



Report on the Citizens' Jury on Air Quality

Part IV Appendices

Prepared for

Department of
Environment Food and Rural Affairs

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05/030



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Appendix 1 Recruitment questionnaire

Department of Environment and Rural Affairs (Defra) Public Consultation Recruitment Questionnaire

Briefing

Recruitment will be by cold call telephone within a 12 mile radius of Sutton Coldfield, a north-east suburb of Birmingham.

We want to recruit: 11 men and 11 women for 10 men and 10 women to take part in a consultation. Within each gender there should be a spread of ages and social classes. Three men and three women should be recruited from inner city Birmingham, three men and three women from the nearby rural areas and two men and two women locally from suburban Birmingham. Ideally we would like three or four participants to be from black and ethnic minority communities. Quotas are set out at the end.

The consultation will take place on 15 December, the weekend of 21/22 January and Saturday 28 January. The 15 December session will last 2½ hours and the three weekend days will last 5 hours. The evening session will be an introduction to the topic and a chance to ask questions. The middle weekend will be for participants to meet a variety of ‘experts’ in various aspects of the topic. The information the experts provide will be tailored to answer questions arising at the first session. The final session will allow some time for any further interactions with ‘experts’ but the focus will be on the participants drafting their conclusions and recommendations to Defra.

Participants must commit to attending all four days. The incentive will be £350 in total plus lunch on the weekend days and sandwiches on the Weekday evening. All the sessions will take place at Midlands On View in Sutton Coldfield.

Introduction

Hello my name is... and I work for..... We are calling to invite you to a series of workshops on behalf of the Department of Environment, Food and Rural Affairs. Could you spare me a few minutes to answer some questions please?

1	Do you or any of your close relatives work in any of the following occupations?		
	Market research	1	THANK AND CLOSE
	Journalism	2	
	Public relations	3	
	Marketing	4	
	Local government	5	
	Scientific research in health or the environment	6	
	Healthcare services (as doctor or nurse)	7	
	Employed by an environmental group	8	
1a	Are you actively involved in any environmental groups or Local Agenda 21?		
	Yes	1	THANK AND CLOSE
	No	2	



2	Are you...		
	Working full time	1	
	Working part-time	2	
	Retired/not working	3	
	Unemployed	4	CODE AS E
	Student	5	CODE AS C1
3	Job Title (WRITE IN)		
4	Job Description (WRITE IN)		
5	Size of Company (WRITE IN)		
6	Qualifications (WRITE IN)		
7	How many people are you responsible for? (WRITE IN)		
8	CODE SOCIAL GRADE		
	A	1	REFER TO QUOTA
	B	2	
	C1	3	
	C2	4	
	D	5	
	E	6	
	MALE	1	REFER TO QUOTA
	FEMALE	2	REFER TO QUOTA
9	Which of these groups best describes your ethnic origin? READ OUT		
	White	1	REFER TO QUOTA
	Black (including British, Caribbean and African)	2	
	Indian sub-continent (India, Pakistan and Bangladesh)	3	
	Other	4	
	Mixed	5	
10	What was your age last birthday?		
	18-29	1	REFER TO QUOTA
	30-39	2	
	40-49	3	
	50-59	4	
	60-69	5	
	70+	6	



11	Do you have children of your own? IF YES What are their ages? ENTER NUMBER OF CHILDREN IN EACH AGE GROUP		
	No children		REFER TO QUOTA
	0-4		
	5-11		
	12-16		
12	Have you or any of your close relatives been diagnosed with any of the following health conditions? READ OUT		
	Asthma	1	REFER TO QUOTA
	Chronic Obstructive Pulmonary Disease (COPD)	2	
	Emphysema	3	
	Chronic bronchitis	4	
	Chronic obstructive airways disease (COAD)	5	
	Chronic obstructive lung disease	6	
	Chronic airflow obstruction	7	
	Chronic airflow limitation	8	
	Allergies such as rhinitis or hay fever	9	
	Heart condition	10	
	None of these	11	
13	Do you regularly drive a car?		
	Yes	1	REFER TO QUOTA
	No	2	
14	Would you say that where you live is ..READ OUT		
	Urban	1	REFER TO QUOTA
	Suburban	2	
	Rural	3	
15	Have you EVER attended a market or social research group discussion or depth interview before?		
	Yes	1	THANK AND CLOSE
	No	2	RECRUIT

I would like to invite you to a series of workshops on 15 December at 7.00pm until 9.30 pm, and from 11.00 am until 4.00 pm on Saturday 21, Sunday 22 and Saturday 28 January next year in Sutton Coldfield. There will be 19 other members of the public invited from the Birmingham area as well.

At the first session you will be briefed about a local environmental issue and have an opportunity to ask questions and to ask for more information. There will also be time to debate the issues raised with other members of the public. On the weekend of 21/22 January a number of the UK's experts in the issues to be considered will be present to answer your questions. They will answer the questions raised by you and the other members of the public and you will then be able to question them further. In the final session you will have an opportunity to ask any last questions and to formulate recommendations to the Department of Environment Food and Rural Affairs.



During the sessions there will be a number of people interested in what you have to say who will be observing the process in our viewing rooms. In addition the proceedings will be audio and video recorded to provide a record for later analysis. These recordings may also be used to demonstrate the process to a number of interested people working for the Department of Environment Food and Rural Affairs, other Government Departments and universities.

PARTICIPANTS MUST AGREE TO BE RECORDED AND OBSERVED

QUOTAS

GENDER	men	11
	women	11
SOCIAL GRADE	A/B	2 men and 2 women
	C1	2 men and 2 women
	C2	2 men and 2 women
	D	2 men and 2 women
	E	2 men and 2 women
ETHNIC GROUP	Non-white	2/3 men and 2/3 women
AGE	18-29	2 men and 2 women
	30-39	2 men and 2 women
	40-49	2 men and 2 women
	50-59	2 men and 2 women
	60+	2 men and 2 women
CHILDREN	Aged under 12	At least 2 men and 2 women
	Aged 12-16	At least 2 men and two women
HEALTH CONDITIONS	CODES 1 TO 10 AT Q12	4 PEOPLE WITH ANY OF THESE CONDITIONS BUT NO MORE THAN 2 WITH ASTHMA
CAR DRIVING	Regular car driver	AT LEAST 4 PEOPLE
	Non-driver	AT LEAST 3 PEOPLE
AREA OF RESIDENCE	Urban	3-4 men and 3-4 women
	Suburban	3-4 men and 3-4 women
	Rural	3-4 men and 3-4 women



Appendix 2 Jury profile

The final jury was composed of twenty people. The socio-demographic make up of the jury is as shown in the table below.

Variable	Groups	Jury
Gender	Men	11
	Women	9
Social Grade	A/B	3 men and 2 women
	C1	1 man and 1 woman
	C2	3 men and 1 woman
	D	2 men and 2 women
	E	2 men and 3 women
Ethnic Group	Non-White	4 men and 1 woman
Age	20-29	3 men and 1 woman
	30-39	2 men and 2 women
	40-49	2 men and 1 woman
	50-59	1 man and 3 women
	60+	3 men and 2 women
Children	Aged Under 12	5 men and 2 women
	Aged 12-16	2 men and 1 woman
Health Conditions	Any Listed	
	Asthma	1
	COPD	
	Emphysema	
	Chronic Bronchitis	2
	COAD	
	Cronic Obstructive Lung Disease	
	Chronic Airflow obstruction	
	Chronic Airflow limitation	
	Allergies such as rhinitis or hayfever	3
Heart Condition	2	
Car Driver	Regular Driver	9 men and 8 women
	Non-Driver	2 men and 1 woman
Area of Residence	Urban	4 men and 2 women
	Suburban	3 men and 4 women
	Rural	4 men and 3 women



Appendix 3 Agenda for first hearing

Introduction

Introduce self and check everyone has the notebook provided	7.00 pm
Before we start, as you can see, the proceedings are being audio and visually recorded as a record for analysis purposes.	
No one will be identified in the report. All the information will be collected together and anonymised.	
Is everyone happy for the session to be recorded? You should have been informed of this when you were invited here.	
Introduce PSP	
Introduce other PSP staff, John Murlis, Defra representative and Defra. Defra representative should be in the room for this session.	
<p>Before we go any further, let's find out something about all of you. GET EVERYONE TO STAND UP AND FORM A CIRCLE ALTERNATING MALE, FEMALE. THEN ASK ALL THE MEN TO MOVE TWO MALE PLACES TO THE RIGHT. INCLUDE PSP AND DEFRA STAFF</p> <p>SIT EVERYONE DOWN</p> <p>STARTING FROM A RANDOM SPOT IN THE CIRCLE PUT PEOPLE INTO PAIRS AND ASK THEM TO TELL THEIR PARTNER THEIR NAME AND SOME KEY PIECES OF INFORMATION ABOUT THEMSELVES , ESPECIALLY WHETHER THEY LIVE IN URBAN, SUBURBAN OR RURAL AREA, AND WHY THEY AGREED TO COME.</p> <p>ALLOW A FEW MINUTES AND THEN ASK PEOPLE TO INTRODUCE THEIR PARTNER</p> <p>THANK EVERYONE FOR JOINING IN AND INTRODUCE THE PROJECT</p>	
<p>Introduce the project Two things to consider: The topic we want to consider but we'll come to that later. First we want to outline the process we'll be using for this project.</p>	7.15



<p>Outline Citizen’s Jury approach You have a handout about the Citizens’ Jury process, in outline it will be:</p> <ul style="list-style-type: none"> • An advisory committee to ensure balance, which has already met and has the opportunity to comment on the process and the details of delivery • Telephone recruitment of jury, which is how you were recruited • Witnesses to present information to jurors. We’ve already identified some potential witnesses and at the end of this session we’ll be asking you to decide the type of information you want so we can identify witnesses to come here for the next session in January • A charge for the jury to address, again, we’ll come on to this later this evening. • Hearings, and as you know we’ll be meeting for three more days after this evening and presenting you with quite a lot of information but you’ll have time to ask questions and talk through issues as we go along • Recommendations from jurors, so the final session will be for you to finalise and make recommendations to Defra • Report agreed with the jurors. We at PSP will draft the report and circulate it to you for agreement, so you get an opportunity to comment and suggest changes. The report will be published next year and will be available from the Defra and PSP websites in full. • Opportunity to present recommendations to policy-makers. At the final session there will be some other people here from Defra. • Evaluation, we want to know what you all thought of the process at the end, so we’ll be asking you for feedback both as we go along and more formally when it’s all over next year. <p>The important thing about this process is that everyone is entitled to their own view, so we want to hear from everyone. We have an agenda for the evening but we really want to hear your views on the issues we’ll be introducing. You don’t have to answer all of the questions. You are free to leave before the end of the session, if you wish but you will not be able to rejoin the proceedings.</p>	
<p>Does anyone have any questions about the process?</p>	
<p>SPLIT INTO 2 GROUPS</p>	
<p>What sort of environmental issues are you aware of these days?</p>	<p>7.20</p>
<p>COLLECT RESPONSES ON FLIP CHART</p>	



<p>INTRODUCE AIR QUALITY The subject we want to look at with you over the coming weeks is ‘air quality’. PARTICIPANT LED DISCUSSION ON AIR QUALITY, WHAT THE TERM MEANS TO THEM – CLARIFY WHAT IT MEANS TO DEFRA. WE WANT TO EXPLORE THEIR FRAMINGS BUT NOT ABOUT THE PHRASE, ABOUT THE CONCEPT. AT THIS POINT EXCLUDE INDOOR AIR QUALITY.</p> <p>PROMPT QUESTIONS WILL INCLUDE:</p> <ul style="list-style-type: none"> • Have you ever thought about the quality of the air where you live? • Do you think that the air quality where you live is good, bad or indifferent? • What sorts of things do you notice about the air around you? • When/how do you notice, if at all, that the air is better or worse than usual? • What do you know, if anything, about air quality? PROBE FOR ANY AWARENESS OF LOCAL LEVEL MONITORING AND INTEREST IN THIS • What matters about air quality? • Why is air quality poorer than it might be? • What do you think causes poor air quality/air pollution? PROBE FOR ANY TECHNICAL UNDERSTANDING • What do you think should be done to improve air quality? What might have the biggest impact? What should the Government be doing, if anything? What do you think it is doing? What could you yourself do? And your family and friends? 	
<p>RECONVENE AS ONE GROUP FOR JOHN MURLIS PRESENTATION. ALLOW TIME FOR COMFORT BREAK. REFRESHMENTS TO BE AVAILABLE ON SELF-SERVICE BASIS DURING THE PRESENTATION</p>	7.50
<p>ASK FOR QUESTIONS, REFLECTIONS, THOUGHTS FOLLOWING PRESENTATION WITH JOHN MURLIS PRESENT TO ANSWER QUESTIONS</p> <p>RECORD INFORMATION REQUESTED/QUESTIONS ON FLIP CHART THE PURPOSE IS NOT NECESSARILY TO ANSWER THE QUESTIONS BUT TO IDENTIFY TOPICS FOR THE NEXT HEARING TO HELP IDENTIFY RELEVANT WITNESSES</p>	8.20



<p>SPLIT INTO 2 GROUPS FOR GENERAL DISCUSSIONS ON THE ISSUES RAISED BY THE PRESENTATION WITHOUT JOHN MURLIS PRESENT OR OBSERVING</p> <p>[ALLOW COMFORT BREAK TIME DURING ROOM MOVES]</p> <p>FOCUS ON AGREEING THE CHARGE AS THE STIMULUS FOR DISCUSSION</p> <p>PRESENT WITH PROPOSED CHARGE: <i>‘What improvements, if any, would people like to see in air quality and how should these be achieved?’</i></p> <p>Given what you have heard, is this the question you would like to address during the remaining meetings?</p> <p>IDENTIFY SOMEONE TO FEEDBACK ON CONCLUSIONS ON THE CHARGE TO THE WHOLE GROUP</p> <p>BRING TO A CONCLUSION BY MOVING ON TO IDENTIFY A LIST OF QUESTIONS TO BE ANSWERED NEXT TIME AND/OR A LIST OF THE TYPES OF PEOPLE PARTICIPANTS WOULD LIKE TO HEAR MORE FROM ABOUT AIR QUALITY AND THE ISSUES RAISED</p>	<p>8.30</p>
<p>RECONVENE IN ONE GROUP TO AGREE FINAL CHARGE. BOTH GROUPS TO PRESENT THEIR CHARGE AND REASONS LEADING TO FINAL AGREED CHARGE</p> <p>LAST QUESTIONS AND BRIEFING ON NEXT STEPS. First thing in the new year you should receive a note of this meeting. In particular we’ll highlight the questions that have arisen and tell you who we’ve invited to come and talk to you. They’ll be a short note about the experience and expertise of each. If you have any questions or points you want to raise about it please contact PSP, our contact details will be in the report.</p> <p>At the next meeting here on 21 January we will start with a discussion about your thoughts since the last meeting before having sessions where each witness in turn will come and answer your questions from tonight. Once they have answered the questions you will be able to ask them questions and delve into things in more depth.</p> <p>Confirm start and end times and venue for the weekend of 21/22 January Ensure everyone has selected their lunch for both days. If anyone has queries about the meeting in terms of venue, food, timing or whatever, please contact MOV. Your contact here is XXX and you can contact us at PSP through them if you want to. Any last questions, points, concerns?</p> <p>MAKE SURE EVERYONE HAS BOOKED A LUNCH FOR THE WEEKEND</p>	<p>9.00</p>
<p>CLOSE</p>	<p>9.30</p>



Appendix 4 John Murlis presentation overheads

Defra Air Quality Citizens' Jury
 -
First workshop 15 December 2005

John Murlis
 People, Science and Policy Ltd

What causes poor air quality?

- Air quality can be good
- Air quality can be poor
- Poor largely because of human activity
 - Industry (including Electricity)
 - Traffic
 - Transport (air)
 - Consumer products (e.g. aerosols)

Monitoring air quality



Birmingham Centre Air Pollution Monitoring Station


Main Air Pollutants Monitored in the UK

Information on each of the five main pollutants with short-term health effects is gathered every hour from over 110 automatic monitoring sites. The five main pollutants are:

- sulphur dioxide;
- nitrogen dioxide;
- ozone;
- carbon monoxide; and
- particles (PM₁₀).

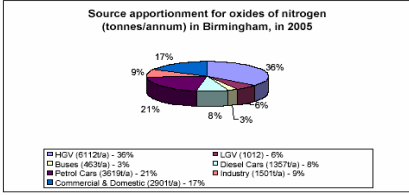
The air pollution level reported in the forecasts and summaries is the highest for any single pollutant. For example, if all but one of the pollutants in a region or city were 1-3 (low), with just a single pollutant registering 7 (high), the summary would describe air pollution as 7 (high). In the UK, very high levels of air pollution are rare. That is why the 'very high' band is only a single number - 10.

Sources of Air Pollution



Pollution in Birmingham

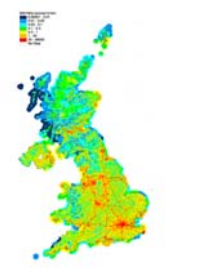
Source apportionment for oxides of nitrogen (tonnes/annum) in Birmingham, in 2005



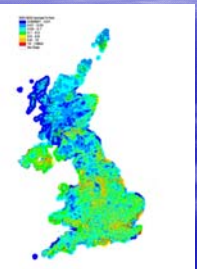
Source	Percentage
HGV (6112t/a)	36%
Busess (4637t/a)	3%
Panel Cars (9238t/a)	21%
Commercial & Domestic (2901t/a)	17%
LGV (1012)	6%
Diesel Cars (1357t/a)	6%
Industry (1501t/a)	9%

FIGURE 4: SOURCE APPORTIONMENT FOR OXIDES OF NITROGEN ACROSS BIRMINGHAM IN 2005.

Map for NOx in 2001

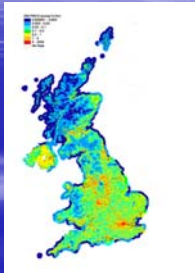


Map for SO2 in 2001





Map for PM10 in 2001



What are the effects of poor air quality?

- On health
- On the environment
- On the economy
- On the wider society

Health Impacts of Main Air Pollutants

- Some believe air pollution at current levels causes respiratory illnesses
- Balance of opinion, however, is that air pollution at current aggravates but does not cause, respiratory illnesses
- However, some components of air pollution have more serious effects over longer periods, depending on level
- For some air pollutants there appears to be effects however low the level

Environmental Impacts of Air Pollution

- Acid rain
- Water
- Attack on materials and crops
- Climate change

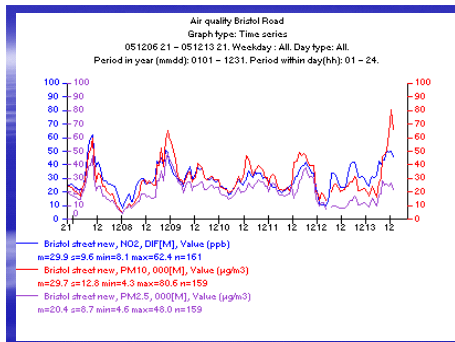
Air Pollution Impacts on Economy and Society

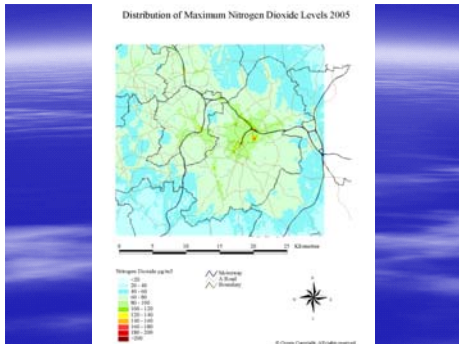
- Costs of poor health
 - Treatment
 - Days of work lost
 - Problems for dependents
- Cost of repairing damage
 - Buildings
 - Countryside restoration
 - Securing water supply

What is the air quality like round here?

- Based on Birmingham City Council
- Data from local monitoring
- Focussed on health impacts

Air Quality Monitoring in Birmingham





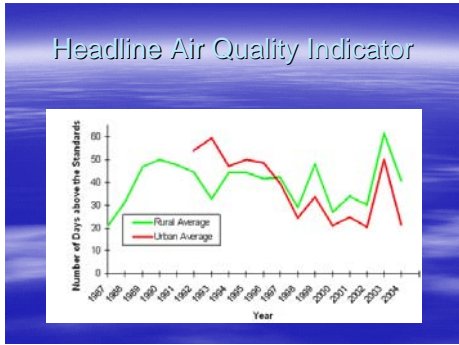
Action Against Air Pollution

Nationally:

- UK Air Quality Strategy: set and plan to achieve Air Quality Standards

Locally:

- Plan for meeting standards, set up special zones



Internationally

- Europe
 - Emission standards for industry and vehicles
 - Air Quality Directives
- UN Economic Commission for Europe
 - Protocols to reduce acid rain, toxic air pollution, ozone
 - International monitoring

Future Directions

- More AQ action areas (London and Heathrow, first)
- Better emission standards for industry
- Road traffic reduction
- Energy efficiency (domestic and industrial)





Appendix 5 List of jurors' questions from first hearing

Causes of poor air quality

What are the different types of air pollution, where do they come from? Need to be able to compare different things.

How can we trade-off different things that have different impacts in different places? e.g. diesel and electric trains.

Some chemicals in industrial applications cause asthma and breathing problems do these get out into the environment?

How much is known about the impact of crop spraying?

What sort of research is going on to investigate the differences and similarities between urban and rural air quality?

What is the effect of cremations on air quality?

Is Ozone good or bad?

Is radiation a factor? (Either ionising – radioactivity or electro-magnetic – power cables phone and TV masts).

Weather

How does the weather influence air quality?

What are the effects of electrical storms on air quality?

Is the weather a get-out clause?

Winters don't seem to be as cold as they were, is this linked to air pollution?

Measurement

How many monitoring stations are there in the UK? How much do they cost?

Where are we in terms of air quality? Where should we be getting to?

What are the optimum achievable targets?

How much have we improved since, say, the early 20th century?

Roads and transport

How do people work out the effects of future road building on air quality? Whose responsibility is it to do this? How far “down” (in terms of grade of road) do the requirements go?

Has a road ever not been built because the effect on air quality would be too bad?

Has there been an increase of emissions with speed bumps? (Someone suggested that something had been investigated in Leicester.)

Has there been research on whether putting roads underground helps air quality? (Boston Ma)

Is diesel technology improving? If so how and what impact has it had?

Could using canals for transportation play a role in improving air quality?

How can the planning system be used to reduce the need for to travel?



Solutions

What technologies are available to reduce pollution by industry and transport providers?

What are the best solutions?

What has worked in the past to improve air quality?

How is the effectiveness of different solutions measured?

How much can “nature” deal with pollution? Can things be done like planting trees?

Responsibility

Who is most at fault – industry, different sorts of transport, domestic?

How responsible are we as individual people?

Is there any evidence about which works best, financial rewards or penalties?

Health

What is the evidence that air pollution aggravates, not causes, illnesses?

What illnesses other (than asthma) does poor air quality impact on or cause?

Broad policy questions

How much does USA pollution affect us?

How is the Government leading by example?

How are we trying to reduce waste by reducing production?



Appendix 6 Agenda for second hearing

Saturday, 21 January 2006

10.30 am Coffee available

11.00 am Start

Warm-up and round robin of thoughts and information found since the first hearing.
Comments from jurors on the PSP report sent to jurors in advance of the hearing.

Defra to recap on objectives of the project.

Recap of the questions from the first jury and the addition of new questions, refinement and/or removal of existing questions.

11.30 am Causes of poor air quality and the impact of the weather
Professor Dick Derwent, University of Birmingham

12.00 noon Health effects
Professor Frank Kelly, King's College London

12.30 pm Lunch

1.00 pm Dealing with poor air quality
Dr Mike Holland, Ecometrics Research and Consulting

1.30 pm Break out discussions on causes and effects. In break out groups draw issues, conclusions, further questions (perhaps for other witnesses) together.

RECONVENE IN MAIN ROOM (COMFORT BREAK)

2.15 pm Local policy
Gavin Tringham, Head of Public Health, Birmingham City Council

2.45 pm Refreshment break

3.00 pm Regulation and the future
Martin Bigg, Environment Agency

3.30 pm National and international policy
Tim Williamson, Defra

4.00 pm Break out discussions on causes and effects. In break out groups draw issues, conclusions, further questions (perhaps for other witnesses) together.

4.55 pm Reconvene as one group for final thoughts and questions. Outline of next day agenda.

5.00 pm Close



Sunday, 22 January 2006

10.30 am Coffee available

11.00 am Start

Warm-up and round robin of thoughts from the previous day. Finish with identifying new questions, refinement and/or removal of existing questions for today.

11:30 am Transport and industry

Simon Barnes, Society of Motor Manufacturers and Traders

Dr David Carslaw, University of Leeds

12.30 pm Friends of the Earth

Lesley James

1.00 pm Lunch

1.30 pm Break out discussions on policy issues and solutions. In break out groups draw issues, conclusions, further questions together.

2.30 pm Report backs from breakout groups over the 2 days.

3.30 pm Break

3.45 pm Reconvene as one group for final thoughts and questions. Outline of next week's agenda.

4.00 pm Close



Appendix 7 List of witnesses

Professor Dick Derwent

Professor Frank Kelly, King's College London

Dr Mike Holland, Ecometrics Research and Consulting

Gavin Tringham, Head of Public Health, Birmingham City Council

Martin Bigg, Environment Agency

Tim Williamson, Defra

Simon Barnes, Society of Motor Manufacturers and Traders

Dr David Carslaw, University of Leeds

Lesley James, Friends of the Earth



Appendix 8 Witness presentations

Professor Frank Kelly, King's College London

Air Pollution & Health


Frank J. Kelly
Environmental Research Group
King's College London

January 2006

Air pollution is the environmental factor with the greatest impact on health in Europe and is responsible for the largest burden of environment-related disease

Source: European Environment Agency 2005

Air pollution – Europe

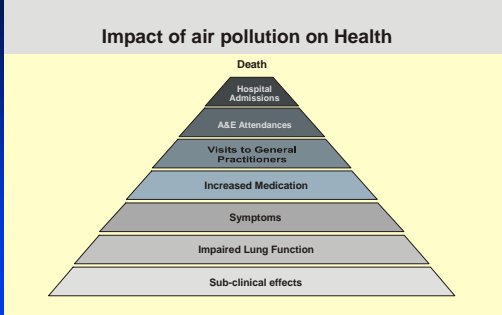


Each year 348,000 premature deaths can be attributed to exposure to air pollution

13,000 children die from outdoor particulate matter

WHO, 2005

Impact of air pollution on Health



Death

Hospital Admissions

A&E Attendances

Visits to General Practitioners

Increased Medication

Symptoms

Impaired Lung Function

Sub-clinical effects



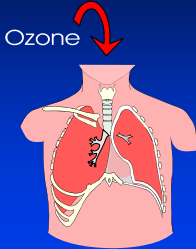
Air Pollution

Ozone

Particulates

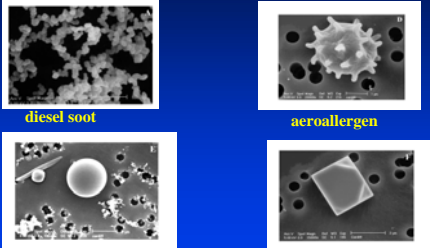
Nitrogen dioxide

Pulmonary response to ozone



- decreased lung capacity
- increased flow resistance
- increased permeability
- inflammation
- increased bronchial reactivity

Air contains many different types of particles



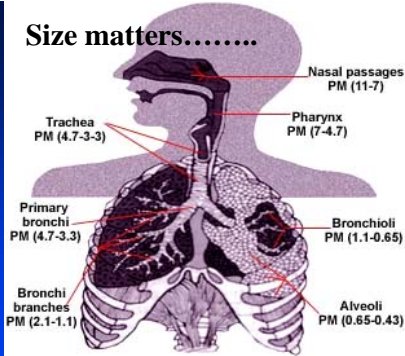
diesel soot

aeroallergen

metal

salt

Size matters.....



Nasal passages PM (11-7)

Pharynx PM (7-4.7)

Trachea PM (4.7-3.3)

Primary bronchi PM (4.7-3.3)

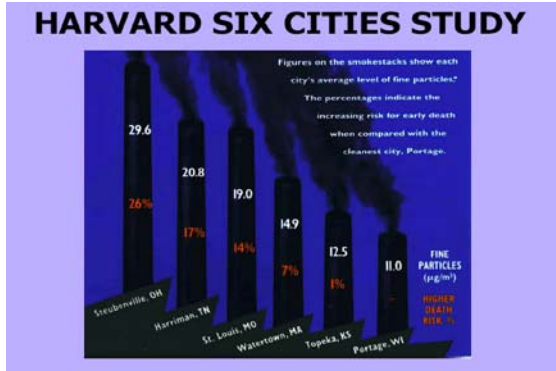
Bronchi branches PM (2.1-1.1)

Bronchioli PM (1.1-0.65)

Alveoli PM (0.65-0.43)



How do we know that air pollution can really causes health problems?



- ### What illness's does air pollution make worse (or cause)
- Asthma
 - COPD
 - Lung cancer
 - Heart disease (atherosclerosis)
 - Diabetes
 - Low birth weight
 - Children (health & development)
 - Elderly (established disease?)



Dr Mike Holland, Ecometrics Research and Consulting

Dealing with poor air quality

Dr Mike Holland
EMRC
Ecometrics, Research and Consulting

Questions raised

- What has worked in the past to improve air quality?
- What technologies are available to reduce pollution by industry and transport providers?
- What are the best solutions?
- How is the effectiveness of different solutions measured?
- How much can “nature” deal with pollution? Can things be done like planting trees?

What worked in the past?



What worked in the past?

- Clean Air Acts of 1956 and 1968
- Controls on fuels for domestic and industrial consumption
 - Planning regulation – moving large polluters out of cities

More recent action

- Vehicle emission controls from 1993 on (Euro standards)
- Fuel quality controls
- Industrial controls
- Construction codes, energy efficiency subsidies
- Fiscal incentives
- Liberalisation of the energy market

Costs of pollution control, £million, transport sector

Policy	Forecast cost estimate 1990-2001	Ex-post cost estimate 1990-2001
Unleaded petrol	2,540	<1,036
Euro I petrol cars	5,834 – 8,751	437 – 729
2000 fuel standards	737	368
2005 fuel in 2001	270	135

Costs of pollution control, power sector, £million

Policy	Forecast cost estimate	Ex-post cost estimate
1 st Sulphur Protocol	4,600 – 29,000	0 – 4,800
2 nd Sulphur Protocol	800	0 – 29
Low sulphur coal	484	0
FGD	900	>935
Low NOx burners	180	83

You asked...“What technologies are available to industry and transport?”

- Also need to consider...
 - ... non-technical solutions
 - ... other sectors



What technologies are available to industry and transport?

- Future Euro standards for vehicles
- Road pricing
- IPPC regulation on industry
 - More efficient filters
 - Better construction standards for plant
 - NOx controls
 - SO₂ control

Other actions

- Energy efficiency
 - E.g. Bedzed (Beddington Zero Emission Development), ideas on “one planet living”

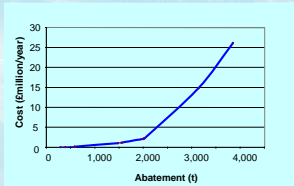


Other actions

- More efficient vehicles
 - Technical improvements
 - Proper maintenance (from ignition to tyre pressure)
- More efficient transport modes
 - Walking, cycling
- Sustainable procurement
 - E.g. consideration of energy and eco-labels
- Planting trees?

How is efficiency measured?

- Use of cost curves – this example showing costs of ammonia control from industrial facilities in the UK



What are the best solutions?

- Solutions that save money
 - Energy efficiency, many sustainable procurement initiatives
- Solutions with additional benefits
 - Traffic controls (congestion charging in London, road pricing more generally)
- Measures directed to major reductions in important sectors
 - FGD, particle controls in industry
 - NOx, particle controls in vehicles
 - Potential for innovation, e.g. through renewable energy schemes



Gavin Tringham, Head of Public Health, Birmingham City Council

Gavin used large maps of the West Midlands area to highlight specific air quality issues associated with urban development and transport infrastructure.



Martin Bigg, Environment Agency



Regulation and the future
Dr Martin Bigg
Head of Industry Regulation

creating a better place




Introduction

- Background
- Regulators
- Achievements
- Regulation
- Future Regulation

creating a better place





Background

- Average loss of life expectancy 7 months
- Cost of health effects £15-£50 billion per year
- Deprived communities affected by nitrogen dioxide, fine particles, sulphur dioxide, carbon monoxide and benzene
- UK and EU air quality objectives will not be met due to transport

creating a better place



The Environment Agency

- England and Wales
- Flooding, Fishing, Waste
- 4000 industrial sites and processes
- Integrated Pollution Regulation - air, water, waste
- Contribute towards achievement of UK air quality objectives and EU standards

creating a better place





Other regulators

- Scottish Environmental Protection Agency
- Local authorities regulate emissions from 500 complex and 17000 small industrial processes
- Local air quality (153 air quality management areas - 95% due to traffic)

creating a better place



Environment Agency

Achievements

- Since 1990 reduced emissions from industries we regulate
 - Sulphur dioxide 75%
 - Particles 78%
 - Nitrogen oxides 52%

creating a better place

Environment Agency

Regulation

- “Best available techniques”
 - Equipment, training, management
 - Energy, resources
 - Economic considerations
- Emission limits
- Air quality standards
- Improvement programmes
- Monitoring and reporting

creating a better place



Environment Agency

Future Regulation

- Risk based regulation and charging
- Air quality monitoring
- Pollution taxes
- Emissions trading
- Environmental management systems

creating a better place

Environment Agency

Conclusions

- Air Quality is a continuing issue
- Several Regulators
- Significant achievements
- Regulations
- Future changes and improvements

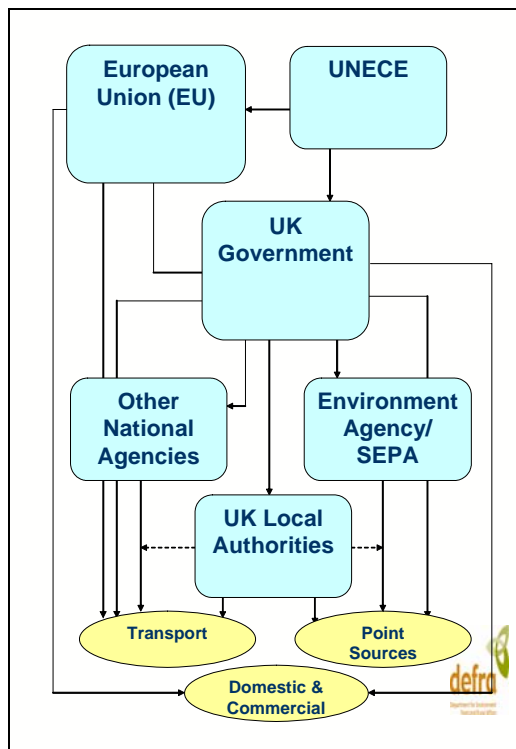
creating a better place



Tim Williamson, Defra

National and International Policy

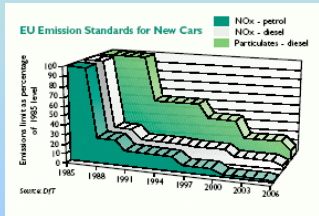
Tim Williamson
Air and Environment Quality
Division
Defra





Simon Barnes, Society of Motor Manufacturers and Traders

“Euro” standards – Regulation on the automotive sector



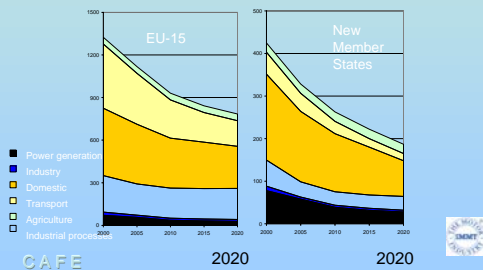
Similar standards apply to HGV, buses and coaches

Particulates - soot

- Predominantly from diesel engines.
- Can be reduced by engine technology and “trap” technology.
- Where is this an issue and what contribution does road transport make?

Particulates

PM 2.5 Emissions by Sector, with climate change scenario (kt)

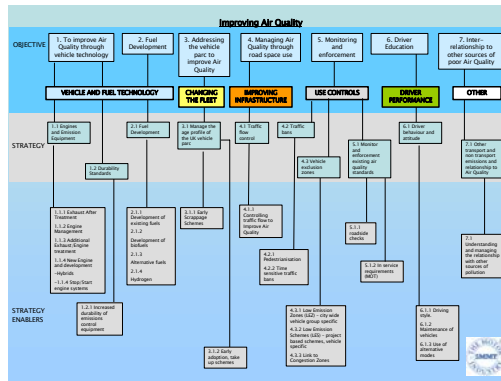
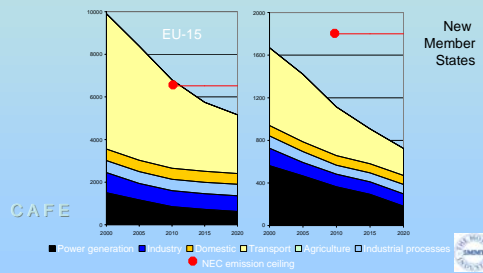


Nitrogen Oxide

- Ozone formation – smog
- Health impact
- Impact on vegetation
- Needs after engine treatment to reduce

NOx

NOx emissions by sector
“With climate measures” scenario [kt]






Dr David Carslaw, University of Leeds

www.its.leeds.ac.uk

Citizen's Jury – Air Quality

David Carslaw

22 January 2006





Institute for Transport Studies

www.its.leeds.ac.uk

An old problem...

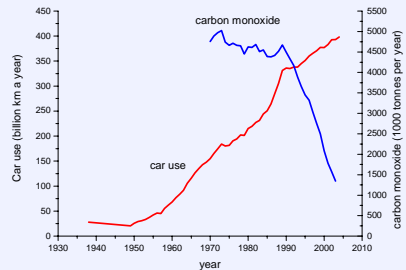

- Article in The Lancet from 1907 "Motor traffic and pollution of the air"
- Still a problem nearly 100 years later! – Why?

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Car use and emissions in the UK

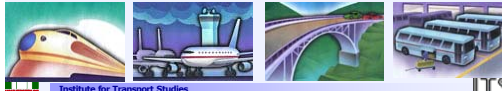




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Trains, planes and automobiles (and buses)

- How do the different forms of transport compare in relation to air pollution?
- Are buses any better than cars for travel in urban areas?
- Should I have taken a train, bus, car or a plane to get to Sutton Coldfield?
- How can you compare these things?

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Bus versus car: a trip into town

Let's compare a bus and a car for a typical urban journey

Roughly speaking, for most pollutants a bus is 5-10 times more polluting for every km travelled compared with a car

Most appropriate comparison is amount of pollution emitted per passenger per mile

The occupancy rate is of key importance






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Bus versus car: a trip into town

- Perception is that buses are "dirty"
 - In one sense this is true – a single bus compared with a single car is worse
- Importance of where pollutants are emitted
 - A street with lots of buses can be more polluted than the same street with lots of cars






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Train versus plane

- Longer journeys between large cities
- Occupancy rate still important
- How is the train powered?
 - Diesel or electric
- Studies show that for most pollutants trains (particularly electric trains) are better





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A moving target

- For road transport
 - Catalysts and particle filters can result in sudden and large reductions in emissions
 - Improvements in engines and fuels
 - New technologies – hybrid cars
- For electric trains (and other services that use electricity)
 - Electricity generation has changed considerably and will continue to do so (much less coal, emissions abatement on power stations)
- Aircraft are a bit trickier
 - No step-changes in emissions



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Lesley James, Friends of the Earth

Citizen's Jury on Air Quality
Second hearing
22.1.2006

Lesley James
Friends of the Earth
www.foe.co.uk

Responsibility for poor air quality

- Who is most at fault – industry, transport or domestic sources
- How responsible are we as individuals?

Solutions to poor air quality

- What are the best solutions?
- How much can nature deal with pollution?
- How is the effectiveness of different solutions measured?
- Individual people in the big picture

**Who's most at fault? Industry
 Transport
 Domestic sources**

- Total pollution calculations too complex
- Impact of emissions depends upon local factors
- Simpler approach looks at:
 - emissions not impacts
 - particular pollutants or sources

Emissions of key pollutants

	SO2	NOx	NM VOCs	PM (dust)	CO	Smk	GHG
Industry	34%	21%	3%	18%	17%	12%	52%
Transport	11%	53%	40%	28%	74%	57%	21%
Domestic	28%	13%	4%	23%	7%	25%	13%
Other	27%	13%	53%	31%	2%	6%	14%

MMU 1998 DEFRA 2000

Greenhouse gas emissions by source (MtC)

Sector	1990	2000	2010	2020
Energy supply	74.2	58.7	52.6	51.8
Business	49.6	37.2	36.2	38.4
Transport	35.5	37.7	43.8	49.1
Domestic	23.5	23.5	23.6	24.2
Agriculture	23.9	21.1	19.5	18.2
Public	5.0	4.7	4.5	4.5
TOTAL	211.7	182.9	180.2	186.2

Source: DEFRA, November 2004

What are the best solutions?

- Demand reduction eg. switch off lights
 consume less
- More efficient use eg. efficient appliances
 car sharing
- Use alternatives eg. renewable energy
 public transport
- Prevent pollution eg. low-S/lead-free fuel
 low-NOx burners
- Clean up pollution eg. abatement filters

How is the effectiveness of different solutions measured?

Cost – benefit analysis
 Cost of measure vs value of environmental benefit

CoBA



What can individuals do?



- Much legislation is at European level
- Legislation can only cover some things
- Private actions as a political force
- Public participation

The air belongs to everyone



Appendix 9 Agenda for third hearing

Saturday, 28 January 2006

10.30 am Coffee available – DISTRIBUTE PERMISSION FORMS

11.00 am Start with introductory reminder:

SH to be in main room.

Introduce self
Introduce PSP and independence from the client
As before, there are no right or wrong answers. Everyone is entitled to their own view, so I'd like to hear from everyone because everyone's view is valid. This session is about preparing the messages for Defra. Some may be unanimous, some might be a majority view and some might be minority views.
You are free to leave before the end of the session, if you wish.
As before we are audio and video recording the discussions, so that we have a full record of everything. There is an advisory committee and members may be logging-in during the day to watch events in the main room but they can only observe this room. During the day we'll be breaking into groups and those discussions will also be recorded. We would like to take some stills photos possibly for our website but also to include in the report. We may want to show part of the video to others interested in using this type of approach to involve members of the public in policy-making. We have consent forms for you to sign if you're happy for us to show you. HAND OUT FORMS
No one will be identified in the written report. All the information will be collected together and anonymised.

You have a copy of the agenda, so you will see that after this introductory session we will be breaking into 3 groups, so you will be in different groups from last week because Rosie isn't here this week.

At the end we will give out an evaluation sheet for you to complete before you leave today and in a couple of weeks time, if you agree, we will contact you to get more in-depth feedback in a couple of weeks.

EXPLAIN PERMISSION FORMS

Feedback on one thing each witness would do to improve air quality.

The objective of the day is to identify the points you want to make to Defra on how they should tackle the issue of air quality in England and Wales.

So the questions Defra would like you to consider are:
THESE TO BE ON FLIP CHART:

- How concerned are you about air quality? (NOTE TO MODERATORS: COVER COSTS AND BENEFITS OF POOR AIR QUALITY THAT HAVE BEGUN TO EMERGE, HERE)



- What, if anything, should government do about air quality?
- Where should action be taken (LA level, UK Government, EU, UN)?
- What actions would you personally be prepared to take to improve air quality?
- How might other people be encouraged to take these actions to improve air quality?
(MODERATOR NOTE: COVER PENALTIES AND INCENTIVES, HERE)

There are a few outstanding questions from last week which Sarah has the answers to.
SARAH TO RESPOND

- Quantitative info on impact on quality of life in addition to death
- Impact of cleaner alternative energy sources
- How can members of the public do cost benefit analysis

Are there any last queries, factual info required that Sarah or John might be able to answer?

ONCE THESE ARE CLEARED UP DIVIDE INTO THE 3 BREAKOUT GROUPS. FLIP CHARTS ON WALL WITH ROOMS TO GO TO

Break for lunch at 12.30 pm and reconvene in here (main room) for 1.00 pm ready to give feedback from each of the breakout groups.

SH moves to viewing room until 2.30 pm. unless called on to answer questions.

11.30 am Breakout groups – 3 groups by badge colour. A chance in small groups for everyone to have their say and contribute to the final report. You need to appoint a spokesperson to feedback from your group, so that later on every group can feedback to the main group. Feedback shouldn't be more than 10 minutes.

Objectives:

- To identify the main points for the report;
- To identify spokesperson for the group for today
- To identify who from the group is willing and able to go to Defra meeting in London in March/April

Possible structure for feedback, based on second hearing discussions:

- How concerned are you about air quality? On a scale of 1 to 10.
- What, if anything, should government do about air quality?
- Where should action be taken (LA level, UK Government, EU, UN)?
- What actions would you be prepared to take to improve air quality?
- How might other people be encouraged to take these actions to improve air quality?
(MODERATOR NOTE: TRY TO GENERALISE FROM SPECIFIC IDEAS)

12.30 pm Lunch

1.00 pm Feedback session from morning groups
Each group to report back, no more than 10 minutes each.



1.30 pm Agree content of final report to Defra

By the end of this session we will have a complete list of the points the jurors want PSP to include in the report to Defra.

Possible report structure based on second hearing discussions:

- How concerned are you about air quality?
- What, if anything, should government do about air quality?
- Where should action be taken (LA level, UK Government, EU, UN)?
- What actions would you be prepared to take to improve air quality?
- How might other people be encouraged to take these actions to improve air quality?

Appoint spokesperson (may be 2 maximum) to present to SH today.
Finalise list of no more than 6 to go to Defra meeting.

2.15 pm Tea

2.30 pm Present report to Defra

SH to sit at front of main room.

2.40 pm Response from Defra and outline of next steps

SH to respond to report content, as far as possible.

Any last points.

Confirm PSP will circulate draft report mid-March for comments, final report due to Defra at the end of March.

2.50 pm Evaluation

COLLECT PERMISSION FORMS AND EVALUATION QUESTIONNAIRES

3.00 pm Thank and close.