Greening of Industry under the Montreal Protocol
Argentina’s’s perspective

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Montreal Protocol after 20 years

MP has demonstrated to be the most successful Multilateral Environmental Agreement implemented to date

- By the end of 2009, the majority of the most potent ODSs will be phased out globally

- The ozone layer has not grown thinner since 1998 over most of the world. It appears to be recovering and is expected to return to 1980 levels by 2065
There are many reasons for this success

- Developing countries have benefited from the **financial support** provided by developed countries through the Multilateral Fund (common responsibility but differentiated)

- **Institutional strengthening.** One of the outstanding accomplishments of the MLF was to create and support the work of National Ozone Units in each country (145)

- **Best available technologies** were transferred, which has not always been the case within N-S cooperation

- **Technical assistance** received from implementing agencies and international and national experts made possible smooth transfer and adaptation to new technologies
MP Situation by 2009

- Global ratification
- Mature institutions working and producing
- Success of MP makes it too, the best climate change treaty upto date
  - Reduced net GWP-weighted emissions from ODSs in 2010 by about 11 Gt CO2-eq/yr., i.e. 5-6 times the reduction target of the Kyoto Protocol
  - Delay of climate change attributable to the MP is calculated to be 7-12 years.
Ozone hole is over the south of Argentina

September 19, 2002

September 11, 2003
Argentina

- 1990: Vienna Convention for the Protection of the Ozone Layer

- 1990: Montreal Protocol on Substances that Deplete the Ozone Layer


- 1994: Country Program was approved by ExCom

- 1996: Oficina Programa Ozono (OPROZ) was created which is responsible for all tasks related to the implementation of the Country Program
Ministry of Foreign Affairs

Secretary of Industry

Secretary of Environment and Sustainable Development

Undersecretary of Sustainable Development Promotion

Oficina Programa Ozono (OPROZ)
Projects approved
144

Projects financed by MPMF

- Mobile Air Conditioning: 5
- Dom.& com. refrigeration: 24
- Foam Sector: 36
- Methyl Bromide: 5
- Halon Bank: 1
- Solvents: 3
- Aerosols: 2
- Sterilization: 1
- Closure of CFC production: 1
- National CFC Phase out Plan: 1
- Training: 4
- Technical assist.: 4
- Institutional Strengthening: 3
- Country Program: 3
- Project preparation: 41
Investment Projects implemented by OPROZ

- Individual or umbrella Industrial conversion projects in foam, refrigeration, solvents, industrial aerosols, sterilization, automobile air conditioning and MDI sectors
- National CFC phase-out in the foam sector (78 SMEs)
- National CFC Phase-out Plan in the refrigeration sector
- National ODSs Phase-out Plan for the solvent sector
- CFC Production Phase-out
- Projects for the accelerated phase out of MBr in the production of tobacco, strawberries, flower crops and protected and open field vegetables
- Demo project for the phase-out of MBr in the post-harvest treatment of citric and cotton.
Non-investment Projects implemented by OPROZ

- Licensing system for import and export of ODSs
- Technicians training in good refrigeration practices
- Training project for customs officers
- Halon Bank
- HPMP preparation
CFC Consumption in Argentina
CFC National Phase-out Plan in the refrigeration sector

- Phase out remaining consumption mainly in servicing sector: 2700 tons.
- Secure CFC supply beyond 2009 for remaining equipment
- Budget: U$ 7.4 millions
- Implementing Agency: UNIDO
- Time frame: MYA, 2003-2009
CFC NATIONAL PHASE OUT PLAN

**Activities approved earlier**

- Licensing System
- Customs officials training
- Training in Good Refrigeration Practices for technicians

**New activities approved in NPP**

- Refrigeration equipment Manufacturers (18)
- Continue training in GRP for technicians and equipment delivery
- Refrigerants R&R Plan
- End users incentive program (includes chillers retrofitting)
LICENSING SYSTEM

- Registry for importers/exporters
- Quota allocation for ODS with control measures
- License needed for each ODS import/export operation
- Mostly operated by Internet, licenses delivered in 1-3 days
- On line with Customs
- Obligation to report annually quantities sold and intended use by customer

Achievements:

- 69 companies registered
- 1781 import licenses by Dec 2008
- 1006 export licenses by Dec. 2008
- Minor illegal trade issues
- Very good data base for CP and Art. 7 reports
CUSTOMS TRAINING

- December 2004, training of 35 trainees
- 816 trained agents at 6 Customs
  Regional Directions
- 19 ODS identifiers provided
- Manual on ODS Illicit Traffic
- Training in the Licensing System
- On line training course
- Close cooperation with Customs
Training of Technicians in GRP

- 67 trainees were trained
- 18 training institutions received kits for training
- 268 Courses (2004-2008)
- In 50 cities around the country plus BA
- More than 6500 technicians trained
- 95% were certified
- Data bank for assigning R&R equipments
Technicians Training in GRP
70 deliveries in 48 cities throughout the country

 Equipments and tools were donated to 2,750 technicians

- recovery units with cylinders of 13.6 kg.: 474
- vacuum pumps: 1863
- leak detectors: 347
- digital scales: 811
- nitrogen tubes: 423
- refrigerants Identifier: 33
- Tool Kits: 2718
San Juan

Mendoza

Córdoba

Resistencia
R&R ODS Reporting System

5- Datos del Usuario:

2.- Recuperación:

Ingrese al menú de Recuperación y luego Recuperación Refrigerantes, aparecerá la siguiente pantalla para completar:

3.- Recuperado/Reciclado:

Ingrese al menú de Recuperado/Reciclado presionará la siguiente pantalla a ser completada siguiendo las instrucciones del botón 2 (Recuperación)
Information required by the MLF for services that received R&R equipment

- **Quantity of CFCs recovered:**
  - reused
  - sent to R&R Centers
  - Stored at each refrigeration service

- **Quantity of recycled or reclaimed CFCs used at the service workshop**

<table>
<thead>
<tr>
<th>Refrigerante</th>
<th>Recuperado</th>
<th>Reusado</th>
<th>Reciclado/Regenerado</th>
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<tbody>
<tr>
<td>CFC-11</td>
<td>190</td>
<td>190</td>
<td></td>
</tr>
<tr>
<td>CFC-12</td>
<td>12200</td>
<td>10900</td>
<td>195</td>
</tr>
<tr>
<td>HCFC-22</td>
<td>15200</td>
<td>14900</td>
<td>357</td>
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<tr>
<td>HFC 134</td>
<td>2210</td>
<td>2000</td>
<td>210</td>
</tr>
<tr>
<td>R-502</td>
<td>370</td>
<td></td>
<td></td>
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<tr>
<td><strong>total</strong></td>
<td><strong>30170</strong></td>
<td><strong>27990</strong></td>
<td><strong>762</strong></td>
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</table>
Recovery Equipment Audits

- Technical audit with the equipment’s manufacturer.
- If equipment not used it must be returned.
- 65 audits throughout the country.
Lessons Learned

- Logistics.
- Coordination with all stakeholders.
- Continuous follow up with the technicians.
- Public awareness.
- Diffusion activities.
Refrigerant R & R Plan

- Consultations with the private sector
- Development of business criteria
- Drafting of technical specifications
- Bid for the equipment
- Installation of 2 reclaiming and 9 recycling centers was agreed, with funds from the MLF under our NPP
- First reclaiming center began operating in June 2006, and the second one, in March 2008
- Seven recycling centers are already in operation.
Refrigerant R & R Plan

All centers received:

- Reclaiming machines for CFC12, HCF 22 and HFC134
- Cylinders and tanks
- Leak detectors
- Digital scales
- Vacuum and transfer pumps
- Equipment for cylinders cleaning
- Reclaim centers also received laboratory analytical equipment
Reclaiming Centers
Recycling Centers
End Users Sub-project

- Owners of industrial and commercial refrigeration equipment with more than 15 Kg of CFC (hotels, restaurants, ice cream shops, refrigerated transport, cold chambers, etc.)
- Survey through service shops and technicians, mainly
- Retrofitting or change of equipment
- Only 2 projects went ahead

**Problems**
- Owner didn’t want other technician to do the retrofitting
- Few technicians with expertise in retrofitting
- Lack of interest of end users, never sent papers
End Users Sub-project

- A survey of chillers was conducted
- More than 350 chillers were identified
- Technical specifications for bidding chillers retrofitting were drafted
- Enterprises at home capable of doing this retrofitting were identified and invited to quote
- Bid is undergoing now
- Target: health institutions and governmental organizations
Sources of unwanted ODS

- Contaminated refrigerants, mixtures of recovered refrigerants, for which recycling or reclaiming is not feasible.
- Estimated amount: 2.0-2.5 tones
- Storage situation: some in technicians’ workshops
- No big or governmental storage facility
- Rest: lost to the atmosphere
- Impact on ozone layer and climate change
Sources of unwanted ODS: Banks

- Domestic refrigerators
  - Government Exchange Program
  - Refrigerant recovery (1.3 tons estimated)

- Commercial refrigerators

- Air conditioning (HCFCs)

- Blowing agent in foams
Destruction of Unwanted ODS

- There was no answer to the environmentally safe disposal of these unwanted ODS

- A Plasma 2000 unit was bought from Asada Corp. in Japan, and should arrive to our country by Nov. 2009

- If unwanted ODS quantities grow it will be necessary to consider other technologies, such as cement or rotary kiln injection

- Survey of potential kilns performed, and a project of bilateral cooperation with Japan to evaluate possibility of upgrading them has been just submitted.
OPROZ received the MP Implementers Award from the Ozone Secretariat for the NPP
In 2007, on occasion of celebrating the Protocol’s 20th Anniversary, a new adjustment was approved by the Parties, which may present one of the biggest challenges experienced by the ozone community up to date:

the **accelerated HCFC phase out** that will require substantial financial, technical and human resources

Reduced net GWP-weighted emissions from HCFCs phase out will be similar to the reduction target of the 1st. period of Kyoto Protocol
Decision XIX/6 approving the HCFCs accelerated phase out asked Parties that in replacing HCFCs, the following should (also) be taken into account:

- High ODP solutions first
- Energy efficiency
- Possibilities for low GWP solutions
- Climate aspects

The main challenges of this new set of considerations are that:

- for some uses, the most effective alternative currently available (mostly HFCs) have high GWP.
- Others of low GWP are much more expensive than those with high GWP.
Argentina took a very proactive approach since the beginning of the MP striving at the same time to adopt climate friendly technologies

- LCD foam blowing was not still sufficiently mature and it took around 6 years to convert 6 plants to this technology. We were successful because there was a lot of input in human resources from each company.

- In the same way, most of the big or big to medium enterprises in the foam sector were converted to HC.

- Therefore, only SMEs were converted to HCFC technologies, for which there are only not very mature low GWP alternatives available.

- One big refrigerators manufacturer was converted to HC
HCFCs Consumption in Argentina

<table>
<thead>
<tr>
<th></th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
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<tr>
<td><strong>Total</strong></td>
<td>745,2</td>
<td>2524,6</td>
<td>2548,3</td>
<td>3415,5</td>
<td>4002,0</td>
<td>5332,0</td>
<td>5814,759</td>
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<tr>
<td>HCFC-22</td>
<td>667,9</td>
<td>2357,5</td>
<td>2163,2</td>
<td>3003,6</td>
<td>3340,6</td>
<td>4163,49</td>
<td>4820,677</td>
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<tr>
<td>HCFC-141b</td>
<td>70,6</td>
<td>156,7</td>
<td>360,8</td>
<td>297,0</td>
<td>543,4</td>
<td>904,92</td>
<td>711,13</td>
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<tr>
<td>HCFC-142b</td>
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<td>0,9</td>
<td>5,8</td>
<td>57,9</td>
<td>62,6</td>
<td>191,69</td>
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<tr>
<td>HCFC-123</td>
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<td>9,5</td>
<td>16,0</td>
<td>34,2</td>
<td>38,0</td>
<td>52,09</td>
<td>82,429</td>
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<td>HCFC-124</td>
<td>0,0</td>
<td>0,0</td>
<td>2,6</td>
<td>0,0</td>
<td>17,4</td>
<td>19,89</td>
<td>27,613</td>
</tr>
</tbody>
</table>
2008 Consumption by Sector

- **ref. service**: 52.4%
- **ref. manuf.**: 30.8%
- **foams**: 11.0%
- **fire exting.**: 4.6%
- **aerosols**: 1.2%
- **others**: 0.1%
- **sterilization**: 0.0%

The chart shows the distribution of consumption by sector for 2008.
Environmental Effects

Source: Dupont
HCFCs Challenges Ahead

- cut off date to determine eligibility
- funding 2nd. conversion of plants that had originally converted to HCFCs with MPMF support. Critical for many A5 Parties
- use of widely commercially available, economic, mature and environmentally friendly alternatives
- Incremental Operating Costs
- LVC will have to reduce consumption only through reductions in the servicing sector
- impact of economic crisis will lead to the establishment of misleading low HCFC baselines (2009-2010), making compliance after this downturn more difficult.
A very important new international scenario is now governing MP on the initiative of several Parties.

The international community has committed itself to try to maximize the benefits not only for the ozone layer but for climate change too,

this will reinforce what is worldwide recognized, i.e. the MP has been the most efficient climate change protocol up to now.
Thank you for your attention

http://medioambiente.gov.ar/ozono