Transport and Transformation of Pollutants (T&TP), Access to Emission Data, Access to Laboratory Data, Aerosols, Remote Sensing from Space (AT2), BIAFLUX, Modelling

AT2

BIAFLUX

Future Scientific and Policy Challenges in Tropospheric Composition (FSPC)

Meeting Report

The 5th ACCENT Barnsdale Expert Workshop was held at the Barnsdale Hall Hotel, Rutland Water from Monday October 27th to Wednesday October 29th 2008. (*Appendix 1*) Some 49 scientific experts attended from nine European countries, from Israel and from the United States (*Appendix 2*).

The aims of the workshop were to

a. To identify and review the key uncertainties in the factors controlling tropospheric composition.

b. To provide a basis for future collaborative research priorities in this area.

c. To examine the conclusions and outcomes of the ACCENT Syntheses and Integration (S&I) process

The meeting was organised (*Appendix 3*) around guided discussions on four topics.

Topic 1	Measuring Atmospheric Composition Changes.
Topic 2	Atmospheric Composition Change and Ecosystems.
Topic 3	Atmospheric Composition Change and Climate.
Topic 4	Atmospheric Composition Change: Air Quality and Health.

Following presentations by the four discussion leaders, the groups considered the draft chapters of the ACCENT S&I reports, re-working them where necessary to improve them, and provided lists of suggestions for the necessary future work in their respective areas, both from the point of view of scientific progress and for policy development in the areas of air quality and climate change. They also considered the Gothenburg questions provided by the ACCENT Outreach Coordinator (*Appendix 4*).

The final outcome of the meeting will be the ACCENT S&I Report, to be published in 2009.

The 5th Barnsdale Expert Workshop was supported by the following ACCENT groups: Transport and Transformation of Pollutants (T&TP), Access to Emission Data, Access to Laboratory Data, Aerosols, Remote Sensing from Space (AT2), BIAFLUX, Modelling

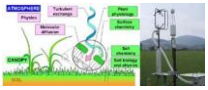
Peter Borrell
P&PMB Consultants
Newcastle-under-Lyme
October 2008

Appendix 1 FSPC Programme
Appendix 2 FSPC Participants List
Appendix 3 FSPC Briefing Sheet
Appendix 4 Gothenburg Questions

Appendix 1

Transport and Transformation of Pollutants (T&TP), Access to Emission Data, Access to Laboratory Data, Aerosols, Remote Sensing from Space (AT2), BIAFLUX, Modelling

AT2



BIAFLUX

Future Scientific and Policy Challenges in Tropospheric Composition (FSPC)

The 5th ACCENT Barnsdale Expert Workshop
Monday October 27th to Wednesday October 29th 2008

Programme

Meetings and breaks are held in the Edith Weston Suite.
Meals are in the Spa and Restaurant Complex

Monday, 27th October 2008

11.45 to 12.30	*Check-in (Hotel Reception)* *Registration (Edith Weston Common Room)*		
12.30	*Lunch (Osprey room)*		
13.30 to 14.00	*Registration (Edith Weston Common Room)*		
14.00	Opening *(Langham Room)*	***Chair:***	***Claire Granier***
	ACCENT Synthesis and Integration		Mchela Maione
14.15	Welcome: the aims and organisation of the meeting		Paul Monks
14.30	Atmospheric Composition Change: Air Quality and Health *Topic 4 plenary and 15 min discussion*		Paul Monks
15.15	Atmospheric Composition Change and Climate *Topic 3 plenary and 15 min discussion*		Ivar Isaksen
16.00	Conference arrangements		Peter Borrell
16.05	*Tea (Edith Weston Common Room)*		
		Chair:	***Sandro Fuzzi***
16.35	Atmospheric Composition Change and Ecosystems *Topic 2 plenary and 15 min discussion*		David Fowler
17.20	Measuring Atmospheric Composition Changes *Topic 1 plenary and 15 min discussion*		Paolo Laj
18.05	Close		
from 19.00	*Mixer (Rutland room)*		
19.30	*Dinner (Osprey room)*		

Tuesday, 28th October 2008

9.00	Group Discussions, Session 1 *Discussion rooms:* Group 1. *Rockingham;* Group 2. *Hambleton;* Group 3. *Langham;* Group 4. *Whitwell.*	
10.45	*Coffee (Edith Weston Common room)*	
11.15	Group Discussions, Session 2	
13.00	*Lunch (Osprey room)*	
14.30	Group Discussions, Session 3	
16.00	*Tea (Edith Weston Common room)*	
16.30	Group Discussions, Session 4	
18.30	Close	
from 18.45	*Mixer (Rutland room)*	
19.30	*Dinner (Osprey room)*	

Wednesday. 29th October 2008

	Plenary *(Langham Room)* ***Chair:***	***Tony Cox***
09.00	Measuring Atmospheric Composition Changes *Topic 1 report*	Michela Maione
09.20	General discussion on Topic 1	Michela Maione
09.40	Atmospheric Composition Change and Ecosystems; *Topic 2 report*	Chris Fletchard
10.00	General discussion on Topic 2	Chris Fletchard & David Fowler
10.20	Atmospheric Composition Change and Climate *Topic 3 report*	Michiel van Weele
10.40	General discussion on Topic 3	Michiel van Weele & Ivar Isaksen
11.00	*Coffee (Edith Weston Common room)*	
	Chair:	***Don Weubles***
11.30	Atmospheric Composition Change: Air Quality and Health; *Topic 4 report*	Stefan Reimann
11.50	General discussion on Topic 4	Stefan Reimann & Paul Monks
12.10	The ACCENT Policy Report	Frank Raes
12.30	What have we learned and where do go from here?	Sandro Fuzzi
12.45	*Lunch (Osprey room)*	
13.30	***Workshop Close***	
14.00	*ACCENT S&I Lead Authors' Meeting to follow*	

Peter Borrell
P&PMB Consultants
Newcastle-under-Lyme
October 2008

Appendix 2

Transport and Transformation of Pollutants (T&TP), Access to Emission Data, Access to Laboratory Data, Aerosols, Remote Sensing from Space (AT2), BIAFLUX, Modelling

Future Scientific and Policy Challenges in Tropospheric Composition (FSPC)

The 5th ACCENT Barnsdale Expert Workshop
Monday October 27th to Wednesday October 29th 2008

Actual Participants

Group 1	**Measuring Atmospheric Composition Changes**	
Paolo Laj **Chair & Speaker**	Uni-Clermont-Ferrand, F	P.Laj@opgc.univ-bpclermont.fr
Michela Maione **Rapporteur**	Uni-Urbino, I	michela.maione@uniurb.it
Wenche Aas	NILU, N	Waa@nilu.no
Urs Baltensperger	PSI, CH	urs.baltensperger@psi.ch
John Burrows	IUP, Uni-Bremen, D	john.burrows@iup.physik.uni-bremen.de
Pierre Coheur	Uni-Libre, Brussels, B	pfcoheur@ulb.ac.be
Jens Hjorth	JRC, Ispra, I	jens.hjorth@jrc.it
Jörg Klausen	EMPA, CH	joerg.klausen@empa.ch
Gelsomina Pappalardo	IMAA-CNR, Potenza, I	pappalardo@imaa.cnr.it
Christian Plass-Dulmer	DWD, Hohen-Peissenberg, D	Christian.Plass-Duelmer@dwd.de
Frank Raes	JRC, Ispra, I	frank.raes@jrc.it
Yinon Rudich	Weizmann Inst., Israel	yinon.rudich@weizmann.ac.il
Group 2	**Atmospheric Composition Change and Ecosystems**	
David Fowler **Chair & Speaker**	CEH Edinburgh, UK	dfo@ceh.ac.uk
Chris Flechard **Rapporteur**	INRA, Rennes, F	Chris.Flechard@rennes.inra.fr
Neil Cape	CEH Edinburgh, UK	jnc@ceh.ac.uk
Francesco Loreto	CNR, Bologna, I	francesco.loreto@ibaf.cnr.it
Eiko Neimitz	CEH Edinburgh, UK	en@ceh.ac.uk
Kim Pilegaard	Risoe Natl. Lab., Roskilde, DK	kim.pilegaard@risoe.dk
Ute Skiba	CEH Edinburgh, UK	ums@ceh.ac.uk
Juha Pekka Tuovinen	FMI, Helsinki, Finland	juha-pekka.tuovinen@fmi.fi

Group 3	**Atmospheric Composition Change and Climate**	
Ivar Isaksen **Chair & Speaker**	Uni-Oslo, N	i.s.a.isaksen@geo.uio.no
Michiel van Weele **Rapporteur**	KNMI, de Bilt, NL	weelevm@knmi.nl
Terje Koren Berntsen	Uni-Oslo, N	t.k.berntsen@geo.uio.no
Bill Collins	Met.Office, Exeter, UK	bill.collins@metoffice.gov.uk
Tony Cox	Uni-Cambridge, UK	rac26@cam.ac.uk
Michael Gauss	Uni-Oslo, N	michael.gauss@geo.uio.no
Drew Shindell	NASA, Goddard, USA	Drew.T.Shindell@nasa.gov
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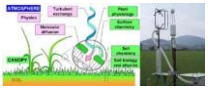
Andre Prevot	PSI, Villingen, CH	Andre.Prevot@psi.ch
Andreas Richter	IUP, Uni-Bremen, D	Andreas.Richter@iup.physik.uni-bremen.de
Keith Shine	Uni-Reading, UK	k.p.shine@reading.ac.uk
Trude Storelvmo	Uni-Oslo, N	trude.storelvmo@geo.uio.no
Don Wuebbles	Uni-Illinois, USA	wuebbles@atmos.uiuc.edu
Group 4	**Atmospheric Composition Change: Air Quality and Health**	
Paul Monks **Chair & Speaker**	Uni-Leicester, UK	P.S.Monks@leicester.ac.uk
Stefan Reimann **Rapporteur**	EMPA, Dübendorf, CH	Stefan.Reimann@empa.ch
Nicola Blake,	Uni-California, Irvine, USA	nblake@uci.edu
Sabine Eckhardt	NILU, Kjeller, N	sec@nilu.no
Claire Granier	Service d'Aéronomie, Uni-Paris 6, F	claire.granier@aero.jussieu.fr
Greg Frost	NOAA, Boulder, USA	Gregory.J.Frost@noaa.gov
Sandro Fuzzi	CNR, Bologna, I	s.fuzzi@isac.cnr.it
Mike Jenkin	Atm. Chem. Services, Yelverton, UK	atmos.chem@btinternet.com
Zbigniew Klimont	IIASA, Laxenburg, A	klimont@iiasa.ac.at
Gordon McFiggans	Uni-Manchester, UK	g.mcfiggans@man.ac.uk
Nicolas Moussiopoulos	Uni-Thessaloniki, GR	moussio@eng.auth.gr
David Simpson	Norwegian Meteo, Oslo, N	david.simpson@met.no
Robert Vautard	LSCE/IPSL, Gif sur Yvette, F	Robert.Vautard@cea.fr
Martin Williams	Defra, London, UK	Martin.Williams@defra.gsi.gov.uk
Organisation		
Peter Borrell	P&PMB Consultants, UK	pborrell@luna.co.uk
Patricia Borrell	P&PMB Consultants, UK	pmborrell@luna.co.uk

Appendix 3

Transport and Transformation of Pollutants (T&TP), Access to Emission Data, Access to Laboratory Data, Aerosols, Remote Sensing from Space (AT2), BIAFLUX, Modelling

AT2



BIAFLUX

Future Scientific and Policy Challenges in Tropospheric Composition (FSPC)

The 5th ACCENT Barnsdale Expert Workshop
Monday October 27th to Wednesday October 29th 2008

Briefing Sheet

1. Workshop Arrangements

The aims of the workshop

a. To identify and review the key uncertainties in the factors controlling tropospheric composition.

b. To provide a basis for future collaborative research priorities in this area.

c. To examine the conclusions and outcomes of the ACCENT Syntheses and Integration (S&I) process

It is intended that the workshop should complement and enhance the main contributions to the ACCENT S&I Report. *By the time of the meeting it is hoped that the **lead authors** will have received the various contributions to their sections, and be able to use these for their introductory plenary talks. The discussion will then concentrate on the future possibilities, gaps, policy links and challenges.*

Discussion Topics

The meeting will be organised around guided discussions on four topics.

Topic 1 Measuring Atmospheric Composition Changes.
Topic 2 Atmospheric Composition Change and Ecosystems.
Topic 3 Atmospheric Composition Change and Climate.
Topic 4 Atmospheric Composition Change: Air Quality and Health.

Group Chairs and Rapporteurs

	Chair	*Rapporteur*
Group 1	Paulo Laj	Michela Maione
Group 2	David Fowler	Chris Flechard
Group 3	Ivar Isaksen	Michiel van Weele
Group 4	Paul Monks	Stefan Reiman

Discussion Questions

The principal questions to be addressed by each group are as follows.

Future

1. What are the principal uncertainties which now require resolution for future advances in the scientific understanding and in developing reliable policy applications?

   One would expect some of these to arise from the S&I Report but, if not, some justification for inclusion of new items should be given.

2. How can the attempted resolution of the uncertainties best be achieved - by individual or by coordinated work?

S&I Report

3. What are the principal scientific discoveries in atmospheric science since the year 2000?
4. Does the S&I Report capture the main findings of scientific activities since 2000?
5. What are the key integrating themes of each S&I Report.
6. What are the policy implications of each S&I Report?

Gothenburg Questions

The workshop has also been asked to consider whether any help can be given with the Gothenburg Questions, a copy of which is provided on a separate sheet.

Organisation of the Discussion

As already indicated, the workshop is intended to complement and enhance the main contributions to the ACCENT Synthesis and Integration Report. By the time of the meeting the lead authors should have received the various contributions to their sections, and so should be able to use these for their introductory plenary talks. The discussion will then concentrate on the future possibilities, gaps, policy links and scientific challenges.

The meeting will start with a plenary session with an invited review paper on each topic by the leading ACCENT author, who will also Chair the Discussion Group. The groups will then separate for the individual discussions, which will include the presentation of "voxboxes" by the Participants. The plenary session will the reconvene for a final combined session, which will be devoted to reports from the Rapporteurs of each of the Groups and an extended general discussion on future directions.

Contributions to the discussion

All invited participants are expected to contribute to the discussions with "voxboxes", *i.e.* one or more brief contributions of key points, results or conclusions, illustrated with one or two overheads. The emphasis should be on future directions and challenges (both scientific and legislative) in their area. *Unlike previous Barnsdale workshops, there is no requirement for participants to produce individual written reports.*

Outcome of the Workshop

The outcome will be a brief report, consisting mainly of the reports from the rapporteurs, revised in the light of the general discussion. Each report should be organised around bullet point recommendations each accompanied, where necessary, by a brief paragraph of explanation. The recommendations will be directly incorporated into the ACCENT Synthesis & Integration report.

2. Roles of Chairs, Rapporteurs and Participants

Role of the Participants

- The principal role is to participate! *i.e.* to contribute to the discussion on the various questions.
- Contributions to the discussion should be made as "voxboxes" – five minute verbal contributions supported by one or two overheads, which are pertinent to the question being discussed.
- Participants are welcome, at the discretion of the Chair, to make several "voxbox" contributions.

Role of the Chairs/Speakers

- *Prior to the meeting*, Chairs should to consult with Rapporteur for their topic on the questions and issues that require attention in the discussions.
- *Prior to the meeting*, Chairs might wish to contact some members of their group to raise particular issues.
- For each question, the Chair should endeavour to ensure that a clear statement emerges which can be recorded by the Rapporteur and can be brought together with information from the other sessions to provide a definitive conference statement on the issue.
- Prior to the final topic presentation, the Chair should assist the Rapporteur for their topic, in putting together the results of the discussion on the topic, for presentation and subsequent publication.

Role of the Rapporteurs

- *Prior to the meeting*, Rapporteurs should consult with Chair for their topic on the questions and issues that require attention in the discussions.
- *In each of the group discussions*, the Rapporteur should record the highlights of the presentations and the main points of the discussion, concentrating on providing clear statements which include the answers to and suggestions for tackling the questions and issues raised. Specific recommendations for necessary work should be incorporated if possible.
- The aim of the *final topic presentation and discussion* is to consider and clarify the specific recommendations for future work and activities, and allow some interactivity between groups. Rapporteurs should put together the conclusions of their groups to provide a clear presentation on the issues and recommendations, organised around bullet point recommendations each accompanied, where necessary, by a brief paragraph of explanation.
- The *final account for inclusion in the Synthesis and Integration Report* should include the results, and recommendations of the final discussion,

3. Claiming Expenses and Cost Limits

Accommodation

The organisers will pay for two nights' accommodation and meals at the Barnsdale Hall Hotel. Any other costs, including *any cancellation charges* will be borne by the participant.

For those who can economise on travel costs by staying an extra night, the organisers will pay for the extra night's accommodation. *Participants from Greece and outside Europe* automatically qualify for an extra night's accommodation on Sunday night, if they need it. Others wishing to extend their stay can book Bed and Breakfast for £85 per person

In order to receive travel support, it will be necessary to attend the complete meeting and observe the booking conditions.

Claiming expenses

- *The agreed hotel costs* will be paid directly; participants are expected to pay any extra costs they incur.
- *Travel arranged by our travel agent* will be paid directly. Other travel should be claimed from the University of Leicester.
- *Claims* should be made on a University of Leicester Form. Any claims must be supported with the original receipts. If you wish to be paid by bank transfer, and/or in foreign (non–sterling) currency, then fill in the additional form, giving the currency, and bank details including the SWIFT and IBAN numbers for foreign transfers. Guidance notes and forms can be downloaded from *ftp://ftp.keele.ac.uk/pub/cha12/T&TP/*
- *At the workshop*, kindly give claims forms and receipts to *Patricia Borrell* for checking and onward transfer.
- *After the workshop*, send completed forms and receipts, ***within one week***, to:
  Dr. Paul Monks, Department of Chemistry, University of Leicester, Leicester LE1 7RH, UK
- Payment is usually made within about a month after submission of the claim.

Limits for travel support

Where support is offered by T&TP to attend meetings and workshops, claims are normally allowed for necessary travel and accommodation. Claims for all expenses must be supported by receipts.

For surface or air travel, there are limits on the fares as shown in the table.

From within the same country	300 €	£240	
From European countries	450 €	£360	
From outside Europe	750 €	£600	$1150

Only the lesser of the amount spent or the limit will be authorised for payment. If the limits pose a particular problem, kindly contact us before incurring any expenditure.

4. Wireless connections

A wireless internet connection is available in the Edith Weston Conference Suite. The parameters are:

Wireless Name: **Barnsdale Hall Hotel**
Connection Key (case sensitive) : **barns201208**
Security Type: **WPA-PSK**
Encryption Type: **TKIP**

Peter Borrell
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October 2008

Appendix 4

Transport and Transformation of Pollutants (T&TP), Access to Emission Data, Access to Laboratory Data, Aerosols, Remote Sensing from Space (AT2), BIAFLUX, Modelling

Future Scientific and Policy Challenges in Tropospheric Composition (FSPC)

The 5th ACCENT Barnsdale Expert Workshop
Monday October 27th to Wednesday October 29th 2008

AT2

BIAFLUX

The Gothenburg Questions

The four FSPC working groups should consider whether the ACCENT Synthesis and Integration Report can provide either part or full answers to these questions. The questions were provided by Jens Hjorth (JRC, Ispra).

Observational evidence

1a Is there *observational* evidence that climate change is affecting the life cycle of air pollutants, i.e. their emissions, atmospheric transport, atmospheric chemistry and/or removal? Can these effects be distinguished from natural variability?

1b Is there *observational* evidence that levels of air pollution do have an effect on regional climate? Can these effects be distinguished from natural variability?

Can ACCENT say something more than what is mentioned in the IPPC AR4?

Data sets and metrics

2a Which data sets regarding air pollution and climate change are needed and which data sets are presently available in order to support integrated air pollution and climate change policies?

We think of emission inventories, emission scenarios, activity levels, control options and their costs etc.

2b Is there a need and possibility to harmonize the above mentioned data sets or to reduce them to a more limited number, so that different modelling and integrated assessment approaches can become more easily comparable?

2c What common metric(s) can be used to compare climate change and air pollution impacts, e.g. in order to evaluate synergies and trade-offs of integrated air pollution and climate policies. Do such metrics exist in the realm of the natural sciences or are they to be found in the realm of socio-economics only?

Measures and technologies

3a Which measures and technologies reduce simultaneously the emissions of greenhouse gases and of air pollutants or their precursors. What is the relevance of such synergies (including economic relevance), e.g. are they such that these measures and technologies should be pursued as a first priority?

3b Which measures and technologies reduce the emissions of long lived greenhouse gases but increase the emissions of air pollutants or their precursors. What is the relevance of such opposing effects for air pollution, are they such that these measures and technologies should be avoided?

3c Which measures and technologies reduce the emissions of air pollutants or their precursors but increase the emissions long lived greenhouse gases. What is the relevance of such opposing effects for climate, are they such that these measures and technologies should be avoided?

By "greenhouse gases" we mean long lived greenhouse gases such as carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O) and halocarbons. By "air pollutants" we mean ozone and particulate matter and their precursors (sulphur dioxide, nitrogen oxide, volatile organic hydrocarbons,..) resulting from anthropogenic activities.

Measures and technologies could for instance include:

Biofuels. *How will their use affect atmospheric chemistry and greenhouse gas emissions?*

Carbon Capture and Storage. *To what extent does it also reduce emissions of air pollutants?*

Reducing particulate matter. *How significant is the effect on radiative forcing and temperature?*

Emission Trading Schemes in Europe and globally. *How will they affect local and regional air pollution?*

Combined Heat and Power (CHP). *What will be the consequences of increased useof small CHP plants within towns?*

Change in global consumption and production patterns. *How will they effect air pollution?*

Effects of present and proposed measures

4 What are the effects of commonly applied and future emission abatement techniques on the physical and chemical characteristics of particulate matter in the emission stream or in the atmosphere?

E.g. Measures to reduce particle emissions from diesel cars might have an impact on ambient particle size and composition. It might change the ratio of inorganic to organic substances in the particles. There is also the issue nano particles.

5 What is the expected effect of the new EU energy policies on the levels of local and regional air pollution.

The combined climate and energy package proposed by the European council on 8/9 March 2007 mentions highly ambitious targets on:

energy efficiency: 20% saving of EU's energy consumption compared to projections for 2020

renewable energies: 20% share in overall EU energy consumption by 2020

the use of biofuels: minimum 10% in overall EU transport petrol and diesel

The package furthermore calls for the development of environmentally safe Carbon Capture and Sequestration.

Transport impacts

6a What are the impacts of global and regional marine transport, including the presence of harbours, on global, regional and local air pollution and climate?

6b What is the effect of global and regional aviation, including the presence of airports, on global, regional and local air pollution and climate?

Nitrogen cycle

7a What is the link between the nitrogen cycle and biodiversity, and how do anthropogenic changes in the nitrogen cycle globally, regionally and locally affect biodiversity?

7b What must be the elements of an integrated assessment of changes in the nitrogen cycle, of their effects and of the potential for controlling these effects? What elements can be provided by the atmospheric chemistry community alone or in partnership with other communities?

7c What are the requirements for monitoring nitrogen budgets?

Effects on vegetation

8 How will climate change influence ozone deposition on vegetation? How important is this influence this for the vegetation and for human health? How can this influence be quantified? What can the atmospheric chemistry community contribute to this quantification, alone or in partnership with other communities?

Effect of air pollution on CO_2 uptake

9 How will air pollution (ozone in particular, but not exclusively) influence carbon dioxide uptake in the biosphere? How important is this influence for the global and regional carbon emission – sink balances?

Changes in land use

10 Which datasets on changes in spatial patterns of land cover and agricultural practices do exist that are of interest for research on atmospheric composition change? Is there sufficient access to these data? If not, how should it be improved?

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October 2008