

# Intelligent Hybrid Thermo-Chemical District Networks

The H-DisNet project develops a new generation of district heating and cooling network: **a district thermochemical network without thermal losses in the storages and transport.**

The technology will be applied to form an intelligent network which will significantly:

- increase **energy efficiency** of heat transport and storage, also long-term storage
- increase utilization of **residual heat and renewables** at low temperature
- contribute to a wider usage of district networks by allowing heating and cooling in one **multifunctional network** and by adding the additional services drying and humidity control
- reduce the **primary energy usage**

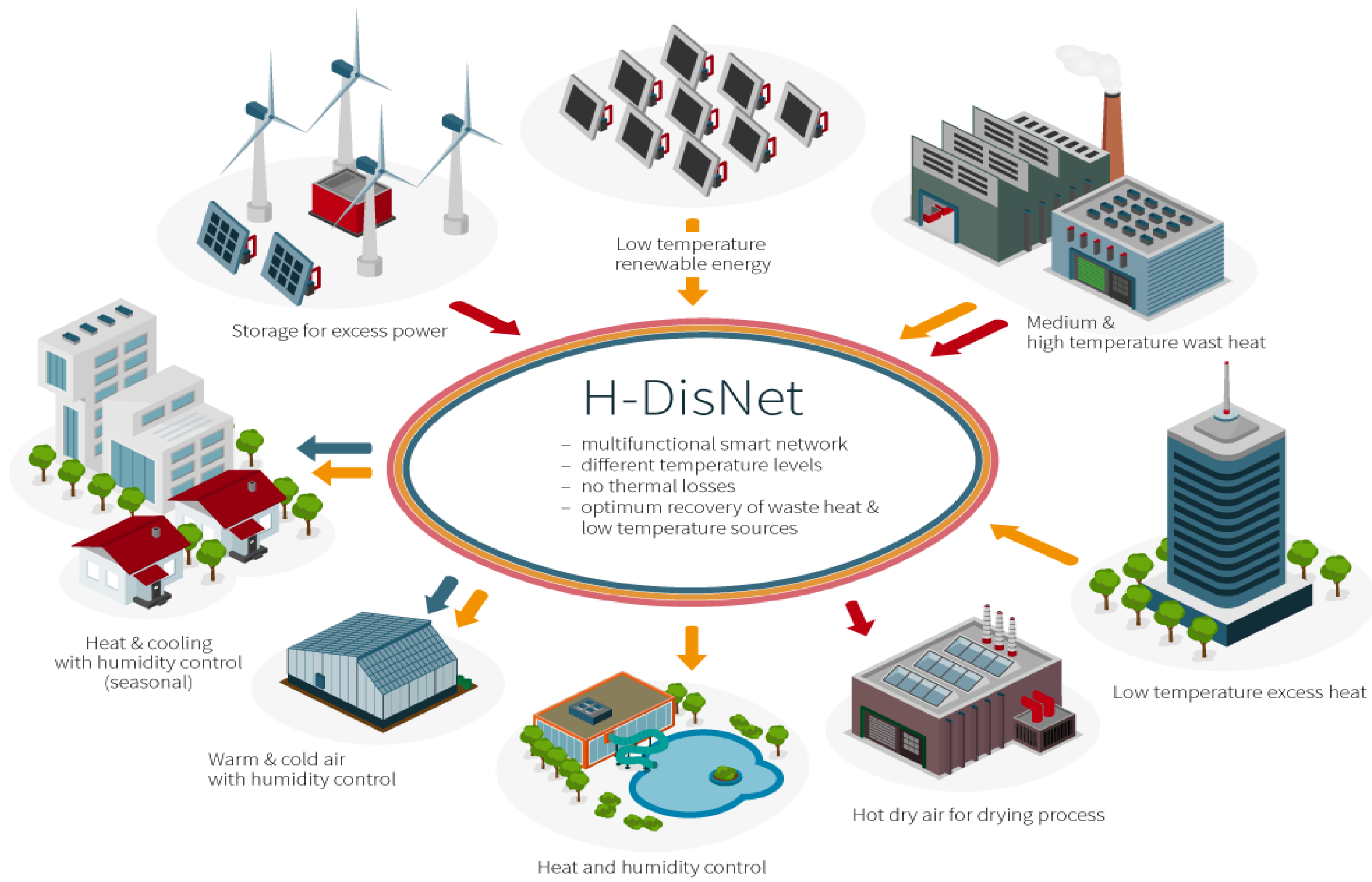


Figure 1: the Intelligent Hybrid Thermo-Chemical District Networks

The core innovation is the use of thermochemical fluids, for example **brine**, instead of water as transport medium: **chemical potential is transported**, not thermal energy, the thermal energy is released by contact between fluid and water vapor. The absorbed water shall be then separated from the fluid to start a new cycle (regeneration) by use of heat also at low temperatures as residual heat or renewables.

H-DisNet allows to transport heat to users far away from the heat sources as well as a time shift between heat production and use.

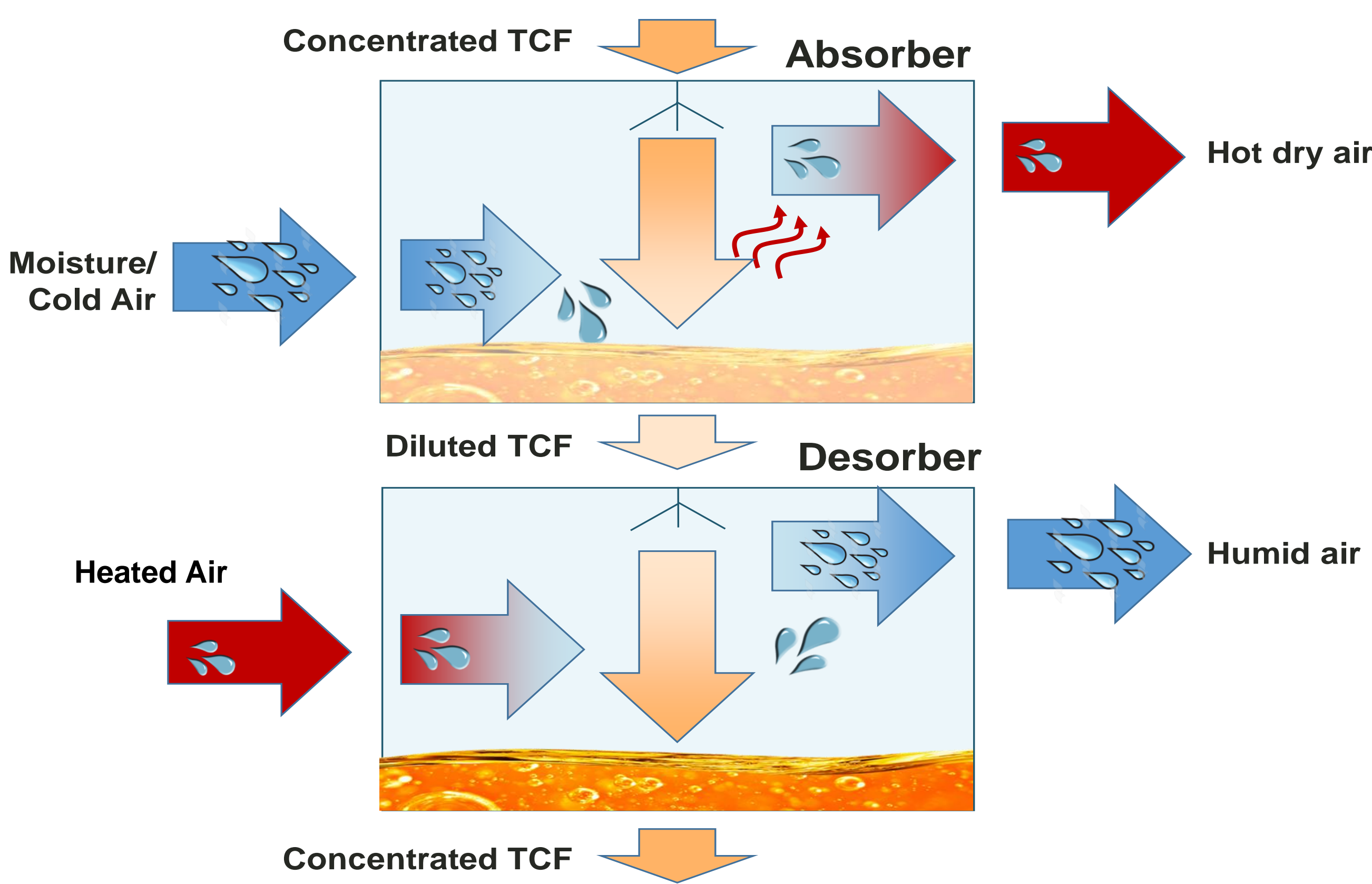


Figure 2: the energy amount required to concentrate the solution (evaporation or desorption process) is then release during the absorption process. The “evaporation energy” is transported and stored without energy losses.



Figure 3: ZHAW and Watergy tested the absorption technology in previous projects: the High Temperature Condensing Technology (ZHAW) in the power plant Berlin Buch, recovers heat from the flue gas in an ab- /desorption process (top); an absorption box of Watergy is installed in a prototype building in Berlin (bottom).

Four project work levels guarantee to reach the readiness for broad industrial development:

- Development of the components and intelligent network technology and demonstration in a residential area and in an industry environment
- Modelling of components to carry out simulation of networks. On this basis, smart control strategies and a network identification tool are developed
- Economic and environmental assessment to determine the potential of the technology and to allow defining the path to market
- Dissemination and exploitation activities with the outlook of a full-scale pilot implementation.

The technology is tested in different demonstrators in Switzerland, Germany and Great Britain.

The project will gain the required knowledge about processes, components, network applications as well as simulation and control methods and will demonstrate the feasibility to allow the industrial R&D to pick up the technology and to bring it to the market.