



# OzonAction Special Issue

A Healthy Atmosphere: the Future We Want



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## A healthy atmosphere: the future we want

**A**s stated by the Secretary General of the United Nations, Mr. Ban Ki-Moon, “Extraordinary challenges require extraordinary responses. A generation ago, the world’s nations came together quickly and resolutely to protect the endangered Ozone Layer, initiating an inter-governmental process that blazed new trails.”

Today, the remarkable success story of the Montreal Protocol in protecting the ozone layer and contributing to climate change mitigation stands as a shining example of what the nations of the world can do to protect our common future.

In fact, the Montreal Protocol has done more than achieving its own objectives. Its success has served as an inspiration to all, and a lynch pin in the architecture of global environmental agreements. It serves as a hopeful sign that environmental treaties can work, and that this generation has both the commitment and ability to work beyond the national differences so that the future generations may inherit a healthy earth.

One key result of Rio+20 is the renewed global effort to define sustainable development goals. This is happening in a parallel track with the discussions on the post-2015 development goals under the Millennium Development Goals. Achievements of the Montreal Protocol have been an important contributor to achieving the sustainable development goal of protecting the atmosphere and will continue to play this role as the Parties move forward in phasing out HCFCs and other remaining ozone depleting substances and, at the same time, endeavour to pursue co-benefits for climate by employing energy efficient technologies and avoiding the use of alternatives with high global warming potential (GWP).

The phase out of the HCFCs is both a challenge as much as an opportunity. In this regard the Parties to the Montreal Protocol and its institutions are working together to get rid of HCFCs while avoiding the use of high global warming substitutes and promoting high energy efficient technologies.

The parties are also considering other options to protect the global climate system. Ambitious proposals to address the production and use of high global – warming potential HFCs have been considered by the Parties since 2009.

Some important recent developments include the agreement between the Presidents of China and the USA to work together and with other countries to phase down the consumption of rapidly growing HFCs and to do so by using the expertise and institutions of the Montreal Protocol as one of the vehicles. And building upon that bilateral agreement the Group of the largest 20 economies of the world, expressed their support for initiatives under the Montreal Protocol that are complementary to efforts under the UN Framework Convention on Climate Change (UNFCCC).

Such developments are being heard loud and clear by the market, which is responding by increasing efforts to develop and commercialize suitable alternatives. These developments are also inspiring a renewed sense of optimism about climate solutions.

The above provides a political backdrop for what the Parties are likely to discuss at the coming MOP;

A decision will need to be taken on the study to assess a threshold of the level of funds required for the next replenishment of the Multilateral Fund. Various scenarios of remaining ODS phase-out activities will be considered, current proposal includes consideration of HFC phase down.

The Parties will likely discuss issues related to additional funding for maximizing climate benefits under the Montreal Protocol.

And the Parties will likely address the many policy, technical and financial issues related to the management of HFCs under the Montreal Protocol in a contact group this year and continue in the meetings of next year.

All these issues taken together would set the stage for some important ozone and climate benefits for a “Healthy Atmosphere, the Future We Want”.

**Marco Gonzalez** has served the Ozone Secretariat as its Executive Secretary since 2002.

**I**t is widely acknowledged that the Montreal Protocol on Substances that Deplete the Ozone Layer is the most successful international environmental treaty in history. Such recognition is accompanied by high expectations and confidence that the Protocol can effortlessly solve the problem of depletion of the ozone layer and play a significant role in global efforts to mitigate climate change. While the Montreal Protocol family shares these ambitions, they are accompanied by challenges. The ozone layer remains vulnerable and the window of opportunity to mitigate climate change, through activities under the Protocol is shrinking.

The Montreal Protocol is now 26 years old and all countries of the world are committed to its control measures for ozone depleting substances (ODS). These commitments by national governments along with strong Montreal Protocol institutions, effective implementing agencies, regional networks, and national ozone officers have ensured the success of the Montreal Protocol. The Multilateral Fund (MLF) and its implementing agencies have empowered Article 5 (A5) countries with over US\$3 billion dollars' worth of financial assistance from contributing Parties and A5 countries have effectively and efficiently used this support to eliminate production and consumption of CFCs, halons, CTC and other ODS with the exception of small amounts for essential uses. Despite the global economic situation and difficulties with their domestic economies, contributing countries have continued to pledge their support for the MLF. However in the coming years there will be increasing need for the Executive Committee of the MLF to maximize even further the use of limited financial resources.

The passing this year of Joe Farman, the scientist whose discovery of the ozone hole led to the Montreal Protocol, serves as a reminder of the scientific research that underpins the Protocol and that financing such research must continue in spite of economic challenges. It also underlines the fact that *protecting our atmosphere for generations to come* is not a task for a single generation alone. As the batons of leadership are passed from one generation to the next we must ensure that the knowledge, experience and Montreal Protocol memory is passed to the next generation of the ozone family.

The vast majority of countries are in compliance with the Protocol's control measures but we should not forget that the ozone layer still remains vulnerable due to the

4 **Maria Nolan** served as Chief Officer of the Multilateral Fund Secretariat from February 2004 to September 2013



## Challenges, change and solutions: the Montreal Protocol's future

long lifetime of ODS. The Montreal Protocol is working and must continue to work if A5 countries are to meet the challenge of phasing out methyl bromide by 2015 and HCFCs by 2030. With regard to HCFC phase-out, A5 countries with a manufacturing industry are focusing mainly on the foam sector and to conversion of air-conditioning manufacturing enterprises in order to meet, as a minimum, the 2013 HCFC freeze and the 10 per cent reduction step in 2015. Despite the fact that, in technology terms, one size does not fit all, there are a good number of alternative foam technologies available. A5 countries that are using HCFCs only for the servicing of refrigeration and air-conditioning systems are implementing activities in this area to achieve the 2013, 2015 and in many cases the 2020 HCFC control measures. HCFC phase-out activities in the refrigeration and air-conditioning servicing sector are also under implementation in several A5 countries with manufacturing sectors. The next step will be to address the significant challenges in the refrigeration and air-conditioning manufacturing sectors where the chief replacements for HCFCs are HFCs. Given the growing demand in A5 countries for refrigeration and air-conditioning it will be important to further develop and optimize low-GWP (greenhouse warming potential) technologies for these applications and to provide A5 countries with guidance on the viability, reliability and costs of ozone /climate friendly alternatives.

In 2009 United Nations Secretary-General Kofi Annan called the Montreal Protocol "perhaps the single most successful international agreement to date". That statement is still true today and I believe it will be true in 2030 when, other than a small service tail, the phase-out of HCFCs will have been achieved.



## “Putting a Face” to ozone layer protection!

**T**he Montreal Protocol is widely regarded as one of the most effective international environmental treaties ever. Secretary-General Ban Ki-moon has stated that ‘tackling climate change is one of the top priorities for the UN system and the story of the Montreal Protocol highlights the benefits of pursuing an inclusive green economy’.

Any effective international agreement needs to recognize the special needs of developing countries. In the Montreal Protocol, this has taken the form of the provision of financial assistance, technology transfer and developing countries being full partners in the decision-making procedures.

Under the Multilateral Fund of the Montreal Protocol, a special dedicated resource is available to help Article 5 countries to meet their obligations: the UNEP Compliance Assistance Programme (CAP), which is currently working with 148 such countries.

In 2002, UNEP strategically reoriented its approaches and delivery mechanisms by creating a unique CAP to help developing countries better cope with demands of the Protocol’s compliance period. The majority of CAP staff is located in UNEP’s Regional Offices, where they closely interact with countries on a day to day basis to support and sustain compliance. This regional delivery mechanism is a distinct feature of the OzonAction Programme.

The CAP provides a country-specific special compliance services, operates 9 Regional/Sub-Regional Networks of Ozone Officers, facilitates South-South cooperation, assists with regional awareness activities, and provides a global Information Clearinghouse that serves National Ozone Units (NOUs) through information, communication, education, electronic knowledge management and capacity building activities.

**Shamila Nair-Bedouelle**  
Head of OzonAction Branch, UNEP

For the next three years, CAP will enhance the countries’ capacities for implementing new HCFC phase-out responsibilities. UNEP is assisting 99 countries to implement HCFC Phase-out Management Plans (HPMPs), with a focus on establishing accurate and comprehensive baseline data, and creating awareness about technology options and co-benefits with climate.

Curbing the rising production and use of HCFCs is one of the last remaining challenges to protect the ozone layer. The Protocol has adopted an ambitious schedule for accelerated phase out of HCFCs, taking into account linkages and synergies with climate change mitigation.

The HCFC phase-out presents issues and challenges for technology selection and policy responses that are different from the earlier CFC phase-out. These include the choice of alternatives, energy efficiency considerations, climate change concerns, destruction and disposal, and policy and enforcement issues.

Alternative technologies are evolving rapidly and are extremely dynamic. NOUs and industry in Article 5 country need up-to-date and unbiased information in order to make sound policy decisions and technology choices. HPMPs provide countries an opportunity to make the right technology choices of non-HCFC, low-GWP refrigerants and embrace energy efficiency.

Energy efficiency standards, integrated with the standards for non-HCFC, low-GWP refrigerants, has can deliver multiple benefits.

Take, for example, integrated planning of green buildings. Good building design and relevant policy measures can help reduce both indirect emissions (through energy efficiency gains) and direct emissions (by use of low-GWP refrigerants). Linking building regulations with the national HPMPs is worth pursuing.

UNEP is an instrument of international cooperation. It is our task to show that, by helping collaboration and dialogue to thrive, environmental sustainability can thrive too. Within the dynamics of climate change, we should maximize the importance of the ozone as a common denominator value.

Just as important, we need to relate all our work to people whose health, livelihoods and prosperity we are trying to safeguard. I grew up in South Africa and still remember how Nelson Mandela once addressed us in the Academy of Science in the early 1990s. He urged us all to “put a face to science!”

Can we ‘put a face’ to ozone layer protection?



## The road to Montreal Protocol and beyond

**T**his may be my last article in my capacity as Director of the Montreal Protocol programme of UNDP, before I retire in January 2014. I was thrilled with the opportunity to leave some thoughts, maybe a message or even some advice to those who will continue helping countries fulfill their commitments with the Protocol and who have the responsibility to make decisions that may change the world as we know it.

My journey to protect the ozone layer started 25 years ago. Initially, I was a member of the Brazilian delegation, then a TEAP co-chair and later I joined the UNDP team. The Montreal Protocol has been for all those years widely known as the international treaty to be the example to follow. Ingredients of such huge success which we have heard about many times were: the right dose of diplomacy, the sound scientific, technical and economics advice from the assessment panels, the critical industry partnerships, the dedicated financial mechanism, the Multilateral Fund (MLF) and its bodies, which include the implementing agencies and the National Ozone Units.

During all those years, those passionate about the cause, like I have always been, said that we also needed a leap of faith! From ancient times when philosophers defined knowledge as “justified true belief”, it was clear that it was important to understand what was needed in order for us to have knowledge! And then a leap!

The success of the Protocol was rooted in its community of knowledge pursuing a common goal - a healthy atmosphere for generations to come.

I am proud to have contributed to the Protocol's success. It is clear to me that the search for knowledge brought the answers to the many technology and policy related questions from developing countries.

Agencies know the importance of environmentally friendly solutions that respond to questions on the ground and which are safe and affordable.

With the purpose of finding the knowledge on the ground, UNDP initiated HCFCs surveys funded by the MLF, which were very important to pave the road to the 2007 Adjustment of the Montreal Protocol, as the results of the surveys brought more clarity to developing countries so informed decisions could be taken.

We are currently facing questions about HFCs controls, which are similar to the ones faced in the beginning of the Montreal Protocol, with CFCs and later with HCFCs. Together with partners of the Climate and Clean Air Coalition, UNDP is helping with HFC surveys, so countries understand their market and on the ground needs. Knowledge is the first step to overcoming barriers in the adoption of national and international control measures. Knowledge is belief!

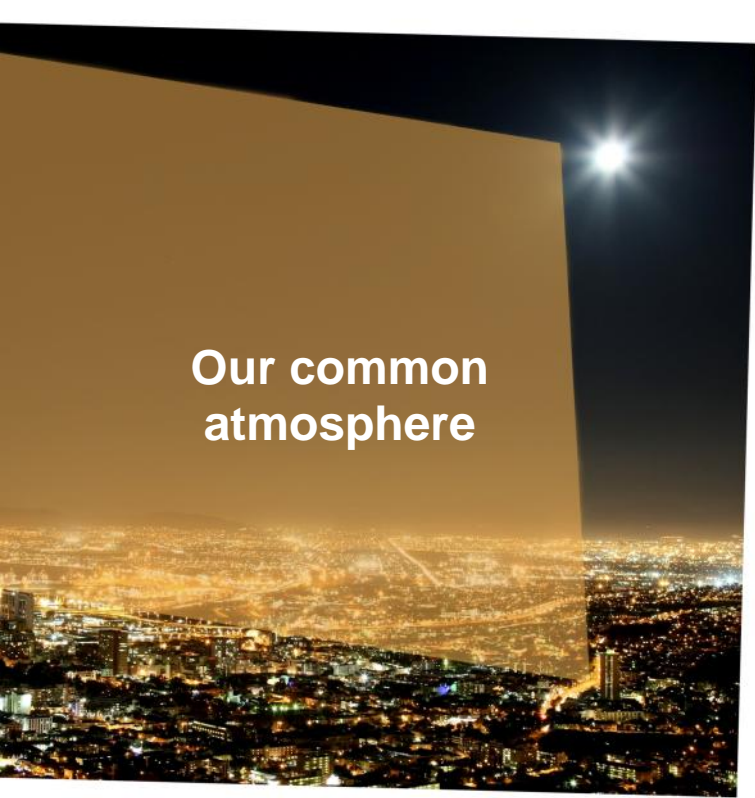
We cannot shy away from accepting that the implementation of the Montreal Protocol has to embrace solutions that also benefit the climate regime. After all, there is no time to waste, climate change is here. It has left us very little to do but adapt, or gain some time if we tackle the short-lived atmospheric pollutants, such as HFCs.

I have found during my 25 years working with the Montreal Protocol family that it is very complicated to leave our comfort zone, because the Protocol and its financial mechanism (MLF) are very focused on ozone layer protection. Being so focused, and result oriented has been one of the reasons of our success, no doubt about it! Nevertheless we cannot let our success be our failure when we talk about protecting the Earth against climate change.

Our local and global actions were very successful to safeguard the ozone layer. A leap of trust is now needed. Let's for a moment have the “suspension of suspicion” and join forces to bring the climate benefits of our MP interventions at project and policy levels.

When I think of the many years and the multitude of wonderful colleagues and friends this road has brought me, I smile. It has been a wonderful road, sometimes bumpy but always one where I found the ride was for a common good and worth taking.

**Suely Machado Carvalho** is  
Director Montreal Protocol Unit/  
Chemicals at UNDP



## Our common atmosphere

**T**wenty six years ago, a treaty to protect the ozone layer became a reality, against all odds. It was a tremendous challenge to phase out chemicals that were regarded as useful to our daily comfort. Strong commitments by diverse stakeholders - industrialists, researchers, politicians and activists - helped start the long journey to protect the ozone layer. It isn't over yet.

Coming from a developing country with many priorities, I embarked on trying to convince our decision makers that protecting stratospheric ozone was a globally shared responsibility. This was my first opportunity to contribute to solving a global challenge. A few years later, I joined UNIDO and pursued that goal under the leadership of Dr. Archalus Tcheknavorian-Asenbauer. She was an inspiring manager to build a programme in assisting developing countries in complying with Montreal Protocol obligations. I am proud to have been on her team and now continue that journey.

The statue of Goddess Nua, recently erected in the Vienna International Centre, is a symbol of our common efforts to protect ozone. Much has been achieved already, but more remains to be done to ensure the ozone layer's recovery.

More recent amendments to the Montreal Protocol seek to phase out transitional substances such as HCFCs. We now realize that HFCs, which have no impact on the ozone layer, have a high Global Warming Potential and should thus be avoided.

Although at UNIDO we have to remain technology neutral, we consider it our duty to alert our partners in the developing world on the availability of natural substances coming into the market. Our technology summit in Vienna in early June was testimony to our commitment to promote technologies that are both ozone and climate friendly.

UNIDO has also recently called upon top experts to look at the essential use exemptions in Methyl Bromide for quarantine and pre-shipment uses. It is clear that most such applications can be replaced with a non-ozone depleting substance. Our next step will be to disseminate such findings to a wider audience to catch the attention of decision makers.


There is also the worrying issue of ODS banks in developing countries. If these gases are released to the atmosphere, it can negate all our efforts to date. We have shown in selected countries how this matter can be

**Protecting ozone  
is linked  
to mitigating climate  
change and regulating  
hazardous chemicals.  
We are all  
in this together.**

tackled. Let us hope that the international community will soon come up with a global solution.

As years pass, we realize how all global environmental issues are interlinked. This calls for a common approach. Ozone layer protection cannot be separated from mitigating climate change, or regulating hazardous chemicals such as POPs. The synergies will need to be consolidated to ensure a healthy atmosphere and safe planet.

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## CCAC: working on short lived climate pollutants

**S**hort-lived climate pollutants (SLCPs) are gases or particles that have a relatively short lifetime in the atmosphere - from a few days to a few decades - which are responsible for a substantial fraction of global warming and can be dangerous air pollutants, with various detrimental impacts on human health, agriculture and ecosystems.

The main short lived climate pollutants are black carbon, methane and tropospheric ozone. These are the most important contributors to global warming after CO<sub>2</sub>.

Many hydrofluorocarbons (HFCs) also fall into this category. HFCs are ozone safe but have a high global warming potential. They are currently used as ozone-friendly alternatives for ozone-depleting substances which being phased out under the Montreal Protocol.

While the volume of HFCs in the atmosphere right now is small, their contribution to climate forcing is projected to rise as these gases are increasingly used in air conditioning, refrigeration, foam blowing, fire fighting, solvents and aerosols as a result of their adoption as ozone-friendly alternatives in these sectors.

By taking action to curb this growth of HFC use, significant global warming can be avoided.

The Climate and Clean Air Coalition to Reduce Short-Lived Climate Pollutants (CCAC) is a partnership of governments, intergovernmental organizations, the private sector, the environmental community and others. The voluntary Coalition is the first global effort to treat SLCPs as a collective challenge. It provides a platform to catalyze concrete and substantial efforts to reduce SLCPs in ways that protect the environment and

public health, promote food and energy security, and address near term climate change.

CCAC partners are working to significantly reduce projected growth of high-GWP HFCs by mobilizing the private sector, civil society, international organizations, and governments to promote development, commercialization, and adoption of climate-friendly alternatives and overcome barriers to technology deployment. The Coalition's work is focusing on:

- **Conduction of national HFCs inventories** to help countries understand current use patterns for HFCs, projected future use patterns, and opportunities to avoid the use of high-GWP HFCs.
- **Organization of private sector and policymaker roundtables** to share lessons on the design and implementation of phase down policies, and policy options to avoid future growth.
- **Dissemination of information** on climate-friendly alternatives to high-GWP HFCs to government and private sector entities that play a role in technology development, promotion, or purchasing.
- **Conduction of Technology Demonstrations** to test and validate technologies that are or will be commercially viable options to the use of high-GWP HFCs.

In a first phase of activity, the Coalition has focused its efforts on capacity building to enable countries and civil society to address HFCs. The CCAC co-sponsored two large technical conferences and technology exhibitions with 300-400 participants that showcased alternative technologies in the refrigeration, air conditioning and foams sectors. The Coalition also hosted a commercial refrigeration technology forum on climate-friendly alternatives for 150 people, and is completing case studies on alternative technologies in this sector. In addition, six forward-looking inventories are underway in Bangladesh, Colombia, Chile, Ghana, Nigeria, and Indonesia, and this work is connecting to policy opportunities.

In September 2013 in Oslo, Ministers and high level representatives of CCAC Partner countries engaged to adopt domestic approaches to encourage climate-friendly HFC alternative technologies and work toward a phase-down in the production and consumption of HFCs under the Montreal Protocol. They will also work with international standards organizations to revise their standards to include climate-friendly HFC alternative. More information from: <http://www.unep.org/ccac>





## Protecting ozone: the Swedish contribution

**P**rotecting the stratospheric ozone layer is an inspiring example of humanity acting locally and cooperating globally.

Historically, the problem of ozone layer depletion became a concern in the 1970s when the major role played by chlorofluorocarbons (CFC) was established. Concern led to action whereby Sweden along with United States, Canada and Norway banned the use of CFCs in aerosol applications. Aerosol applications accounted for virtually half of the consumption of CFCs at that time. Sweden's prohibition on the manufacture and import of aerosols with CFCs became effective on 1 July 1979.

**A continued partnership for meeting future ozone and climate challenges is possible due to the foundations laid by the Montreal Protocol's 25 years of work.**

Despite the ban imposed on aerosols, global CFC consumption had continued to increase and was greater in 1986 than it was 10 years earlier. The major growth areas were the refrigeration, foam manufacturing, and the solvent sectors.

On 16 September 1987, the Montreal Protocol (MP) was signed whereby a 50% reduction of CFCs by 1998 was agreed to by 25 signatories, including Sweden.

The discovery of the ozone hole over the Antarctic in the mid 1980s showed that the problem was more acute than what earlier studies indicated. Even worse, despite the ban

Since the signing of the Protocol, additional ozone depleting substances (ODS) have been added through several amendments.

Sweden not only ratified the MP but pioneered by an ambitious CFC phase-out programme for the domestic CFC market. A Proposal (1987/88:85) was adopted by the Swedish Parliament in May 1988 and an Ordinance (1988:716) was subsequently issued legislating a phase-out of ODS. The Ordinance came into force on 1 January 1989 mandating a 50% reduction of CFCs by 1 January 1991 and a complete phase-out in all applications by 1 January 1995. The plan went well beyond the targets laid down in the MP and also laid the basis for a proactive role for Sweden that continues to pay dividend for ozone protection and also climate mitigation.

Successful protection of the ozone layer has been achieved by a dedicated cooperation through the overarching Vienna Convention and the Montreal Protocol. The strategy is based on application of the precautionary principle, pioneering domestic regulation and phase-out, and a global "start and strengthen" modus operandi to enhance existing measures.

Today, virtually all the major ODS are regulated. Success of the Protocol's work is upheld by four fundamental pillars: sound and independent scientific, technical and economic advice; binding decisions on phasing-out controlled substances on the basis of consensus; a dedicated multilateral fund, with equal representation of the developed and developing countries that finances phase-out in the developing countries; and an effective monitoring of the implementation of decisions with a unique possibility of economic sanctions for non-compliance.

Given the experience Parties have gained in their work on protecting the ozone layer for over 25 years, we can say that genuine trust has been established for continued partnership. This provides good ground for optimism to meet future challenges...

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## Arctic ozone depletion

The ozone hole over the South Pole, or more correctly the Antarctic ozone hole, is a well known phenomenon due its recurrent nature and the large degree of ozone loss. Shortly after the discovery of the Antarctic ozone hole in 1985 the scientists started to ask themselves if similar ozone loss could also happen in the north polar region. American scientists, led by NASA arranged an airborne campaign during the winter of 1988-89. They did not observe large-scale ozone as was found in the Antarctic, but, they did reveal that the same photochemical processes associated with so-called polar stratospheric clouds produced large amounts of reactive chlorine compounds with the potential to destroy ozone.

During the 1990s and the 2000s several measurement campaigns were conducted in the Arctic both by European and other scientists. During some winters it was found that quite substantial ozone loss occurred, although not to the same extent as observed in Antarctica. So why does extensive winter/spring ozone loss occur in the polar regions and not elsewhere? The answer to this lies in the meteorological conditions in the stratosphere, which are different near the poles as compared to other regions of the Earth. During the winter the polar stratosphere (both in the north and in the south) gets isolated from the surrounding air masses and as the sun disappears temperatures cool down. Over the Arctic, stratospheric temperatures can drop below  $-80^{\circ}\text{C}$  and over Antarctica it is not uncommon that stratospheric temperatures drop below  $-90^{\circ}\text{C}$ . The figure above shows how low temperatures in the stratosphere give rise to ozone depletion in the polar regions.

During the 1990s and the 2000s there were some winters that suffered substantial ozone loss with average column ozone loss ranging from a few percent up to 30%. Then, suddenly, in 2011, one observed Arctic ozone loss that surpassed anything one had seen before, and by the end of March the ozone column loss reached 38%.

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The upper panel shows how ozone destruction happens when there are no clouds present. This kind of ozone destructions takes place to a certain but rather small extent all over the world, in particular quite high up in the stratosphere, around 40 km. The lower panel shows what happens in the polar regions where stratospheric temperatures drop during winter. Despite the fact that the stratosphere is very dry and usually cloud free, clouds can form if it gets cold enough, i.e.  $-78^{\circ}\text{C}$  or colder. Chemical reactions take place on the cloud particles and these reactions speed up ozone loss. Illustration: Finn Bjørklid, Norwegian Institute for Air Research.

The worst ever observed before that was 30% in March of 1996. A discussion arose among scientists whether this should be called an “Arctic ozone hole”. The question is rather semantic and it depends on how one defines an “ozone hole”. The fact is that the degree of Arctic ozone loss in 2011 was unprecedented and moved the “worst ever observed” column ozone loss from 30 to 38% over the Arctic region. The degree of ozone loss was similar to that observed in Antarctica at the beginning of the ozone hole era in the early 1980s, but not as severe as one typically has observed in Antarctica in recent years. However, the large degree of ozone loss observed in the Arctic in 2011 shows that the atmosphere is still vulnerable and prone to attack from the ozone depleting gases. The large ozone loss in 2011 was due to low temperatures in the stratosphere that persisted over an extended period of time. The temperatures were not record cold, but cold enough to cause formation of polar stratospheric clouds, and the time period that suffered such low temperatures was unusually long and persisted into the spring when the sun came back after the polar night.

The next two winters after 2011, the winters of 2011-12 and 2012-13, experienced more moderate total ozone column loss, 14% and 18%, respectively. If one considers the time period from 1993 to 2013, the average springtime Arctic ozone loss has been 18%. As long as the concentrations of chlorine and bromine remain large in the atmosphere, there is a risk that one might experience winters with large-scale ozone destruction also in the future. The degree of ozone loss will depend on the meteorological conditions in the stratosphere. A long and cold winter, with stratospheric temperatures dropping below  $-78^{\circ}\text{C}$ , will cause extensive ozone loss whereas a mild winter will give rise to only modest or nearly no ozone loss.

**T**hat melanoma skin cancer goes up as stratospheric ozone depletes has been known for many years. When estimating the human cost of melanoma, experts typically look at the world age standardised incident rates across the globe. Those with white skins are more susceptible to melanoma, particularly in Australia and New Zealand.

However, this only tells part of the story. We are now seeing that the rate of melanoma increase across many countries is significantly greater than in Australia.

In Australia, melanoma rates have been relatively stable, and are even decreasing in younger age groups. However, in the United Kingdom, Iceland, Netherlands and many other European countries, the rates of melanoma over the last 10 years have been increasing at an alarming rate, some as much as 5% per year.

There has also been no significant improvement in sun protective behavioural in the UK and the United States over the last decade. Therefore, it is likely that significant human and financial burden of melanoma will not decrease in these countries in the near future. Contrast this with Australia, which has recorded a marked reduction in sunburn rates and public preference for tanning. This is largely due to over three decades of sun protection campaigns.

There are three key reasons why we see melanoma rates increasing in most countries: fashion trends, a large indoor tanning industry, and increasing media attention given to possible health benefits of vitamin D which is generated largely from UV exposure.



**Preventing skin cancer:  
no time to relax!**

To combat this, more effort is needed to ensure that people are aware of the risks associated with UV exposure and the importance of sun protection. They also need to better understand what activities cause sunburn and how.

**Skin cancer risk from a depleted ozone layer remains a public health concern for everyone on the planet.**

In Australia and the UK, data shows that most people actually get sunburnt doing activities that are home based or when they are just 'out and about' engaged in gardening, exercising or other chores. Yet the popular perception is about being sunburnt primarily during water based activities, such as at the beach.

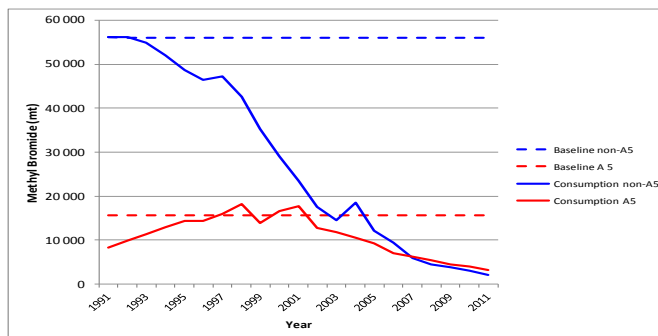
Thus, skin cancer prevention campaigns need to stress the importance of sun protection to include all outdoor activity when UV levels are greater than 3.

Given the rising burden of skin cancer, we simply cannot relax our efforts in promoting sun protection. In fact, we need a long term and sustainable commitment to skin cancer prevention, particularly by government funding bodies to ensure that we can arrest the rapidly rising rates of melanoma across many countries worldwide.

**Craig Sinclair** is  
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# Methyl bromide: counting down to 2015

Fig 1. Global MB consumption trends and baselines 1993 - 2011



Source: Ozone Secretariat Database, 2013

**M**ethyl bromide (MB) was used extensively for several decades, mainly as a pre-plant soil fumigant but also to treat agro products in storage, structures, museum artifacts and others.

In 1992 MB was found to be a potent ozone depleting substance, and soon became controlled under the Montreal Protocol (except for quarantine and pre-shipment uses,

**Methyl bromide has long been farmers' friend. But as an ODS, its days are now numbered. We have to let it go.**

(QPS). Since then, MB has been through a series of reduction steps, which were different for developed (non-Article 5) and developing (Article 5) Parties.

### What has been achieved – and how

Non-A5 Parties phased out controlled uses of MB in 2005 with a provision for critical uses. Out of more than 115 critical use nominations submitted for 2005, only three remain in the pipeline at present; for 2013, an amount of MB which is less than 1% of the baseline (reported consumption for 1991) was approved.

As the 2015 deadline for phasing-out MB in A5 Parties approaches, very significant progress has been made in achieving this milestone. In 2011, the total consumption for A5 parties represented 20% of the baseline (average consumption 1995-1998) (Fig. 1).

Of the 25 A5 Parties reporting MB consumption in 2011, nine were above 100mt and accounted for 91% of total A5 consumption. Latin America has phased out 65% of its regional baseline, Africa 92% and Asia 86%. Eastern Europe phased out entirely in 2008.

Phase-out has been achieved to a great extent through projects funded by the Multilateral Fund of the Montreal Protocol, about 80% of which were implemented by UNIDO. Several large consumers of the past (in the 500mt range) have phased-out completely in the last five years (Brazil, Turkey and Lebanon) while others - China and Mexico - have made great strides in reducing MB use.



Grafting tomato plants in Mexico

### The added benefits

Replacing MB posed many challenges, but it also brought by interesting and significant benefits. It soon became clear that there is no single, in-kind replacement for MB: an integrated approach combining different measures - chemical and non-chemical - was agreed as the best option.

Thus, environmentally-friendly production techniques such as grafting (for cucurbits, tomatoes, eggplants and others) and biosolarization (a combination of biofumigation and solarization) have been introduced to producers around the world, with great results.

Scouting for pests and diseases - to determine when a threshold that requires treatment with chemicals is reached - has inspired more rational use of pesticides and decreased fumigation needs including during the post-harvest phase. Production in substrates is often leading to improve quality and higher yields. Fertilization and watering needs are reduced by incorporating organic matter and controlling more closely.

The above has often helped growers from developing countries to comply with stringent production and quality requirements of importing markets, such as using fewer chemicals, preserving natural resources, and in general, observing environment-friendly practices. It has also developed working opportunities - in many instances for women - and enhanced training and technical expertise amongst growers.

#### Remaining challenges and pending issues

As 2015 approaches, some challenges remain. Producing certified, healthy plant materials for propagation purposes is often difficult as they have little tolerance for diseases. Training requirements are more stringent. And availability, cost and maintenance of some alternatives can be restricted or costly.



Strawberry runner production in substrates in Morocco

In recent years, QPS uses of MB show an increasing trend in some A5 countries. Although there are various reasons for this, some Parties have expressed concern that MB imported for these exempted uses could end up being used instead for controlled uses.

The Methyl bromide Technical Options Committee (MBTOC) has found viable alternatives for many QPS uses. Parties should seriously consider these.



Roses produced in substrates in Kenya



Biosolarization in Ecuador

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In 1997, the Parties to the Montreal Protocol established a licensing system for the import and export of new, used, recycled and reclaimed ozone depleting substances (ODS) and ODS-containing mixtures. This was primarily implemented in order to combat the significant illegal trade in these chemicals which emerged in the early 1990s.

While a licensing system on its own is not sufficient to eliminate ODS smuggling, it provides an essential foundation, giving the national authorities a means to take stock of legitimate ODS traders, to allocate import and export permits among the authorised traders and to eliminate unauthorised trade, whether intentional or unintentional. Vigilant and well informed enforcement officers and timely communication with trading partner countries is also crucial.

Some multilateral environmental agreements with trade-related obligations - such as the Basel Convention ([www.basel.int](http://www.basel.int)) and Rotterdam Convention ([www.pic.int](http://www.pic.int)) - have established a formal and mandatory system of "prior-informed consent" to monitor and control trade. The Montreal Protocol did not follow this route. However, many National Ozone Units recognised the usefulness of such an initiative and UNEP developed a similar but informal system for ODS trade - the "informal prior-informed consent" mechanism, or iPIC.

iPIC is a voluntary and informal mechanism of information exchange on intended trade between countries in ODS, mixtures, products and equipment. In practice, applying the iPIC procedure entails firstly sharing details of eligible importers and exporters with other iPIC members. Then, before issuing a trade licence (import or export), the relevant authority requests the iPIC focal points of their trade partner country to confirm that they agree to the intended trade. The import/export licence is then issued accordingly.

This informal system has proved to be valuable in facilitating and expediting information exchange and can also assist in forging links between responsible staff in importing and exporting countries. Since its inception, iPIC has helped clarify the status of hundreds of suspicious or uncertain shipments of ODS, and has been responsible for preventing numerous illegal or unauthorized shipments.



## iPIC - Timely communication to prevent illegal and unwanted trade

For example last year, of the 138 cases reported through iPIC, over 30% were rejected. This prevented trade in almost 1000 metric tonnes of ODS, including CFCs, HCFCs and carbon tetrachloride. Furthermore, participation in iPIC also assists countries in the effective enforcement of their own national licensing systems, for example, by identifying trading companies that are unaware of existing obligations or are acting unscrupulously.

### Timely, voluntary and informal exchange of information helps check illegal trade in ODS.

Currently there are 89 members of iPIC, which includes major producing/exporting countries such as China and those in the European Union. iPIC has been recognised by the Parties of the Montreal Protocol as a tool to help combat illegal trade in ODS and provide information on potential imports of controlled substances. Specific countries have been encouraged to participate in the iPIC process to help overcome the difficulties of being new members of the Protocol.

Earlier this year, iPIC online was launched to make it easier and more secure for participating countries to use as well as also significantly accelerating the screening and cross-checking process. All countries, both developed and developing, which are not already members of iPIC are strongly encouraged to join and reap its benefits.

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## CFC lessons for HCFC phase-out in Africa

The French-speaking African countries comprise Algeria, Benin, Burkina Faso, Burundi, Cameroon, Cap Verde, Central African Republic, Chad, Comoros, Congo, Congo (Democratic Republic of), Cote d'Ivoire, Djibouti, Equatorial Guinea, Gabon, Guinea, Guinea Bissau, Madagascar, Mali, Mauritania, Morocco, Niger, Sao Tome and Principe, Senegal, Togo, Tunisia.

Africa joined the rest of the world in sustained efforts to eliminate CFC use. Now it faces the twin challenges of managing and phasing out HCFCs, and finding viable alternatives that are both ozone and climate-friendly.

All African countries are in compliance with Montreal Protocol. Some eliminated CFC use well ahead of the deadline, which shows political will and implementation capability. However, they must now maintain the momentum and involve governments in taking decisions for phasing out HCFCs and promoting equipment containing alternatives.

**Getting rid of CFC entailed concerted efforts. Those generic lessons can now be applied to phasing out HCFC.**

The main lessons learned from the elimination of CFCs in Africa are as follows:

- A strong commitment of the CAP team for training Customs Officers by demonstrating the use of refrigerant identifiers to check the quality of refrigerants that are being imported/exported in order to control illegal importation/exportation of refrigerants and control the quality of refrigerants being imported/exported.

- Similarly, training refrigeration technicians by demonstrating how to retrofit refrigerators, by replacing ODS-based equipment with transitional refrigerants such as HCFCs, or alternative substances.
- The use of hydrocarbons such as alternatives to CFCs in the domestic refrigeration sector.
- The proliferation of poor quality of refrigerants due to the high price of these refrigerants.

The phase-out of HCFCs in Africa is now underway but it faces some challenges. For many countries, there is some continuity between the elimination of CFCs and that of the HCFCs; they are indeed tempted to systematically replace R-22 by a hydrocarbon. This is potentially risky because the contexts are very different and this kind of practice must be done with special precautions and in the framework of an appropriate legislation.

This is why the CAP decided to bring much more assistance to countries to help them not only make the right choice of technology and alternatives to use in place of the HCFCs, but also to better manage the quantity of HCFCs already in circulation.



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## Balancing compliance with economic growth

**T**he Regional Network of ODS Officers for English-speaking African countries comprises 28 countries, all of them Article 5, i.e. Angola, Botswana, Egypt, Eritrea, Ethiopia, Gambia, Ghana, Kenya, Lesotho, Liberia, Libya, Malawi, Mauritius, Mozambique, Namibia, Nigeria, Rwanda, Seychelles, Sierra Leone, Somalia, South Africa, South Sudan, Sudan, Swaziland, Uganda, Tanzania, Zambia, Zimbabwe.

**As Africa accelerates economic growth, countries face the challenge of balancing development with ozone and climate protection.**

The network provides a regular forum aimed at strengthening and improving the capacities of the National Ozone Officers (NOOs) in the implementation of the Montreal Protocol activities; helping NOOs share experiences, challenges and opportunities that exist; and identify other needs of NOOs such as training and networking. Currently, all countries in the region are in compliance with the Montreal Protocol.

Africa is ranked as the second fastest growing region over the past decade. Due to the expansion of infrastructure development, the region is experiencing increased demand for RAC services. To maintain the Montreal Protocol phase-out momentum and in readiness for future phase-out obligations, capacity building for customs and other law enforcement officers has been one of the major activities in the region.

This helps ensure that border control is effective and ODS control measures are enforced and monitored adequately.

One challenge in the region is increased cases of illegal trade of ODS refrigerants, especially cases of mixed, mislabeled and fake refrigerants. UNEP Regional Office for Africa (ROA) Compliance Assistance Programme (CAP) is working with national authorities and relevant regional and international partners to put in place appropriate measures to curb this problem.

Implementation of HCFC Phase-out Management Plans (HPMPs) in the Region commenced in readiness for the coming HCFC reduction targets. Most countries have established HCFC licensing and quota systems to ensure controlled consumption of HCFCs.

Technology options are still a major challenge in implementing HPMPs. The region faces a lack of HCFCs alternative technologies that are sustainable and environment-friendly but at the same time realistic, cost-effective and safe. In most countries, there are no safety standards for handling of refrigerants. To bridge this gap, UNEP ROA CAP has been conducting good refrigeration practices training programmes aimed at building the capacities of servicing technicians.



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**S**ince 1997, the regional ozone network in West Asia has been striving to enhance, strengthen and catalyze efforts of 12 member countries to sustain compliance with the Montreal Protocol. The goal is to do so in a timely manner with minimum negative impacts on economic and social aspects, and in coordination with key stakeholders at all levels.

Since 2011, instability in the region has made it more challenging for CAP to deliver its services - especially in Syria, Yemen and Iraq. In response, the CAP team adjusted its focus to ensure sustained compliance and address the main regional priorities until 2015.

CAP plans to continue its services to all countries to ensure sustaining the achieved compliance post-2010, with special attention to meeting HCFCs phase out targets in 2013 and 2015. Several HPMPs and investment projects have been approved for phasing out HCFCs in foam and RAC sectors. The key milestone in 2013 was the approval of HPMPs for Bahrain, Kuwait, Saudi Arabia and Yemen. The HPMP for Syria is pending approval.

In 2012, CAP/ROWA focused on foam industries - one of the key consuming sectors - to facilitate their meeting impending targets. Several regional events and consultation work have been conducted to update insulation codes and standards. Work has also been initiated to find long-term alternatives in the air conditioning industry for high-ambient countries.

Member states also agreed to compile detailed information on unwanted ODS to facilitate in-depth discussion about best management approaches and propose activities/projects as necessary.

Another collaboration started in 2012 with the Air-Conditioning, Heating and Refrigeration Institute (AHRI) will set up a regional refrigeration and air-conditioning industry association by end 2013. This will allow the unification of industry position in several technical concerns including the long term alternative refrigerants.

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## Chasing targets in West Asia

### Fast-track to HCFC Phase-Out

In 2007, the Parties to the Montreal Protocol decided to accelerate the phase out of HCFCs. This posed a challenge for the West Asia region, especially for the Gulf Cooperation Council (GCC) countries. Given their harsh climate with high temperatures, these countries rely heavily on air-conditioning, refrigeration and insulation - all of which consume HCFCs.

To support the accelerated phase out, laws had to be amended adding HCFCs to the ODS licensing systems and lists of controlled substances. To fast-track the process, CAP ROWA cooperated with the GCC Secretariat to take up the issue at the 33rd GCC High-Summit in Bahrain in December 2012. There it was endorsed by Heads of State and became enforceable in all GCC member countries: Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and United Arab Emirates.

In 2014, CAP/ROWA will focus on ensuring sustained compliance, and expedite the implementation of HPMPs. It will also facilitate the total phase-out of Methyl Bromide and maintain the regional momentum of key emerging issues, particularly the development of national and regional policies, legislations and enforcement.

Technological concerns specific to the region - such as sound alternatives for the high ambient temperature and management of unwanted ODS - will continue to receive attention through thematic meetings and south-south cooperation.

## Asian hands shape the future: promoting energy, climate and ozone (ECO) synergy in South Asia

**T**he South Asia Regional Network of Ozone Officers is one of the most diverse networks. It comprises the two rising giant economies of China and India; industrialised Republic of Korea; middle volume consuming countries of Bangladesh, Iran, North Korea, Pakistan and Sri Lanka; low volume consuming countries Afghanistan, Bhutan, Mongolia and Nepal; and the small island state of the Maldives.

All eyes of the Montreal Protocol community are focused on Asia, and rightly so: combined HCFCs in China and India make up 96% of global baseline production, and almost 60% of the global baseline consumption in Article 5 Parties. The rest is divided among the 145 remaining countries.

Asia is also the world's largest consumer and exporter of HFC-based equipment such as air-conditioners, supplying to markets within the region and in other regions. Researchers and environmentalists are concerned about Asia's rising consumption of HFCs, a highly potent greenhouse gas.

Taking note of this, the Executive Committee of the Multilateral Fund has approved the highest funded project in history for China's HCFC Phase-out Management Plan (HPMP). HPMPs of most other network countries have also been approved, and Ozone Officers and governments are now diligently implementing them to ensure they meet HCFC reduction targets. The success of these projects will be measured post-2015.

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Technology options are still a major challenge in HPMPs. NOUs look for alternatives that are more sustainable and environment-friendly but at the same time realistic, cost-effective and safe. Asia has taken one step forward by emphasizing ozone protection's linkages with climate and energy use (CEU).



Several countries have included CEU in their HPMPs to be co-financed with non-MLF funding. For members of the South Asian Association for Regional Cooperation (SAARC), a proposal to fund CEU activities

has been submitted to the SAARC Development Fund (SDF). Meanwhile, GEF funding is being sought by the governments of the Maldives and Pakistan, in separate projects, both linking ozone to their climate and energy efficiency programmes.

UNEP Asia Pacific's Compliance Assistance Programme (CAP) has been encouraging network countries to maximize climate benefits in HCFC phase-out. Since 2010, CAP Asia Pacific has worked with the Indian Bureau of Energy Efficiency (BEE) to conduct capacity-building workshops on ozone and energy synergies in Bhutan, the Maldives, Nepal and Pakistan. It also organized an Energy Efficiency Symposium as part of the Joint Meeting of South Asia and Southeast Asia Networks in September 2013 with support from the United States Environmental Protection Agency (USEPA).

Asian countries can take advantage of the current concerns to energy efficiency shown by governments and the business community for advancing HCFC phase-out targets, policies and programs. Doing so will yield multiple benefits for everyone.



The Southeast Asia and the Pacific Network of the Ozone officers (SEAP) covers 12 countries, i.e. Brunei Darussalam, Cambodia, Fiji, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand, Timor-Leste and Vietnam. Australia and Sweden are the two Article 2 country partners.

All 12 countries are in compliance with the control measures on ODS under the Montreal Protocol. The network countries are also fulfilling their reporting obligations to the Executive Committee of the Multilateral Fund, especially on the CP progress report.

Most countries have progressed well with the implementation of the approved HCFC Phase-out Management Plans (HPMPs). For maximizing climate benefits with the HCFC phase-out, manufacturing countries have chosen the low GWP, flammable alternatives in foam, refrigeration and air-conditioning (R/AC) manufacturing as much as company capacity permits. In doing so, it is essential to ensure safety of transportation, storage and handling of flammable chemicals in keeping with national regulations and standards.

In countries without manufacturing capacity, strict safety regulations are often not in place. So installing, maintaining and eventually disposing of refrigeration equipment and air-conditioners with flammable refrigerant need particular attention. The same applies to foam products with flammable agent introduced in place of HCFCs.



## SEAP: on target but fresh challenges

**Handle with care: as Southeast Asian countries switch to HCFC alternatives, safety becomes Paramount.**

Our key challenge in the coming years is how to get all countries ready for introducing flammable refrigerants/foaming agent based non-HCFC equipment/product: For the countries with safety regulations/standards, how they can remove the regulatory barriers, and for countries without strong safety regulations, how they can improve such safety awareness of all national stakeholders, and build the capacity of the servicing technicians for the safely conduction of installation and servicing .

Related to this is the other challenge of mobilizing funds at country level for delivering energy efficiency and climate benefits under their HPMPs.



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**T**he Pacific Island countries (PICs) are a number of independent states and territories scattered over the Pacific Ocean covering 165.2 million square km, or 44% of the world's oceans. In 2009, the total population in these countries made up just 0.14% of the world population.

**Pacific Island countries depend on imported HCFC for vital economic sectors. Phasing out should not knock these out.**

Under the Montreal Protocol, PICs operate both as Article 5 and non-Article 5 countries. For the PICs operating under Article 5, all have maintained compliance. The only ODS reported as consumed in the PIC is the Hydrochlorofluorocarbons (HCFC) used as a refrigerant in air conditioning and refrigeration (RAC). RAC services are used mainly in fisheries, agriculture, tourism and for cooling buildings.

As the economies expand for these countries so too does the demand for RAC services. All RAC technologies and appliances are imported. This dependence on external market availability can result in a high risk of non-compliance with MP phase-out targets. Customs and other law enforcement officers have to be ever vigilant. To sustain MP compliance management, it is necessary to have adequate national capacities in both public and private sectors, and to engage relevant regional and international partners. RAC has to be addressed as an important sector in the context of national development, particularly in relation to energy demand and climate impacts.

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To meet national obligations for the phasing out of HCFCs, UNEP through the Montreal Protocol Compliance Assistance Program is working with all PICs. UNEP also manages the PIC Network of Ozone Officers (NOOs).

This service of networking provides a regular, interactive forum for officers in National Ozone Units (NOUs) to exchange experiences, develop skills, and share knowledge and ideas with counterparts from both developing and developed countries. This, in turn, allows countries to have the information, skills and contacts required for sustaining compliance to the MP and in tandem with the wider national sustainable development goals.



## Regional ozone network for Europe & Central Asia transforms into multi-stakeholder community

**T**he Regional Ozone Network for Europe and Central Asia (ECA network) has evolved into a multi-stakeholder network involving a wide range and increasing number of national and international stakeholders. All of them have contributed to the ECA region's compliance with Montreal Protocol targets.

The credit and praise of this is widely shared. We congratulate and thank the high-level Government officials and their national ozone teams, Customs and other enforcement officers, refrigeration and air-conditioning experts, building planners and architects, private companies, academia, vocational schools, non-governmental organizations, public schools, media and the general public for the tremendous efforts and contributions.

Our special thanks are extended to all the resource persons from the Ozone Secretariat, the Multilateral Fund Secretariat, the implementing agencies and bilateral partners, our technical and policy experts from inside and outside the Montreal Protocol community as well as cooperating organizations such as IIR, AREA, ASHRAE, REHVA, UNCTAD, UNODC, WCO and EIA.

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All of them contributed knowledge and shared their experiences often at their own costs and using their private time.

**The achievements of the ECA regional network are a result of the strong engagement by sector experts, national governments and international organizations involved in the Montreal Protocol.**

We are also very grateful to UNDP and UNIDO who facilitated the participation of the countries with economies in transition in relevant activities.

Why these extensive words of appreciation?

We like to give credit where it is due, but also want to demonstrate how the hundreds of Government officials and experts who participated in ECA network activities continue supporting the network and receiving our news through the 7 dissemination lists which contain several hundreds of contacts. Additional outreach to this Montreal Protocol community in the ECA regions is done through our website ([www.unep.org/ozonaction/ecanetwork/](http://www.unep.org/ozonaction/ecanetwork/)), the ECACool website [[www.ecacool.com/](http://www.ecacool.com/)] as well as articles placed in regional journals or publications of our partner agencies.



## Latin America: built capacity to share

**T**he Latin America region comprises 19 countries from Mexico to Chile including Cuba and the Dominican Republic in the Caribbean. Their consumption of ODS ranges in general from low to high level, depending on the size of the country and its industrial base. Some countries - Argentina, Mexico and Venezuela - also have ODS production facilities.

During recent years, Latin America has been characterized as a dynamic region with sustained growth levels and expanding economies. This, in turn, has led to increased levels of consumption of ODS and related technologies.

In most Central American countries, comprehensive HCFC Phase-out Management Plans (HPMPs) run until 2020. They have particular focus on enhancing legislative frameworks, and control and prevention of illegal trade in ODS.

Other countries have been implementing first stage of their strategies which will run until 2015 with a diverse focus on those sectors that represent greater impact in terms of ODP reductions and cost-effectiveness, i.e. PU foam sector, commercial refrigeration, domestic refrigeration, etc.

A key activity in all countries is enhancing capacities and skills of Customs officers and refrigeration technicians. Many countries have also embarked on conversion processes of production facilities in the refrigeration sector from HCFCs and HFCs to alternatives such as HCs in refrigeration and air conditioning, or to methyl formate, HCs and HFOs in the foam industries.

In fact, the region has benefitted from the approval of demonstration projects in methyl formate and CO<sub>2</sub> supercritical alternatives. These projects have enabled the relevant sectors in the region and beyond to have information at hand to evaluate the results and make informed decisions on technology choices.

**As economies expand in Latin America, countries face new challenges in keeping to Montreal Protocol targets. But their resolve is unshaken.**

The region now has a robust institutional framework and substantial experience gained through technology conversions and demonstration projects with alternatives that have minimum or no impact to the climate system. This holds great potential for south-south cooperation, especially for the Caribbean countries, particularly in developing the institutional base (regulations, standards, certification), and training and capacity building for a sustainable refrigeration servicing sector.

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## The Caribbean: every ODS gram counts

**T**he Caribbean Network of Ozone Officers comprises Antigua and Barbuda, The Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Haiti, Jamaica, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname and Trinidad and Tobago. All of them operating under Article 5 of the Montreal Protocol. Except for Jamaica and Trinidad and Tobago, the rest are considered low volume consuming countries.

**Mostly low volume consuming countries, Caribbean islands are firmly committed to ensuring Compliance.**

Implementation of HCFC Phase-out Management Plans (HPMPs) has already started in all the countries; depending on the approval date, they have accomplished different levels of progress.

Most phase-out strategies give priority to enhancing licensing and quota systems to address the HCFC freeze in 2013. To control and prevent illegal trade in ODS, Customs and other law enforcement officers have been trained in classification, identification including blends, and other topics.

Training programmes for technicians have also been conducted, along with the provision of the necessary tools and equipment for safe handling ODS.

For countries with relatively small consumption levels of refrigerants, any minor disruption in the dynamics of the licensing and quota system may mark the difference between compliance and non-compliance. Since this represents a high risk for most Caribbean countries, building the capacities and enhancing skills of Customs and enforcement officers is a key priority in national strategies.

On the other hand, as most of the consumption is in the servicing sector, the region is characterized as “technology taker”. This has led to the introduction of transitional technologies in the refrigeration and air conditioning sectors. Considering their potential climate impacts, it is vital to reduce the imports of transitional equipment.

For this purpose, some Caribbean countries have been introducing flammable refrigerants with retrofits in air conditioning units as first demonstration experiences. Safety infrastructure - i.e. regulations, standards, certification, training and capacity building - are critical in the phase-out strategies to prepare those countries and the region for the introduction and safe management of those technologies.



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## Regional ozone network for Europe & Central Asia turns 10

The Regional Ozone Network for Europe & Central Asia (ECA network) is producing its 10th anniversary brochure to share major achievements and case studies with countries within and outside the region. The network consists of 12 developing countries spreading from Central Asia and Caucasus to the Balkans. In terms of Montreal Protocol implementation, they are doing well:

- All 12 countries are in compliance with the Montreal Protocol phase-out schedule.
- All have operational import/export licensing systems in place.
- Eight countries established quota systems to control HCFC imports and to comply with the HCFC freeze in 2013.
- All countries have ratified all the Montreal Protocol amendments since 2011.
- All countries have reported Article 7 & Country Programme implementation data for 2012.
- All countries already phased-out methyl bromide consumption, well ahead of the ban in 2015.
- Eight countries have reported HCFC consumption in 2012 below the baseline (freeze in 2013).
- Ten countries have designated Customs focal points for the Montreal Protocol.
- Eight countries participate in the informal Prior Informed Consent initiative (iPIC).
- Nine countries have national refrigeration and air-conditioning associations (and additional two countries are in the process of creating such associations).

Similar efforts are undertaken by the 7 countries with economies in transition (CEIT countries) following the more challenging phase-out schedules for developed countries. Overall, all CEIT countries demonstrate a high commitment to comply with the Montreal Protocol provisions although some countries are facing compliance challenges:

- Azerbaijan in terms of its HCFC consumption and UNIDO assists the country in implementing a GEF-funded project to phase out all remaining HCFC consumption in the country.
- Kazakhstan in terms of its HCFC and methyl bromide consumption and UNIDO is currently preparing projects to assist the country to return to compliance.
- Ukraine is currently implementing its HCFC plan of action to return to compliance by 2015.

Priorities of the ECA network & associated CEIT countries in 2014 will include:

- Implementation of integrated policy measures to promote ozone and climate-friendly technologies and the adoption of performance and safety standards applicable to the refrigeration & air-conditioning (RAC) sector.
- Establishment of training and certification schemes for refrigeration technicians and companies. This involves the promotion of e-learning courses as a complement to traditional face-to-face and practical training.
- Enforcement support related to the iPIC initiative, analysis of trade data and the ECA Ozone Protection Award for Customs and Enforcement Officers.
- Cooperation with national RAC associations, building planners and architects and international stakeholders.
- Monitoring of Montreal Protocol implementation in terms of compliance, consumption trends, data reporting, operation of import/export licensing and quota system, etc.

The priorities of the network will continue to evolve according to the needs of network countries.

For more information please visit the ECA website: [www.unep.org/ozonaction/ecanetwork/](http://www.unep.org/ozonaction/ecanetwork/)

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## Natural refrigerants, Ice Cream and Unilever

**A**t Unilever we rely on about 2 million ice cream cabinets around the world to get our ice creams such as Magnum, Cornetto and Ben & Jerry's to consumers. We know that refrigeration can be a significant contributor to greenhouse gas emissions but equally the business case for action on climate and ozone depleting substances is clear. That's why, as part of the Unilever Sustainable Living Plan, we have accelerated our efforts to roll out ice cream cabinets that use HFC-free, energy-efficient, hydrocarbon refrigerants.

Refrigerants traditionally used in cabinets and other storage facilities have a much higher global warming potential (GWP) than carbon dioxide. Hydrofluorocarbons (HFCs), hydrochlorofluorocarbons (HCFCs) and chlorofluorocarbons (CFCs) have GWP ranges from 1,200 to 8,500 whereas CO<sub>2</sub> has, by definition, a GWP of one.

Finding environmentally-friendly alternatives to refrigerants is important in reducing greenhouse gas emissions. We have committed to using refrigerants which have a GWP of less than three, such as hydrocarbons (HC), CO<sub>2</sub>, ammonia, water and air. Almost all our production facilities and cold stores already use ammonia in their refrigeration systems, which is also very energy-efficient.

Our primary focus is our point-of-sale ice cream freezer cabinets. Since 2004 we have been rolling out new climate-friendly freezers using an HC refrigerant.

When we launched our Plan in November 2010, we had already purchased 450,000 units with the new refrigerant. By end 2012, we had well over 1 million such cabinets in the marketplace. These climate-friendly hydrocarbon freezers have a negligible global warming potential compared to those that contain HFCs. They are also around 10% more energy-efficient. We estimate that freezers we bought in 2012 alone avoided around 40,000 tonnes of CO<sub>2</sub> emissions compared to 2008 models.

For technical and legal reasons, we cannot currently replace all our cabinets with HC technology. Advocacy is an important part of influencing changes in legislation. We are working with stakeholders, such as governments and NGOs, to bring about regulatory change so that new, greener technologies can be introduced.

In the United States, introduction of new refrigerants is highly regulated, requiring formal application through the Environmental Protection Agency (EPA). Working with Greenpeace, the United Nations Environment Programme (UNEP) and others, we lobbied the EPA to convince them that HC refrigerants are safe and efficient alternatives to HFCs. As a result of this work, at the end of 2011 the EPA approved hydrocarbon gas as an alternative refrigerant. This enables all companies to take advantage of significant greenhouse gas savings.

We are also driving an industry commitment to phase out HFCs by 2015 through our participation in the Consumer Goods Forum, and as the chair of Refrigerants, Naturally! The latter is a multi-stakeholder group established in 2004 and is supported by Greenpeace and UNEP. It aims to promote a rapid shift away from the use of HFCs towards natural refrigerants for refrigerated point-of-sale equipment.

Only with broader efforts to accelerate a phase down of HFC refrigerants will the right market signals be sent for an accelerated deployment of natural refrigerants. UN Member States have a leadership role to play here in making this possible.

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Global Advocacy Director of Unilever



**Low energy & low emissions buildings: Pick low hanging solar fruits first!**

**T**he heating, cooling, and lighting of a building is not just the responsibility of mechanical and electrical engineers, but also of the architect.

For low energy design, the building itself through must accomplish as much of the heating, cooling and lighting as possible as described in the Three Tier Approach to Sustainable Design (see Figure).

If the right architectural strategies are chosen at Tier One with regard to form, orientation, color, fenestration and insulation etc, the building itself can accomplish about 60% of the heating, cooling and lighting. Another 20% of the energy can be saved at the Second Tier, which consists of the architectural strategies such as passive solar, passive cooling and daylighting.

As a result, the Third Tier, which consists of the mechanical and electrical equipment, only has to accomplish the remaining 20%. When such equipment is carefully designed, the energy consumption of a building can be reduced by another 5%.

This approach to green building design can save as much as 85% of the energy compared to a conventional building - thereby greatly reducing emissions at both the power plant and at the refrigeration equipment which will be much smaller and less expensive.

**Prof. Norbert Lechner** is Professor Emeritus at Auburn University, USA, and expert in energy responsive architectural design

Everyone agrees that the easy, inexpensive and effective strategies to save energy should be used before turning to the more difficult and expensive ones. Yet, most interest in solar energy is focused on photovoltaics. In fact, there are lower hanging solar fruits!

The cheapest and easiest among them is building orientation, which saves much energy at no cost. Yet, it is used much too little. Building orientation, roof and wall color, window orientation, and window size are all low hanging fruit that cost nothing extra - yet save huge amounts of energy.

**Right kind of building designs can help save massive amounts of energy, reducing carbon emissions needed to generate it.**

Although shading, passive solar and daylighting are not free, their payback period is measured in months not years. Active solar for preheating ventilation air (i.e. transpired collectors) is affordable. Active solar domestic (sanitary) hot water is cost effective in most locations, while active solar space heating is only cost effective in certain locations.

Of course, photovoltaics should also be used - but only after all the lower hanging solar fruit have been picked. The goal of reducing greenhouse gases is best achieved when the available money is used to dramatically reduce the lighting, heating and cooling (refrigeration) systems. That can be accomplished by picking the low hanging fruit first.



**A**s a result of the HCFC phase-out schedule under the Montreal Protocol, countries - particularly developing countries are introducing alternatives to replace the HCFCs they are phasing out. They can take advantage of experiences and lessons learned by the developed countries, which have already progressed significantly along the path of HCFCs phase-out.

HFCs, which have a zero ozone depleting potential (ODP) but have high global warming potential (GWP), are still the most commonly used replacement for HCFCs. There are a number of other available replacements. These include 'ozone and climate friendly alternatives' such as natural refrigerants - hydrocarbons (HCs), ammonia (NH<sub>3</sub>) and carbon dioxide (CO<sub>2</sub>); and lower GWP HFCs, termed hydrofluoroolefins (HFOs).

However, these alternatives exhibit a range of specific properties which may prevent them from being directly adopted: flammability, toxicity, high working pressures, and high costs which can limit their applicability and require special practices or approaches for safe handling. "Standards" are one such approach.

A standard (sometimes called a "norm"), is a formal document developed by experts to ensure a certain uniform level of products and services. Such standards can be very useful tools for the introduction of ODS alternatives, especially from the point of view of their safe handling and preventing hazards.

International standards adopted by countries into national legislation bring with them the great advantage of a tool which was agreed by the global consensus of technical experts. The use of such standards can also support and simplify international trade, support customs and enforcement officers to combat illegal trade, help develop adequate training programmes for personnel, and ensure the overall quality and operation of ODS and reliant equipment.

Some of the most relevant technical standards relating to ODSs and their uses are now under revision by the relevant standardisation bodies. These are being updated to incorporate some safety and other issues related to natural refrigerants and HFOs (for example ISO 5149:1993 on Mechanical refrigerating systems used for cooling and heating - Safety requirements).



## International standards can benefit HCFC phase-out

For the introduction of low-GWP alternatives and the technologies using them, it is important to consider other relevant standards focused on environmental and quality management. The most relevant and internationally-used standards fall into the category of technical standards which relate to substances, equipment, containers and other issues.

The International Standardization Organization (ISO) and International Electrotechnical Commission (IEC) are the main international standardization organisations developing technical standards related to the use of HCFCs and their alternatives. At the regional level, European Committee for Standardization (CEN) and European Committee for Electrotechnical Standardization (CENELEC) are the main relevant organisations. Some national bodies have particular importance due to the size of the stakeholder groups and wide sphere of influence e.g. the American Society of Heating and AC Engineers (ASHRAE), Air-Conditioning, Heating & Refrigeration Institute (AHRI) and Standards Australia (AS).

Standards are commercial products and have no legal force until integrated into national law. Before the adoption of any international or regional standard, or its incorporation into national legislation, it is necessary for the country to ensure that it is appropriate to the national context, will be beneficial and will not create any barriers to particular products or practices. In the process of adopting standards, they can be modified at national level to meet local needs and to suit national conditions.

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## Resource mobilisation: opportunities for ozone/climate co-benefits

The actions taken by National Ozone Officers to implement their HPMPs can open doors to additional support for climate co-benefits while, at the same time, meeting commitments on ozone depleting substances.

When refrigeration and air conditioning are the primary sources of the ozone depleting substances to be addressed in an HPMP, energy efficient replacements using low-GWP or zero-GWP refrigerants can provide the basis, through resource mobilisation, for significant additional funds for projects. This is due in part to the fact that, as the Technology and Economic Assessment Panel (TEAP) has reported, systems using low-GWP alternatives are able to achieve equal or superior energy efficiency in domestic refrigeration, commercial refrigeration and some types of air-conditioning systems.

In 2008, 20% of world electricity consumption was used to power refrigeration and air conditioning which cost about US\$ 14 billion at an average cost of US\$ 3.5 per kWh. Energy savings translated into avoided electricity generation and reductions of CO<sub>2</sub> equivalents can be transformed into financial gains for governments through a variety of climate change programs.

UNEP is currently working on a guide on resource mobilisation for NOUs in Low Volume Consumption countries (LVCs) with servicing only. As the table on the right illustrates, the guide outlines where activities an NOU can take locally to implement the HPMP can create potential ozone and climate co-benefits.

The guide then goes on to describe the global, national, regional and local partners and donors that could support financially climate co-benefits of the HPMP. Finally, the guide suggests how the NOU can find and prepare to approach potential partners and donors in an LVC to take advantage of resource mobilisation opportunities for climate co-benefits.

Activity	Potential benefit	Beneficiary		
		Equipment owner	Government	Environment
Good refrigeration servicing practices	Reduced purchases of refrigerant	✓	✓	✓
	Reduced or avoided direct GHG emissions		✓	✓
Replacement of high-GWP refrigerants with low- or zero-GWP refrigerants	Reduced GWP of refrigerants		✓	✓
Replacement of vapour-compression equipment with equipment based on different cycles (e.g. adsorption)	Reduced or avoided direct GHG emissions		✓	✓
	Reduction of energy consumption (cost savings)	✓	✓	✓
	Reduced need for additional electricity generation capacity (power plants) and/or fuel imports		✓	✓
Improved energy efficiency of replacement technology	Reduction of energy consumption (cost savings)	✓	✓	✓
	Reduced need for additional electricity generation capacity (power plants) and/or fuel imports		✓	✓
Building design that avoids/minimizes need for refrigeration	Reduction of energy consumption (cost savings)	✓		✓
	Reduction or avoidance of direct GHG emissions			✓
Recovery and recycling of refrigerants	Reduced requirement for importing/purchasing new refrigerants	✓	✓	✓
Destruction or disposal of waste/contaminated ODS	Reduction or avoidance of direct GHG emissions			✓



## Ghana: integrating energy efficiency, climate mitigation and ozone protection

In 2009 UNDP, in collaboration with the Environmental Protection Agency of Ghana, Energy Commission and the Center for Rural and Industrial Research, developed an overarching strategy to achieve benefits for global climate and ozone layer through the Integrated Plan for Energy Efficiency, Climate Mitigation and Reductions of Ozone-Depleting Substances (ODS) for the Refrigeration Sector in Ghana.

This integrated plan brings about the convergence of three synergistic interventions:

- Phasing out HCFCs in the refrigeration sector as part of meeting Ghana's commitments under the Montreal Protocol. This work is funded by the Multilateral Fund for the Implementation of the Montreal Protocol (MLF), and implemented by UNDP and Italy.
- Promoting energy efficient refrigerators through market transformation, a project co-financed by the Global Environment Facility (GEF). These efforts are aimed at appliances that are at or nearing the end of their useful life.
- A complementary pilot project for recovering and disposing of ozone-depleting substances, funded by MLF.

The ultimate objective of this plan is to bring economic, social and environmental benefits to the people in Ghana by scaling up energy efficient appliances with low global warming potential (GWP) and zero ozone depleting potential (ODP). These twin objectives would help mainstream ozone and climate benefits into the national development plan.

The pilot demonstration project on ODS waste management and disposal uses unwanted refrigerants that originate in the first and second of the above-mentioned programmes. It would show how to set up an ODS management and disposal facility. The project will demonstrate the management and disposal of ODS refrigerants recovered from old stocks (about 1.8 tonnes) and subsequent early retired or end of life (EOL) refrigerators/freezers, air-conditioners as well as from the servicing sector.

ODS waste will be collected from the refrigerator dismantling centers set up with GEF-project support (for end-of-life equipment) as well as from the Recovery Centers to be set up through HPMP (for functioning equipment being serviced). ODS will then be sent overseas for proper destruction.

The project will explore various solutions to pay for ODS waste management. It will look at possibilities to monetize the ODS destroyed as voluntary carbon credits, as well as other potential financial modalities.


The progress so far includes the following:

- The pilot scheme was launched in September 2012 that encourages people to turn in their old refrigerators for a rebate to purchase a new and more energy efficient one. A national roll-out of the scheme commenced on 15 May 2013. A total of 2100 refrigerators have been recovered since commencement of the scheme.
- Two companies have been sub-contracted to collect and recover ODS from old refrigerators being turned in as well as obtaining unusable refrigerant from the servicing of existing equipment.
- Technicians were trained for proper functioning of turn-in and rebate schemes and for collection and recovery of old refrigerants.
- Information about project activities and the rebate scheme has been disseminated through newspapers, radio, television and the web.

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# Challenges and opportunities low GWP EE technology in Small



## Pacific Island Countries (PICs): Aiming for triple benefits in the Pacific

**C**ountries of the Pacific region are all parties to the Montreal Protocol and are in compliance. The only ozone depleting substance (ODS) used in the Refrigeration and Air-conditioning (RAC) sector is Hydrochlorofluorocarbons (HCFC).

Being of key importance in infrastructure development, public buildings, tourism, hospitals, agriculture, food storage management and fishing, the RAC sector also accounts for the largest demand of electricity. Thus, addressing the RAC sector is important in relation to energy demand, climate impact and managing compliance to the Montreal Protocol.

**With the right policies,  
Pacific island nations  
can integrate  
ozone protection,  
climate mitigation  
and energy efficiency.**

For the Pacific region, RAC technologies are purchased based on market availability and prices. The climate impacts and energy ratings are not pre-requisites. To meet the requirements of the Montreal Protocol, many countries do however control the entry of RAC technologies that are ODS dependent. Small imports volumes cannot command market shares on best longer term alternatives.

In public sector, the three arms of energy efficiency, climate mitigation and ODS management are assigned to different governmental agencies which makes it difficult to achieve a unified national approach in technology adaptation. For example, there is high level of attention on investments targeting the generation and distribution of electricity but with the energy efficiency management of the RAC sector still lagging. For climate impacts, the focus in the Pacific region is on adaptation.

Moving Pacific countries to technologies that integrated all three components will require the following:

- Having public policies and incentives for the RAC sector to bring together the three objectives of energy efficiency, climate mitigation and ozone protection as a unified platform for technology adaptation.
- Having appropriate institutional and human resources for addressing longer term alternatives.
- Making the RAC sector a professional industry with better trained and certified personnel.
- Continuous consumer education and awareness rising, with emphasis on the benefits of selecting longer term alternatives.

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Countries) with UNEP Regional Office for Asia  
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# with introduction of Islands Developing Countries (SIDS)

**S**mall Island Developing States (SIDS) are often characterised by their dispersed and miniature size, restricted resources, limited access to technology, vulnerability to natural disasters and heavy reliance on international trade and foreign aid.

With their rich and diverse cultures, SIDS face unique challenges and limited options for implementing sustainable development strategies. Their ecologies - which sustain tourism, fisheries and other key economic sectors - are fragile and vulnerable.

**SIDS face unique challenges and limited options for implementing sustainable development strategies.**

the Protocol, and have been key partners in its remarkable achievements.

However, since it was decided to accelerate the hydrochlorofluorocarbons (HCFC) phase-out, SIDS have been pondering over the new challenges of compliance. These are on top of what SIDS, by their nature, are already coping with. SIDS must now identify, select and make the transition to longer-term alternatives to ozone depleting substances that have low global warming potential and are also more energy-efficient.

Not being developers or manufacturers of climate-friendly and energy-efficient alternative technologies, SIDS must choose wisely on what to buy from where. They have to manage within tight budgets and limited technical skills.

SIDS sometimes face a dilemma because technology is not always suitable for their situations, or their technical capacity is not adequate to manage the technology. As “technology takers”, SIDS are increasingly reliant on the international market to sustain their fragile economies. This makes them vulnerable to external economic shocks. Some new technologies also may not always be viable for their small scale economic activities.

Of the 197 Parties to the Montreal Protocol, 38 are SIDS. They play an important role in implementing



**Saint Lucia:  
small islands take  
on big challenges**

Despite these challenges, the transition to low GWP, energy efficient technologies presents opportunities to optimise environmental and economic benefits. SIDS can take advantage of these by building resilience through enhanced information and knowledge exchange, increased public education and awareness and build capacity.

The lifespan of existing technologies can be extended by maximising recycling, recovery and retrofitting practices. Such a ‘delay’ in transition gives SIDS a chance to evaluate alternatives, make an informed decisions, and ensure a smooth transition.

All SIDS are also Parties to the UNFCCC, and implementing activities in mitigation and adaptation. With the HCFC phase-out, SIDS can maximize climate mitigation benefit by avoiding the emission of thousands of tons of carbon dioxide equivalent.

And by opting for more energy-efficient alternatives, SIDS can buffer against rising cost of energy which is critical to their economies and societies. With careful planning, SIDS can attain a 20% reduction in electricity consumption in the public sector by 2020 - this is part of their commitments under the Barbados Declaration on Achieving Sustainable Energy for All in SIDS (May 2012).

Thus, while the technology transition may appear tedious, SIDS stand to gain much from it. They will also be playing their part in global efforts to protect ozone and stabilise climate.

**Donnalyn Charles and Joanna Rosemond** are attached to the Sustainable Development and Environment Division, Ministry of Sustainable Development, Energy, Science and Technology, Saint Lucia

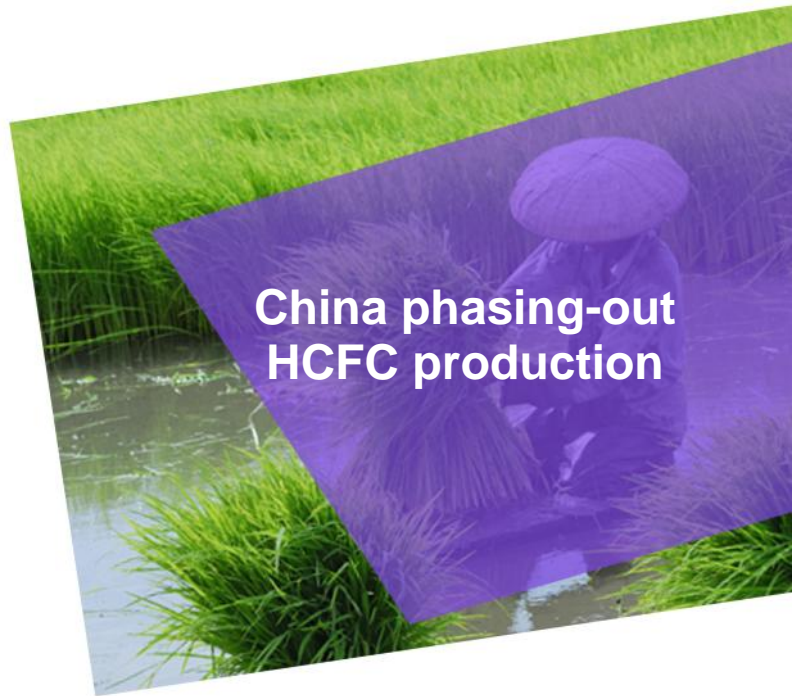
**T**his year 2013 is the freezing year for HCFCs. At the 69<sup>th</sup> Executive Committee meeting of the Multilateral Fund held in April, China's HCFC Phase-out Production Management Plan (HPPMP) was approved.

China's HPMP is very important and also complex. By implementing the HCFC production sector plan, China will gradually phase out HCFC production, which will avoid more than 4.3 million metric tons of HCFC substances by 2030. This is equal to 300,000 tons of ODP, as well as 8 billion tons CO<sub>2</sub>-equivalent greenhouse gases emissions. Thus, it benefits both the ozone layer and the global climate system.

Implementing the production sector plan is a big challenge. China is still the largest developing country in the world. Its GDP per capita is about 5,000 USD, which ranks about the 100th in the world, or only around a tenth of the level of the major developed countries. Domestically, China is facing major environmental protection pressures too. The HCFC production enterprises involved in the HPPMP are usually pillars in their local economy, providing significant employment. The phase out will require much sacrifice not only from the enterprises but also from society.

After the approval, we have put all our efforts into the preparatory work for the implementation. The production sector plan has a long time span and is closely related to policies. It also involves closure and dismantling of production lines which are very complex and challenging.

On the basis of ample discussions between stakeholders, we set up the implementing strategy for the sector plan, which will implement in three aspects, which are policy regulating, financial incentive, and monitoring and controlling. These will help ensure reaching the freezing and phase-out targets.



## China phasing-out HCFC production

On 14 September 2013, the Launch Meeting of the HPMP was held in Beijing. The vice minister of the Ministry of Environmental Protection delivered a speech emphasizing the importance of the implementation of the HCFC production sector plan. Representatives from the Ozone Secretariat, the Secretariat of the Multilateral Fund, the donor countries and the World Bank participated in the event. A workshop was held with the HCFC enterprises afterwards. From that day on, the Chinese HCFC industry has started to release production quotas, to close plants, to cut quotas and begun a series of work to implement the production sector plan.

**China's phasing out HCFC production will avoid more than 4.3 million metric tons of HCFC by 2030.**

China is firmly committed to the mission of the Montreal Protocol. We have previously acquired much experience in ODS phase-out.

Although very difficult, we believe that, through the efforts of government and industry, and with the support of the international community, we will be able to implement the HPPMP and achieve the compliance target.

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Foreign Economic Cooperation Office,  
Ministry of Environmental Protection,  
China





**I**n 2012, UNEP Ozone Secretariat and OzonAction Programme conducted a global competition for young people to produce a very short video on the Montreal Protocol. It was open to all born on or after the historic date 16 September 1987, when nations came together to protect the endangered ozone layer. The video's theme was "PROTECTING OUR ATMOSPHERE FOR GENERATIONS TO COME".

The first place was won by Zhou Zhanyu of China. Two young people tied for the second place: Iwani Zoë Mawocha of South Africa, and Elio Alonso Vasquez Miranda, Peru.

In this interview, Iwani shares her views on ozone protection.

**How did you work on the winning video?**

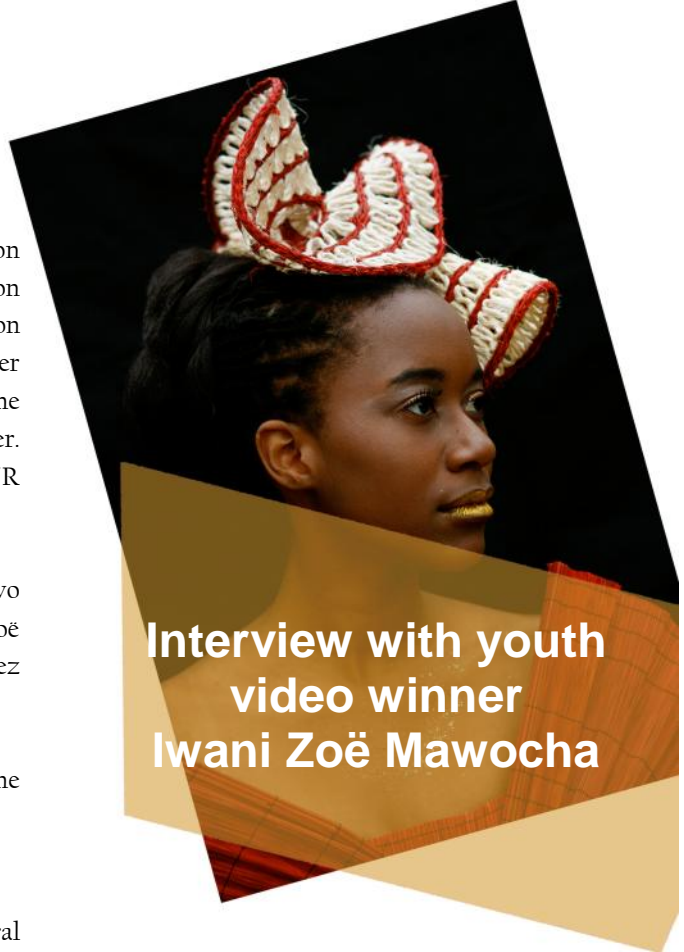
I filmed it over the course of two weeks, at several locations. I'm a one-person team when it comes to video production, however, I couldn't have completed it without my friends' help.

**What motivated you?**

I was determined to show its success on a wide platform. In this constant struggle to obtain zero emissions and total sustainability, we are always looking forward, and the situation seems dire. We don't take enough time to reflect on the positive changes already made. What would the world have been like without the Montreal Protocol? I chose to portray the progress that had been made in 25 years. However, I also stressed the need to carry on the good work.

**What kind of information amazed or worried you about ozone/climate issues?**

I was mostly frustrated that for all the good work being done, people are continuing to emit noxious gases without qualms. For all the efforts made to reduce emissions, governments and societies are still in a race to obtain, consume and/or control finite energy resources. It baffles me: with all our challenges, the most logical step is to use alternative methods and reduce our output. We are still too concerned with "what does it cost us now?" rather than "what does it cost us in 25 years time?"



## Interview with youth video winner Iwani Zoë Mawocha

**What is your wish for an ozone-safe world?**

I wish for change within our so-called "think-tank" minds. Every human needs to embrace the idea of leaving this world cleaner for the next generation. For "slacktivists" to realise a "share" on Facebook is not enough. For leaders to grasp the concept of "future livelihood" and not think with their pockets in mind. For education systems to teach geography, or environmental systems, or even the basics: ride a bike, or switch your lights off.

**What do you personally want to do?**

I want to study sustainable architecture and film, and bring my knowledge to the developing nations of Sub-Saharan Africa. Rather than have to change our systems to accommodate greener living, it needs to be kept in mind as we develop. That's how we become game-changers. If I can look back in 25 years and see that I have made a difference, in whatever way, I'd have done a small deed to repay my planet...

**Iwani Zoë Mawocha (18) is**

Completing the International Baccalaureate Diploma Programme at Waterford Kamhlaba United World College. In addition to being a photographer, videographer and composer, Iwani is the co-founder of Mustard Seed Africa, a community development initiative focused on socio-economic empowerment for women at the grassroots in Swaziland and Zimbabwe. She is also co-founder of The Stereo Project, which aims to combat the negative perceptions held by societies across the globe.

Outreach materials



**Cooling Without Warming the Planet.** Produced by UNEP OzonAction ROLAC and the Colombian NOU (English, Spanish and Portuguese, aprox. 30 mn) unveils successful alternative cooling experiences with natural refrigerants for domestic and industrial applications in 5 Latin American and Caribbean countries. These technologies have been smoothly up taking as energy efficient alternatives to the HCFC-based equipment retirement-replacement in the region, being crucial to the protection of the ozone layer and to the avoidance of further potential global warming chemicals' release into the atmosphere.



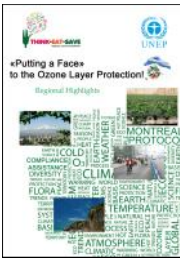
**Protecting Our Atmosphere for Generations to Come: 25 Years of the Montreal Protocol.** The signing of the Montreal Protocol in September 1987 launched an unprecedented global effort in the protection of the environment. To this day, the Vienna Convention and the Montreal Protocol are the only universally ratified treaties, uniting 198 countries in taking on the fight against man-made ozone depleting substances. This short documentary was produced for the United Nations Environment Programme Ozone Secretariat and OzonAction Programme, on the occasion of the Protocol's 25th anniversary. This documentary tells its story; how it started, how it grew stronger and stronger with time, how its unique mechanism of funding and assistance has turned it into the success.



**Alternatives to HCFCs in the Foam Sector: Taking on the Challenge.** A 15 min short documentary developed by UNEP OzonAction Branch that seeks out answers from the technical and scientific experts closest to the issue and showcases some inspiring conversion projects. With financial assistance and technology transfer facilitated by the Protocol's Multilateral Fund, developing countries are already taking on this uphill battle, thus paving the way for the adoption of ozone and climate friendly alternatives to HCFCs.



**The Arctic & the ozone layer: stabilizing our environment and climate.** In 2011, extremely low-ozone levels were recorded in the Arctic region. This episode the North Pole – the Arctic- has triggered concerns on the trend of the ozone layer's recovery, expected to fully happen by mid century. With the support of the government of Norway, UNEP is investigating the causes of this depletion and the scientific explanations for such unexpected episode in the Arctic. This 16 minute- documentary reports the impacts on the region's ecosystem and the foreseen risks of the changes in the Arctic that may affect human life also in mid-latitudes. This video output is jointly branded by the WMO (World Meteorological Organization) and brings to light some of the so much discussed inter-linkages between the climate and ozone issues on the voices of internationally known scientists.



### “Putting a face” to the Ozone Layer Protection.

As we implement the outcomes of the Rio+20 conference on sustainable development, the remarkable success story of the Montreal Protocol on Substances that Deplete the Ozone Layer acts like a beacon of hope. The ozone layer protection has multiple benefits toward biodiversity, health, the world’s economy and climate change.

The regional highlights is a bi-annual booklet including updated information from all regional networks.



### Informal Prior-informed Consent (iPIC).

The iPIC mechanism is a voluntary and informal system of information exchange on intended trade between the authorities in importing and exporting countries that are responsible for issuing ODS trade licenses.

The designated authorities in charge of issuing import / export licenses are encouraged to consult the iPIC info sheets of their respective trade partners before issuing any license.



### Enforcement Strategies for Combatting the Illegal Trade in HCFCs and Methyl Bromide.

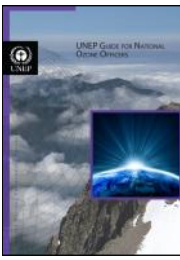
In 2012, the Protocol’s 25th anniversary and its remarkable success. Parties to this agreement have much to celebrate; through concerted international effort, they phased out 98% of production and consumption of nearly 100 ozone depleting substances (ODS), setting the ozone layer on the path to recovery. Because these chemicals also caused global warming, reducing them has made a significant contribution to climate protection.



### Achievements & Highlights: 10th Anniversary of the Regional Ozone Network for Europe & Central Asia.

The 10th anniversary brochure of the ECA network reflects a decade of network operation and aims to share major achievements, case studies and highlights to provide inspiration for countries within and outside the region.

Government officials, refrigeration and enforcement experts, building planners and academia, Montreal Protocol secretariats, implementing agencies and bilateral partners, private sector companies and trade associations as well international organizations contributed more than 85 exciting articles and quotes to this bilingual English - Russian brochure.



### National Ozone Officers Guide.

This guide introduces and summarises the many important issues about the Montreal Protocol on Substances that Deplete the Ozone Layer that Ozone Officers (NOOs) need to know to perform their job effectively. Presented in an easy to understand format, the guide is designed to provide new NOOs and their assistants with the critical knowledge needed to quickly understand the Montreal protocol system and the country’s obligations under the Montreal Protocol.



### Putting a face to ozone depletion in Africa: HPMP Implementation in Africa, a special case study of Senegal.

This guide introduces the implementation of Montreal Protocol in Africa. It describes the HCFC phase-out management plans (HPMPs) in selected African countries, especially in Senegal. It focuses on ozone, climate and energy efficiency aspects.



### OzonAction Publications Catalogue 2014.

Information on science, policies, and technologies forms the base of technology support and capacity building. Since 1991, the information clearinghouse of UNEP DTIE OzonAction has been helping developing countries to make informed decisions about phase-out by providing quality reviewed, need-based information services. Never before has such a powertool been so badly needed as now, when the Montreal Protocol is entering the second phase and when the climate benefits of its implementation are becoming so clear and evident. Showcased in this catalogue - sector-wise, as well as function-wise - are more than 145 publications, CD ROMS, videos, posters, TV spots, radio spots, DVD and other awareness materials to help National Ozone Units (NOUs) and other stakeholders in industry and governments to build their capacity to implement the Montreal Protocol and at the same time derive climate.



## Acknowledgements

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**OASI is available online at** <http://www.unep.org/ozonaction/News/OzonActionNewsletter>

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