TECHNOLOGY TRANSFER AND THE CLEAN DEVELOPMENT MECHANISM

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Technology transfer has contributed positively to solve various local and global climate change problems. Technology transfer prevents developing countries have the same pattern of development of the most industrialized. In Article 4.7 of the Convention, calls our attention the fact that the commitments to the environment and success depends in particular on two factors: the financial support from developed countries to tackle emissions of GHGs and technology transfer between Annex I countries to non-Annex I countries.

The Clean Development Mechanism (CDM) would provide the inclusion of developing countries in efforts to combat climate change and facilitate the transfer of technology and knowledge from developed to developing countries. In the Marrakesh agreements, it is seen that CDM projects can generate efficiently transfer technology, in addition to knowledge and equipment. Thus, since the Convention, it was noticed that one of the main mechanisms suggested and adopted at COP n.3 to promote technology transfer was through the CDM.

Given the importance of technology transfer within the climate change and the CDM in climate change, the paper aims to analyze quantitatively the technological transfer in the major host countries of CDM projects, noting whether there was more to the spread of clean technologies from developed countries for developing countries, one of the main objectives of the UNFCCC to mitigate greenhouse effect in the world.

So, the methodology used in this paper is an empirical analysis of CDM projects approved and related on the basis of UNFCCC by 2010, with some indication of the use or employment of technology transfer in the three main recipients of CDM projects in the world: China, India and Brazil. With this, we will make use of total 2786 projects of 3761 CDM projects (74.1%) with some technology transfer, calculating the share of each country, type of project or type of technology used.

It is evident that attempts to technology transfer from developed, presents the Annex I countries of the Kyoto Protocol, for developing not generate results as estimated by the CDM projects. CDM projects were employed using intensive technology generated in the developing countries themselves, raising a conclusion that the solution to climate change by developed countries shall not be considered by holders

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of emission of low-carbon technologies. Developing countries that are able to achieve a level of development equal to developed using its own technologies.

Keywords: Climate change, International negotiations, Technology transfer, CDM projects.

1. Introduction

The scientific evidence relating emissions of greenhouse gases (GHGs) with human activities to climate change generated a huge global concern. The reports of the Stockholm Conference, in 1973, and later studies in subsequent years showed the urgent need for a global treaty to tackle this problem. In the early '90s, United National Framework Convention on Climate Change (UNFCCC), prepared a document in 1992 which was opened for signatures was taken at the Summit Earth in Rio de Janeiro, made by 154 countries (including the European Community) and is valid only on March 21, 1994. In mid-1997, this document has had 165 ratifying countries committing to the terms set forth in the Convention (UNFCCC, 1992; 1998).

The importance of using technology to minimize the impact of socio-economic development of developing countries is present in the Convention document:

"All Parties, taking into account their common but differentiated responsibilities and their specific national and regional development priorities, objectives and circumstances, shall: […] (c) promote and cooperate in the development, application and diffusion, including transfer of tehnology, pratices and processes that control, reduce or prevent anthropogenic emissions of greenhouse gases not controlled by Montreal Protocol in all relevant sectors, including the energy, transport, industry, agriculture, forestry and waste management sectors." (UNFCCC, 1992, p. 5).

This application of new technologies follows a logic of unilateral importance in that, particularly, the transfer of these technologies should from developed to developing countries, , according to Article 4 of the Convention document. The developed and applied technologies should be monitored with the creation of a database relating with the aim of showing the economic and social consequences through the use of these strategies to determine the results .

It is clear the importance of technology in the context of climate change in the base document of the UNFCCC and with it, the need to study this concept and its place in the international negotiations and the economic or regulatory mechanisms to encourage the application of cleaner technologies, especially in developing countries, whose economic growth leads to a greater need for consumption of energy sources and thus higher emissions of greenhouse gases. The use of technology should be higher in developing countries in comparaison of developed countries, which already have economic and technological means to stabilize emissions or even decrease it.

In 1995, instruments were created for developed countries (Annex I) to help developing countries in this direction and, conversely, could use those benefits with the implementation of technologies in these countries to achieve goals of reducing greenhouse gas greenhouse proposed by the Kyoto Protocol. One of the ways is

through the Clean Development Mechanism (CDM). Therefore, this paper will examine not only the issue of technology transfer , the normative point of view , but also from an empirical point of view, with data transfer technology from that instrument, to ascertain the results of the application of technologies from developed countries in developing countries.

The paper is divided into: (1) an analysis of the definition given by the UNFCCC technology transfer and how it entered in official documents about climate change, (2) study the CDM and how this instrument can contribute to this transfer, (3) and finally, a quantitative overview of the relationship between technology and CDM by exploiting database UNFCCC, analysing three main recipients of CDM projects in the world: China, India and Brazil.

The main objective of this paper is, in the end, determine that the majority of CDM projects doesn't have technology transfer. Developed countries reduce emissions in other countries with the use of existing local technologies, technologies present in developing countries. These technologies permit that developed countries have lower cost of abatement of greenhouse gases compared with others mitigation policies in developed countries. And that, these countries reduce emissions without restricting their social welfare. Thus, the solution to achieve the goals proposed by the Kyoto Protocol is the most cost-effective abatement of GHG emissions in developing countries. This is perhaps the most critical issue of the technology.

2. Technology transfer and climate negotiations

According to IPCC (2001), technology transfer can be defined as a process that enables the interaction of knowledge, experience and equipment to mitigate and adapt to climate change with the participation of various actors: government, private entities, NGOs, financial institutions, educational and research. This technology transfer is one of the main ways of solution to reduce greenhouse gases. Technology transfer has contributed positively to solve various local and global climate change problems. At the same time, the use of cleaner technologies already implemented in developed countries, creating sustainable development on a global scale when you have a transfer for developing countries:

"Development with modern knowledge offers many opportunities to avoid past unsustainable practices and move more rapidly towards better technologies, techniques and associated institutions." (IPCC, 2001, p. 15).

This idea is linked to the concept of tunnel effect, in which developing countries can achieve the same level of development with less environmental risk of developing countries with implementation of cleaner technologies with lower environmental cost (IPCC, 2001).

"In developing countries, the goal is to leap to advanced eco-efficient technologies […], thus avoiding a recapitulation of the resource-intensive stages of industrialization. […] By adopting innovative technologies and practices, developing countries could tunnel below the safe limit." (Raskin et al., 2002, p. 68).

This scenario becomes even more evident the enormous importance of technology in mitigation and sustainable development in developing countriesgos. In Article 4.7 of the Convention, calls our attention the fact that the commitments to the environment and success depends in particular on two factors: the financial support from developed countries to tackle emissions of GHGs and technology transfer (Paterson 1996; Forstyth , 2007).

The role of technology transfer pervades in many international negotiations, over the years, but always deepening a perception that this transfer must start from developed to developing countries. At the Conference of the Parties (COP) n.16, in Cancun in 2010, the beginning of the text established agreements emphasizes the need for all parties cooperated within the principles of the Convention, with the use of various proposed mechanisms encouragement, aiming to develop and transfer technology from developed to mitigate and adapt to climate change countries. This idea is not only considered these documents cited above, but in others generated in many different COPs At COP n.1, by Decision 13, we have the base for implementing incentive mechanisms for technology transfer within Chapter 34 of Agenda 21, *Transfer of environmentally sound technology, cooperation and capacity-building*.

Since the Convention, technology transfer has been the subject of study of the UNFCCC, with discussion on all COPs and meetings in the Subsidiary Body for Scientific and Technological Advice (SBSTA) (Metz et al, 2000; UNFCCC, 2006). This intense discussion led to the creation of the Expert Group on Technology Transfer (EGTT) and TTClear, which aims to enhance the technology transfer within the principles of the Convention. However, one of the main mechanisms suggested and adopted at COP n.3 to promote technology transfer was through the Clean Development Mechanism (CDM) .

3. Technology transfer and CDM

In 1997, at COP n.3, it was implemented a series of measures to reduce the emission targets of Annex I countries, mostly considered, developed, called the Kyoto Protocol. To achieve the goals stipulated in the Protocol, efficiently, various flexible mechanisms emerged. One such mechanism is the so-called Clean Development Mechanism (CDM).

The CDM is a mechanism of market trading in the Annex I countries of the document can implement projects to reduce greenhouse gases in countries not mentioned in this Annex. Thus, this instrument would provide for the inclusion of developing countries in efforts to combat climate change, the developed countries to help achieve their goals without high costs compared to costs curves in the Annex I countries.

"While its primary goal is to save abatement costs, the CDM is also considered by many as a key means to boost technology transfer and diffusion." (Dechezlepêtre et al., p.2, 2008).

At the same time, these countries facilitate technology transfer and knowledge to developing countries, as outlined in Article 10 (c) of the Kyoto Protocol:

"Cooperate in the promotion of effective modalities for the development, application and diffusion of, and take all practicable steps to promote, facilitate, and finance, as appropriate, the transfer of, or

access to, environmentally sound technologies, know-how, practices and processes pertinent to climate change, in particular to developing countries." (UNFCCC, 1998, p. 10).

This article of the Kyoto Protocol was emphasized, years late , in the Marrakesh agreements, showing that CDM projects can generate technology transfer efficiently (UNFCCC , 2000).

"In 2001, the Marrakech Accords emphasized that CDM project activities should lead to the transfer of environmentally safe and sound technology and know-how. More recently, the Stern Review stated that the CDM was explicitly designed to provide offsets to enable developed countries to meet their commitments more cheaply, while allowing developing countries to participate in carbon reduction and gain co-benefits from technology transfer. Technology transfer and the CDM are now clearly linked in the policy debate." (Dechezlepêtre et al., p.8, 2007).

The Kyoto Protocol, however, if well analyzed, no warranties or includes mandatory or legally binding formal apparatus technology transfer from Annex I countries to countries with CDM projects. At the same time, we can see a immense power that the CDM has as a tool not only mitigation but also as a driver of technology transfer to developing countries (Sprintz and Luterbacher, 2001; Lütken, 2005; Lütken and Michaelowa, 2008; Gupta, 1997; Grubb et al., 1999; Richards, 2001; Philbert , 2003; De Conick et., 2007).

One of the first studies was Haites et al. (2006) with the analysis of 854 CDM projects mentioning the word technology in projects, but, as shown by the author , only one third of these projects were truly technological transfer, with 2/3 for reducing emissions of greenhouse gases with the implementation of these projects. In the article, Dechelzlepêtre et al. (2008), showed that in a sample of 644 CDM projects registered, 43% involved some form of technology transfer, reducing the expected annual emissions by 84%. Seres et al. (2008) worked with a base of more extensive data, with 3296 projects which had some similarities with keywords related to technology. Despite a larger database, the results did not differ from earlier studies (36% of projects actually had some form of technology transfer, with 59% of the expected annual emission reductions). These studies have highlighted three important reasons in the relationship between technology and CDM. Three facts are relevant to the shipment takes place: (a) project size; (b) expected number of certified emission reduction (CERs), (c) the number of projects of the same type in a single country or concentrated in a few countries. This last situation decreases the chances of having technology transfer and the Annex I countries use the technology present in the host country (Dechezlepêtre et al, 2008; Seres et al, 2008; Haites et al, 2006; Schmid, 2012). The article will examine this last factor: the negative correlation between number of projects in a country with a type of technology and possibility of technology transfer, when we look for the main host countries of CDM projects: Brazil, India and China.

4. Methodology and results

According to the UNFCCC, by the year 2010, it is estimated that there were about 4984 CDM projects in various countries, but only 75% of these projects, approximately, can be evaluated for analysis of whether or not technology transfer

(3761 projects), as described in Table 1. In this paper, in order to assess progress with the technology transfer of Annex I countries of the Kyoto Protocol for China, India and Brazil, we used these projects in which there is mention of technology transfer in the PDD (Project Design Document) CDM project. With this, the article used data from 2786 CDM projects. But, 77.7% of total is the project specifically, which renounce technology transfer (self-reliant). In this case, technology and expertise used in this project is domestic, so the technology is made in China, India or Brazil.

It is noteworthy that the article is analyzing the projects described as TT Code -1. However, there are cases where even though the host country of the CDM project and the origin of the technology used are different (descitos in other codes), there are a slew of projects that the origin of this technology is arising from a developing country (countries not Annex I of the Kyoto Protocol). In the future, authors should observe the other projects to get a better accuracy of the participation of developing countries in the use and development of cleaner technology.

TT/No TT	TT Code	Description	Number of projects	%
TT	1	Technology transfer of equipment only	515	13.7
	2	Technology transfer of knowledge only	205	5.5
	3	Technology transfer of equipment and knowledge	792	21.1
	4	"Joint ventures" between two or more countries - i.e. technology transfer of expertise	4	0.1
No TT	-1	No technology transfer s occurring – "self-reliance"	2245	59.7
		TOTAL	3761	100.0

Table 1 - Description of TT codes, number of CDM projects and participation of each type of technology transfer, according to UNFCCC by the year 2010

Source: UNFCCC, 2012

As the table above shows, the majority of CDM projects there is no technology transfer. But, in the text of Convention, the technology transfer should be of Annex I countries to non-Annex I, because these countries detain the best technologies with low emission of greenhouse gases. Most projects use the technology present in developing countries. In most cases, technologies that are combated or forgotten by the developed and developing countries, as is the case of biomass in Brazil. Of the 62 CDM projects, 54 projects were used technology developed by Brazil. Technology criticized by many developed countries the social impact:

"The workday consists of 8 to 12 hours of cutting and carrying sugarcane stalks, while inhaling dust and smoke from the burned residue. In addition, working conditions such as water, restrooms, and food storage facilities are usually absent in sugarcane fields." (Martinelli e Filoso, 2008, p. 893).

According to Table 2, most of the analyzed projects are concentrated in a few countries, especially China (48.1%), India (19.9%) and Brazil (6.1%). This indicates the possibility that there may be low technological transfer. A large number of CDM projects implemented in one country or a few are less likely to have technology transfer. These clues are even more likely watching either Table 1, where almost 60% of CDM projects had no technology transfer, but there was use of local technologies,

to reduce greenhouse gases, as Table 3, in which the majority of CDM projects are restricted to few technologies: hydropower (30%), wind (19.9%) and use of biomass (11.4%). To corroborate this hypothesis, this paper will analyze both the main receiving countries of CDM projects and what kinds of technologies where there is low technology transfer.

Position	Country	Number of projects	%
1	China	1808	48.1
2	India	750	19.9
3	Brazil	228	6.1
4	Mexico	139	3.7
5	Thailand	97	2.6
6	Malaysia	83	2.2
7	Viet Nam	81	2.2
8	indonesia	62	1.6
9	Philippines	54	1.4
10	Republic of Korea	42	1.1
	Others countries non-Annex I	417	11.1
	TOTAL	3761	100

Table 2 - Number of CDM projects and relative share (%) among major countries - 2010

Source: UNFCCC, 2012

Type of project	Number of projects	%
Afforestation	6	0.2
Biomass energy	427	11.4
Cement	18	0.5
CO2 capture	2	0.1
Coal/bed/mine methane	55	1.5
EE Households	16	0.4
EE Industry	67	1.8
EE service	6	0.2
EE Supply Side	43	1.1
Fossil fuel switch	74	2.0
Energy distribution	16	0.4
EE own generation	322	8.6
Fugitive	16	0.4
Geothermal	11	0.3
HFCs	22	0.6
Hydro	1127	30.0
Landfill gas	221	5.9
Methane avoidance	419	11.1
N2O	66	1.8
PFCs and SF6	8	0.2
Reforestation	24	0.6

Solar	35	0.9
Tidal	1	<0.0
Transport	11	0.3
Wind	748	19.9
TOTAL	3761	100.00

Table 3 - Number of CDM projects by type in absolute amount and relative share (%) - 2010

Source: UNFCCC, 2012

Analyzing the top three countries, one realizes that most of the projects had appropriated local technology, with a percentage higher than 60%, as shown in Table 4.

Country	Number of projects - Self-reliance	Total of projects	"Self-reliance" projects/Total of CDM projects (%)
Brazil	142	228	62,3
China	1429	1808	79,0
India	593	750	79,1
Total	2164	2786	77,7

Table 4 - Total of CDM projects and number of "self-reliance" projects (TT Code -1) and projects self-reliance/Total of CDM projects (%) - 2010

Source: UNFCCC, 2012

Observing the size project, more than 55% of total projects, the most commum scale is large. But we look only CDM projects in Brazil, India and China, the percentage increases a little to 59%, as shown Tables 5 and 6.

Size project	Number of projects	%
Large	2093	55,7
Small	1668	44,3
Total	3761	100,0

Table 5 – Distribution for size CDM projects in all countries – Total and % - 2010

Source: UNFCCC, 2012

Size of projects	Number of projects	%
Large	1640	58,9
Small	1146	41,1
Total	2786	100,0

Table 6 – Distribution for size CDM projects – China, India and Brazil - Total and % - 2010

Source: UNFCCC, 2012

When comparing the project technology with the size of this project is to assess how much technology is implemented in the country, the greater the chances of the scale of this project is to be large, they evaluate the studies in the literature, this statement is not quite the analyze both Tables 7 and 8 for all countries and for the three countries

we are analyzing in this article. In fact, the major factor for the technology to focus on a particular country is the amount of projects in that country. From now on, this paper will analyze, in detail, the three countries mentioned, noting that technologies in developing countries are mostly used by Annex I countries of the Protocol and corrobored with the theory that the most important factor to receive CDM projects is the amount of project in the host country, because situation increases the chances of having more enterprise to generate technology used in these projects present in the host country.

		Scale		Total
		Large	Small	
Type	Afforestation	0	2	2
	Biomass energy	139	165	304
	Cement	16	0	16
	Coal bed/mine methane	54	0	54
	EE Households	0	13	13
	EE Industry	8	41	49
	EE own generation	244	52	296
	EE Service	0	2	2
	EE Supply side	15	7	22
	Energy distribution	11	4	15
	Fossil fuel switch	43	9	52
	Fugitive	4	1	5
	Geothermal	2	0	2
	HFCs	16	3	19
	Hydro	460	521	981
	Landfill gas	75	22	97
	Methane avoidance	26	81	107
	N2O	38	0	38
	PFCs and SF6	4	0	4
	Reforestation	8	2	10
	Solar	1	11	12
	Transport	1	5	6
	Wind	475	205	680
Total		1640	1146	2786

Table 7 – Distribution for size CDM projects by type of technology – Brazil, India and China - Total and % - 2010

Source: UNFCCC, 2012

		Scale		Total
		Large	Small	
Type	Afforestation	3	3	6
	Biomass energy	180	247	427
	Cement	18	0	18
	CO2 capture	1	1	2
	Coal bed/mine methane	55	0	55
	EE Households	0	16	16
	EE Industry	9	58	67
	EE own generation	263	59	322
	EE Service	0	6	6
	EE Supply side	31	12	43
	Energy distribution	11	5	16
	Fossil fuel switch	55	19	74
	Fugitive	14	2	16
	Geothermal	10	1	11
	HFCs	19	3	22
	Hydro	522	605	1127

	Landfill gas	181	40	221
	Methane avoidance	99	320	419
	N2O	66	0	66
	PFCs and SF6	8	0	8
	Reforestation	14	10	24
	Solar	2	33	35
	Tidal	1	0	1
	Transport	3	8	11
	Wind	528	220	748
Total		2093	1668	3761

Table 8 – Distribution for size CDM projects by type of technology in all countries – Total and % - 2010

Source: UNFCCC, 2012

4.1 Brazil

Most projects are focused on three types of technologies in Brazil, as shown in Table 9. The use of Brazilian technologies are concentrated in key technologies where the country has great advances in the area. One of the main countries whose energy mix is hydroelectricity, attracts numerous projects for application of this technology. Of the 57 projects, 95% of CDM projects using Brazilian technology. This is no different with the biomass. Country pioneer in the area, especially ethanol, in which 87% of projects use technology in Brazil to mitigate greenhouse gases. This is another example that confirms the thesis of appropriation of technology in developing countries by developed.

Type of project	"Self-reliance" projects	Number of projects	"Self-reliance" projects /Total of CDM projects (%)
Biomass energy	54	62	87.1
EE Households	1	1	100.0
EE Industry	1	1	100.0
EE own generation	2	5	40.0
Fossil fuel switch	3	4	75.0
Hydro	54	57	94.7
Landfill gas	4	24	16.7
Methane avoidance	20	55	36.4
PFCs and SF6	1	3	33.3
Reforestation	1	2	50.0
Wind	1	8	12.5
N2O	0	5	-
Total	142	228	62.3

Table 9 - Total of CDM projects and "self-reliance" projects (TT Code -1) and "self-reliance" projects/Total of CDM projects (%) – Brazil – 2010

Source: UNFCCC, 2012

4.2 India

For India, the scenario is no different (Table 10). The main technologies are focused on biomass, hydroelectricity and wind. In recent years, for example, China and India have developed a strong construction industry equipment for wind power generation in both the upstream and in the downstream. The most plausible hypothesis is that these countries have made as high costs of technology transfer that is easier to kill using Chinese technology, for example, than shifting equipment, knowledge or both, in countries like Germany. The abatement costs with the use of technology in developing countries themselves are smaller.

Type of project	"Self-reliance" projects	Number of projects	"Self-reliance" projects /Total of CDM projects (%)
Afforestation	1	1	100.0
Biomassa energy	151	160	94.4
Cement	5	6	83.3
EE Households	4	7	57.1
EE Industry	21	48	43.8
EE own generation	42	53	79.2
EE Service	1	2	50.0
EE Supply side	10	13	76.9
Energy distribution	4	4	100.0
Fossil fuel switch	6	18	33.3
Fugitive	4	4	100.0
HFCs	1	8	12.5
Hydro	97	104	93.3
Landfill gas	13	15	86.7
Methane avoidance	13	17	76.5
N2O	0	6	-
PFCs and SF6	0	1	-
Reforestation	4	6	66.7
Solar	6	7	85.7
Transport	1	6	16.7
Wind	209	264	79.2
Total	593	750	79.1

Table 10 - Total of CDM projects and "self-reliance" projects (TT Code -1) and "self-reliance" projects/Total of CDM projects (%) – India – 2010

Source: UNFCCC, 2012

4.3 China

As stated previously and observing Table 11, China follows the same logic of other countries, especially in technologies such as: biomass energy, energy eletric own gereneration, hydro and methane avoidance. Thus, like the other countries studied, China has a huge percentage of hydropower projects with use of local

technology. One of the main reasons outlined in the publication of the IRENA (2013), is that:

"Total installed costs are lowest in China, India and Latin America [especially in Brazil] but higher in Africa and Europe and Central Asia. This reflect the fact that in Europe and Central Asia most of the low-cost hydropower potential has already been exploited. In Africa, the higher costs are partly due to the fact many projects are in remote areas with poor infrastructure and have higher transport and logistical, as well as grid connection costs." (IRENA, 2013, p. 42).

Type of project	"Self-reliance" projects	Number of projects	"Self-reliance" projects /Total of CDM projects (%)
Afforestation	1	1	100.0
Biomassa energy	66	82	80.5
Cement	9	10	90.0
Coal bed/mine methane	26	54	48.1
EE Households	5	5	100.0
EE own generation	151	238	63.4
EE Supply side	3	8	37.5
Energy distribution	8	11	72.7
Fossil fuel switch	3	30	10.0
Fugitive	1	1	100.0
Geothermal	0	2	-
HFCs	1	11	9.1
Hydro	815	820	99.4
Landfill gas	20	58	34.5
Methane avoidance	29	35	82.9
N2O	0	27	-
Reforestation	2	2	100.0
Solar	5	5	100.0
Wind	284	408	69.6
Total	1429	1808	79.0

Table 11 - Total of CDM projects and "self-reliance" projects (TT Code -1) and "self-reliance" projects/Total of CDM projects (%) – China – 2010

Source: UNFCCC, 2012

5. Conclusion

The paper proposes an analysis of the relationship between technology transfer and CDM projects with study of the major documents mentioning the issue of technology in international climate change negotiations and literature, and, empirically with analysis of CDM projects until 2010 approved and listed in the database of the UNFCCC.

By 2010, CDM projects have allowed a reduction in the order of 697.4 $GgCO_2$, where only Brazil, India and China accounted for 31.8% of these reductions (approximately 221.6 $GgCO_2$). Regarding the total projects received, this number is higher, as seen in

the article in these three countries accounted for about 74.1% of CDM projects (2786 projects) by 2010.

It is evident that attempts to technology transfer from developed, presents the Annex I countries of the Kyoto Protocol for developing not generate results as estimated by the CDM projects. CDM projects were employed using intensive technology generated in the host countries. So, the solution for reduction of greenhouse gases is in the development countries, using our .

Developing countries that are able to achieve a level of development equal to developed using its own technologies, ie its development passes for more than national matter what is sustainable in developed countries .

Therefore, these data allow us to show that there is a strong negative correlation between strong use of technology in a country and technology transfer and CDM projects using technologies from Annex I countries are more advantageous both from an environmental and economic terms, as that there is a clear preference for having lower cost of abatement of emissions. If not lower this cost, it was preferable to transfer technology widely encouraged by the major organs and combat climate emissions of greenhouse gases.

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