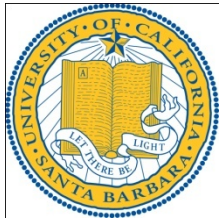
International Workshop on Carbon Markets in Emerging Economies



22 November 2010

CDM in Brazil –
CDM experiences in Brazil, drawing from diverse perspectives

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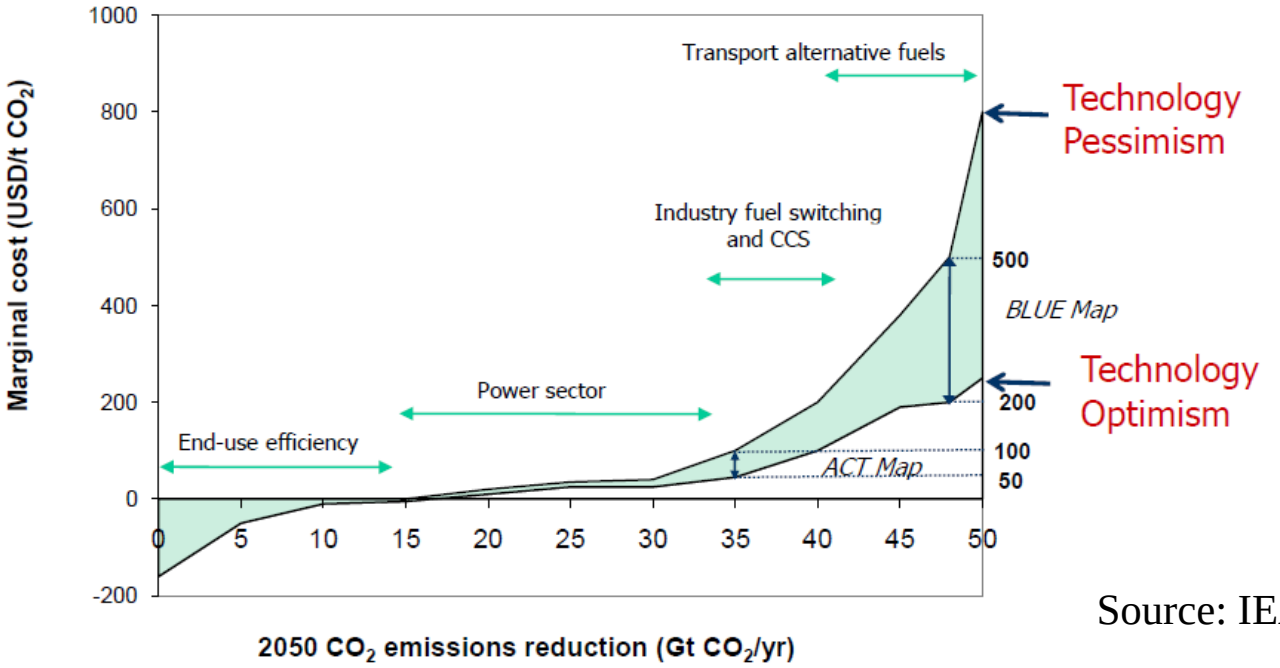
Outline

- Carbon markets – what does it mean for emerging economies?
- CDM statistics, by October 2010.
- The CDM experience in Brazil.
- CDM projects related to electricity production from biomass, in Brazil (sugarcane residues, in particular).
- Concluding remarks.

Why carbon markets?

- Carbon markets are related with mechanisms that allow flexible investments. The aim is the reduction of the mitigation costs, as opportunities and costs vary a lot from country to country.
- Most of the low cost opportunities are in developing countries/emerging economies (i.e., non-Annex I countries).
- In theory, such markets could induce economic and technological development. In addition, the market for some technologies would be amplified.

Why emerging economies?

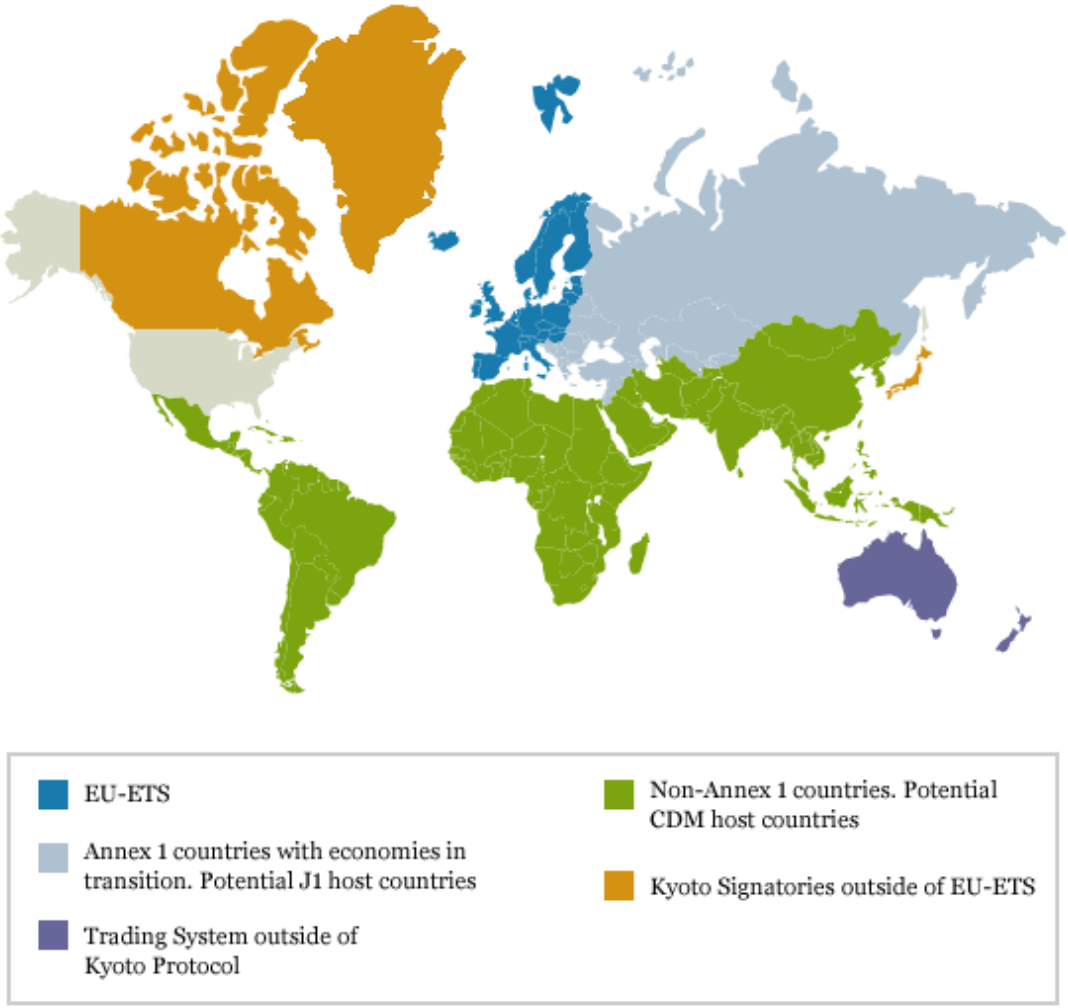


Source: IEA (2008)

To bring emissions back to current levels by 2050 options with a cost up to USD 50/t are needed. Reducing emissions by 50% would require options with a cost up to USD 200/t.

- In emerging economies, low cost mitigation opportunities are, in theory, more easily found.

Existing carbon markets



- In the existing carbon markets the only real option for the emerging economies is CDM (as host countries).

Source: House of Commons (2010)

The basics of CDM

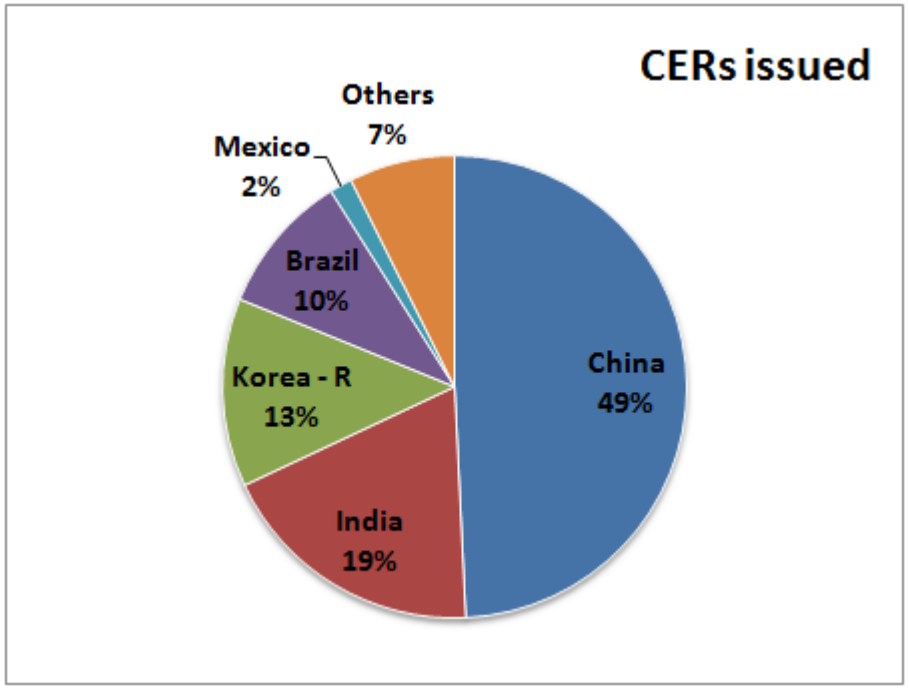
- The Clean Development Mechanism (CDM) was set up alongside the Kyoto Protocol and has been operational since 2006.
- Under the CDM, projects in the developing world that are deemed to reduce emissions can earn credits, each equivalent to one tonne of CO_2.
- These credits can be bought directly by industrialised countries to meet a proportion of their emission reduction targets under the Kyoto Protocol. A proportion of them may also be bought by businesses within the EU to use instead of EU ETS allowances in covering their emissions.

CDM statistics by November 2010 (1)

- 4,200 projects, of which 2,520 registered (175 rejected and 52 withdrawn).
- Annual average CERs of these projects = 396 million, with expected 1,860 million CERs until the end of 2012.
- The number of CERs shall surpass 2,900 million until the end of 2012.
- 2.9 $GtCO_2$ (expected result by 2012; considering 7 years on average) correspond to less than 1% of current GHG emissions per year (estimated as 50 $GtCO_2$).
- Considering 2,590 projects, 1,415 (~44%) are classified as large.

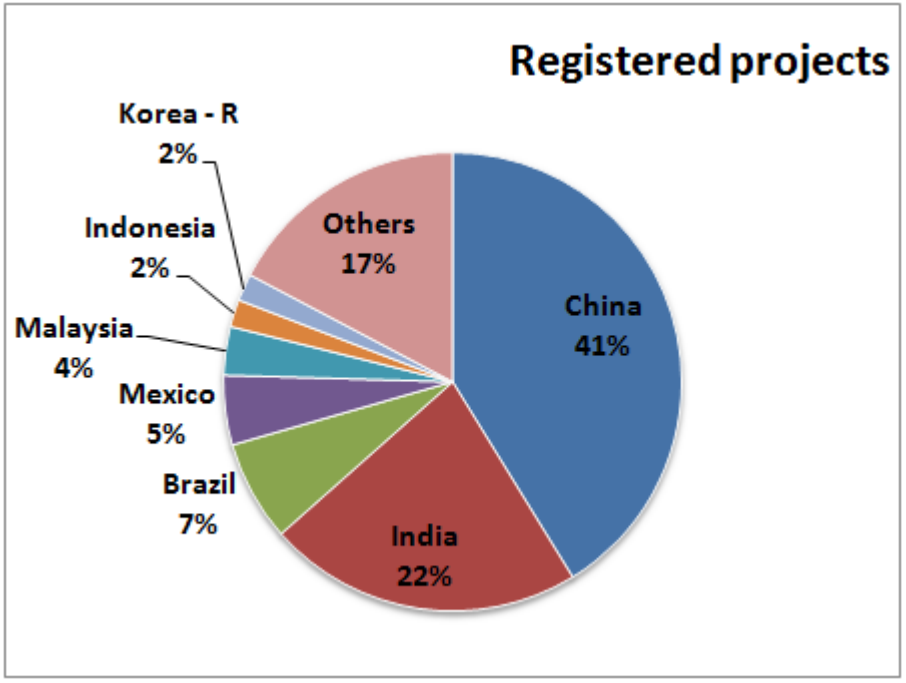
Source: www.cdm.unfccc.int

CDM statistics by November 2010 (2)



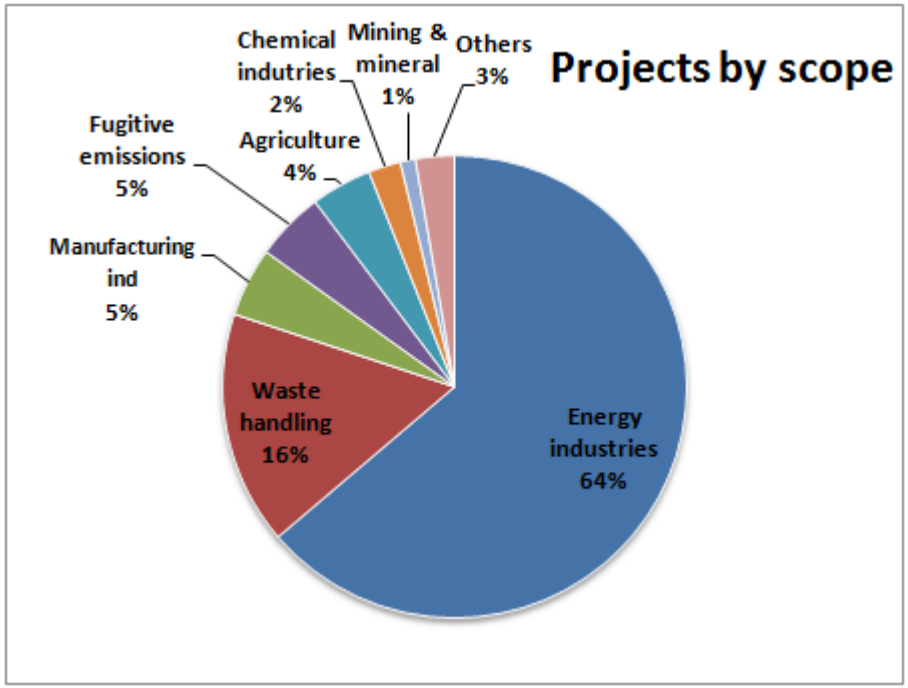
90% of the results in just four countries.

70% of the projects in just three countries.

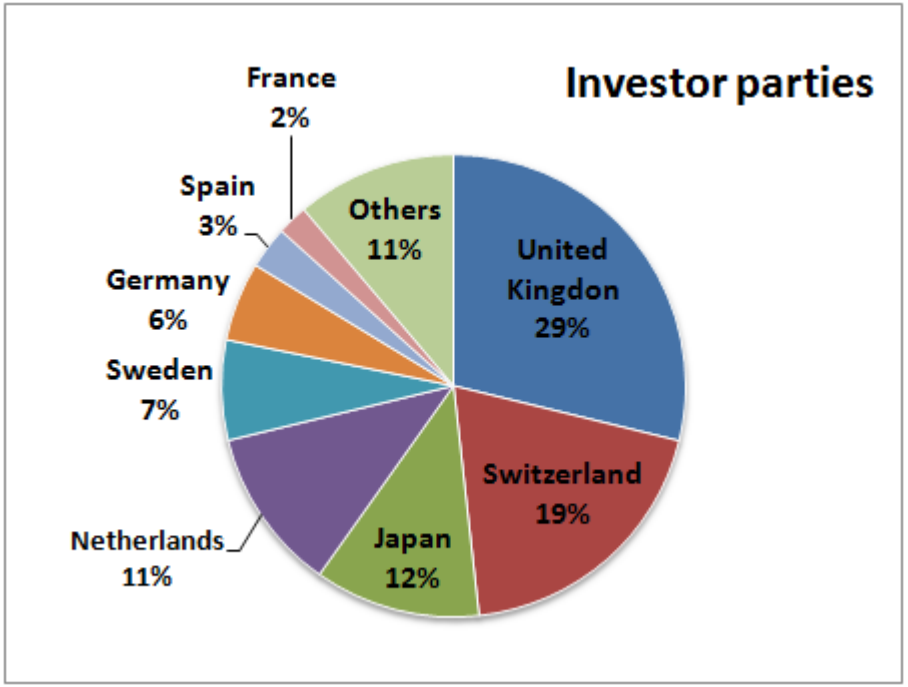


Source: www.cdm.unfccc.int

CDM statistics by November 2010 (3)



80% of the projects in two groups.



At least 75% of the investment done by European countries.

Source: www.cdm.unfccc.int

CDM statistics by November 2010 (4)

- Many countries with (very) few projects; a lot of them in Africa.
- Figure shows non-Annex I countries with less than 10 projects.
- Only 19 countries have more than 10 projects.

Source: www.cdm.unfccc.int

CDM statistics by November 2010 (5)

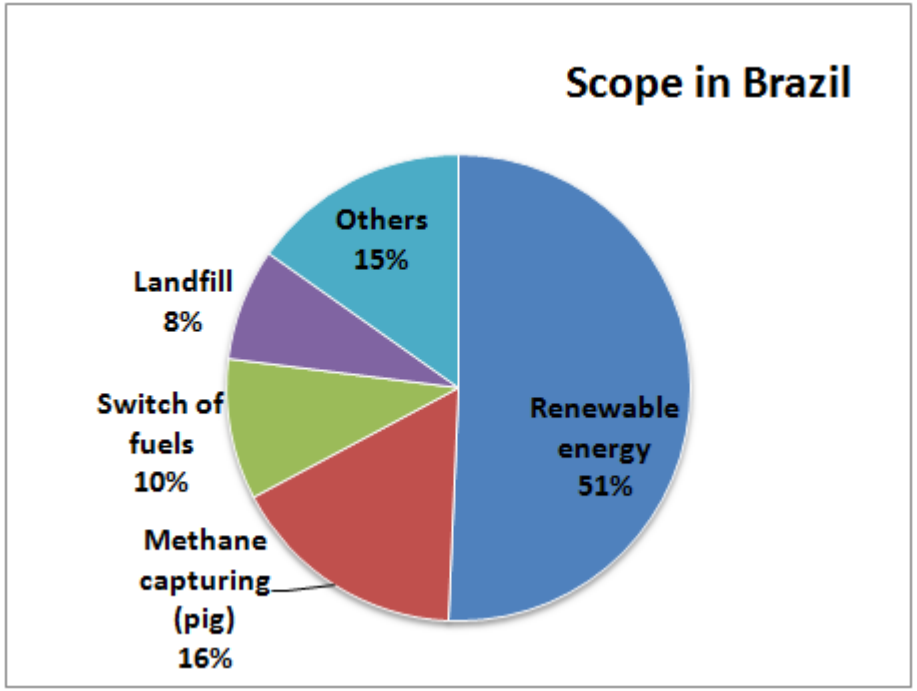
	# projecs	# methodologies	Projects/methodology
(01) Energy industries (renewable - / non-renewable sources)	1920	55	34,9
(02) Energy distribution	0	2	0,0
(03) Energy demand	30	17	1,8
(04) Manufacturing industries	145	27	5,4
(05) Chemical industries	68	19	3,6
(06) Construction	0	0	
(07) Transport	3	9	0,3
(08) Mining/mineral production	32	1	32,0
(09) Metal production	8	7	1,1
(10) Fugitive emissions from fuels (solid, oil and gas)	145	8	18,1
(11) Fugitive emissions from production and consumption of halocarbons and sulphur hexafluoride	24	8	3,0
(12) Solvent use	0	0	
(13) Waste handling and disposal	490	18	27,2
(14) Afforestation and reforestation	17	18	0,9
(15) Agriculture	128	5	25,6
TOTAL	3010	194	

Source: www.cdm.unfccc.int

CDM statistics – Brazil (2010)

- 179 projects registered at UNFCC, being the first one in November 2004.
- Classification cause double counting of projects.
- There are more projects (99) in the “energy industries” group (among registered and requesting registration). In this set there are cogeneration units, small hydro, wind plants, etc.
- “Waste handling and disposal” is the second most important, with 76 projects.
- Other groups: “Agriculture” (41), “Fugitive emissions from fuels” (16), “Chemical industries” (6), “Metal production” (2), “Fugitive emissions from halocarbons and SF_6” (1).

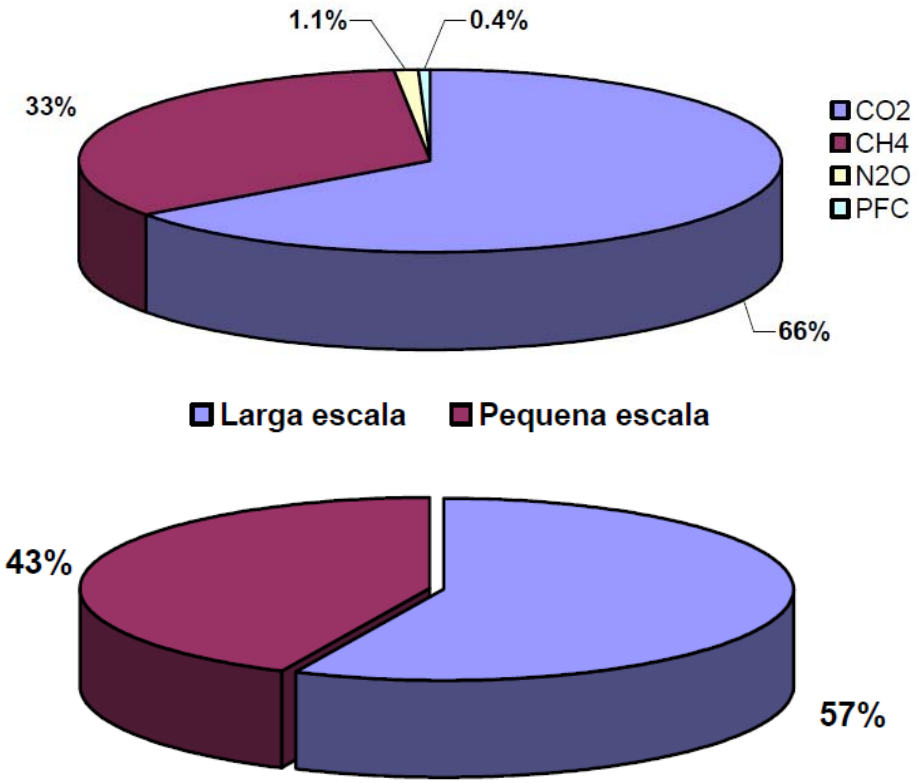
Scope of the projects - Brazil



- In Brazil, by August 2010, 51% of the projects were related to renewable energy (88 projects); no other project was registered after 2008.

Source: Status atual das atividades de projeto no âmbito do Mecanismo de Desenvolvimento Limpo (MDL) no Brasil e no mundo (at www.mct.gov.br).

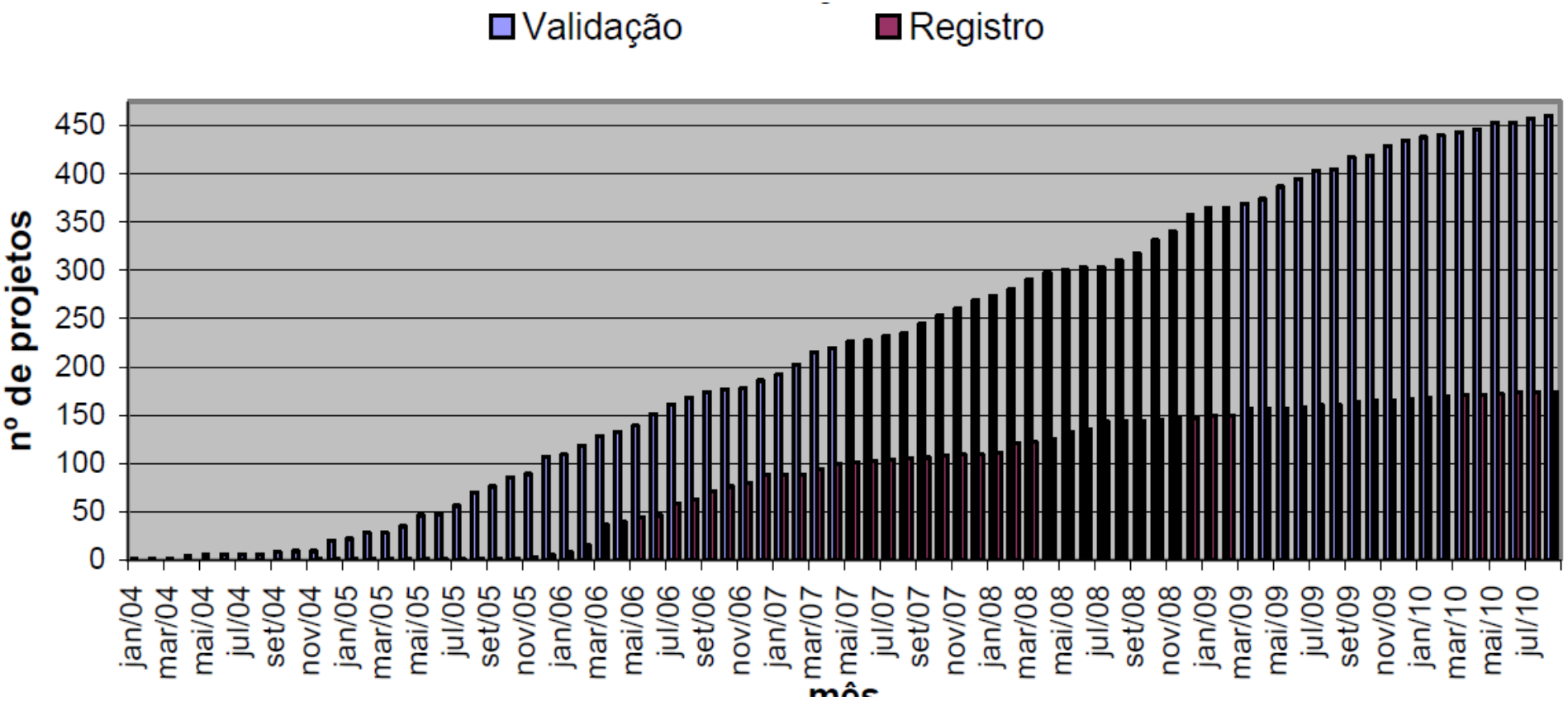
CDM projects in Brazil (1)



- The bulk of the projects are related to the avoidance of CO_2 emissions.
- 57% of the overall projects are classified as large-scale ones.

Source: Status atual das atividades de projeto no âmbito do Mecanismo de Desenvolvimento Limpo (MDL) no Brasil e no mundo (at www.mct.gov.br).

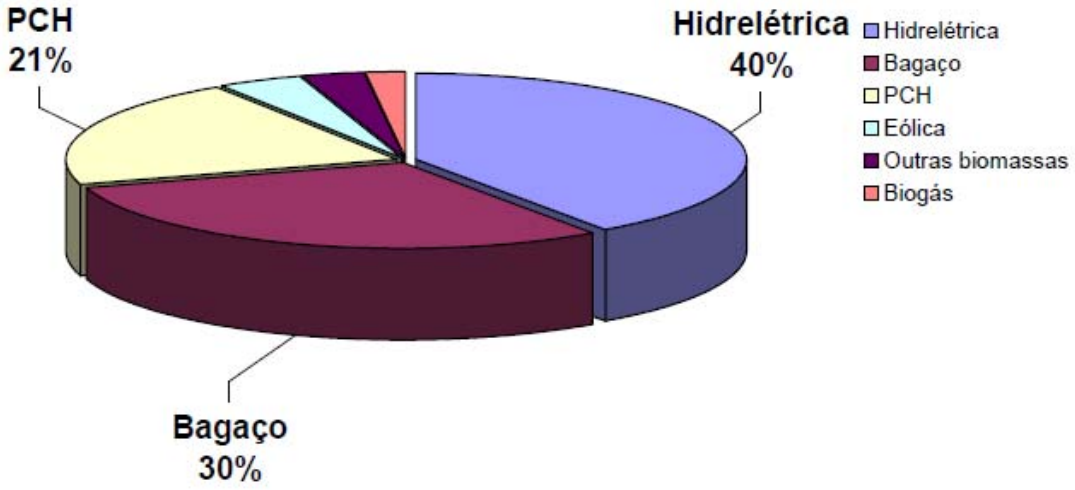
CDM projects in Brazil (2)



- Reduction of the rate of projects registered.

Source: Status atual das atividades de projeto no âmbito do Mecanismo de Desenvolvimento Limpo (MDL) no Brasil e no mundo (at www.mct.gov.br).

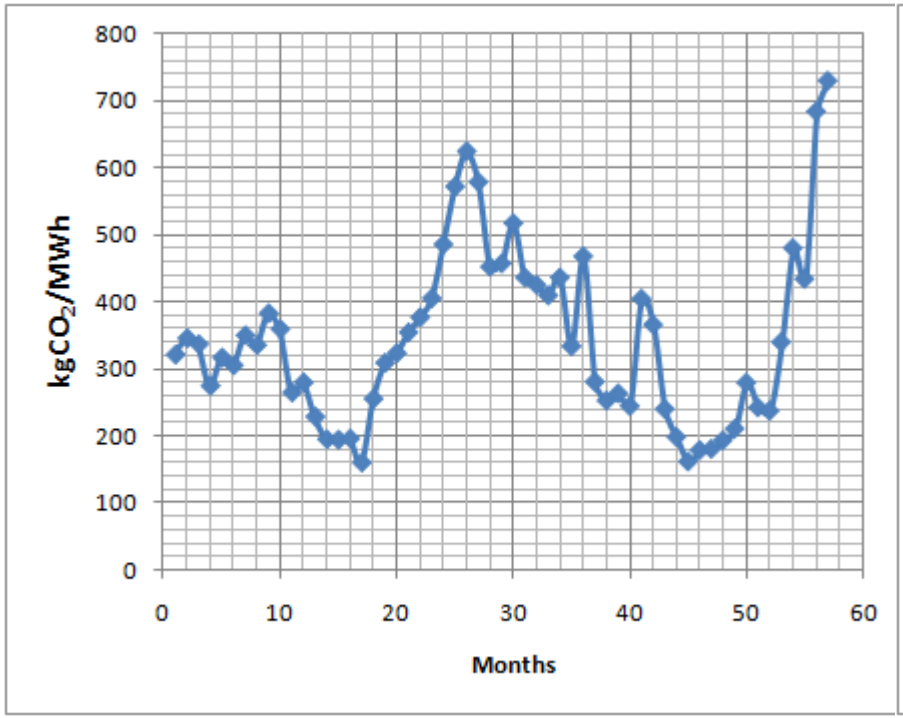
CDM projects in Brazil (3)

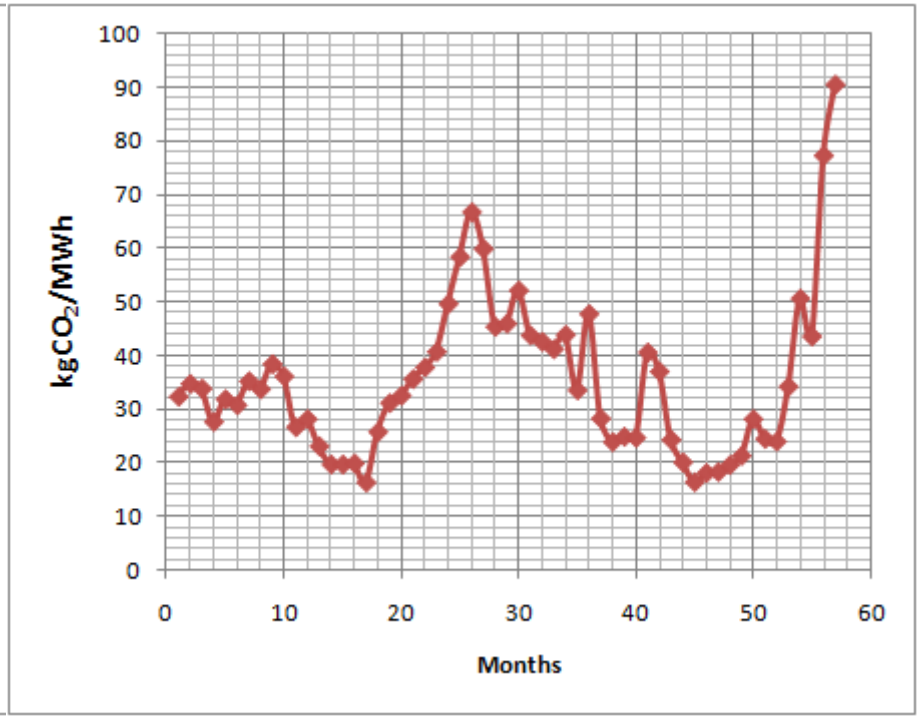


- Regarding the capacity of the CDM projects related to renewable energy, 1,334 MW are due to sugarcane bagasse cogeneration.

Source: Status atual das atividades de projeto no âmbito do Mecanismo de Desenvolvimento Limpo (MDL) no Brasil e no mundo (at www.mct.gov.br).

Emission factors in Brazil (1)

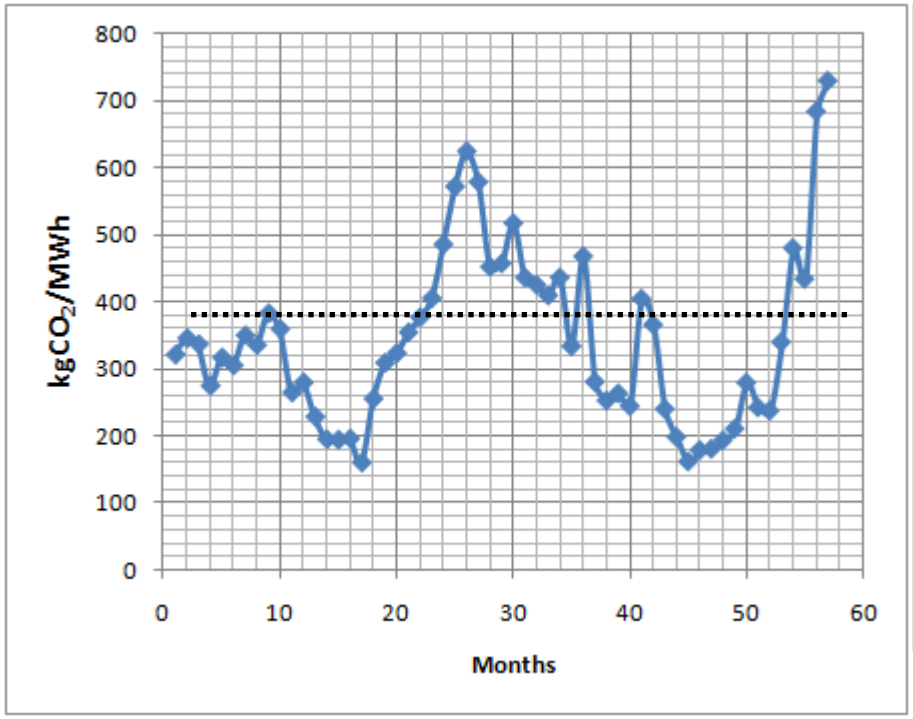


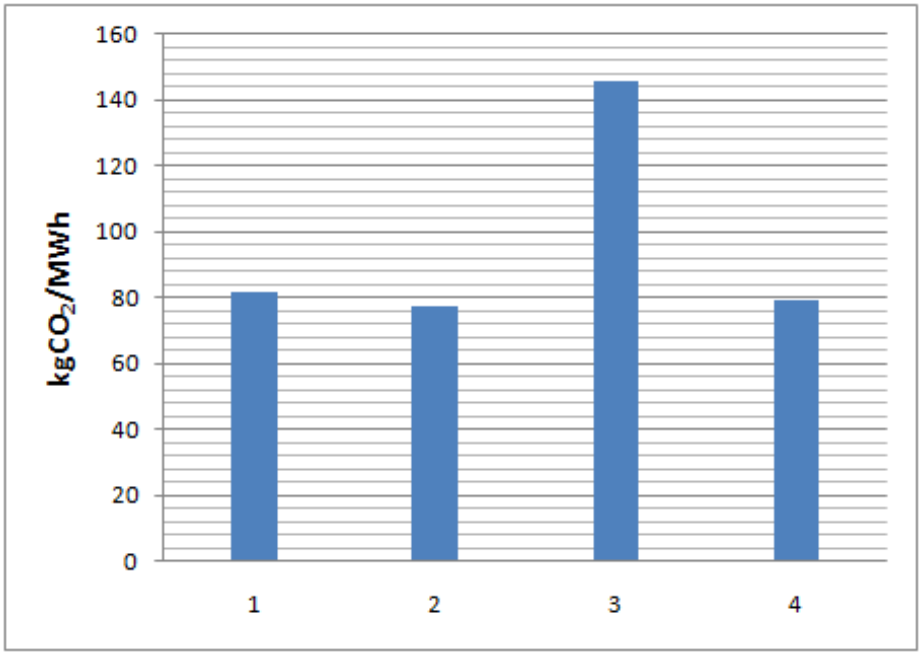


- Emission factor due to the electric sector operation, from January 2006 to September 2010. Left side, operating margin; right side, total average emissions.

Source: MCT (www.mct.gov.br)

Emission factors in Brazil (2)





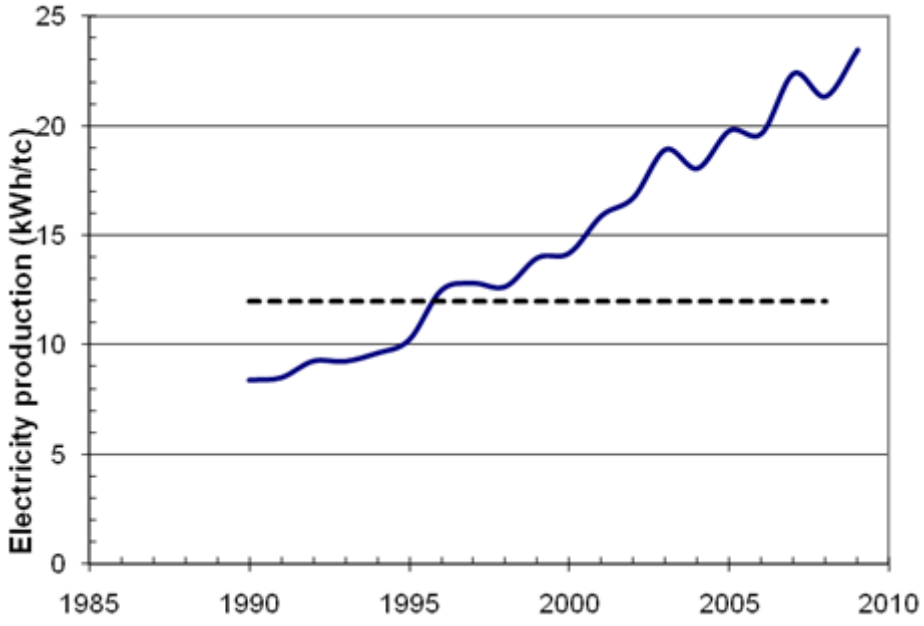
- Left side, operating margin from January 2006 to September 2010.
- Right side, construction margin in 2006-2009.

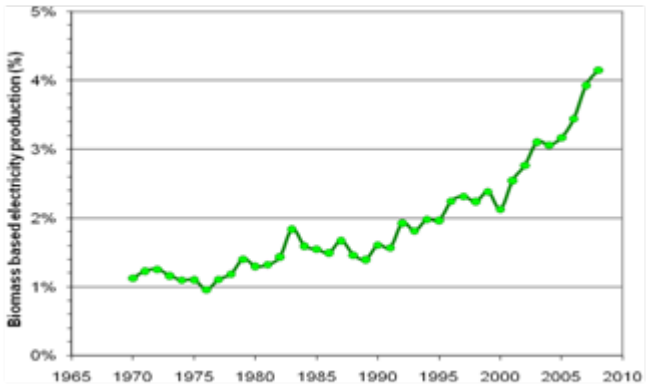
Source: MCT (www.mct.gov.br)

Electricity production from biomass – 1

- In the context of CDM projects, low avoided GHG emissions in Brazil is a drawback for electricity production from biomass.
- 35 projects related to sugarcane bagasse cogeneration and other UTEs based on biomass. Most of the projects submitted years ago.
- 1,334 MW of new capacity in the context of CDM projects is “not a bad result”, considering that the current installed capacity in sugarcane mills is about 6 GW (in 314 mills), with more than 1.2 GW under construction (and 1.8 GW authorized).
- On the other hand, the evaluation “not so good result” is related with the existing potential.

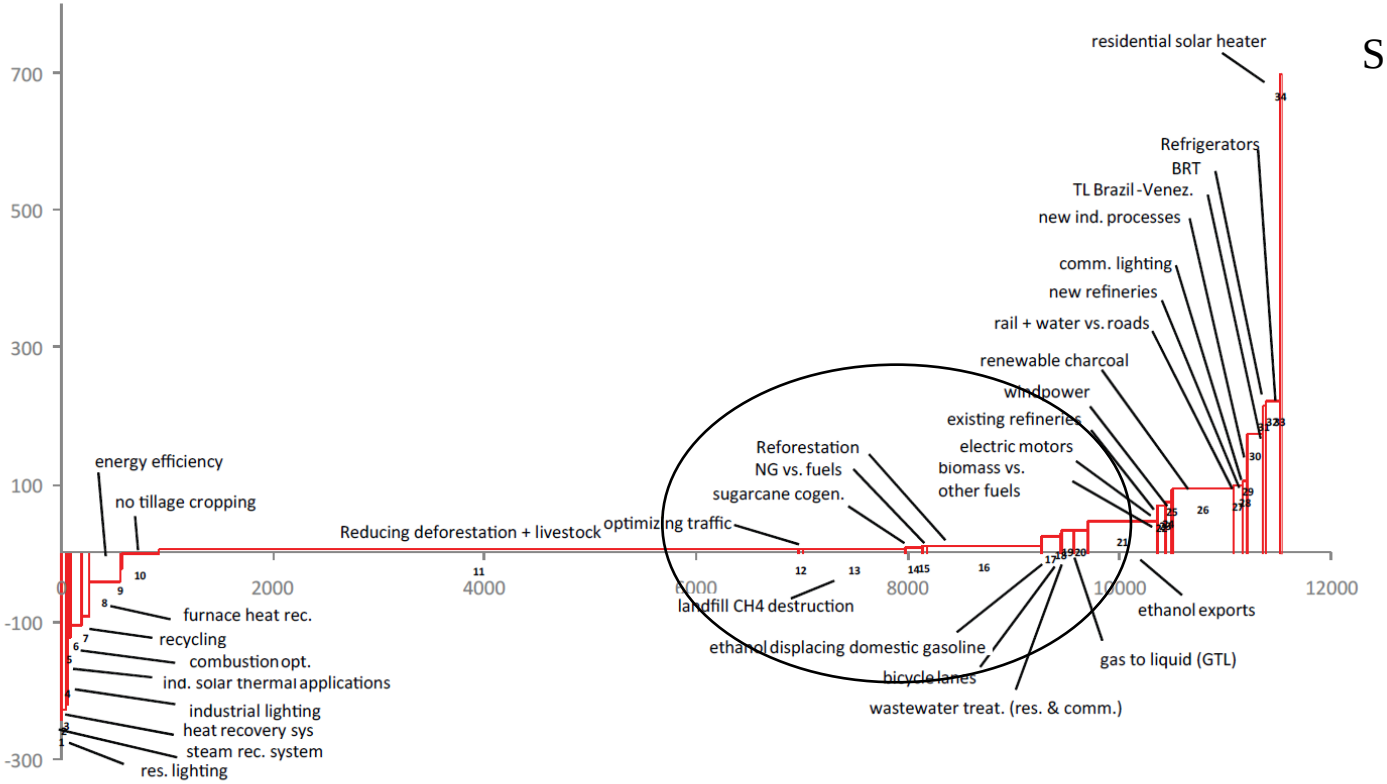
Electricity production from biomass – 2





- Electricity production in sugarcane mills grew 5.7% during the last ten years, but the results are still modest regarding the potential.
- Current surplus production is about 12 kWh/tc (estimated as 39 kWh/tc in PNE 2030 and 116 kWh/tc in Gouvello, 2010).
- Constraints are mostly due to the interconnection costs and higher expected rates of return.
- CDM (alone) cannot solve these constraints.

Electricity production from biomass – 3



Source: Gouvello (2010)

- Surplus electricity production: potential reduction of 158 $MtCO_{2eq}$ in 20 years, with a break-even cost of 28 US$/$tCO_2$.

Concluding remarks – 1

- CDM results, so far, are modest (worldwide). CDM projects have been concentrated in few countries, and the scope of the projects is still narrow. CDM has induced sustainable development?
- In Brazil, the number of new projects has been reduced in last years. No other project related with electricity production from sugarcane residues has been presented.
- There are still crucial constraints for the deployment (of the potential) of electricity production from biomass (e.g., high interconnection costs and higher expected rate of return).

Concluding remarks – 2

- The low amount of avoided emissions in Brazil, mainly due to the characteristics of the electric sector, and mostly regarding the predict construction margin, is also an important drawback.
- Higher prices of avoided emissions would motivated investments in the context of CDM. But the investments are occurring anyway even without this contribution.
- In practice, it seems that in Brazil the growth of electricity production from sugarcane bagasse is not related, in short-term, with CDM.

- Thanks for your attention!
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