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### The Montreal Protocol: Fit for Hydrofluorocarbons

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# THE MONTREAL PROTOCOL: FIT FOR HYDROFLUROCARBONS

by Veronica Kennedy\*

As the most successful environmental treaty to date, the Montreal Protocol<sup>1</sup> is the prime arena for implementing policy to reduce hydrofluorocarbon (“HFC”) emissions and mitigate the threat of climate change.<sup>2</sup> The Montreal Protocol began phasing out chlorofluorocarbon (“CFC”) production and consumption in 1989 and has since stopped, and even reversed, destruction of the ozone layer.<sup>3</sup> Hydrochlorofluorocarbons (“HCFCs”) were produced to replace the highly ozone-depleting CFCs because of HCFCs’ reduced ozone depleting potential.<sup>4</sup> To completely phase out all ozone depleting substances (“ODSs”), industrial gas producers introduced HFCs to replace HCFCs.<sup>5</sup> Although HFCs have no ozone depleting potential, they have thousands of times the strength of carbon dioxide to warm the earth, known as “global warming potential.”<sup>6</sup> HFCs, like HCFCs and CFCs before them, are used in refrigeration and air conditioning, solvents, foam production, sterilization, fire extinguishing, and aerosols.<sup>7</sup> The next phase is to replace HFCs with gases that have low to no global warming potential. Based on current replacement technology, the treaty’s historical and political success, and its legal framework, the Montreal Protocol should house the HFC phase out to reduce greenhouse gas emissions.

Low to no global warming potential replacement gases are currently available in each sector of the market.<sup>8</sup> Carbon dioxide, hydrocarbons, and ammonia are currently used in Europe and Asia to replace HFCs in foams, refrigeration, and air conditioning.<sup>9</sup> Even so, the availability of these alternatives warrants the Parties to the Protocol to create an HFC phaseout schedule, forcing the market away from HFCs towards these alternatives.

Furthermore, the treaty’s historical and political success shows that adding an HFC phaseout schedule is politically feasible. In 1987, twenty-four countries signed the Montreal Protocol agreeing to control eight chemicals.<sup>10</sup> Today, the treaty

is universally ratified and controls 100 chemicals.<sup>11</sup> Much of this success is due to the flexible legal framework discussed below. The increase in the number of chemicals for which it provides phaseout schedules shows that HFCs can be added to the list. In addition, last November, 108 countries indicated their support for an HFC phaseout by signing a request for action to cap HFC consumption.<sup>12</sup>

The treaty’s legal framework is also conducive to an HFC phaseout schedule. The Protocol successfully relied on the principle of common but differentiated responsibility (“CBDR”) to bring developing countries on board, allowing these nations an extended grace period to phase out ODS.<sup>13</sup> It also established assessment panels, which provide the Parties the best available information for decision-making.<sup>14</sup> These principles could also be applied to an HFC phase out. CBDR could bring financial and technology transfers to developing countries to aid the phase out of HFCs without stretching already-limited budgets, similar to the current Multilateral Fund process.<sup>15</sup> Assessment panels, which allowed Parties to quickly control new chemicals, could continue to provide the latest scientific information on replacement gases to HFCs, allowing for stricter control measures on HFC use.<sup>16</sup>

The Montreal Protocol was successful in reacting to the threat of ozone depletion. Since its initial ratification, it has enabled the Parties to reduce over ninety-seven percent of global consumption of controlled ODS.<sup>17</sup> Considering the replacement technologies available, the success of the treaty, and its flexible legal framework, the Montreal Protocol is the best context under which HFC consumption can be reduced to start mitigating the threat of climate change.



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## Endnotes: The Montreal Protocol: Fit for Hydrofluorocarbons

<sup>1</sup> Montreal Protocol on Substances that Deplete the Ozone Layer, Sept. 16, 1987, 27 U.N.T.S. 1522.

<sup>2</sup> *Climate Politics Delay Phase-Out of Super Greenhouse Gases by Montreal Protocol: India, China and Brazil Thwart Action on HFCs*, CLIMATE CONTROL Co. Ass’n (Jan. 22, 2012, 8:23PM), <http://www.ccca.org.nz/news/10/15/Climate-Politics-delay-Phase-out/>.

<sup>3</sup> *The Montreal Protocol on Substances that Deplete the Ozone Layer: The Evolution of the Montreal Protocol*, UNITED NATIONS ENV’T PROGRAMME [UNEP] OZONE SECRETARIAT (Feb. 19, 2012, 10:31PM), [http://ozone.unep.org/new\\_site/en/montreal\\_protocol.php](http://ozone.unep.org/new_site/en/montreal_protocol.php).

<sup>4</sup> U.S. ENVTL. PROT. AGENCY [U.S. EPA], INVENTORY OF U.S. GREENHOUSE GAS EMISSIONS AND SINKS: 1990–2009 62–63 (2011); U.N. Env’t Programme and World Meteorological Org., Intergovernmental Panel on Climate Change

[IPCC], Intergovernmental Panel on Climate Change, *Changes in Atmospheric Constituents and in Radiative Forcing in Climate Change 2007: The Physical Science Basis*, 212 (S. Solomon, et al. eds., 2007) (providing HFC-23’s GWP as 14,800).

<sup>5</sup> U.S. EPA, *supra* note 4.

<sup>6</sup> *Id.*

<sup>7</sup> *Id.*

<sup>8</sup> ENVTL. INVESTIGATION AGENCY, THE MONTREAL PROTOCOL IN 2011: DYNAMIC ACTION FOR OZONE AND CLIMATE PROTECTION 10 (Feb. 20, 2012), [http://www.eia-international.org/wp-content/uploads/EIA\\_2011\\_OWEG.pdf](http://www.eia-international.org/wp-content/uploads/EIA_2011_OWEG.pdf).

<sup>9</sup> *Id.* at 10–12.

*continued on page 62*

- <sup>201</sup> See UNFCCC, *Project 3404: Rwanda Electrogaz Compact Fluorescent Lamp (CFL) distribution project* (2010), <http://cdm.unfccc.int/Projects/DB/AENOR1265819671.65/view>; UNFCCC, *Project 4613: Rwanda Natural Energy Project: Water Treatment Systems for Rural Rwanda (Shyira and Fawe)* (registered Mar. 25, 2011), <http://cdm.unfccc.int/Projects/DB/RWTUV1301046533.96/view>; UNFCCC, *Project 4799: Rwanda Natural Energy Project: Water Treatment Systems for Rural Rwanda (Mugonero Esepan, Rwesero, Nyagasambu)* (registered May 16, 2011), <http://cdm.unfccc.int/Projects/DB/RWTUV1305453175.2/view>.
- <sup>202</sup> See UNFCCC, *Project 0908: Landfill gas recovery and electricity generation at "Mtoni Dumpsite", Dar Es Salaam, Tanzania* (registered June 2, 2007), <http://cdm.unfccc.int/Projects/DB/DNV-CUK1169853184.14/view>.
- <sup>203</sup> See UNFCCC, *Project Cycle Search-Registered*, <http://cdm.unfccc.int/Projects/registered.html>.
- <sup>204</sup> See RWANDA ENV'T MG'T AUTH. (REMA), <http://www.rema.gov.rw/> (last visited Feb. 14, 2012).
- <sup>205</sup> See Stephen Otage, *Uganda: Students to Start Sitting Climate Change Examinations*, ALLAFRICA.COM (Feb. 10, 2011), <http://allafrica.com/stories/201102110152.html>.
- <sup>206</sup> In the latter front, the World Bank, UNEP, UNDP, the UN Food and Agriculture Organization ("FAO"), and the EU particularly stand out for mention. In the bilateral realm, the US International Development Agency ("USAID"), DfID, the Japanese International Cooperation Agency ("JICA"), the Swedish International Development Agency ("SIDA"), the Canadian International Development Agency ("CIDA"), the Austrian Development Agency ("ADA"), the Belgian Development Agency ("BTC"), and the Danish International Development Agency ("DANIDA") lead the pack. See, e.g., Catherine Karongo, *UNEP Kenya in Sh270m Mau rehabilitation plan*, CAPITAL FM NEWS (Nov. 29, 2011), <http://www.capitalfm.co.ke/news/2011/11/unep-kenya-in-sh270m-mau-rehabilitation-plan/>.
- <sup>207</sup> *Id.*
- <sup>208</sup> See, e.g., Annemarie Roodbol, *Foreign Players Show Interest in Green Energy in Africa*, KBC NEWS (Mar. 11, 2011), <http://www.kbc.co.ke/news.asp?nid=69306>.
- <sup>209</sup> See, e.g., *Ormat to Increase Capacity of Olkaria III Geothermal Plant*, RENEWABLEENERGYWORLD.COM (Feb. 17, 2010), <http://www.renewableenergyworld.com/rea/news/article/2010/02/ormat-to-increase-capacity-of-olkaria-iii-geothermal-plant?cmpid=rss>; *Ormat Secures US\$310M Loan for Olkaria II Refinance and Expansion*, THINK GEOENERGY (Sept. 14, 2011), <http://thinkgeoenergy.com/archives/8700>; *Olkaria III*, EMERGING AFR. INFRASTRUCTURE FUND, <http://www.emergingafricafund.com/news/olkaria-iii.aspx> (last visited Feb. 14, 2012).
- <sup>210</sup> See, e.g., Patrick Thuita, *Lake Turkana Wind Power Farm Gets Carbon Credit Approval*, CONSTRUCTION BUS. REV. (May 25, 2011), <http://www.constructionkenya.com/2073/lake-turkana-wind-power-farm-gets-carbon-credit-approval/>; Victor Juma, *Big Returns Spark Foreign Funds Rush for Kenyan Firms*, ALLAFRICA.COM (Jan. 24, 2012), <http://allafrica.com/stories/201201250335.html>; Erik Ombok, *Lake Turkana Wind Project in Kenya to Break Ground in April*, BLOOMBERG NEWS (Jan. 20, 2012), <http://www.bloomberg.com/news/2012-01-20/lake-turkana-wind-project-in-kenya-to-break-ground-in-april-1-.html>.
- <sup>211</sup> See generally ILEG, *supra* note 180.
- <sup>212</sup> See, e.g., Nancy Kachingwe, *African Civil Society Engagement with COP 17: One Step Closer to an African Climate Change and Development Agenda* (Nov. 11, 2011), <http://www.boell.org.za/web/cop17-814.html>; Kevin Kinusu Kinyangi, *KCCWG at the African Pavilion, Durban*, [http://www.kccwg.org/index.php/en/events/111-kccwg-at-the-african-pavilion-durban?CSRF\\_TOKEN=](http://www.kccwg.org/index.php/en/events/111-kccwg-at-the-african-pavilion-durban?CSRF_TOKEN=).
- <sup>213</sup> See, e.g., *Africa Enterprise Challenge Fund: Renewable Energy and Adaptation to Climate Technologies (REACT)*, CLIMATE FINANCE OPTIONS, <http://www.climatefinanceoptions.org/cfo/node/226> (last visited Feb. 10, 2012).
- <sup>214</sup> *Id.*
- <sup>215</sup> *Id.*
- <sup>216</sup> Since 2006, UAP has been at the forefront in offering insurance products targeting farming enterprises. The products cover both crop and livestock farmers against natural perils like drought, floods, frost, fire, winds and hail storms. While the livestock covers insure mortality losses, the crop covers insure losses due to failed harvests or destruction of crops or harvests. See ILEG, *supra* note 180, 87-88.
- <sup>217</sup> See, e.g., Xan Rice, *Kenya herders to be offered livestock insurance against drought*, THE GUARDIAN (Jan. 22, 2010), <http://www.guardian.co.uk/environment/2010/jan/22/kenya-drought-insurance>; Jeff Haskins and Neil Palmer, *Kenya: Livestock Insurance – A Chance to Outsmart Drought?*, TRINITY AFER (Jan. 9, 2012), <http://www.trinityafer.com/en/index.php/news/8425-kenya-livestock-insurance-a-chance-to-outsmart-drought>; see also Susan MacMillan, *Herders in drought-stricken northern Kenya get first livestock insurance payouts*, ILRI NEWS (Oct. 21, 2011), <http://www.ilri.org/ilrinews/index.php/archives/7310>; Susan MacMillan, *Livestock Director and Partners Launch First-ever Index-based Livestock Insurance Payments in Africa*, ILRI NEWS (Oct. 25, 2011), <http://www.ilri.org/ilrinews/index.php/archives/7348>.
- <sup>218</sup> Susan MacMillan, *Livestock Director and Partners Launch First-ever Index-based Livestock Insurance Payments in Africa*, ILRI NEWS (Oct. 25, 2011), <http://www.ilri.org/ilrinews/index.php/archives/7348>.
- <sup>219</sup> See *Southern Sudan, DRC lining up to join the EA Community*, TRADEMARK S. AFR. (Jan. 10, 2011), <http://www.trademarksa.org/node/3182>.
- <sup>220</sup> *Id.*
- <sup>221</sup> *Id.*
- <sup>222</sup> See East African Community, *13th Ordinary Summit of the Heads of State, Nov. 30, 2011, Communiqué of the 13th Ordinary Summit of the EAC Heads of State ¶ 11* (2011).
- <sup>223</sup> See Christine Mungai, *East Africa: Region's Economy Expands Amid Deepening Levels of Poverty*, NORWEGIAN COUNCIL FOR AFRICA (Apr. 10, 2012), <http://www.afrika.no/Detailed/21372.html>.
- <sup>224</sup> See generally NICHOLAS STERN, *THE ECONOMICS OF CLIMATE CHANGE: THE STERN REVIEW* (2007); see also OTTMAR EDENHOFFER & LORD NICHOLAS STERN, *TOWARDS A GLOBAL GREEN RECOVERY: RECOMMENDATIONS FOR IMMEDIATE G20 ACTION* 43-47 (2009).

## Endnotes: THE MONTREAL PROTOCOL: FIT FOR HYDROFLUOROCARBONS

*continued from page 25*

- <sup>10</sup> UNEP Ozone Secretariat, *Montreal Protocol on Substances that Deplete the Ozone Layer 2007: A Success in the Making*, 6 (Feb. 22, 2012), [http://ozone.unep.org/Publications/MP\\_A\\_Success\\_in\\_the\\_making-E.pdf](http://ozone.unep.org/Publications/MP_A_Success_in_the_making-E.pdf).
- <sup>11</sup> *The Vienna Convention for the Protection of the Ozone Layer and its Montreal Protocol on Substances that Deplete the Ozone Layer*, UNEP OZONE SECRETARIAT (Feb. 22, 2012, 5:19PM), [http://ozone.unep.org/new\\_site/en/index.php](http://ozone.unep.org/new_site/en/index.php).
- <sup>12</sup> CLIMATE CONTROL CO. ASS'N, *supra* note 2.
- <sup>13</sup> UNEP Ozone Secretariat, *supra* note 10.
- <sup>14</sup> Danielle Fest Grabel, *Crucial Crossroads*, OUR PLANET MAGAZINE, September 2007, at 20.
- <sup>15</sup> *Id.*; INST. GOVERNANCE & SUSTAINABLE DEV., *QUESTIONS & ANSWERS ABOUT REGULATING HYDROFLUOROCARBONS UNDER THE MONTREAL PROTOCOL* 9 (Jan. 22, 2012), <http://www.igsd.org/documents/UpdatedHFCFAQsAugust.pdf>; UNEP Ozone Secretariat, *supra* note 10, at 10.
- <sup>16</sup> Grabel, *supra* note 14.
- <sup>17</sup> UNEP Ozone Secretariat, *supra* note 10.