

# H-DisNet

## Intelligent Hybrid Thermo-Chemical District Network

### Introduction

The H-DisNet is a project funded by the Eu-programm Horizon2020, with the participation of seven partners from the industry and university. The project started in June 2016 with a duration of 3 years.

### Concept

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 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 (i.e. air humidity). The absorbed water shall be then separated from the fluid to start a new cycle (regeneration) by use of heat 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.

### Demonstrator plants

ZHAW is testing the technology in a biogas plant closed to Schaffhausen and in a green house in the Zurich area.

The thermal potential of the fluegas from a biogas engine is used to evaporate the water contained in the brine. Two effects are reached: the concentration of brine and, through the condensation of the evaporated water, the release of thermal energy on site.

The concentrated brine is then transported to the green house. The humid air is brought in contact to the concentrated brine which absorbs/desorbs the humidity. During the absorption process heat is released and the air temperature and humidity can be maintained at the required level setting the recirculation of the brine. Parallel to the climatisation through absorption, an innovative distribution system of conditioned air is developed and tested (fig. 2 and 3) allowing to treat only the air in contact to the crop instead the air of the entire green house.



Figure 1: ZHAW and the project partner Watery test the absorption technology. Left: the absorber installed in the Swiss demonstrator at the greenhouse in Wangen for the air temperature and humidity control (ZHAW). Right: the absorption box of Watery is installed as air conditioner in a prototype building in Berlin.

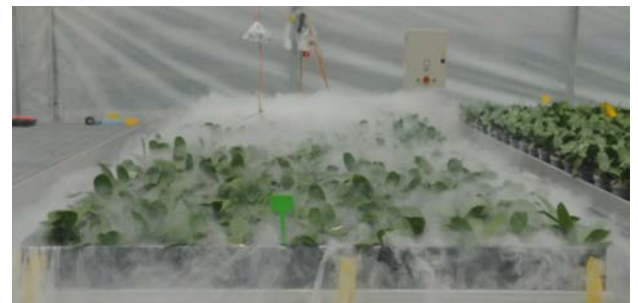


Figure 2: the innovative system for the air distribution feeds the conditioned air directly below the crops allowing to create different climate zones inside a green-house room.



Figure 3: ZHAW test the technology under real conditions with the installation of nine absorbers in a 600m<sup>2</sup> greenhouse in Wangen by Dübendorf.

ZHAW School of Engineering  
Technikumstrasse 9  
8401 Winterthur  
info.engineering@zhaw.ch  
www.engineering.zhaw.ch

IEFE Institut für Energiesysteme  
und Fluid-Engineering  
Dr. Thomas Bergmann  
Technikumstrasse 9, 8401 Winterthur  
Telefon +41 58 934 47 05  
thomas.bergmann@zhaw.ch  
www.iefz.zhaw.ch