Automation and Control of Renewable Energy Systems

Vision

The Area **Automation and Control** at BEST - Bioenergy and Sustainable Technologies GmbH focuses on the **optimal operation** of **sustainable biorefinery** and **renewable energy systems**, the optimal interaction of different technologies and systems and the **highly automated operation management** by **new digital services**. The overall aim of Sub-Area 2.2 is the optimal operation of sustainable biorefinery and renewable energy systems.
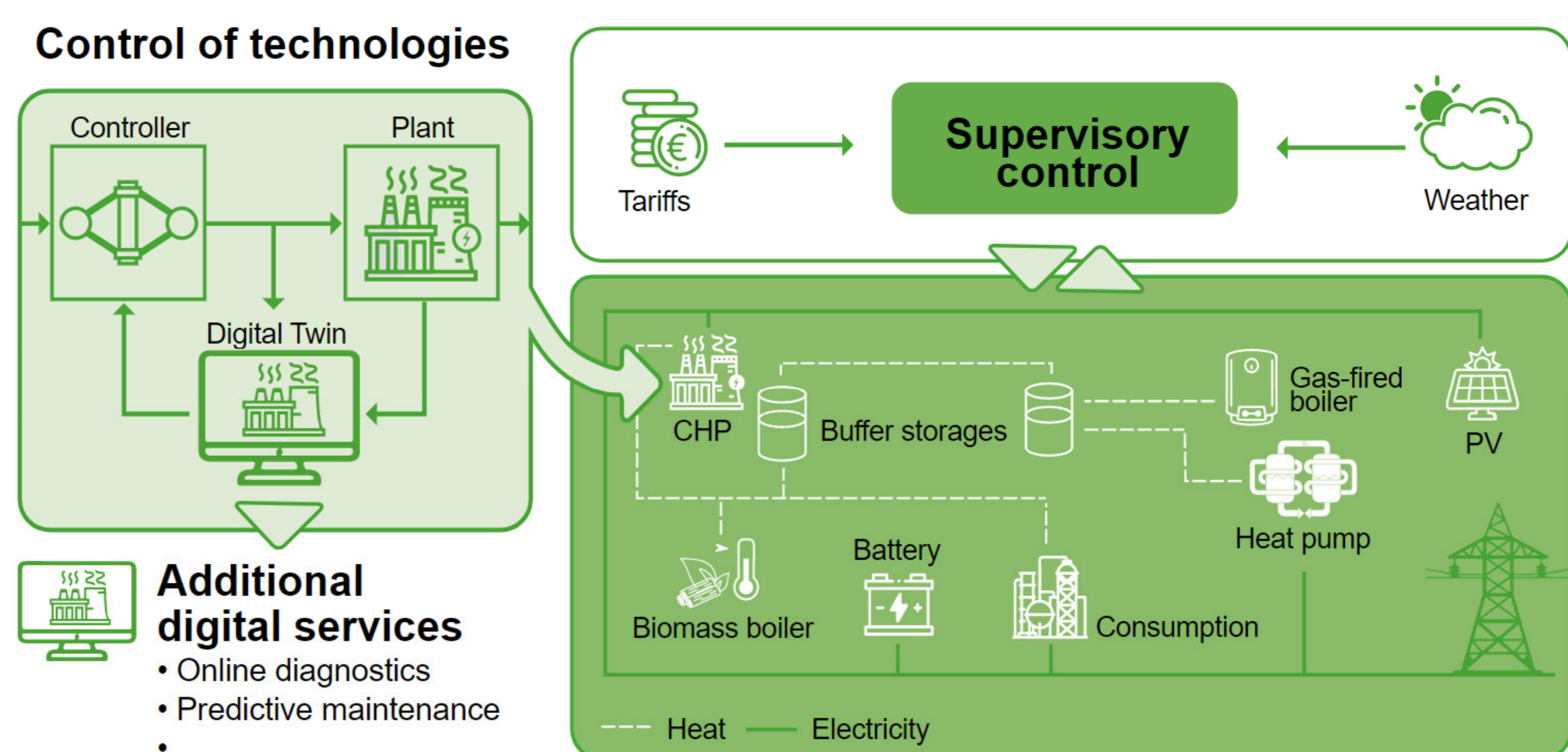
Optimal operation (control) of biorefinery and energy technologies:

The first steps towards a highly efficient, sustainable and flexible system are **efficient individual technologies** that can be **operated flexibly.** For this reason, we develop **advanced control systems** for bio-technological, thermochemical and thermotechnical plants (e.g. gas production or solar thermal plants).

Optimal interaction of different technologies and systems:

At the system level, it is then necessary to ensure **optimal interaction of all components** and **systems**. To this end, we are developing various methods for the **predictive control of hybrid energy and resource systems**, with a particular focus on the specific consideration of the individual sectors (e.g. different temperature levels in the heating sector).

Control of technologies — Controller, Plant, Digital Twin, **Additional digital services**: • Online diagnostics • Predictive maintenance • ...

Supervisory control — Tariffs, Weather — CHP, Buffer storages, Gas-fired boiler, PV, Heat pump, Biomass boiler, Battery, Consumption — --- Heat ― Electricity

Highly automated operational management by new digital services:

In addition to the actual controls, we are working on **new digital services** that allow a significant **increase** in the degree of **automation** of the plants' and systems' operational management (e.g. methods for automatic plant monitoring, plant simulators for training purposes, ...). We mainly focus on the use of **digital twins**, but purely **data-based methods** are used, too.

BEST – Bioenergy and Sustainable Technologies GmbH

Markus Gölles
Area Manager - Automation and Control

P +43 5 02378-9208
markus.goelles@best-research.eu
www.best-research.eu