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Case Study to Assess Options and Mechanisms for GHG Mitigation in Cuba

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TITLE: GREENHOUSE GAS (GHG) MITIGATION STRATEGIES AND ENERGY OPTIONS IN CUBA

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ABSTRACT

The work carried out for Cuban include mainly: the evaluation of the roll of different energy option to reduce GHG in the Cuba energy sector for three energy supply scenarios and the environmental impact to global scale of the GHG reductions achieved.

Using the IAEA tools, MAED and MESSAGE, three energy supply scenarios were developed:

- Business as usual (BAU) or "Base", where the future development follows the trend of recent years,
- Mitigation 1, which evaluate different options and technologies that will contribute to an emissions growth lesser than those in the based scenario and,
- Mitigation 2, where the Carbon dioxide capture and storage (CCS) is evaluated for a potential study case.

The 2004 is the study base year and the assessed period is until 2030, divided into 5 years intervals since 2005.

In the mitigation scenarios, energy renewable participation is greater than in the Base scenario; beside is evaluated the introduction of nuclear power starting from 2025. In mitigation scenario are evaluated the use of wind energy and hydropower up to its maximum identified potential, and the efficiency increment in the biomass use due to the introduction of new types of bagasse power plant. Also is evaluated the increment of the use of solar energy for heating water, contributing to reduce the electricity consumption for this activity.

The report provides the cost and main characteristics of the evaluated electricity technologies, as well as the assumed fuel price. The cost for CCS was taken for the relevant literature for a Natural Gas Combine Cycle (NGCC) with post combustion system. Also provide a preliminary evaluation of the local potentialities for the use of CCS as mitigation option.

A mitigation cost analysis was carried out, given as result that Nuclear Energy is the option with lower mitigation cost, followed by hydro energy and NGCC.

The report also includes a review of the Climate Change Integrated Assessment Models: PAGE2002, RICE and FUND3.3, a comparison of the models and evaluation of their adaptability. Besides is including an analysis of the advances of the FUND 3.3 version and some recommendation for its use. A preliminary estimation of the Damage Costs of Climate Change was achieved.

The work carried out included also an analysis of the Cuba potentialities for the national participation in the clean development mechanism (CDM) projects and the national mechanisms created for its implementation.

Some recommendations were elaborated for supporting energy policy decisions.