Written evidence from the International Fugitive Emissions Abatement Association (IFEAA) (MET0023)

Data, measurement and monitoring

8) What is the status of methane accounting, monitoring and reporting in the UK at present and how does it compare internationally? Is UK accounting and reporting considered to be accurate and robust? What improvements, if any, are possible and what benefits would these deliver?

8.1 Methane emissions from ruminant livestock are estimated internationally using a system of calculations developed by IPCC. The perceived wisdom based on these calculations is that levels of enteric emissions are significantly higher than emissions from manure management, which has led to significant focus on reducing enteric emissions, including work on cattle genetics and feed additives, while work to reduce emissions from manure management has been relatively limited.

8.2 There has been a range of international studies examining methane emissions in livestock production, these studies have carried out measurements of methane emissions and then compared them to IPCC inventory estimates for these emissions. In general, studies have found that enteric emissions compare well to IPCC estimates. However, there is growing evidence that inventory estimates of emissions from manure management are underestimated, with some studies finding that emissions from slurry lagoons were underestimated by a factor of three. [doi: 10.1111/gcb.12687, doi:10.3168/jds.2017-13881, doi:10.1016/j.aeaoa.2022.100171, doi:10.1016/j.jenvman.2022.115319, doi:10.1016/j.atmosenv.2022.119448, doi:10.1016/j.scitotenv.2023.165896, doi:10.3168/jdsc.2022-0240].

8.3 In the UK, recent comparisons between measured livestock emissions and inventory estimates do not exist in the literature. A newly funded project (MOMENTUM, Royal Holloway Collage, Manchester University, National Physical Laboratory and Environmental Defence fund, funded by NERC, Mobile Observations and quantification of Methane Emissions to inform National Targeting, Upscaling and Mitigation — Royal Holloway Research Portal), is now working to undertake measurements of emissions from inventory methane sources including agriculture. Evidence is also emerging from technology developed to capture methane from slurry lagoons, for example manufactured by Bennamann. Data from these covered lagoons has shown that levels of methane from slurry lagoons could be 5 times higher than inventory estimates. Further measurement work is recommended to understand the differences between measured emissions and inventory estimates for manure management.

8.4 If current assessments of methane emissions from manure management are accurate, this would mean that emissions are on a par with enteric emissions, and greater effort to reduce manure emissions is needed.

UK Methane emissions and sectors

12) What progress has the UK made on reducing methane emissions and where is there room for improvement?

12.1 Little progress has been made recently in reducing emissions in agriculture, CCC data showed that in 2020, CO2e emissions in agriculture were reduced by 4% compared to a reduction of 19% in surface transport [https://www.theccc.org.uk/publication/2022-progress-report-to-parliament/#key-messages]. Much of the discussion on reducing methane emissions in agriculture has focused on reducing meat consumption to reduce emissions in this sector, with a recommendation from CCC that meat eating is reduced by 35% by 2050. However in the short and longer term, significant reductions in remaining methane emissions from livestock could be made by capturing methane emissions from manure management (in addition to measures to reduce enteric emissions). Once captured these emissions can be used to replace fossil fuels either on farm, saving farmers expenditure on fuel, or off farm to provide additional income for farmers. The current focus on reducing enteric emissions for livestock risks neglecting the potential to capture and use emissions from manure.

14) Are there sources that could be mitigated quickly and easily in the short term, and which would take longer or be more complex?

14.1 Methane emissions from manure management can be captured on farm and processed for use to replace fossil fuels. This approach has been demonstrated by Bennamann in a pilot project funded by Cornwall Council [https://bennamann.com/big-steps-forward-on-the-6-farm-pilot/]. The 6 Farms pilot is installing methane capture technology on dairy farms in Cornwall, with the methane used on farm to power a tractor or generator, and sold for use off farm by CORMAC in their road maintenance operations. Early results from the pilot have demonstrated a methane capture potential of ~150kg per year, per cow and reductions in farm carbon footprint of nearly 90% as calculated by the Farm Carbon Toolkit. Bennamann are now ramping up commercial production of this technology, with financial backing from CNHi. Other companies offer similar technology: in the UK QUBE Renewables offer a slurry lagoon cover system; internationally, such systems are in use in France, Germany and the USA.

14.2 Additionally, acidification of slurry can reduce emissions from manure and feed additives to reduce enteric emissions are commercially available. Technology to remove methane emissions from barn air is at a research stage, with a current project funded by the EU [https://cordis.europa.eu/project/id/101069491]

15) To what extent is there existing regulation in each emitting sector to mitigate methane emissions, and how well is this working?

15.1 Regulation and incentives for reducing emissions from livestock are not currently sufficient to promote reduction of emissions from manure management, perhaps due to the focus on reduction of enteric emissions due to

the persistent underestimation of emissions from manure management. The intention to mandate covers for slurry lagoons was announced in the Clean Air Strategy 2019, but has not been enacted to date and the focus of this requirement was to reduce ammonia emissions and run off due to water ingress, rather than to abate methane emissions. Currently the slurry infrastructure grant will contribute towards covering lagoons, and the funding can be used to purchase covers that capture methane, but the available funding is sufficient for around a third of the capital investment required for methane tight covers.

Agriculture

16) Are there emerging technologies, such as methane suppressant feed products or approaches to slurry management, that could aid with methane emissions reduction in agriculture? What impact could they deliver?

16.1 As mentioned in Q14, a range of companies have developed technology to capture methane emissions from slurry lagoons. The Bennamann system consists of a cover to trap methane emissions from the lagoon, trapped gas is then processed to remove hydrogen sulphide and water, at which point the biogas can be used in a correctly specified genset. Further processing to remove CO_2 makes the gas suitable for use in vehicles. Bennamann have developed a mobile processing system that can process gas at a number of farms to reduce investment for farmers. Processed gas can be used on farm for example in a methane powered tractor or off farm as a replacement for fossil gas or to power vehicles or generate electricity. Bennamann are currently scaling up production, and early analysis shows that the system is commercially viable with a payback time of around 5 years possible. Although the replacement of bought in fossil fuels with on farm produced gas and the sale of gas for off farm use can provide savings and revenue for farmers, the upfront investment can be challenging. Therefore, capital grants or favourable loans would be expected to increase uptake of the technology and accelerate abatement of methane emissions.

17) How effective are existing policies and incentives, such as Slurry Infrastructure Grants, in driving methane reduction?

17.1 See Q15, the Slurry Infrastructure Grant can fund covers which are suitable for capturing methane, but gas tight covers not mandated and the funded amount finances about a third of the cost of the methane capture cover leaving a significant investment to be made by the farmer. A larger grant for covers to capture methane would incentivise farmers to install this technology and lead to greater abatement of methane emissions.

17.2 Methane emissions from manure and other farm waste can also be mitigated by its use in anaerobic digesters (AD) as a feedstock, provided care is taken to avoid fugitive emissions from processing plant and digestate. The Green Gas Support Scheme provides a subsidy for AD plants where gas is injected into the gas grid (typically industrial scale plants). However, no support is provided for small AD plants or methane capture systems where gas is processed and

used locally, eg on farm digesters. Additional methane emissions reduction could be achieved where digestion of waste is encouraged by subsidies that cover all sizes and types of AD plant.

18) What other policy tools, frameworks or incentives could be employed in agriculture to drive methane reduction?

18.1 Planning and permitting activities involved with installing an Anaerobic Digester or covered slurry lagoon involve multiple agencies, including local Council, Environment Agency and Natural England. This process can be long and costly with no guarantee of success for the applicant. This can be a significant deterrent for some farmers. Therefore, streamlining of this process and provision of support for applicants would be expected to reduce this barrier to technology uptake.

19) How can efforts to mitigate methane emissions in agriculture be integrated into broader approaches to facilitate and incentivise climate and nature-friendly farming practices?

19.1 Manure from covered slurry lagoons can be used directly on the land to reduce the use of artificial fertiliser. Anecdotal evidence from farm trials suggests that the nutritional value of this processed slurry is greater than slurry kept in traditional open lagoons, partly because the texture makes it easier to spread and also potentially because the cover prevents ammonia emissions increasing nitrogen content in the slurry.

20) How can efforts to reduce methane reduction be balanced against other important considerations in the agricultural sector, including food security?

20.1 Covering lagoons and small AD does not reduce farm productivity, indeed it has been shown to provide improved fertiliser nutritional value which may increase productivity due to greater grass yield. Additionally, covers can prevent water ingress into the slurry store and can be used to capture water for use on farm.

Replacement of fossil gas use on farm, and sale of excess gas provides cost savings and additional revenue for the farmer which could amount to an income of up to £50 000 a year (depending on gas use) for a small dairy farmer, increasing the financial resilience of the farm. Covering slurry lagoons therefore reduces methane emissions and turns waste into a valuable byproduct from milk to improve farm profitability.