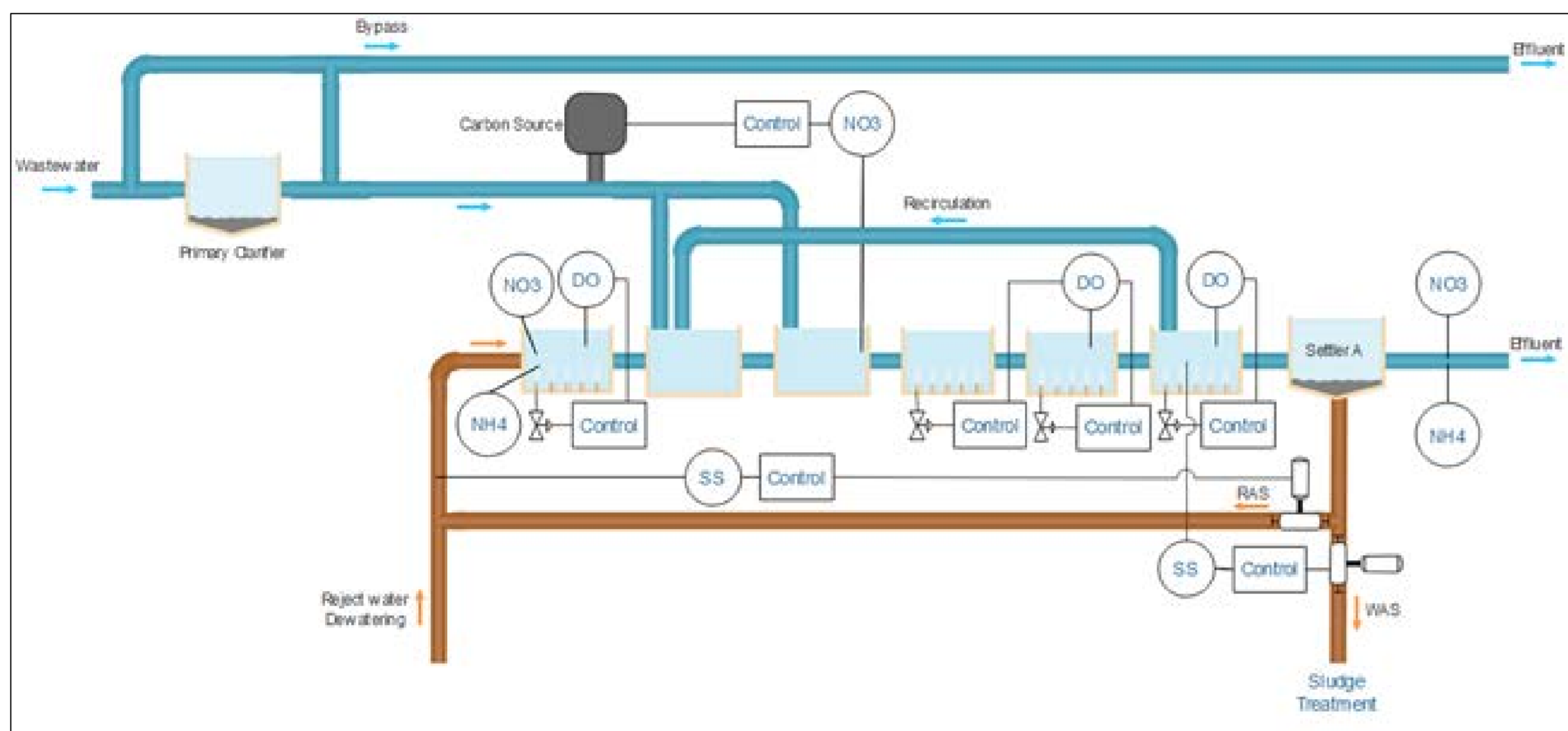


FUDIPO project aims to develop an integrated set of methods combining mathematical modeling and simulation to optimize all the processes in a factory or technology from an holistic point of view. The applications will be for both improvements of existing processes of a factory or technology as well as for developments of totally new production system solutions, where experience from existing processes is gathered in the simulation models. One of the case studies is a **biological wastewater treatment plant**.

Partner: ABB & Mälardalen University (Sweden)
Process: Wastewater Treatment Plant
Location: Västerås, Sweden
Description:

- The plant treats sewage from the equivalent of 118,000 population.
- The treatment involves screening, pre-precipitation, biological treatment, primary and secondary settler, and sludge treatment.
- One of the treatment lines is taken as case study.

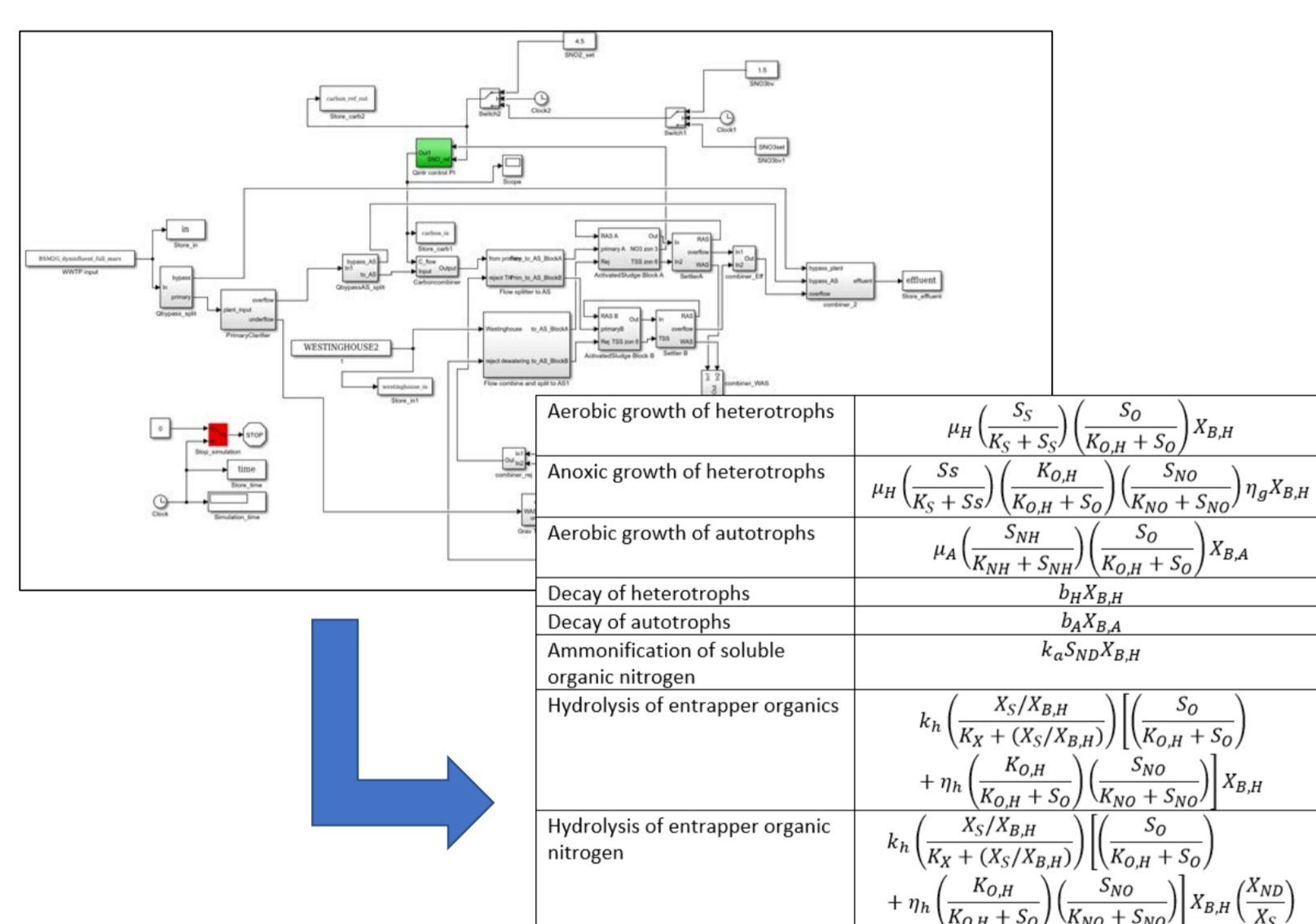


The current case study involves the following control strategies:

- Control of dissolved oxygen concentration in aerobic tanks (with set-point fixed by the operator) via aeration system.
- Control of suspended solids concentration by manipulation of the external recycle flow rate.

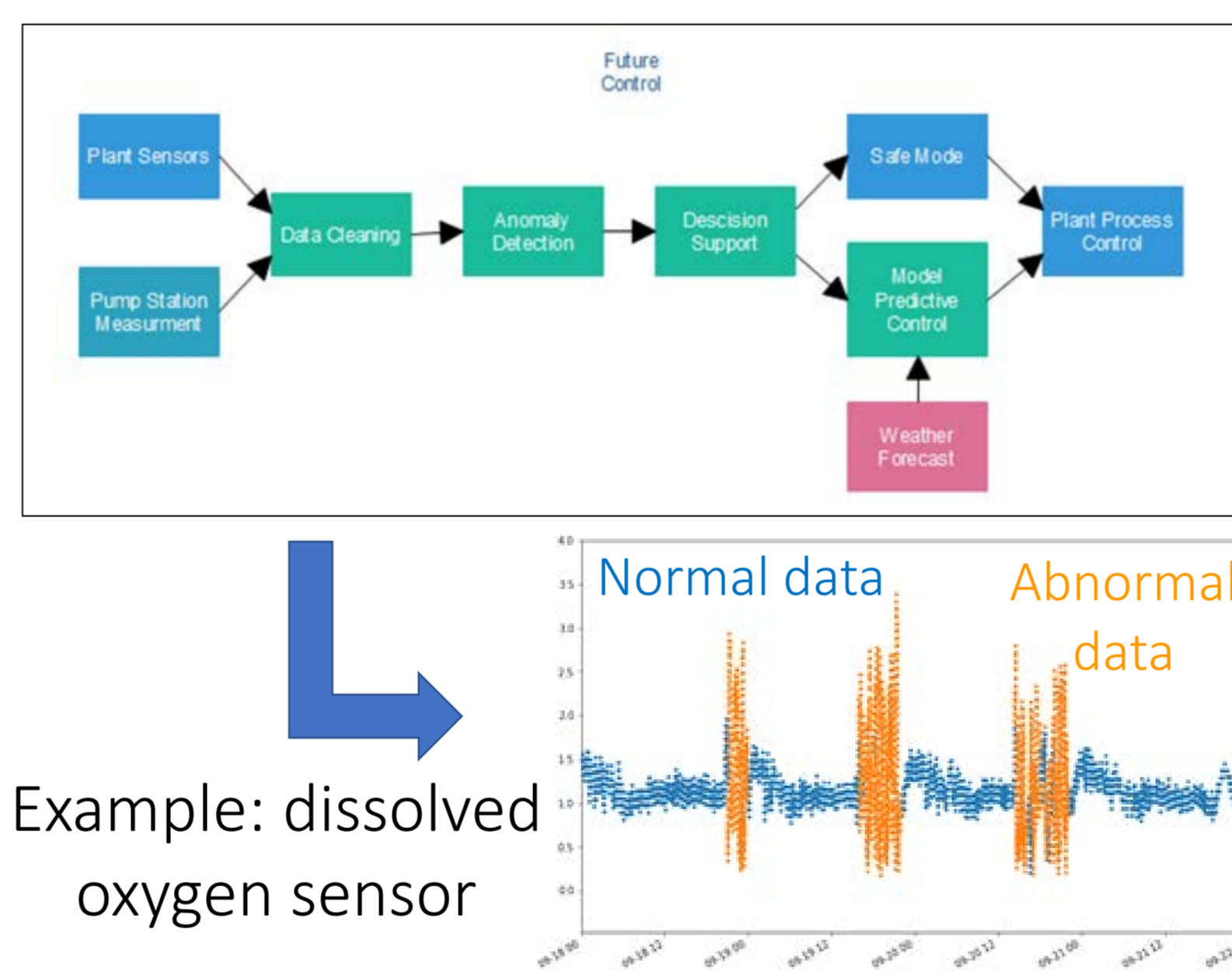
Process Modeling

- Mathematical description of the process dynamics.
- Implementation in Matlab/Simulink platform.



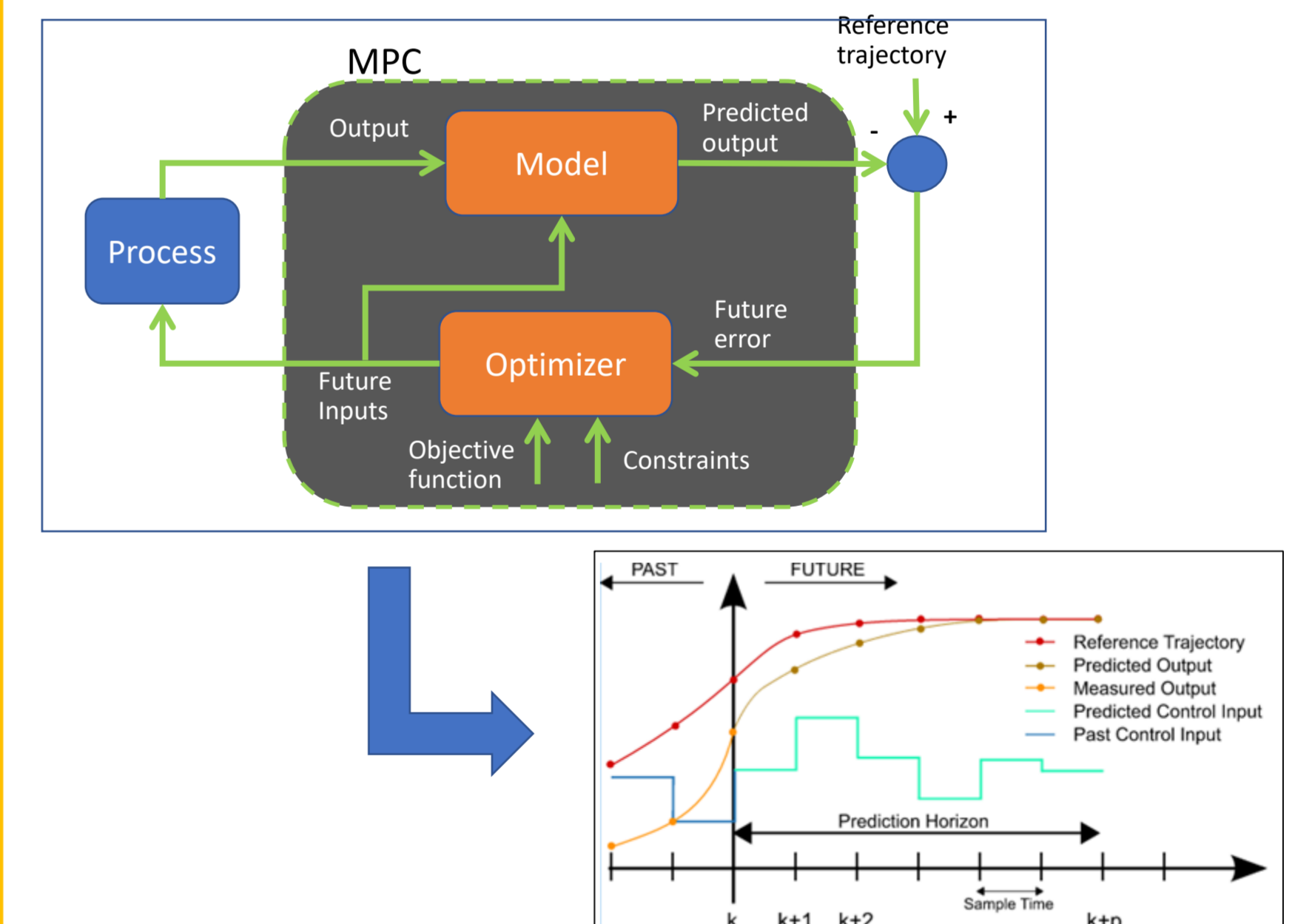
Data Cleaning

- Identify data with high variance.
- Implemented using K-means clustering.
- Faulty data replaced by accepted data.



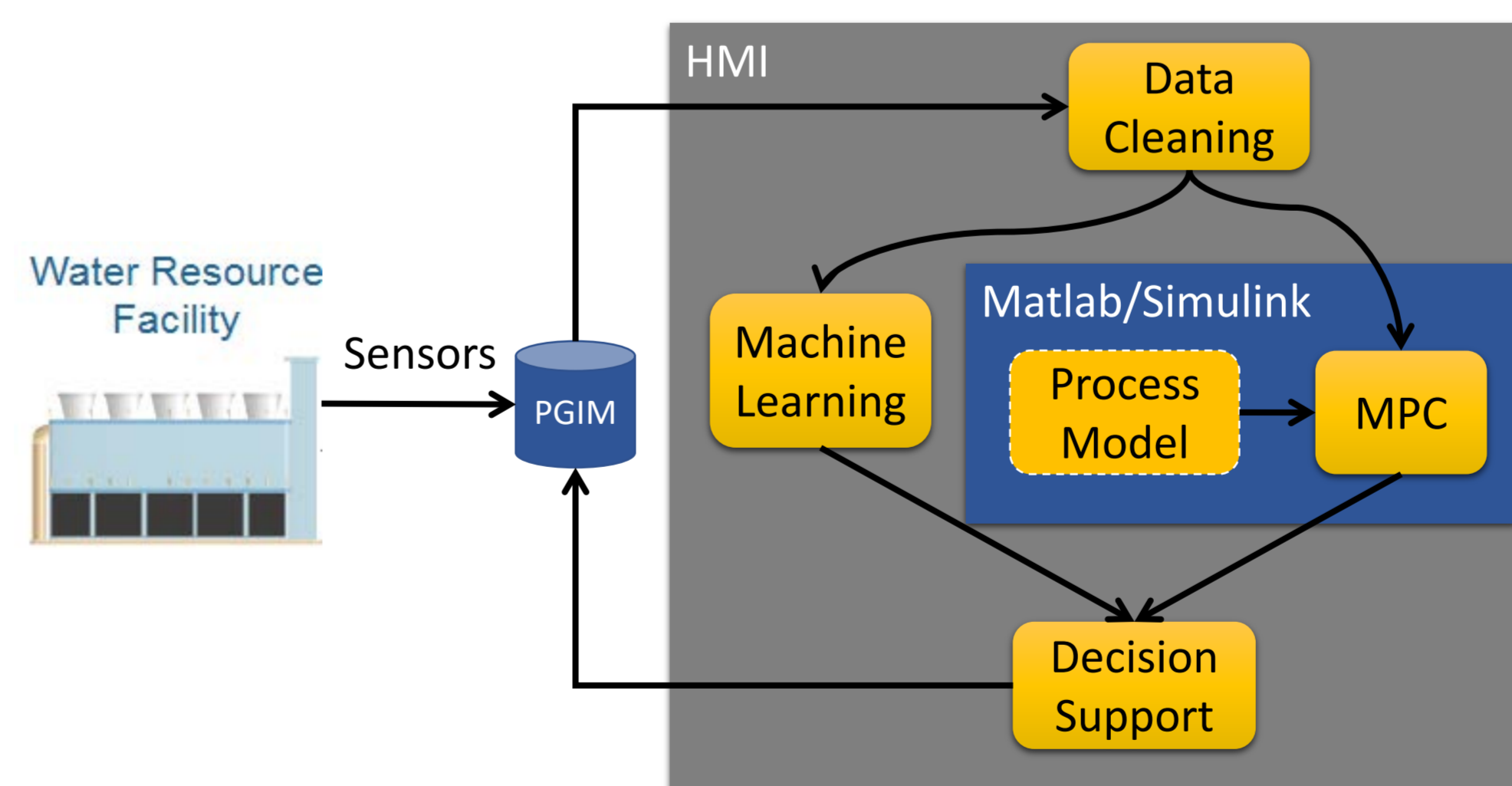
Model Predictive Control

- Model obtained via system identification.
- Benchmark Simulation Model no 1 used as initial simulation platform.



Learning System Implementation

- Involves the interaction between data acquisition, data cleaning, process modeling, model predictive control, decision support.
- Implementation in a Human Machine Interface (HMI) for off-line and on-line testing.



- PGIM: Power Generation Information Manager
- HMI: Human Machine Interface
- MPC: Model Predictive Control

About the project

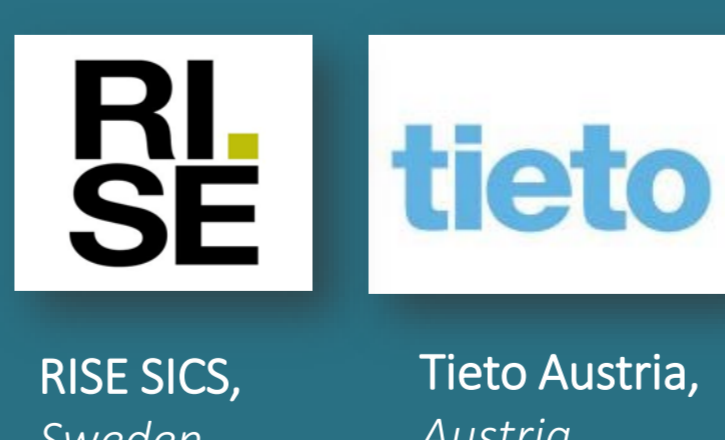
	Start date	1st October 2016
	Duration	48 months
	Budget	5,740,676.25 €
	Coordinator	Prof. Erik Dahlquist

Fudipo Consortium

Universities



RTDs



Large Industries



SMEs

