

## INNOVATIVE WASTE HEAT UTILIZATION – VIENNA

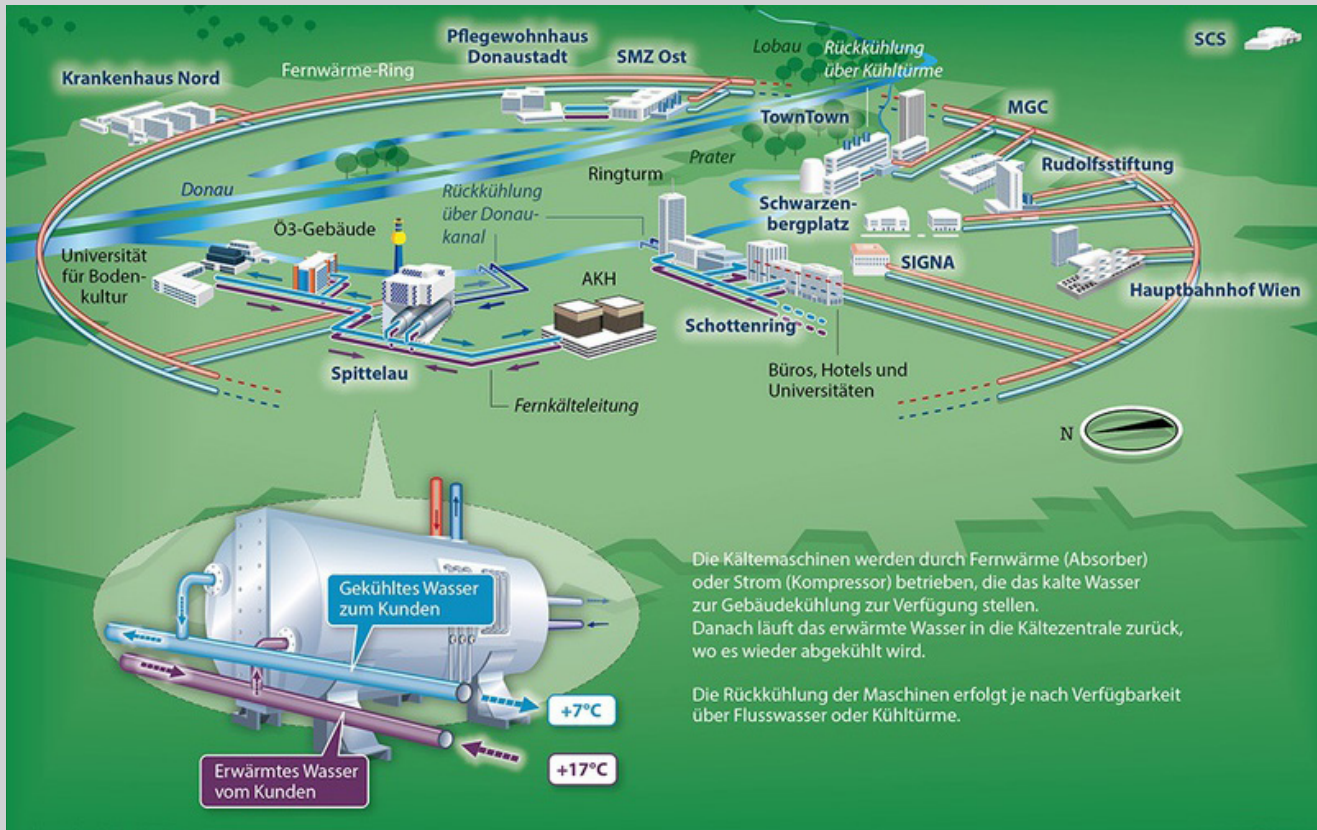


Fig. 1: Schematic representation of the district heating and cooling networks operated by the Wien Energie GmbH ([www.wienenergie.at](http://www.wienenergie.at), 09.01.2018)

## Summary of the project

The Wien Energie GmbH operates the largest district heating network of Austria with a pipe length of about 1 200 km and about 350 000 connected households. Furthermore, the Wien Energie GmbH offers large customer solutions for the cooling of buildings.

For cooling purpose two concepts are available. The first one is called "decentralized", within this concept the Wien Energie GmbH installs a refrigeration center at the customer site to supply cooling energy. The second one is called "centralized", within this concept the Wien Energie GmbH installs a refrigeration center and supplies a certain number of customers with cooling energy through a district cooling network. The flow temperature in a district cooling network is about 6 °C.

## "UTILIZATION OF WASTE HEAT OF A CHILLER FOR BUILDING AIR CONDITIONING VIA A HEAT PUMP FOR HEAT SUPPLY INTO A DISTRICT HEATING NETWORK"

Within both concepts absorption and compression chillers are used which require cooling devices for heat rejection such as cooling towers or river water. Basically, absorption chiller demand higher investment cost but they may increase the heat demand in district heating networks during the summer months compared to compression heat pumps which only need a connection to the electricity network as source for driving energy. An advantage of absorption chil-



lers is that they increase the heat demand in the district heating network during the summer months.

In the year 2017 the Wien Energie GmbH decided to realize an innovative project in which waste heat of a chiller is used as heat source for a heat pump which supplies heat into the supply pipe of the district heating network.

For this a 2-stage compression heat pump is used to supply chilled water at a temperature of about 7 °C to the customer for air conditioning and heat to the district heating network at a temperature of up to 90 °C. The heat pump will be in operation only during the summer months, at this time the return temperature of the district heating network varies between 58 °C and 65 °C.

## FACTS ABOUT THIS PROJECT

**Building type:** Residential and office building  
**Heated floor area [m2]:** -

**Installed heat capacity [kW]:** 400

**Heat source:** Waste heat from a chiller for air conditioning

**Participating countries:** Austria

**Time frame:** Start of operation planned in 2018

**Project organisation:** Wien Energy GmbH

**Academic support:** Institute of Thermal Engineering, Graz University of Technology

## Expected results

- The idea of this project is to supply heat into the district heating network instead of heat rejection with cooling devices. This offers high potential for further applications especially within city centers.
- The installation of chillers without cooling towers is an advantage with regard to rooftop gardens, reduction of sound emissions, microclimate and cityscape.
- Due to the heat supply of the heat pump into the supply pipe of the district heating network savings of about 78 tons CO2 per year are expected.

*File compiled by Arnitz, A., Rieberer, R., Institute of Thermal Engineering, Graz University of Technology, 14.11.2018*

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**IEA Technology Collaboration Programme on Heat Pumping Technologies (HPT TCP)**