Mapping CCS in Portugal

Report Summary

New thermal power plants

There are no announced plans for new coal power plants; however the Government approved the National Energy Strategy in 2005 and there is written that will be a reserve of 800 MW at Sines for clean coal. There are no further information about this reserve.

There will be four new NGCC power plants (Lares, Pego, Figueira da Foz and Sines) until 2012 and there is a competition for Twelve Biomass power plants.

Units	Gas	Power (MW)	Goal year	State
Lares (EDP)	Natural Gas	862	2009	The unit is expected to begin operations by August 2009
Pego (ElecGas)	Natural Gas	835	2010	The construction of this unit has started. Expected to start operations during 2011
Figueira da Foz (Iberdrola)	Natural Gas	800	2012	The construction of this unit has not started yet.
Sines (Galp)	Natural Gas	800	2012	The construction of this unit has not started yet.

There are two coal-fired powers plants operating in Portugal. These are located in Sines (1250 MW) and Pego (620 MW). Both plants operate with efficiencies in the range of 32 to 35%. Sines power plant has typical emissions of 890 g CO_2 per kWh. A revamping of Sines and Pego power plants initiated to desulphurise the flue gases has reaching its conclusion. At Sines and Pego coal power plants have also plans to introduce 5-10% of Biomass or Residue Derived Fuel (RDF) during 2010.

Energy production and emission breakdown from different fossil fuels

(2008)

	% of power generation	TWh (electricity)	CO_2 emissions (million tonnes) from electricity
Coal	26.3	12.406	10 447
Gas	27.8	13.123	3 862
Oil	10.3	4.873	2 108
Total	**64.3**	**30.402**	**16 417**

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Scenarios for different greenhouse gas reduction trajectories

Title	Organisation	Years covered	Brief description
Cost of energy and environmental policy in Portuguese CO_2 abatement - scenario analysis to 2020	New University of Lisbon	2007-2050	This paper quantifies the contribution of Portuguese energy policies for total and marginal abatement costs (MAC) for CO_2 emissions for 2020. The TIMES_PT optimisation model was used to derive MAC curves from a set of policy scenarios including one or more of the following policies: ban on nuclear power; ban on new coal power plants without carbon sequestration and storage; incentives to natural gas power plants; and a cap on biomass use.
PORTUGUESE NATIONAL INVENTORY REPORT ON GREENHOUSE GASES, 1990 – 2007	The Ministry of Environment	2007-2020	This document contains a summary of the Action Plan and the Climate Change and Clean Energy Strategy.
PNALE	Agência Portuguesa do Ambiente	2009-2050	Includes an Energy annex

State of regulatory process for CCS

Implementation of the CO_2 storage directive has already started. The Directorate-General for Energy and Geology has already started analyzing the first draft for the transposition into national law of the Geological Storage of CO_2 Directive (2009/31/EC).

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National CCS supporting programs and plans for full-scale CCS

There are no full scale plans for CCS in Portugal and there it is not known what is going to be the

reserve of 800MW for clean coal in Sines.

The National Laboratory on Energy and Geology, (LNEG), recently created, is the largest public sector research and development institution in Portugal, focused on Energy and Geology, also providing services to the private sector. LNEG is carrying out research and technological development in the field of CCS. Two projects are being carried out in this field:

- KTejo - the first Portuguese study aiming to assess the possibility of applying the CCS technology at a local power plant. The project – a Feasibility Study of CO_2 Capture and Storage (CCS) at Pego Coal Power plant - will be jointly developed by the University of Évora and the National Laboratory for Energy and Geology (LNEG), Tejo Energia (the plant owners) and Pegop (plant operators), and it aims to identify suitable formations for geological storage and assess the future costs and needs for retrofitting the Plant. KTejo is partially funded by NSRF, National Strategic Reference Framework (QREN), through the Operational Agenda for Competitiveness Factors (COMPETE) of the European Community Support Framework.

- COMET - aims at identifying and assessing the most cost effective infrastructure of CO_2 transport and geologic storage, that will be able to serve the West Mediterranean area, considering the temporal and spatial aspects of the development of the energy sector and other industrial activities in Spain, Portugal and Morocco, as well as the location, capacity and availability of potential CO_2 storage in geological formations. Special attention will be given to a balanced decision on transport modes, matching sources and sinks, addressing safety and lifetime objectives, meeting optimal cost - benefit trade-offs, for a CCS network infrastructure as part of an international cooperation policy. This partially founded by the 7th Framework Programme.

There have been meetings with different stakeholders to start what will be called the *Portuguese Platform for CO_2*. This will probably happen until the end of 2009.

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