



GHGT-11

CCS infrastructure development scenarios for the integrated Iberian Peninsula and Morocco energy system

Amit Kanudia^a, Niels Berghout^c, Dulce Boavida^b, Machteld van den Broek^c,
Helena Cabal^d, Júlio Carneiro^e, Patrícia Fortes^f, Maurizio Gargiulo^g, João Pedro
Gouveia^f, Maryse Labriet^h, Yolanda Lechón^d, Roberto Martinezⁱ, Paulo
Mesquita^e, Abdelkrim Rimi^j, Júlia Seixas^f, GianCarlo Tosato^{k*}

^a KanORS EMR, India; ^b Instituto Nacional De Engenharia, Tecnologia E Inovação –INETI, Portugal; ^c Copernicus Institute, Utrecht University, the Netherlands; ^d Centro de Investigaciones Energéticas, Medio Ambientales y Tecnológicas – CIEMAT, Spain; ^e Universidade de Évora, Portugal; ^f CENSE - Center for Environmental and Sustainability Research, Faculdade de Ciências e Tecnologia, Universidade Nova de Lisboa 2829-516, Caparica, Portugal; ^g E4SMA srl, Italy; ^h ENERIS, Spain; ⁱ Instituto Geológico y Minero de España, Spain; ^j University Mohamed V Agdal -Institut Scientifique De Rabat – UM5A-ISR; ^k ASATREM srl, Italy

Abstract

This paper briefly illustrates a method to represent national energy systems and the geographical details of CCS infrastructures in the same technical-economic model. In the MARKAL-TIMES modeling framework a model of Morocco, Portugal and Spain with both spatial and temporal details has been implemented. As a function of assumptions on the development to 2050 of mitigation levels, economic growth and CO₂ capture-transport storage characteristics, dozens of scenarios were prepared with the TIMES-COMET model. A few results on optimal levels of CCS contribution to mitigation compared to other energy system options are presented. The results also indicate the least cost lay out of the main capture, transport and storage infrastructures. It is concluded that the availability of CCS after 2020 will reduce the cost of mitigation in the Iberian Peninsula as soon as the EU GHG emissions reduction targets become more stringent than decided so far.

© 2013 The Authors. Published by Elsevier Ltd.
Selection and/or peer-review under responsibility of GHGT

Keywords: Energy scenarios; climate change mitigation; CO₂ emissions; capture transport storage infrastructures; MARKAL-TIMES; partial economic equilibrium; bottom-up technological models; GIS transport models

* Corresponding author. Tel.: +39-335-537-7675.
E-mail address: gct@etsap.org.