AM0014 METHODOLOGY UTILIZATION ASSESSMENT

This report summarizes the feasibility analysis for the utilization of approved methodology AM0014 – "Natural gas-based package cogeneration" for Corn Products Brasil's cogeneration project, which has been in operation since April 2003 at the Mogi-Guaçu Plant. This analysis, among other criteria established in the methodology itself, took into consideration the tendency and the guidance of the Executive Board's Meth Panel in seeking increasingly generic methodologies, which may be applied to different projects and at different places. Thus, the utilization of the AM0014 methodology for other projects, such as that of Corn Products, is believed to be in line with CDM assumptions.

Two basic questions have to be analyzed in order to verify whether a given methodology can or cannot be used for a project activity: applicability and "additionality".

In terms of applicability, the methodology defines the conditions which the Project Activity should fulfill in order for the Corn Products' cogeneration project to be consistent with the methodology applied in AM0014 (e.g., project technology, sector circumstances, region).

The only criteria of the applicability conditions that could lead to a misunderstanding is the third one defined in AM0014, which is: "No excess electricity is supplied to the power grid and no excess heat from the cogeneration system is provided to another user". This criterion could cause the following misinterpretation: was it referring to projects that have as their main purpose to supply energy to the grid or other users; or was it referring to any project that exported any amount of energy to the grid or any other user? In other words, does any minor power flow between the project and the grid violate the approved methodology, or are some conditions for such a power transfer allowable if the intent is to maximize cogeneration system efficiency?

For example, in order to follow the Executive Board's Meth Panel generic approach, our interpretation was that projects with the main purpose of selling energy to the grid wouldn't be eligible to use AM0014 (i.e., projects with annual sales or exports of more than 15% of the total energy produced by the cogeneration package). By using this understanding and generic approach, AM0014 would be applicable to projects where the cogeneration

package was designed to meet part or total energy demand of the facility at which the package is going to be implemented. Under these circumstances, therefore, some energy import and export would be acceptable as energy production from the cogeneration package was adjusted to meet changing energy demands at the production facility caused by typical production fluctuations. Such minor power flows would be acceptable for maximizing the overall efficiency of the cogeneration system as long as the total annual export of power does not exceed some threshold level, e.g., 15% of the total energy produced by the cogeneration package. Otherwise, the methodology AM0014 will be applicable only to projects designed to meet part of the energy demand of the facility.

In terms of "additionality", a systematic (step by step) procedure is supplied for determining whether the project is different from the baseline scenario or not.

APPLICABILITY

The methodology AM0014 is applicable to natural gas-based cogeneration projects under the following conditions:

- The cogeneration system is a third party cogeneration system, i.e. not own or operated by the consuming facility that receives the project heat and electricity.

Corn Products' cogeneration system is a third-party (owned and operated by EnergyWorks do Brasil Ltda) cogeneration system, in accordance with a contract signed on January 24, 2001.

- The cogeneration system provides all or a part of the electricity and or heat demand of the consuming facility.

The cogeneration system supplies all steam and power necessary for the Mogi Guaçu plant's processes.

- No excess electricity is supplied to the power grid and no excess heat from the cogeneration system is provided to another user.

The objective of the proposed cogeneration system is to meet exclusively the steam and power requirements of Corn Products' Mogi Guaçu plant. Although the cogeneration contract stipulates that excess power or a shortfall of power can be sold to or bought from the local concessionaire, possible debits or credits resulting from these events were not taken into account in the financial analysis of the project.

The sale or purchase of power will only take place in the following situations: in order to compensate for an excess or shortfall in the supply from the cogeneration plant vis-à-vis the demand for power on the part of the industrial plant.

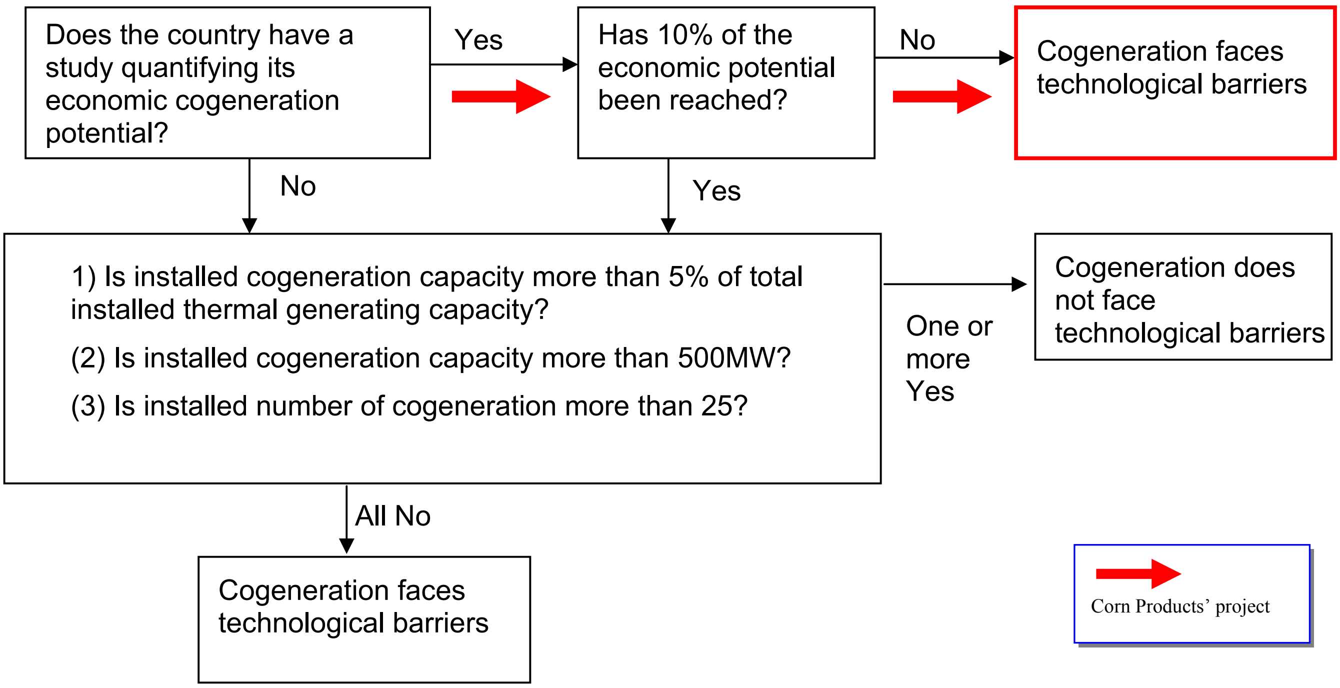
From the start-up of the Mogi Guaçu cogeneration plant up to 2004, about 330,751 MWh were generated. In this period, about 25,421 MWh were purchased from the local concessionaire, representing 7.69% of the total amount generated by the plant, and about 24,784 MWh were sold to the local concessionaire, representing 7.49% of the total power generated by the plant. These data clearly show that the objective of the above-mentioned cogeneration package is not to export power to the grid, but exclusively to meet the demand for steam and power of the Corn Products plant in Mogi Guaçu.

ADDITIONALITY

The methodology AM0014 establishes three additionality tests. The first two tests are applicable to any cogeneration ownership scenario. The third test is specific to the "package cogeneration" case where the cogeneration system is owned by a party other than the company using the heat and electricity from the system. All three tests shall be passed in order for the project activity to be additional.

The flow chart of the three tests is presented in the following.

1. Are there technological barriers to cogeneration in the country?



Does the country have a study quantifying its economic cogeneration potential?

Yes, the 2000-2009 Ten-Year Expansion Plan (GCPS, 2000), a study[1] prepared by the National Institute for Energy Efficiency (INEE) and a study[2] presented by the Thermal Production and Non-conventional Sources Group (GPT) define the technical cogeneration

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[1] Poole, Alan D. "*Observations on the Potential for Cogeneration in Brazil*", Sept./2003.

[2] *Grupo de Produção Térmica e Fontes Não Convencionais* (Thermal Production and Non-conventional Sources Group). "*Estimativa do Potencial de Cogeração no Brasil*" (Estimate of the Cogeneration Potential in Brazil). Oct./1999.

potential in Brazil as being about 12,5 GW, although the available studies dealing with the theme "Cogeneration Potential in Brazil" are not very thorough.

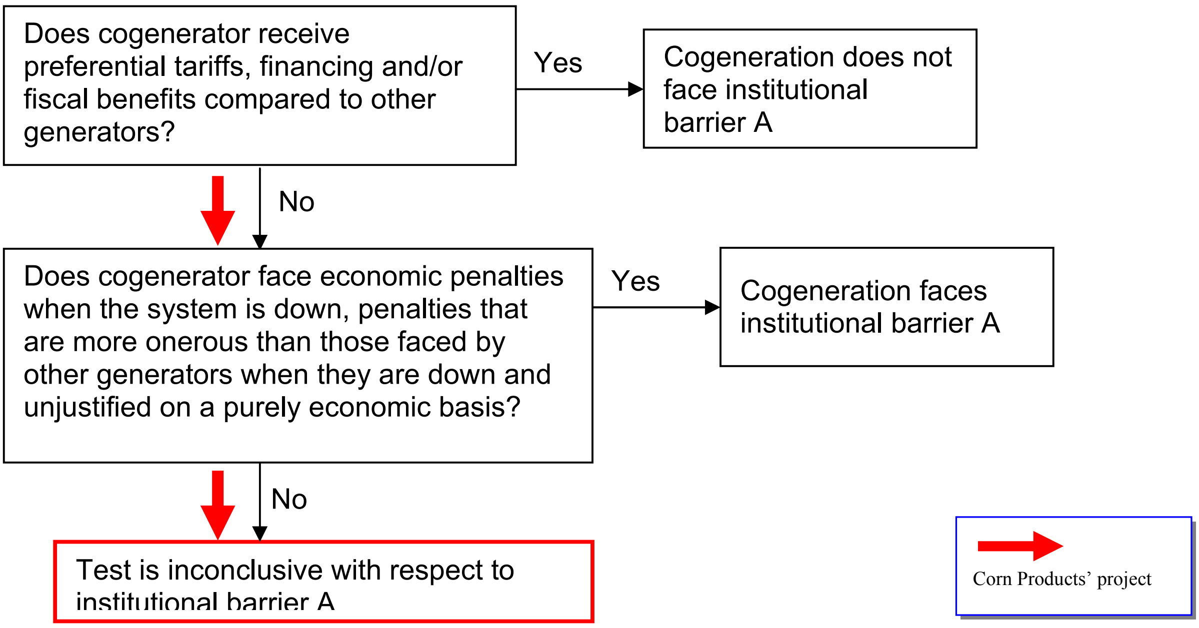
Has 10% of the economic potential been reached?

No. According to another study[3] carried out by UNESP / CPFL, "in countries with supplies of natural gas and whose degree of industrialization is similar to Brazil's, cogeneration represents between 10% and 20% of the load installed. In Brazil, it is no more than 4%". The data analyzed in the assessment of institutional barrier 2B confirm this estimate.

Thus, the project in question faces technological barriers.

2.A Institutional barrier A: Are there institutional barriers to cogeneration in general?

It should be noted that even if preferential tariffs or other incentives do exist, they may not be sufficient to promote cogeneration.



If the result of this test is inconclusive, then other barriers will need to be considered to determine additionality.

[3] Sobrinho, Pedro M. "*(Oportunidades de Negócio através da Obtenção de Créditos de Carbono e Cogeração*" (Business Opportunities presented by the Acquisition of Carbon Credits and Cogeneration).

Does cogenerator receive preferential tariffs, financing and/or fiscal benefits compared to other generators?

No, at the time the project was designed, Corn Products received neither a preferential tariff nor a tax benefit, in comparison with other generators.

After the definition of the project and the decision to implement it, the project was included in the Priority Program for Thermoelectric Plants ("PPT"). The Mogi Guaçu cogeneration plant did not receive any preferential tariffs in comparison with any other generator included in the Priority Program for Thermoelectric Plants. The PPT was intended to correct market deficiencies existing at the time by assuring independent power producers like Corn Products sufficient access to natural gas to meet project needs. The financial analysis conducted by Corn Products incorporated the price of natural gas it was receiving under its gas supply contract.

Also, it should be noticed that the cogeneration packages in operation at the Mogi Guaçu and Balsa Nova plants are the only cogeneration plants operating under PPT conditions. The "*Take or pay*" and "*Ship or pay*" penalties in the contracts for the supply of natural gas (80% and 95%, respectively, of the daily amount contracted for) constitute high barriers for the implementation of PPT cogeneration projects. So even if the PPT was incorrectly treated as a type of incentive, it is not sufficient to promote cogeneration projects.

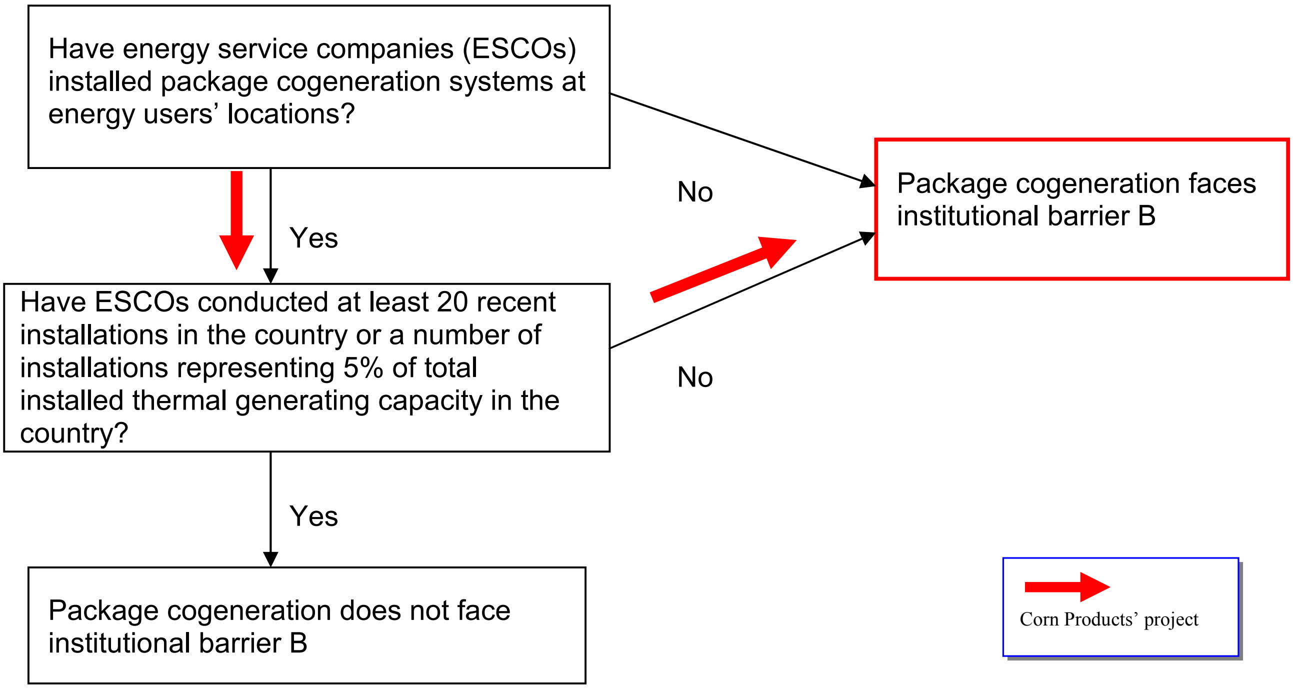
That is, the project had no kind of economic advantage in comparison with other generators or the penalties stipulated.

Does cogenerator face economic penalties when the system is down, penalties that are more onerous than those faced by other generators when they are down and unjustified on a purely economic basis?

No. At the time it was decided to implement cogeneration in Mogi Guaçu, the project was not subject to any economic penalties if the system interrupted supply; such penalties would be more costly than those that other generators would be subject to, and that would not be justifiable on a purely economic basis.

Test 2A is therefore inconclusive in relation to institutional barrier A.

2.B Institutional barrier B: Are there institutional barriers to the "package cogeneration" operational context? In other words, is there enough experience in which one company installs a cogeneration system at the location of a separate energy user?



Have energy service companies (ESCOs) installed package cogeneration systems at energy users' locations?

Yes, power utilities have installed "cogeneration package" systems on the premises of power users.

Have ESCOs conducted at least 20 recent installations in the country or a number of installations representing 5% of total installed thermal generating capacity in the country?

No. According to data obtained from the Brazilian Electric Power Atlas (*Atlas de Energia Elétrica do Brasil*)[4] - 2nd edition - the country's total installed capacity for thermal generation amounts to 19.7GW (inspected load). Also, in accordance with Table 2.1 of the Atlas ("Cogeneration plants in operation in the country"), there were 37 cogeneration enterprises installed in the country up to 2003, with a total output of about 781MW. Out of these, 21 enterprises are Independent Power Producers ("IPPs"), totaling 459MW. That is,

[4] ANEEL. "*Atlas de Energia Elétrica do Brasil*" (Brazilian Electric Energy Atlas) - 2nd edition, 2005.

in 2003, cogeneration represented a little less than 4% of the country's total installed capacity for thermal generation (3.97%, to be precise, if we consider Self-producers and IPPs, and 2.33% if we consider only the IPPs).

At the time it was decided to implement the cogeneration project, the country's total installed capacity for thermal generation amounted to approximately 11,44GW, according to data from the National Energy Balance Sheet (*Balanço Energético Nacional*)[5] (BEN 2002).

Considering that there is not even one official document summarizing the participation of cogeneration in the Brazilian energy matrix, such as the above-mentioned table (Table 2.1 of the Electric Power Atlas, 2nd edition), the methodology employed to measure the participation of cogeneration in the period when it was decided to implement the project was the following: based on the official data in Table 2.1, of October 2003, the cogeneration plants already in operation were identified, as well as those that had been enlarged and the respective periods. That is, from Table 2.1, cogeneration capacities that had started up from the end of 2001 on (as verified in the data available at Aneel, Eletrobrás and the Ministry of Mines and Energy) were deducted.

In short, at the end of 2001 cogeneration represented an even smaller amount than that observed in 2003: 3.89%, if we consider Self-Producers and IPPs, and 2.52% if we consider only IPPs. It should be stressed that these percentages are conservative because, whenever it was not possible to confirm the exact start-up times of the cogeneration plants mentioned above, due to the lack of data or a trustworthy source of information, those plants were included in the calculations.

Therefore, the above-mentioned project encountered institutional barrier B.

[5] MME. "*Balanço Energético Nacional*" (National Energy Balance Sheet) – BEN 2002 (Base Year 2001)

Table 2.1 – Cogeneration Plants operating in Brazil.

Plant	Municipality	State	Potency (kW)	Owner	Service	Source
Açominas	Congonhas	MG	66,340	Aço Minas Gerais S/A	APE	Other
Cogeração International Paper (Fases I e II)	Mogi Guaçu	SP	50,500	International Paper do Brasil Ltda	APE-COM	Fossil
Energy Works Kaiser Pacatuba	Pacatuba	CE	5,552	Energyworks do Brasil Ltda	PIE	Fossil
Copesul	Triunfo	RS	74,400	Companhia Petroquímica do Sul	PIE	Other
Globo	Duque de Caxias	RJ	5,160	Globo Comunicações Ltda	APE-COM	Fossil
Energy Works Rhodia Santo André	Santo André	SP	11,000	Energyworks do Brasil Ltda	PIE	Fossil
Suape, CGD e Koblitz Energia Ltda.	Cabo de Santo Agostinho	PE	4,000	Suap[illegible]oblitz Energia Ltda.	PIE	Fossil
Suzano	Suzano	SP	38,400	Com[illegible]e	APE	Fossil
Celpav IV	Jacareí	SP	107,480	Votorantim Celulose e Papel S/A	APE-COM	Biomass
Barra Grande de Lençóis	Lençóis Paulista	SP	62,900	Usina Barra Grande de Lencóis S/A.	PIE	Biomass
Coinbra - Cresciumal	Leme	SP	5,700	Coinbra Cresciumal S/A	PIE	Biomass
Energy Works Kaiser Jacareí	Jacareí	SP	8,592	Energyworks do Brasil Ltda	PIE	Fossil
São Francisco	Sertãozinho	SP	6,738	Bioenergia Cogeradora Ltda	PIE	Biomass
Lucélia	Lucélia	SP	15,700	C[illegible]	PIE	Biomass
Santa Adélia	Jaboticabal	SP	42,000	Termoelétrica Santa Adélia Ltda	PIE	Biomass
UGPU (Messer)	Jundiaí	SP	7,700	Sociedade Brasileira [illegible] Ltda	PIE	Fossil
Guarani - Cruz Alta	Olímpia	SP	30,000	Açúcar Guarani S/A	PIE	Biomass
São José da Estiva	Novo Horizonte	SP	19,500	Usina São José da Estiva S/A Açúcar e Álcool	PIE	Biomass
PROJAC Central Globo de Produção	Rio de Janeiro	RJ	4,950	TV Globo Ltda	APE	Fossil
Unidade de Geração de Energia -Área II	Limeira	SP	6,000	Cooperativa dos produtores de Cana, Açúcar e Álcool do Estado de São Paulo	APE	Fossil
Energy Works Rhodia Paulínia	Paulínia	SP	10,000	Energyworks do Brasil Ltda	PIE	Fossil
Iguatemi Fortaleza	Fortaleza	CE	4,794	Condomínio Civil Shopping Center Iguatemi	APE	Fossil
Cesar Park Business Hotel/Globenergy	Guarulhos	SP	2,100	Inpar Construções e Empreendimentos Imobiliários Ltda	APE	Fossil
Bayer	São Paulo	SP	3,840	Bayer S/A	APE	Fossil
CTE Fibra	Americana	SP	9,200	Fibra S/A	APE	Fossil
Cerradinho	Catanduva	SP	29,000	Usina Cerradinho Açúcar e Álcool S/A	PIE	Biomass
EnergyWorks Corn Products Mogi	Mogi Guaçu	SP	21,400	Energyworks do Brasil Ltda	PIE	Fossil
EnergyWorks Corn Products Balsa	Balsa Nova	PR	10,800	Energyworks do Brasil Ltda	PIE	Fossil
Santa Elisa - Unidade I	Sertãozinho	SP	58,000	Companhia Energética Santa Elisa	PIE	Biomass
Carioca Shopping	Rio de Janeiro	RJ	3,200	Administradora Carioca de Shopping Centers S/C Ltda	APE-COM	Fossil
IGW/Service Energy	São Paulo	SP	2,825	Telecomunicações de São Paulo S/A	APE	Fossil
Santo Antônio	Sertãozinho	SP	23,000	Bioenergia Cogeradora Ltda	PIE	Biomass
Stepie Ulb	Canoas	RS	3,300	Stepi[illegible]	PIE	Fossil
Inapel	Guarulhos	SP	1,204	Inapel Embalagens Ltda	APE	Fossil
Eucatex	Salto	SP	9,800	Euca[illegible]	PIE	Fossil
Bunge Araxá	Araxá	MG	11,500	Bunge Fertilizantes S/A	APE	Other
Millennium	Camaçari	BA	4,781	Millennium Inorganic Chemicals do Brasil S/A	APE	Fossil

Source: BIG, october 2003.

End of 2001, according to ONS.
Delayed, according to fiscalization docs from Aneel.
Jul/2001
Resolution 718 Aneel (31/12/01)
Sep/2002 - expansion of 34MW, according to ONS.
Jun/2002 - start-up of 22MW, according to fiscalization docs from Aneel.
Delayed, according to fiscalization docs from Aneel.
Jul/2002 - start-up of 25MW, according to fiscalization docs from Aneel.
Jul/2002 - start-up, according to fiscalization docs from Aneel.
Oct/2001
Annel's Authorization - Mar/2002

Installed thermo generation in the end of 2003 (GW)	**19.7**	(AtlasEE 2003)
total (kW)	781,356	**3.97%**
PIE (kW)	459,082	**2.33%**

Until the middle of 2001

Installed thermo generation in the end of 2001 (GW)	**11.44**	(BEN 2002)
total (kW)	444,876	**3.89%**
PIE (kW)	288,082	**2.52%**

From the original table 2.1, presented above, cogenerations operating from the end of 2001 were subtracted (according to the verification of available data).