	Improve willow field performance	Surface storage	Pre-treatment prior to infiltration (CRI) and full scale development	Pre-treatment prior to storage/ distribution

Green: Tested during project and suitable for producing freshwater alternative
Yellow: Not tested during project but suitable and/or planned for producing a freshwater alternative
Red: Not suitable and/or not planned for producing a freshwater alternative