

***The Sotacarbo coal gasification pilot plant  
for hydrogen production and CO<sub>2</sub> removal***

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**Abstract**

Nowadays, the increase in energy demand and the interest in the environment preservation, have improved the attention toward hydrogen production through coal gasification, owing to the remarkable advantages offered by this technology in pollution control and greenhouse gases-emissions monitoring.

To this aim, Sotacarbo, with Ansaldo Ricerche, ENEA and the University of Cagliari, is developing a pilot plant for hydrogen production through gasification of coal, biomass and wastes. The project, characterized by a total cost of about 12 millions euros, has been funded by the Italian Ministry of Education, University and Research and by the European Commission.

The pilot plant, which has been recently set up in the Sotacarbo Coal Research Centre located in Sardinia, includes two fixed-bed Wellman-Galusha gasifiers (a 700 kg/h pilot gasifier and a 35 kg/h laboratory-scale gasifier), fed up with high and low sulphur coals and with mixtures of coal, biomass and wastes. Both gasifiers are equipped with a wet scrubber for gas cooling and depulverization; moreover, the laboratory-scale plant is equipped with a flexible syngas treating process, which is composed by a raw-gas cleaning section, an advanced integrated water-gas shift and CO<sub>2</sub> removal unit and the hydrogen separation unit. In particular, the raw gas cleaning section includes a hot- and a cold-gas desulphurization processes, in order to compare their performances.

This paper reports a detailed description of the research project and the main results of the preliminary analysis. In particular, the plant configuration and the main goals of the experimental campaigns are described.

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