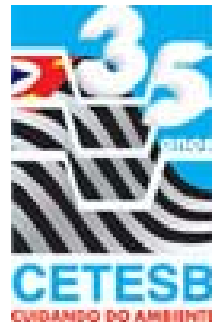


Country profile – Brazil

3rd issue

May, 2007

João Wagner Alves – CETESB – BRAZIL



SECRETARIA DE ESTADO
DO MEIO AMBIENTE



GOVERNO DO ESTADO DE
SÃO PAULO
CUIDANDO DE GENTE

Summary

According with Brazilian press (Gazeta Mercantil, 2007), on year 2008, the demand of electric energy in the country will reach the same level of the available energy. Today, the rate of asseguarated offer of electric power in Brazil is near to 54GW and the consumption is 50GW. If the official prediction of annual economic growth at rate of 5% or more be confirmed, this diference is not enough for more than two years. As happened in 2001, the government will have to adopt several measures of restriction of consumption to the residential sector, to services and mainly to industry.

Today, electric thermogenesis with natural gas are the more probable technology and source trends for the next years in this sector and, until this moment, there is not a satisfactory strategy to improve the use of cleaner sources like landfill gas.

Five years ago, in the country there were less than ten initiatives related with biogas use, including laboratorial experiments in landfills, wastewater treatment plants and farms.

Summary

In the last two years, between opportunities of trade of Carbon Credits, according the Kyoto Protocol, the Clean Development Mechanism (CDM) projects that were approved by Designated National Authority (DNA) are 131 at April, 2007. There are 20 projects about recovery of biogas in farms and other 20 in landfills. It means 31% of all Brazilian initiatives. Local consultants on CDM have other 27 projects in landfills under negotiation. Despite this figure, there is only one project generating electricity and another evaporating leachate. All other projects are only destroying or, in other words, collecting cleaning and burning (with a complex system of monitoring and certification) the methane contained in biogas without use the available energy.

In the country level, CETESB is preparing, in partnership with local representatives from AIDIS, a meeting to clarify the barriers to the energetic use and find the best solution including social, economic and environmental aspects. A partnership with US-EPA will be specially welcome and helpfull.

Solid waste management sector

Brazil, for many years had only one source of data about the solid waste management sector. The lack of information and inconsistency of data available was a real problem. In last years, the traditional knowledge, issued by the IBGE, the National Statistics Center, have a new source – SNIS (National System of Data on Sanitation), coordinated by the Ministry of Cities. In the annexes was included only three of a large number of tables. SNIS, is collecting information of operation, project, economics, social, environment, etc, that helps to understand this sector like never in the past. The following information was collected, organized and issued on INTERNET by SNIS (www.snis.gov.br).

Solid waste management sector

Municipalities and frequency of population

	Municipalities	Population Total	Urban
Until 100.000	5336	83.000.000	54.000.000
From 100.001 to 500.000	194	40.000.000	38.000.000
More than 500.000	31	47.000.000	46.000.000
Brazil	5561	170.000.000	138.000.000

Source: IBGE, [2007](#)

Municipalities, according SNIS's [ranges](#)

range	Municipalities		
	total	sample	fraction (%)
1	4.562	27	0,60%
2	903	69	7,60%
3	81	51	63,00%
4	12	12	100,00%
5	2	2	100,00%
Total	5.560	161	2,90%

Source: SNIS, 2007

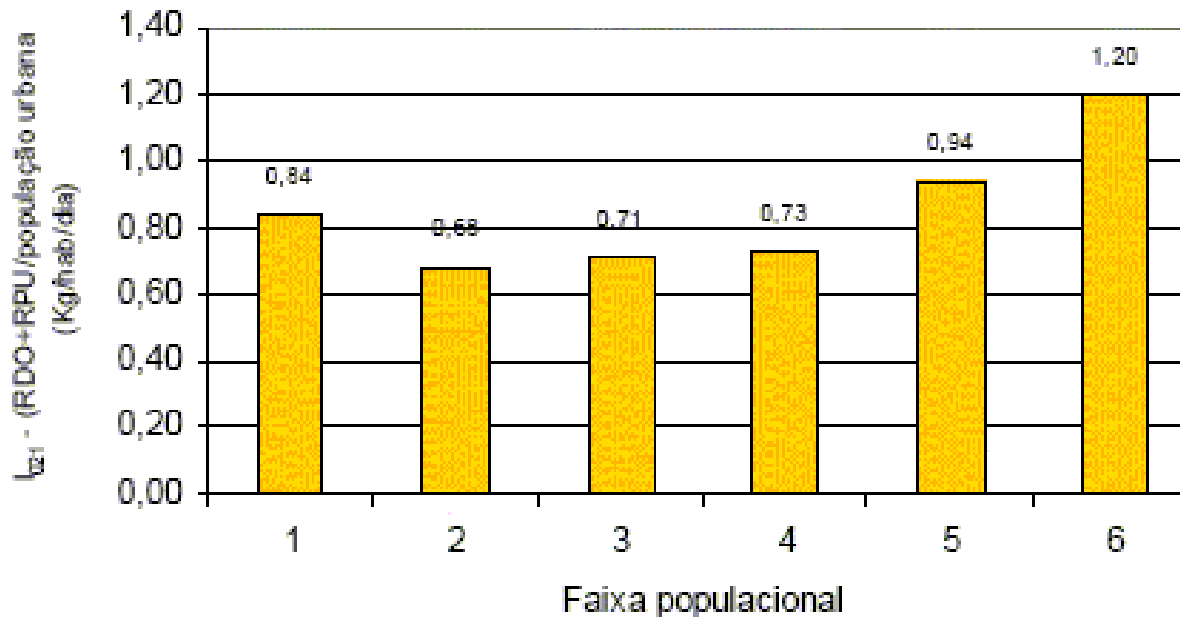
Solid waste management sector

Population and municipalities in 27 States of Brazil and at SNIS's sample

State	Municipalities			population		
	Brazil	SNIS's sample	fraction (%)	<u>Brazil</u>	SNIS's sample	fraction (%)
1 <u>AC</u>	22	1	4,50%	620.634	284.555	45,80%
2 <u>AL</u>	102	2	2,00%	2.980.910	1.081.840	36,30%
3 <u>AM</u>	62	2	3,20%	3.148.420	1.630.679	51,80%
4 <u>AP</u>	16	1	6,30%	547.400	326.466	59,60%
5 <u>BA</u>	417	10	2,40%	13.682.074	4.271.151	31,20%
6 <u>CE</u>	184	5	2,70%	7.976.563	2.629.042	33,00%
7 <u>DF</u>	1	1	100,00%	2.282.049	2.282.049	100,00%
8 <u>ES</u>	78	5	6,40%	3.352.024	1.242.619	37,10%
9 <u>GO</u>	246	7	2,80%	5.508.245	2.200.088	39,90%
10 <u>MA</u>	217	5	2,30%	6.021.504	1.302.088	21,60%
11 <u>MG</u>	853	25	2,90%	18.993.720	6.505.676	34,30%
12 <u>MS</u>	77	3	3,90%	2.230.702	1.013.415	45,40%
13 <u>MT</u>	139	3	2,20%	2.749.145	556.949	20,30%

Solid waste management sector

The SNIS study suggests new standards of waste generation in the country. Projects in cities like Sao Paulo, Rio de Janeiro, Belo Horizonte, Salvador, Recife and Fortaleza have to consider the generation rate of 1,2kg/person.day, while projects in smaller cities have to considerate a generation of approximately 0,68kg/person.day. New standards if compared with recent data available.



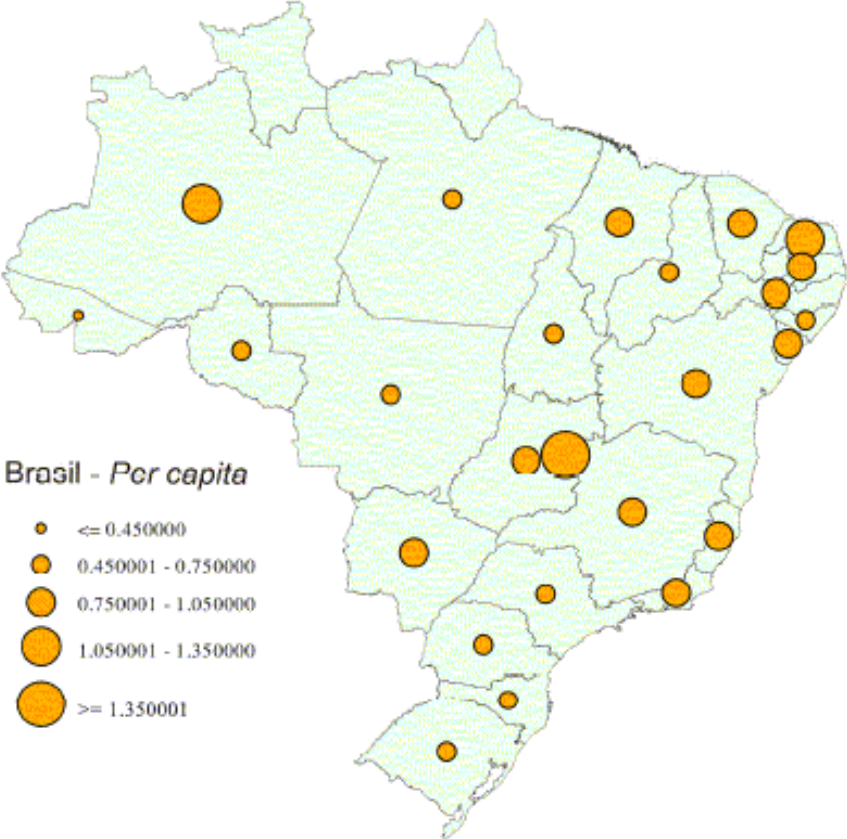
Faixa populacional = SNIS's range

RDO+RPU/população urbana = Amount of solid waste [kg/person.day]

Source: SNIS

Solid waste management sector

The following map from SNIS study also shows standards of waste generation by region.



Overview of LFG in Brazil

There are several Clean Development Mechanism projects on the waste sector (landfill gas and manure management) submitted to the Brazilian Designated National Authority, following the CDM projects in Brazilian landfills:

Urban Solid Waste						
Name	State	waste (t/day)	Open	Close	Use/Methodology	CO ₂ equiv/year (t/year)
Canabrava Landfill	BA	2.800	1974	2001	Flaring/ACM0001	250.000
Vega Landfill	BA	900	1997	2010	Flaring/ACM0002	n.a.
Manaus Landfill	AM	n.a.	1986	2015	Flaring/ACM0002	800.000
Pedreira landfill		n.a.	2007	2013	Flaring/ACM0001	200.000
Marca Landfill	ES	1.000	2002	2017	Flaring/ACM0001	200.000
Aurá Landfill	PA	402	1990	2010	Flaring/ACM0001	
Nova Gerar Landfill	RJ	2.000	2003	2023	Flaring/ACM0001	200.000
						1.000.000
Sil Landfill	RS	n.a.	2001	2014	Flaring/ACM0001v3	800.000
Anaconda Landfill	SP	419	2000	n.a.	Flaring/ACM0001v3	100.000
Bandeirantes Landfill	SP	7.500	1979	2006	20MWe/ACM0001	1.000.000
Caieiras Landfill	SP	2.000	2002	2020	Flaring/ACM0001	500.000
						1.000.000
Embralixo/Araúna Landfill	SP	148	1990	2013	Flaring/ACM0001	66.000
Estre/Itapevi Landfill	SP	900	2001	2014	Flaring/ACM0001v3	
Estre/Paulínia Landfill	SP	1.637	2000	2010	Flaring/ACM0001v2	200.000

⁹Source: SNIS - <http://www.snis.gov.br/#>

Research and Development

Previous list: Gravataí RS; Porto Alegre RS; **Passo Fundo** RS; Florianópolis SC; Curitiba PR; **Londrina** PR; **Maringá** PR; Goiânia GO; **Distrito Federal** DF; **Campo Grande** MS; Americana SP; **Santos** SP; Guarulhos SP; **Santo André** SP; **Belo Horizonte** MG; Nova Iguaçu RJ; Duque de Caxias RJ; **São Gonçalo** RJ; Mesquita RJ; **Niterói** RJ; **Recife** PE; **Olinda** PE; **Maceió** AL; **São Luís** MA; Caucaia CE; Lauro de Freitas BA; **Camaçari** BA; Manaus AM; **Fortaleza** CE; Belém PA

New list: Belo Horizonte – MG; **Governador Valadares** – MG; **Juiz de Fora** – MG; Niterói – RJ; São Gonçalo – RJ; **Piracicaba** – SP; Santo André – SP; Santos – SP; **Jacareí** – SP; **Jundiaí** – SP; **Alvorada** – RS; **Caxias do Sul** – RS; Gravataí – RS; Florianópolis – SC; **Joinville** – SC; Londrina – PR; Maringá – PR; Passo Fundo – PR; Campo Grande – MS; Distrito Federal – DF; **Alagoinhas** – BA; Camaçari – BA; **Vitória da Conquista** – BA; **Aracajú** – SE; Fortaleza – CE; **Maceió** – AL; Olinda – PE; Recife – PE; São Luiz – MA; **Terezina** – PI

Research and Development

The screenshot shows a Windows Internet Explorer browser window. The address bar displays the URL <http://www.cetesb.sp.gov.br/biogas/default.asp>. The page content includes a header for the 'PORTAL DO GOVERNO DO ESTADO DE SÃO PAULO' and a large logo for 'BIOGÁS GERAÇÃO E USO ENERGÉTICO'. Below the logo, there is a section titled 'Programas "Biogás, geração e uso energético" aterros e efluentes & resíduo rural, versão 1.0.' followed by a detailed text block and a list of downloadable programs.

PORTAL DO GOVERNO DO ESTADO DE SÃO PAULO

BIOGÁS GERAÇÃO E USO ENERGÉTICO

Programas "Biogás, geração e uso energético" aterros e efluentes & resíduo rural, versão 1.0.

Esses programas foram desenvolvidos no Brasil com recursos dos Governos Federal e do Estado de São Paulo. Seu uso, reprodução e distribuição são livres, desde que sejam citadas as instituições realizadoras e financiadoras. Eles estimam as emissões de biogás e as quantidades de energia disponíveis pela sua recuperação e uso em aterros sanitários e estações de tratamento anaeróbio de esgotos domésticos ou efluentes industriais ou resíduos rurais. Os resultados gerados por eles são as primeiras e menos onerosas informações que permitirão ao interessado dar início ao extenso processo de obtenção dos benefícios energético e financeiro pela recuperação e uso energético do biogás.

A CETESB preparou um CD para aterros e outro para efluentes e resíduo rural. Eles permitem a instalação dos programas executáveis contêm pastas que também incluem o manual de orientação do uso do programa, o programa instalador e o código fonte do programa original. Para baixar o CD de sua preferência, clique em uma das linhas abaixo.

- Programa "Biogás geração e uso energético" efluentes e resíduo rural, versão 1.0 - (90MB)
- Programa "Biogás geração e uso energético" aterros, versão 1.0 - (107MB)

Para descompactar cada CD empregue o programa Winzip. Caso não esteja instalado em seu computador clique [aqui](#)

Sobre a cooperação entre SMA-SP, CETESB e MCT.
Estes programas de computador para estimativa de geração de biogás e avaliação de recuperação e uso energético, fazem parte dos produtos desenvolvidos no âmbito de dois Convênios firmados entre o Governo do Estado de São Paulo, por meio da Secretaria de Estado do Meio Ambiente e da Companhia de Tecnologia de Saneamento Ambiental - CETESB, e do Governo Federal, por meio do Ministério da Ciência e Tecnologia. Esses Convênios têm como objetivo a elaboração de manuais de orientação para a recuperação e uso energético do biogás de estações de tratamento anaeróbio de esgotos e de aterros sanitários. Os Convênios foram

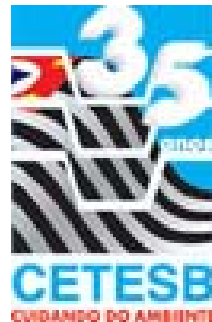
http://www.cetesb.sp.gov.br/biogas/aterro.zip

Available at www.cetesb.sp.gov.br/biogas or send us our address by e-mail to: biogas@cetesbnet.sp.gov.br

Thank you

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SECRETARIA DE ESTADO
DO MEIO AMBIENTE



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