SpotView Newsletter # 3

Introducing Key Exploitable Results and Exploitation Strategies

The objective of the SpotView project is to develop and demonstrate innovative, sustainable and efficient processes and technology components in order to optimize the use of natural resources, especially water, in three industrial sectors (Dairy, Pulp and Paper, and Steel).

Each alternative processes and technologies to be implemented will be assessed in terms of environmental impacts and benefits that could be generated by achieving proposal targets (reduction of water use, wastewater production, chemicals and energy use). The impact and exploitation plan is updated during the project's life and will include the following sections: i) exploitable knowledge and its use: in this section, partners will identify all the exploitable results arising from the project and their intentions for use; ii) key performance indicators, iii) Exploitation of foreground IP: in this section partners will establish a timeline for further development and commercialization of core SPOTVIEW technologies.

This 3rd Newsletter presents the list of water management strategies and technologies assessed after mid-term of the SpotView project (October 2016 to March 2020) and details some of the Key Exploitable Results (KER) and Exploitation Strategy.

Strategies and technologies being developed and demonstrated in SpotView

Strategies				Technologies			
Separative technologies to recycle process water and recover valuable substances				Pulp Washer (Screw press)			
Improve WWTP to recycle water and produce biogas				Dissolved Air Flotation (DAF)			
Water reuse without treatment (cascade technique)				Sand filter			
Microbial control for water recycling				Ultrafiltration (UF)			
Saving fresh water using rain/sea water				Reverse osmosis (R)), ion exchange (IX), Capacitive Deionization (CDI)			
Waste heat recovery				Enhanced biological treatment			
				Micellar Enhanced Ultrafiltration (MEUF)			
				Elevated Pressure Sonication (EPS)			
				Membrane Bio Reactor (MBR)			
				Biocontrol Concept			
				Chemical Heat Pump (CHP)			

Zoom on Methodologies

- CERTH / MEVGAL Recovery of valuable compounds from dairy wastewaters using membrane technology
- CERTH / MEVGAL Anaerobic/aerobic MBR lab-unit for dairy effluent valorization
- BFI / Desalting and softening of cooling water with capacitive deionization
- PDC / Exploitation Strategy

OUTLINE

CERTH
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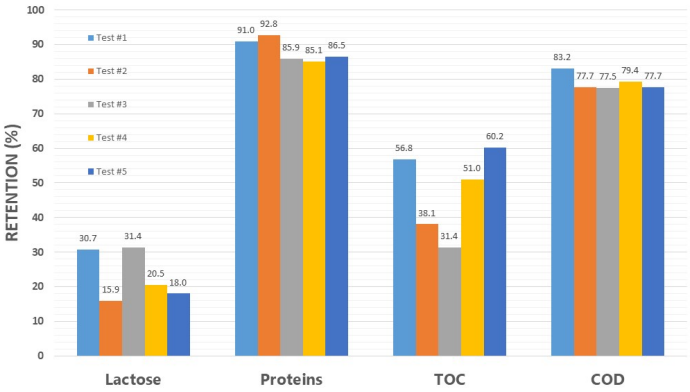
MEVGAL
Milk. The essence of our life

Recovery of valuable compounds from dairy wastewaters using membrane technology

Existing and novel membrane-based separation technologies were evaluated at CERTH for the recovery of valuable compounds from the dairy wastewater streams. Aqueous streams from cleaning equipment processing milk and yoghurt (henceforth termed "flushing milk" and "flushing yoghurt") were of particular interest due to their significant contents of the valuable compounds. Using these streams, different types of membranes and of operating modes were tested at lab scale to recover compounds such as fat, protein and lactose. Four types of membrane processes were systematically investigated, including microfiltration, ultrafiltration; micellar enhanced ultrafiltration (MEUF) and nanofiltration. Submerged -type UF membranes emerges as the best choice overall for practical applications (pursued in this study), since it is characterized by relatively high selectivity, low membrane-fouling tendency and performance stability as well as relatively low energy consumption. The results have shown that both flushing milk and yoghurt streams were sufficiently concentrated by the selected UF membrane, thus permitting their direct reuse in appropriate dairy production lines. Typical data of UF-membrane retention characteristics, useful for pilot- and full-scale process design, are shown in the Figure below.



Anaerobic/aerobic MBR lab-unit for dairy effluent valorization

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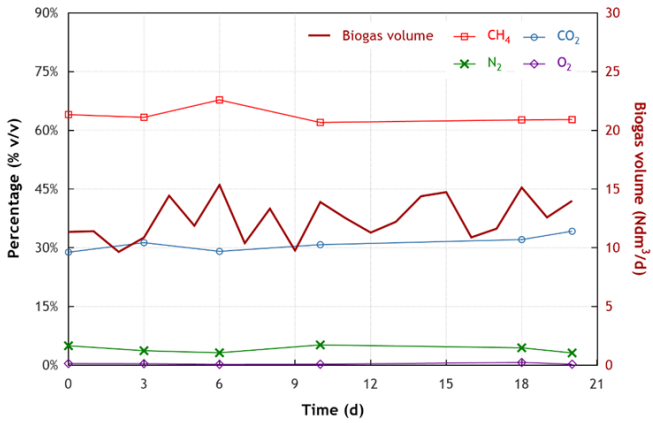
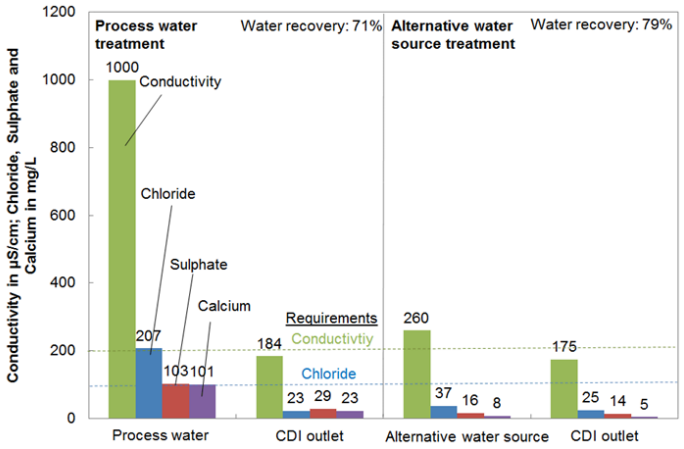
The aim of this task is to valorize effluents with significant organic load, by recovering biogas in an anaerobic processing stage and clean water for recycling in a subsequent aerobic MBR treatment. The overall performance of a lab-scale anaerobic/aerobic MBR pilot unit, developed at CERTH, was quite satisfactory for this task. The removal efficiencies of organic matter and the biogas production rate were satisfactory, in pilot system operation under both low and high rates of organic loading, which are likely to be encountered in the dairy processing industry. The resulting effluent from the final stage of the aerobic MBR was of fairly high quality, with characteristics permitting its reuse / recycling for water conservation. The quality of produced biogas was quite good (~65% methane, v/v), as shown in the Figure below, considering the relatively low organic loading. In general, the investigated novel technology, appears to have notable advantages in valorizing the effluents (biogas production, water recycling), as well as in significantly reducing the load of the MEVGAL waste-water treatment plant.



Desalting and softening of cooling water with capacitive deionization

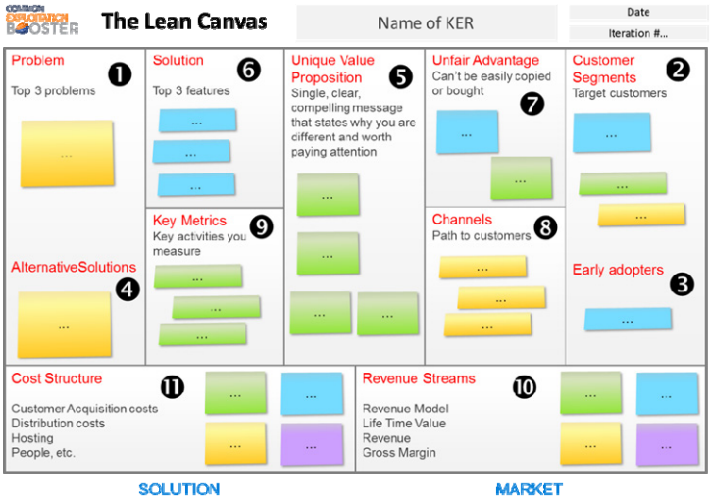
Capacitive deionization (CDI) is a new ionization method for the removal of ions from water by electrostatic adsorption on two opposed charged electrodes by a low-voltage electromagnetic field. In front of the porous electrodes, ion exchange membranes are installed to improve the removal efficiency. After loading the electrodes with ions a cleaning cycle is performed by reversing the polarity of the electrodes and discharging the ions in a concentrate stream. The CDI differs from electro deionization (EDI) and reverse osmosis (RO) by a low energy demand.

Focus in the Spotview project is the application of the CDI for the desalting and softening of process waters and alternative water sources in steel industry. Main components prohibiting the use of this sources are salts as chloride and sulfate causing corrosion respectively hardness forming components as calcium or magnesium causing scaling. By using the CDI, Cl and hardness forming components can be decreased up to 87% respectively sulphate up to 66% with a water recovery up to 79%.First trials with waste water from paper industry showed promising results.



Exploitation Strategy

All SpotView partners actively attended the Exploitation Strategy Seminar (ESS) which was organised as Common Exploitation Booster service on 11th of April 2018 in Luxembourg and supported by the EC H2020 Common Support Centre. The seminar and preparation work focused on identification and evaluation of Key Exploitable Results (KERs), mutual interaction with other technologies, setup of lean CANVAS models for the KERs, and guidelines on how to approach potential customers including how to pitch the KER. Four out of these KERs have been the subject of this first ESS. Beyond June 2018 the KERs will be re-evaluated several times. The commercial exploitation of the SpotView results follows different routes, depending on the type of organization involved, developed IPR, and industrial sector. It is expected that the list of KERs will grow towards the end of the SpotView project (March 2020) and will also include new sustainable implementation strategies beside technologies.



SPOTVIEW WORKSHOP

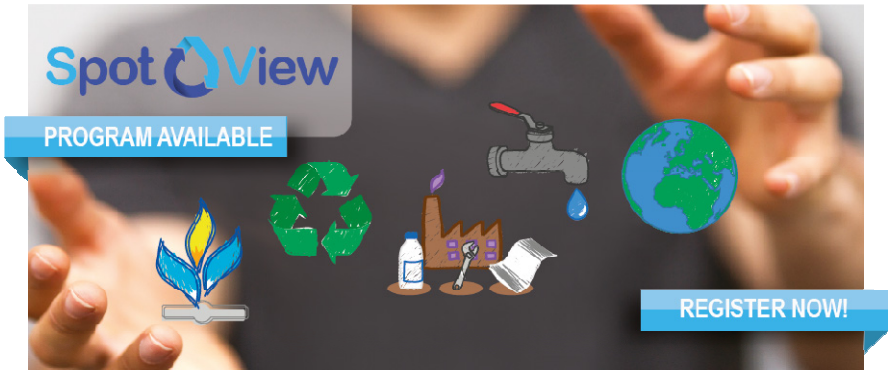
4th October 2018, in Avilès (Spain).

Workshop focus:

Water treatment and separation technologies
Alternative water sources for process industries
Heat and chemical substances recovery from effluents
Alternative disinfection techniques

Programme:

The Workshop Programme with venue information and registration form are now available on www.spotview.eu…
Participants can submit poster proposal before August 31.



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Venue and Times

One day from 9 am to 5 pm
At Centro Niemeyer, Avda. Del Zinc, s/n
33400 Avilés / 902 306 600, Spain

SPOTVIEW

Spot View

Communication

ctp centre technique du papier

Eric FOUREST
Sandrine PAPPINI

www.SpotView.eu

Events for SpotView Project

SPOTVIEW MotionDesign CTP 04 2018 Objectives

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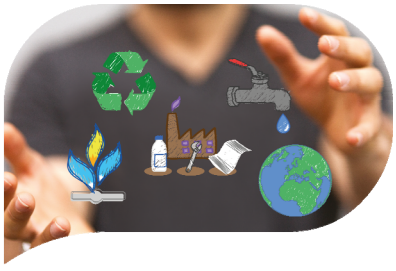

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