

# Atmospheric composition change research: the next decade workshop report

ACCENT-Plus Deliverable 4.3



# ACCENT-Plus - Atmospheric composition change research: the next decade workshop report

Barnsdale Hall Hotel, Rutland, UK, 1st-3rd April 2014.

Report compiled by P.S. Monks, University of Leicester

## 1. Aims and Introduction

The workshop had 2 concomitant aims:

1. To undertake a critical review of the ACCENT Synthesis integration topic papers
2. To explore the scientific and political challenges for the composition research agenda for the next decade.

Twenty-nine people attended the Workshop from both the EU and USA. The attendees were typically contributors to the ACCENT topic papers (*Vida Supra*) or invited reviewers to give their perspective on the topic papers or the international scientific agenda in atmospheric composition research moving forward. Figure 1 shows the role of the workshop on tier 3 of ACCENT+ to review the topic papers. Appendix 1 contains the agenda for the meeting.

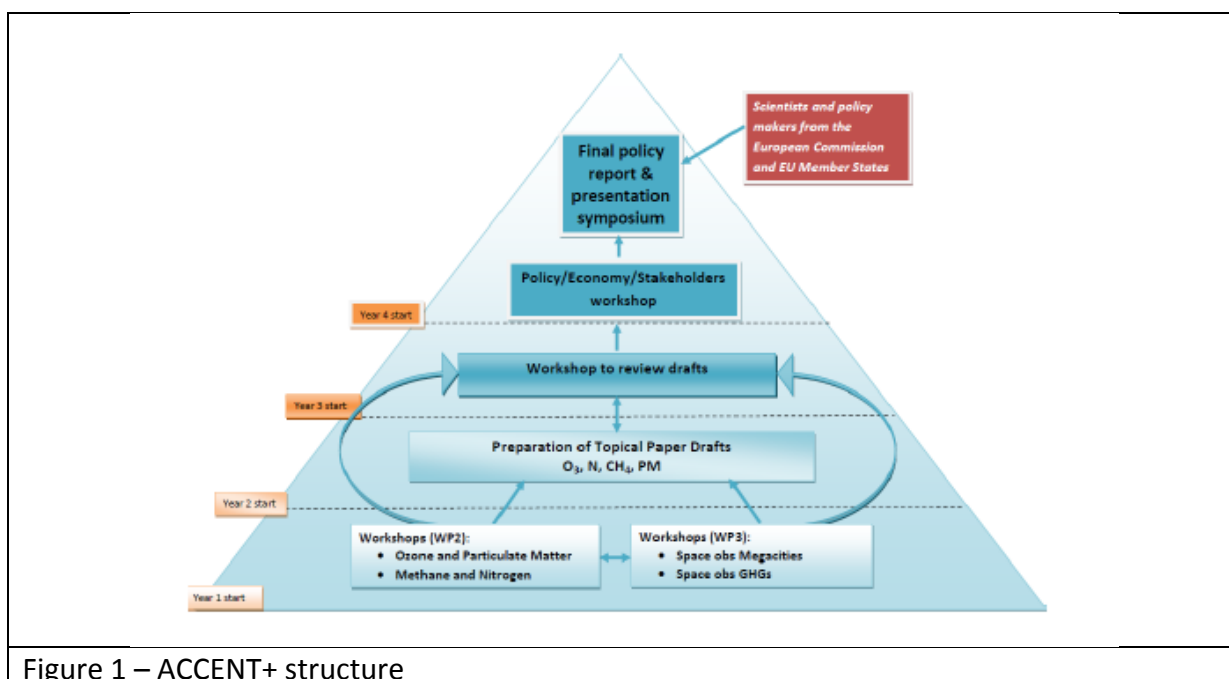


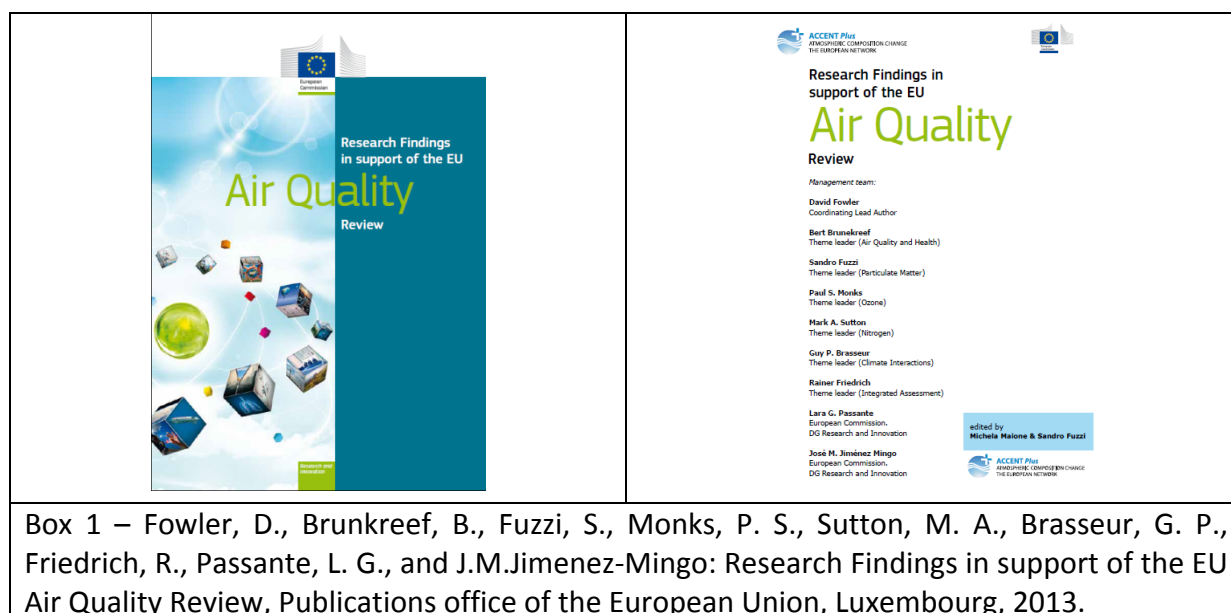
Figure 1 – ACCENT+ structure

Topically, the period of the workshop coincided with a major UK air pollution episode (<http://www.bbc.co.uk/news/uk-26844425>) which led to much media interest in the discussed topic and a number of attendees were drawn into media comment roles.

## 2. Critical Review

An identified output of ACCENT+ was for scientific review papers on key topical issues of both scientific and policy relevance (tropospheric ozone, particulate matter, methane, nitrogen) and a policy orientated paper/book which compiled the scientific information derived from the four science papers for a policy oriented use.

Owing to a sequencing request from the EU in respect of the requirements for input into the EU air quality review, the synthetic book entitled “Research findings in support of the EU Air Quality Review” (edited David Fowler, CEH, Accent+) had already been produced and published prior to the meeting (see Box 1). The topic paper work was therefore focused on undertaking a critical review of the synthesis and integration topic papers in respect of the scope, scientific gaps, new research, policy implications, conclusions and future directions.



All lead authors, for the aerosol topic papers, Sandro Fuzzi, for the ozone topic paper Paul Monks, for the methane topic paper John Burrows and for the nitrogen topic paper David Fowler gave an overview of the status of their papers the critical elements and the science and policy directions. Small breakout groups met the 5 or 6 experts to them critique these papers and provide input into the final papers.

Insights gained from the workshop included

- A better focus on the line from scientific evidence to policy outcome
- A better European scope for the topical papers coupled to a greater global context
- Presentation and update of current/breaking research ideas
- Better integration of the model and observational elements of the research topics

These topic papers have now been submitted for review in Atmospheric Chemistry and Physics ([http://www.atmos-chem-phys-discuss.net/special\\_issue240.html](http://www.atmos-chem-phys-discuss.net/special_issue240.html)).

### 3. Future

The goal of the second part of the workshop was to explore the science and political challenges for the composition research agenda for the next decade and produce an opinion piece aimed both at Decision Makers (e.g. EU H2020, Future Earth, National Funding Councils) and the science community.

As can be seen from the agenda in appendix 1 a number of parties were asked to present oral opinion pieces as the elements of the future direction. New ideas were talked about in terms of the “field was the new lab” and whether the paradigm of natural vs anthropogenic was any longer useful. There was much discussion on sampling and measuring change.

An area around “New paradigms for atmospheric science in a human-modified world or confronting a new environmental era in atmospheric science: A case study on PM air quality issues” was discussed.

The ideas centre around; humans affect and are affected by the environment in a profound and inseparable way, yielding a “modified world” in which anthropogenic and natural influences cannot be disentangled. Further, a combination of “natural” (unforced by human actions) and human influences lead to environmental issues, as exemplified by the ozone hole that is caused by the natural factors of the formation of a vortex and cold temperatures with the addition of man-made halogen compounds. In addition, the atmosphere is the medium for efficient transport, reactivity, and interfaces with other systems, extending the spatial scales affected by local activities, and creating challenges requiring coordinated interdisciplinary efforts. This “modified world” requires new paradigms for scientific research and environmental policy. Lastly, human influences alter (enhance or suppress) natural emissions and removal processes and addition of a chemical is not exactly the opposite of the removal of that compound since the earth system is changed. So, what do we call the anthropogenic influence?

Owing to the ongoing UK pollution episode, an opinion piece around “Investigating Smog to inform policy” was developed for Nature and published (see Appendix 2)

## Appendix I

### ACCENT+ - Atmospheric composition change research: the next decade

#### Workshop Agenda

The workshop has two concomitant aims

- i) To undertake a critical review the Accent Synthesis and Integration Topic Papers
- ii) To explore the science and political challenges for the composition research agenda for the next decade

<b>1<sup>st</sup> April 2014 – Day 1</b>		
11.30-12.30	Check-in ( <i>Hotel Reception</i> )	
12.30-13.30	Lunch & Registration	
	<b>Chair:</b>	Michela Maione
13.30-13.45	ACCENT+ - Aims and Achievements	Sandro Fuzzi
13.45-14.00	Introduction and aims of workshop	Paul Monks
14.00-14.45	Methane – S&I paper	John Burrows
14.45-15.30	Nitrogen – S&I paper	David Fowler
15.30-16.00	Tea and Coffee	
16.00-16.45	Aerosols – S&I paper	Sandro Fuzzi
16.45-17.30	Ozone – S&I paper	Paul Monks
17.30-17.45	Charge for Breakouts	Paul Monks
19.00	Dinner	
<b>2<sup>nd</sup> April 2014 – Day 2</b>		
09.00	Group discussions – Session 1 Group 1 – Aerosols (led by S. Fuzzi) Group 2 – Ozone (led by P. Monks) Group 3 – Nitrogen (led by D. Fowler) Group 4 – Methane (led by J. Burrows)	
10.30-11.00	Working Tea & Coffee	
11.00-12.30	Group discussions – Session 2	
12.30-13.30	Lunch	
13.30-14.30	Plenary	<b>Chair:</b> Claire Granier
13.30-13.45	Report from Aerosol Group	
13.45-14.00	Report from Ozone Group	
14.00-14.15	Report from Nitrogen Group	
14.15-14.30	Report from Methane Group	
14.30-14.45	Conclusions and recommendations	
	<b><i>The Future of Atmospheric Composition research</i></b>	
	<b>Chair:</b>	Illan Koren
14.45-15.00	What have we said about the future in the past?	Paul Monks
	<i>Opinion Pieces</i>	
15.00-15.30	Where do I think its all going?	Ravishankara

15.30-15.45	What's the role for the laboratory?	Yinon Rudich
15.45-16.15	Tea and Coffee	
16.15-16.30	Pesky Particles	Cristina Faccini
16.30-16.45	Take a quick look – with what in the future?	John Burrows
16.45-17.00	What more in the gas-phase?	Kathy Law
17.00-17.15	Its all about chemistry and climate?	Guy Brasseur
17.15-17.45	General Discussion	
19.00	Dinner	
<b>3<sup>rd</sup> April 2014 – Day 3</b>		
09.00	Group discussions – Session 3 All participants invited to make short 2-3 overhead presentation on what their view is on the shape of the future in respect of atmospheric composition research in the future.	
10.30-11.00	Working Tea & Coffee	
11.00-12.00	Group discussions – Session 4	
	<b>Chair:</b>	Sandro Fuzzi
12.00-12.45	Plenary and Wrap up	
12.45-13.00	Turning a good discussion into an output	Paul Monks
13.00-	Lunch and depart	

[PSM 04/02/14]

## Appendix II

### Nature Comment Piece from workshop

#### **Investigate smog to inform policy**

The severe air-pollution episodes that affected Europe this spring (see, for example, [go.nature.com/si6mhu](http://go.nature.com/si6mhu) and [go.nature.com/1b7ygf](http://go.nature.com/1b7ygf)) highlight the need for effective policy measures and management strategies, given the persistence and potential global reach of such acute events.

Reducing particulate matter, ozone and greenhouse gases is essential to mitigate air pollution as well as climate change, so policies need to be coordinated. For example, climate policy encourages use of fuels such as diesel (because its combustion releases less carbon dioxide per kilometre than petrol) and biomass, which offsets most of its own carbon release as it grows. However, both fuels generate harmful particulates.

For now, the factors that triggered Europe's latest air-pollution episodes and influenced their duration and spread must be investigated. This insight will aid the development of much-needed cross-border policies that are based on sound scientific advice.

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*\*On behalf of 11 co-authors (see [go.nature.com/nxe3pb](http://go.nature.com/nxe3pb) for full list).*

Monks, P. S.: European pollution: Investigate smog to inform policy, *Nature*, 509, 427-427, 10.1038/509427a  
<http://www.nature.com/nature/journal/v509/n7501/abs/509427a.html#supplementary-information>, 2014.