

SpotView

Sustainable Processes and Optimized Techniques
for Industrially Efficient Water Usage

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SpotView



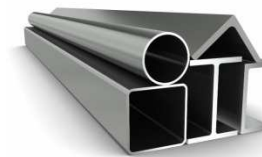
Horizon 2020
European Union Funding
for Research & Innovation



Concept of the project

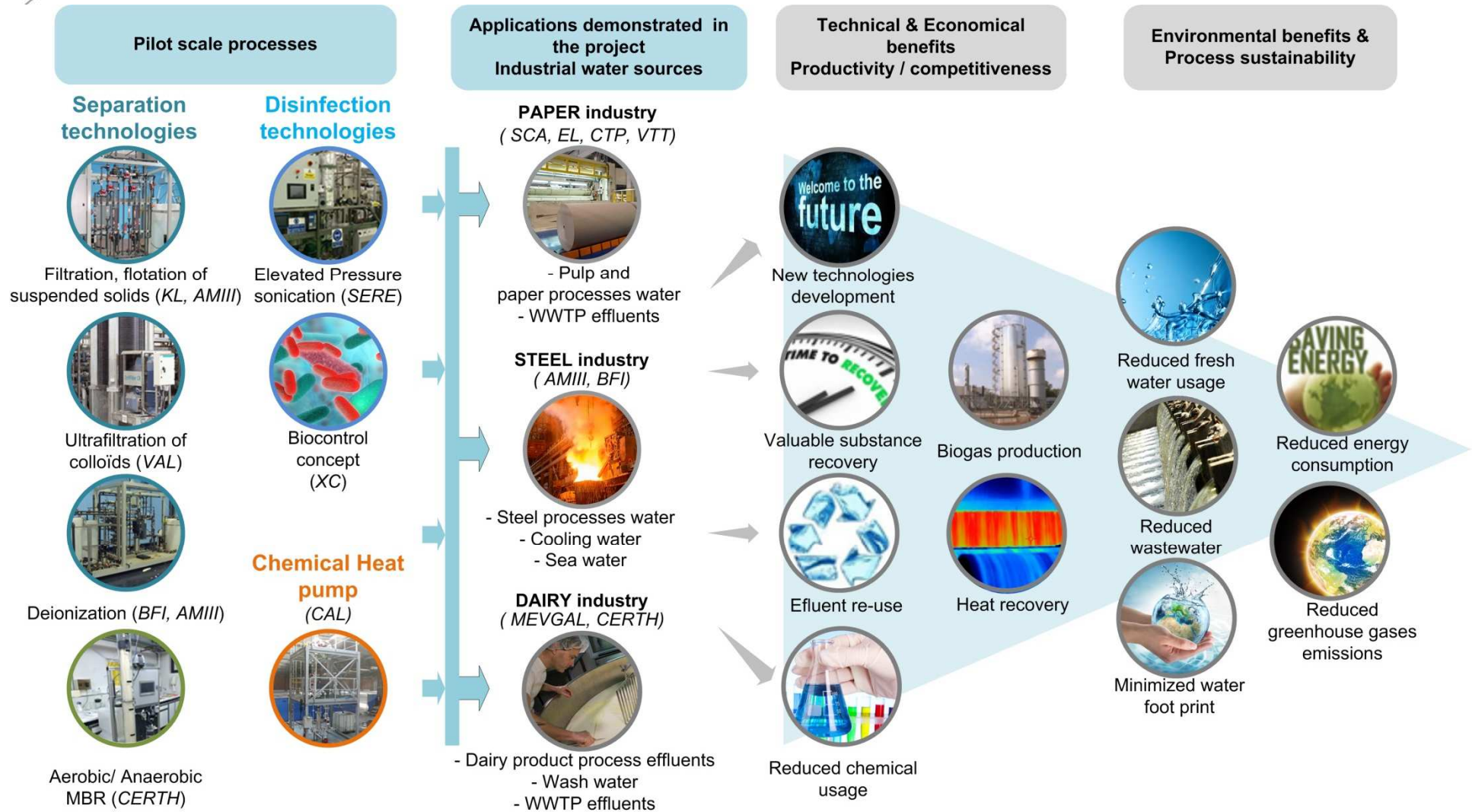
- **Objectives:**

- 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**)



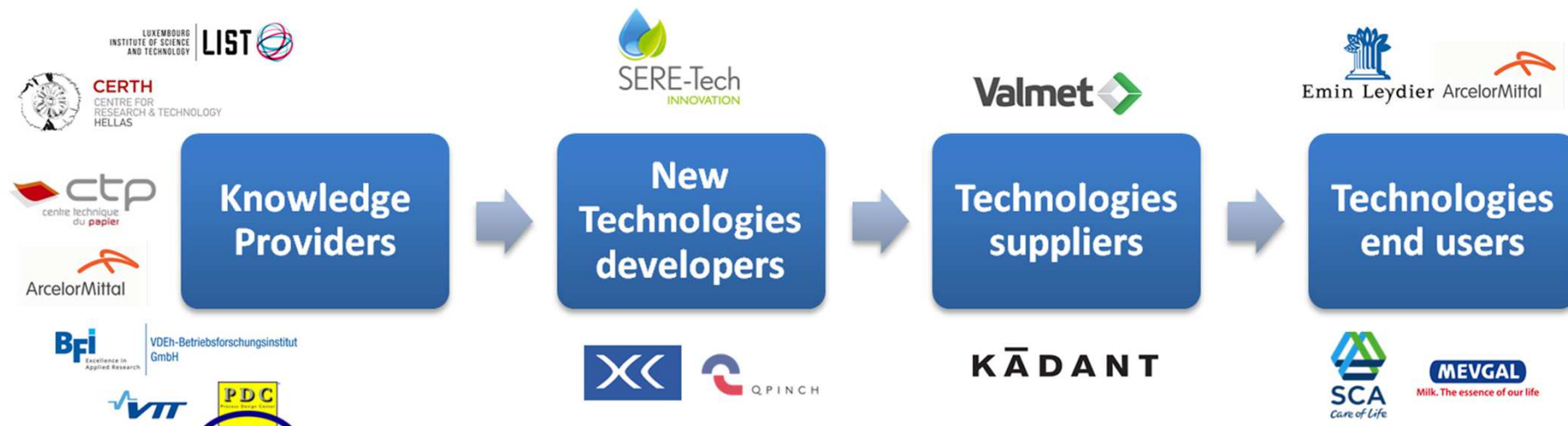
- **14 existing and new technologies** will be assessed, including solid/liquid separation, ultrafiltration, deionization, biological treatment, disinfection and chemical heat pump
- **9 water management practices** assessed in simulated or operational environment for in the three industrial sectors
- **7 selected technologies demonstration** in industrial environment

Concept of the project







European consortium

The XV of Europe



from 9 EU countries

Technologies and Strategies

| Strategies (deliverable D4 – WP2) |  |  |  |  |
|--|---|---|---|---|
| Extraction and recovery of valuable compounds from process streams | | | | |
| Reuse of WWTP effluent | | | | |
| Product sterilization on a by-product/waste stream | | | | |
| Use of biogas from the anaerobic WWTP | | | | |
| Close loop water recycling (CIP effluents) | | | | |
| Novel method form microbial control | | | | |
| Internal process water purification and microbial control | | | | |
| Use of waste heat recovery from effluents | | | | |
| Recycling of back flush water of sand filtration | | | | |
| Cascade reuse of process water with different qualities | | | | |
| Saving fresh water using rain/sea water | | | | |

Concept of the project



- **Objectives**

- Each **process and technology** will be evaluated in terms of **environmental impacts and benefits** (SpotView targets: **20% to 90%** reduction of water usage, wastewater emissions, chemicals and energy use).
- **Economic exploitation** of the proposed technologies is pursued through a well described business case scenario and market penetration strategy

- **Expectations**

- **Market opportunities for future services and technology products**
 - up to **2800 new equipment** and **7000 new jobs** in Europe
- **Expected gains for the industrial sectors:** **1.5 b€** for Europe
 - recovery of by-products
 - cost economy related to energy, chemicals and additives saving,
- **Production capacity increased** for technology end-users: up to **20 b€**

Work Programme

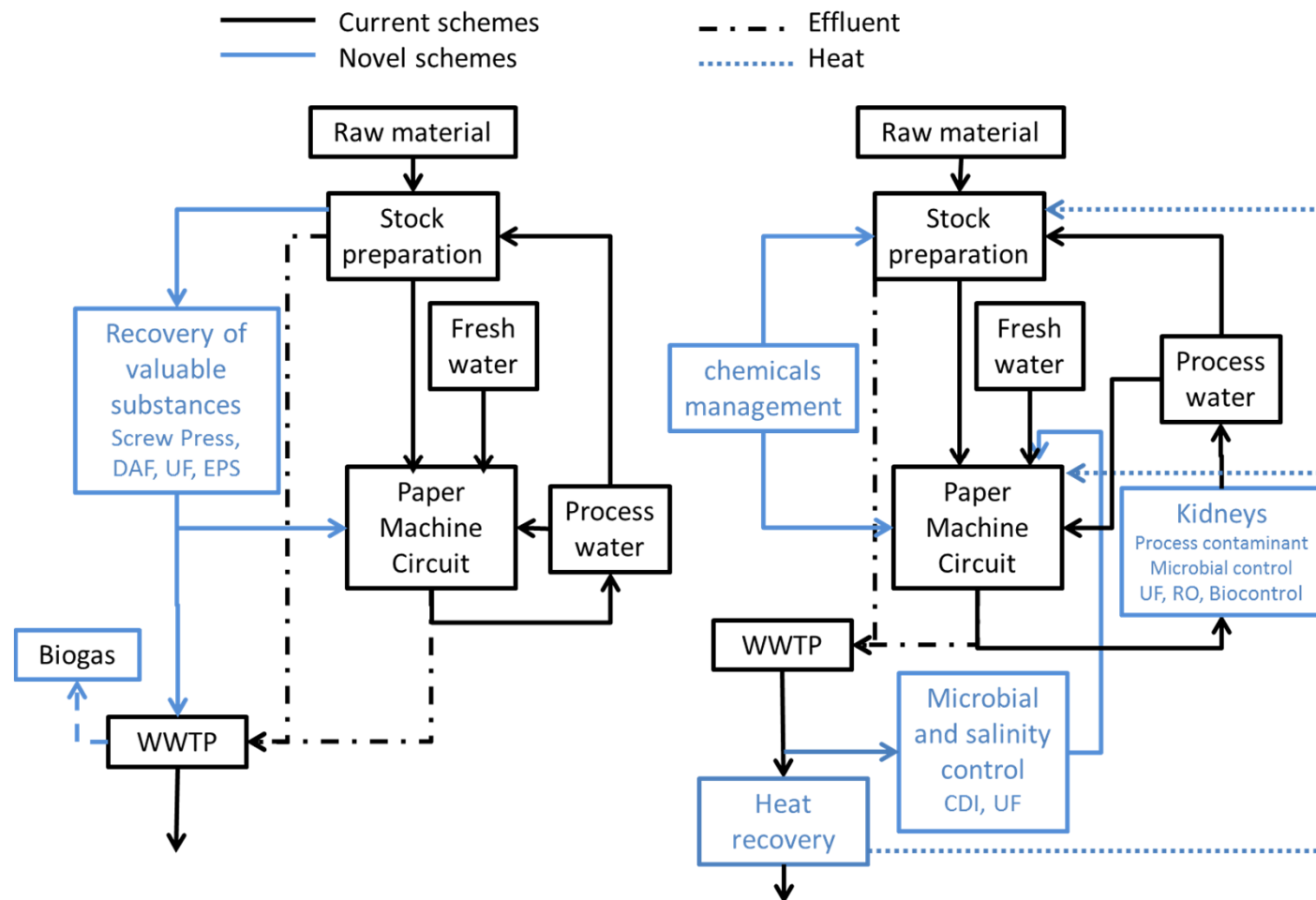
- **WP2 – Technologies components testing in realistic environment**
 - **Select and assess** existing or innovative technologies and process components.
 - **Test individual technologies or process components** in realistic environment,
 - under ‘high-fidelity’ laboratory set-ups
 - with real or closely simulated water and wastewater samples.
- **WP3 - Technologies assembling in simulated or operational environment**
 - **Combination of selected technologies and processes** to optimize water usage in each industrial sectors,
 - **Assessment** of these combinations in **simulated** (process model) or **operational environment** (pilot).

Work Programme

- **WP4 - Technologies demonstration in operational environment**
 - **Demonstrate** the techniques selected in the WP3 **at industrial sites** from the **dairy, paper and steel industries**.
 - As basis for the business cases the **pilot plant** will be installed in situ..
 - Results will be compared with the ones obtained in WP3 to **define rules for the scale up** used for the later business
- **WP5 - Environmental and techno-economic evaluation**
 - Supporting the **development of technology solutions** in WP2 and WP3 and at assessing the sustainability of the demonstrators from WP4 through **environmental, hazard and techno-economic evaluations**
- **WP6 - Innovation outreach, impact, and exploitation**
 - Maximize the outreach and impact of innovations of the SPOTVIEW project in terms of **enhanced market and business opportunities**, growth and jobs in Europe, and **dissemination of non-proprietary results**

Concept of the project

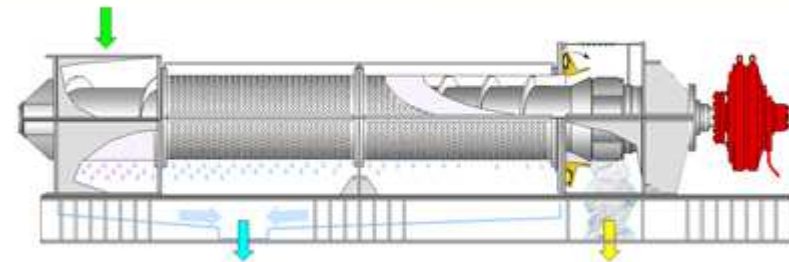
Figure 3: new water management practices for the Paper Industry



Key technologies – Pulp washing

- **Kadant Lamort Physico** – Chemical separation includes pulp washing technologies: **extraction presses** seems to be most relevant unit for efficient separation.
- Such equipment have been applied in several industries including Pulp & Paper, mainly for thickening and liquid / solids separation.
- **Application:** optimizing the extraction of solids and colloids by designing a high extraction yield unit.
 - Demonstration in industrial Environment
 - TRL of such technology is 7 or 8.

KĀDANT



Emin Leydier

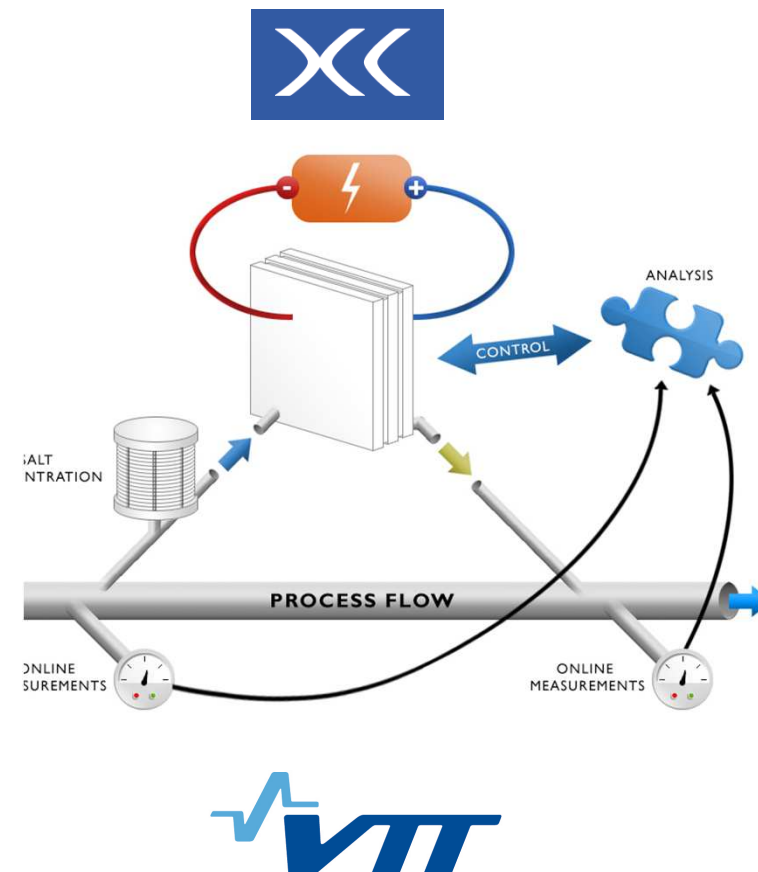
Key technologies – OptiFilter CR

- **Valmet Technologies Inc.** has developed a new **Optifilter CR ultrafilter** for tissue mills
- Produce **high quality water** for the paper machine's wire and press section showers.
 - free from solid substances, colloidal material, turbidity, bacteria and secondary/micro sticky
 - contains 50-70 % less anionic trash than the feed water.
- OptiFilter CR device will be used at **Essity Nokia mill** to **replace warm fresh water** by UF process water,
 - **decreasing fresh water** consumption by **1-2 m³/t paper**
 - Generating **savings in heating** energy.



Key technologies - Biocontrol

- **Biocontrol concept**
 - Biocide is produced at-site directly from the salt substances in the process by utilizing **electrolysis**.
 - For **cost efficiency**, concentration of the salts is needed before electrolysis.
 - **Membrane technology** will be used in purification and concentration of salt substances for the electrolysis.
- Biocontrol will be tested on site with electrolysis system developed by **XerChem**.

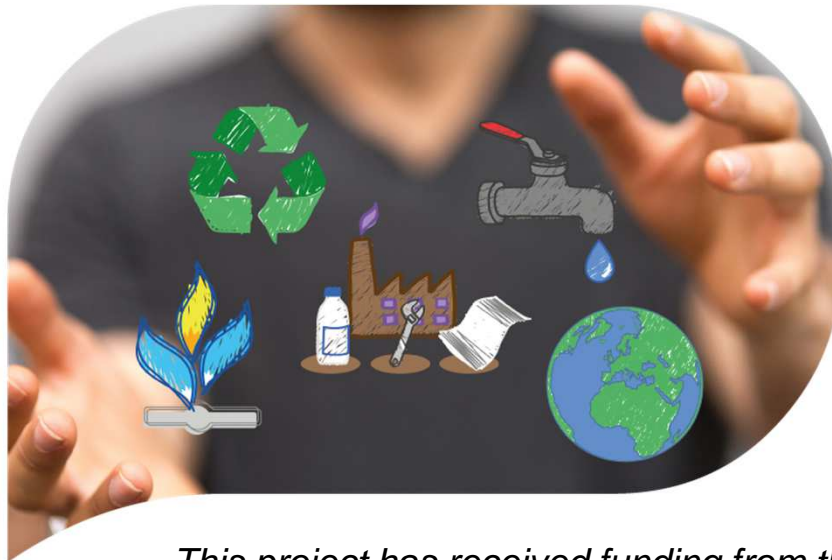


Key technologies – Chemical Heat Pump

- **Description:** The novel and patented **chemical heat pump** uses liquid polyphosphates and water,
 - analogy to adenosine triphosphate (ATP) as used by living cells.
 - much **higher temperature increases**
 - up to 100°C –
 - 20 to 30x **less electrical energy consumption**.
- **Application:** the chemical heat pump will be further studied and developed for dairy, paper and steel industry with a focus on **lower temperature waste heat (<75°C)**.



Thank You



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