

# Instalacja demonstracyjna CCS

## Demonstration plant for carbon dioxide capture, transport and storage (CCS)



**Co-financed by the European Union**

European Energy Programme for Recovery

In 2009 PGE Elektrownia Bełchatów S.A. initiated works aiming at construction of a demonstration CCS installation. Currently, as a result of the Consolidation Programme of the PGE Group, the works are run by PGE Górnictwo i Energetyka Konwencjonalna SA (PGE GiEK SA). The installation will be integrated with the 858 MW unit which is since September 2011 operated in PGE GiEK SA Oddział Elektrownia Bełchatów (Bełchatów Power Plant) and will comprise the following key components which constitute the full value chain in the validation process of the CCS technology:



- Carbon Capture Plant (CCP) of size equivalent to >250MW and the CO<sub>2</sub> capture efficiency of >85% utilizing the Advanced Amine Process (AAP) & its integration with the 858 MW unit. It means, that the CCP will capture approximately 1,8 million tonnes of CO<sub>2</sub> per annum. The task includes also a modification of the new 858MW unit for the needs of the CCP construction to obtain the status „Capture Ready”
- CO<sub>2</sub> Transportation: this component will consist of a pipeline and the associated infrastructure to transport the compressed CO<sub>2</sub> from the Carbon Capture Plant to the storage site
- CO<sub>2</sub> Storage: this will include the injection of pressurized CO<sub>2</sub> into the ground (deep saline aquifers) for permanent storage.

In the field of solutions concerning the CO<sub>2</sub> capture technology, the „post-combustion” option based on advanced amines has been chosen. A comprehensive FEED study has been prepared for the selected option in the years 2009-2011. As the 858MW unit was originally not designed to be coupled with the CO<sub>2</sub> capture installation, works have been carried out (see photo below) to reach the Capture Ready status. The CO<sub>2</sub> from the CCP installation will be compressed to the supercritical conditions for the needs of pipeline transportation.



*Photo showing the flue gas ducts adapted for the need of the CCP (flue gas pick up and return). Lower in the photo part of the cooling water installation for the CCP.*

In 2009 three geological structures were identified in the Łódzkie voivodeship for potential storage of the CO<sub>2</sub> leaving the CCP, i.e.: (1) Lutomiersk-Tuszyn-Pabianice-Bełchatow, (2) Budziszewice and (3) Wojszyce.

As a result of the feasibility study for the transport component completed in 2009, routing for three pipelines to the three considered

storage sites was preliminarily determined.

Following comprehensive geological works, analyses and examinations carried out in 2009-2011 and based on the experts' recommendation Wojszyce structure (north part of the Łódzkie voivodeship) was selected at the beginning of 2012 as most appropriate from geological point of view for continuation of geological works. The works will be done to get a detailed characterization of the site and thereby to confirm its suitability for safe CO<sub>2</sub> geological storage in industrial scale.

The above mentioned storage site selection enabled commencement of preparatory works in the transport component in June 2012. The works regard the CO<sub>2</sub> pipeline routing determination, inclusion of the routing in the Local Plan for Spatial Development of relevant communes, preparation of the environmental impact assessment report, obtainment of the environmental decision and preparation of elements of the terms of reference for the public tendering process for selection of the pipeline construction contractor.

The PGE GiEK SA's CCS Project was selected, along with other five European CCS projects, to receive €180 million subsidies that would come from the EU funds in the framework of the European Energy Programme for Recovery (EEPR). Awarding the subsidy and signing the relevant Grant Agreement in May 2010 was essential for the project implementation, especially in its initial phase in years 2009-2011.

Cooperation with other EEPR subsidized projects was begun in 2010 within the CCS Project Network under the auspices of the European Commission. The goal of the network is to share knowledge and experiences from the realization of the CCS demonstration projects.

In addition to the €180 million grant being the subject of the EEPR Agreement, PGE GiEK SA is seeking additional funding from sources such as "NER 300" (New Entrant Reserve) – a mechanism within the EU Emissions Trading System, Norwegian Financial Mechanism and financing in the framework of Domestic Support Mechanism. European Commission released a working document in July 2012 where the Bełchatów CCS Project has been classified in second position in the list of candidates for award decision in the framework of the NER300 programme.

Gaining public acceptance especially regarding the CO<sub>2</sub> storage and for transportation of compressed CO<sub>2</sub> is of fundamental importance for the implementation and dissemination of the CCS technology. To that end, strategic activities are conducted in that area from the beginning of the project realization. Public engagement and information campaigns are run which are dedicated to the implementation of the CCS technology. A base for the campaigns is a strategy which includes identification and characterization of stakeholders, the scope of planned activities and appropriate tools to conduct these activities, based on proved experiences from similar campaigns dedicated to novel projects.

## **Events**