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DETAILS

PROJECT TITLE: Intelligent Water Treatment for water preservation combined with simultaneous energy production and material recovery in energy intensive industries.
START DATE: 01/10/2020
END DATE: 31/03/2024
TOPIC: Preserving fresh water, recycling industrial waters industry
SECTOR: Water technology

CONTACTS

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MORE INFO
www.intelwatt.eu
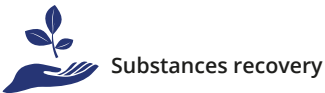
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PROBLEM

Water environmental monitoring is an important key to control and take care of human life and environment health. When water quality is poor, it affects not only aquatic life but the surrounding ecosystem as well. Man-made settlements, pollution and climate change have long been generating problems that they can directly influence the quality of supply sources. Continuously increasing contamination levels are detected in water bodies due to fertilizers, heavy metals and pesticides.

For this purpose, following key technologies have been identified to have a strong potential for boosting fresh water preservation in energy intensive processes. The consortium aims to improve the state of the art in these technologies in order to bring the technology up to the level of demonstration on real environments (TRL7-8).
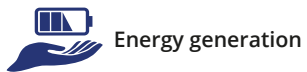
Three pilot units will be developed for:

Water reuse

Substances recovery

Energy generation

PROJECT

intelWATT is an Horizon 2020 funded project which aims to create intelligent Water Treatment Technologies for water preservation combined with simultaneous energy production and material recovery in energy intensive industries. Three TRL7 case studies will be implemented in crucial EU and global industrial applications such as electricity production, mining and metal plating.

CASE STUDIES

Cooling tower blow down treatment: water abstractions for production of electricity

The salinity gradient energy: seen as a renewable energy source

Simultaneous metal recovery and wastewater treatment in plastic electroplating production

METHODOLOGY

Phase 1
Water process streams

Phase 2
Customization of membranes

Phase 3
Design, construction, commissioning and operation

SOLUTION

The intelWATT project aspires to provide an integrated water management concept for the water reuse and preservation for energy intensive industries. This approach takes under consideration future directives and restrictions concerning water abstraction and material use. To ensure that this is applicable and satisfies real demands, a precise analysis of water usage in the industrial processes will be performed. Machine learning, incorporated to intelWATT's proposed demonstrative units, will effectively control and optimize their operation after training, taking as feedback, not only the smart sensors data but also key production requirement indexes, as well as, energy and water consumption restrictions. The proposed solutions will also target at zero liquid discharge while implementing maximum water reuse. Tailor made sensors and automated decision-making mechanisms will optimize the process conditions in real time. The project will implement smart sensor technology for online monitoring, real time process adaptation and deep learning, with customizable intelligent industrial process software module based on an agnostic protocol connectivity cloud infrastructure.

KEY TECHNOLOGIES

Life Cycle Assessment

Process Optimization

Artificial Intelligence

Smart Sensor

Membrane & IX technology