The University of the West of England, Bristol

What has been achieved in the 60 years since the first Clean Air Act?

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Presentation by

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Routes to Clean Air 2
Bristol

October 11th -12th 2016

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Structure of Presentation

- 2016 marks 60 years since the first UK Clean Air Act.
- This presentation considers the factors contributing to successful management of air quality and the factors that act as barriers to progress.
- The public health catastrophe of the 1952 London Smog created the political momentum for the 1956 Act to be passed.
- The presentation reviews the progress in meeting the air pollution challenge and comments on the weakness of the governmental and societal response to the national and global public health challenge.

Times have changed

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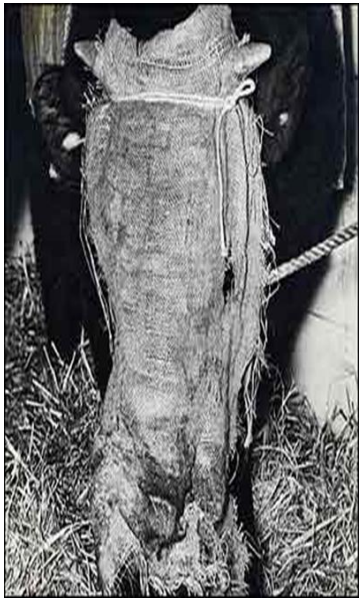
Manchester Ship Canal in Smog.

HELIX Image Service for Higher Education

Fresh Air from the Potteries

http://www.staffspasttrack.org.uk/exhibit/coal/historical%20overview/pottery.htm

The London Smog, 1952



London 1952, Source: National Archives

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The London Smog of 1952

- In 1952 London experienced a major smog event which led to large numbers of excess deaths and substantial increases in respiratory illness.
- This public health toll was the most significant amongst the many reported smog events in London's history that stretch back over many centuries.
- Its impacts on health were profound and such was the public response to the problem that political action to ensure it could not be repeated was inevitable.
- The result was the Beaver Committee whose recommendations ultimately resulted in the Clean Air Act, 1956

Catastrophe drives action.

Creates a willingness to act

Good intentions fall foul of vested interests

The Beaver Committee and the Act

- The recommendations of the Beaver Committee were subject to lobbying by powerful vested interests which watered down the effect of many of their recommendations but the Act came to pass and the smokeless zone became national policy.
- The Act banned dark smoke emissions from chimneys, railway engines and vessels, required new furnaces to be smokeless, required the emissions of grit and dust from furnaces to be minimised, and gave local council's powers to introduce smokeless zones.
- The Clean Air Act helped the UK achieve a world leading position in the battle against air pollution.
- Can we say that today?

Reflecting on the 1952 Smog and the 1956 Clean Air Act.

- The Clean Air Act demonstrated that substantial air quality improvements could be produced when concerted and sustained governmental action was directed at an environmental and public health problem.
- However, the importance of sustained interest became apparent later on as elimination of "pea soupers" created a prevailing ideology that air pollution had been conquered.
- Resources were directed towards other problems as governmental priorities changed.
- The onset of health based concerns about the impacts of the growth of road traffic in the 1980s and 1990s left the UK woefully ill prepared to tackle a new form of air pollution.

A new Form of Pollution? Was it Avoidable?

Not a New Problem After All

Environment Act,1995

- Late 1980s and early 1990s - a growing public health concern related to childhood asthma and an association with traffic emissions.
- The Environment Act of 1995 and the National Air Quality Strategy, 1997 provide the foundations for what promised to be a sustained and concerted attempt to manage air pollution and to reduce it below levels considered to be a risk to public health.

Public Health Challenge of Air Pollution

- The political support for the radical actions required to manage the sources of air pollution contributing to today's NO_2 and PM public health challenges appears absent.
- Policy proposals and interventions proposed today are failing to recognise the scale and intensity of the public health challenge created by air pollution.

It's Not for the Want of Legislation

- We have had plenty
- In the 60 years since the 1956 Act we have many, many acts that directly or indirectly relate to air pollution.
- Perhaps not always as effective and hard hitting as we might want
- Often the intent has been watered down by special interest lobbying
- Always at risk from the anti-regulation red tape cutter
- Often the enforcement has been under resourced, weak or ineffectual

National Laws

- Road Traffic Regulation Act 1984
- Environmental Protection Act 1990
- Clean Air Act 1993
- Environment Act 1995
- Transport Act 2000
- The Air Quality (England) Regulations 2000
- The National Emission Ceilings Regulations 2002
- The Large Combustion Plants (National Emission Reduction Plan) Regulations 2007
- The Environmental Permitting (England and Wales) Regulations 2010
- The Air Quality Standards Regulations 2010

From https://www.ukela.org/

European laws

- National Emission Ceilings Directive 2001/81/EC
- Directive 2004/107/EC
- The Air Quality Framework Directive 2008/50/EC
- The Industrial Emissions Directive 2010/75/EU
- From https://www.ukela.org/

The Policy and Regulatory Context Today

- The 1997 National Air Quality Strategy legislated by the 1995 Environment Act, provided a consistent UK approach to air quality management, committed to ensuring access for all citizens to outdoor air without significant health risk.
- The Strategy identified national measures to tackle larger-scale issues such as vehicle fuel quality, engine technology standards and emissions from combustion processes whilst local air quality management became the remit of Local Governments recognising the importance of subsidiarity, and the need for proportionate, collaborative action that takes account of the local context.
- It was initially thought there would be a handful of AQMAs

The Policy and Regulatory Context Today

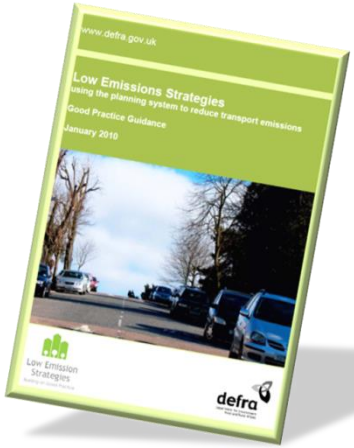
- Since 1997, relevant European Air Quality Directives have been consolidated as the European Ambient Air Quality Directive 2008/50/EC and three revisions of the UK National Air Quality Strategy have been published.
- The Air Quality Strategy, 2000 recognised that "Clean air is an essential ingredient of a good quality of life. People have the right to expect that the air they breathe will not harm them".
- The most recent Air Quality Strategy for England, Scotland, Wales and Northern Ireland was published in 2007 whilst the last update to the UK Air Quality Regulations was published in 2010.

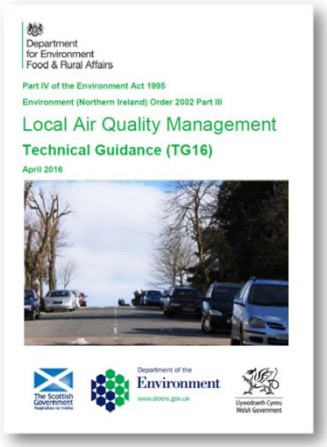
The Policy and Regulatory Context Today

- Clearly these policy and regulatory positions require updating but there appears little appetite in government to do so.
- Despite some process-reporting streamlining and modifications of AQO timescales, values and/or exceedence limits, LAQM's two-stage effects-based approach of air quality assessment in the context of public exposure followed, where necessary, by an AQMA declaration and development of an action plan, has remained largely unchanged since its inception

Diagnosis but Not Solutions

- We have had plenty of guidance but has it been effective in delivering cleaner air?
- Undoubtedly it has helped us to identify where poor air quality exists but has it led to cleaner air?





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The Increasing Evidence of Policy Failure

- 1995 Environment Act and UK Air Quality Strategy set domestic annual mean AQ Objective for NO_2 of 40µg/m^3 **to be achieved by 2005**

- It was evident by 2004 that this was unlikely to be achieved on time as over one hundred local authorities had one or more AQMA declarations for NO_2 at the start of the year.

- Concentrations are stubbornly refusing to comply with the policy intentions.

The Solutions do not Match the Problem

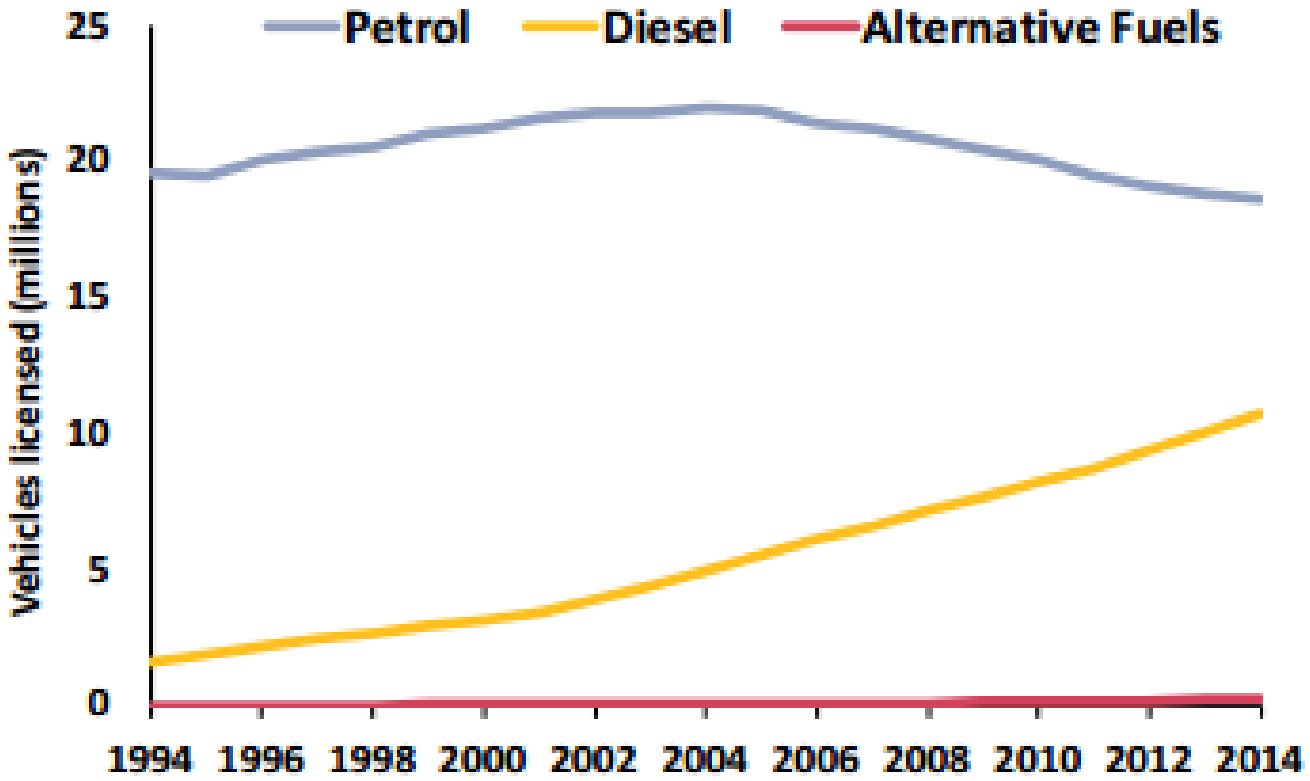
- The Local Air Quality Management (LAQM) process was designed in 1995 it was expected that there would be "*a handful of AQMAs in large cities and metropolitan areas*"

- By 2008: 225 LAs (52%) had AQMAs (≈500 AQMAs in total)
- Now: 274 LAs (84%) with AQMAs (704 AQMAs)

- These are not 'localised hotspots' they are local manifestations of a national problem

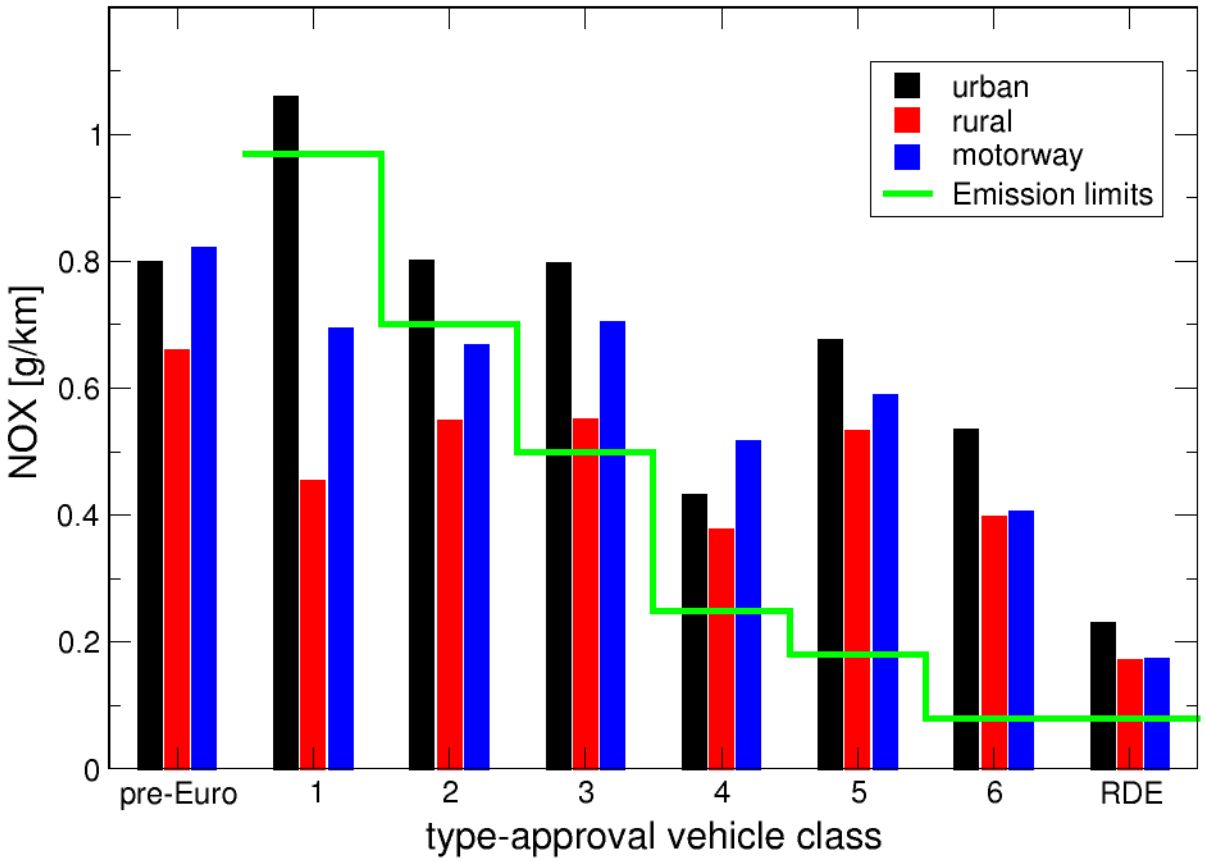
The inexorable rise of diesel

Licensed cars by propulsion type, GB 1994 - 2014



DfT Vehicle Licensing Statistics Q4 2014

Reliance on improvements from Euro Standards for vehicles



NOx emission factors of *diesel passenger cars* (TNO, 2016)

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Non-Alignment of Domestic and EU work on AQM

- Monitoring and modelling of air quality for reporting under the European Directives is not well connected to domestic Local Air Quality Management
- No clear responsibility for LAs in EU process
- National PCM model not able to identify local hotspots
- Majority of Air Quality Management Areas not registered as exceedences of the European Directive

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Failure of Local Air Quality Action Plans

- Very hard to identify clear cases where AQAPs have been effective and improved air quality to the extent that and AQMA has been revoked
- Little political weight within LAs
- Even if taken seriously by LA, actions are within context of national policies backing increasing traffic flows
- Not properly resourced

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Typical Measures in an AQAP

- Emissions enforcement
- Promotion of modal shift
- Speed reduction
- Low Emission Zone
- Retrofitting/scrappage

- What powers does a Local Authority Environment Department have to implement these measures?

Failure to Act on the Lessons

- Despite evidence of widespread non-compliance across the UK the 2007 Air Quality Strategy failed to provide the step change in action required to get back on track
- Key initiatives were
  - Incentivising the early uptake of new Euro-standards
  - Increased uptake of low emission vehicles
  - Reducing emissions from ships
- No major revisions to LAQM regime proposed. Business as usual.
- Einstein reminded us that doing the same thing over and over again and expecting different results is insanity.

Governance of Air Quality

- Poorly targeted solutions and disconnected spheres of governance.
- Poor history of cross-department working across departments - Defra, DfT, DCLG and Health
- DETR a momentary glimpse of hope!
- Public Health outcomes poorly integrated
- Separation of review and assessment and action plan functions in many local authorities.
- LAQM good at diagnosis but poor at curing the causes of air pollution problems.
- Substantial and sustained cuts in budgets in local and national government since 2010 reducing the capacity to innovate and respond to emerging problems.

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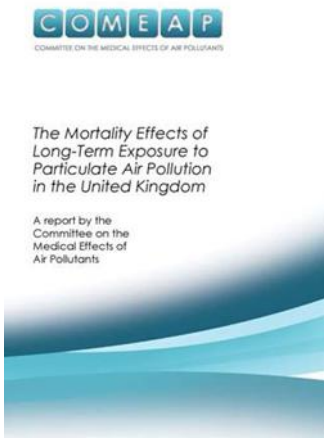
Deaths, Costs and Legal Action

Air Pollution as a Cause of Death

- In the UK about 29000 deaths per year are associated with exposure to fine particles, less than 2.5mm in diameter (PM2.5). This is about 6% of total deaths.
- In cities PM2.5 primarily comes from cars, lorries and buses but they are also produced by the burning of wood, heating oil or coal for domestic or industrial purposes.
- In Europe, the WHO estimates about 500,000 people die prematurely as a result of air pollution every year.
- These estimates do not include any contribution from NO_2.



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Committee on the Medical Effects of Air Pollutants (COMEAP)

- It is estimated that the effects of NO_2 on mortality are equivalent to 23,500 deaths annually in the UK.
- Many of the sources of NOx (NO_2 and NO) are also sources of particulate matter (PM).
- The combined impact of these two pollutants maybe as much as 52000 deaths per year and represents a significant public health challenge.
- The response to this burden is inadequate to say the least.
- https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/411756/COMEAP_The_evidence_for_the_effects_of_nitrogen_dioxide.pdf

RCP/RCPH Report (Feb 2016)

- Focus on health impacts of continuous exposure to chronic air pollution over a lifetime, with specific reference to:
    - Pregnancy ,children and adults
    - indoor and outdoor exposure
    - the influence of local, regional and national policy relating to pollution control measures
    - examining the influences of climate change
    - socio-economic impacts of air pollution.
- Estimate 40000 premature deaths annually from PM and NO_2 in the UK, this is slightly less than other estimates.

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WHO

- WHO reports that in 2012 3.7 million deaths were attributable to ambient air pollution.
- This finding more than doubles previous estimates and confirms that air pollution is now the "world's largest single environmental health risk".

- http://www.who.int/phe/health_topics/outdoorair/databases/en/

Costs in Context

- WHO estimates air pollution costs European economies US$ 1.6 trillion a year in diseases and deaths.
- For comparison
  - the UK national debt is about US$ 2.33 trillion
  - the Greek national debt is US$ 405 billion.

- WHO study. Costs corresponds to the amount societies are willing to pay to avoid these deaths and diseases with necessary interventions.
- http://www.euro.who.int/en/media-centre/sections/press-releases/2015/air-pollution-costs-european-economies-us$-1.6-trillion-a-year-in-diseases-and-deaths,-new-who-study-says

Inequality of air pollution

- Who is polluted? Who is polluting?

Defra Air Quality Plan

- Air quality plan for the achievement of EU air quality limit values for nitrogen dioxide (NO_2) in the UK, 2015

- https://uk-air.defra.gov.uk/library/no2ten/

Defra Air Quality Plan

- The requirement for action set out in the Plan is much more modest than that previously identified by Defra.
- In the Plan, which acknowledges that full compliance will not be achieved until 2025.
- Exceedences after 2020 are predicted only to occur in 6 locations, Birmingham, Leeds, Southampton, Nottingham Derby and London without additional actions.

The Clean Air Zone

- By 2020 the most polluting diesel vehicles (but not private cars) will be discouraged from entering the centres of Birmingham, Leeds, Southampton, Nottingham and Derby.
- Birmingham and Leeds will discourage old diesel vans and implement measures such as park and ride schemes, signage, changes in road layouts and infrastructure for alternative fuels.
- London's strategy for improving air quality by 2025, includes the implementation of an ultra-low emission zone by 2020, retro-fitting of buses and licensing new taxis to be zero emission capable from 2018.

Defra Air Quality Plan

- The CAZ seems to be a sibling of the smokeless zone or the AQMA. A spatial response to the problem.
- The Government's intentions are quite limited and will not, address the contribution of private cars.
- The Plan does not appear to offer any new financial resources to implement the CAZ nor does it appear to be backed up by substantially new regulatory powers.
- Few of the measures outlined in the Plan can be described as novel and indeed most of the measures are already available to local authorities as part of their tool kit for air quality action planning.

House of Commons Environment, Food and Rural Affairs Committee

- In 2016 the Committee published its report on Air Quality.
- In this report the influential Committee stated that that deaths from air pollution represent a public health emergency for the UK.
- Defra's plans for CAZs to cut NO_2 were criticised as giving local authorities insufficient control over implementation.
- The Committee noted that there many more local authorities where EU limits are not met and for whom powers should be given to create a CAZ where local circumstances require one.

Defra's Air Quality Plan

- In summary, the Air Quality Plan suggests that progress towards compliance could be more rapid than previously projected, and that all UK zones could be compliant by 2025.
- However the basis of the Air Quality Plan's conclusion that NO_2 concentrations will be brought within EU limits by 2020 (2025 in London) is much more optimistic than the projections made previously.
- The basis of the projections appears to be a combination of model selection, input assumption and changes to vehicle emissions principally associated with the introduction of the new Real Driving Emissions (RDE) standard.

The Defra Air Quality Plan

- Within the UK a broad consensus has emerged amongst the air quality community.
- These plans are not sufficient to address the public health challenge in the shortest time possible.
- Is this an example of the UK Government striving to achieve compliance?
- The Air Quality Plan simply does not go far enough to address the complexity and depth of air quality problems confronting many localities in the UK.
- Much more direct action is required to confront behaviours and vested interests that retard progress towards cleaner air for all.

The Air Quality Problem

- In the two decades since the Environment Act 1995 and EU Framework Directive 96/62/EC there has been lots of activity especially at the local authority level but very little success in achieving cleaner air!
- New thinking is required

A Clean Air Commission?

- The Clean Air Alliance has called for a major new initiative to tackle the health problems resulting from air pollution.
- In a letter to Andrea Leadsom, the Secretary of State for the Environment, Food and Rural Affairs, Dan Byles, the Chairman of the Clean Air Alliance, said,
- "We are today (18 July) proposing to you and your colleagues the establishment of a high level Clean Air Commission to create a new momentum for the urgently needed action to tackle air pollution in our cities and countryside and to clean up the air we all breathe.

- http://www.environmental-protection.org.uk/clean-air-commission/

Reframing the problem

- Recognising the social AND the techno centric causes and solutions to air pollution
- Address the social and structural inequalities related to both the cause of air pollution and its impacts
- Enable widespread emission reductions - not just hotspot management
- Clair City

ClairCity

Our future with clean air

www.claircity.eu
@claircity

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 689289.

CLAiR-City

- CLAiR-City project, the largest citizen-led air-quality project ever in Europe.
- Considering the who and the why not just the what and where.
- From top down to bottom up decision making.
- What do citizens want and what are they prepared to do to get it?

ClairCity objectives

ClairCity will integrate and quantify citizens' behaviour and activities to enrich city, national and EU level policy-making, resulting in improved air quality, reduced carbon emissions, improved public health outcomes and greater citizen awareness.

ClairCity consortium

1. Trinomics B.V. (Project Coordinator - Netherlands)
2. University of the West of England, Bristol (Technical Lead - UK)
3. PBL Netherlands Environmental Assessment Agency (NL)
4. Statistics Netherlands CBS (Netherlands)
5. Technical University of Denmark (Denmark)
6. Norwegian Institute for Air Research (Norway)
7. REC Regional Environmental Centre (Hungary)
8. TECHNE Consulting (Italy)
9. Transport & Mobility Leuven (Belgium)
10. University of Aveiro (Portugal)
11. Municipality of Amsterdam (Netherlands)
12. Bristol City Council (UK)
13. Intermunicipal Community of Aveiro Region (Portugal)
14. Liguria Region (Italy)
15. Municipality of Ljubljana (Slovenia)
16. Sosnowiec City Council (Poland)

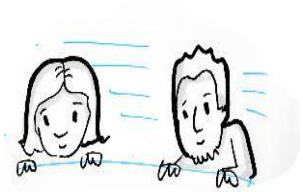
ClairCity

Selection of pilot cities

Different air quality and carbon sources, emissions and concentrations; social, economic and health challenges; benchmarks in their management capacity and capability; spatial scales and population demographics; regionality across Europe; and engaged with various networks for dissemination purposes.

ClairCity

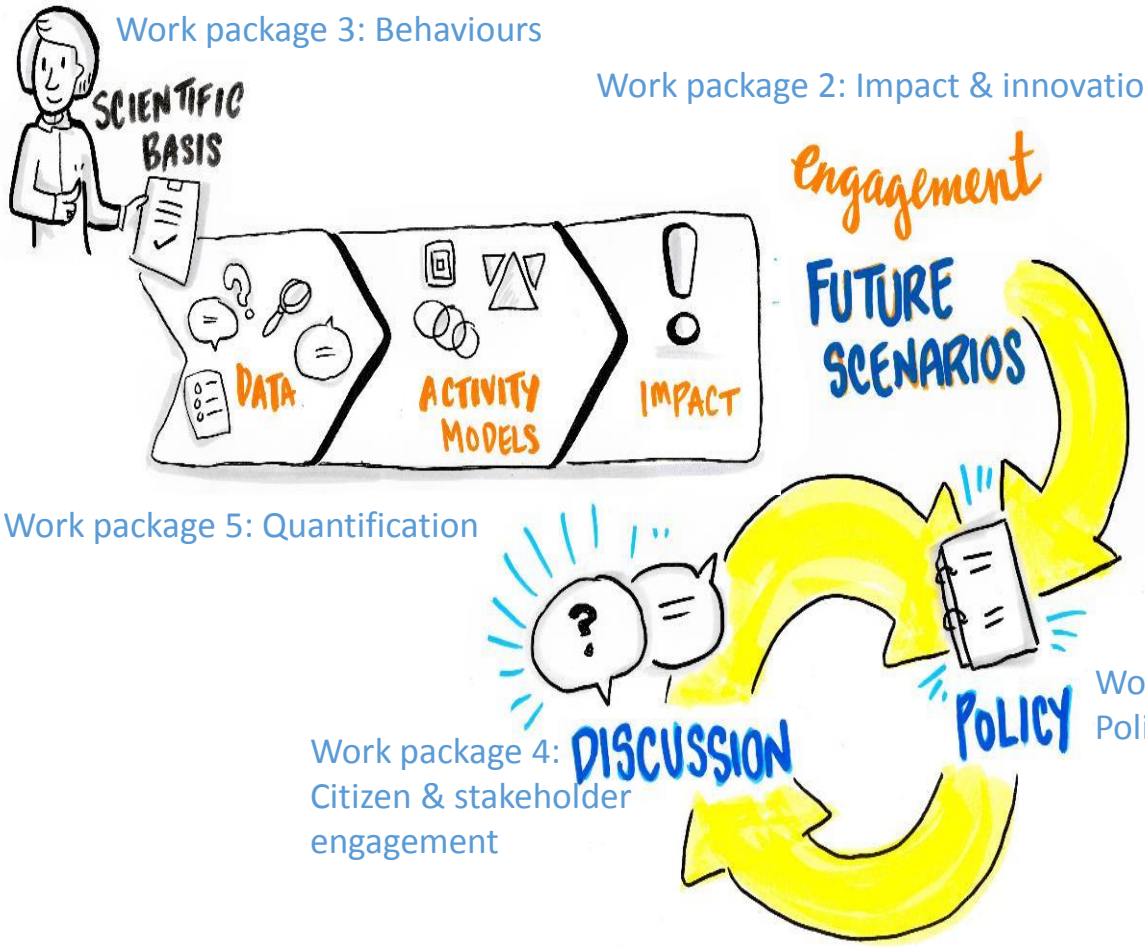
ClairCity project overview



Work package 1: Project management

Work package 3: Behaviours

Work package 2: Impact & innovation



Work package 7: Scenario coordination & city policy package

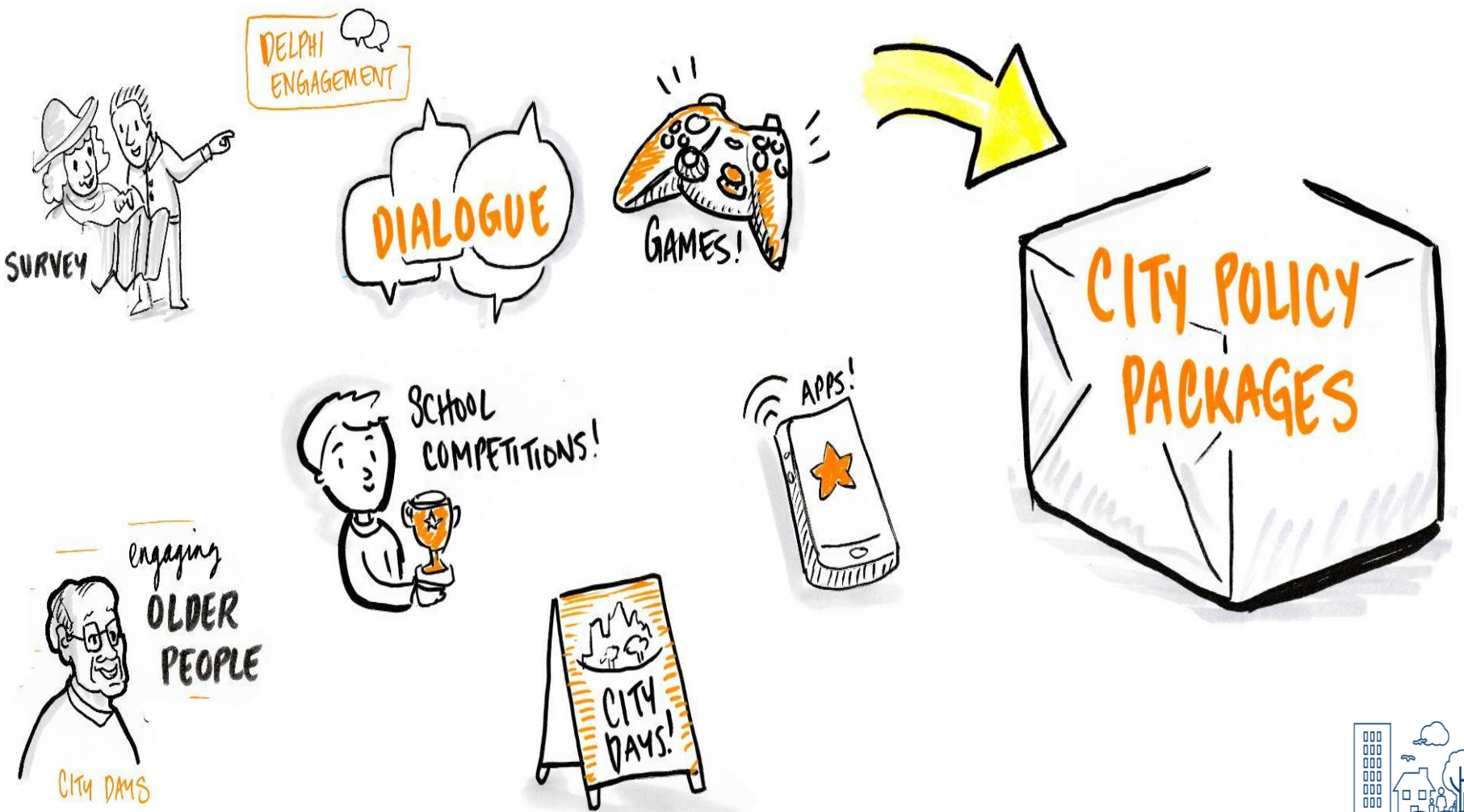
Work package 5: Quantification

Work package 6: Policy & governance

Work package 4: Citizen & stakeholder engagement

ClairCity

ClairCity engagement tools



ClairCity

Our future with clean air

www.claircity.e
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Conclusions

- Air quality in the UK and across the EU continues to pose a public health risk to much of the population.
- Efforts to control emissions and to manage and reduce exposure continue but are often under resourced, lack sufficient political support and public understanding and engagement is often absent.
- Ultimately air pollution is a choice society makes through its collective and individual behaviours and social practices.
- However the consequences of those behaviours and choices will play out in many different ways with those who are least able to exercise choice having air pollution concentrations imposed upon them.
- History shows that concerted, collective and sustained action can lead to dramatic improvements in air quality.
- Society can choose to minimise the effects of air pollution.
- New ways of thinking and acting are required.
- Do we want to change?

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