UNDP Montreal Protocol Unit's contribution to sustainable development in Latin America and the Caribbean region since 1992: achievements, gaps and way forward to sustainability

Contents

UNDP Montreal Programme

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UNDP established the Montreal Protocol Unit (MPU) in 1991. Since then UNDP MPU managed the implementation of over 2,000 projects funded by the Multilateral Fund for the Implementation of the Montreal protocol (MLF) in more than 100 countries. UNDP's portfolio of ozone-related projects funded by MLF has a cumulative total value exceeding US$ 532 million in grants and to date has prevented the annual release of over 64,000 tonnes of ozone-depleting substance (ODS) into the atmosphere.

As part of the preparation for the United Nations Conference on Sustainable Development (Rio+20) it is important to identify and analyze enabling factors as well as to be prepared to tackle the challenges ahead.

Results of UNDP Montreal Programme work in Latin America and the Caribbean since 1992

This report outlines the successes, enabling factors and emerging challenges of UNDP activities to support countries of Latin America and the Caribbean (LAC) region to implement the Montreal Protocol on Substances that Deplete the Ozone Layer to eliminate ozone-depleting substances. Although challenges remain, the Montreal Protocol has been recognized as a global success, demonstrated by the massive reductions in ODS use worldwide since it came into force. By its 20th anniversary in September 2007, the Montreal Protocol had succeeded in facilitating the sustainable phase-out of over 95 percent of the ozone depleting substances it was designed to control. In addition to depleting the ozone layer, most ozone depleting substances controlled by the Montreal Protocol are also powerful greenhouse gases. Thus the activities undertaken in support of the Montreal Protocol have resulted in greenhouse gas reductions equivalent to several billion tonnes of CO_2 (CO_2-eq).

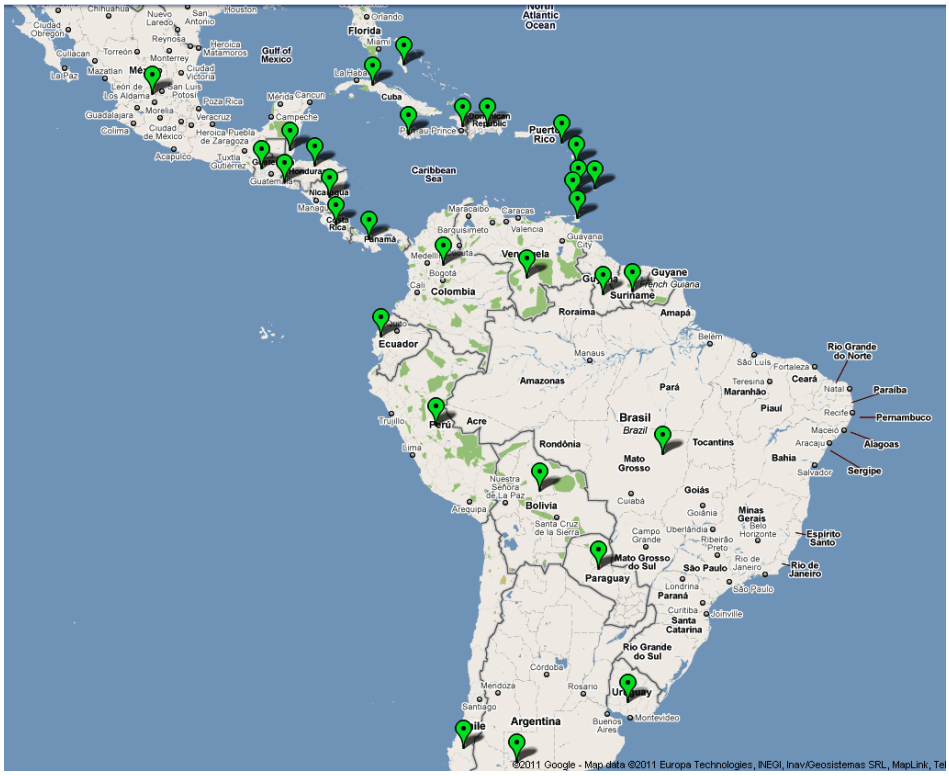
Since 1992, UNDP Montreal Protocol Unit (MPU) has managed a programme in more than 30 countries in the region worth almost US$183m. MPU has assisted the countries in the region to assess needs, select alternative technology and implement industry conversion required to become ODS-free. Multilateral Fund for the Implementation of the Montreal Protocol (MLF) was tapped to fund 731 projects. Projects funded by MLF have contributed to the success of the implementation of the Montreal Protocol by phasing out 176,788 tonnes of ozone-depleting substances when counted on a

cumulative basis. Considering their global warming potential, this result translates to the elimination of greenhouse gas emissions of 1,130,246,667 tons of CO_2-eq [1].

Table 1: UNDP Montreal Protocol Programme (1991-2011) funded by MLF

	Global	Latin America and the Caribbean
Number of countries	109	30
Number of projects	2,113	731
Grants approved, US$ million	532	183
Tonnes of ODS phased out (annual)	65,962	22,819
Tonnes of ODS phased out (cumulative)	569,202	176,788
Reduction of greenhouse gas emissions, CO_2-eq (cumulative)	3,444,593,843	1,130,246,667

The map below shows countries of Latin America and the Caribbean countries where UNDP implemented MLF-funded projects from 1991 to 2011.



[1] The calculation of the level of climate benefits achieved is based on the Inventory of Projects maintained by the Secretariat of the Multilateral Fund, but focusing on UNDP projects only. The emissions (tonnes of CO_2-eq) per project is calculated based on the cumulative phase out value (applying GWP values) subtracted by the amount that was phased in. Other factors, such as energy efficiency gains or losses, are not being taken into account in this calculation.

Table 2: Number of projects and MLF approved grant funding by countries for projects implemented by UNDP (1991-2011)

Countries	Number of projects	Grants approved, US$
Argentina	66	16,775,756
Bahamas	2	151,232
Barbados	5	236,761
Belize	7	393,629
Bolivia	15	1,196,329
Brazil	207	64,178,133
Chile	17	2,973,901
Colombia	52	23,139,016
Costa Rica	41	9,357,421
Cuba	27	10,853,846
Dominica	3	103,000
Dominican Republic	29	4,269,448
Ecuador	1	140,000
El Salvador	14	1,822,514
Grenada	4	153,400
Guatemala	9	1,201,038
Guyana	3	229,988
Haiti	5	429,656
Honduras	2	163,000
Jamaica	10	1,105,915
Mexico	59	22,339,239
Nicaragua	5	463,878
Panama	13	1,640,202
Paraguay	13	1,573,130
Peru	25	4,222,522
Saint Kitts and Nevis	2	105,000
Saint Vincent and the Grenadines	2	128,000
Suriname	6	493,180
Trinidad and Tobago	18	1,433,522
Uruguay	28	3,656,802
Venezuela	34	6,530,312
Regional projects	7	1,431,401
Total	**731**	**182,891,171**

UNDP Montreal Protocol Programme not only facilitated the elimination of ODS production and consumption but also supported the market transformation towards the use of low-ODS technologies. Examples from different countries of the region below highlight the work on transferring to low-ODS

technologies in refrigeration and air conditioning, foams, solvents, agriculture and health sectors. Alternative technologies were also more energy-efficient, cost-effective and environment-friendly and it led to maintaining competitiveness of thousands of small and medium-size enterprises and ensuring sustainable livelihoods for their families.

Examples of UNDP MPU projects for each sector

Brazil - Greening the foam production industry

At a time when virtually all polyurethane foam manufacturers were using CFCs as a blowing agent, UNDP was approached by Poly-Urethane Industria e Comercio Ltda, a national chemical and equipment supplier, with the idea of introducing a castor oil-based polyurethane CFC-free system to the Brazilian market.

At that time, Poly-Urethane supplied standard petroleum based polyurethane chemicals purchased from major international suppliers and blended to customers' specifications. In order to move away from CFCs to the new castor-oil based process, the existing dispensing equipment needed replacement.

In August 1994 the project 'Conversion of three companies to CFC-free technology in the manufacture of rigid polyurethane spray foam' was approved. The project, which depended on local technical support and coordination, marked a series of firsts for Brazil: the first MLF-funded ODS phase-out investment project to be implemented by UNDP in the country; the first approved group project, targeting conversion of three enterprises; and, the first project, at the global scale, to contribute negative global warming potential thanks to the use of a renewable feedstock with CO_2 absorption potential – mamona, the local name for the castor oil plant.

Poly-Urethane developed and tested prototype equipment, before producing commercial versions for the three enterprises involved in the project, and providing training in its use. By July 1997, the project was certified as technically complete and the three large spray foam contractors that had converted to the non-CFC technology were recognized as having reduced Brazil's CFC consumption by 72 tonnes per year.

Also, by establishing a local, ongoing demand for mamona, Poly-Urethane provided the impetus for the re-establishment of mamona farming in the northern part of Minas Gerais state. By scaling up mamona production to industrial levels, approximately 4,500 farming families were kept employed and mamona is being considered as a possible base for the manufacture of other products. An additional and important advantage of using mamona is that the plants absorb carbon dioxide, thereby reducing greenhouse gas accumulations in the atmosphere. The estimated carbon dioxide absorption level of mamona plants is 34.6 tonnes per hectare, with two growing cycles per year.

Working with a grant of US$ 470,000, this project established partnerships that not only phased-out 72 tonnes of CFCs but also launched an impressive ODS phase-out programme in the Brazilian foam industry, built considerable local capacity, supported innovation, generated local level jobs and economic benefits, and contributed to reducing global warming.

This project was followed by many other cost-effective projects in Brazil that transformed market to environmentally friendly technologies in important sectors of the economy. By 2010 Brazil had eliminated the dependence on CFC imports. The successful implementation of CFC phase-out plan not only helped the ozone layer but also reduced greenhouse gas emissions. The impact on climate change mitigation of the MLF assisted MP in Brazil from 1992-2010 is of 531,306,365 tons of CO_2-eq.

Costa Rica - Addressing the needs of the fishing sector

In 2003, CFC consumption in Costa Rica was heavily influenced by needs of fishing industry in the port of Puntarenas. Although the fisheries sector's refrigeration capacity represented only 5 percent of the country's total installed capacity, it accounted for more than 50 percent of national CFC consumption. The Government, working with UNDP and sectoral stakeholders, decided to design an end-user incentive programme aimed at retrofitting 50 percent of the sector, which became an important component in the Costa Rica refrigerant management plan (RMP).

The port of Puntarenas' fishery sector had been characterized by poor refrigeration practices. In most cases, vessel owners were completely unaware of the high costs that resulted from their inefficient CFC systems. Poor maintenance and leaking cooling systems were common and it was not unusual for substantial quantities of CFC refrigerants to be added to a vessel's cooling system prior to a fishing trip, only to leak out before the vessel returned to shore. An inefficient cooling system could use six times as much CFC as normally required.

After extensive consultation with stakeholders, and with UNDP support, a pilot end-user incentive project was launched as part of the country's RMP. Three fishing vessels were converted and benefits included lower operating costs for the cooling system which repaid the investment in less than one year. As news of the project's success spread, more vessels were converted. The project assumed 50 percent of the associated costs, with the remainder were borne by owners.

By the end of 2006, a total of 17 vessels had been converted and annual national CFC consumption had been reduced by 6.4 tonnes per year. Since the project generated widespread awareness of CFC issues it led indirectly to the reduction of CFC consumption in vessels that were not participants in the original programme and worked to the benefit of the refrigeration servicing industry in Puntarenas.

Cuba - Phase-out of CFC consumption in the manufacture of MDIs

More than 1.1 million Cubans suffer from asthma. In order to supply domestic needs, Cuba produces six million units of CFC-based Metered Dose Inhalers (MDIs) each year, which calls for the use of 109 tonnes of CFCs. In 2002 there was growing concern in Cuba that a process for obtaining CFC-free MDI technology had not yet begun and that as a result, the country was unlikely to comply with Montreal Protocol CFC phase-out targets. It was also feared that the lack of a replacement technology would seriously jeopardize the availability of medications. The Cuban Government approached UNDP for assistance.

Cuba urgently needed to identify an appropriate replacement technology that would meet specific criteria related to Cuba's laboratory capacity, product availability and cost-effectiveness needs without infringing intellectual property rights. Underpinning these considerations was the need to secure adequate financing to implement a conversion project.

With UNDP's help, the Cuban MDI Technology Transfer Project, the first ever MDI conversion project funded by the MLF, was approved in 2003 with total funding of US$ 5,960,000.

UNDP assisted Cuba to establish base-line equipment needs, calculate eligible funding limits and identify potential technology suppliers. This ground-breaking work helped develop MLF policy and guidelines for the MDI sector.

The partnership enabled Cuba to get the equipment necessary for the stable and safe production of CFC-free MDIs, along with extensive and targeted training. To facilitate product transition, a national awareness campaign has been launched to inform doctors of the characteristics of CFC-free MDIs so that they may, in turn, educate their patients. The project is under implementation and production of CFC-free MDIs (Salbutamol) has been launched and more than 1.5 million units have been produced so far.

Factors of success

The analysis of the work of UNDP Montreal Protocol Unit allows making some conclusions about the factors which enable countries to adopt technologies with low ozone-depleting potential.

1. LAC countries' commitments taken within the framework of the Montreal Protocol served as a powerful incentive to stimulate and facilitate actions toward sustainable development by bringing market transformation to adopt environment-friendly technologies.
2. Availability of funding for 'incremental' costs associated with shifting from ozone-depleting substances to alternative technologies was essential to support the efforts of countries. In this regard the technical and financial support through the Multilateral Fund for the implementation of the Montreal Protocol was critical.
3. Technology transfer is only successful when complemented by targeted strengthening of relevant human and institutional capacities. UNDP's long-standing experience in capacity development was an important driver in developing and implementing coherent packages for LAC countries. Funding from the MLF for institutional strengthening was instrumental to maintain government personnel dedicated to ozone layer protection.
4. Significant backing and buy-in from private sector continues to be essential to develop, test and adapt technologies. In selecting the alternative technologies it is important to consider sustainability (alternatives shouldn't have negative side effects) and economic viability aspects.
5. Consideration of the entire lifecycle of substances being phased in as alternative technologies (move to 'cradle to cradle' design) is also important.

Future and emerging challenges

As previous paragraphs described, UNDP through its Montreal Protocol Unit (MPU) has had a privilege to assist LAC countries to achieve control targets under the Montreal Protocol while contributing to sustainable human development. However many challenges remain and new ones emerge.

It is important for countries to maintain the momentum to ensure the repair of the ozone layer. During the last two decades, the industry has transitioned from CFCs to different alternatives, including HCFCs, hydrocarbons (HC), and hydrofluorocarbons (HFC) and it is now beginning the transition from HCFCs to alternatives that do not deplete the ozone layer and at the same time are climate friendly. Like CFCs, HCFCs are used mainly in refrigeration and air conditioning, and in foam manufacturing products, and represent the largest portion of remaining ODS consumed worldwide. Unfortunately, not all available alternatives to HCFCs are climate-friendly.

The Parties of the Montreal Protocol took the decision in 2007 to accelerate the phase-out of HCFCs, largely due to the substantive climate benefits this would bring.

HCFCs were used as an interim alternative solution to CFCs, due to their lower Ozone Depleting Potential (ODP) which is between 5-10% when compared to CFCs. It also provided a low cost alternative that allowed for a smooth industry transition. While the Global Warming Potential (GWP) of currently available HCFCs is moderate to high (600-2,200 CO_2-eq) (TEAP 2010 Progress Report), it is much lower than that of CFCs (6,000-10,600 CO_2-eq). However, the majority of HCFCs still have high GWP; therefore, their phase-out will contribute significantly to climate change mitigation. On the other hand and depending on the alternative selected, this contribution can be very significant (large climate benefits) or can be so deleterious and of such magnitude as to nullify the efforts a country is making via other voluntary actions, such as efficient lighting or appliances replacement programmes for energy savings.

Due to the magnitude of climate change impact, it is important that countries take into account the HCFC phase-out activities as a step towards transformation to a low-carbon economy.

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