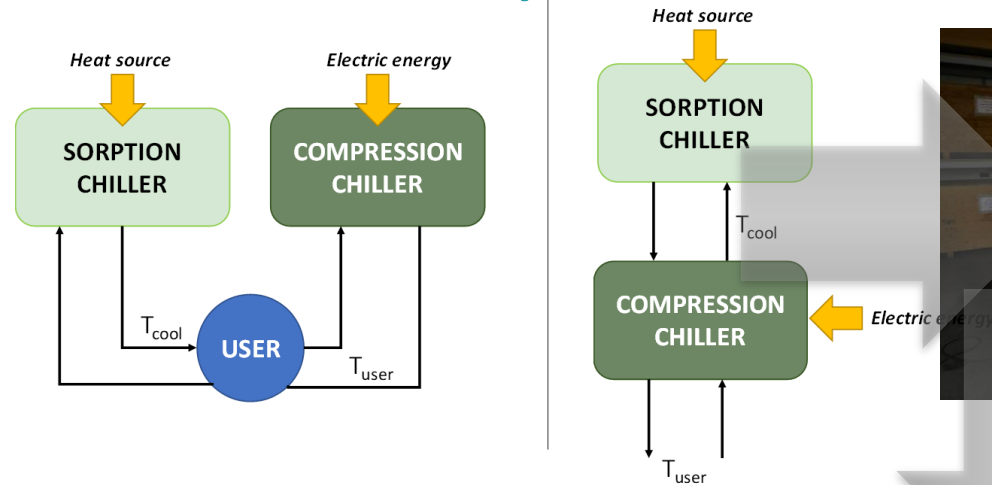


# Experimental evaluation of a hybrid adsorption-compression cascade chiller for solar cooling applications in industrial processes

**Valeria Palomba, Giuseppe E. Dino, Steffen Kühnert, Andrea Frazzica**

## What is a hybrid chiller?



**FAHRENHEIT** solution for industries  
Cooling Innovation.



	Food industry	Chemical industry
<b>HHP layout</b>	Cascade	Pre-cooling
<b>Adsorbent</b>	Silica gel	Zeolite
<b>Refrigerant</b>	R1270	R290
<b>Sizing</b>	20 kW	80 kW AU and 200 kW CU

## Testing conditions and scope

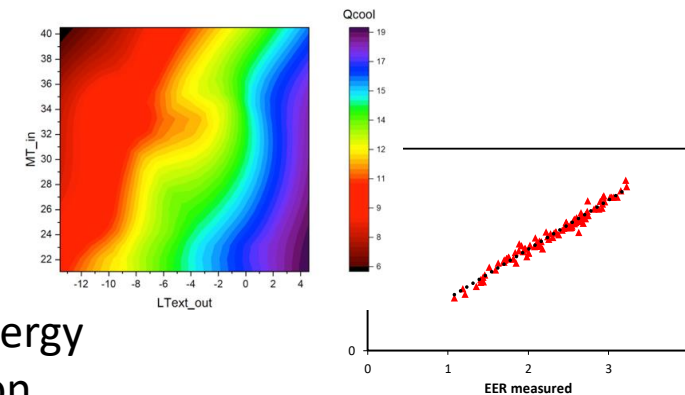
	Min	Max
Heat source [°C]	67.2	92.7
Cooling water [°C]	21	40.8
Chilled brine [°C]	-16.2	20.2
Cooling capacity [kW]	6.0	29.7
EER	1.1	4.3

Hybrid chiller tests at **ITAE**

Full performance map

Definition of reduced models for energy management system implementation

Evaluation of achievable savings



**Up to 4 t/y CO<sub>2</sub> emissions avoided and up to 70% EER gain!**