



*The World's Most Successful
Ozone/Climate Change Multi-*

Stewardship Initiative



MOPIA Awareness Session

Summer, 2011

Manitoba, Canada



Presentation Overview



- **Snapshot of MOPIA.**
- **Highlight the current science/implications and status of the ozone layer, ozone destruction and the ozone “hole”. Montreal Protocol status.**
- **Alternative Refrigerants – various sectors.**
- **Highlight emerging industry trends.**
- **Questions and Answers**

1993 - MOPIA was Appointed by Province of Manitoba



Vanessa Krahn, Executive Assistant; Graham Issak Special
Projects Coordinator



MOPIA's Board is Multi-stakeholder based
Chairperson (George Kurowski) and Secretary (John Kub)
Doug Alexander (VP), Inez Miller, Laverne Dalglish
(Tres.), Michael Blackey (Past Chair), Bill Taylor (PPC)



MOPIA Current Projects

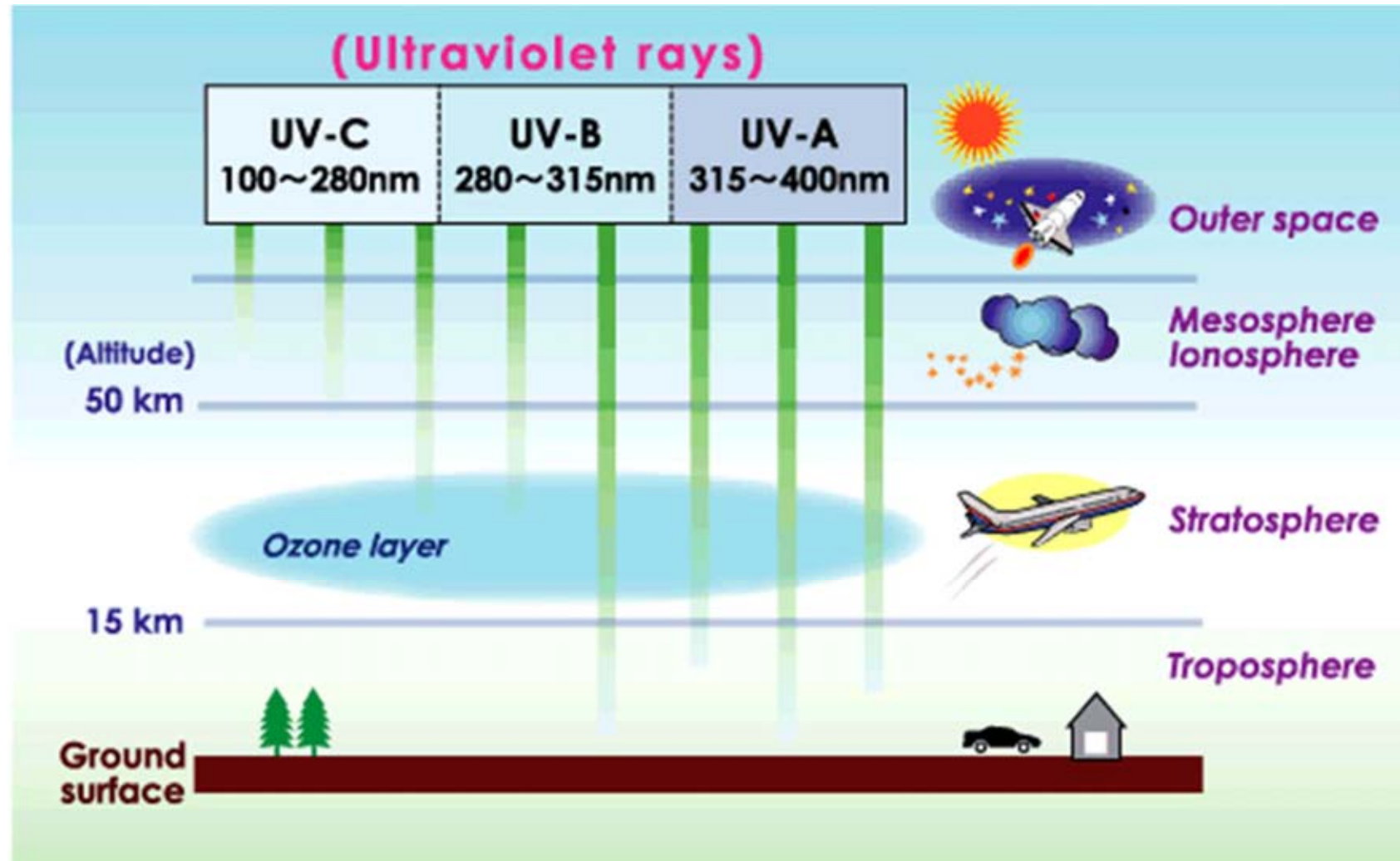
- Re-launching website – www.mopia.ca
- Preparing to launch consumer and industry awareness campaign – branding
- Addressing the HFC aerosol issue
- Addressing Retail sale of select refrigerants
- Engaged with int. policy makers
- Aware of developments outside Manitoba
- Destined to introduce regulatory changes



3000 uses for ODS's

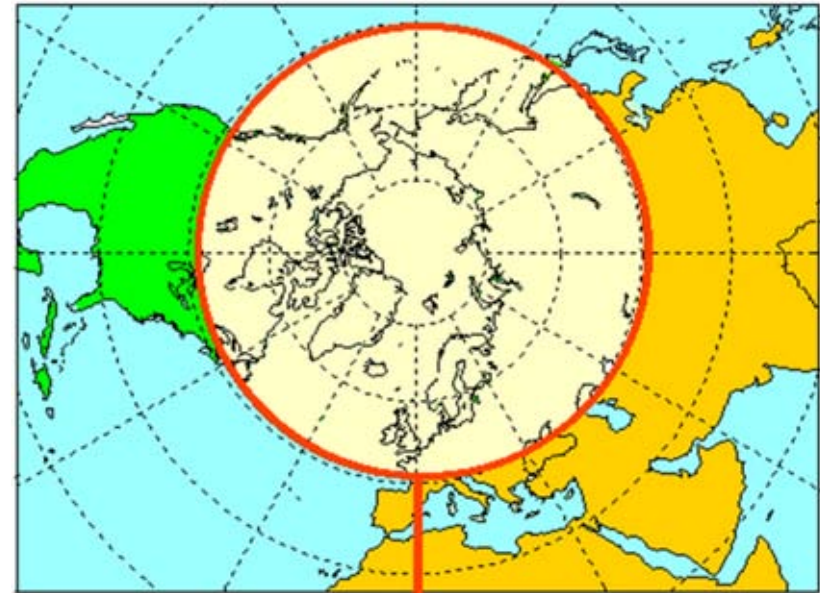


Ozone Layer is 15-45 kms above us in Stratosphere

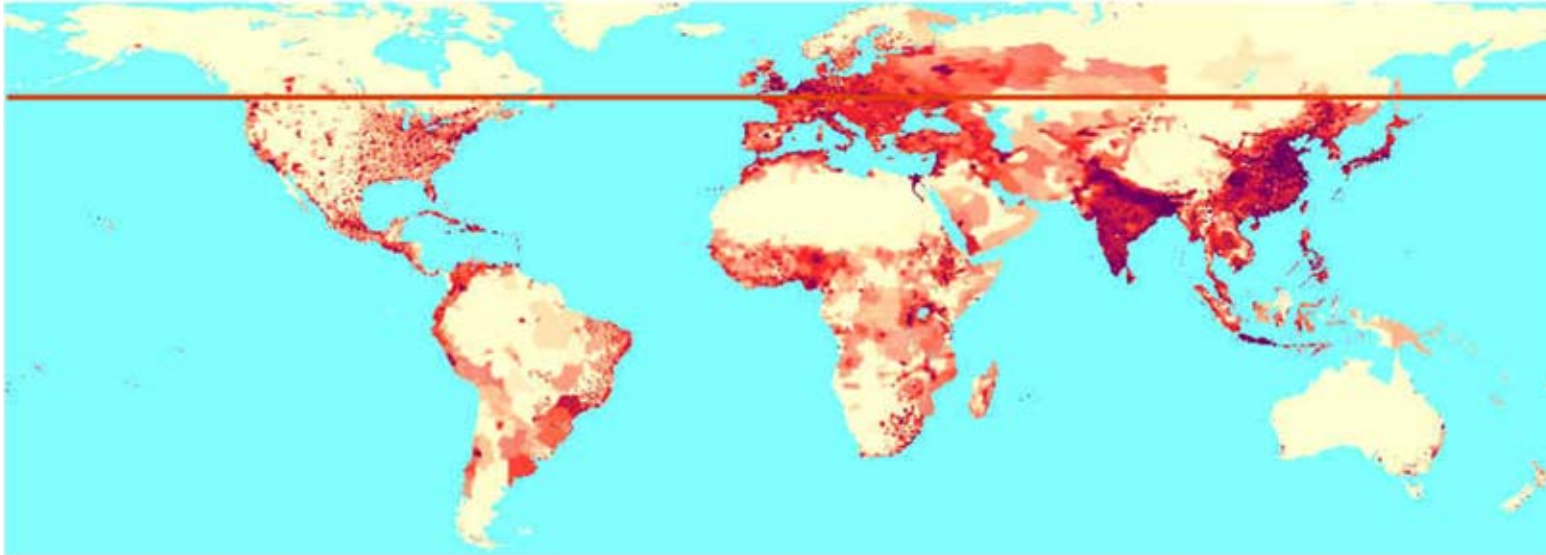


Stratospheric Ozone “Hole”

- **September (25), 2006**, NASA reported the **largest Antarctic ozone hole ever** with total ozone depletion at 29.5 million km².
Sept 13 – 24 m km²
- 2010 was 2nd smallest (22 mkm). 2009 saw the **10th** largest ozone hole (27 million km²).
- In Canada, **2011 saw the most significant ozone depletion 40%. late winter and early spring (March). WMO**
- ODS can persist for many years with life spans of 25 to 400 years.
- Is recovery possible? The World Meteorological Organization estimates that the ozone layer will **slowly recover to pre-1980 levels by 2060-75.**



Northern Ozone Hole Limits

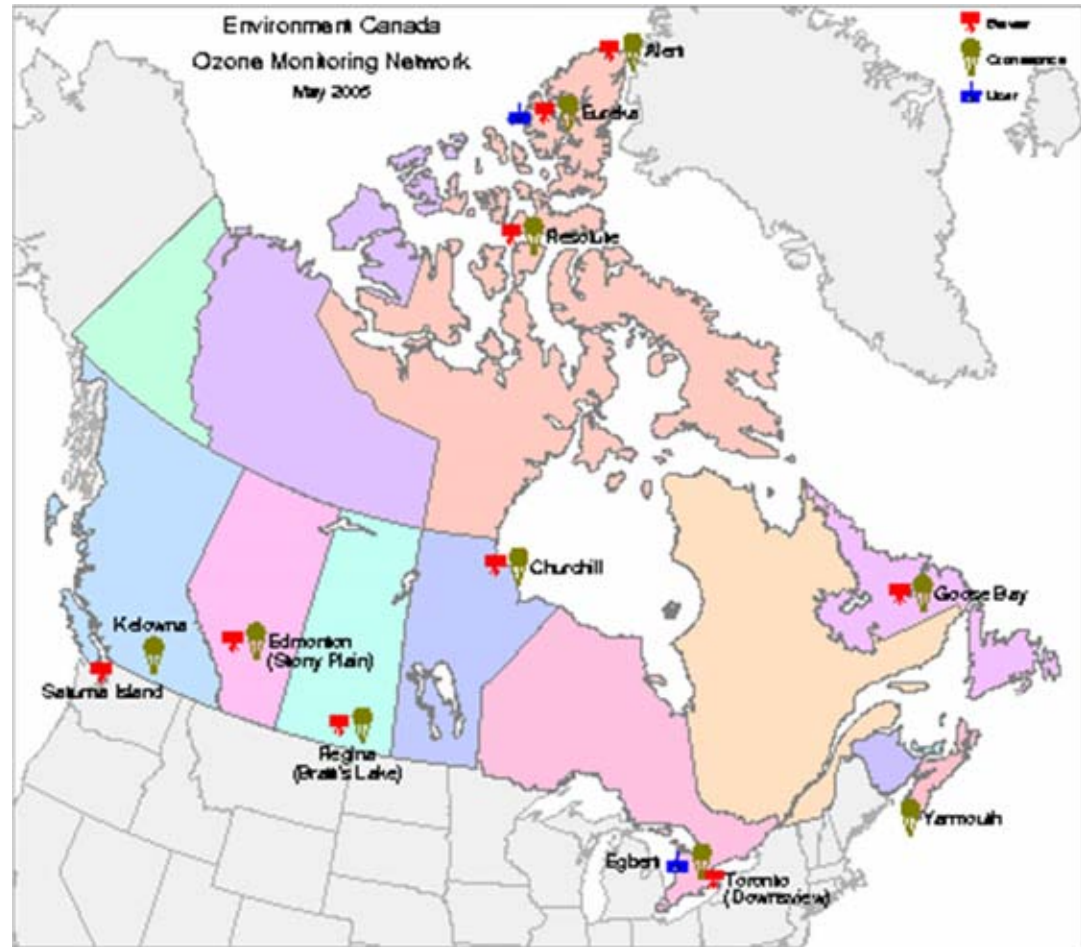
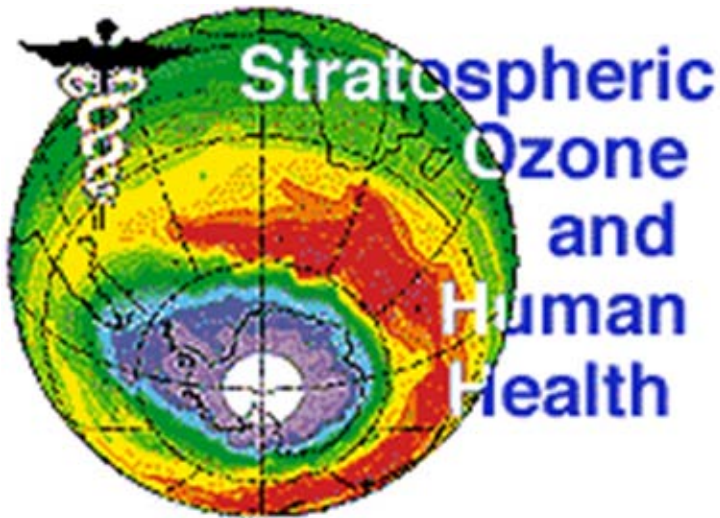


UV & Ozone Monitoring

Monitoring in Manitoba

- Churchill & Winnipeg

- 12 stations in Canada
- 300 worldwide



UV Index

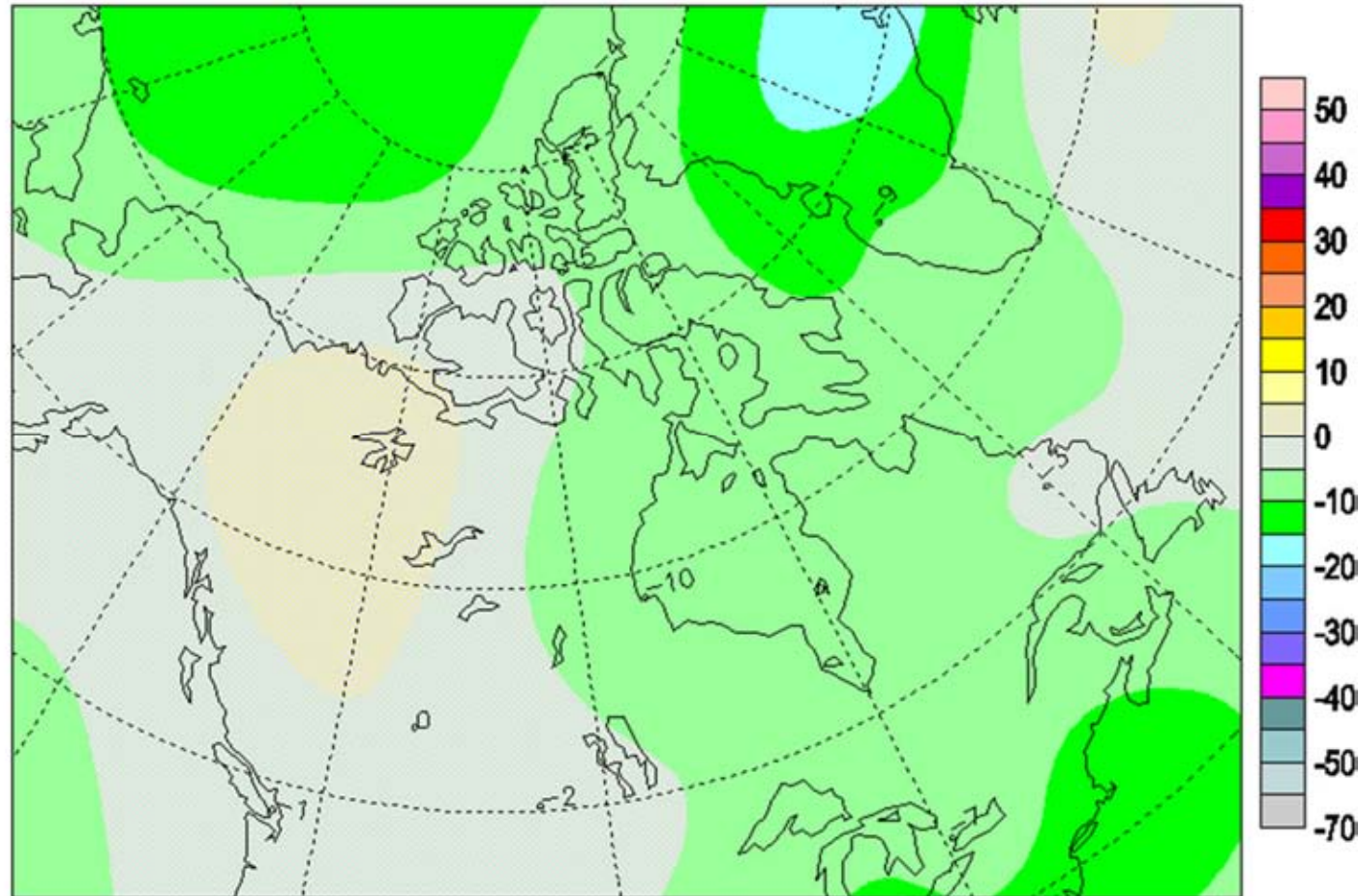
Exposure Category	UVI Range
Low	< 2
Moderate	3 to 5
High	6 to 7
Very high	8 to 10
Extreme	11+

<http://exp-studies.tor.ec.gc.ca/clf2/e/monitor2.htm>



Recent Observations

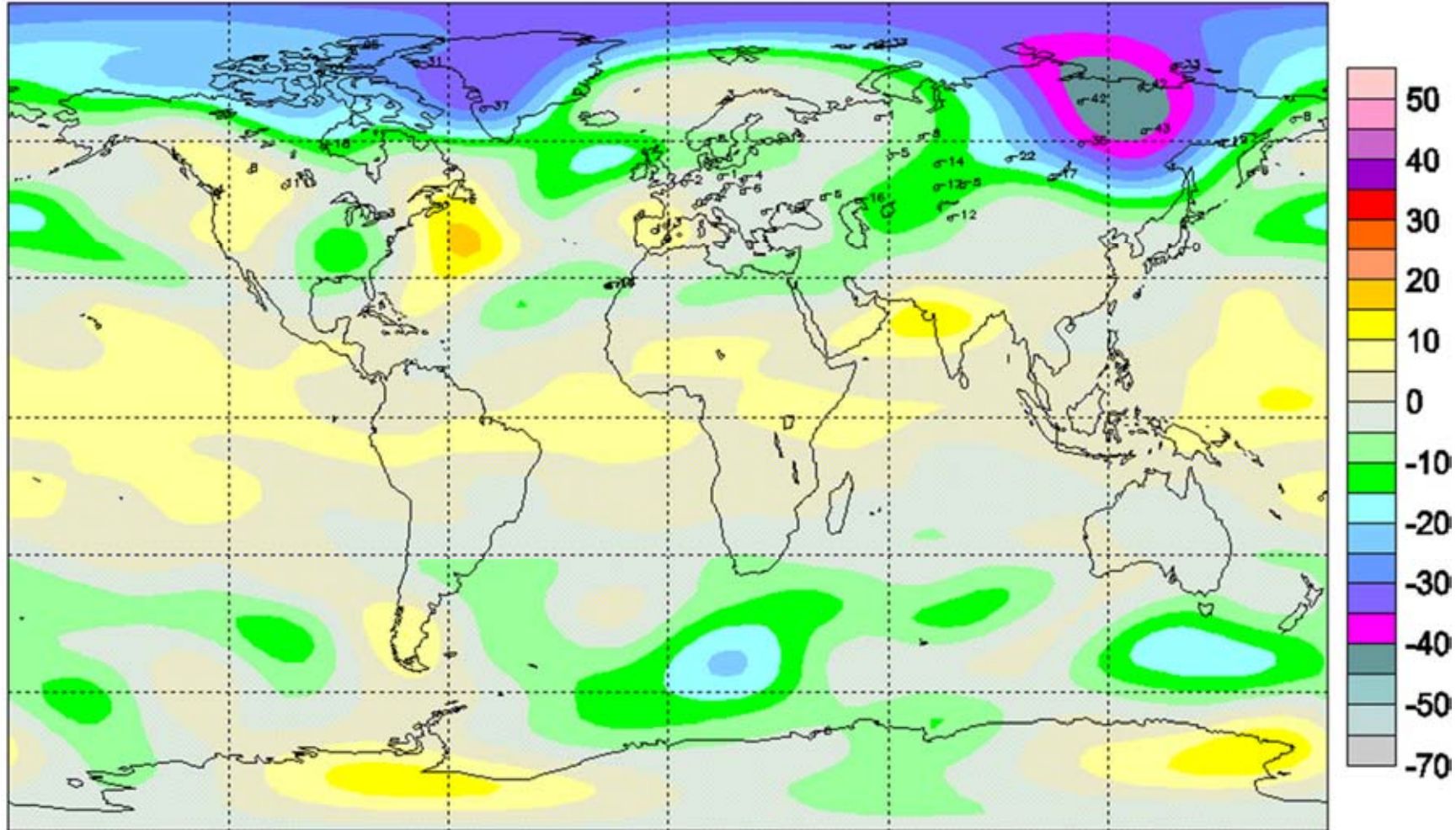
Deviations (%) / Ecart (%) , 2011/06/12



With the world-wide phase-out of ODS the A/C, Refrigeration and Fire Protection Industries are already taking steps to change systems to use non-ODS products through normal business activities

Global Ozone Loss

Deviations (%) / Ecart (%) , 2011/03/22



Regulated ODS and Replacement Products

- **Regulated Substances**

- **Class 1:** CFCs, Methyl chloroform, Carbon tetrachloride and Halons (all mixtures and isomers)
- **Class 2:** HCFCs (all mixtures and isomers)
- **Class 3: HFCs** and PFCs (all mixtures and isomers)
 - Other halocarbons or replacement products
 - Non-ODS, but are GHGs
 - Consistent requirements for replacement products

2,3,3,3-Tetrafluoropropene – April 2011

EPA acceptance www.1234facts.com

~~HFCs – no class – too new – to be classified~~





Impacts of ozone depletion - excessive UV radiation leads to

- New cases of skin cancer and eye cataracts (Canada 76,000+) – USE AN SPF OF 35+.
- Crop yields impacted from UV radiation over-exposure leading to less plant productivity
- Increased incidences of short and long term health effects leading to a loss of immunity to diseases
- Effects on biogeochemical cycles, aquatic ecosystems, air quality and materials, etc.

\$235 billion to implement 2-4 x
costly



Australia has the highest rate of skin cancer in the world. Two in every three Australians develops [skin cancer](#) at some time during their life. Skin cancer now accounts for over 80 per cent of all cancer diagnosed in Australia.

More than 440,000 Australians are diagnosed with skin cancer every year - 434,000 with non-melanoma skin cancer and 10,600 with melanoma. 21 million people. 6x higher than Canada.

Over 1600 people die from skin cancer each year.

Skin cancer costs the health system around \$300 million each year.

On a fine January day in Australia, you can get burnt in less than 15 minutes.

Each year, Australians are four times more likely to develop a common skin cancer than any other form of cancer.

Other Threats to the Ozone Layer

University of Colorado March 31, 2009

The global market for rocket launches may require more stringent regulation in order to prevent significant damage to Earth's stratospheric ozone layer in the decades to come, according to a new study by researchers in California and Colorado.

Future ozone losses from unregulated rocket launches will eventually exceed ozone losses due to chlorofluorocarbons, or CFCs, which stimulated the 1987 Montreal Protocol banning ozone-depleting chemicals, said Martin Ross, chief study author from The Aerospace Corporation in Los Angeles. The study includes research from the University of Colorado at Boulder and Embry-Riddle Aeronautical University.



Commitments to Protect Our Earth

1987 Montreal Protocol (World's 1st Global Climate and Ozone Treaty) Chlorine & bromine

- To prevent, reduce and eliminate release of ODS into the atmosphere to protect the earth's ozone layer
- Today, all nations, **196 countries** have ratified The Montreal Protocol

2005 Kyoto Protocol (Feb 16, 2005) 169 nations



Kyoto Protocol

The six gases:

- carbon dioxide (CO_2)
- methane (CH_4)
- nitrous oxide (N_2O)
- sulphur hexafluoride (SF_6)
- perfluorocarbons (PFC s)
- hydrofluorocarbons (HFCs).



Accomplishments to Date & on-going...

- Attend and actively engage with Parties at the Montreal Protocol and Kyoto Protocol Meetings.
- HFC aerosol issue has been raised with the world. They contain HFCs - GWPs.



- Medical CFC sterilants eliminated (1996)
- CFC Asthma MDIs inhalers and HFC targetted
- New Certification Training introduced January 2010
- MOPIA supports Tanning Bed restrictions - labelling Bill in the House of Commons

Indoor Tanning - Sun Beds Restrictions

2010 – WHO put indoor tanning beds in the highest cancer risk category.

BC Ban on use under the age of 18 (6/2/11) – unless for recognized medical purposes



List of Compulsory Trades in Manitoba

There are over 50 designated trades in Manitoba in which you can take apprenticeship training. **Nine** of these trades require compulsory apprenticeship training, meaning that to legally work in Manitoba, you must be a registered apprentice or a certified journeyman.

Construction Electrician**

Industrial Electrician**

Crane & Hoisting Equipment Operator (includes Mobile, Boom Truck and Tower Crane Operators)

Electrologist*

Esthetician (includes Skin Care Technician and Nail Technician)*

Hairstylist*

Refrigeration & Air Conditioning Mechanic

Sprinkler System Installer

Steamfitter - Pipefitter

Manitoba Apprenticeship Training Contacts

1010 - 401 York Avenue

Winnipeg MB R3C 0P8

Phone: (204) 945-3337

Fax: (204) 948-2539

Toll-Free: 1-877-978-7233 (1-877-97-TRADE)

Email: apprenticeship@gov.mb.ca



- **Compulsory Trades**
- **Is Certification Compulsory or Voluntary?**

- Occupations are classified as either compulsory or voluntary. Generally, compulsory occupations require workers to be certified or registered as apprentices in order for them to practice in the occupation.

In Manitoba, "**certified journeyperson**" means a person who holds a Certificate of Qualification issued by Apprenticeship Manitoba. "**Registered apprentice**" means a person who has signed a formal apprenticeship training agreement with his or her employer, and has registered that agreement with Apprenticeship Manitoba.

Refrigeration and air conditioning mechanics install, maintain, repair and overhaul residential central air conditioning systems, commercial and industrial refrigeration and air conditioning systems and combined heating, ventilation and cooling systems. They are employed by refrigeration and air conditioning installation contractors, various industrial settings, food wholesalers, engineering firms and retail and servicing establishments. Transport refrigeration mechanics are included in this unit group.



Over a Decade of Progress

- **1990 Manitoba ODS Act**
 - Enabling legislation to meet commitments under Montreal Protocol
- **1992 Manitoba ODS Regulation enacted**
- **1994 New ODS Regulation (MR 103/94)**
 - Manitoba a national leader in stratospheric ozone layer protection
 - MOPIA appointed to provide atmospheric protection information and technical service resources
 - MOPIA retains fees to administer and manage Manitoba's program
- **1995 Amending ODS Regulation (M.R. 128/95)**
- **1999 Manitoba ODS Act amended**
 - Enabling legislation to allow for the regulation of “replacement products” [i.e. HFCs (GHGs)]
- **2005 Amendments to the ODS Regulation (M.R. 178/05)**
 - Amendments consistent with Canada's NAP to phase-out CFCs and halons
 - Regulation name change to “Ozone Depleting Substances and Other Halocarbons Regulation”
- **2011?? Amdmts to the ODS Regulation / New Fed. Code of Practice**
 - under consideration based on stakeholder recommendations, EC, MP

HCFC Accelerated Phase-out

January 1, 1996 Beginning benchmark

January 1, 2004: Cap reduced by 35% of above

January 1, 2010: Cap reduced by 65% No new or HCFC 22 eqpmt manufactured or imported

January 1, 2015: Cap reduced by 90%

January 1, 2020: Cap reduced by 99.5%

January 1, 2030: Cap reduced by 100%



HCFC Phase-out

- **HCFC Alert: Montreal Protocol Parties Accelerate Phaseout of HCFCs**
- **In September of 2007, the Parties to the Montreal Protocol agreed to accelerate the phaseout schedule for HCFCs in developed countries including Canada. The Parties agreed to reduce HCFC consumption and production between 2010 and 2015 from 65% to 75% which restricts by approximately 20% the amount of HCFCs that would have been available between 2010 and 2015.**
- **Environment Canada is currently conducting consultation on these proposed changes to the ODS regulations in Canada and have indicated the changes to the Regulations will be completed sometime in 2009. Until that time, the regulations noted on this webpage are still in effect.**

More than 95% of commercial and residential air conditioning units and more than 50% of commercial refrigeration equipment in Canada operate on HCFC refrigerants (primarily R-22). Many commercial refrigeration units were converted to HCFCs from CFCs. By January 1, 2010, 65% of HCFC refrigerants currently imported into and manufactured in Canada on an annual basis will be eliminated from the supply chain and no HCFC-22 (R-22) equipment will be manufactured in or imported into Canada. These important environmental steps could create significant service and maintenance issues for the refrigeration and air conditioning (RAC) industry and their customers.

- The challenge for the RAC industry and equipment owners is to prepare for the orderly move from HCFC refrigerants to the many alternatives offered in the refrigeration marketplace. This is becoming more important when the typical life cycle of 10 to 30 years for HCFC equipment is taken into consideration. Based on these life cycle timeframes and the phase-out schedule for HCFCs, industry members and their customers need to be aware of the facts on the HCFC phase-out and the alternatives available when planning for future refrigeration and air conditioning equipment needs.



Declaration on the Global Transition Away From Hydrochlorofluorocarbons (HCFCs) and Chlorofluorocarbons (CFCs)

Recognizing that hydrofluorocarbons (HFCs) are replacements for ozone depleting substances (ODS) being phased out under the Montreal Protocol, and that the projected increase in their use is a major challenge for the world's climate system that must be addressed through concerted international action,

Recognizing also that the Montreal Protocol is well-suited to making progress in replacing hydrochlorofluorocarbons (HCFCs) and chlorofluorocarbons (CFCs) with low-GWP alternatives,

Mindful that certain high-GWP alternatives to HCFCs and other ODS are covered by the UNFCCC and its Kyoto Protocol and that action under the Montreal Protocol should not have the effect of exempting them from the scope of the commitments contained thereunder,

Interested in harmonizing appropriate policies toward a global transition from HCFCs to environmentally sound alternatives,

Encourage all Parties to promote policies and measures aimed at selecting low-GWP alternatives to HCFCs and other ODS,

Declare our intent to pursue further action under the Montreal Protocol aimed at transitioning the world to environmentally sound alternatives to HCFCs and CFCs.

Afghanistan, Antigua and Barbuda, Armenia, Austria, Australia, Bahamas, Bangladesh, Belgium, Belize, Benin, Bosnia and Herzegovina, Bulgaria, Burkina Faso, Cambodia, Cameroon, Canada, Colombia, Comoros, Congo, Cook Islands, Costa Rica, Cyprus, Czech Republic, Democratic Republic of the Congo, Denmark, Dominican Republic, Egypt, Estonia, European Union, Federated States of Micronesia, Finland, France, Gabon, Gambia, Georgia, Germany, Ghana, Greece, Haiti, Hungary, Indonesia, Iraq, Ireland, Italy, Japan, Kazakhstan, Kyrgyzstan, Latvia, Liechtenstein, Lithuania, Luxembourg, Madagascar, Mali, Mauritius, Macedonia, Malta, Mexico, Montenegro, Mozambique, Myanmar, Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Palau, Philippines, Poland, Portugal, Republic of Moldova, Romania, Saint Lucia, Sao Tome and Principe, Senegal, Serbia, Slovakia, Slovenia, Spain, Somalia, Sri Lanka, Sweden, Switzerland, Timor-Leste, Togo, Tuvalu, Uganda, United Kingdom, United States of America, Vietnam



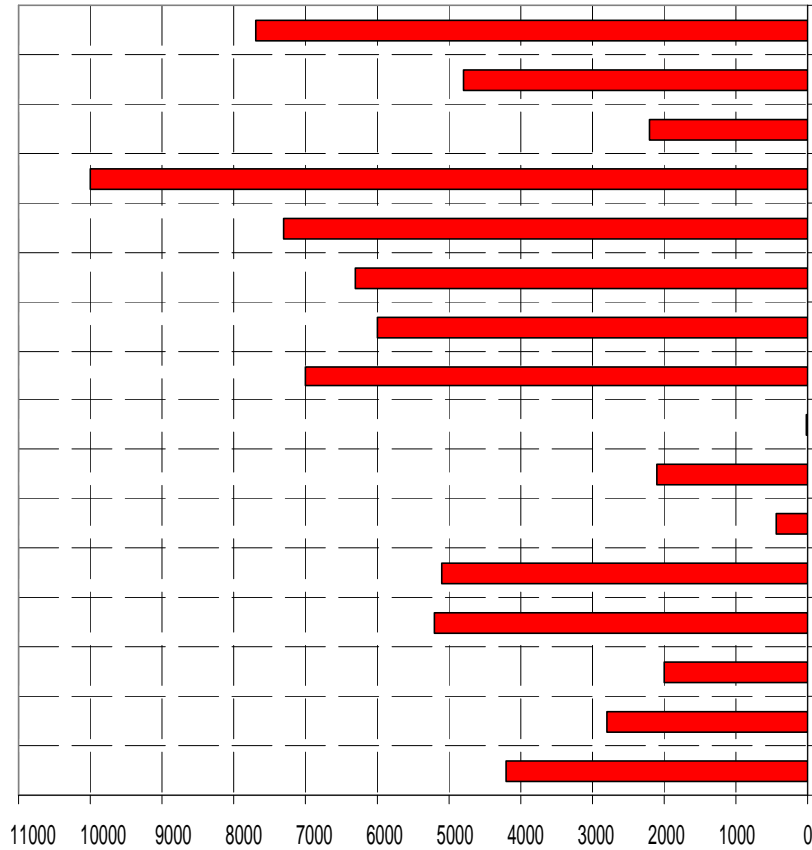
At this time, HFCs contribute less than 1% towards climate change. Their use is growing rapidly. The most conservative predictions are that HFCs will increase to a 7-12 % contribution to global warming. HFCs are far more potent than CO₂, some types being thousands of times for potent. Even a small increase in HFC use can have an enormous impact on climate change.

It appears to be inevitable that HFC use will increase. Though most CFCs have been phased out, the process has only begun for several other ozone depleters, the HCFCs. The Montreal Protocol , doesn't end HCFC use until 2030.

The IPCC estimates that HFCs will be triple their 2002 level in 2015. Some studies demonstrate that continuation of HFC emissions will result in them becoming as much as 45% of all greenhouse gas emissions by 2050⁽¹⁾.

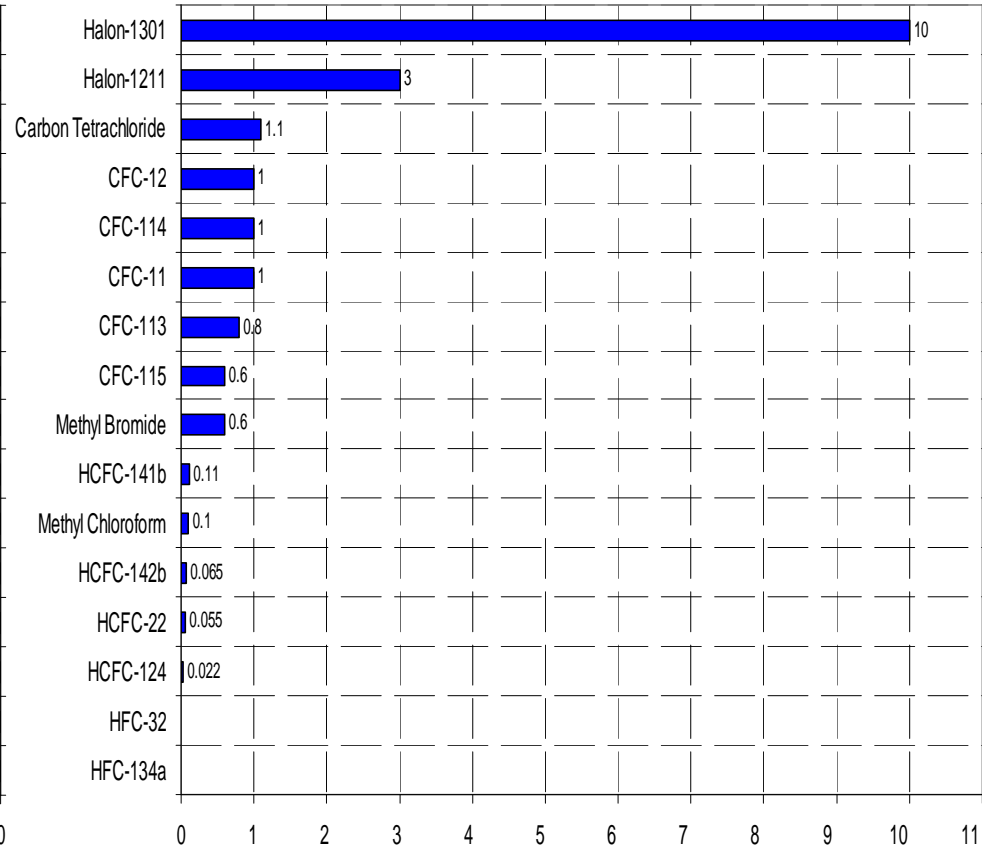


Climate Change/Ozone Depletion



Global Warming Potential (20 Year, CO2 = 1)

(Source: Scientific Assessment of Ozone Depletion)



Ozone Depletion Potential (CFC-11 = 1)

(Source: The Montreal Protocol)



HFC Phase-down or Out

- Proposals to Phase-down HFC's or Phase-out HFC's will be introduced at the 23rd Meeting of the Parties in November

Next Generation Refrigerants



HFC or HFO 1234yf

On July 23, 2010, [General Motors](#) announced that it will introduce HFO-1234yf in 2013 Chevrolet, Buick, GMC and Cadillac models in the U.S

R744 CO₂ Hydrocarbons



Fridge & Ice Cream cooler running on Hydrocarbons = propane/butane



White Goods Efforts



- Municipal Guidelines
- Consumer Awareness Information
- Waste Management Best Practices
- White Goods Awareness Poster
- NEW* Hydrocarbon fridges coming to Canada/NA GE app. To EPA June 2011 expected

Fridge Recycling in Europe



Hydrocarbons....

Can not cross fill (contaminate) or vent 134a etc.



Chillers – Permits for CFC use



Chiller Requirements

Chiller: Air-conditioning or refrigeration equipment having a compressor, evaporator and secondary refrigerant

Compressor Purge Systems

- Restriction on operation of compressor purge systems
 - high efficiency systems only
 - release limit of 0.1kg/kg air

Class 1 (CFC) Chiller Permit Required by Owners/Operators

- Persons who own or have care and control of a building, structure or part of a building or structure where a CFC-chiller is installed
- Permit to be obtained for continued operation - \$50
- Service technicians may not service CFC-chillers unless a valid permit is in place
- Class 1 (CFC) Chiller Permit expires following a major overhaul or by December 31, 2014

CFC-Chillers Continued

Class 1 (CFC) Chiller Recharge Ban Effective

- Chillers cannot be recharged with a CFC refrigerant if it undergoes a major overhaul
- Major overhaul includes:
 - Replacement or modification of an internal sealing device.
 - Replacement or modification of an internal mechanical part other than
 - an oil heater,
 - oil pump,
 - float assembly, or
 - vane assembly, in the case of a chiller with a single-stage compressor
 - Any procedure or repair that results from the failure of an evaporator or a condenser heat exchanger tube.
- Chiller is to be concurrently converted to operate with an alternate refrigerant, decommissioned or replaced.
- No recharging with CFCs after **December 31, 2014**.
- Chiller may be refilled once provided the failure is an immediate threat to human life or health, and the chiller is converted or replaced within one year of the refill date

HCFC 22 Alternatives

- There are several refrigerants that do not cause the depletion of the ozone layer and that can be used as the alternatives for R22. Some of these are R-134a, R-507, R-404A, R-407c, MO 99 and R-410A. Refrigerant 507 is the azeotropic mixture comprising 50% of R-125 and 50% of R-134a. Refrigerant 407C is the mixture of 23% of R-32, 25% of R-125, and 52% of R-134A.
 - For the air conditioning applications the best choice available in the market is R-410A and for refrigeration applications the best choices are R-404A and R-507.
 - With the availability of the new refrigerants it is the duty of the contractors to recommend to their customers to switch over to the alternative refrigerants that are 100% non-ozone depleting in nature and that they are not subject to phase out. The contractors should preferably recommend the refrigerants that are more efficient than R22 since they would require less electricity and will save the utility bills.
 - <http://www.epa.gov/ozone/snap/refrigerants/qa.html>
Read more:
<http://www.brighthub.com/engineering/mechanical/articles/62099.aspx#ixzz1NaInwfa9>
-

MO 99

- DuPont™ ISCEON® MO99™ (R-438A) is the most versatile R-22 replacement refrigerant in the ISCEON® product line. It combines R-22 pressure-enthalpy characteristics with mineral oil compatibility in a unique HFC refrigerant that can be used in R-22 replacement over a wide range of evaporator temperatures.

As an R-22 replacement, ISCEON® MO99™ may be used in a wide range of applications and has advantages over other R-22 replacements. ISCEON® MO99™ has been designed to closely match the pressure, temperature, enthalpy, and mass flow properties of R-22, for a seamless R-22 replacement. ISCEON® MO99™ has a 42% lower global warming potential (GWP) than R-404A.

ISCEON® MO99™ matches R-22 in terms of capacity and efficiency in most systems, but with a significantly lower discharge temperature which may prolong life of the compressor. It's compatible with traditional and new lubricants, providing quick, cost-effective R-22 replacements and can be topped off during service without removing the entire refrigerant charges.

For most R-22 systems, when retrofitting to ISCEON® MO99™ all you need to do is recover the R-22, replace critical seals, charge refrigerant, restart and monitor for leaks, and you're done. R-22 replacement can't get any easier.



Emerging – Into the Future...

- Emissions from automotive air-conditioning are a growing concern because of their impact on climate change. Beginning in 2011 and on, the European Union will phase out refrigerants with a global warming potential (GWP) of more than 150 in automotive air conditioning (GWP = 100 year warming potential of one kilogram of a gas relative to one kilogram of CO₂). This will ban potent greenhouse gases such as the refrigerant HFC-134a – which has a GWP of 1300 – to promote safe and energy-efficient refrigerants. One of the most promising alternatives is the natural refrigerant CO₂ (R-744). Carbon dioxide is non-flammable, non-ozone depleting, non-toxic and has a global warming potential of 1. R-744 can be used as a working fluid in climate control systems for cars, residential air conditioning, hot water pumps, commercial refrigeration, and vending machines.



CO₂ coolers coming.....

- CO₂ coolers are coming to North America in a big way this year. The new ozone and climate friendly refrigerant coolers are being introduced by both Pepsi and Coca Cola. , The CO₂ coolers are designed to eliminate up to 99% of the direct green house gas (GHG) emissions by means of using refrigerant R744. Some include an intelligent energy management system (EMS-55) that cuts energy use by an average of 26% and reduce indirect green house gas emissions by more than three tons over the lifetime of the machine.

•

Some 1,800 Coca-Cola coolers and vending machines will be deployed throughout the USA and here in Canada. Most of the coolers were destined for Vancouver, where 1,400 climate-friendly coolers and vending machines were installed at the venues for the 2010 Olympic Winter Games.



Refrigerant Destruction

- Refrigerant Management Canada - 2.2 M Kg.



Extended Producer Responsibility

- **Product Stewardship**

- Sellers take back of Class 1, 2 and 3 substances
- Continue to store surplus stocks until it can be destroyed in an appropriate manner
- Refrigerant Management Canada (RCM) established an industry-led stewardship program in 2001 for the proper management, collection and destruction of surplus CFC and HCFC refrigerants
 - Chillers and Commercial (Stationary) equipment
 - Voluntary environmental levy (\$1.50/kg of HCFC)
 - Collected over 2.2 million kgs of high and low pressure surplus refrigerants (2010)
 - Total of 1,000,000 kgs of refrigerant waste destroyed
 - Destruction capabilities at Earth Tech in Swan Hills, AB and Onyx Environmental facilities in Texas and Illinois





Penalties are among the highest!

Enforcement: Environment Canada and
Manitoba Conservation = Environment Officers

Persons:

- 1st Offence – up to \$50k and/or up to 6 months imprisonment
- 2nd Offence – up to \$100k and/or up to 1 yr imprisonment
- Up to \$1k per day
- Pay restitution and/or compensation etc....

March 7, 2011: Environment Canada reported that following an investigation, some 5,315 cylinders of HCFC-22 have been seized from a warehouse in Saint-Jerome, Quebec as the products were illegally imported into Canada. The company Gestion Alexis Dionne Inc. has been charged with 4 counts of illegal importation under Canada's ODS Regulations, 1998.

See: www.ec.gc.ca/default.asp?lang=En&n=714D9AAE-1&news=497692DD-50E5-4BDB-B3E6-709714BC4005



Upcoming Events

- **23rd Meeting of the Parties to the Montreal Protocol – Bali, Indonesia, November, 2011**
- **Kyoto Protocol (17th COP) Durban, South Africa November/December 2011**



Questions & Comments

More information:

www.mopia.ca

[Email: mopia@mts.net](mailto:mopia@mts.net)

www.unep.org/ozone



<http://exp-studies.tor.ec.gc.ca/e/ozone/ozoneworld.htm>

www.gov.mb.ca/conservation/pollutionprevention/ods

www.gov.mb.ca/chc/statpub/

http://www.weatheroffice.gc.ca/forecast/textforecast_e.html?Bulletin=fpcn48.cwao

www.hraj.ca/rmc

Major overhaul defined con't

- **What is an overhaul of a chiller?**

The objective of the CFC refill prohibition effective upon the major overhaul of chillers is to achieve an orderly transition from CFC-containing chillers to alternative substances and technology. The term “overhaul” is intended to apply to significant repairs or maintenance procedures, such as:

- the replacement of any internal sealing devices (i.e. gaskets, o-rings);
- the replacement of any internal mechanical moving parts (i.e. impellers, shafts, bearings and hermetic motors); or
- the repair of an evaporator or condenser heat exchanger tube failure.



Supplemental Slides



Certificate & Permit Requirements

Service Technician Certificates

- Mandatory environmental awareness training for A/C, Refrigeration and Halon technicians
- Annual renewal fee: \$25
- Certification renewal date June 1st
- Certification is not transferable and wallet size cards are issued annually (5,000 +)
- Service technicians handling HFCs require certification

Secondary Distributor Permits

- Purchasers or importers of regulated substances or new/used refrigeration or A/C equipment, parts or components connected to closed refrigerant loop
- Annual renewal fee: \$50
- Annual renewal date – January 1st
- Permits issued annually (250 +)
- Controlled sales for distributors or technicians



ODS Regulatory Requirements

- Prohibit releases of all ODS and including Class 3, HFCs or replacement products
- Mandatory recovery/recycling and emission controls
- Leak reporting (10kg/22lbs)
- No recharging, topping-up or dropping-in alternatives to systems without first conducting a leak test
 - no leak testing with regulated substances
- CFC and halon refill bans (cars, fire systems)
- Mandatory use of refillable cylinders for regulated substances purchased, sold or transferred
- Mandatory recovery from equipment before disposal
 - ARI Standard 740-98 *Refrigerant Recovery/Recycling Equipment*
 - includes fridges and motor vehicles



**Example of recovery from vehicles
MPI Refrigerant Recovery**



CFC Phase-Out

- **Existing ODS refill/use bans**
 - Portable fire extinguishers (1994)
 - Sterilants (1996)
 - Solvents (1996)
- **CFC Refill ban for equipment**
 - **Mobile Refrigeration**
 - **Commercial (Stationary) Refrigeration and Air-Conditioning**
 - **Mobile (Vehicle) Air-Conditioning**
 - prohibit refilling with CFCs and HCFCs
 - older than 1995
 - **White Goods or Domestic Appliances exempt**
 - enhance existing recovery programs

CFC Refill Ban & Equipment

When does CFC refill ban become effective?

- CFC refill ban - effective now
- Can continue operation of equipment until it requires service or repair
- following service or repair, the equipment is to be decommissioned, converted or replaced to use an alternative refrigerant

Other regulatory requirements for CFC equipment

- No modification of air conditioning and refrigeration equipment or a white good to use CFCs
- No new installations of air conditioning and refrigeration equipment requiring CFCs