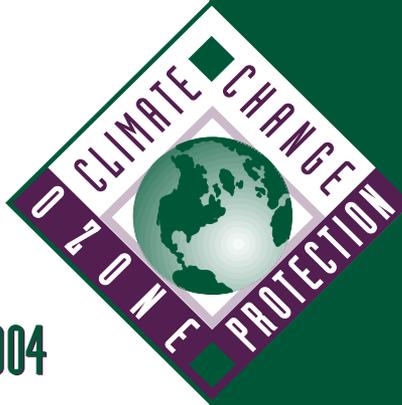


MOBILE AIR

CONDITIONING

SUMMIT

April 14—15, 2004



Summit Program

Sponsored by:

U.S. Environmental Protection Agency
European Commission
Australian Greenhouse Office
Japan Ministry of Environment
United Nations Environment Programme
Alliance for Responsible Atmospheric Policy

Hyatt Regency on Capitol Hill
400 New Jersey Avenue, N.W.
Washington, D.C.

Schedule of Summit Sessions and Events

Tuesday, April 13

7:30 AM –
6:00 PM

■ REGISTRATION

Regency Ballroom Lobby

5:30 PM –
8:00 PM

■ EXHIBITS/EVENING RECEPTION
Sponsored by: Trane

Exhibit Floor

Wednesday, April 14

7:30 AM –
6:00 PM

■ REGISTRATION

Regency Ballroom Lobby

12:30 PM –
2:30 PM

■ SUMMIT PLENARY SESSION: GLOBAL ACTION TO
REDUCE MAC GREENHOUSE GAS EMISSIONS

Ticonderoga

2:30 PM –
3:00 PM

■ EXHIBITS/REFRESHMENT BREAK

Exhibit Floor

3:00 PM –
4:00 PM

■ ROUNDTABLE: TECHNICAL BREAKTHROUGHS

Ticonderoga

4:00 PM –
5:00 PM

■ ROUNDTABLE: DEVELOPING COUNTRY STRATEGY

Ticonderoga

5:00 PM –
8:00 PM

■ EXHIBITS/EVENING RECEPTION
Sponsored by: International Emissions Trading Association

Exhibit Floor

Thursday, April 15

7:00 AM –
1:00 PM

■ REGISTRATION

Regency Ballroom Lobby

SUMMIT SESSIONS

8:30 AM –
10:00 AM

Life Cycle Analysis of Vehicle Air Conditioning

Congressional A

Options to Minimize Direct Refrigerant Emissions: *Coupling
and Sealing Surfaces*

Concord

10:00 AM –
10:30 AM

■ BREAK

Hall of Battles

SUMMIT SESSIONS

10:30 AM –
12:00 PM

Improving MAC Energy Efficiency

Congressional A

Options to Minimize Direct Refrigerant Emissions: *System Level*

Schedule of Summit Sessions and Events

Thursday, April 15 Continued

12:00 PM – 1:30 PM	■ LUNCH: Speaker to be Announced	
	SUMMIT SESSIONS	
1:30 PM – 3:00 PM	■ ROUNDTABLE: RISK ASSESSMENT FOR ALTERNATIVE REFRIGERANT SYSTEMS	Columbia A & B
3:00 PM – 3:30 PM	■ BREAK	Hall of Battles
3:30 PM – 5:00 PM	■ ROUNDTABLE: HFC-152A AND CO2 PROG-	Columbia A & B
5:00 PM – 6:30 PM	■ ROUNDTABLE: YOU HEARD WHAT? OPEN DISCUSSION AND EXCHANGE	Columbia A & B
6:30 PM	■ DEPART FOR PARTY AT HOME OF STEVE AND JANET ANDERSEN	

Please note: all speakers names are linked to their presentation.
Underlined speakers also have a more extensive paper available in the
Earth Technologies Forum proceedings.

MOBILE AIR CONDITIONING SUMMIT

Wednesday, April 14 and Thursday, April 15

MAC Summit '04 will feature the latest technology and corporate leadership in the global quest to reduce the emissions of HFC refrigerants and fuel use in vehicle air conditioning. The 2003 Summit, held in Brussels, was highly influential in persuading the European Commission to allow carbon dioxide, HFC-152a, and hydrocarbon refrigerants as replacements for HFC-134a, which is proposed for phaseout in the European Union at the end of this decade. The 2004 Summit could influence policy makers in the U.S. Environmental Protection Agency (EPA), the California Air Resources Board (CARB) and other states to reward reductions in greenhouse gas emissions from refrigerant containment, fuel efficiency, improved service practices, and alternative refrigerants. Information presented at the Summit will be vital to companies seeking new business opportunities.

THOSE WHO SHOULD ATTEND THE SUMMIT INCLUDE:

Air-conditioning component manufacturers looking to be involved in the development of next-generation systems, automobile manufacturers needing to plan their compliance with international air-conditioning regulations, vehicle service associations advocating professional service, research and development personnel hoping to maximize their efficiency by coordinating research and development efforts with others, and policymakers from regulating bodies intending to create policies that are technically and economically feasible and globally compatible.

PLENARY SESSION

■ Global Action to Reduce MAC Greenhouse Gas Emissions

Wednesday, April 14

12:30 p.m. – 2:30 p.m.

Ticonderoga

Welcome: Stephen O. Andersen, U.S. Environmental Protection Agency, Washington, DC

Peter Horrocks, European Commission, Brussels, Belgium

[Phasing Out HFC-134a in MACs in the Worlds Largest Car Market: State of Play](#)

Hermann Meyer, Association des Constructeurs Europeens d' Automobiles (ACEA), Brussels, Belgium
[ACEA's Position on the Improvement of the GHG Performance of MAC Systems](#)

Richard Corey, California Air Resources Board, Sacramento, CA

[California Leadership in Reducing and Eliminating HFC-134a Emissions in MACs](#)

Takayoshi Matsuno, [Toyota Motor Corporation Japan, Tokyo, Japan](#)

[Japan Automobile Manufacturers Association's \(JAMA\) Voluntary Action Plan to Reduce HFC-134a Emissions](#)

David Doniger and Rowland Hwang, Natural Resources Defense Council, Washington, DC
[Global Action on MACs by Environmental Non-Governmental Organizations](#)

BREAK

Wednesday, April 14

2:30 p.m. – 3:00 p.m.

Exhibit Floor

MACs ROUNDTABLES

■ Roundtable: Technical Breakthroughs

Wednesday, April 14

3:00 pm – 4:00 pm

Ticonderoga

Moderator: Ward Atkinson, Sun Test Engineering, Scottsdale, AZ

Gary Hansen, Red Dot, Seattle, Washington

[HFC-152a as an Alternative to HFC-134a](#)

Ken Matsunaga, Denso, Tokyo, Japan

[Electric Inverter Air Conditioning System for Toyota Prius Hybrid Vehicle](#)

Frank Wolf, Obrist, Lustenau, Austria

[Development of Alternative Refrigerant Technology](#)

■ Roundtable: Developing Country Strategy and Opportunity from the MAC Transition

Wednesday, April 14

4:00 pm – 5:00 pm

Ticonderoga

Moderator: Rajendra M. Shende, Energy and OzonAction UNEP DTIE, Paris, France

Jianxin Hu, [College of Environmental Sciences, Beijing University, Beijing, China](#)

[Growing Markets of MAC with HFC-134a and Future of HFC-152a in China](#)

Vijay Kanwar, Sanden Vikas, India

[Indian Scenario: Refrigerants in MACs and the Importance of Fuel Efficiency](#)

Jorge Habib, [Airtemp de Mexico SA de CV, Mexico City, Mexico](#)

[Overview of HFC-134a, HFC-152a, and Non-HFC Alternatives in MAC Sector](#)

RECEPTION

Wednesday, April 14

5:00 pm – 8:00 pm

Exhibit Floor

Sponsored by International Emissions Trading Association

MACs SESSIONS

■ MACs Session: Life Cycle Analysis of Vehicle Air Conditioning

Thursday, April 15

8:30 am – 10:00 am

Congressional A

Moderator: Dave Godwin, U.S. Environmental Protection Agency, Washington, DC

[Stella Papisavva and Greg Major](#), General Motors, Detroit, MI

[Life Cycle Comparison of HFC-134a, HFC-134a Enhanced, HFC-152a, R-744 and R-290 Systems](#)

[Armin Hafner and Peter Neksa](#), SINTEF, Trondheim, Norway

[Life Cycle Comparison of Carbon Dioxide and HFC-134a Systems](#)

[Caley Johnson](#), U.S. Environmental Protection Agency, Washington, DC

[The Embodied Greenhouse Gas Emissions of Carbon Dioxide Refrigerant \(R-744\) as an Adjustment to Global Warming Potential](#)

■ MACs Session: Coupling and Sealing Surfaces

Thursday, April 15

8:30am – 10:00 am

Concord

Moderator:

[Ward Atkinson](#), Sun Test Engineering, Scottsdale, AZ

[SAE Design Requirements for Mobile Air Conditioning Systems](#)

[Chhotu Patel](#), Hutchinsen, Troy, Michigan

[Dual Plane Compressor Seal \(DPS\) for Enhanced HFC Applications](#)

[Eugene Dianetti](#), Parker Hannifin, Paris, France

[New Products for Enhanced HFC-134a Systems Certified at Less than 20 Grams per Year](#)

[Timothy Wilson](#), Eaton Corporation, Rochester Hills, Michigan

[HFC Emission Reductions in Automotive Air Conditioning Systems](#)

BREAK

Thursday, April 15

10:00 am – 10:30 am

Hall of Battles

MACs SESSIONS

■ MACs Session: Improving MAC Energy Efficiency

Thursday, April 15

10:30 am – 12:00 pm

Congressional A

Moderator: **Erin Birgfeld**, U.S. Environmental Protection Agency, Washington, DC

[John Rugh and Valerie Hovland](#), National Renewable Energy Laboratory, Golden, CO

[Stephen O. Andersen](#), U.S. Environmental Protection Agency, Washington, DC

[Significant Fuel Savings and Emission Reductions by Improving Vehicle Air Conditioning](#)

[Martin Drigotas](#), DuPont, Troy, Michigan

[Enhanced HFC-134a Research Project](#)

[Pega Hrnjak](#), University of Illinois, Urbana, IL

[Challenges and Results of Mobile Air Conditioning Cooling and Energy Efficiency Performance Exploration Project](#)

[Stefano Mola](#), Fiat Research, Milan, Italy

[HEAC Prototype: Comfort Improvement with Reduction of Impact on Fuel Consumption](#)

■ MACs Session: Options to Minimize Direct Refrigerant Emissions: System Level

Thursday, April 15

10:30 am – 12:00 pm

Concord

Moderator:

[Jim Baker](#), Delphi Automotive, Lockport, NY

[Chamber Leak Testing of Assembled Systems](#)

[Denis Clodic, L. Palandre and A. Zoughaib](#), Ecole des Mines de Paris, Paris, France

[Measurement of Leak Flow Rates of Mobile Air Conditioning Components and Systems](#)

[Chris Repice](#), Carrier Corporation, Syracuse, NY

[Reducing HFC Emission Levels for Bus Air Conditioning: A Change in Technology for Rooftop Applications](#)

SUMMIT LUNCH

Thursday, April 15

12:30 pm – 2:00 pm

Ticonderoga

Speaker: **Martin Drigotas**, DuPont, Troy, Michigan

[Enhanced HFC-134a Research Project](#)

MACs ROUNDTABLE

■ MACs Roundtable: Risk Assessment for Alternative Refrigerant Systems

Thursday, April 15

1:30 pm – 3:00 pm

Columbia A and B

Moderator: **Drusilla Hufford**, U.S. Environmental Protection Agency, Washington, DC

[Erin Birgfeld](#), U.S. Environmental Protection Agency, Washington, DC; [Lisa Bendixen](#), ICF Consulting, Washington, DC

[Global Risk Assessment for HFC-152a and Carbon Dioxide MACs](#)

[John Clark](#), HyChill, Kilsyth, Australia

[Australia Experience with Hydrocarbon Retrofit to CFC-12 MACs](#)

[Jeff Cohen](#), U.S. Environmental Protection Agency, Washington, DC

[Small Cans of HFC-134a: Impacts and Options](#)

BREAK

Thursday, April 15

3:00 pm – 3:30 pm

Hall of Battles

MACs ROUNDTABLES

■ MACs Roundtable: HFC-152a and CO2 Progress

Thursday, April 15

3:30 pm – 5:00 pm

Columbia A and B

Moderator:

Stephen Anderson, Australian Fluorocarbon Council, Manuka, Australia
[Australia Welcomes Climate Protection Partnerships: Red Dot Case Study](#)

Jim Baker, Delphi Automotive, Lockport, NY
[HFC-152a Engineering Mitigation Strategy](#)

Stephen Memory, Modine, Racine, WI
Mid-Size SUV CO2 Cooling and Heating System

Kiwamu Inui, Toyota, Aichi, Japan
Concerns and Solutions for CO2 Air Conditioning Systems for Compact Vehicles

■ MACs Roundtable: You Heard What! Open Discussion and Exchange of Perspectives Between Panel and the Audience

Thursday April 15

5:00 pm – 6:30 pm

Columbia A and B

Which Crisis Will Inspire OEMs to Action? Will There Be One Global Refrigerant or Many? Will There be A Surprise Performance of Secondary Loops? Which OEMs will Pioneer CO2 and HFC-152a? What Barriers Will Exist to Fuel-Efficient AC Systems?

Moderator: Mack McFarland, DuPont, Wilmington, DE

Ward Atkinson, Sun Test Engineering, Scottsdale, AZ

Jim Baker, Delphi Automotive, Lockport, NY

Denis Clodic, Ecole des Mines, Paris, France

Elvis Hoffpauir, Mobile Air Conditioning Society Worldwide, Lansdale, PA

Frank Wolf, Obrist, Lustenau, Austria

John Rugh, National Renewable Energy Laboratory, Golden, CO

DEPART HOTEL FOR RECEPTION

Thursday, April 15

6:30 pm

Home of Steve and Janet Andersen

EPA WORKSHOP ON BARRIERS, PARTNERSHIPS, AND INCENTIVES

Friday, April 16

9:00 am to 12:00 pm

EPA Headquarters, 1310 L Street, Washington, DC

Discussion Topics Include:

Reducing Emissions from Refrigerant Containers

Component and System Specifications to Reduce Greenhouse Gas Emissions

EPA Enforcement of Service Procedures and Refrigerant Marketing

Invited EPA Experts to Answer Questions and Agree on the Way Forward

Drusilla Hufford, Director, EPA Global Programs Division

Jeff Cohen, Chief, Alternatives and Emission Reduction Branch

Julius Banks, Team Leader, Refrigerant Management

Stephen Andersen, Director, Strategic Climate Projects

Erin Birgfeld, Director, EPA Risk Analysis of Alternative Refrigerants

Dave Godwin, Manager, SNAP Refrigerant Review

Kate Choban, Communications Specialist, Stratospheric Implementations Branch

2004 MACs Summit Speaker List

Last	First	Company	City	Email
Agarwal	Praveen	Danden Vikas	New Delhi, India	rsarwal@netearth.iitd.ernet.in
Andersen	Stephen O.	U.S. Environmental Protection Agency	Washington, DC	Andersen.Stephen@epamail.epa.gov
Anderson	Stephen	Australian Fluorocarbon Council	Manuka, Australia	afcweb@bigpond.net.au
Atkinson	Ward	Sun Test Engineering	Scottsdale, AZ	wast@ix.netcom.com
Baker	Jim	Delphi	Lockport, NY	james.a.baker@delphi.com
Birgfeld	Erin	U.S. Environmental Protection Agency	Washington, DC	Birgfeld.Erin@epamail.epa.gov
Clarke	Rachael	Australia Greenhouse Office	Canberra, Australia	Rachael.Clarke@ea.gov.au
Clodic	Denis	Ecole des Mines de Paris	Paris, France	clodic@cenerg.ensmp.fr
Cohen	Jeff	U.S. Environmental Protection Agency	Washington, DC	Cohen.Jeff@epamail.epa.gov
Corey	Richard	California Air Resources Board	Sacramento, CA	rcorey@arb.ca.gov
Dianetti	Eugene	Parker Hannifin	Paris, France	gdianetti@parker.com
Doniger	David	Natural Resources Defense Council	Washington, DC	ddoniger@nrdc.org
Drigotas	Martin	DuPont	Troy, Michigan	Martin.D.Drigotas@USA.Dupont.com
Godwin	David	U.S. Environmental Protection Agency	Washington, DC	Godwin.Dave@epamail.epa.gov
Habib	Jorge	Airtemp de Mexico Sa de CV	Mexico City, Mexico	hwachi@airtemp.com.mx
Hafner	Armin	SINTEF	Trondheim, Norway	Armin.Hafner@sintef.no
Hansen	Gary	Red Dot	Seattle, Washington	garyhansen@redditcorp.com
Hoffpauir	Elvis	Mobile Air Conditioning Society Worldwide	Lansdale, PA	elvis@macsw.org
Horrocks	Peter	European Commission	Brussels, Belgium	peter.horrocks@cec.eu.int
Hovland	Valerie	National Renewable Energy Laboratory	Golden, Colorado	vhovland@mesoscopic.com
Hrnjak	Pega	University of Illinois	Urbana, IL	pega@uiuc.edu
Hu	Jianxin	College of Environmental Sciences, Peking University	Beijing, China	Jianxin@ces.pku.edu.cn
Hufford	Drusilla	U.S. Environmental Protection Agency	Washington, DC	Hufford.Drusilla@epamail.epa.gov
Hwang	Rowland	Natural Resources Defense Council	Washington, DC	rhwang@nrdc.org
Inui	Kiwamu	Toyota	Aichi, Japan	kinui@tera.tec.toyota.co.jp
Johnson	Caley	U.S. Environmental Protection Agency	Washington, DC	johnson.caley@epamail.epa.gov
Major	Greg	General Motors	Detroit, MI	
Matsunaga	Ken	Denso	Aichi, Japan	matsunaga@re1g.denso.co.jp
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Memory	Stephen	Modine	Ricine, WI	

Meyer	Hermann	Assoc. des Constructeurs Europeens d' Automobiles	Brussels, Belgium	HM@ACEA.BE
Mola	Stefano	Fiat Research	Milan, Italy	
Neksa	Peter	SINTEF	Trondheim, Norway	petter.neksa@sintef.no
Palandre	L.	Ecole des Mines de Paris	Paris, France	lionel.palandre@ensmp.fr
Papasavva	Stella	General Motors	Detroit, MI	stella.papasavva@gm.com
Patel	Chhotu	Hutchinsen	Troy, Michigan	chhotu.patel@hutchinsonfts.com
Picker	Greg	Australia Greenhouse Office	Canberra, Australia	greg.picker@greenhouse.gov.au
Repice	Chris	Carrier Corporation	Syracuse, NY	chris.repice@carrier.utc.com
Rugh	John	National Renewable Energy Laboratory	Golden, Colorado	john_rugh@nrel.gov
Shende	Rajendra	Energy and OzonAction UNEP DTIE	Paris, France	rmshende@unep.fr
Singh	Rajiv R.	Honeywell International	Buffalo, NY	rajiv.singh@honeywell.com
Spatz	Mark W.	Honeywell International	Buffalo, NY	mark.spatz@honeywell.com
Wilson	David P.	Honeywell International	Buffalo, NY	
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Zoughaib	A.	Ecole des Mines de Paris	Paris, France	