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| **UNITEDNATIONS** | **EP** |
| UNEP | **United Nations****Environment****Programme** | Distr.GENERALUNEP/OzL.Pro/ExCom/82/6914 November 2018ORIGINAL: ENGLISH |

EXECUTIVE COMMITTEE OF
 THE MULTILATERAL FUND FOR THE
 IMPLEMENTATION OF THE MONTREAL PROTOCOL
Eighty-second Meeting

Montreal, 3-7 December 2018

**KEY ASPECTS RELATED TO HFC-23 BY-PRODUCT CONTROL TECHNOLOGIES: OPTIONS RELATED TO THE CONTROL OF HFC-23 BY-PRODUCT EMISSIONS IN ARGENTINA (DECISION 81/68)**

**Background**

# At its 81st meeting, the Executive Committee requested the Secretariat to contract an independent consultant to prepare a report for the 82nd meeting, providing information:

## On options and all costs and savings related to the control of HFC-23 by-product emissions in Argentina, based on the quantities of HCFC-22 and HFC-23 produced at the plant and information included in relevant past reports to the Executive Committee, including the option of shipping HFC-23 for off-site destruction;

## On estimates of fugitive emissions and options for monitoring, leak detection and control of HFC-23 by-product at the plant; and

## On the costs, technical feasibility, and logistical, legal and transaction issues associated with shipping HFC-23 for off-site destruction by means of a technology such as the fluor process described in document UNEP/OzL.Pro/ExCom/81/54.

# The Executive Committee also requested the Government of Argentina to provide, on a voluntary basis, relevant information for the report, and allocated, from existing Secretariat resources, up to US $25,000 for the contract of the independent consultant (decision 81/68(b), (c) and (d)).

Scope of the document

# In line with decision 81/68(b), the Secretariat contracted an independent consultant to undertake the study. The consultant, together with two staff members from the Secretariat, visited the HCFC-22 production facility Frio Industrias Argentinas (FIASA) located in San Luis, Argentina on 28 to 30 August 2018. The team also met with the representatives of the Government of Argentina and discussed the options for HFC-23 by-product control, including requirements for off-site destruction of HFC‑23 by‑product.

# Based on the data collected from the mission to Argentina and relevant documents that were previously considered, the consultant submitted a report detailing options for HFC-23 by-product control and their costs for the consideration of the Executive Committee. The Secretariat undertook an extensive review of the consultant’s report, which is contained in Annex I to the present document. The report consists of an executive summary (including findings); it describes the HCFC-22 production and generation of HFC-23 at FIASA; it describes the physical and mechanical conditions of the incinerator available at the production facility, and the estimated costs for restoring it; the potential for fugitive emissions of HFC-23; it presents a cost analysis of onsite destruction of HFC-23 and transporting HFC-23 for off-site incineration. The report also includes five annexes, including an analysis of the estimated capital cost to restore the incinerator (Annex II); estimated cost for incinerating HFC-23 at FIASA (Annex III); and the amounts of HCFC-22 production and the estimated HFC-23 by-product generated from 2019 to 2029 (based on three different generations rates), and the costs of destruction at three facilities (in-situ, in a cement kiln in the vicinity of FIASA, and in a plasma arc incinerator in Monterrey, Mexico).

# To facilitate the Executive Committee’s review of the consultant’s report, the present document consists of the following sections:

* Regulatory framework for the transport and/or export of HFC-23
* Technologies approved for destruction of HFC-23
* Summary of the conclusions of the consultant’s report
* Additional information for consideration by the Executive Committee on: rotary kilns, monitoring, closure, and the time of project initiation
* Summary
* Recommendation

**Regulatory framework for transport and/or export of HFC-23**

# Regulations related to the transport and/or export of HFC-23 depend on whether it is intended for controlled uses, in which case it is treated as a product, or for destruction, in which case it is treated as a hazardous waste. In particular, HFC-23 by-product for destruction is considered a hazardous waste under Argentinian law. The transport of such waste within Argentina would require strict adherence to a number of conditions, including: permits would have to be obtained from each province through which the waste is transported, and the waste could only be transported on federal (and not provincial) roads by an entity that was registered to transport hazardous waste.

# Similarly, the regulations related to the export of HFC-23 by-product for destruction in Argentina are different from the regulations related to the export for the controlled use of HFC-23 (e.g., fire protection applications or low-temperature refrigeration). For the latter, HFC-23 is treated as a product and its export would therefore not fall within the meaning of the Basel Convention or other regulations related to the export of waste. The same export requirements would apply for HFC-23 that is used as a refrigerant as would apply to other HFC refrigerants, noting that the use of a substance as a refrigerant may need to be demonstrated if there is no apparent market.

# Under the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal (the Basel Convention),[[1]](#footnote-1) a waste is considered a hazardous waste if it falls within one of the categories of Annex I (“y categories”) unless they do not possess any of the characteristics specified in Annex III (“h characteristics”) of the Convention; or if it considered or defined as a hazardous waste under the domestic legislation of the importing, exporting or transiting Party. The Government of Argentina considers that HFC-23 by-product for destruction would fall within category y45 of Annex I of the Basel Convention and, therefore, a hazardous waste.[[2]](#footnote-2)

# In line with obligations under the Convention, the Government therefore considers that permission would have to be received from both the country to which the waste was being exported to, and any transit countries through which the waste is shipped (i.e., the countries of intermediate ports, if any, before the waste was delivered to the final country where the destruction would take place). While the process of obtaining the necessary permits is onerous, that is the process that has been used for all other shipments of hazardous waste that fall under the Basel Convention from Argentina, and the Government would follow a similar process for the case of export of HFC-23 by‑product for destruction.

**Technologies approved for destruction of HFC-23**

# Subsequent to the 81st meeting, the consultant starting working in line of the requirements of decision 81/68, and in consultation with the Secretariat, considered relevant to evaluate three options for the control of HFC-23 by-product in Argentina, including incineration at a cement kiln located 160 km from FIASA.

# Subsequent to the finalization of the consultant’s report, the Thirtieth Meeting of the Parties[[3]](#footnote-3) adopted a decision,[[4]](#footnote-4) wherein the Parties approved technologies for the destruction of HFC-23. The incinerator currently at FIASA and the plasma arc incinerator in Mexico are both among the technologies approved by the Parties for destruction of HFC-23. While the Parties approved cement kilns for the destruction of Annex F group I substances, they did not approve cement kilns for the destruction of HFC‑23 as information on the destruction and removal efficiency (DRE) for HFC-23 was lacking. Until the Parties decide to approve cement kilns for the destruction of HFC-23, the Government of Argentina could not use that technology to comply with the HFC-23 by-product control obligations under the Kigali Amendment.

# As the consultant’s report had assessed the cost for destruction of HFC-23 at a cement kiln prior to the Thirtieth Meeting of the Parties, the Executive Committee may wish to consider this analysis only as a reference.

**Summary of the conclusions of the consultant’s report**

# The consultant’s report addressed all the requirements of decision 81/68, and evaluates three options for the control of HFC-23 by-product in Argentina based on quantities of HFC-23 by-product generated:

## Restarting FIASA’s incinerator and destruction of HFC-23 by-product on-site;

## Transporting the HFC-23 by-product to a cement kiln in San Luis province for incineration; and

## Exporting HFC-23 by-product for incineration to an off-site destruction facility.

HFC-23 by-product generation rate

# Absent additional data, the consultant assumed that the production of HCFC-22 would be maintained at the level of production in 2017 of 1,823 mt (the last year for which data was available) until 2024, at which time production would decrease to 1,531 mt from 2025 to 2029, in accordance with the Montreal Protocol control schedule. The quantity of HFC-23 to be destroyed is based on FIASA’s historic by-product generation rate of 3.32 per cent i.e., the average rate when FIASA was generating credits under the Clean Development Mechanism (CDM). Accordingly, about 61 mt of HFC-23 by-product would be generated annually between 2019 and 2024, and 50 mt annually between 2025 and 2029, and cease from 2030 onward.

# Process improvements, which would involve additional capital investments, can reduce the by‑product generation rate to as low as 1.4 per cent.[[5]](#footnote-5) The consultant also estimated the quantity of HFC-23 to be destroyed using a by-product generation rate of 2.0 per cent and 1.45 per cent.

Restarting FIASA’s incinerator

# FIASA has an on-site thermal oxidation incineration system purchased from SGL Carbon Group of Meitingen, Germany that was shut down in October 2013 and has been idle since. The capacity of the on-site incinerator is 613 metric tonnes (mt)/yr.

# The on-site incinerator at FIASA, at 100 per cent of design capacity, can destroy 613 mt of HFC‑23 in 365 days. FIASA’s highest HFC-23 by-product generation was 134 mt in a year. During the period in which FIASA was destroying HFC-23 for credits under the Clean Development Mechanism (CDM), FIASA installed a 40 mt cryogenic storage tank to improve the control of HFC-23 feed to the incinerator. The cryogenic tank is a key part of the incineration system. It allows for storage of HFC-23 generated in 109 days at the record production of 134 mt per year; and 243 days at HFC-23 generation of 60 mt per year, given current HCFC-22 and HFC-23 production and generation levels. Therefore, the incinerator can be operated at 50 per cent of design capacity in campaigns that destroy the cumulative content of the cryogenic tank and minimize the shutdowns and start-ups of the incinerator, thus extending its life.

# The estimated costs required to refurbish the incinerator are US $897,840[[6]](#footnote-6) (as described in Annex II of the consultant’s report). Incremental operating costs (IOCs) will be a function of the extent of utilization of the incinerator capacity.[[7]](#footnote-7) The consultant estimated IOCs between US $1.10/kg (100 per cent capacity) and US $2.22/kg (50 per cent capacity) (Table 4 of the consultant's report). Annual operating costs for incineration will also depend on the HFC-23 by-product generation ratio (Annex 5 of the consultant’s report).

Transporting the HFC-23 to a cement kiln in San Luis province for incineration

# In order to minimize the legal and logistical issues required for off-site destruction, a cement kiln within San Luis province where FIASA is located was considered as a possible destruction facility. The cement kiln is not registered to destroy hazardous waste and in order to obtain the necessary permits, it is likely that the Government of Argentina and the province of San Luis would require the kiln to perform a test burn to demonstrate that 99.99 per cent of HFC-23 is destroyed.

# FIASA would need to purchase two 8.6 mt-capacity isotanks to transport the HFC-23 from FIASA to the cement kiln at a cost of US $460,000. The safe transport of HFC-23 requires the use of an isotank with thick, steel walls given the high vapor pressure of HFC-23.[[8]](#footnote-8) The isotanks when filled have a gross weight of approximately 14.36 mt, i.e., the weight of the tank itself is almost as much as the HFC‑23 contained therein.

# The consultant estimated the costs of destruction at the cement kiln of approximately US $1.05/kg, including the cost of transportation, and excluding the capital costs of the two isotanks (Table 5 of the consultant’s report).

Exporting the HFC-23 to Mexico for destruction at a plasma arc incinerator

# The consultant assessed the option of exporting HFC-23 for destruction at the plasma arc incinerator in Monterrey, Mexico.[[9]](#footnote-9) That facility has demonstrated the destruction of HFC-23 with a DRE of at least 99.99 per cent under the CDM. The HFC-23 would be transported by truck from FIASA to the port in Buenos Aires, by ship to the port in Tampico, Mexico, and then by truck to the plasma arc incinerator in Monterrey. Permits would need to be obtained for each leg of the journey, as well as for each province between San Luis and Buenos Aires, Argentina. In addition, FIASA would need to obtain prior informed consent from the Government of Mexico.

# The consultant estimated the transportation costs to be US $1.09/kg, and assumed incineration costs of US $7.40/kg,[[10]](#footnote-10) resulting in a cost of US $8.49/kg (Table 6 of the consultant’s report). In addition, FIASA would need to purchase two isotanks suitable for the transport of HFC-23 at US $460,000.

# Fugitive emissions

# All HFC-23 by-product currently generated at FIASA is vented to the atmosphere, and not monitored. Emissions of HFC-23 from the vent stack of the incinerator, when it was in operation, were below the 1.14 parts per million (ppm) detection limit of the gas chromatograph used to monitor the stack emissions.[[11]](#footnote-11)

# FIASA seeks to minimize fugitive emissions from its HCFC-22 production in order to maximize its collection of HCFC-22, the product it sells. To do so, among the measures, the enterprise checks every flange joint and other connections using a soap solution every couple of weeks. In addition, the enterprise closely monitors the HCFC-22 production process variables. The packaging area has a leak detection system but sniffers or other detection instruments are not used by the enterprise, with the exception of the incinerator (when it is in operation) which includes monitoring of the exhaust gases (including of HFC‑23).

# All the process units in the HCFC-22 production line and incineration system operate as a closed system with no chance for fugitive emissions in between. Should an unexpected leak occur it will be of such magnitude that it cannot be missed and will be fixed immediately for safety considerations.

**Additional information for consideration by the Executive Committee**

Incineration at rotary kilns

# Among the technologies approved by the Thirtieth Meeting of the Parties for the destruction of HFC-23, is rotary kilns. While the consultant did not assess the estimated costs of incineration using rotary kilns, the Executive Committee will considered at its 82nd meeting the synthesis report on the pilot ODS disposal projects.[[12]](#footnote-12) This document indicates that destruction costs at rotary kilns in Germany and Poland range between US $1.87/kg and US $2.45/kg, based on bids received from these facilities that are registered for ODS destruction in the European Union. The Secretariat also notes that costs to transport HFC-23 from FIASA to a rotary kiln in either Germany or Poland can be expected to be up to twice the cost of transportation to the plasma arc incinerator in Mexico (i.e., up to US $2.17/kg). Based on this data, the total cost of destruction would range between US $4.04/kg and US $4.62/kg; and an additional, capital cost of US $460,000 for two isotanks.

Costs related to the monitoring of destruction of HFC-23

# The IOCs estimated by the consultant included costs related to the monitoring of HFC-23 emissions from the incinerator stack, including the costs to operate the sampling and monitoring equipment, including for its calibration. However, the consultant did not include costs related to provincial or federal government monitoring, or costs related to an independent audit or verification. As reference, stage II of the HCFC phase‑out management plan (HPMP) for Argentina, includes US $8,333 per year for annual monitoring of HCFC-22 production and stockpiles, and in situ verification by experts (for a total of US $50,000). Monitoring and verification of HFC-23 by-product emissions would be an additional task. An additional 50 per cent of the annual cost to monitor HCFC-22 production and stockpiles, and verification, could be considered to also monitor and verify HFC-23 emissions, bringing the total annual monitoring and verification costs to US $12,500 for both HCFC-22 production and HFC‑23 emissions.

Preliminary estimated cost of closure of HCFC-22 production

# The Executive Committee decided to consider possible cost-effective options for compliance with the HFC-23 by-product control obligations under the Kigali Amendment, including closure of HCFC-22 swing plants (decision 79/47(c)). Within the budget available, the consultant was unable to undertake a techno-economic analysis to assess the lost profits that would be associated closure of FIASA.

# In order to provide a comparison between alternative approaches for management of HFC-23 by‑product emissions in line with the Kigali Amendment and the closure of the HCFC-22 swing plant, the Secretariat broadly assessed the lost profits for FIASA that would be associated with early closure. Such a determination is complicated by the following factors:

## An enterprise’s profits are determined in part by the difference between the revenue generated from the sales of the product and the costs to produce and sell that product. The major costs to produce HFCF-22 include the costs for the raw materials (anhydrous hydrogen fluoride and chloroform), labour costs and, to a lesser degree, maintenance costs. While the HCFC-22 is sold locally, raw materials are imported, and therefore profits at the enterprise will depend on the exchange rate of the local currency (i.e., Argentina Peso).[[13]](#footnote-13) Maintenance costs may vary as the equipment in the production line (except of a distillation column that was replaced in 2006) is the original equipment used to manufacture CFCs (i.e., 31 years old);

## On any given year, the level of production of HCFC-22 has been lower than the production capacity of the enterprise (i.e., 7,792 mt/yr as reported by the Government of Argentina or 5,000 mt/year based on the consultant’s estimation), and every year HCFC‑22 is imported into the country (Table 1 of the consultant’s report), suggesting that FIASA may be able to command a higher price than for imported HCFC-22, increasing its profitability by an unknown amount. In contrast, decreasing utilization of production capacity is expected to result in increasingly variable profitability. Table 1 below shows the extent of utilization of quotas and capacity at FIASA.

**Table 1: Utilization (per cent) of quotas and production capacity in Argentina**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Utilization (per cent)** | **2013** | **2014** | **2015** | **2016** | **2017** |
| Import quota | 89 | 91 | 95 | 92 | 100 |
| Production quota | 48 | 56 | 67 | 47 | 50 |
| Capacity (7,792 mt/yr) | 25 | 29 | 31 | 22 | 23 |
| Capacity (5,000 mt/yr) | 39 | 46 | 49 | 35 | 36 |

# In accordance with Argentina’s laws and regulations, workers who are laid off are provided compensation according to the number of years the employee has worked for the enterprise. Based on the years of service of the employees at FIASA and their salaries, and assuming the HCFC-22 production line were to close on 1 January 2020, the compensation to workers would be approximately US $1,775,000.

# In the absence of data, a profit margin of approximately 5 per cent of the sales revenue for commodity chemicals can be assumed. On that basis, and assuming: the 2017 production levels (1,823 mt) are maintained until the 1 January 2025 control target, at which point production would be reduced to the Montreal Protocol control target (1,531 mt/yr) until 1 January 2030, when production would cease; the price of HCFC-22 reported by FIASA for 2017; and a 5 per cent inflation rate, results in a net present value of lost profit for the period of 2020-2030 of approximately US $4,500,000. Varying the profit margin by ±2 per cent results in a range of the net present value of lost profit of approximately US $2,700,000 to US $6,300,000.

# Following CFC agreements, the CFC/HCFC reactors and distillation column would need to be destroyed, dismantled or rendered unusable; in contrast, the incinerator and the scaffolding holding the reactors, for example, could be used for another purpose or sold. In addition, the site would not need to be de-contaminated to comply with environmental regulations if the site were to continue to be used as a chemical plant.

# Closure of FIASA would provide both ozone and climate benefits, as neither HCFC-22, an ODS, nor HFC-23 by-product, a potent greenhouse gas, would be produced or generated by the facility. Moreover, the monitoring of closure would be substantially easier than if the facility were to continue to operate and destroy HFC-23 either on- or off-site.

Time of project initiation

# FIASA currently is venting all the HFC-23 by-product generated during the production of HCFC‑22. The HFC-23 emission control obligation under the Kigali Amendment commence on 1 January 2020. However, there are no technical impediments that would preclude destruction to commence before then. Reconnecting the pipes to the cryogenic tank to allow the HFC-23 to be stored for subsequent destruction could be accomplished within days or at most several weeks. At current production levels, FIASA would then have at least six months to complete all the work needed to restart the incinerator or finalize all the necessary arrangements required for off-site destruction. In order to maximize the climate benefits of HFC-23 by-product control, the Executive Committee could consider, on an exceptional basis, to provide additional funding for the control of HFC-23 starting on 1 January 2019. This would provide an additional 890,368 mt-CO2eq of climate benefits.

**Summary**

# FIASA could be the first HCFC-22 swing plant for which compensation is provided to control HFC-23 by-product emissions in line with decision 79/47(c).

# At the 79thmeeting, the Committee recognized that a number of challenges were faced when considering of HFC-23 by-product control technologies including, *inter alia¸* the wide range of incremental operating costs reported, the burden on production companies and the need for funding to assist with disposal and destruction activities, that the destruction of HFC-23 could be considered to be part of the regular cost of doing business, that it was necessary to ensure that the application of particular funding modalities did not create perverse incentives that encouraged an increase in by-product output, and the need for a flexible approach, among other challenges.[[14]](#footnote-14)

# Accordingly, the Executive Committee faces a number of policy decisions (e.g., the number of years for which IOCs are provided, the by-product generation rate used to determine IOCs, the benefits of closure versus continued production of HCFC-22 and destruction of the HFC-23 by-product, and possible additional compensation to maximize the climate benefits of HFC-23 control, amongst others). Without prejudice to those decisions, Table 2 summarizes the costs of different HFC-23 by-product control options in Argentina.

**Table 2. Costs of HFC-23 by-product control options in Argentina**

| **Option** |  **Minimum**  | **Maximum** | **Average** | **Years** |  **Total**  |
| --- | --- | --- | --- | --- | --- |
| **On-site incinerator** |
| Refurbish incinerator |   | 897,840 |
| Incineration 2019-2024 | 29,131 | 133,379 | 81,255 | 6 | 487,530 |
| Incineration 2025-2030 | 24,464 | 112,011 | 68,238 | 6 | 409,425 |
| Total on-site incinerator |   | 1,794,795 |
| **Plasma arc, Mexico** |
| Isotanks (2) |   | 460,000 |
| Incineration 2019-2024 | 224,326 | 510,535 | 367,431 | 6 | 2,204,583 |
| Incineration 2025-2030 | 188,385 | 428,738 | 308,562 | 6 | 1,851,369 |
| Total plasma arc |   | 4,515,952 |
| **Cement kiln,\* San Luis** |
| Isotanks (2) |   | 460,000 |
| Incineration 2019-2024 | 27,677 | 62,990 | 45,334 | 6 | 272,001 |
| Incineration 2025-2030 | 23,243 | 52,898 | 38,071 | 6 | 228,423 |
| Total cement kiln |   | 960,424 |
| **Rotary kiln, European Union** |
| Isotanks (2) |   | 460,000 |
| Incineration 2019-2024 | 106,797 | 277,948 | 192,373 | 6 | 1,154,235 |
| Incineration 2025-2030 | 89,687 | 233,420 | 161,554 | 6 | 969,322 |
| Total rotary kiln |   | 2,583,557 |
| **Production closure** |
| Worker compensation |   | 1,775,000 |
| Lost profits | 2,701,871 | 6,304,366 | 4,503,119 | n/a | 4,503,119 |

\* Not a technology approved by the Parties for the destruction of HFC-23.

# The Government of Argentina indicated that it would wish to select UNIDO as the implementing agency for an HFC-23 by-product control project that could be approved under the Multilateral Fund.[[15]](#footnote-15) To facilitate discussion during the meeting, the Executive Committee may wish to consider the text below as the basis for a recommendation if funding for control of HFC-23 by-product were to be approved at the present meeting:

## Approving US $[…], plus agency support costs of US $[…] for UNIDO, to enable the Government of Argentina to comply with the HFC-23 by-product control obligations under the Kigali Amendment on the understanding that:

### The Government of Argentina would ensure that, starting 1 January [2019][2020], emissions of HFC-23 by-product were destroyed to the extent practicable;

### The Government of Argentina would have flexibility to use the funding approved by the Executive Committee for any of the options for the destruction of HFC-23 by-product identified in document UNEP/OzL.Pro/ExCom/82/69;

### That UNIDO would submit independent verification reports documenting the Government of Argentina’s compliance with sub-paragraph (a)(i) of the present decision;

### That a penalty of US $[…]/kg of HFC-23 would be applied to emissions of HFC‑23 by-product that were determined not to have been destroyed to the extent practicable;

### The Government of Argentina, through UNIDO, would provide annual reports on the status of the project, including the level of disbursement, the quantity of HFC-23 by‑product generated, destroyed and emitted, at the last meeting of the year until the completion of the project;

### That the project would be completed by 1 January 2030 or upon closure of FIASA, whichever comes first;

### That UNIDO would submit the project completion report six months after project completion, and that any remaining balances after the completion of the project would be returned the Multilateral Fund;

### That any penalty applied in line with sub-paragraph (a)(iv) of the present decision would be returned to the Multilateral Fund by the Government of Argentina, through UNIDO, to the meeting following the determination that HFC-23 by-product that was generated was not destroyed to the extent practicable; and

## Requesting the Treasurer to transfer US $[…], plus agency supports costs of US $[…] for UNIDO once the Government of Argentina had submitted its instrument of ratification, acceptance or accession of the Kigali Amendment to the Headquarters of the United Nations in New York.

**Recommendation**

# The Executive Committee may wish to consider:

## Noting the report on key aspects related to HFC-23 by‑product control technologies: options related to the control of HFC-23 by-product emissions in Argentina (decision 81/68) contained in document UNEP/OzL.Pro/ExCom/82/69;

## Noting with appreciation the relevant information provided by the Government of Argentina, on a voluntary basis, that allowed the preparation of document UNEP/OzL.Pro/ExCom/82/69; and

## Considering any technical and financial assistance it wishes to provide to the Government of Argentina to allow for compliance with the HFC-23 by-product control obligations of the Kigali Amendment of the Montreal Protocol, and in light of the information contained in document UNEP/OzL.Pro/ExCom/82/69.

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1. The Basel Convention is an international treaty to reduce the movements of hazardous waste between nations, to prevent transfer of hazardous waste from developed to less developed countries (LDCs), and to minimize the amount and toxicity of wastes generated, to ensure their environmentally sound management as closely as possible to the source of generation. As of October 2018, 186 states and the European Union are parties to the Convention. [↑](#footnote-ref-1)
2. The law on hazardous waste in Argentina differs from the Basel Convention in that if a waste either falls within one of the categories of Annex I (“y categories”) or has one or more of the characteristics specified in Annex III (“h characteristics”) of the Convention, then it is considered a hazardous waste and the Government would consider that the Basel Convention obligations would apply. [↑](#footnote-ref-2)
3. Quito, Ecuador 5-9 November 2018. [↑](#footnote-ref-3)
4. The report of the meeting showing decisions numbers, has not been issued at the time of finalizing the present document. [↑](#footnote-ref-4)
5. As indicated in document UNEP/OzL.Pro/ExCom/81/54. [↑](#footnote-ref-5)
6. Under normal conditions, the consultant would rely on estimates from three independent contractors for the capital investment needed to restore FIASA’s incineration system. However, in the absence of independent contractors’ estimates, the consultant relied on FIASA’s estimated cost for the restoration of the incinerator. [↑](#footnote-ref-6)
7. As reported in document UNEP/OzL.Pro/ExCom/81/54. [↑](#footnote-ref-7)
8. The vapour pressure of HFC-23 is 681 pounds per square inch (PSI) at 25 °C, which is five times higher than that of HCFC-22. For added safety, the isotanks have a pressure rating of 2,400 PSI. [↑](#footnote-ref-8)
9. Argentina, as a party to the Basel Convention, would likely be precluded from shipping HFC-23 for destruction to the United States of America, unless the Governments were to enter into a bilateral agreement related to the treatment of hazardous waste. The consultant therefore did not estimate the costs of shipping the HFC-23 by-product for destruction via the United States of America. The difference between shipping HFC-23 to Tampico, or to Brownsville, Texas are likely to be negligible. In contrast, the costs of shipping the HFC-23 by rail from Brownsville to Monterrey are likely to be lower than the costs of transporting the HFC-23 by truck from Tampico to Monterrey. [↑](#footnote-ref-9)
10. Cost as reported by UNIDO in UNEP/OzL.Pro/ExCom/80/12. [↑](#footnote-ref-10)
11. Two methods are used to measure the stack gases, USEPA 040 for sampling and method ME-48 for chromatographic analysis. The gas chromatograph is an Agilent Technologies Model 6890. [↑](#footnote-ref-11)
12. As indicated in document UNEP/OzL.Pro/ExCom/82/21. [↑](#footnote-ref-12)
13. During the last six months, the value of the Argentina Peso relative to the US dollar, the Euro, and the Renminbi has decreased by approximately 50 per cent. [↑](#footnote-ref-13)
14. See paragraph 154 of UNEP/OzL.Pro/ExCom/79/51. [↑](#footnote-ref-14)
15. As per the letter of 14 November 2018 from the Ministry of Foreign Affairs and Worship of Argentina to the Secretariat. [↑](#footnote-ref-15)