

## Activity Plan

Progetto ERANET2018\_ZEHTC\_Melino - ERANET ZEHTC "Zero Emission Hydrogen Turbine Center

Title "Analysis and optimization of hydrogen production, storage and conversion networks integrated with non-programmable renewable generators"

The research project concerns design methods and management strategies for hydrogen based networks integrated with non-programmable renewable generators. In particular, it is planned to study - as a conversion system - the use of hydrogen in co-combustion in gas turbines. The research activity includes: 1) research on the state of the art of hydrogen production and storage networks; 2) research on the state of the art relating to the co-combustion of hydrogen in gas turbines; 3) development of a simulation model of a hydrogen production, storage and conversion network; the network will be characterized by photovoltaic systems as a device for electricity production and by a gas turbines (considering the co-combustion of hydrogen and natural gas) as conversion technology; Activities include: 1) elaboration of guidelines for the design of the grid as function of the installed power with photovoltaic systems; 2) development of optimized network control strategies to maximize the round trip efficiency.