

Comments on Food Wise 2025 - Strategic Environmental Assessment -Draft Environmental report

Air Quality Issues

The primary impact that will arise in relation to air quality from the Food Wise 2025 strategy is in relation to ammonia. The environmental impact from such emissions as regards the atmosphere occurs through two different pathways, namely (i) the subsequent deposition to land or water which can have an acidifying and/or eutrophying impact on ecosystems, and, (ii) the formation of fine particulate matter (PM_{2.5}) as a result of the chemical transformation of ammonia in the atmosphere.

Deposition on land and water: This can have an acidifying and/or eutrophying impact on ecosystems, with negative impacts for biodiversity. Standards for the protection of ecosystems from atmospheric deposition are set in terms of critical loads for the annual deposition of nitrogen under the Gothenburg Protocol to the Convention of Long Range Transboundary Air Pollution¹. A critical load is the quantitative estimate of the level of exposure of natural systems to pollutants below which significant harmful effects on specified sensitive elements of the environment do not occur.

Fine Particulate Matter (PM_{2.5}): Fine particulate matter, with an aerodynamic diameter of less than 2.5 microns, is also known as PM_{2.5}. Ammonia can undergo chemical transformation in the atmosphere to produce PM_{2.5} which has significant human health impacts and importantly has no lower threshold for health impacts. Thus any increase in emissions and ambient air concentrations has health impacts.

Emission of ammonia are limited under the National Emissions Ceilings directive (2001/81/EC) which capped national emissions from 2010. The Gothenburg Protocol further caps emission from 2020 at 1% below 2005 levels, and the EU Clean Air Package which sets the legislative framework to address air pollution from 2020 proposed to set further EU wide targets for ammonia for 2030. The proposed target for Ireland is a 10% reduction on 2005 levels.

The Strategic Environmental Assessment (SEA) Draft Environmental Report, refers to the CAFÉ Directive which address a range of air pollutants (including NO_x, SO_x, PM, Carbon monoxide, Lead, benzene, ozone, PAHs and heavy metals), however, ambient ammonia is outside the scope of the CAFÉ Directive.

It is difficult to see, given the scenarios outlined and the consequent challenges in meeting ammonia emission ceilings for 2020 and 2030 that the scenarios could result in *a slight positive impact on air quality* as stated in the SEA Draft Environmental Report. Given that agricultural activity is responsible for 98% of ammonia emissions and given the potential growth under the envisaged scenarios it would be important that a comprehensive national ammonia monitoring and mitigation strategy be devised if this strategy is to proceed.

We very much welcome the continuing engagement between DECLG, DAFM, Teagasc, EPA and other bodies with regards to the assessment of potential ammonia increases under the Food Wise 2025 strategy and the assessment of necessary mitigation options for same.

¹ http://wge-cce.org/Publications/CCE_Status_Reports/Status_Report_2014

To assist consideration of these comments, the following comments highlights where the above points are addressed in the text and suggests how they should be addressed.

p.20 Assessment of Alternative Strategies - Increase in ammonia emissions should be included here.

p.21 Biodiversity, Flora and Fauna - An increase in NH₃ concentrations is likely to lead to an increased exceedance of Critical Loads of Nitrogen which are already being exceeded across many Natura 2000 sites in Ireland. http://www.rivm.nl/media/documenten/cce/Publications/SR2012/CCE_SR2012Ch2.pdf
Critical Loads exceedance is shown in the EPA SOE 2012 report: http://www.epa.ie/media/00061_EPA_SoE12_Ch03.pdf

Such increases in Nitrogen loading on ecosystem are known to cause a decrease in species diversity and change in species composition in favour of nitrogen loving species². The Gothenburg Protocol aims to achieve a not net loss of Biodiversity. Given the current Critical Loads exceedances and future projections and associated ammonia emissions the delivery of this ambition must be called into question.

The FP 7 funded ECLAIRE³ project recommend that more stringent air pollution abatement measures beyond the revised Gothenburg Protocol are required to achieve 'no net loss of biodiversity'.

p.21 Air Quality and Climate Change – It is stated that *'Broadly as developed the strategy will have a slightly positive effect on air quality'*.

Based on the measures provided in Food Wise 2025 it is unclear how any of the proposed production scenarios, in which output and associated emissions increase, can have an even slightly positive impact on Air Quality.

Food Wise 2025 states *'The ambition of this strategy is that the sector is not only committed to meeting its various obligations set out in the framework of relevant environmental legislation, but also the sector aims to achieve higher standards to underscore its sustainability credentials'...*

'A guiding principle to meet these sustainability goals will be that environmental protection and economic competitiveness will be considered as equal and complementary, one will not be achieved at the expense of the other'.

² http://wge-cce.org/Publications/CCE_Status_Reports/Status_Report_2014

³ ECLAIRE project
<http://www.rivm.nl/media/documenten/cce/Publications/Final%20WGE%20brochure%20ES%20&%20biodiversity%20%28160413%29.pdf>

Given the current knowledge in terms of potential ammonia increases and levels of ambition set out within Food Wise 2025 and the potential to abate these emissions, it will be challenging for Ireland to comply with its current obligations regarding the 2020 emission ceilings for Ammonia under the Gothenburg Protocol/NECD but it would be more challenging again to meet the proposed 2030 ceilings, a 10% reduction on 2005 emission levels.

p.23 Inter –relationships – The following bullets should be considered under this section

- The emissions of ammonia are a secondary precursor for the formation of particulate matter (PM_{2.5}) which has health implications for exposed populations.
- Critical loads of nitrogen are currently being exceeded across many Natura 2000 sites in Ireland and across Europe. Much of this nitrogen is in the form of ammonia emissions from the agricultural sector. Such increases in Nitrogen loading on ecosystem are known to cause a decrease in species diversity and change in species composition in favour of nitrogen loving species.

p.25 Table C Plan/Programmes Considered for Cumulative Effects

The **National Emissions Ceilings Directive**⁴ is not listed under this Table. It should be noted that the Clean Air Package adopted by the EU in December 2013 includes a proposal to amend the NECD setting 2030 emission ceilings with interim targets for 2025 also.

p.28 Monitoring - The Draft Environmental Report states that monitoring proposal should be focused on a number of areas including '*areas that indicate a likely breach of international, national or local legislation, recognised guidelines or standards*'. Table E outlines suggested monitoring approaches of different Agri Food Actions. However it is noted that there is currently no indicator included specifically for air pollution i.e. ammonia emissions.

On Table E, Under the **Dairy, Beef and Sheep sector** it is recommended that an **ambient ammonia monitoring network** is included which could act as an indicator for ammonia increases nationally and would be an important metric to monitor the efficacy of the envisaged ammonia abatement strategies.

As stated in other sections of this submission there are clear concerns about Ireland being able to meeting in current 2020 and possible future emissions ceilings for ammonia for 2030 based on proposal in the revised NECD. There is on-going EPA research on ammonia monitoring which is due to be published in 2016 which could inform this recommendation. The scope and structure of this network could be agreed between relevant departments and agencies such as the EPA and Teagasc who already undertake ammonia monitoring for research purposes.

In the UK, the Department for Environment, Food and Rural Affairs (DEFRA) which have remit for agriculture policy is supporting work to monitor the air concentrations of gaseous ammonia (NH₃) and particulate ammonium (NH₄⁺) in the UK National Ammonia Monitoring

⁴ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2001:309:0022:0030:EN:PDF>

Network (NAMN). Established in 1996, the objectives are to quantify temporal and spatial changes in air concentrations and deposition in NH₃ and NH₄⁺ (included since 1999) on a long term basis. The monitoring provides a baseline in the reduced nitrogen species (NH_x = NH₃ + NH₄⁺), which is necessary for examining responses to changes in the agricultural sector and to verify compliance with targets set by international agreements. http://pollutantdeposition.defra.gov.uk/ammonia_network. There are currently 85 sites in the NAMN.

An additional indicator to consider here is the uptake by farmers of grant aid under the Targeted Agricultural Modernisation Scheme (TAMS) to switch from splash plate slurry spreaders to lower emissions technologies such as trailing hose/shoe. Current abatement calculations undertaken by Teagasc⁵ for achievement of NECD ceilings are based on an assumption that there will be only a 50% uptake of Trailing hose/shoe by 2030 under all of the Food Wise 20205 production scenarios. Accurate activity data such as this allows a more accurate assessment of emissions from the sector as well as emission abatement potential from same. Consideration could be given to whether it would be appropriate to mandate the use of low emission technologies as is the case in some other EU Member States.

p.30 Table E –On Table E, Under the **Dairy, Beef and Sheep sector** it is recommended that ammonia is added to the statement;

- Numbers and Numbers and type of livestock – proxy for methane emissions

p.50 Section 1.8.1 “the *Agri-Food Strategy 2025* committee sub-groups did not attempt to translate the ambitions for each sector into specific headline quantitative production targets numbers when framing the Strategy.”

In the content of air quality and greenhouse gas emissions, given that projection of emission increases are based on livestock numbers and farming activity data, the lack of production numbers hinders the development of an accurate assessment of potential emission increases and impacts.

p.54 Table 2.1 Strategic Environmental Objective – Manage Air Pollution

THE SEO Indicator here refers to the Air Quality measurements from the EPA network. It should be noted that the EPA ambient air quality network was set up to comply with the objectives of the CAFÉ Directive <http://www.epa.ie/air/quality/standards/#.Vbn4q7FOPcs> . The main parameters of the CAFÉ directive are NO_x, SO_x, PM, Carbon monoxide, Lead, benzene, Ozone, PAHs and heavy metals. Ammonia is outside the scope of the CAFÉ Directive.

Ireland as a party to the Convention on Long Range Transboundary Air Pollution also undertakes background air quality monitoring under the EMEP network. Some ammonia

⁵ Lanigan , G et al. 2015, An Analysis of the Cost of the Abatement of Ammonia Emissions in Irish Agriculture to 2030

monitoring is included in the EMEP network but sites are located where anthropogenic influence is understood to be minimal. In order to monitor ammonia emissions, a network of monitors in areas where concentrations are expected to increase would be needed. It is recommended that **an ambient ammonia monitoring network** is included as an SEO indicator which could act as an indicator for ammonia increases nationally and in particular where livestock numbers are expected to increase significantly.

As stated in other sections of this submission, in the context of the growth envisaged under Food Wise 2025 there are clear questions about Ireland being able to stay below emissions ceilings for ammonia emissions for 2030 based on the proposed 10% reduction for Ireland in the revised NECD. There is on-going EPA research on ammonia monitoring which is due to be published in 2016 which could inform this recommendation. The scope and structure of this network could be agreed between relevant departments and agencies such as the EPA and Teagasc who already undertake ammonia monitoring for research purposes.

An additional SEO indicator to consider here is the **uptake by farmers of TAMS grant aid to switch from splash plate slurry spreaders to lower emissions technologies** such as trailing hose/shoe. Current abatement calculations undertaken by Teagasc⁶ for achievement of NECD ceilings are based on an assumption that there will only be 50% uptake of trailing hose/shoe by 2030 under all of the Food Wise 2025 production scenarios. Accurate activity data such as this allows a more accurate assessment of emissions from the sector as well as emission abatement potential from same. Such information would allow the timely intervention with further measures in the event that grant aid was not providing a sufficient incentive to increase the penetration of low emission technologies.

p.57 section 1.8.1 refers to a **Sustainable Growth Scenario** – *“In order to mitigate potential environmental impacts arising from the above scenarios a Sustainable Growth Scenario was developed. This scenario recognises that environmental protection and sustainability will need to be central to any increases in production”*

However section 2.6 ‘*Analysis of alternatives*’ does not refer to this Sustainable Growth Scenario which aims to mitigate environmental impacts. Why was this alternative scenario not included for analysis?

p.61 Biodiversity – There is no reference to the potential impact of air pollution on biodiversity. An increase in NH₃ concentrations is likely to lead to an increased exceedance of Critical Loads of Nitrogen which are already being exceeded across many Natura 2000 sites in Ireland.

http://www.rivm.nl/media/documenten/cce/Publications/SR2012/CCE_SR2012Ch2.pdf

Critical Loads exceedance is shown in the EPA SOE 2012 report:

http://www.epa.ie/media/00061_EPA_SoE12_Chp03.pdf

Such increases in Nitrogen loading on ecosystem are known to cause a decrease in species diversity and change in species composition in favour of nitrogen loving species. The

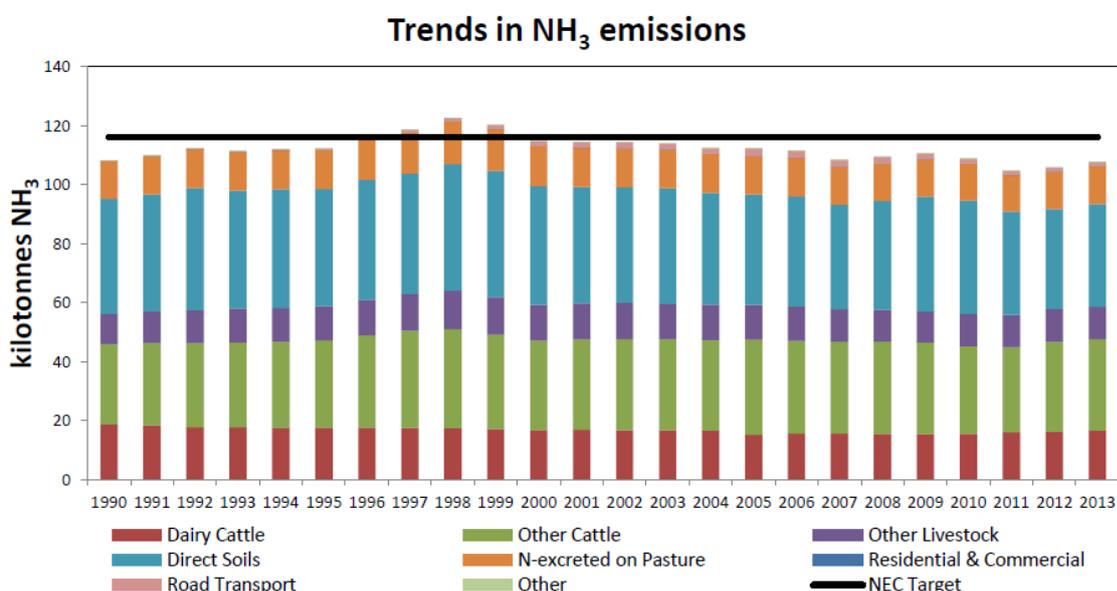
⁶ Lanigan , G et al. 2015, An Analysis of the Cost of the Abatement of Ammonia Emissions in Irish Agriculture to 2030

Gothenburg Protocol aims to achieve a not net loss of Biodiversity. Given the current Critical Loads exceedances and future projections this ambition is unlikely to be achieved.

The FP 7 funded ECLAIRE⁷ project recommend that more stringent air pollution abatement measures beyond the revised Gothenburg Protocol are required to achieve 'no net loss of biodiversity'.

p.64 Air Quality and Climate Change

Whilst the report states that fertiliser use has generally been falling in recent years ammonia emission inventory trends present relatively stable ammonia emissions albeit with slight increases noted annually from 2011 onwards.



(Source: <http://www.epa.ie/pubs/reports/air/airemissions/NECD%20Summary%20Report%202015.pdf>)

Correction: Report states that Ireland has a target of 0.5% reduction in ammonia productions from agriculture below 2005 levels by 2020. The Gothenburg Protocol includes a 1% reduction in the ammonia emissions for Ireland (Note: not a 0.5% reduction). The revision to the NECD proposes a 10% decrease for 2030 is amongst the smallest decreases of EU Member States.

There is no mention of the exceedance of **critical loads** in the air quality and climate change section. An increase in NH₃ concentrations is likely to lead to an increased exceedance of

⁷ ECLAIRE project <http://www.rivm.nl/media/documenten/cce/Publications/Final%20WGE%20brochure%20ES%20&%20biodiversity%20%28160413%29.pdf>

Critical Loads of Nitrogen which are already being exceeded across many Natura 2000 sites in Ireland and other Member States. http://www.rivm.nl/media/documenten/cce/Publications/SR2012/CCE_SR2012Ch2.pdf
Critical Loads exceedance is shown in the EPA SOE 2012 report: http://www.epa.ie/media/00061_EPA_SoE12_Ch03.pdf

Such increases in Nitrogen loading on ecosystem are known to cause a decrease in species diversity and change in species composition in favour of nitrogen loving species. The Gothenburg Protocol aims to achieve a **no net loss of Biodiversity**. Given the current Critical Loads exceedances and future projections this ambition is unlikely to be achieved.

The FP 7 funded ECLAIRE⁸ project recommend that more stringent air pollution abatement measures beyond the revised Gothenburg Protocol are required to achieve 'no net loss of biodiversity'.

- p.65** The SEA report states that *'The Air Quality in Ireland report (EPA, 2013) identifies that air quality in Ireland continues to be good and is among the best in Europe'*. It should be noted that this EPA report refers to parameters monitored under the CAFÉ Directive. Ammonia, which is the key air quality parameter of concern with regards to the Food Wise 2025 strategy (not including GHGs) is outside the scope of the CAFÉ directive and this statement is of little relevance to the air quality assessment of the SEA.
- p.82** SEA states *"Air quality in relation to a number of pollutants (e.g. NH₃, NO_x, PM₁₀) is regularly monitored by the EPA at specific locations throughout the country"*

It should be noted that the EPA ambient Air quality network was set up to comply with the objectives of the CAFÉ Directive <http://www.epa.ie/air/quality/standards/#.Vbn4q7FOPcs> . The main parameters of the CAFÉ directive are NO_x, SO_x, PM, Carbon monoxide, Lead, benzene, Ozone, PAHs and heavy metals. Ammonia is not included in the CAFÉ Directive.

Ireland as a party to the Convention on Long Range Transboundary Air Pollution also undertakes some background air quality monitoring under the EMEP network. Ammonia monitoring is included in the EMEP network but sites are located where anthropogenic influence is understood to be minimal. In order to monitor ammonia emissions a network of monitors (most likely passive samplers) in areas where concentrations are expected to increase would be needed. It is recommended that **an ambient ammonia monitoring network** is included as an SEO indicator which could act as an indicator for ammonia increases nationally and in particular where livestock numbers are expected to increase significantly.

It is agreed that agricultural intensification and its impact on national air pollutant levels and GHG emissions will have to be modelled in subsequent implementation plans. However there exists a critical lack of up to date **activity data** in relation to the agricultural sector.

⁸ ECLAIRE project
<http://www.rivm.nl/media/documenten/cce/Publications/Final%20WGE%20brochure%20ES%20&%20biodiversity%20%28160413%29.pdf>

Many assumptions used in the EPAs inventory and projections of emissions from the agricultural sector are based on a 12 year old national farm survey. Through the Bord Bia Carbon Navigator Farm level audit a significant amount of useful activity data has been collected nationwide that could be used for inventory and projections purposes. This data could be anonymised should data access be an issue.

p. 88 Air Quality and Climate change

There is insufficient evidence provided in either the Food Wise 2025 strategy or accompanying SEA Draft Environmental to justify the statement that *'Broadly the strategy as developed will have a slightly positive effect on air quality. Actions under Origin Green are predicted to have a moderately positive effect'*

A positive impact on air quality would arise from a reduction in emissions from air pollutant sources. Given the projected increases in livestock numbers as part of Food Harvest 2020 and Food Wise 2025 and consequent increases in GHG and air pollutants from same a positive impact on air quality is unrealistic.

More concrete, measureable and verifiable mitigation measures and Sustainable Environmental Objectives (SEOs) should be included in the SEA. For example the set-up of a national ammonia monitoring network is recommended to monitor ambient ammonia concentrations into the future focussing on areas likely to be impacted by this strategy.

Such a network was recommended by De Kluzenaar and Farrell⁹ and will be detailed in a pending EPA research publication on ammonia monitoring undertaken by UCD.

A GHG MACC has been prepared by Teagasc which is a useful tool for identifying cost effective management options for GHGs from the Agricultural sector. A draft ammonia MACC¹⁰ has also been prepared by Teagasc to inform analysis of potential future ammonia ceiling for Ireland under the National Emissions Ceilings Directive. It should be noted that there is a trade-off between some mitigation measures for GHG and their impact on ammonia and vice versa. Further work is needed on integrating GHG and Air pollutant MACC curves so that deleterious impacts do not occur in other policy areas.

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⁹ De Kluzenaar, Y., Farrell, E.P. (2000) Ammonia Monitoring in Ireland, Environmental Protection Agency R&D report Series No. 8.

¹⁰ Draft document at present. Not for public circulation