The Rt. Hon. George Eustice MP  
Secretary of State for Environment Food and Rural Affairs  
c/- Air Quality and Industrial Emissions – Agricultural Emissions Team  
Department for Environment, Food and Rural Affairs

By email to: ammonia@defra.gov.uk and consultation.coordinator@defra.gov.uk

26 January 2021

Dear Secretary of State (and the Agricultural Emissions Team)

**Clean Air London (CAL) – Response to the consultation on reducing ammonia emissions from solid urea fertilisers.**

I am writing on behalf of Clean Air in London in response to your consultation on reducing ammonia emissions from solid urea fertilisers (the “Consultation”). Thank you for the opportunity to do so. The Consultation can be seen here:


The Consultation highlights the need for a joined-up approach to clean air across government that embraces cities, health, justice and action on air pollution and climate change in the months to COP26 and beyond.

**Clean Air London**

Clean Air in London (“CAL”) campaigns to achieve, urgently and sustainably, full compliance with World Health Organisation (WHO) guidelines for air quality throughout London and elsewhere.

A review by the government found air pollution to be the “largest environmental risk to the public’s health in the UK”1 (11 March 2019). A letter to The Times published on 28 September 2019 and signed by nearly 40 doctors, scientists and others called for new legislation to enshrine (precisely and explicitly) the human right to breathe clean air and a corresponding duty of the state and public authorities to provide and ensure healthy air and a healthy environment.

A new health study commissioned by the Mayor of London titled ‘London Health Burden of Current Air Pollution and Future Health Benefits of Mayoral Air Quality Policies’2 (25 January 2021) estimates that between 3,600 to 4,100 deaths were attributable to long-term exposure to human-made fine particles (PM$_{2.5}$) and nitrogen dioxide (NO$_2$) in Greater London in 2019 with a central estimate of 2,955 deaths attributable to anthropogenic PM$_{2.5}$. These new estimates are consistent with Public Health

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England estimates that poor air quality contributed to 6.6% of all deaths in London in 2018\textsuperscript{3} and 4. A large proportion of background PM\textsubscript{2.5} concentrations come from outside London (section 8.4 on page 61 of the health report). This could be as high as 9.75 \(\mu g/m^3\) in total in a typical current year out of an average total concentration of about 11.4 \(\mu g/m^3\).

Preliminary data from the City of London Corporation estimates that average PM\textsubscript{2.5} concentrations were unchanged at 12 \(\mu g/m^3\) in 2018, 2019 and 2020.

It is against this background that CAL comments on the Consultation on reducing ammonia emissions from solid urea fertilisers.

**Agricultural ammonia emissions and clean air**

Urban air pollution typically comprises PM\textsubscript{2.5} contributions from different geographical origins such as street, city, national, transboundary and natural. ‘Natural’ is often referred to as non-anthropogenic (e.g. Saharan dust or volcanic ash) with other sources being anthropogenic or human-made. PM\textsubscript{2.5} can come from primary or secondary sources.

So-called ‘primary’ particulate matter is mainly emitted from combustion processes such as household heating, industrial combustion or diesel engines. It also includes ‘tyre and break wear’ from vehicles. Of the precursor substances for secondary aerosol or particulate matter, NH\textsubscript{3} is almost exclusively emitted from agricultural processes (both animal husbandry as well as fertilising fields) while sulphur dioxide (SO\textsubscript{2}) is predominantly generated in the energy producing industry and oxides of nitrogen (NO\textsubscript{x}) are spread between the transportation, industry and household combustion sectors.

The air quality and climate change impacts of agricultural emissions are felt far from the original source of the emissions and are not only a rural problem. Key air pollutants from farming include ammonia (NH\textsubscript{3}) and methane (CH\textsubscript{4}). This Consultation focuses on NH\textsubscript{3}.

The agriculture sector accounts for 88\% of UK emissions of ammonia, which is emitted during storage and spreading of manures and slurries and from the application of inorganic fertilisers. Ammonia damages sensitive natural habitats and contributes to ‘background’ particulate pollution in urban areas.

An expert report by the European Commission titled ‘Research findings in support of the EU Air Quality Review’\textsuperscript{5} (30 January 2014) estimated that a reduction of 4.0 \(\mu g/m^3\) of PM\textsubscript{2.5} could be achieved in London for a reduction of 50\% in emissions of NH\textsubscript{3} (Table 2.1 on page 38) i.e. 16\% then. Ammonia’s contribution to PM\textsubscript{2.5} was much higher than sulphur dioxide, oxides of nitrogen or volatile organic compounds.

Another important report titled ‘Urban PM\textsubscript{2.5} levels under the EU Clean Air Policy Package’\textsuperscript{6} highlighted the large contribution of secondary particulate matter from industry and agricultural sources (Figure 2.22 on page 19).

\textsuperscript{4} https://www.gov.uk/what-do/environment/pollution-and-air-quality/health-and-exposure-pollution
\textsuperscript{5} http://nors.merc.ac.uk/id/eprint/304622/
\textsuperscript{6} https://ec.europa.eu/environment/air/pdf/TSAP_12.pdf
For these reasons agricultural emissions cannot be viewed and treated as a problem for the agricultural sector alone — they are a significant contributor to air pollution in cities and the corresponding illness and death caused by polluted air.

COVID-19 and other health issues

Short and long-term exposure to PM$_{2.5}$ are harmful to public health and the contribution of ammonia to both is poorly understood by the general public. For example, a research paper titled ‘The UK particulate matter air pollution episode of March-April 2014: more than Saharan dust’ concluded:

"The combined analysis of model results and speciated PM measurements indicates that these elevated PM concentrations were mainly driven by ammonium nitrate, much of which was derived from European NOx and NH3 emissions outside the UK. The contribution of Saharan dust, which was widely reported in the UK media, has been shown to be restricted (at surface level) to the latter part of the elevated PM episode and regionally to the southern UK. Both types of PM and PM precursors arrived in the UK with the same southerly airflow, but originated from quite independent sources."

The paper’s policy section noted that poor messaging or a lack of official messaging meant that there was a false emphasis in the media “on a natural phenomenon [i.e. Saharan dust], which cannot be addressed by policy action.” (page 7)

As well as short and long-term health impacts from PM$_{2.5}$, such as heart attacks and strokes, recent research has found that long-term exposure to PM$_{2.5}$ has made people more susceptible to COVID-19.

It is important also to note that the WHO is expected to publish updated Air Quality Guidelines in 2021 including for PM$_{2.5}$. CAL does not have any ‘inside information’ about these new guidelines but considers, based on evidence published in January 2020, that these guidelines are likely to be significantly tightened for PM$_{2.5}$ — perhaps even a halving of the current guideline i.e. an annual mean of 10 µg/m$^3$ to 5 µg/m$^3$.

Separately and together this information reminds us of the need to reduce PM$_{2.5}$ concentrations.

Government’s legal obligations

Pursuant to regulation 6(2) and Table 2 of Schedule 3 of the National Emissions Ceilings Regulations 2018, the government is required to ensure that ammonia emissions do not exceed a proportion of 2005 levels of ammonia by 2020 and to maintain that level in each subsequent year until 2029.

In 2030 the government is required to reduce emissions further, to 16% of 2005 levels (reg.6(3)). In addition, in 2025 ammonia emission reductions should be on a linear trajectory between the 8% and 16% targets (reg.7(1)) or, at the very least, emissions must reduce each year from 2025 to 2029 (reg.7(3)).

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3 https://www.healtheffects.org/meeting/brussels-meeting-air-pollution-and-health-recent-advances-inform-european-green-deal
Reporting on the UK’s 2020 levels of ammonia emissions is not due under the regulations until 15 February 2022 (reg.3(1)(a)). However, the government’s environmental impact assessment (EIA) states that it is likely that this emissions target will not be met. The EIA goes on to state that the policy focuses on “reducing ammonia emissions as early as possible after 2020 and on achieving the 16% reduction by 2030”.

The government is therefore required to take all necessary measures to ensure compliance with the 8% reduction target as a matter of urgency.

In addition, the government must act to protect the rights of persons in the UK to life and health (Articles 2 and 8 of the European Convention on Human Rights (“ECHR”)). This includes putting in place adequate administrative and legislative measures to protect against threats to life and health and to protect persons from harmful levels of pollution.

Consultation proposals

The focus of the consultation is on the use of solid urea fertilisers.

Although it is important to tackle the use of solid urea fertilisers in agriculture and their contribution to ammonia emissions, it represents only a small part of the overall ammonia problem:

“In 2017, emissions from solid urea fertilisers contributed to 8% of total ammonia emissions in the UK and accounted for 48% of emissions from inorganic N fertilisers in the same year, compared to 34% in 2013.” (paragraph 27 on page 13 of the Impact Assessment document).

The Consultation document refers to the “projected 51.3kt gap [in 2030] has been calculated based on UK NAEI Projected Emissions and Projected activity data for NOx, SOx, NH3, VOCs and PM2.5 as published in October 2019”.

This seems to be based on 2017 data shown in the “UK Informative Inventory Report (1990 to 2017)”10 (pages 275 and 276) published in April 2019 i.e. NH3 exceedance gaps of 31kt (2020) and 51kt (2030) (in Tables 9-4 and 9-5 on pages 275 and 276). This document refers to the 2005 baseline of 283kt.

This is very odd because the “UK Informative Inventory Report (1990 to 2018)”11 was published in March 2020 i.e. more up-to-date information was published well before the current consultation was launched. This shows NH3 exceedance gaps of 27.64kt (2020) and 48.84kt (2030) (in Tables 9-3 and 9-4 on pages 344 and 345). That document refers to the 2005 baseline of 278.97kt.

Further information is available here (i.e. before the current Consultation was launched):

14 October 2020:

https://uk-air.defra.gov.uk/assets/documents/reports/cat09/2010220959_DA_Air_Pollutant_Inventories_1990-2018_v1.2.pdf

Defra estimates that the proposed ban on urea fertiliser would reduce NH₃ emissions by 15.9kt in 2022 and 15.7kt in 2030 (page 11 of the Impact Assessment). In other words, it would roughly halve the gap for 2020 and reduce it by 32% in 2030.

Given the government is already failing in its obligation to ensure compliance with the 2020 target and will likely fail to meet the 2021 target also, it is insufficient to bring forward a single measure that would reduce ammonia emissions by between 30% and 55% of the required minimum amount.

Even if the government decides to proceed with option 1 and achieves ammonia reduction of 15.9kt, a range of other measures are urgently required to achieve the 31kt (or 27.64kt) reduction needed. Despite the government’s obligations and clear failings in this regard, there is currently no clear plan on what other measures the government will adopt to ensure the 2020 obligation is met as soon as possible.

In addition, as set out above, ammonia emissions contribute to PM₂.₅ levels, which in turn leads to poor health and in some instances death. The government is therefore required to take the necessary measures to protect rights to life and health enshrined in Articles 2 and 8 of the ECHR.

**Action by Defra**

As set out above and in the annex, the government is failing in its legal obligations under the 2018 Regulations, Gothenburg Protocol and in its duty to protect its citizens and all those residing in the UK.

The government is therefore required to publish and consult immediately on the following:

1. Its plan to ensure that the UK never exceeds the NH₃ limit of 297kt that was required to be met in 2010, 2018 and 2019.
2. Its plan to comply fully with the UK’s NH₃ limits for 2020.
3. Its plan for the UK to comply fully with the UK’s national limits for NH₃ as required by: the linear reduction trajectory (“LRT”) in each year between 2020 and 2029 inclusive; the 2025 target; and the 2030 limit.
4. Its plan for the UK to comply fully with the UK’s national limit for PM₂.₅ for 2020.
5. Its plan for the UK to comply fully with the UK’s national limits for PM₂.₅ as required by: the LRT in each year between 2020 and 2029 inclusive; the 2025 target and the 2030 obligation.
6. Its plan for the UK to comply fully with the UK’s national limits for NOx as required by: the LRT in each year between 2020 and 2029 inclusive; the 2025 target; and the 2030 obligation.

In addition, in order to ensure a comprehensive solution for tackling air pollution, CAL recommends that the government:

i. recognises the right of all persons to breathe clean air precisely and explicitly in UK law;
ii. brings forward legislation for a Clean Air Act that would give Metro Mayors and local authorities the powers that they need to decarbonise emissions from buildings (as the first such Act did so successfully in 1956)\(^\text{12}\);

iii. incorporates the duty of public authorities to achieve and maintain clean air and contains sufficient powers to enable them to do so;

iv. ensures clean air targets are set in line with international standards on climate change and air quality and are revised periodically;

v. ensures ministers consult and take advice from independent persons and bodies with relevant expertise, such as the Committee on Climate Change;

vi. ensures adequate monitoring of emissions takes place and that accurate and detailed information is provided to the public on emissions levels;

vii. ensures that decision making by public authorities is based on environmental principles; and

viii. ensures that the right to clean air is enforceable.

**FOI/EIR requests**

CAL requests any of the following information held by Defra:

A. Estimates including projections of ammonia’s contribution as a source to average total PM\(_{2.5}\) concentrations (i.e. anthropogenic plus non-anthropogenic) in the Greater London agglomeration in each of the following years: 2017; 2018; 2019; 2020; 2022; 2025; and 2030 i.e. in micrograms per cubic metre (\(\mu g/m^3\)) and % ages.

B. Estimates including projections wood burning’s contribution as a source to average total PM\(_{2.5}\) concentrations (i.e. anthropogenic plus non-anthropogenic) in the Greater London agglomeration in each of the following years: 2017; 2018; 2019; 2020; 2022; 2025; and 2030 i.e. in micrograms per cubic metre (\(\mu g/m^3\)) and % ages.

C. (A) and (B) above for the following other Metro Mayor authorities:

a. Cambridgeshire and Peterborough Combined Authority
b. Greater Manchester Combined Authority
c. Liverpool City Regions Combined Authority
d. North of Tyne Combined Authority
e. Sheffield City Region Combined Authority
f. Tees Valley Combined Authority
g. West of England Combined Authority
h. West Midlands Combined Authority

D. Details or reports on any plans to comply with the national emissions ceilings that have been prepared since the publication of the Clean Air Strategy on 14 January 2019.

Please contact me if you have any questions about the above. I would like the response please in electronic form sent to the email address in the covering email sending this letter.

\(^{12}\) CAL considers that BEIS would be the best government department to lead such legislation because of its responsibilities for the decarbonisation of emissions from buildings.
Close

As well as treating this letter as a response to the solid urea fertiliser consultation and a request for information under the Environment Information Regulations, we request that the government replies to this letter as a matter of urgency setting out whether the plans at 1-6 exist and if so when they will be made publicly available.

I look forward to hearing from you.

Yours sincerely

Simon Birkett
Founder and Director
Clean Air in London

Cc Kate Harrison, Harrison Grant Solicitors
Outline timeline for ‘National Emission Ceilings’ with selected references

2010 – 1 January
Deadline for UK to comply with National Emissions Ceilings Directive 2001/81/EC\textsuperscript{13} for sulphur dioxide, oxides of nitrogen, NVOCs and ammonia. UK achieved compliance for all four pollutants (European Environment Agency report (1 June 2011))\textsuperscript{14}.

2011 – 30 September
CAL writes to European Commission calling for continuity and the tightening of health and legal protections from the ‘Year of Air’ in 2013\textsuperscript{15}

2012
AQEG publishes ‘Fine Particulate Matter (PM\textsubscript{2.5}) in the United Kingdom’\textsuperscript{16}

4 May
CLRTRAP Gothenburg Protocol updated\textsuperscript{17} for 2020 deadlines with PM\textsubscript{2.5} included\textsuperscript{18}

2013
European Commission’s ‘Review of the EU Clean Air Policy’\textsuperscript{19} agrees to enforce limit values and proposes new NEC\textsuperscript{20}.

2014 March – April
‘UK particulate matter air pollution episode of March-April 2014: more than Saharan dust’\textsuperscript{21}

2015
UNECE ‘Framework Code for Good Agricultural Practice for Reducing Ammonia Emissions’ published\textsuperscript{22}.

2016 – 31 December
National Emissions Ceilings Directive (EU) 2016/2284\textsuperscript{23} enters into force for sulphur dioxide, nitrogen oxides, non-methane volatile organic compounds, ammonia and fine particulate matter\textsuperscript{24}. Annex III, Part 2(A) listed ‘Measures to control ammonia emissions’

2017 – 3 July
European Environment Agency report\textsuperscript{25} shows UK expected to exceed ceilings for oxides of nitrogen, ammonia and particulate matter in 2020 and all five pollutants in 2030.

2018 – 11 January

\textsuperscript{13} https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32001L0081
\textsuperscript{15} https://uk-air.defra.gov.uk/assets/documents/reports/caf11/12122141150_AQEG_Fine_Particulate_Matter_in_the_UK.pdf
\textsuperscript{17} https://www.airelim.org/acidnews/new-gothenburg-protocol-adopted
\textsuperscript{18} https://cc.eea.europa.eu/environment/air/clean_air/review.htm
\textsuperscript{19} https://cc.ee.europa.eu/environment/air/reduction/index.htm
\textsuperscript{20} https://ionscience.iop.org/article/10.1088/1748-9326/11/4/044004
\textsuperscript{21} https://unece.org/fileadmin/DAM/env/frap/Publications/Ammonia_SR13_28-1_HR.pdf
\textsuperscript{23} https://cc.ee.europa.eu/pressiner/detail/en/IP_16_4358
\textsuperscript{24} https://www.eea.europa.eu/publications/nec-directive-reporting-status-2017-1
five pollutants – ammonia, nitrogen oxides, non-methane volatile organic compounds, fine particulate matter and sulphur dioxide – by 2020 initially, and by 2030 for a deeper cut. Our commitment to meeting these legally binding targets is not affected by the UK’s departure from the EU.” (page 97)

1 July
National Emissions Ceilings Regulations 2018\(^{26}\) enters into force\(^{27}\).

AQEG publishes ‘Air Pollution from Agriculture’\(^{28}\).

2019
New national emissions ceilings deadlines for 2019 and caps (Part 3, section 5 of the NECR 2018). Ceiling and cap for NH\(_3\) is \(297\text{kt}\) (Table 1, Schedule 3).

14 January
Clean Air Strategy 2019\(^{29}\) states:

“Air quality is the largest environmental health risk in the UK. It shortens lives and contributes to chronic illness. Health can be affected both by short-term-high pollution events and by long-term exposure to lower levels if pollution.”

Page 11:

“The agriculture sector accounts for 88% of UK emissions of ammonia, which is emitted during storage and spreading of manures and slurries and from the application of inorganic fertilisers. Ammonia damages sensitive natural habitats and contributes to particulate pollution in urban areas. Action by farmers can make a big difference to ammonia emissions. The government is already acting to help farmers by funding the necessary equipment.

“We have provided a national code of good agricultural practice (COGAP) to reduce ammonia emissions.

“We will require and support farmers to make investments in the farm infrastructure and equipment that will reduce emissions.

“A future environmental land management system will fund targeted action to protect habitats impacted by ammonia.

“We will continue to work with the agricultural sector to ensure the ammonia inventory reflects existing farming practice and the latest evidence on emissions.

We will regulate ammonia emissions from farming by requiring adoption of low emissions farming techniques.

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\(^{27}\) CAI understands that the Gothenburg Protocol ceilings were further updated to align to NECD 2016 ceilings.  
\(^{28}\) https://uk-air.defra.gov.uk/assets/documents/reports/909/1807231333_280518_Agricultural_emissions_draft_vfinal_for_publishing.pdf  
“We will extend environmental permitting to the dairy and intensive beef sectors.

“We will regulate to minimise pollution from fertiliser use, seeking advice from an expert group on the optimal policy approach.”

Conservative Party Manifesto\(^{30}\) pledges:

“In parallel, we will legislate to ensure high standards of workers’ rights, environmental protection and consumer rights.” (page 5)

“In return for funding [farmers] must farm in a way that protects and enhances our natural environment, as well as safeguarding high standards of animal welfare” (page 42)

“Our Environment Bill will guarantee that we will protect and restore our natural environment after leaving the UK. Because conservation has always been at the very heart of Conservatism.” (page 43)

“Getting Brexit done will allow us to do more on the international stage. We will continue to be an outward looking country that is a champion of collective security, the rule of law, human rights, free trade, anti-corruption efforts and a rules-based international system.” (page 51)

“After Brexit, we will bolster the alliances and institutions that help project our influence and keep us safe: the UN and the UN Security Council; NATO; the G7; and the World Trade Organisation. We will open new markets and support free trade and global growth.” (page 51)

“We will support clean transport to ensure clean air, as well as setting strict new laws on air quality. We will consult on the earliest date by which we can phase out the sale of new conventional petrol and diesel cars.” (page 55)

11 March

Public Health England published a ‘Review of interventions to improve outdoor air quality and public health’\(^{31}\) and stated:

“The evidence is clear on the scale of the harm from air pollution. It is the largest environmental health risk to the public’s health in the UK” (page 7).

2020

Gothenburg and NECR ceilings deadline and caps for each subsequent year to 2029 (Part 3, section 6 of the NECR 2018).
March

‘UK Information Inventory Report (1990 to 2018)\[^{33}\]’ estimates that UK will exceed its emission reduction commitment for ammonia (NH\(_3\)) of 256.66kt in 2020 by 27.64kt (at 284.30kt) and 234.34kt in 2030 by 48.84kt respectively (Tables 9-3 and 9-4 on pages 344 and 345 respectively). The same tables estimate that the UK will exceed its emission reduction commitment for fine particulate matter (PM\(_{2.5}\)) of 87.13kt in 2020 by 9.70kt (at 96.83kt) and 67.21kt in 2030 by 24.21kt respectively its emission reduction commitment for oxides of nitrogen (NOx) of 458.81kt in 2030 by 71.44kt.

5 May

Harvard School of Public Health\[^{34}\] estimates that someone who lives for decades in a county with high levels of fine particulate matter is 8% more likely to die from COVID-19 than someone who lives in a region that has just one unit (one microgram per cubic metre) less of such pollution.\[^{35}\]

3 November

Defra launches consultation on reducing ammonia emissions from urea fertilisers\[^{36}\] projecting that without further intervention the UK expects to miss its emission reduction commitment for ammonia by 31.5kt in 2020 and by 51.3 kt in 2030 (paragraph 136, page 41 of the Impact Assessment)\[^{37}\].

> “Germany is the only country that has regulations in place specifically controlling the use of urea fertilisers.” (section 1, page 14 of the consultation document).

> “Use of urea fertilisers is very low in Denmark and the Netherlands. They have taken substantial action to control ammonia emissions, leading to emissions reductions of 40% and 64%, respectively. Specific action to control the use of urea fertilisers has not been taken, however both countries have imposed controls on the use of nitrogen fertilisers in general by applying plans and limits.” (section 2, page 15 of the consultation document).

> “The Government must take action to reduce ammonia emissions. The emissions reduction target was to reduce ammonia against the 2005 baseline by 8% in 2020. However, it is likely that this emissions target will not be met and this will be known by February 2022 when the emissions data will be published for the year 2020. Therefore, this policy focuses on reducing ammonia emissions as early as possible after 2020 and on achieving the 16% reduction by 2030, in line with the commitments made under National Emissions Ceilings Regulations, 2018 and well as the Convention on Long-Range Transboundary Air Pollution (CLRTAP) and the Gothenburg Protocol.” (paragraph 6, Page 10 of the Impact Assessment)

"However, when best available techniques for ammonium nitrate production are used, embedded carbon in ammonium nitrate production can be reduced substantially and in plants that apply these practices, embedded GHG emissions can be lower than the most-emitting urea plants." (paragraph 116 on page 35 of the Impact Assessment).

11 November  Agriculture Act 2020 enters into force.

10 December  European Environment Agency published report titled ‘Measures to reduce emissions of air pollutants and greenhouse gases: the potential for synergies’.

2021 – 26 January  Environment Bill due to have its report stage and third reading.

10 February  European Commission consultation on the EU’s Action Plan Towards a Zero Pollution Ambition for air, water and soil closes.

New World Health Organisation air quality guidelines expected to be published.

2022 - February  Report on 2020 compliance expected (see above).

2025  ‘Linear reduction trajectory’ deadline (Part 3, section 7 of NECR 2018) to ensure that relevant pollutants do not exceed the linear reduction trajectory.

2030  Final emission ceilings deadlines under NECR 2018 and Gothenburg Protocol.

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39 https://www.eea.europa.eu/publications/measures-to-reduce-emissions-of
40 https://services.parliament.uk/bills/2019-21/environment.html
42 https://www.healtheffects.org/meeting/brussels-meeting-air-pollution-and-health-recent-advances-inform-european-green-deal