Agricultural Greenhouse Gas Inventory Advisory Panel Meeting

13 November 2012

MPI, Pastoral House, Meeting room 8.3

Minutes

Meeting start: 10:15

Attendees:

The Panel comprised:

- Chris Jones MPI (Chair)
- Dr Andrea Brandon, Senior Analyst, MfE
- Dr Harry Clark (NZMethanet)
- Dr Frank Kelliher, AgResearch (NZN2Onet)
- Dr Keith Lassey, Lassey Research and Education LTD (NZMethanet)
- Dr Andy Reisinger, New Zealand Agricultural Greenhouse Gas Research Centre (The Royal Society of New Zealand)
- Peter Ettema, Acting Manager, Resources Information & Analysis, MPI
- Simon Wear, Senior Analyst, Resources Information & Analysis, MPI

Administration was provided by Simon Wear, Resources Information and Analysis, MPI.

The purpose of the meeting was for Panel members to discuss and consider approving proposed changes to the Agricultural Greenhouse Gas (GHG) Inventory. The Panel's recommendations, of which changes were considered scientifically robust enough to implement, are provided to the Deputy Director-General, Policy. Two proposed changes were presented for nitrous oxide from leaching and runoff, and for the deer population and productivity parameters. A briefing paper, the report and a review were all submitted for each proposed change for discussion and agreement. Summaries of reports are found in the briefing papers.

Draft meeting summary to be provided by Monday 19 November 2012 for review by the Panel.

General discussion

The Panel noted in 2011 that uncertainty was not included in many of the inventory research reports. In the past many reports have not attempted to assess the uncertainty associated with emission factors and the parameters of emissions methodologies. A requirement is now stated in contracts to ensure this area of work is covered.

MPI is considering holding a workshop and reviewing the current reporting of uncertainty in the National Inventory Report. The workshop would be open to MfE officials working on uncertainty. The Panel noted that the way that uncertainty is most usefully characterised depends on the policy context, i.e. whether the key is reporting of uncertainty absolute annual emissions, uncertainty of time series, or uncertainty of projections. MPI clarified that the main interest would be reporting of uncertainty in absolute emissions as required under the UNFCCC, but that other aspects might also be relevant and would be considered in scoping the workshop.

Improvements from 2011 Panel Meeting

Recommended improvements from the 2011 Panel meeting were implemented in the 2012 Agricultural Inventory submission, with the exception of the changes to the population modelling for cattle, sheep and deer recommended in briefing seven: Review of population models within the national methane inventory (2010). The implementation was delayed until the 2013 submission when the new Visual Basic version of the code (VBA) will be ready and could support the population model changes.

A review by an Expert Review Team coordinated by the UNFCCC of the 2012 greenhouse gas inventory is underway. There was interest from the reviewer on the emissions methodology developed for goats and approved in the 2011 Panel Meeting. The draft report of the expert review team's findings is due early 2013.

Nitrous oxide from leaching and runoff

Summary

The current national inventory uses a default emission factor (EF_5) for nitrous oxide emissions from nitrogen leaching and runoff from the *Revised 1996 IPCC Guidelines*. The EF_5 default comprises three components for nitrous oxide (N_2O) emissions from groundwater and surface drainage ($EF_{5\text{-}g}$), estuaries ($EF_{5\text{-}e}$) and rivers ($EF_{5\text{-}r}$). The *Revised 1996 IPCC Guidelines* default emission factors for groundwater and surface drainage, estuaries, and rivers are: 0.015, 0.0025, and 0.0075 kg N_2O-N/kg $N_{LEACHED}$, respectively. Therefore the combined EF_5 in the *Revised 1996 IPCC Guidelines* is 0.025 kg N_2O-N/kg $N_{LEACHED}$.

Rivers in New Zealand are short and fast flowing, compared with rivers in other parts of the world on which the current international defaults were based. A field study of nitrous oxide emissions from New Zealand's longest river, the Waikato River did not measure an $EF_{5\text{-}r}$ higher than 0.005 kg N_2O-N/kg $N_{LEACHED}$. The river is situated in the Waikato region in New Zealand's North Island. The paper also cited two recent studies of N_2O of South Island rivers that confirmed emissions from New Zealand rivers were typically less than 0.005 kg N_2O-N/kg $N_{LEACHED}$.

A paper seeking approval to change the emission factor (EF_5) for nitrous oxide emissions from nitrogen leaching and runoff to 0.0075 N_2O-N/kg $N_{LEACHED}$ was presented to the Panel. The paper used the value of 0.0025 N_2O-N/kg $N_{LEACHED}$ from the *IPCC 2006 Guidelines* (to be conservative) and the change implied an $EF_{5\text{-}g}$ of 0.0025 N_2O-N/kg $N_{LEACHED}$ (also from the *IPCC 2006 Guidelines*).

Discussion

The discussion considered whether:

- it was appropriate to adopt the *2006 IPCC Guidelines* default value for $EF_{5\text{-}g}$ (0.0075 kg N_2O-N/kg) given there was no analysis or research specifically on whether the $EF_{5\text{-}g}$ from the *IPCC 2006 Guidelines* were appropriate to New Zealand; and
- the research adequately accounted for the effects of wind and water turbulence. It was noted that more gases can be liberated from water during turbulence, but that measuring N_2O emissions from water in New Zealand has safety problems. Sampling of nitrogen in water before and after falls and rapids was confirmed.

It was noted by Keith that the report appeared to contain some factual errors in the treatment of water-air exchange of gases and that the peer-reviewer represented only one side of relevant expertise.

Keith offered to complete a targeted review of the final EF_5 report and provide comments to MPI but also recommended that that MPI seek a more in-depth review by experts in water-air gas exchange. MPI will forward the comments to the authors and request the authors correct any factual errors (if any) and provide feedback on Keith's review.

The Panel considered that it was a policy rather than scientific decision whether to adopt the default 2006 Guidelines value for $EF_{5\text{-}g}$, given that there was no NZ-specific research. The Panel recommended

that in light of some of the questions raised about the EF_{5-r} factor, it would be useful for MPI to commission a wider review of available evidence relevant to NZ regarding all three elements of EF_5. The results from this wider review could be brought back to the Panel in the future and may justify adoption of the *IPCC 2006 Guidelines* values even if no NZ-specific experimental work had been carried out.

Actions

- Simon to forward electronic copy of report to Keith for commenting.
- Keith to provide comments to MPI.
- MPI to forward comments to authors.
- MPI to commission a review of New Zealand and international research on all sources of emissions of N_2O from EF_5, and recommend appropriate values for New Zealand for EF_{5-r}, EF_{5-g}, and EF_{5-e}.

Decisions

The emission factor for EF_5 is unchanged for the 2013 agriculture greenhouse gas inventory submission and the value remains the default value from the *Revised 1996 IPCC Guidelines* of 0.025 kg N_2O-N/kg $N_{LEACHED}$.

Parameters in the national inventory model for New Zealand Deer

Summary

The current inventory model estimates dry matter intake for livestock, based on productivity inputs and population models. The current model assumes some parameters for the deer due to the lack of verifiable data. The estimates of methane emissions and nitrogen excretion are then derived from the estimated dry matter intake.

As part of greenhouse inventory research program, a review of the current assumptions and parameters used for the deer model in the national inventory was completed. This ensures that the assumptions and parameters are used accurately and transparently reflect changes over time in New Zealand deer farming practices and the national deer herd.

A wider review of the energy equations for livestock used in the inventory was also completed. A number of deer-specific recommendations were made during this review.

Discussion

The discussion noted:

- In 2003 when the tier 2 model was developed, there was not a lot of information readily available to develop deer specific information to build a tier 2 model for deer. Assumptions and expert judgement were used as were necessary at the time.

Actions

- The brief paragraph (11 f) recommended slaughter dates affecting all stock classes. A split slaughter date is inconsistent with the approach used in the other ruminant models.
    - Carry out an analysis to determine a single slaughter date that recognises the proposed split.
    - Confirm the slaughter data are valid and can be applied back to 1990.
- MPI to validate the effects of changing gestation length. The Panel agreed to 233 days for deer gestation, noting that there appeared to be a genuine natural variability rather than uncertainty in the parameter, but recommended that MPI should do sensitivity analysis on the gestation length. MPI will report the effects of the sensitivity results in the National Inventory report recalculation

explanation for the 2013 inventory submission. Sensitivity analysis should be feasible with the new VBA version of the model. The results are not expected to be sensitive to the length of gestation.

- MPI to confirm the justificiation for the calving date chosen as 2007 or 2008.
- The Panel noted that while there remains a lack of deer specific information in determining energy demand, the proposed changes especially for gestation ensure consistency between the deer model and the other models and greater accuracy.

Decisions

All except three of the proposed changes documented in the deer brief were accepted and will be implemented in the 2013 agriculture greenhouse gas inventory. The remaining three (paragraphs i, j, and k in the brief) require further analysis.

Terms of reference

The terms of reference for the Panel had been operating well since 2009; however MPI reviewed the terms of reference and the process of agreeing changes to the national inventory. Minimal changes to the terms of reference were made and the process of agreeing changes to the inventory was agreed within the new MPI structure.

Paragraph 26 was added to the terms of reference to allow changes to very small[1] sources of emissions to be noted to the Panel only; allow officials to implement changes that may be required to be made within six weeks to meet international reporting and accounting timelines; and to implement the *IPCC 2006 Guidelines* when required to meet the post-2014 reporting requirements[2].

Daily rates set out in the Terms of Reference for the Panel were increased to NZ$600 per day.

Revised reporting guidelines

The revised reporting guidelines under the Convention were summarised for the Panel. After the 2015 submission, all Annex 1 Parties to the Convention will be required to use the *2006 IPCC Guidelines*. The post-2014 reporting guidelines are included in decision 15/CP.17[2]. The reporting guidelines apply regardless of decisions made under the Kyoto Protocol framework after the first commitment period.

Under the new reporting guidelines the global warming potentials used will be based on the *IPCC Fourth Assessment Report* (N_2O: 298 CH_4: 25).

The notation key NE (not estimated) will also be permitted where sources of emissions can be demonstrated to be less than 0.05 per cent of total national emissions and less than 500 kt CO_2-equivalent. Emissions of gases will also be reported as kilotonnes instead of gigagrams, as most people are more comfortable with kilotonnes.

Expert review team–Review of 2011 submission

The Panel were debriefed on the latest completed review of the national inventory. The agriculture section of the 2011 Annual review of New Zealand greenhouse gas inventory organised by the UNFCCC was provided to the Panel. The review of the 2011 submission and earlier review reports are available for download from the UNFCCC website[3].

The difference between mandatory reporting and encouraged reporting was explained. Sources of emissions are mandatory for reporting and accounting where:

- the activity occurs in the country;

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[1] Less than 0.05 per cent of total national emissions and less than 500 kt CO_2-equivalent.

[2] 15/CP.17 Revision of the UNFCCC reporting guidelines on annual inventories for Parties included in Annex 1 to the Convention www.unfccc.int.

[3] http://unfccc.int/national_reports/annex_i_ghg_inventories/inventory_review_reports/items/6048.php.

- there are methodologies available in the *Revised IPCC 1996 Guidelines* or *IPCC 2000 Good Practice*, and
- the UNFCCC and Kyoto Protocol Decisions use the mandatory language “shall”.

Recommendations apply where improvements must be made based on mandatory requirements.

In the 2011 review report, New Zealand was encouraged to account for Emus and Ostriches, using emission factors for poultry, because emus and ostriches are now reported in the Agriculture Production Survey. Expert review teams will encourage or recommend adding and emissions source if the activity is reported by the FAO or national statistics. In this case the review team can only encourage and not recommend because there are no IPCC methodologies for emus and ostriches.