



Department
for Environment
Food & Rural Affairs

Defra Air Quality Policy & Associated Evidence Needs

John Newington - 6th July 2023



Forestry Commission
England



Environment
Agency

The next 10 mns

- Defra Air Quality Remit
- Understanding Complexity and Translating to Policy
- Current Evidence Base
- Areas of Research Interest
- Clean Air SPF & SAQN - What Next?
- Closing thoughts



Defra Policy Remit – Ambient Air Quality

Ambient Air Pollutant Emissions:

- Set out in National Emissions Ceiling Regulations (2018)
- **Currently exceeding the PM_{2.5} emission ceiling (2020-2029)**
- **Not on track for 2030 emission ceiling for PM_{2.5}, NO_x, NH₃, SO₂**

Ambient Air Pollutant Concentrations

- Set out in Air Quality Standards Regulations (2010) & The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023' (ETFPM).
- **Currently exceeding existing NO₂ Limit Value (AQSR)**
- **Not on track to meet the new PM_{2.5} targets without additional measures**

The Response

- The National Air Pollution Control Programme & Environmental Improvement Plan sets out a semi-quantified potential policy pathway.



Indoor Air – AQEG Report

Defra's interest in indoor air:

- Estimated that we spend 90% of our time indoors in developed countries (60% of our time in our homes)
- Air pollution exposure happens mostly indoors, even if the pollutants are generated outdoors
- In the absence of indoor sources, indoor air concentrations are determined by ingress from outdoors, balanced by internal losses such as deposition and ventilation
- There are numerous indoor sources, including the occupants (receptors)

What did the report find:

- Severe limitations to determine trends over time, nothing equivalent to outdoors. Difficult to advise on relative indoor/outdoor balance in the UK, or whether the situation is improving/degrading
- Very limited emissions data, for example by indoor activity, appliance or building materials type. This then limits modelling and best advice on interventions/policy
- Model inputs are complex and rapidly require very high computational needs
- Very limited indoor air measurements

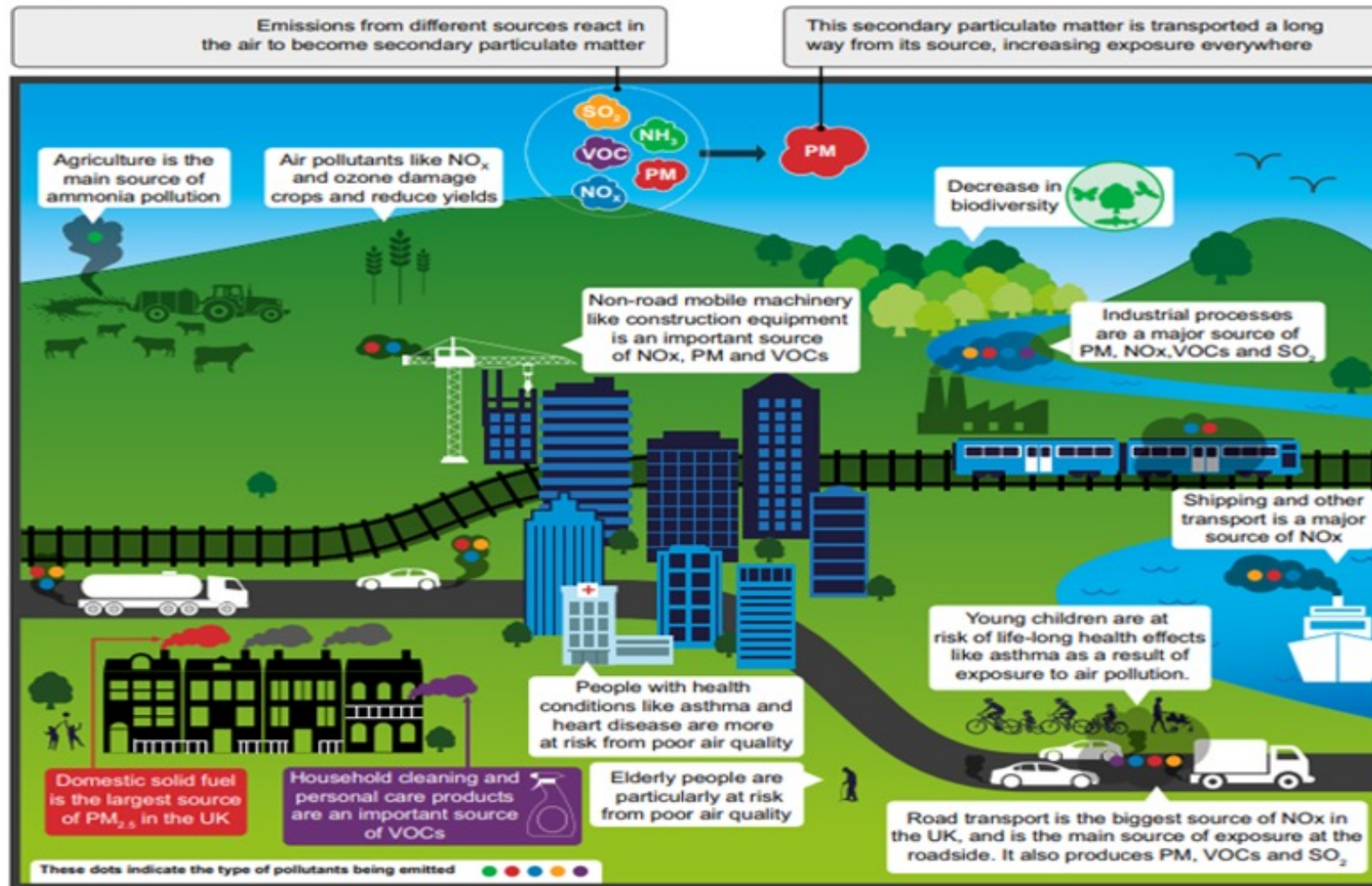


Environmental Improvement Plan

- Delivery focussed Plan which sets out the actions that will drive us towards reaching our long-term targets and goals for improving the environment.
- It sets out the first set of interim targets (for the two PM2.5 targets) by the end of January 2028
- It reiterates the commitment to existing legal limits on emissions for 5 air pollutants.
- Action set out in the EIP on air quality includes:
 - Continuing to tackle domestic emissions by reducing the maximum emissions for domestic burning appliances in Smoke Control Areas and promoting best practice in use of stoves and fireplaces.
 - Challenging councils to improve air quality more quickly by assessing their performance and use of existing powers, while supporting them with clear guidance, funding, and tools.
 - Facilitating the rollout of further Clean Air Zones (CAZs) in areas which are in breach of air quality targets, with further zones and other non-CAZ measures as required.
 - Consulting on an extension to the existing North Sea Emission Control Area to cover the Irish Sea, reducing emissions from shipping.
 - Reducing ammonia emissions by using incentives in our new farming schemes, while considering expanding environmental permitting conditions to dairy and intensive beef farms.

Understanding Complexity and Translating to Policy

The sources of air pollutants and their effects



Types of pollution

Nitrogen oxides (NO_x)

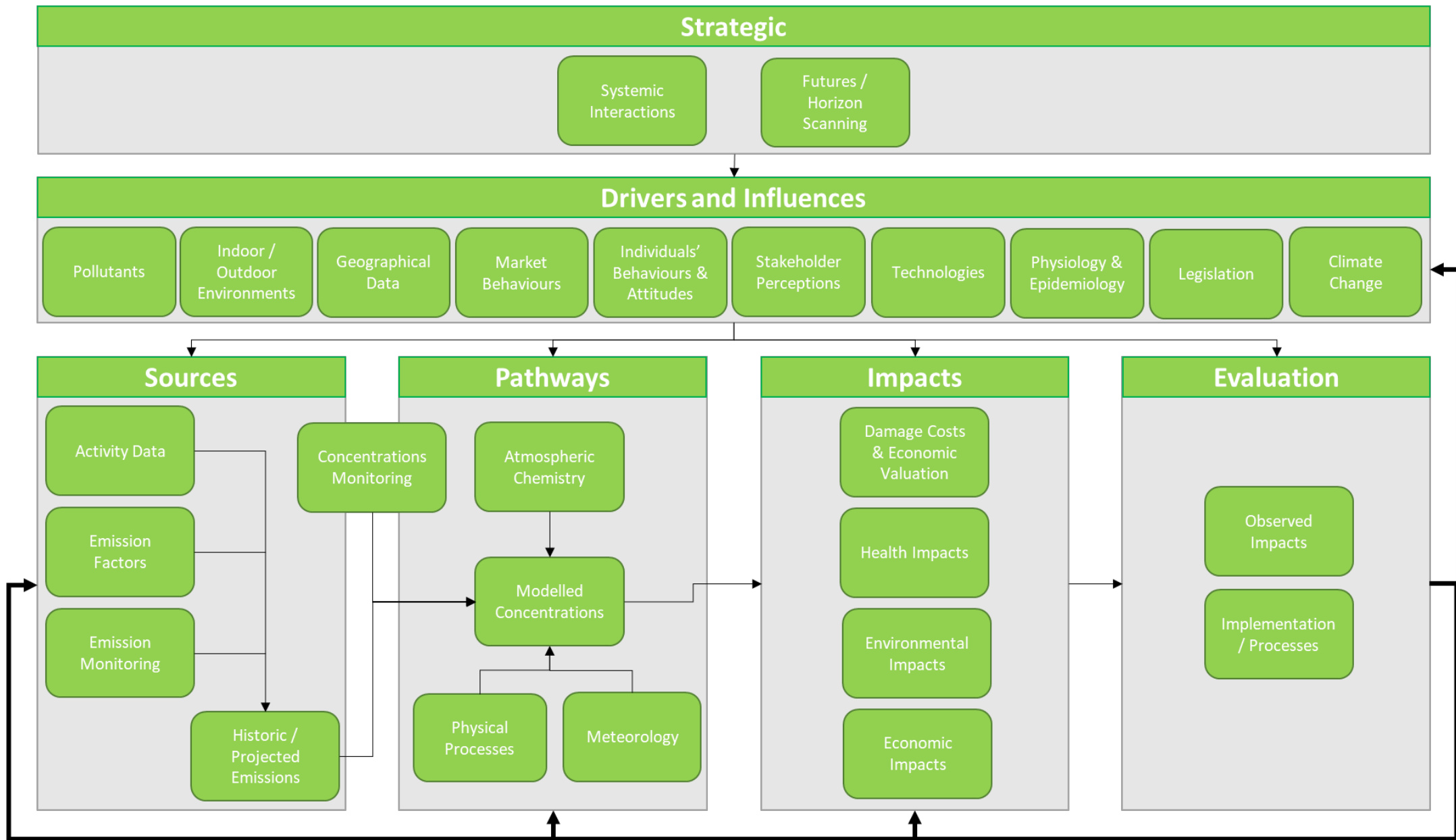
Ammonia (NH₃)

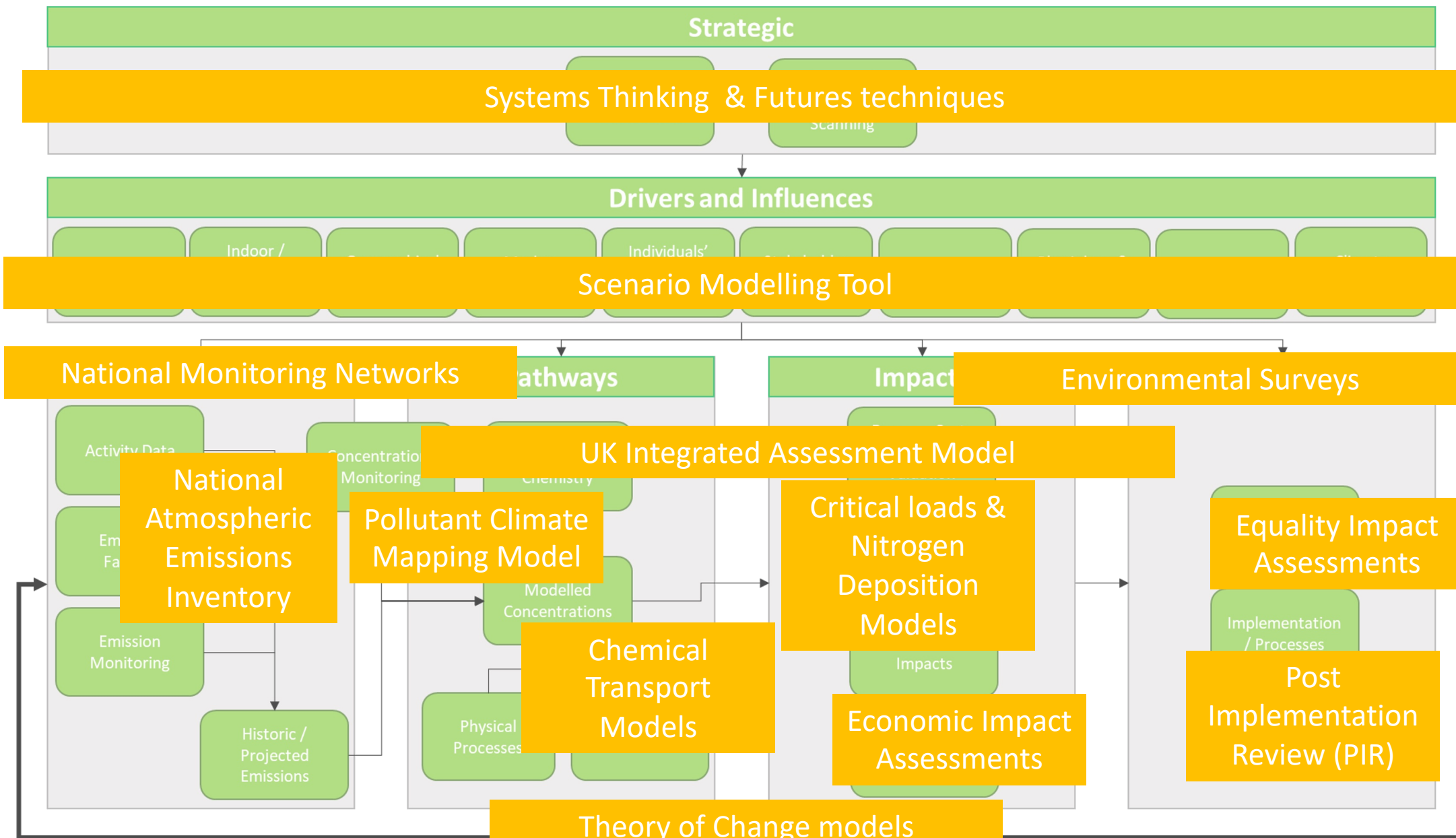
Sulphur dioxide (SO₂)

Primary Particulate Matter (PM_{2.5})

Volatile organic compounds (NMVOCs)



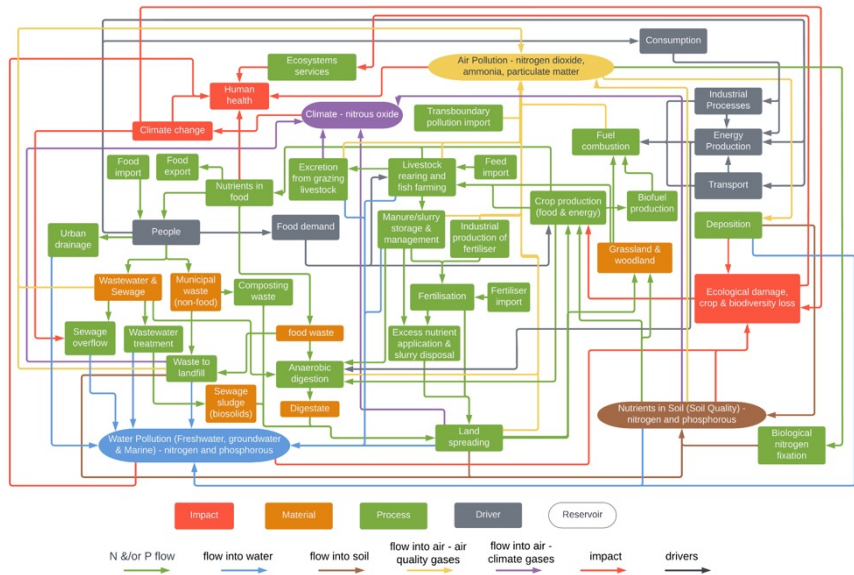
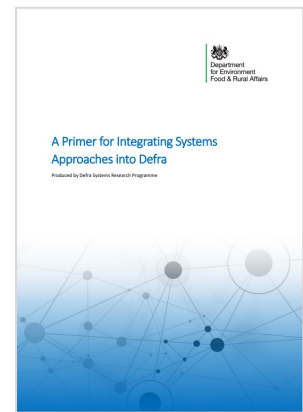




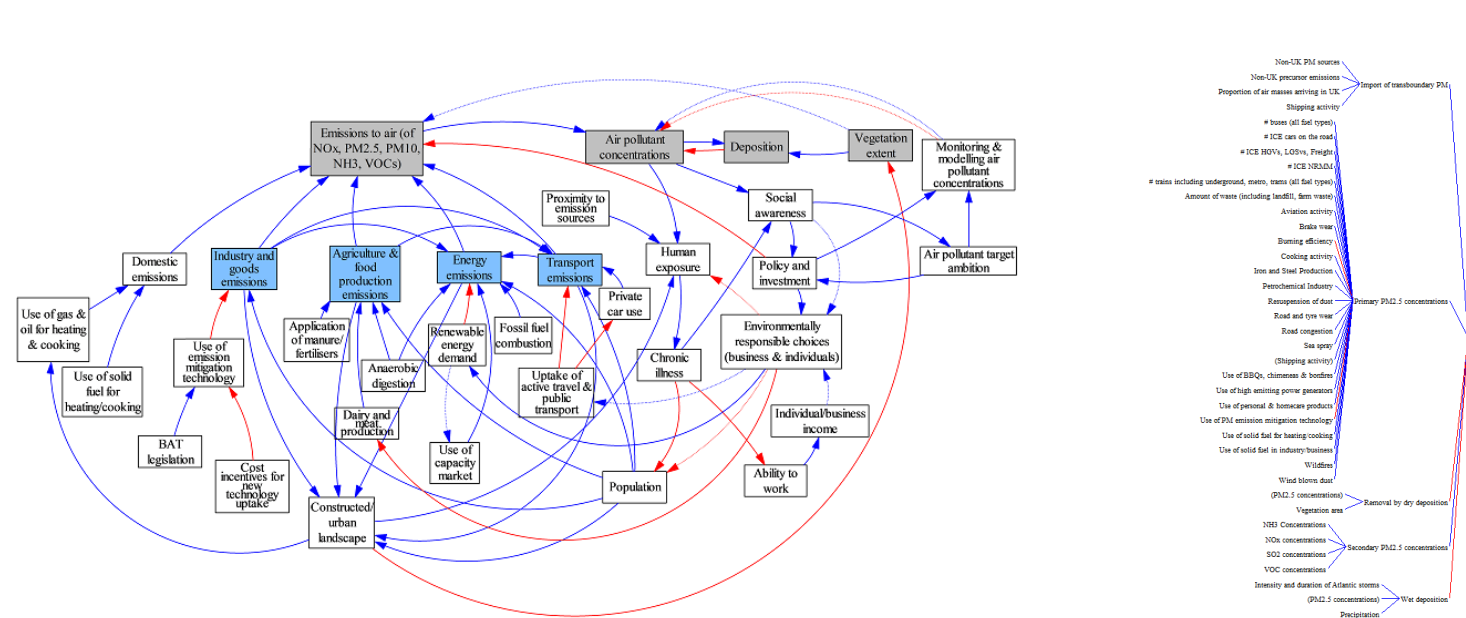
- better understand of ecosystem responses to air quality impacts and rates of recovery of impacted systems in response to policy interventions
- improve quantification of air pollution impacts on ecosystems
- understand differential toxicity of particulate components
- developing methods to assess personal exposure to air pollution at a range of spatial scales and quantify health impacts and costs
- improve our understanding of how behavioural change can help meet air quality policy ambitions
- develop new and improved monitoring and modelling approaches, incorporating systems-based considerations.
- develop innovative and improved abatement technologies for air pollutant emissions across all sectors and sources

Systems Thinking & Futures

- Government Office for Science: Introduction to systems thinking for civil servants
- Defra Chief Scientific Advisors Office worked with GO Science to publish the **Systems Toolkit** and case studies on GOV.UK
- Published **Defra's Systems Primer** on GOV.UK
- Launched Defra Systems Thinking Community of Practice



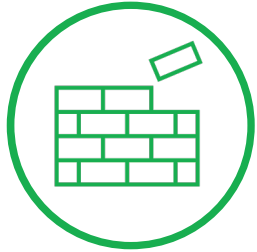
Nitrogen Causal Map



PM2.5 Causal map

5 Strategic Themes

“Building upon and leveraging existing council-led investments, we will invest at least a further £185 million to support five strategic themes”



Building a Green future

NERC leading



Securing better health, aging and wellbeing

MRC leading



Tackling infection

BBSRC leading



Building a secure and resilient world

AHRC leading



Creating opportunity, improving outcomes

ESRC leading

[UKRI strategic themes – UKRI](#)

Final Message

- The outputs from the Clean Air SPF and SAQN have tackled some of the Areas of Interest – but it is just a beginning.
- The Clean Air SPF Community has grown in size and has significant potential to influence future research areas to include air pollution relevant science
- Government recognises the need for embedding a systems based approach to policy making and that requires the continued application of multi-disciplinary research