

International Workshop on Managing Perfluorinated Chemicals and Transitioning to Safer Alternatives

12-13 February 2009
Geneva, Switzerland

Draft Workshop Summary

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Introduction & Outline

Participants from countries around the world, industry, environmental groups, intergovernmental organizations and academia gathered 12-13 February, 2009, in Geneva, to explore opportunities for reducing exposure to, as well as making a transition from, perfluorooctyl sulfonate (PFOS), perfluorooctanoic acid (PFOA), PFOS and PFOA precursors and related higher homologue chemicals. Summaries of presentations and discussion with each Workshop session follow. These endeavor to capture highlights from the agenda, which is also appended to this summary, along with key points from the Workshop. Specific presentations and other materials, e.g., agenda, participants list, etc., are available online at the [Workshop website](#). Following session summaries, themes that emerged from the break out groups along with next steps are outlined. This includes how the Workshop may feed into a background INF document, potential cooperative actions and/or a resolution for consideration by ICCM2 and consistent with SAICM guidance and discussions on emerging policy issues. These documents will be circulated and/or posted along with this Summary for review and comment from Workshop participants, attendees and other interested parties in the near term. A timeline will also specify desired timing for feedback. Also noteworthy was the announcement that a side event on this topic will also occur early on during the ICCM 2 agenda.

Overview of PFCs: Origin, Fate and Concerns

The overview provided an in-depth review of the state of the science, issues associated with these chemistries, key findings, and emerging concerns. Properties of perfluorinated chemicals (PFCs) are unique and desirable in many applications for their water, stain and oil repellency. However, there is no known degradation of PFOS and PFOA, which are among the ultimate degradant products of PFOS-related and PFOA-related chemicals, making these chemicals one of the most persistent chemicals known. PFOS and PFOA are globally distributed in the environment and humans, and have long half-lives in humans that are measured in years. As a result of changes in manufacturing and use, major reductions of PFOS and PFOA in human blood have been measured in U.S. and some European countries. There is additional ongoing research to learn more about sources, fate, and pathways of exposure to PFCs. Furthermore, there is parallel research on reactive PFC intermediates for potential toxicities, exploration of the properties of perfluorinated phosphate acids (PFPA) and other per- and poly-fluorinated chemicals, and research on degradation of fluorinated polymers, a large potential source of PFCs production.

International Activities

Internationally, the Stockholm Convention secretariat reviewed the nomination status of PFOS and perfluorooctanesulfonyl fluoride (PFOSF), the primary intermediate for synthesis of PFOS and PFOS-related substances, for listing under either Annex A or B of the Convention, which will be considered at the next Conference of the Parties in May, 2009. Several issues associated with the listing were noted, including PFOS' uses in processes versus products, confidential business information (CBI), exemptions, acceptable uses, and alternatives. Information sharing and capacity building with policy formulation, implementation, and technology conversion were highlighted as needs for developing countries while the listing would also enable access to financial assistance.

The Organization for Economic Cooperation and Development (OECD) reviewed progress with recommendations as a result of the 2006 Workshop on Perfluorocarboxylic Acids (PFCAs) and Precursors. An internet platform on sustainable ("green") chemistry will soon be posted along with harmonized bioaccumulation test methods for PFCs. An update was also provided on earlier survey results along with plans for a near term updated survey soon to be circulated for completion. Notable feedback showed a dramatic decline in production volume of PFOS from 2004-2006, while volumes of PFCA precursors increased. A 2009 survey will endeavor to collect more reliable data on the production and use of PFCs, including information from producers on environmental releases of targeted substances from manufacturing and the content of targeted substances in products. The OECD was further encouraged to follow-up on additional recommendations, particularly to engage non-participating countries in this work, and to also consider how its work might inform or be coordinated with the Stockholm Convention Secretariat.

Country/Regional Regulatory Actions & Risk Management Activities

The Workshop highlighted risk management activities across governments. A number of common features could be found with several regulatory actions, for instance, with respect to restrictions and exemptions or derogations for certain essential uses where alternatives may not

currently exist. Programs also indicated that additional research and monitoring was ongoing in several countries to inform assessments and future potential actions and safer alternatives. For instance, U.S. EPA is conducting research on telomer biodegradation, toxicology and pharmacokinetics, and analytical techniques including aged article analysis. EPA has also issued provisional health advisories for PFOA and PFOS to protect against potential risk from exposure to these chemicals through drinking water. Canada showcased how assessments to date of new notified substances with alternative chemistries have not been suspected to be toxic under their authorities. Australia relayed how safe handling and use information were provided in Material Safety Data Sheets (MSDS) and also shared results of a hazard assessment with potassium perfluorobutane sulfonate (PFBS), a four-chain length carbon compound. This assessment led Australia to develop definitions of and limit uses to non-dispersive applications, similar to restrictions in EPA consent orders with companies. The European Commission reviewed how current restrictions are being transferred to its REACH regulation and also elements of its research programme, including a PFOA risk assessment. Japan has conducted extensive environmental monitoring, published an environmental risk assessment in March 2008, and added PFOS to its Pollutant Release and Transfer Register (PRTR) for annual reporting. China has experienced increased production of PFOS as a result of withdrawal of PFOS production from U.S. and European markets, and while there is no control for existing substances registered on its inventory, it is implementing EU requirements for PFOS in certain applications. Noted challenges include test methods, controlling market demand, risk management, alternative technologies, increased public awareness and guidance for industry. Strengthening cooperation on capacity building, import and export figures and health effects were some of the suggestions discussed by the workshop.

Country Stewardship Programs

The second day of the workshop introduced features and progress of two country-led PFOA stewardship programmes. The U.S. programme includes eight major companies and commitments to achieve no later than 2010, 95% reduction in both emissions from facilities to all media and product content of PFOA, PFOA precursors, and related higher homologue chemicals measured from a year 2000 baseline, and to work toward elimination of these chemicals from emissions and products by 2015. These commitments include reductions to be achieved not only in the U.S., but also through companies' global operations. Programme does not specify how reductions should be achieved so that companies have flexibility to meet goals through a variety of strategies, e.g., treatment and control technologies, process changes, product reformulation, and new chemical/product development. To date, many companies are meeting initial targets ahead of schedule. Noteworthy measurable progress has been achieved to date, as evidenced by reduction in the geometric mean for PFOA and PFOS in blood, by was reduced by 25% and 32%, respectively, from 1999/2000 to 2003/2004 in a representative sample of the U.S. population. Canada has embarked on a similar stewardship and will launch the program in the next few months. The programme intends to include all companies that import products containing PFCs into Canada. A positive aspect of stewardship programmes is the ability to drive early action prior to the completion of full assessments of chemicals and such action can also further inform latter risk management actions. Principles and design criteria for the development of such programmes were also informative, e.g., clear objectives and measureable results. Several comments on stewardship activities included its relationship to risk management actions, ensuring that the information provided is accurate while also verifying what's reported, harmonizing requirements for products, considering how new substances or low volume/release substances might be included along with labeling or aspects of extended producer responsibility in the future.

Additional concerns related to developing countries included levels of awareness, the need for global action perhaps through the upcoming second session of the International Conference on Chemicals Management (ICCM2), and with the need for potential clean-up of contaminated sites.

Company Efforts to Reduce Exposure

Principal companies in the perfluorinated industry provided insights on the history of these chemicals, technologies to achieve reductions and the development of alternatives. 3M/Dyneon developed capture and recycling capabilities, granular activated carbon to treat water and groundwater and are also studying reverse osmosis. DuPont has pursued similar reductions across environmental media including scrubbers to reduce emissions to air, pre-filtration associated with water discharges and industrial incineration of waste streams. Product content and byproduct reductions are also being pursued. Emission and product content reduction technology have been included in a new facility in China and some control technology is offered for licensing royalty free. Some of the investments in these releases reach up to \$100 million USD. Discussion raised concerns about possible occupational exposures, and it was noted that 3M and DuPont are conducting extensive monitoring and looking for health effects. Another question asked whether companies might get out of fluorine chemistries altogether whereby it was noted how this experience had lead one company to create a new policy to carefully evaluate all persistent, bioaccumulative and toxic chemicals.

Transitioning to Alternatives

With regard to alternatives, U.S. EPA has reviewed over 100 new chemicals by end of 2008, and is taking an integrated approach to testing of chemicals to speed the development of data needed to understand issues and concerns that may be presented. EPA expects the value of all testing to be more than \$25 million USD. Data on the C4 sulfonate and the C6 acid have shown different pharmacokinetics (shorter half-life) and lower toxicity than PFOA and PFOS. Leading companies relayed their efforts to develop and bring viable alternatives to market. 3M reviewed how PBT analyses, use of existing equipment, customer acceptance, and the potential for competitive advantage as important considerations. Its PFOS alternative, PFBS, has undergone extensive testing, applications are generally non-dispersive, and PFBS-based products can be used in protective treatments and surfactants. Ammonium perfluorooctanoate (APFO) is no longer used by 3M/Dyneon and has developed a replacement for APFO in production of fluoropolymers by emulsion polymerization. The performance of the alternative is equal to APFO and has a favorable environmental, health, and safety profile, i.e., low toxicity, rapid elimination, etc. DuPont's alternatives program is accelerating the development of next generation technologies, including fluoropolymers made without PFOA and short-chain fluorotelomer products. Asahi highlighted how its shorter chain (C6) telomer products were commercialized in 2006 and have obtained regulatory approvals. Their polytetrafluoroethylene (PTFE) will also be made with an APFO alternative for commercialization early in 2009. This has secured regulatory approvals in Japan, the U.S., and has been registered under REACH for the EU. Daikin also employs a range of design parameters for alternatives of APFO as the surfactant in polymer production including less biopersistence, less overall toxicity, drop-in replacement and compatibility with the existing emission control technology. The result is that 50% of the polymer product line has already been replaced. An in-depth textile example was highlighted to show how polymer systems and performance are evaluated. Daikin is on track to cease manufacturing, use and sales of PFOA and C8 telomer products by 2012. A discussion on

how alternatives could further be encouraged along with potential concerns from various research articles and waste or stockpiles with old products ensued. Opportunities for cooperation to further encourage safer alternatives could be facilitated through regulatory incentives and intergovernmental organizations, such as through the OECD's mutual acceptance of notification (MAN) project.

Opportunities and Observations to Engage Countries and Companies to Promote Stewardship and Alternatives

A final panel reviewed the relationship to other international partnership activities, observations from the prior workshop on stakeholder needs for information on chemicals in articles/products and with upcoming preparations on emerging policy issues under the Strategic Approach to International Chemicals Management (SAICM) for ICCM2. UNEP relayed how experience from its Global Mercury Partnership, among others, might offer useful considerations and a model for further cooperative action on perfluorinated chemicals. For instance, its Partnership principles, similar to those employed by Canada in the development of its Stewardship Programme, could guide further work. An advisory group and other tools, such as listings of best available technologies (BAT) and best environmental practices (BEP), might offer constructive elements to help raise awareness, share information and build capacity. The initial workshop on stakeholder needs for information on chemicals in products included several parallels with the workshop on PFCs. On top of the need for more data and information on viable alternatives, the involvement of actors along the supply chain, need to influence demand with end users and consumers and the need to translate information so that it is more understandable to lay audiences were noted. The formation of a workgroup to further scope out a proposal for an information system(s) including other pertinent activities was a conclusion of the first workshop to be considered by ICCM2. The SAICM Secretariat then reviewed the state of play on emerging policy issues and its preparations for ICCM2. While PFCs are not among the four emerging policy issues slated for the ICCM2 agenda, a side event is included during ICCM2 and PFCs may also be raised by participants during the requisite portion of the ICCM2 agenda. A number of draft background documents and proposed cooperative actions or resolutions are being posted on the SAICM website for review and comment by interested participants by early March. In addition to this, the Secretariat highlighted that responses to invitations to ICCM2 are also requested by 9 March.

Break-out Sessions & Major Themes

Following the above extensive panels and discussions, four concurrent break-out sessions explored in-depth some of the challenges and potential paths forward on PFCs stewardship and transitioning to safer alternatives. Questions utilized and inputs from these sessions are appended to the meeting summary and include recommendations from Workshop participants to overcome potential barriers, set and obtain goals, and engage countries, companies and stakeholders to promote broader stewardship and alternatives of PFCs. Several major themes emerged from these sessions and other discussions with the panels including:

- **More information is needed though it is already sufficient to warrant necessary cooperative action**
 - PFCs are persistent and have widespread presence in humans and environment

- What's in commerce (including products), precursors and their contribution (including polymers), the range of PFCs including degradation products, and available alternatives
- The most significant routes of human exposure – why/how in human blood, mechanisms of action, human health and environmental effects, hazard, toxicological information, bioaccumulation, fate – especially in the food chain
- Information to inform constituents in products, reused and recycled products, end-of-life waste, stockpiles and clean-up with facilities in order to avoid shifting impacts to developing countries
- Research on how best to handle products already manufactured and prioritize their management
- **Continue to raise and broaden awareness**
 - Compile research findings, government actions, assessments, analytical techniques, etc., via clearinghouse(s) or information portal(s)
 - Utilize or create mechanisms to share information along the supply chain and life cycle, from producers to users to retailers and consumers
 - Convert and/or translate information so that it's more user friendly to lay audiences and to inform decision making along the value chain and by consumers
- **Enhance application of technologies to reduce exposure and monitoring activities**
 - Significant emissions have been reduced (e.g., 90% with PFOA for several companies) in a few years through technologies, e.g., activated carbon, wet scrubbers, etc.
 - Need options to increase more widespread applications, e.g., through licensing, etc.
 - More monitoring needed in developing countries along with capacity to conduct analyses
 - Understand and reduce pathways, precursors, impacts across the life cycle
- **Tap supply and demand to facilitate transitioning to alternatives**
 - More information on alternatives from both manufacturers and governments including potential geographic availability and technical, economic, health, safety and environmental aspects
 - Participate in OECD parallel process/mutual acceptance of notification
 - Need to move beyond information dissemination, e.g., influence demand, consumer labeling, product disclosure, Montreal Protocol-type regulation, assessment reports, work to develop PFC-related and non-halogenated alternatives
 - Engage downstream users and corporate and international purchasing specifications and extending programs across sectors
 - Need to ask whether the function/use and need is essential, could also consider other materials, product re-design, non-chemical alternatives, for instance, as prompted by elements of the REACH regulation or concept of no data no market
- **Need for international engagement with stakeholders and a range of cooperative actions**
 - Engage all players (governments, industry & downstream users, NGOs, IGOs) into the dialogue

- Improve information sharing and coordination across regulatory agencies, with regulatory actions, inventories, categorization/prioritization, and at the national, regional, e.g., NAFTA, and international levels, e.g., OECD plus other interested countries, SAICM focal points
- Follow-up on and expand the work of intergovernmental organizations (IGOs)
- Implement OECD recommendations and expand OECD survey to enhanced engagement countries
- Develop phased action plan(s), address existing production and uses considering the economics and feasibility with industry
- Inform possible listings under the Stockholm Convention (although PFOA is not sufficiently bioaccumulative by conventional bioaccumulation tests) or Rotterdam Convention
- Implementation alongside other partnership-type programs, e.g., UNEP mercury under UNEP chemicals, to also facilitate information exchange and monitoring
- Extend the U.S.-Canadian PFOA Stewardship Program model to producers globally and in balance with other regulatory actions

Next Steps

The outcomes of Workshop presentations, panel discussions and input from break out sessions will inform next steps in the lead up to and for consideration by the Conference at ICCM2. A revised background or INF paper will be developed for review and comment that follows guidance from the SAICM Secretariat on emerging policy issues. Accompanying this updated background will be a series of proposed cooperative actions and a possible resolution for consideration by the Conference at ICCM2. To aide interested Workshop attendees and interested SAICM participants tracking emerging policy issue, a timeline or schedule for providing feedback on these papers will also be shared. Hopefully, these materials can be posted on the SAICM website and will otherwise be circulated to SAICM focal points for notice, review and comment as soon as possible. It is anticipated that this will be a fairly ambitious schedule in order to mirror other emerging policy issue schedules in preparation for ICCM2. Finally, Workshop presenters and attendees will also be included in circulations to ensure that they are also aware of next steps and can provide additional feedback in follow-up to the Workshop.

More Information, Links & Contacts

Presentations and background papers associated with the Workshop:

http://www.chem.unep.ch/unepsaicm/cheminprod_dec08/PFCWorkshop/default.htm#MtgDocs

SAICM emerging policy issues workplans, background papers and proposed cooperative actions and resolutions for review and comment in the lead up to ICCM2:

<http://www.saicm.org/index.php?menuid=9&pageid=340&submenuheader=>

Follow-up Questions on the PFCs Workshop and Associated Activities:

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APPENDICES

Workshop Agenda

International Workshop on Managing Perfluorinated Chemicals and Transitioning to Safer Alternatives

February 12 & 13, 2009

Geneva, Switzerland

Goals of the Workshop

Explore opportunities for reducing exposure to, as well as making a transition away from perfluorooctyl sulfonate (PFOS), perfluorooctanoic acid (PFOA), PFOS and PFOA precursors, and related higher homologue chemicals.

More information

http://www.chem.unep.ch/unepsaicm/cheminprod_dec08/PFCWorkshop/default.htm

Day 1: February 12, 2009

AFTERNOON SESSIONS		
14:30 – 14:45	Welcome, Introduction and Scene Setting	UNEP and Sponsors
14:45 – 15:30	Overview of PFCs: Origin, Fate, and Concerns	Scott Mabury, University of Toronto
15:30 – 15:45	PFOS under Stockholm Convention	Fatoumata Keita Ouane, Stockholm Convention Secretariat
15:45 – 16:00	SAICM & Overview of Emerging Policy Issues	Lesley Onyon, SAICM Secretariat
16:00 – 16:30	Implementation of Recommendations from the 2006 OECD Workshop on PFCs and Precursors; overview of 2006 and 2009 OECD Surveys on PFCs	Henrik Harjula, OECD
	OECD 2006 Survey on the Manufacture, Import and Use of PFOS, PFAS, PFOA, PFCA and Related Substances & Products/Mixtures containing these Substances	Kerry Nugent, NICNAS
16:30 – 16:45	<i>Break</i>	
16:45 – 17:55	Session 1	
	Country/Regional Regulatory Actions and Risk Management Activities on PFCs	
	U.S. Regulatory Actions and Risk Management Activities on Perfluorinated Chemicals	Toni Krasnic, U.S. EPA
	Polyfluorinated Substances: Regulatory Activities under the Canadian Environmental Protection Act	Ruben Gandia, Health Canada
	Regulatory Actions and Risk Management Activities on PFCs in European Union	Peter Korytar, European Commission
	Regulatory Actions and Risk Management Activities in Australia	Kerry Nugent, NICNAS
	Current Regulatory Activities on PFCs in Japan	Kunihiko Yamazaki, MOE, Japan
PFOS related actions in China	Han Wenya, MEP FECO	
17:55 – 18:00	Day 1 Summary & Preparations for Day 2	John Shoaff, U.S. EPA

Day 2: February 13, 2008

MORNING SESSIONS		
09:00 – 09:10	Overview of Morning Sessions	Kevin Munn, UNEP
09:10 – 09:50	Session 2	
	What are some country stewardship activities on PFCs?	
	2010/15 PFOA Stewardship Program	Toni Krasnic, U.S. EPA
	Canada's Stewardship Program	Lyne Monastesse, Environment Canada
09:50 – 10:20	Session 3	
	What are companies doing to help reduce exposure to PFCs? What <i>technology</i> is available to reduce releases and product content? What are their costs and transferability?	
	PFC Exposure Reduction Activities at 3M and Dyneon LLC	Michael Santoro, 3M
	DuPont Approach to PFOA Stewardship Exposure Reduction	Kathleen Shelton, DuPont
10:20 – 10:30	<i>Break</i>	
10:30 – 11:30	Session 4	
	What <i>alternatives</i> are available? What are their health and environmental profiles? When will they be ready for the market? How much do they cost? What are the drawbacks? What are some areas where countries could cooperate?	
	New Chemical Review of Alternatives for PFOA and Related Chemicals	Toni Krasnic, U.S. EPA
	Activities at 3M and Dyneon LLC to Develop PFC Alternatives	Michael Santoro, 3M
	DuPont Approach to PFOA Stewardship Alternative Technology	Kathleen Shelton, DuPont
	PFC Activities at Asahi	Seiji Shin-ya., Asahi
	Daikin Presentation	Takashi Tozuka, Daikin
11:30 – 12:00	Session 5	
	What are some ways to engage other countries and companies (including other manufacturers, formulators, processors, and users of PFCs) to promote stewardship and alternatives?	
	Experience with Global Partnerships & Toolkits	Brenda Koekkoek, UNEP Chemicals, Mercury Programme
	Observations from Chemicals in Articles Workshop	Johanna Lissinger, Peitz, Sweden Ministry of Environment
	Preparations for May 2009 and ICCM2	Lesley Onyon, SAICM Secretariat
12:00 – 12:10	Overview for Afternoon & Break Out Sessions	Kevin Munn, UNEP
12:10 – 14:00	<i>Lunch</i>	

AFTERNOON SESSIONS		
14:00 – 16:00	<p>Facilitated Dialogue:</p> <ul style="list-style-type: none"> What are some of the issues and challenges associated with facilitating stewardship and transitioning from PFOS, PFOA, PFOS and PFOA precursors, and higher homologues to safer alternatives? What recommendations do participants have to overcome potential barriers, set and obtain goals, and engage countries, companies and stakeholders to promote broader stewardship and alternatives? 	Concurrent break-out sessions
16:00 – 16:30	<i>Break and preparations for group reports</i>	
16:30 – 17:30	Group Reports and Plenary Dialogue	Group facilitators/attendees
17:30 – 17:50	Summary and Next Steps	Group facilitators
17:50 – 18:00	Closing remarks	Kevin Munn, UNEP

Break-Out Session Guidance & Input from Four Concurrent Break-Out Groups

Guidance for Break-out Sessions

The purpose of the break-out sessions are to explore more in-depth some of the challenges and potential paths forward on PFCs stewardship and transitioning to safer alternatives. To the greatest extent possible, discussion should:

- follow-up on earlier and current efforts, for instance, recommendations from the 2006 OECD Workshop including current national activities,
- flow from questions posed in the background Thought Starter,
- track questions and interests from the Workshop Sessions, and
- compile broader issues and interests of attendees as a result of the Workshop.

The outcome will feed into a Workshop summary, inform a background INF paper for ICCM 2 and contribute largely to proposed cooperative actions including a possible resolution that might be supported by the Conference. Given the quick timeline associated with emerging policy issues under SAICM, the aim is to have these papers posted or distributed for review and feedback consistent with that process.

With that in mind, the break outs are organized to review and collect views on challenges, issues and opportunities associated with possible cooperative actions on PFCs stewardship and transitioning to safer alternatives. Overarching themes include:

- What are some of the issues and challenges associated with facilitating stewardship and transitioning from PFOS, PFOA, PFOS and PFOA precursors, and higher homologues to safer alternatives?
- What recommendations do participants have to overcome potential barriers, set and obtain goals, and engage countries, companies and stakeholders to promote broader stewardship and alternatives?

A. Developing and Sharing Information on PFCs

1. Is there enough information to indicate that PFCs (i.e., PFOS, PFOA, PFOS and PFOA precursors, and higher homologues) present concerns?
2. What additional information would help to advance our understanding of PFCs?
3. What mechanisms could you recommend to share available information on PFCs?
4. How can existing information be used to support national and/or international action to address the concerns presented by PFCs?

B. Reducing Exposure to PFCs and Transitioning to Safer Alternatives

1. What options could be considered to reduce exposure to PFCs?
2. What technology is available to reduce releases and product content?
3. What information on technologies to reduce releases is available and what mechanisms could you recommend to share available information on technologies to reduce releases of PFCs?
4. What information on alternatives is available?

5. Is there a need for more information on the alternatives, including: cost, performance and health and environmental effects?
6. What mechanisms could you recommend to share available information on safer alternatives to PFCs?
7. What options are available to handle confidential business information (CBI)?
8. What technology and alternatives are feasible, considering: cost, information on the health and environmental effects of the alternative, market readiness, etc.?
9. What is needed to support development and implementation of new technology and alternatives: incentives, design criteria, guidance, understanding drawbacks or limitations, etc.?
10. What are some of the main issues that countries will face in making a transition from PFOS, PFOA, PFOS and PFOA precursors, and higher homologues to safer alternatives?
11. What are effective methods to remain aware of and engaged in such efforts?

C. PFCs Stewardship Programs

1. How can existing regulatory and voluntary approaches be used to develop national and/or international program(s)?
2. How can these approaches avoid shifting impacts from developed to developing countries?
3. What are some of the issues that countries might face in developing national and/or international program(s)?
4. How can the range of stakeholders, e.g., governments, industry, environmental groups and IGOs, engage in such an effort?
5. How can downstream users be engaged in such activities and information sharing on product content?
6. What would you recommend to overcome barriers and/or further promote national and/or international programs(s) on these PFCs?
7. What short and long terms goals are feasible for the national and/or international program(s)?
8. What options are available to measure performance of national and/or international program(s)?
9. What options are available to report progress of national and/or international program(s)?
10. What mechanisms could you recommend to share available information and report progress of voluntary PFCs stewardship program(s)?
11. What other issues should be considered?

D. Looking Ahead

1. How can various stakeholders promote broader stewardship and alternatives to PFCs?
2. What actions or statements might be considered and what is the respective feasibility and effectiveness of each?
3. What are some recommendations to overcome barriers, achieve economies of scale and/or further promote international program(s) on PFCs?
4. What are some overarching recommendations from this dialogue?
5. What are the next steps in continuing this dialogue?
6. What are the next steps in preparing for ICCM2?

Break-out facilitators may use the above questions to help promote dialogue and bin feedback into the suggested three headings and with the assistance of break-out note takers. Thereafter facilitators will compare and compile notes along these headings to report back to the full plenary on the range of input and possible cooperative actions. This will in turn lead to a Workshop summary and proposal for feedback by attendees and interested participants in conjunction with the SAICM emerging policy issues process and, ultimately, consideration by the Conference at ICCM 2.

PFCs Workshop Concurrent Break-Out Group 1

Developing and Sharing Info

- PFCs present concerns? Yes
 - Note: short chain compounds are persistent and are being found in the environment
- Additional information?
 - sufficient info to establish that action should be taken
 - more info needed for cleanup
 - overall answer is context dependent
 - better understanding of fate, especially in food chain
 - better info on precursors and their contribution
- Mechanisms to share info?
 - better mechanisms for sharing info across regulatory agencies -- national, regional and international (e.g., OECD)
 - better mechanisms for sharing info across the supply chain and entire life cycle, from chemical manufacturers to chemical users to retailers to consumers to end of life management
 - this is a case study of the info needs identified in the informal workshop.
 - “Information” includes: hazard, exposure, risk, chemical constituents in products
 - Need to raise awareness that information is needed and available across the entire supply chain.
- How can existing info support national and/or international action?
 - Need further dissemination of existing info to relevant agencies
 - PFOS through Stockholm
 - PFOA not addressed through Stockholm - not sufficiently bioaccumulative
 - Other plausible international options for actions include Rotterdam

Reducing Exposure to PFCs and Transitioning to Safer Alternatives

- Options to reduce exposure?
 - Exposure pathways
 - precursors
 - product life cycles
 - fugitive emissions
 - 90% reduction in a few years
 - Technologies: activated charcoal, wet scrubbers, etc.
 - options for widespread dissemination
 - Note that substitution is more than chemical to chemical alternatives, includes other materials, product re-design, eliminating the need in the first place
 - Think about, is the use essential. Need to define whether needs are essential.
 - For chemical alternatives, companies disseminate information on their chemicals.
 - Need to identify and disseminate the availability of full range of alternatives.
 - Include the technical, economic and geographic availability of alternatives.

- For example, see REACH process which solicits information from producers of alternatives, both chemical and non-chemical options.
 - Need health and safety data on alternatives as well. Are the alternatives safer? This issue being addressed through Stockholm on alts to PFOS.
 - Australia: is performing government review of alternatives
 - Apply best available technique/substitute whenever possible.
 - Ecolabeling is option to stimulate demand.
 - German ecolabels tend to specify PFC-free
 - Other ecolabel options to indicate lack of most hazardous PFCs?.
 - Note: need to identify functions of and essential uses (e.g., photolithography, etc.) for PFCs in general as well as for specific chemicals. What is the function? What are the alternatives?
 - Regulations, for example, ozone importation bans, reduce exposure and raise the level of performance required globally
 - For developing countries, need to “address” these chemicals as quickly as possible to short circuit global concerns. This includes monitoring, knowledge of these chemicals in products as well as elimination/movement to safer alternatives.
 - Need to assess capacity for analysis. Major holes in scientific data for c4, c5, c6 chemicals; exposure pathways for all PFCs; monitoring data.
- CBI?
 - If new technologies protected by CBI may lead to continued use of older technologies in developing countries unless capacity building is available. Depends of course on the industry producing it, eg, if multinational corporation using the technology, easier to transfer the technology. Licensing is an option to consider.
- Effective methods to remain aware of and engaged in such efforts?
 - Generally known across producers of what best available technology is and how to use it.
 - Need to move beyond disseminating information: for example, consumer demand, labeling, Montreal protocol-type regulation. Note that labeling has its limits. Australian program and other assessment reports...

PFCs Stewardship Programs

- How can existing regulatory and voluntary approaches be used to develop national and/or international programs?
 - OECD program. But also need to move beyond OECD.
 - Corporate international purchasing specifications, for example, extending programs across sectors, auto sector and chemical industry.
 - Need to avoid shifting impacts to developing countries. Would these chemicals be found in products that are reused, recycled, disposed of in developing products? Unclear the answer to this question.
 - Also need to address sales of new products in developing countries.
 - NAFTA chemical information exchange.
 - Concept of partnerships for both monitoring and information exchange. For example, mercury program under UN Chemicals.
 - How could the US EPA Stewardship program be extended to include all PFOA producers in the world?
 - Canada collecting information from producers and importers.
 - Developing countries, need to know which products the chemicals are in.

- How are downstream users engaged?
 - Need a facilitated process to move information along the supply chain.
 - Need to know if the chemical of concern is in the product across the supply chain -- for example, EPR.
- Short and long term goals?
 - Include all producers globally. Include PFOS as well as PFOA. PFOS likely to be covered under May 2009 Stockholm decision. There may be a transition period for PFOS implementation.
 - Expand OECD program.
 - Stewardship program include reporting that covers questions in OECD survey.
 - Short term goal: extend the U.S. program globally covering same reporting questions.

Looking Ahead

- How can various stakeholders (government, business, consumers) promote broader stewardship and alternatives to PFCs?
 - Need standard for “virtually-free” for PFOA (e.g., 100 ppb). Note there is no such thing as PFOA-free. Possibility of label as “PFOA-free”.
 - Need to raise consumer awareness
 - Disseminate chemical ingredients in products through the supply chain and availability of alternatives
 - Need governments to take action available to them, including restrictions. Restrictions will set level playing field.
- What are the next steps for continuing this dialogue? for ICCM2?
 - OECD
 - dealt with to a certain extent
 - Stockholm will address PFOS
 - ICCM2
 - PFC Stewardship is an emerging policy, but it is not a priority issue
 - There will be a side meeting at ICCM2 on PFC Stewardship
 - There will be a discussion of the process for dealing with all emerging issues in the future.
 - cross cutting (environment, industry, global, etc.) , not covered by other issues, magnitude,
 - Important that PFCs included as a priority issue. Possibly for ICCM3.
 - Can point to the need for action; coordinating role; but can’t require any actions.
 - UNEP Chemicals
 - Could -- dependent upon funding -- continue dialogue.

PFCs Workshop Concurrent Break-Out Group 2

Developing and Sharing Info

1. Is there enough information to indicate that PFCs present concerns?
 - a) Yes – There's a lack of info and different levels of understanding across developed and developing countries
2. What additional information would help to advance our understanding of PFCs?
 - a) Need to be clear about what info we are seeking to find.
 - b) Surprising to find new info on new compounds, there's a gap with identifiable compounds between those identified and those that turn up, i.e., we do not know if we were capturing everything
 - c) More information's needed on what's in commerce – chemicals that are used, precursors – don't concentrate on final chemicals/products alone
 - d) Human health and environmental effects, mechanisms of action, more toxicological info, the most significant routes of human exposure, why-how in human blood, more and such information can also further inform substitutes
3. What mechanisms could you recommend to share available information on PFCs?
 - a) Fulfill original OECD recommendations
 - b) Increase awareness of reports and materials through clearinghouse, review of literature, govt reports, etc.
 - c) Convert information so that its more easily understood by consumers and lay audiences
4. How can existing information be used to support national and/or international action to address the concerns presented by PFCs?
 - a) To support action under the Stockholm Convention among other actions

Reducing Exposure to PFCs and Transitioning to Alternatives

1. What options could be considered to reduce exposure to PFCs?
 - a) Education for consumers, e.g., through print media
 - b) Risk communication
 - c) Labeling
 - d) Use prohibitions
 - e) Government (authoritative) communications on risks and alternatives
 - f) Political support (will)
 - g) Implementation of cleaner production programs and technical assistance to SMEs, users, developing economies
 - h) Health surveys and involvement of the health sector
2. What technology is available to reduce releases and product content?
 - a) Carbon treatment for water
 - b) Also need to match goals with the application of technologies
 - c) May also need more test methods, standards, data

- d) May need more info on process changes and technologies specific to product content releases
3. What information on technologies to reduce releases is available and what mechanisms could you recommend to share available information on technologies to reduce releases of PFCs?
 4. What information on alternatives is available?
 - a) Most available now in fluotelomer area, more challenging with fluoropolymers, more information's needed along the value chain
 - b) More on costs and application with consumer goods, longer term alternatives that might become available and on alternatives that might be incorporated into material itself
 - c) Revisit what's needed and evaluate applications where alternatives might be used
 - d) Toxicity, environmental and transport info with alternatives
 - e) Alternatives assessment framework(s) are needed
 5. Is there a need for more information on the alternatives, including: cost, performance and health and environmental effects?
 - a) Yes – Performance and environmental-health improvements to inform choices along with cost information
 - b) Non-halogenated alternatives and alternatives dealing with design changes
 6. What mechanisms could you recommend to share available information on safer alternatives to PFCs?
 7. What options are available to handle confidential business information (CBI)?
 - a) Trade association or 3rd party databases ; company information could be merged to help protect individual company information that may be CBI
 - b) Product registry databases
 8. What technology and alternatives are feasible, considering: cost, information on the health and environmental effects of the alternative, market readiness, etc.?
 9. What is needed to support development and implementation of new technology and alternatives: regulatory incentives, design criteria, guidance, understanding drawbacks or limitations, etc.?
 - a) No data no market
 10. What are some of the main issues that countries will face in making a transition from PFOS, PFOA, PFOS and PFOA precursors, and higher homologues to safer alternatives?
 - a) Transition periods, waste management, collecting unused products or stocks, common guidelines on how to handle, storage and disposal, how to deal with use in products and transition to use of new alternatives in those products, costs for haz-toxic identified materials, e.g., if PFOS is listed on the Stockholm Convention, potential shifts to developing countries
 - b) No costs – there could be a net gain with transition that occurs and with removal of residual materials
 11. What are effective methods to remain aware of and engaged in such efforts?

PFC Stewardship Programs

1. How can existing regulatory and voluntary approaches be used to develop national and/or international program(s)?
 - a) Need to encourage additional companies in other countries to engage in activities
 - b) Goals of existing programs are still short term so also need to encourage innovation with different technologies and products
 - c) Incentive measures for companies at the national level
 - d) This issue demonstrates parallels similar to other substances like mercury and its range of activities on partnerships and movement toward a binding initiative
2. How can these approaches avoid shifting impacts from developed to developing countries?
 - a) Extended producer responsibility, e.g. as with e-waste
3. What are some of the issues that countries might face in developing national and/or international program(s)?
 - a) Coordinated action across countries
4. How can the range of stakeholders, e.g., governments, industry, environmental groups and IGOs, engage in such an effort?
5. How can downstream users and consumers be engaged in such activities and information sharing on product content?
 - a) Need to increase knowledge in particular with SMEs and consumers
 - b) More info needed for design stage of product development and for consumer decision making
6. What would you recommend to overcome barriers and/or further promote national and/or international program(s) on these PFCs?
 - a) Need standards or guidelines, goals, criteria, e.g. with existing labeling programs, for compliance, engagement and to drive customer and consumer decisions

Looking Ahead

1. How can various stakeholders promote broader stewardship and alternatives to PFCs?
 - a) No other chemical pollution issue that went from discovery to reductions so quickly so this could serve as model although information and ability to deal with this problem is uneven across countries
 - b) Can do more now with information than previously, eg, pcbs
 - c) Much work remains to be done
2. What actions or statements might be considered and what is the respective feasibility and effectiveness of each?
3. What are some recommendations to overcome barriers, achieve economies of scale and/or further promote international program(s) on PFCs?
4. What are some overarching recommendations from this dialogue?
 - a) Getting access to more information for producers and consumers can further promote stewardship of PFCs
 - b) Expand programs to other top producer companies (need to know who additional producers are)

- c) Examining regulatory options for relevant chemicals
 - d) Consolidation of existing guidelines in addition to considering what additional international guidelines might be needed
 - e) Increase capacity of developing countries with technical and financial assistance
 - f) More awareness of phosphates
5. What are the next steps in continuing this dialogue?
6. What are the next steps in preparing for ICCM2?

PFCs Workshop Concurrent Break-Out Group 3

1. What actions or statements might be considered and what is the respective feasibility and effectiveness of each?
2. How can various stakeholders promote broader stewardship and alternatives to PFCs?

Players: Industry + downstream users and others in the supply-chain; Governments; IGOs; NGOs; consumers; academia / research institutions

Issue: Need to ensure information exchange among players in the supply chain

What can be done & how?

- Need common understanding and coherent/coordinated action at global level;
- Awareness raising needed (incl about articles / products containing PFCs) – a role for Governments & especially NGOs
- IGOs should engage the governments at the global level and facilitate coordinated actions, e.g. the SC
- Find balance between voluntary and regulatory to ensure the most effective risk reduction measures
- Incentives needed for industry for innovation of alternatives
- Civil society/ public actions to communicate their wishes / opinions would be another way of influencing industry
- Consumers: should have the right to choose but have presently not enough information to do so

Recommendation:

Engage all players (governments, industry & downstream users, NGOs, IGOs,) into the dialogue.

Provide information throughout the supply-chain to end-users all the way to disposal.

3. What are some recommendations to overcome barriers, achieve economies of scale and/or further promote international program(s) on PFCs?

Find ways to overcome barriers:

- enhance the information flow and exchange;
- improve availability of cost-effective alternative;
- enhance awareness among policy makers in most countries;
- increase pressure for switching to alternatives; through “sticks and carrots”,
- promote consumer pressure

4. What are some overarching recommendations from this dialogue?

Need for global action to phase out PFOS and PFOA and their precursors (PFOS under consideration under SC);

stockpiles of these substances should be identified and destroyed in an environmentally sound manner;

Encourage PFCs producers to join global stewardship programmes, such as the US-Canadian, to reduce and eventually phase out the production of PFOA and precursors

research into what should be done about products already manufactured and how to prioritize their management;

promote research into alternatives and assessment of safety / risks of these alternatives, incl. studying residues of longer chain substances in shorter chain alternatives.

5. What are the next steps in continuing this dialogue?
6. What are the next steps in preparing for ICCM2?

ICCM2 side-event: provide report on workshop and the overarching recommendations

Parties of the SC will consider inclusion of PFOS and should also consider addressing PFOA (subsequent actions in BC would then have to follow)

Involve relevant non-OECD countries into international activities on PFCs

PFCs Workshop Concurrent Break Out Group 4

Developing and Sharing Information on PFCs

1. *Is there enough information to indicate that PFCs present concerns?*
 - Number of activities on assessments of PFOA, PFOS
 - Persistence, widespread presence on PFCs
 - Not as much other info on other PFCs
 - Categorization: Chemical specific; Class; Inclusion of degradation products?
2. *What additional information would help to advance our understanding of PFCs?*
 - Inventory
 - Exposure pathways for sectors
 - Toxicity
 - Bioaccumulation
 - Non-halogenated alternatives
 - Analytical techniques
 - Capacity for risk assessments
3. *What mechanisms could you recommend to share available information on PFCs?*
 - International offices
 - Awareness raising
 - SAICM Focal Points
 - International info portal on PFCs: Hazard data; Country actions on PFCs; Country legislation
 - Labeling of products: What PFCs; Intentional presence; Thresholds; Concentrations; CBI concerns
4. *How can existing information be used to support national and/or international action to address the concerns presented by PFCs?*
 - Stockholm POPs
 - International guidelines
 - Other country's guidelines
 - Regional standards
 - Country-specific flexibility/evaluation

Reducing Exposure to PFCs and Transitioning to Safer Alternatives

1. *What options could be considered to reduce exposure to PFCs?*
 - Prioritization of chemicals
 - Prioritization of sources and exposure scenarios
 - Product content information
 - Extended producer responsibility
 - Existing techniques for pollution prevention & exposure profiling
2. *What technology is available to reduce releases and product content?*
 - Existing technology
 - New technology: Emission controls; Product content

- Disposal of PFC products
 - Treatment of polluted media
3. *What information on technologies to reduce releases is available and what mechanisms could you recommend to share available information on technologies to reduce releases of PFCs?*
- Chemical has to be identified of concern before transfer of technology and alternatives occurs
4. *What information on alternatives is available?*
- US & Canada data
5. *Is there a need for more information on the alternatives, including: cost, performance and health and environmental effects?*
- Health & environmental effects
 - Performance of substitutes
6. *What mechanisms could you recommend to share available information on safer alternatives to PFCs?*
- Information portal
7. *What options are available to handle confidential business information (CBI)?*
- OECD Parallel Process
 - SAICM guidance on CBI
 - Clearinghouse (e.g., Stockholm convention)
8. *What technology and alternatives are feasible, considering: cost, information on the health and environmental effects of the alternative, market readiness, etc.?*
9. *What is needed to support development and implementation of new technology and alternatives: incentives, design criteria, guidance, understanding drawbacks or limitations, etc.?*
- International action
 - Country prioritization
10. *What are some of the main issues that countries will face in making a transition from PFCs (C8 & greater) to safer alternatives?*
- Gradual action plan
 - Regulation model
 - Economics of existing industry in country
 - Sector by sector evaluation for feasibility
 - Addressing existing production/uses
 - Green chemistry/design of alternatives
11. *What are effective methods to remain aware of and engaged in such efforts?*
- Information portal on country actions & other major developments

PFCs Stewardship Program(s)

1. *How can existing regulatory and voluntary approaches be used to develop national and/or international program(s)?*

- OECD Survey
Inventory of manufacture & use

2. *How can these approaches avoid shifting impacts from developed to developing countries?*
 - International cooperation: Stockholm POPs; LRTAP; SAICM
 - Informed consumers: Leverage of consumer; Industries; Cost of alternative
 - Government regulation: Regulation models

Looking Ahead

1. *How can various stakeholders promote broader stewardship and alternatives to PFCs?*
 - Sharing information on country actions
 - International bodies
 - Regional focal points
 - Regional free trade agreements (e.g., CAFTA, BRIC)
2. *What actions or statements might be considered and what is the respective feasibility and effectiveness of each?*
3. *What are some recommendations to overcome barriers, achieve economies of scale and/or further promote international program(s) on PFCs?*
 - Information exchange: Info portal; International meetings
4. *What are some overarching recommendations from this dialogue?*
 - Drive change in supply chain via consumers and down-stream users: Promote disclosure of PFCs in products
 - Continue development of alternatives: PFC related alternatives; Work to develop non-halogenated alternatives
5. *What are the next steps in continuing this dialogue?*
 - Information portal on major actions
6. *What are the next steps in preparing for ICCM2?*
 - International Action Plan
 - Listing on Stockholm POPs