

New Zealand Greenhouse Gas Inventory

Approval for change to emission factor, parameter or methodology

Reviewer	Diana Mathers FAR
Date of review	1 September 2011

Inventory sector ¹	Agriculture
Name of EF, variable or category	1. Updated activity (production) data (since 2008) for cereals and seed peas.
Current value of emission factor, variable or methodology Tier	NZ statistics for production from 1990 to 2008. In some cases we are adding new estimates of activity.
Suggested value of emission factor, variable or methodology Tier	No Change
Use from year (start year)	1990 to 2010
Recommend that a change to the new value or methodology is approved	Yes

Please comment on whether the supporting review or report sufficiently covers the following topics and provides adequate justification for a change.

	Yes/no	Comment
Is the need for a change well documented?	Yes	<p>In my opinion the current best data source is from Statistics NZ.</p> <p>The comparison between APS and FARDB data indicates that APS figures are often higher. The difference is likely to be related to cereal silage areas, which are currently not collected by FAR</p> <p>FAR is currently undertaking more detailed surveys for a number of arable crops, under its business sustainability project. This data set may be a better option for accurate data in the future.</p>
Is the proposed change scientifically defensible?	NA	Not applicable, relates to activity data and not emissions methodology
Has any documentation been peer-reviewed or published?	Yes	<p>A published report has been prepared and will be put on MAF's website.</p> <p>The report was internally-peer reviewed,</p>

¹ Energy, Industrial Processes, Solvents, Agriculture, LUCF, Waste

		and has been reviewed by Diana Mathers (FAR).
Is the proposed methodology, EF or variable consistent with IPCC GPG?	Yes	Pages 7.18-7.19 IPCC GPG (2000) acknowledges some information is hard to come by and provides methods to derive the activity data. This is prioritizing method selection for data following IPCC GPG method choice.
Is any new EF, variable or methodology comparable with any other countries?	Yes	Most parties use national statistics for this source.
Is the level of uncertainty reported?	No	The level of uncertainty is not reported for activity data.
Is there a comparison with IPCC default emission factors, variables or Tier 1 methodology	No	Activity data are not internationally comparable and not comparable with IPCC defaults.

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Inventory sector ²	Agriculture
Name of EF, variable or category	2. New activity data for sweet-corn, onions and squash
Current value of emission factor, variable or methodology Tier	NZ statistics for production from 1990 to 2008. In some cases we are adding new estimates of activity.
Suggested value of emission factor, variable or methodology Tier	No Change
Use from year (start year)	1990 to 2010
Recommend that a change to the new value or methodology is approved	Yes

Please comment on whether the supporting review or report sufficiently covers the following topics and provides adequate justification for a change.

	Yes/no	Comment
Is the need for a change well documented?	Yes	In my opinion the current best data source is from Statistics NZ. But as a reference the APS data set should be compared to HortNZ's industry data for these crops. I agree with the recommendation that the updated values for harvest index be accepted and that the default value of 0.1, be used, given that there is no root data available for these crops
Is the proposed change scientifically defensible?	NA	Not applicable, relates to activity data and not emissions methodology
Has any documentation been peer-reviewed or published?	Yes	A published report has been prepared and will be put on MAF's website. The report was internally-peer reviewed, and has been reviewed by Diana Mathers (FAR).
Is the proposed	Yes	Yes we are using national statistics for

² Energy, Industrial Processes, Solvents, Agriculture, LUCF, Waste

methodology, EF or variable consistent with IPCC GPG?		vegetable production. This is prioritizing method selection for data following IPCC GPG method choice.
Is any new EF, variable or methodology comparable with any other countries?	Yes	Most parties use national statistics for this source.
Is the level of uncertainty reported?	No	The level of uncertainty is not reported for activity data.
Is there a comparison with IPCC default emission factors, variables or Tier 1 methodology	No	Activity data are not internationally comparable and not comparable with IPCC defaults.

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Inventory sector ³	Agriculture
Name of EF, variable or category	3. Activity data for tonnes of seed produced.
Current value of emission factor, variable or methodology Tier	NZ statistics for production from 1990 to 2008. In some cases we are adding new estimates of activity.
Suggested value of emission factor, variable or methodology Tier	No Change
Use from year (start year)	1990 to 2010
Recommend that a change to the new value or methodology is approved	Yes

Please comment on whether the supporting review or report sufficiently covers the following topics and provides adequate justification for a change.

	Yes/no	Comment
Is the need for a change well documented?	Yes	Yes Activity data is most accurately presented from the AsureQuality area data and estimates of yield (expert opinion)
Is the proposed change scientifically defensible?	NA	Not applicable, relates to activity data and not emissions methodology
Has any documentation been peer-reviewed or published?	Yes	A published report has been prepared and will be put on MAF's website. The report was internally-peer reviewed, and has been reviewed by Diana Mathers (FAR).
Is the proposed methodology, EF or variable consistent with IPCC GPG?	Yes	Yes, we are using accurate area data and expert opinion for seed yield. This is prioritizing method selection for data following IPCC GPG method choice.
Is any new EF, variable or methodology comparable with any other countries?	Yes	Most parties use national statistics for this source.
Is the level of uncertainty	No	The level of uncertainty is not reported

³ Energy, Industrial Processes, Solvents, Agriculture, LUCF, Waste

reported?		for activity data.
Is there a comparison with IPCC default emission factors, variables or Tier 1 methodology	No	Activity data are not internationally comparable and not comparable with IPCC defaults.

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Inventory sector ⁴	Agriculture
Name of EF, variable or category	4. Activity data for brassica crops to calculate N-input to soils.
Current value of emission factor, variable or methodology Tier	Not currently estimated for the inventory.
Suggested value of emission factor, variable or methodology Tier	Use data collected by APS for forage brassicas. Collect information about specific areas for brassica types to add accuracy to the crop factors and N-input values. Use Overseer for estimating nitrous oxide emissions where possible, as the model contains the most comprehensive collection of NZ crop factors for arable, brassica and vegetable crops.
Use from year (start year)	1990 to 2010
Recommend that a change to the new value or methodology is approved	Yes

Please comment on whether the supporting review or report sufficiently covers the following topics and provides adequate justification for a change.

	Yes/no	Comment
Is the need for a change well documented?	Yes	In my opinion we are currently in a weak position for estimating the impacts of forage brassicas. I agree that we are doing the best we can with the limited information and expert opinion available to improve the position. However, given that forage brassicas are now the biggest category of cropped land, we need to be confident that we collect the appropriate data to enable a robust estimate for the inventory into the future. Little historic information exists and there

⁴ Energy, Industrial Processes, Solvents, Agriculture, LUCF, Waste

		<p>has been separation into different brassica classes. The area of brassica production has increased in response to demand from the dairy industry. The need for change, with recommendations has been well documented.</p> <p>In the absence of any existing time series data for this source this method is a reasonable approach to constructing a consistent time series.</p> <p>If accurate crop areas were known, Overseer modeling would provide the best option.</p>
Is the proposed change scientifically defensible?	NA	Not applicable, relates to activity data and not emissions methodology or
Has any documentation been peer-reviewed or published?	Yes	<p>A published report has been prepared and will be put on MAF's website. The report was internally-peer reviewed, and has been reviewed by Diana Mathers (FAR).</p> <p>No recommendations for change.</p>
Is the proposed methodology, EF or variable consistent with IPCC GPG?	Yes	Pages 7.18-7.19 IPCC GPG (2000) acknowledges some information is hard to come by and provides methods to derive the activity data. This is prioritizing method selection for data following IPCC GPG method choice.
Is any new EF, variable or methodology comparable with any other countries?	Yes	<p>Most parties report emissions from more crop varieties than NZ.</p> <p>I believe it is better to aim for accurate information on our major crops, rather than attempting to report less accurate information on a bigger range of crops.</p>
Is the level of uncertainty reported?	No	The level of uncertainty is not reported for activity data.
Is there a comparison with IPCC default emission factors, variables or Tier 1 methodology	No	Activity data are not internationally comparable and not comparable with IPCC defaults.

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Inventory sector ⁵	Agriculture
Name of EF, variable or category	5. Estimates of harvest index, root-shoot ratios, DM content and residue nitrogen
Current value of emission factor, variable or methodology Tier	NZ statistics for production from 1990 to 2008. In some cases we are adding new estimates of activity.
Suggested value of emission factor, variable or methodology Tier	No Change
Use from year (start year)	1990 to 2010
Recommend that a change to the new value or methodology is approved	Yes

Please comment on whether the supporting review or report sufficiently covers the following topics and provides adequate justification for a change.

	Yes/no	Comment
Is the need for a change well documented?	Yes	Harvest index values derived for Overseer compiled from NZ scientific crop data. Default values for root/shoot index, should be used in the absence of root data for arable and vegetable crops.
Is the proposed change scientifically defensible?	Yes	Determination and updating of crop factor data is on-going in NZ as part of the recent incorporation of arable and horticultural crops into Overseer.
Has any documentation been peer-reviewed or published?	Yes	A published report has been prepared and will be put on MAF's website. The report was internally-peer reviewed, and has been reviewed by Diana Mathers (FAR).
Is the proposed methodology, EF or variable consistent with IPCC GPG?	Yes	Yes, we are using accurate area data and expert opinion for seed yield. Pages 7.18-7.19 IPCC GPG (2000)

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		acknowledges some information is hard to come by and provides methods to derive the activity data. This is prioritizing method selection for data following IPCC GPG method choice.
Is any new EF, variable or methodology comparable with any other countries?	Yes	Most parties use national statistics for this source.
Is the level of uncertainty reported?	No	The level of uncertainty is not reported for activity data.
Is there a comparison with IPCC default emission factors, variables or Tier 1 methodology	No	Activity data are not internationally comparable and not comparable with IPCC defaults.

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Inventory sector ⁶	Agriculture
Name of EF, variable or category	6. Methodology for estimating cereal cropping area burned 1990 to 2004 & 2005 to 2009
Current value of emission factor, variable or methodology Tier	NZ statistics for production from 1990 to 2008. In some cases we are adding new estimates of activity.
Suggested value of emission factor, variable or methodology Tier	No Change
Use from year (start year)	1990 to 2010
Recommend that a change to the new value or methodology is approved	Yes

Please comment on whether the supporting review or report sufficiently covers the following topics and provides adequate justification for a change.

	Yes/no	Comment
Is the need for a change well documented?	Yes	I agree with the statements in the report that the accuracy of the current information for burning of wheat, barley and oats, is weak. Estimating the burn rates for cereal crops in NZ can be problematic. In future APS should collect specific data on residue removal before burning and areas burned. In the absence of any existing time series data for this source this method is a reasonable approach to constructing a consistent time series.
Is the proposed change scientifically defensible?	NA	Not applicable, relates to activity data and not emissions methodology
Has any documentation been peer-reviewed or published?	Yes	A published report has been prepared and will be put on MAF's website. The report was internally-peer reviewed, and has been reviewed by Diana Mathers (FAR).
Is the proposed	Yes	Pages 7.18-7.19 IPCC GPG (2000)

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methodology, EF or variable consistent with IPCC GPG?		acknowledges some information is hard to come by and provides methods to derive the activity data. This is prioritizing method selection for data following IPCC GPG method choice.
Is any new EF, variable or methodology comparable with any other countries?	Yes	Most parties use national statistics for this source.
Is the level of uncertainty reported?	No	The level of uncertainty is not reported for activity data.
Is there a comparison with IPCC default emission factors, variables or Tier 1 methodology	No	Activity data are not internationally comparable and not comparable with IPCC defaults.

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Inventory sector ⁷	Agriculture
Name of EF, variable or category	7. Above ground biomass fraction and nutrient losses for tussock burning
Current value of emission factor, variable or methodology Tier	NZ statistics for production from 1990 to 2008. In some cases we are adding new estimates of activity.
Suggested value of emission factor, variable or methodology Tier	Frac _{burn} updated to 0.356 Default value for N:C ratio updated to 0.015
Use from year (start year)	1990 to 2010
Recommend that a change to the new value or methodology is approved	Yes

Please comment on whether the supporting review or report sufficiently covers the following topics and provides adequate justification for a change.

	Yes/no	Comment
Is the need for a change well documented?	Yes	Very limited data available
Is the proposed change scientifically defensible?	Yes	Data reported from 2009 trial (Payton and Pearce)- spring burning at Mt Bengar
Has any documentation been peer-reviewed or published?	Yes	A published report has been prepared and will be put on MAF's website. The report was internally-peer reviewed, and has been reviewed by Diana Mathers (FAR).
Is the proposed methodology, EF or variable consistent with IPCC GPG?	Yes	Pages 7.18-7.19 IPCC GPG (2000) acknowledges some information is hard to come by and provides methods to derive the activity data. This is prioritizing method selection for data following IPCC GPG method choice.
Is any new EF, variable or methodology comparable with any other countries?	Yes	Most parties use national statistics for this source.
Is the level of uncertainty	No	The level of uncertainty is not reported for

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reported?		activity data.
Is there a comparison with IPCC default emission factors, variables or Tier 1 methodology	No	Activity data are not internationally comparable and not comparable with IPCC defaults.

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Inventory sector ⁸	Agriculture
Name of EF, variable or category	8. Methodology for estimating tussock area burned 1990 to 2005 & 2005 to present
Current value of emission factor, variable or methodology Tier	NZ statistics for production from 1990 to 2008. In some cases we are adding new estimates of activity.
Suggested value of emission factor, variable or methodology Tier	No Change
Use from year (start year)	1990 to 2010
Recommend that a change to the new value or methodology is approved	Yes

Please comment on whether the supporting review or report sufficiently covers the following topics and provides adequate justification for a change.

	Yes/no	Comment
Is the need for a change well documented?	Yes	Currently data for tussock burning generally weak. Estimating tussock burning in NZ can be problematic. APS data on actual areas burned is the best opportunity, going forward. I agree with recommendation that total consented burn area be used for 1990-2005, acknowledging that the actual burn area may not occur in the consented year and accidental burns are not accounted for. We doing the best we can with the limited information and expert opinion available.
Is the proposed change scientifically defensible?	NA	Not applicable, relates to activity data and not emissions methodology
Has any documentation been peer-reviewed or published?	Yes	A published report has been prepared and will be put on MAF's website. The report was internally-peer reviewed, and has been reviewed by Diana Mathers (FAR).

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Is the proposed methodology, EF or variable consistent with IPCC GPG?	Yes	Pages 7.18-7.19 IPCC GPG (2000) acknowledges some information is hard to come by and provides methods to derive the activity data. This is prioritizing method selection for data following IPCC GPG method choice.
Is any new EF, variable or methodology comparable with any other countries?	Yes	Australia and New Zealand are the only parties to report emissions from this source. In 2009 Australia's emissions from this source accounted for 14.3% of agriculture emissions. In 2009 New Zealand's emissions from this source are less than 0.03% of agriculture emissions.
Is the level of uncertainty reported?	No	The level of uncertainty is not reported for activity data.
Is there a comparison with IPCC default emission factors, variables or Tier 1 methodology	No	Activity data are not internationally comparable and not comparable with IPCC defaults.