



Ministry of Science and Technology – MCT
Interministerial Commission on Global Climate Change – CIMGC

NOTE OF EXPLANATION

1. OBJECTIVE

The purpose of this note of explanation is to make known the decision by the Interministerial Commission on Global Climate Change - CIMGC regarding the CO₂ emission factors for the Brazilian National Interconnected System (SIN) to be adopted by CDM projects in Brazil. It also presents the technical basis of the decision, as well as the timeframe for its implementation.

2. BACKGROUND

In July 2005, a working group composed by the Ministry of Mines and Energy - MME and the Ministry of Science and Technology - MCT, with the participation of the National Operator of the Electricity System (ONS), was created to make available to CDM project proponents the necessary information to apply the ACM0002 methodology. According to version 2 of this methodology, which was the latest version at the time, the dispatch data analysis was indicated as the most adequate method to calculate emission factors, but required detailed hourly information on energy dispatched by each subsystem.

MME, MCT and ONS worked together to adjust the methodology to the particular circumstances of the Brazilian electricity system. In order to ensure the transparency of the process, the details of the criteria adopted in the application of the methodology in Brazil were widely disseminated on MCT web site on the internet (<http://www.mct.gov.br/index.php/content/view/50862.html>). Moreover, two meetings were held with specialists and parties interested in developing projects, one in Rio de Janeiro, on 20 March 2007, before the disclosure of the outcomes, and another in Brasilia, on 16 August 2007, for the discussion of the criteria adopted. The most important issue for project proponents was not the adaptation of the methodology itself but the definition of the number of subsystems in the SIN.

The working group, after discussing relevant issues, proposed the adoption of four subsystems, following the subdivision adopted by the ONS in the dispatch by the SIN, that is, North, Northeast, Southeast/Center-West and South. CO₂ emission factors have been systematically calculated by ONS since January 2006 and made public on the CIMGC web site. Concomitantly the CIMGC submitted to the CDM Executive Board a detailed description of how the ACM0002 methodology had been applied to Brazil.

The four subsystems structure then adopted differed from the structure adopted by the vast majority of projects already submitted to the CIMGC, which considered only two subsystems (North/Northeast and South/Southeast/Center-West).

Viewing to broaden the debate, the CIMGC made a Public Consultation from 7 December 2007 to 31 January 2008, requesting comments on the criteria adopted for the application of the ACM0002 methodology in Brazil. As a result, 21 submissions were received from several institutions involved with the issue. These contributions criticized mainly the four subsystems structure (which was questioned by all submissions). The adoption of four subsystems was supported by only one submission; the other preferred the adoption of two subsystems or only one subsystem. Other issues addressed were making renewable energy projects viable in different regions, adjusting the ACM0002 methodology to the SIN, and possible definitions regarding transmission constraint under the CDM, among others.



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3. ANALYSIS OF THE RESULTS OF THE PUBLIC CONSULTATION

On 25 February 2008, a meeting of the working group was held to consider the submissions. As criticism focused mainly on the subsystem structure, the group analyzed the suggested alternatives, which can be grouped into:

- 1) Four subsystems: North, Northeast; Southeast/Center-West; South.
- 2) Two subsystems: North/Northeast; South/Southeast/Center-West.
- 3) A single system.

It should be noted that during the period of the Public Consultation, the Clean Development Mechanism Executive Board approved in Bonn, Germany, a new version (number 7) of the ACM0002 methodology, which indicates a specific methodological tool to calculate the emission factor for electricity systems. With regard to the number of subsystems of an electric grid, this tool presented two criteria that could be used to identify significant transmission constraints between two subsystems. Such criteria, which are reproduced below, are neither mandatory nor supplementary, but only possible criteria to identify significant transmission constraints, as suggested in the methodological tool:

- a) In case of electricity systems with spot markets for electricity, when there are differences in electricity prices (without transmission and distribution costs) of more than 5% between the systems during 60% or more of the hours of the year.
- b) When the transmission line is operated at 90% or more of its rated capacity during 90% or more of the hours of the year.

The working group used alternative (1) – configuration of four subsystems (North; Northeast; Southeast/Center-West; South) – to verify the possibility of using alternative (2), by means of the analysis of possible transmission constraints between the North and the Northeast, on the one hand, and between the South and the Southeast/Center-West, on the other, according to the proposed criteria (a) and (b). Simulations were carried out by the ONS and evaluated by the other members of the working group. The findings in this stage were that there were no transmission constraints between the South and Southeast/Center-West, neither between the North and the Northeast.

Afterwards, an analysis was made to verify if there were transmission constraints between the two subsystems (North/Northeast; South/Southeast/Center-West). With regard to criterion (a), more or less conservative options were analyzed for the calculations, such as, for instance, the inclusion or not of subsystem South in the calculation of price percentage differences. By means of sensitivity analysis, it was found that according to criteria that reflect more closely the actual operation of the SIN, the time percentage during which prices differed by more than 5% would be 60%, which is within the limit suggested in the calculation tool, thus indicating that there are no significant transmission constraints. In relation to criterion (b) (line saturation), the group did not compare the flow between the subsystems with the rated capacity of transmission between the subsystems because it is a complex procedure, which depends on the configurations of the interconnection system observed during the operation and the direction of the flows between regions. Instead, a simpler analysis was adopted, which consisted in verifying the behavior of price difference between regions. This simplified analysis was considered to be conservative, as it can include constraints beyond the line rated capacity as mentioned in the Executive Board tool. The simulations indicated that in only 70% of the hours of the year there was transmission at 90% or more of the rated capacity. They also indicated that there were no significant transmission constraints. Therefore, a detailed analysis of the flow between the systems along time was not necessary.



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4. FINDINGS AND CONSIDERATIONS BY THE MME, MCT AND ONS WORKING GROUP

The working group met on 28 April 2008, at MME, and analyzed the results of the simulations made.

The members of the group agreed by consensus that the current transmission constraints between the subsystems of the SIN are not significant enough to reduce substantially the global benefit of the project, according to the region where it is implemented, being thus advisable to adopt the configuration of a **single electricity system in Brazil**.

The group highlighted that the adoption of this configuration will be valid only for the purposes of calculation of CO₂ emission factors for CDM projects applying the ACM0002 methodology to estimate their greenhouse gas emission reductions. This decision shall in no way affect the current configuration used by the ONS in operation planning, as well as energy accounting and price definition as carried out by the Electricity Commercialization Chamber - CCEE, which adopts the subdivision of the SIN into four subsystems. It also highlighted that the technical basis provided by the simulations allows different approaches to be made in each case.

At last, the group pointed out that the evolution process of the SIN should only confirm the decision of adopting a single system to calculate the CO₂ emission factor, as the expansion of electricity transmission support between the subsystems will promote gradual reductions in transmission constraints and will enable a project implemented in a given subsystem to produce benefits in the other subsystems of the SIN.

5. DECISION BY THE CIMGC

The CIMGC, in its 43rd meeting on 29 April 2008, after considering the findings of the working group, decided to adopt a **SINGLE SYSTEM** as the pattern for CDM projects using the tool for calculating emission factors associated with the ACM0002 methodology to estimate their greenhouse gas reductions.

Thus the following timeframe is presented for the effective adoption and publication of the emission factors of the SIN, considering a single system:

- Publication of this note of explanation on the web site of the General Coordination Office on Global Climate Change - CGMG on the internet;
- Holding of an extraordinary meeting of the CIMGC, scheduled for 27 May 2008, at which a new resolution should be approved adopting the definition of a single system for the purposes of CDM projects;
- Publication on the MCT web site on the internet, following the publication in the Federal Official Gazette of the resolution mentioned above, the emission factors calculated for the single system, for years 2006 and 2007 and for January and February 2008.

The emission factors for the year 2005 will be published subsequently.