

EXTENSION OF
MEMORANDUM OF UNDERSTANDING

Between

THE U.S. DEPARTMENT OF ENERGY
NATIONAL ENERGY TECHNOLOGY LABORATORY

and

THE BRAZILIAN COAL ASSOCIATION

The U.S. Department of Energy's National Energy Technology Laboratory and the Brazilian Coal Association, collectively herein the "Participants":

NOTING the Memorandum of Understanding between the U.S. Department of Energy National Energy Technology Laboratory and the Brazilian Coal Association of November 28, 2007 (the "Memorandum");

NOTING FURTHER the mutual benefit of their cooperation to date under the Memorandum;
and

DESIRING to extend the term of the Memorandum and to expand the scope of their cooperation,

Have reached the following understanding:

1. The duration of the Memorandum is hereby extended for nine months, to August 28, 2013.
2. While continuing their cooperation under the Memorandum, the Participants intend to develop and conclude an appropriate written agreement for the conduct of collaborative research on base and enabling technologies and assessments of technology options and economics, to advance the technical, environmental, and cost performance of fossil fuel energy technologies. Topics of cooperation may include:
 - a. Development of clean coal technologies applicable to Brazilian coals, including integrated gasification combined cycle (IGCC) systems.
 - b. Development and assessment of sequestration options for carbon dioxide (CO₂) and other greenhouse gases from fossil fuel-based systems, including capture, storage, and utilization.

- c. Development and assessment of technologies to recover coal bed and coal mine methane, including options to sequester CO₂ from fossil fuel-based systems.
 - d. Development and assessment of technologies for coal-to-liquids production.
 - e. Other environmental technologies for assessment, control, and remediation of ground water and soils, including acid mine drainage, affected by fossil fuel production and use.
 - f. Other related technologies, such as minimization and utilization technologies for wastes resulting from fossil fuel production and use (e.g., coal combustion byproducts).
 - g. Other areas of cooperation as may be mutually agreed upon in writing.
3. The agreement cited in paragraph 2 should include, among other relevant matters, appropriate provisions concerning the management and funding of the planned collaborative activities, the protection of any business-proprietary information to be transferred, and the protection and allocation of intellectual property arising from collaborative activities conducted under the agreement.

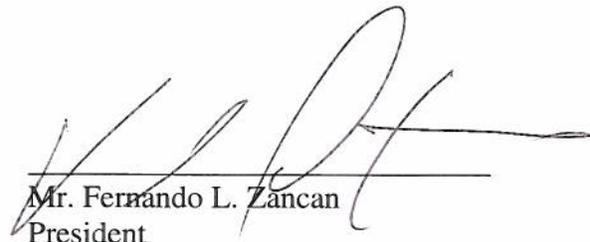
Signed at Pittsburgh, in duplicate, this 29th day of August 2012.

For the United States Department
of Energy/National Energy Technology
Laboratory:



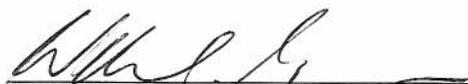
Dr. Anthony V. Cugini
Director

For the Brazilian Coal Association:



Mr. Fernando L. Zancan
President

Witnessed by:



Dr. William Rogers
Deputy Director
Office of Research and Development



Mr. Sergio Luiz Gargioni
President
Santa Catarina R&D Foundation