




ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

HEAT PRODUCTION, TRANSFER AND RECOVERY

Heat production, transfer and recovery are key activities to increase our planet sustainability, which are investigated to find innovative solutions in civil and industrial environment.



Research at the University of Bologna regards the development of models and techniques to allow for a strong impact within several application fields.

Waste Heat Recovery

- Design and development of solutions to recover the wasted heat produced in processes of industrial sectors with, for instance, ORC cycles, heat pumps or district heating
- Development and test of materials for the recovery of high enthalpy heat able to withstand at temperature higher than 700 °C
- Development and test of new Heat Transfer Fluids (HTF) and Phase Change Materials (PCM) to improve heat exchange and heat storage accumulation

Thermal energy production by biomass

- Development and test of innovative filtration systems for residential biomass heating systems
- Development and test of new fuels as fast pyrolysis bio-oils for residential biomass heating boilers with low environmental impact
- Development and test of micro-scale biomass combined heat and power (CHP) technology based

District Heating Implementation

- Development of new approaches for the design and for the operation of District Heating and Cooling (DHC) energy networks aiming at maximising the use of the local wasted heat and renewable energy sources
- Design and development of new approaches for district heating and cooling networks able to reduce energy transportation losses as for instance low temperature district heating
- Development and validation of tools and models as, for instance, self-learning control systems based for instance on cloud able to give indications for the operation and maintenance of district heating and cooling (DHC) networks

HIGHLIGHTS

Significant research projects to study the feasibility of sewage sludge energy recovery through relevant plant solutions have been carried out in collaboration and thanks to the support of the national multiutility HERA.

European Projects

Hybrid-BioVGE - *Hybrid Variable Geometry Ejector Cooling and Heating System for Buildings Driven by Solar and Biomass Heat H2020*

MIGRATE - *Research and training network on Miniaturized Gas flow for Applications with enhanced Thermal H2020.*