ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

EFFICIENCY AND RESOURCES OPTIMIZATION

Research in energy and transport is vital to ensure a sustainable future and a low-carbon society. The main objective is to make energy more secure, affordable and sustainable, and foster sustainable and efficient transport.

The research in this field is studying forms of mobility that are sustainable, energy-efficient and respectful for the environment. Technical innovations such as electric vehicles, intelligent transport systems and smart grids, will contribute to achieving this goal. Alternative fuels like biofuels, synthetic fuels, and non-polluting energy vectors, such as hydrogen, are also pathways towards a more sustainable mobility. 'Decarbonisation' has been identified as a priority target for the development of a sustainable transport system, and circular economy shall also be investigated as an enabling technology.

The research of the University of Bologna on transport-related energy resources and efficiency optimization covers a wide range of issues:

- Renewable, low-carbon advanced fuels, for reducing well-to-wheel CO2 emissions
- Second life / recycling and recuperation of materials including energy balance
- New battery and convenient charging opportunities for different use cases: urban charging, high power charging, power transfer technologies
- Analysis of possible solutions to integrate renewable energy sources into the power grid
- Investigation on grid interoperability with ICT and transport systems.

HIGHTLIGHTS

Design and optimization of small scale plug and play Liquefied Natural Gas (LNG) production processes taking advantage of renewable sources for naval or road transport.

Integrated systems for ZEF2 (zero emissions fuels) production (synthetic H2 or CH4) exploiting renewable non programmable sources and captured CO2.

The University of Bologna participated to **E4-SHARE PROJECT** - Models for Ecological, Economical, Efficient, Electric Car-Sharing. Advanced methods and strategies for optimized planning and for effectively operating different variants of e-car sharing systems to best meet both customer needs and economic effectiveness of the system.