

## World-class research

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"The Central Mining Institute (GIG) is an exception among Polish research institutions. This is mostly because of the research and engineering fields it deals with, as well as the fact that GIG has full academic rights in two disciplines: mining/geo-engineering and environmental engineering", GIG head Professor Józef Dubiński tells Polish Market.

GIG's priority field is mining industry, especially work safety issues. The institute's main strategic goal is gaining the status of a European research institution, which will allow active participation in European research (study programmes, institutes, improvement centres).

Since its beginnings – and especially over the past 20 years – GIG has cooperated with all leading world mining research centres. GIG's experimental mine "Barbara" carried out work safety studies as early as in the 1930s. Today the institute exchanges know-how in new work safety techniques with centres in the U.S., China, India, Russia, Britain, Germany, Spain, Brazil, Mexico, Australia, Ukraine and other countries.

GIG officials attend international conferences and seminars, the institute also hosts such meetings. They also take part in projects under the EU's Framework Programmes, mainly in waste management, post-industrial workover, water usage and air protection, and projects financed from the Research Fund Coal and Steel, where the Institute works with Germany, Britain, Spain and the Czech Republic. It is also part of several U.S. projects, where the partners are the National Institute of Occupational Safety and Health (NIOSH), the National Energy Technology Laboratory (NETL) at the U.S. Department of Energy and the Environmental Protection Agency. Among others GIG is working on a bilateral agreement on methane obtainment from coal beds.

Each year the Institute carries out over a hundred study projects in fields like work safety in mining, environment protection, material engineering, and others. Some of the original concepts, among others concerning hydrogen production from coal, CO<sub>2</sub> storage in geological formations or coal-fuel cells, are considered interesting.

We also work on projects involving CCS technology. In 2003-2006 we launched

Recopol, Poland's first European project involving CO<sub>2</sub> sequestration to unexploited coal beds by means of drillings, on the premises of the Silesia coal pit. Currently we are participating in a project on CO<sub>2</sub> storage in Poland launched by the National Geology Institute. Its location is Upper Silesia, where we are investigating storage possibilities in geological formations (especially formations rich in saline water). We are also working on a European study of migrations of underground-stored CO<sub>2</sub> and a project involving CCS (CO<sub>2</sub> Capture and Storage) technology for the Bełchatów and Blachownia power plants and the Kędzierzyn Nitrogen Works. GIG's partner on these undertakings is the Institute for Chemical Processing of Coal. Two years ago we carried out similar CCS surveys for the Vattenfall company in Warsaw (Siekierki Heat and Power Generating Station), currently we are preparing a similar project for the Bielsko-Biała plant. Let me add that in February of this year we signed a letter of intent on the creation of a Global Carbon Capture and Storage Institute (GCCSI) with the Australian Ministry of Resources, Energy and Tourism. GIG is one of the institute's founding members. GCCSI will support a programme envisaging the worldwide construction of 20 demo CCS installations to promote the technology for CO<sub>2</sub> capture and storage in power industry. The Australian government plans to channel AUD 100 million annually to the project.

We also belong to a consortium which plans to launch a pilot scheme involving a combination of nuclear and coal energy. We are interested in the application of high-temperature reactors for the gasification of coal. Today there are over a hundred such installations around the world but Poland has none. We are also interested in underground coal gasification and are part of a European project involving hydrogen production by means of this process.

Our main export and know-how exchange partner is China. One of our most successful moves in recent years was the sale of our Seismological Observation System (SOS) and a technology aimed at preventing cave-ins to Chinese mines. We also cooperate on combating methane threats with Vietnam. Quite recently we discussed measures against other threats in Vietnamese mines, such as fire and explosives. For our partners in the Czech Republic we are conducting studies on terrain protection in mines. Our passive tomography system is part of an excavation system provided by the Polish manufacturer Famur SA to a modern mine in Siberia.

Most of GIG's proceeds come from research for mining companies, but not only mines. We also carry out compatibility studies on machinery and equipment in explosive environments according to EU Directive 94/9/WE (ATEX). These surveys embrace mines and other industrial plants. Exports account for 6-7% of our proceeds but we plan to raise this to 10%. We also put about 20 patents through

each year.

I wish to stress the GIG and its staff are active in diverse international organizations. I myself head the International World Mining Congress Organizing Committee. We also work in the UN European Economic Commission, the biggest European network of leading ecological institutions, and are in a European system of institutes dealing with safety and reliability. Under a separate agreement we also cooperate with the Institute for Energy (IE) at the EC's Joint Research Centre (JRC) in Petten.

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