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**SUMMARY OF INFORMATION PUBLICLY AVAILABLE ON RELEVANT ELEMENTS OF
THE OPERATION OF CLEAN DEVELOPMENT MECHANISM AND THE AMOUNTS OF
HCFC-22 PRODUCTION AVAILABLE FOR CREDITS**

Introduction

1. This paper has been written in response to the request to the Fund Secretariat to provide a summary of information publicly available on relevant elements of the operation of the Clean Development Mechanism of the Kyoto Protocol (CDM) and the amounts of HCFC-22 production available for credits as a first step (decision 56/64, paragraph c). A more detailed description of the CDM is found in UNEP/OzL.Pro/ExCom/57/64 Annex II. It presents a brief outline of HCFC production in Article 5 countries, HFC reduction projects under the CDM, and Multilateral Fund (MLF) funding. It is meant to supplement and explain the table showing HCFC/HFC-reduction projects that are currently registered with the CDM board or that are in the CDM pipeline, which is included as Annex I.

2. Reducing HFC-23 emissions is worth millions of carbon credits and the destruction of HFC-23, which attracts the credits under the CDM, is a relatively inexpensive process. Former emitters of HFC23 (i.e., HCFC-22 producers) can largely recoup the costs of HCFC22 production by using CDM credits. Although not all of each producer's production is necessarily entitled to CDM benefits, in general access to the credits represents a significant commercial advantage for those that qualify versus non-beneficiaries.

3. As of 10 February 2009 the CDM Executive Board had issued over 250 million certified emission reduction credits (CERs), each CER being equivalent to one tonne of CO₂, for a total of 1,390 registered projects. These issuances have occurred over a period of just over two years. Registered CDM projects have the potential to generate an estimated 1.45 billion CERs up to 2012.¹ With an average price of US \$12.6 (or €10) per CER, this volume equals a market value of US \$18.3 billion (or €14.5 billion).²

4. The price of US \$12.6 per CER, which was used in the table, is that provided in the secondary market. It is only meant to give an indication of market prices and does not accurately reflect the price that HFC project developers receive for their CERs. The prices of carbon credits fluctuate and revenues may be difficult to predict. Prices will normally follow the fossil fuel market, weather conditions (temperature), and economic trends. At present prices stand at around half of what they were during their peak in the summer of 2008. Prices in the primary market (i.e., contracts between project developers and their buyers) are generally lower than in the secondary market. Contracts in the primary market usually concern CERs that have not yet been issued, and prices will be influenced by risk factors such as the predictability of the regulatory process in the host country, contract provisions, and type of project.³ The uncertainty associated with the post-2012 period which marks the end of the first Kyoto commitment period adds to the unpredictability of carbon markets.

5. There are HCFC production facilities in the following Article 5 countries: China, India, Mexico, Venezuela and Argentina. China (followed by India) is the dominant producing country in terms of production capacity, the number of plants and the amount of HCFC produced. There are between 13 and 19 HCFC-22 producers in China⁴ with a capacity in 2007 of just under 500,000 tonnes/year. All of these countries, with the exception of Venezuela, have registered CDM projects and are receiving credits for HFC destruction.

¹ www.cdm.unfccc.int

² OTC, brokered price as stated by Point Carbon on 22 January 2009, at www.pointcarbon.com.

³ The World Bank stated prices for primary forward CERs in the range of €8-13 in 2007 and early 2008, where projects at an early stage of preparation transacted around €8-10 and registered projects with streamlined technology, such as HFC with storage options, transacted at €11-13, see *State and Trends of the Carbon Market 2008*, Karan Capoor and Philippe Ambrosi, World Bank, p. 32. Prices increased substantially during 2008 but dropped towards the end of 2008 and early 2009 and were still falling by the finalizing of this paper. The average price for primary CERs was €1.61 in 2008 and €0.25 in early 2009, according to IDEACarbon as of 12 February 2009.

⁴ The estimated number of HCFC plants in China is between 13 (from experts) and 19 (from SEPA).

6. Over half of the CERs issued (130 million) come from the registered HFC-23 reduction projects listed in Annex I⁵ that request large blocks of credits every six weeks to two months.⁶ China alone has received 90 million CERs from these projects.

7. The MLF has financed the CFC phase-out activities in the host countries of these CDM projects, and almost⁷ all plants outside China, plus one in China that was not financed by the MLF, are swing plants by design. MLF disbursements have been as follows: US \$150 million for China (no swing plants), excluding the accelerated phase-out agreement funding (US \$10 million) that was shared among CFC, CTC and halon production agreements as well as the CFC foam sector agreement. US \$85.17 million for India (all four CFC plants are swing plants), US \$10.6 million for Argentina (one swing plant), US \$31.85 million for Mexico (two swing plants), and US \$16.5 million for Venezuela (one swing plant but no CDM project). The final disbursements are pending in Argentina, China and India (to be completed in 2009).

8. Annex I indicates that the annual aggregated HCFC production of the involved plants is 313,495 metric tonnes; the annual aggregated HFC-23 reduction achieved through the projects is 81,208,905 metric tonnes; the number of CERs issued total 129,556,696, and the estimated market value is between US \$7.6 billion and US \$19.8 billion (US\$ 12.6/CER), depending on renewals of crediting periods. These figures have been calculated over the lifetime of these projects, which extends significantly beyond the 2008-2012 commitment period.⁹

9. The key points that emerge from this brief survey on the CDM, HCFC production and MLF financing are as follows:

- (a) Neither the US \$294.12 million that the Executive Committee has approved for CFC production phase-out in the countries appearing in Annex I nor the amount available for the HCFC phase-out is comparable to the significantly higher levels of funding that are being received from CDM projects.
- (b) All countries that received MLF funding for swing plants, except Venezuela, have also received CDM credits;
- (c) India continues to receive MLF funding for CFC production phase-out while receiving CDM credits for the same swing plants;

⁵ One of the 18 registered HFC destruction CDM projects is hosted in the Republic of Korea and is excluded in Annex I.

⁶ The opportunities for HFC-23 emission reduction related to HCFC production under the CDM should be more or less exhausted with the projects listed in Annex I plus the one in the Republic of Korea, unless Kyoto parties decide to make new HCFC plants eligible.

⁷ The exception is one plant in India that manufactures Polytetrafluoroethylene (PTFE) and produces HCFC as feedstock.

⁹ The total amount of CERs from the listed projects expected by 2012 is around 500 million.

- (d) China is by far the largest beneficiary of CDM credits and has received 70% of CERs issued for HFC-23 emission reduction, but it has no MLF-funded swing plants.

RECOMMENDATION

10. The Executive Committee may wish to note the report Summary of information publicly available on relevant elements of the operation of Clean Development Mechanism and the amounts of HCFC-22 production available for credits as contained in UNEP/OzL.Pro/ExCom/57/62.

Annex I

HFC-23 PROJECTS RELATED TO HCFC PRODUCTION REGISTERED WITH THE CDM BOARD*

Project Title	Host Country and Host Country Participants	Other Parties	Original PDD Date/ Date Registered by CDM Board	HCFC 22 Production (annual) in metric tonnes	HFC Annual Reductions in Metric tonnes of CO ₂ e	Crediting period	CERs issued	Estimated market value (OTC) as of 22-01-09 (USD 12.6 per CER)	MLF Projects
Project for GHG emission reduction by thermal oxidation of HFC 23 in Gujarat, India. SWING PLANT	India (Gujarat Fluorochemicals Ltd.)	Switzerland, Japan, Netherlands, Italy, UK (Ineos Fluor Holdings Limited, Sumitomo Corporation, EDF Trading Ltd, Enel Trade S.p.A., Noble Carbon Credits Ltd)	14/11/2003 08/03/2005	20,700	3,000,000	10 years	18,293,674 01/10/2005- 30/09/2008	378 million	IND/PRO/45/INV/390 ExCom 29 (1999) approved a total of \$82 mil. for the CFC production phase-out in India (4 plants), of which \$76 mil. has been disbursed.
Project for GHG Emission Reduction by Thermal Oxidation of HFC23 in Jiangsu Meilan Chemical CO. Ltd., Jiangsu Province, China	China (Jiangsu Meilan Chemical CO. Ltd.)	NL, Spain, Italy, Denmark, Japan, Canada, UK, Finland, Norway, Sweden, Switzerland, Germany, France (International Bank for Reconstruction and Development)	01/07/2004 04/06/2006	30,000	8,411,432	7 years (Renewable)	15,952,466 01/12/2006- 31/08/2008	7 years: 740 million 21 years: 2.2 billion	CPR/PRO/27/INV/356 ExCom 27 (1999) approved \$150 mil. for the entire CFC production phase-out in China, of which \$142.5 mil has been disbursed. No swing plants financed by the MLF in China.
GHG emission reduction by thermal oxidation of HFC 23 at refrigerant (HCFC-22) manufacturing facility of SRF Ltd. SWING PLANT	India (SRF Ltd.)	UK, Germany, NL, Italy, France, Switzerland (ICEAP, Shell, Climate Change Capital Carbon Fund, EDF Trading, Barclays, KfW, Solvay Fluor, Rabobank, Goldman Sachs, BNP Paribas, Citigroup, CER Investments 1, Nuon Energy, Enel Trade S.p.A., Noble Carbon Credits)	01/07/2004 24/12/2005	11,145	3,833,566	10 years	13,527,318 01/07/2004- 30/06/2008	483 million	IND/PRO/45/INV/390 ExCom 29 (1999) approved a total of \$82 mil. for the CFC Phase-out in India (4 plants), of which \$76 mil. has been disbursed.

* or in the COM pipeline as of 22 January 2009

Project Title	Host Country and Host Country Participants	Other Parties	Original PDD Date/ Date Registered by CDM Board	HCFC 22 Production (annual) in metric tonnes	HFC Annual Reductions in Metric tonnes of CO ₂ e	Crediting period	CERs issued	Estimated market value (OTC) as of 22-01-09 (USD 12.6 per CER)	MLF Projects
Quimobásicos HFC Recovery and Decomposition Project SWING PLANT	Mexico (Quimobasicos S.A. de C.V.)	Japan, NL, UK, Switzerland (Electric Power Development Co., Ltd., EcoSecurities Group Plc., Goldman Sachs International, Electrabel SA, EcoSecurities Group Plc)	01/07/2004 14/06/2006	7,570	2,155,363	7 years (Renewable)	4,120,101 14/06/2006- 29/06/2008	7 years: 189 million 21 years: 567 million	MEX/PRO/47/INV/128 ExCom 40 (2003) approved a total of \$31.85 mil. for the CFC Phase-out in Mexico (two plants), of which all has been disbursed.
HFC23 Decomposition Project of Zhejiang Juhua Co., Ltd, P. R. China	China (Zhejiang Juha Co., Ltd.)	Japan (JMD Greenhouse-Gas Reduction, JGC Corp., Marubeni Corp., Daioh Construction)	01/07/2004 03/03/2006	16,000	5,789,682	7 years (Renewable)	13,173,993 01/08/2006- 31/10/2008	7 years: 511 million 21 years: 1.5 billion	See above for CDM project at Jiangsu Meilan Chemical CO. Ltd., China.
Shandong Dongyue HFC23 Decomposition Project	China (Shandong Dongyue Chemical Co. Ltd.)	Japan, UK (Mitsubishi Corp., Nippon Steel Corp., Natsource Europe Ltd.)	01/07/2004 13/03/2006	36,476	10,110,117	7 years (Renewable)	16,059,798 01/01/2007- 31/08/2008	7 years: 882 million 21 years: 2.6 billion	See above for CDM project at Jiangsu Meilan Chemical CO. Ltd., China.
Project for HFC23 Decomposition at Changshu 3F Zhonghao New Chemical Materials Co. Ltd, Changshu, Jiangsu Province, China	China (Changshu 3F Zhonghao New Chemical Materials Co. Ltd.)	NL, Spain, Italy, Denmark, Japan, Canada, UK, Finland, Norway, Sweden, Switzerland, Germany, France (International Bank for Reconstruction and Development)	01/07/2004 08/08/2006	40,000	10,437,249	7 years (Renewable)	20,135,976 22/12/2006- 25/09/2008	7 years: 920 million 21 years: 2.8 billion	See above for CDM project at Jiangsu Meilan Chemical CO. Ltd., China.

Project Title	Host Country and Host Country Participants	Other Parties	Original PDD Date/ Date Registered by CDM Board	HCFC 22 Production (annual) in metric tonnes	HFC Annual Reductions in Metric tonnes of CO ₂ e	Crediting period	CERs issued	Estimated market value (OTC) as of 22-01-09 (USD 12.6 per CER)	MLF Projects
Destruction of HFC-23 at refrigerant (HCFC-22) manufacturing facility of Chemplast Sanmar Ltd. SWING PLANT	India (Chemplast Sanmar Ltd.)	Switzerland, UK (Sempra Energy Europe Limited (SEEL), Vitrol SA)	01/07/2004 16/02/2007	1,695	539,163	10 years	871,503 16/02/2007- 30/09/2008	68 million	IND/PRO/45/INV/390 ExCom 29 (1999) approved a total of \$82 mil. for the CFC production phase-out in India (4 plants), of which \$76 mil. has been disbursed.
Project for HFC23 Decomposition at Zhejiang Dongyang Chemical Co., Ltd., China	China (Zhejiang Dongyang Chemical Co., Ltd.)	Italy, Switzerland, UK, NL (Enel Trade S.p.A.)	01/07/2004 27/10/2006	18,000	3,656,598	7 years (Renewable)	5,870,517 01/11/2006- 27/03/2008	7 years: 322million 21 years: 966 million	See above for CDM project at Jiangsu Meilan Chemical CO. Ltd., China.
Project for HFC23 Decomposition at Limin Chemical Co., Ltd. Linhai, Zhejiang Province, China	China (Limin Chemical Co., Ltd.)	Italy, Switzerland, NL, UK (Enel Trade S.p.A.)	01/07/2004 27/10/2006	26,000	4,783,753	7 years (Renewable)	5,795,396 01/01/2007- 31/03/2008	7 years: 420 million 21 years: 1.3 billion	See above for CDM project at Jiangsu Meilan Chemical CO. Ltd., China.
HFC23 Decomposition Project at Zhonghao Chenguang Research Institute of Chemical Industry, Zigong, SiChuan Province, China	China (Zhonghao Chenguang)	Italy, Switzerland, UK, NL (Enel Trade S.p.A.)	01/07/2004 01/05/2007	18,000	2,065,533	7 years (Renewable)	2,065,282 01/05/2007- 30/04/2008	7 years: 182 million 21 years: 546 million	See above for CDM project at Jiangsu Meilan Chemical CO. Ltd., China.
Frio Industrias Argentinas S.A ("FIASA") Hydro-fluorocarbon 23 ("HFC23") Capture, Storage and Decomposition Project. SWING PLANT	Argentina (Frio Industrias Argentinas S.A.)	Spain (Endesa Generación S.A., Comercio Internacional Proserdi S.L.)	01/07/2004 10/03/2007	4,087	1,434,143	7 years (Renewable)	197,933 15/10/2007- 31/12/2007	7 years: 126 million 21 years: 378 million	ARG/PRO/44/INV/141 ExCom 38 and 53 (2002 & 2007) approved a total of \$10.6 mil. for the CFC phase-out in Argentina (1 plant), of which \$9.6 mil. has been disbursed.

Project Title	Host Country and Host Country Participants	Other Parties	Original PDD Date/ Date Registered by CDM Board	HCFC 22 Production (annual) in metric tonnes	HFC Annual Reductions in Metric tonnes of CO ₂ e	Crediting period	CERs issued	Estimated market value (OTC) as of 22-01-09 (USD 12.6 per CER)	MLF Projects
GHG emission reduction by thermal oxidation of HFC 23 at Navin Fluorine International Ltd (NFIL), Surat, Gujarat, India. SWING PLANT	India (Navin Fluorine International Ltd.)	UK, Japan, Switzerland, France (INEOS Fluor Limited (IFL), E.ON UK plc, Sumitomo Corporation, BHP Billiton Marketing AG ; Mercuria Energy Trading SA, NATIXIS)	28/07/2006 30/03/2007	7,992	2,802,150	10 years	3,250,142 01/05/2007- 30/06/2008	353 million	IND/PRO/45/INV/390 ExCom 29 (1999) approved a total of \$82 mil. for the CFC phase-out in India (4 plants), of which \$76 mil. has been disbursed.
No.2 HFC-23 Decomposition Project of Zhejiang Juhua Co., Ltd. P. R. China	China (Zhejiang Juha Co., Ltd.)	UK, Switzerland, (British Gas Trading Limited, Deutsche Bank AG, Oz Carbon Trading (Lux), Morgan Stanley, (Climate Change Capital China Ltd., Climate Change Capital Carbon Fund 2)	01/07/2004 05/04/2007	13,708	4,809,631	7 years (Renewable)	5,909,168 06/04/2007- 30/06/2008	7 years: 427 million 21 years: 1.3 billion	See above for CDM project at Jiangsu Meilan Chemical CO. Ltd., China.
Changshu Haike HFC 23 Decomposition Project	China (Changshu Haike Chemical Co.Ltd.)	UK (EDF Traiding Ltd.)	28/07/2006 15/02/2008	18,106	3,473,385	7 years (Renewable)	1,093,047 01/05/2008- 30/06/2008	7 years: 308 million 21 years: 924 million	See above for CDM project at Jiangsu Meilan Chemical CO. Ltd., China.
China Fluoro HFC23 abatement project in China	China (China Fluoro Technology Co.Ltd.)	Japan, UK, Switzerland (Mitsui & Co. Ltd., Sumitomo Corp., The Tokyo Electric Power Co. Inc., Climate Change Capital Carbon Fund II, Climate Change Capital Carbon Managed Account, Bear Stearns International Ltd., Climate Change Capital China Ltd.)	28/07/2006 14/09/2007	12,285	4,248,092	7 years (Renewable)	3,240,382 14/09/2007- 30/06/2008	7 years: 375 million 21 years: 1.1 billion	See above for CDM project at Jiangsu Meilan Chemical CO. Ltd., China.
GHG emission reduction by thermal oxidation of HFC 23 at refrigerant (HCFC-22) manufacturing facility of HFL Ltd. (HCFC as feedstock.)	India (HFL Ltd., SRF Ltd.)	N/A	28/07/2006 14/11/2008	1,265	442,310	10 years	N/A	56 million	Not a swing plant.

Project Title	Host Country and Host Country Participants	Other Parties	Original PDD Date/ Date Registered by CDM Board	HCFC 22 Production (annual) in metric tonnes	HFC Annual Reductions in Metric tonnes of CO ₂ e	Crediting period	CERs issued	Estimated market value (OTC) as of 22-01-09 (USD 12.6 per CER)	MLF Projects
Yingpeng HFC23 Decomposition Project	China (Yingpeng)	Italy, Ireland (Enel Trade S.p.A., Infinity Clean Air Development)	28/07/2006 Review requested, not registered.	25,000	7,865,277	7 years (Renewable)	N/A	7 years: 693 million 21 years: 2.1 billion	See above for CDM project at Jiangsu Meilan Chemical CO. Ltd., China.
Quimobásicos HFC Recovery and Decomposition Project SWING PLANT	Mexico (Plant #2 of Quimobásicos S.A de C.V)	N/A	28/07/2006 Under validation, not registered.	5,466	1,351,461	10 years	N/A	170 million	MEX/PRO/47/INV/128 ExCom 40 (2003) approved a total of \$31.85 mil. for the CFC phase-out in Mexico (2 plants), of which all has been disbursed.
Total:				313,495.0	81,208,905		129,556,696	10/7 years: 7.6 billion 10/21 years: 19.8 billion	