If we consider a new energy framework, based on the concepts of sustainability, energy security using local resources, maximization of the exergy efficiency of the whole system, a possible solution could be based on the following criteria: • Combined cooling, heat and power (CCHP) plants; • Small-medium size plants locally distributed; • Plants with maximization of the energy recovery from the primary sources: maximum exergy efficiency of the whole system; • Flexibility in the use of local primary sources (biogas, bio-syngas, bio-fuels); • Easy and efficient CO2 separation from the plant exhaust. Among the technologies which could satisfy these criteria, a new technology is gaining more and more interest: energy systems based on Solid Oxide Fuel Cells (SOFC) which, in the medium term, could become one of the most interesting technologies able to address the above criteria. The proposal is an applied research project devoted to demonstrate the technical feasibility and the energy and environmental advantages of CCHP plants based on SOFC fed by different typologies of biogenous primary fuels (locally produced), also integrated by a process for the CO2 separation from the anode exhaust gases. The research activity will address the scientific, technical, economical management of two proof-of-concepts of complete energy systems based on SOFCs, through real in-field demonstration units. Several issues will be pointed out, like high efficiency integration designs, impact of pollutants on SOFC and fuel processing units, gas cleaning, operation in CCHP configuration, carbon sequestration module. The activities developed by each Partner, in the different areas of the proposed research, have the ultimate goal of assembling, testing and validate the two proof-of-concept systems. In order to guarantee the success of the Demonstration activity, it is also integrated with: Lab-scale Activities (preliminary to the real demonstration activities); Conceptual and Analysis Activities

Project Information

Type of project: Research
Timing: 01/11/2011 > 30/04/2015
Project Budget: 6.250.227 €

Funding

European Union through FCH JU: Grant agreement 278798 - CORDIS link

Project partners
Coordinator:
Politecnico di Torino

Partners:
Teknologian tutkimuskeskus VTT Oy
CNR - Consiglio Nazionale delle Ricerche
IEN - Instytut Energetyki
University of Turin
TOPSOE FUEL CELL A/S
Società Metropolitana Acque Torino S.p.A.
MATGAS 2000 AIE
ECOLE POLYTECHNIQUE FEDERALE DE LAUSANNE
TECHNISCHE UNIVERSITÄT MÜNCHEN

Sub project(s)

Sub project 1

Country: Italy
Address:
Corso Duca degli Abruzzi 24 10129 TORINO

Sub project categories
Research

Project Id: 1090
This project datasheet was last updated on: 21.11.2017

Modify this project datasheet