



Project Information

Project acronym	SMART-Plant
Title	Scale-up of low-carbon footprint MA terial R ecovery T echniques in existing wastewater treatment PLANT s
Call	H2020-WATER-2014-2015, WATER-1b-2015
Grant agreement no	690323
Starting Date	1/6/2016
Duration	48 Months

Project Abstract

SMART-Plant scales-up in real environment eco-innovative and energy-efficient solutions to renovate existing wastewater treatment plants and close the circular value chain by applying low-carbon techniques to recover materials that are otherwise lost. 7+2 pilot systems have been optimized in real environment in 5 municipal water treatment plants, including also 2 post-processing facilities. The systems are automatized with the aim of optimizing wastewater treatment, resource recovery, energy-efficiency and reduction of greenhouse emissions.

A comprehensive SMART portfolio comprising of biopolymers, cellulose, fertilizers and intermediates is being recovered and processed up to the final commercialisable end products.

The project intends to prove the feasibility of circular management of urban wastewater and environmental sustainability of the systems, to be demonstrated through Life Cycle Assessment and Life Cycle Costing approaches.

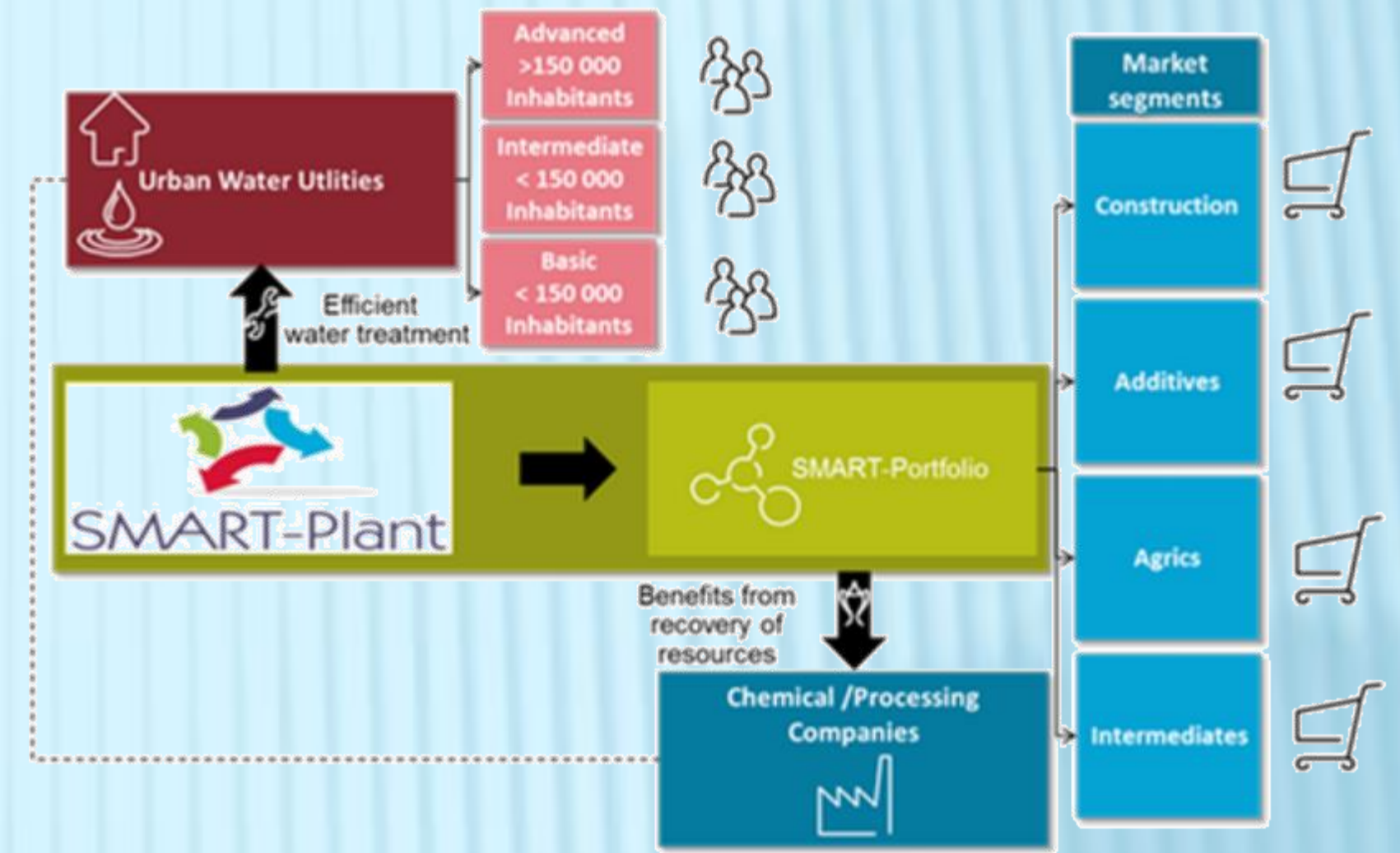


Figure 1: SMART-Plant overview

Location of sites



Figure 2: Psytalia wastewater treatment plant

- SMARTech1 - Geestmerambacht (Netherlands)
- SMARTech2a - Karmiel (Israel)
- SMARTech2b - Manresa (Spain)
- SMARTech3 - Cranfield (UK)
- SMARTech n 4a – Carbonera (Italy)
- **SMARTech4b - Psytalia (Greece)**
- SMARTech n: 5 – Carbonera (b) (Italy)
- Downstream SMARTechA - London (UK)
- Downstream SMARTech B – Manresa (b) (Spain)

Innovative technologies

- Upstream dynamic fine-screen and post-processing of cellulosic sludge
- Mainstream polyurethane-based anaerobic biofilter
- Mainstream SCEPPHAS
- Mainstream tertiary hybrid ion exchange
- SCENA: Short-Cut Enhanced Nutrients Abatement
- **Sidestream SCENA enhanced AD**
- Sidestream Short-Cut Enhanced Phosphorus and PHA recovery (SCEPPHAR)
- Formulation of recovered cellulosic and PHA materials+extrusion
- Post-processing of cellulosic and P-rich sludges

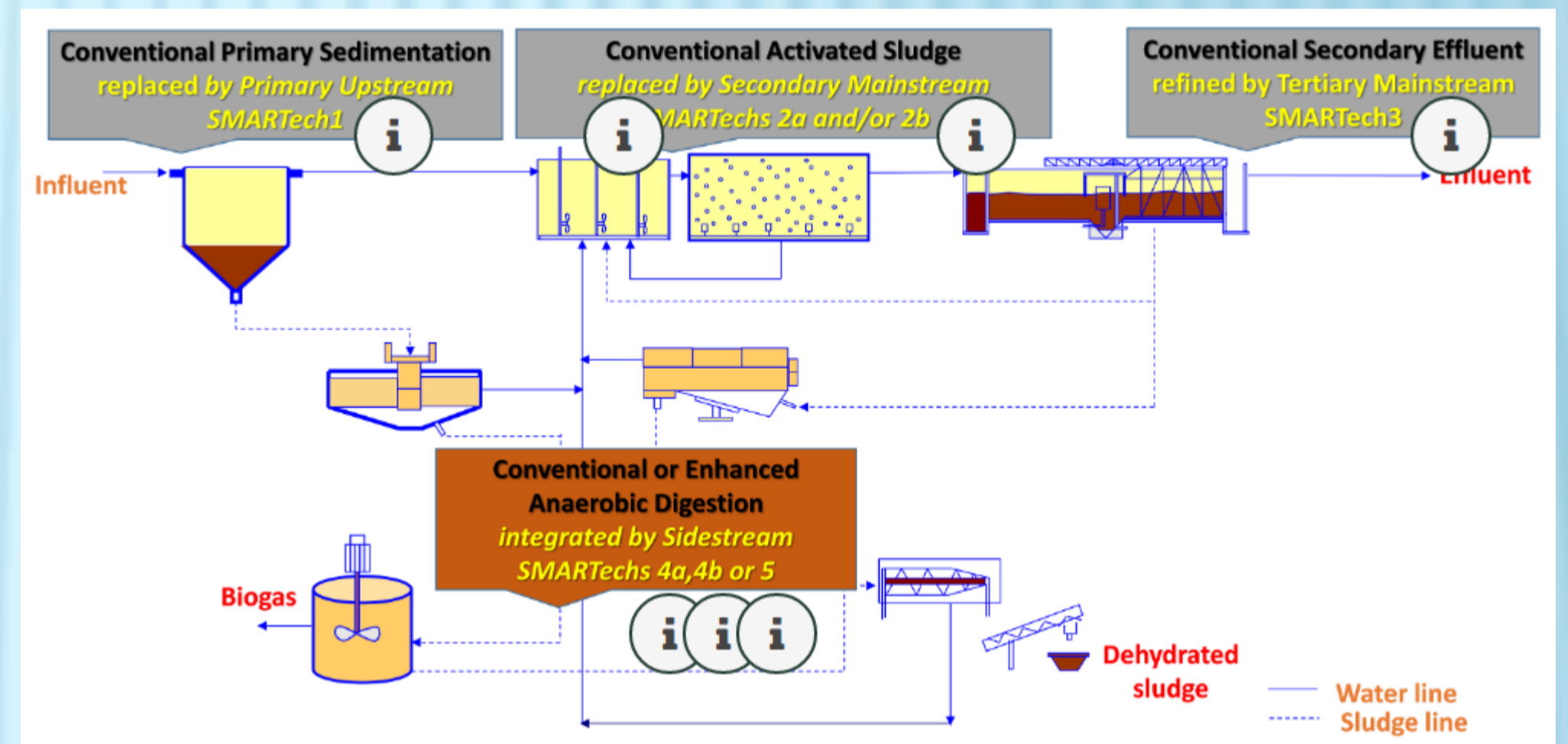


Figure 3. SMART-Plant technology platform: approach for integration in existing conventional wastewater treatment plants

Activities of EYDAP in the project

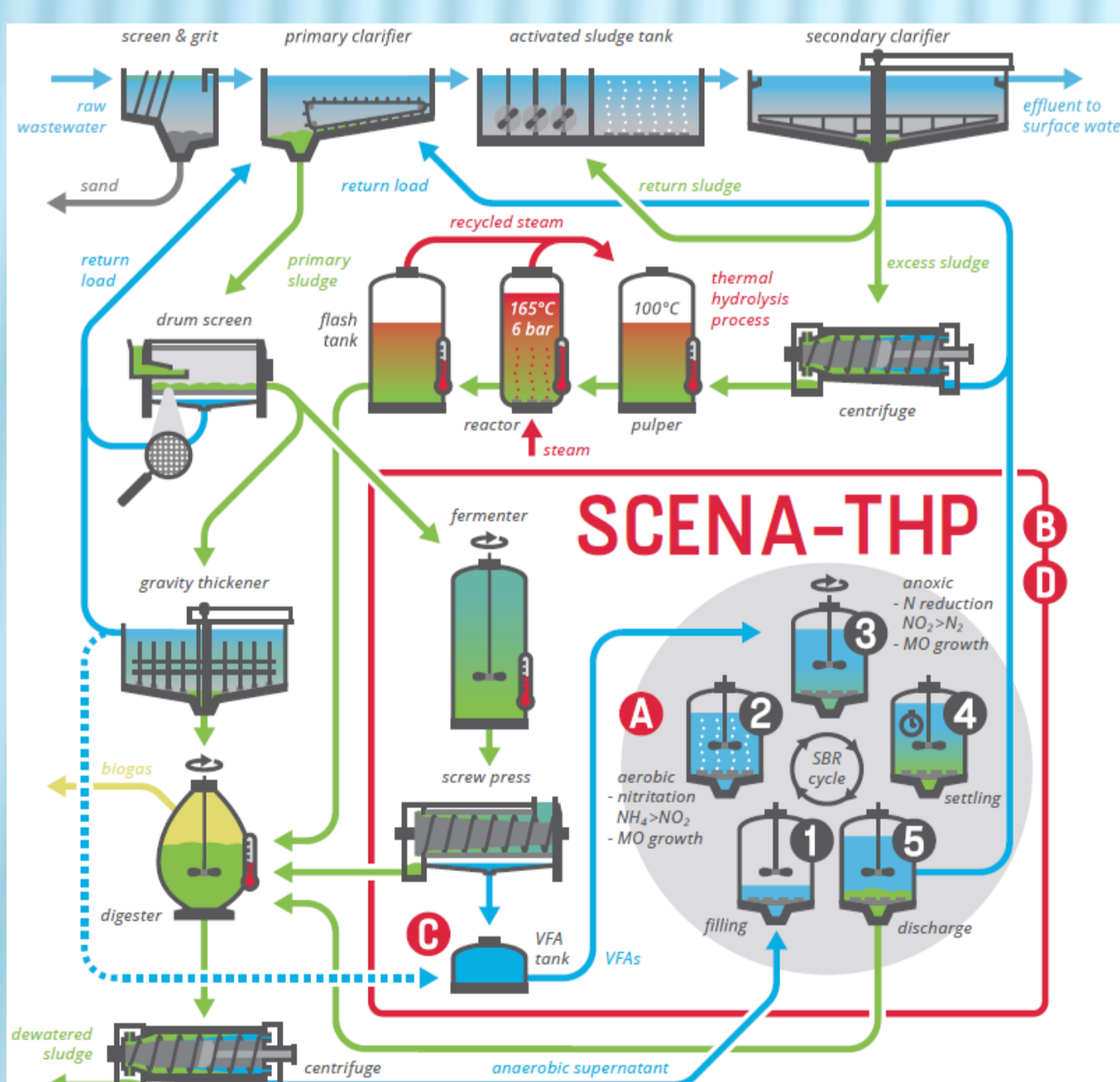


Figure 4. Illustration of the SCENA-THP – SMARTech4b process

- Development, monitoring and optimization of a side- and down-stream pilot plant (SMARTech4b). The SMARTech4b will treat the reject water produced following dewatering primary and secondary sludge.
- Valorization of EYDAP's expertise in public/private water utility management for the development of SMART techniques for biological nitrogen and phosphorus removal from wastewater along with market deployment strategy for biomass exploitation.

Benefits for EYDAP

- Development and demonstration of an innovative biological nitrogen and phosphorus removal system from wastewater.
- Reduction of the energy costs of installation due to lower requirements in oxygen.
- Reduction of the load of nutrients received by the main biological unit



Figure 5. SMARTech4b pilot plant at Psytalia