CLEAN DEVELOPMENT MECHANISM

CDM-MP59-A04

Information note on nitric acid methodologies

Version 01.0

DRAFT

United Nations
Framework Convention on
Climate Change

COVER NOTE

1. Procedural background

1. During the sixty-sixth meeting of the Executive Board (hereinafter referred to as the Board) of the clean development mechanism (CDM), the secretariat made a presentation regarding potential issues with the approved methodologies “AM0028: N_2O destruction in the tail gas of Nitric Acid or Caprolactam Production Plants” and “AM0034: Catalytic reduction of N_2O inside the ammonia burner of nitric acid plants”.

2. The Board, at EB 66 (para. 92), requested the Methodologies Panel (Meth Panel) to assess these methodologies for N_20 abatement from nitric acid production, taking into account the potential issue brought to the attention of the Board by the secretariat, including:

   (a) Clear identification of perverse incentives;

   (b) Provide an analysis of the impact of the incentives in terms of emission reductions;

   (c) Provide recommendation to the Board on how to address the issues.

3. The Board, at EB 70, considered the recommendation by the Meth Panel to revise the consolidated methodology “ACM0019: N_2O abatement from nitric acid production”, to withdraw the methodologies “AM0034: Catalytic reduction of N_2O inside the ammonia burner of nitric acid plants” and “AM0051: Secondary catalytic N_2O destruction in nitric acid plants”, and to revise “AM0028: N_2O destruction in the tail gas of Caprolactam Production Plants” and consequently agreed to request the Meth Panel to review all these methodologies in order to assess how their baselines impact incentives for project participants to implement and continue a CDM project activity.

2. Purpose

4. This information note is prepared in response to the request mentioned above. The note is giving the rationale on why the approved methodologies “AM0028: N_2O destruction in the tail gas of Nitric Acid or Caprolactam Production Plants" (the part applicable to nitric acid plants), “AM0034: Catalytic reduction of N_2O inside the ammonia burner of nitric acid plants" and “AM0051: Secondary catalytic N_2O destruction in nitric acid plants" have been recommended to be incorporated into the revised methodology “ACM0019: N_2O abatement from nitric acid production".

3. Key issues and proposed solutions

5. Several project developers have indicated that new primary catalysers available in the market could provide better performance in terms of conversion efficiency to nitric acid and leading to lower emissions of N_2O. The modification of the primary catalyser requires a new baseline campaign as per AM0034, increasing the costs. This provision was originally intended to work against perverse incentive of installing catalysers with high N_2O yield, but conversely it could provide an incentive to retain an inefficient

catalyser even in cases when a more efficient model becomes available, potentially leading to overestimation of baseline emissions. The proposed solution of withdrawing AM0034 and expanding the applicability of ACM0019 dismisses the need for a baseline campaign, eliminates the historical cap for eligible production and reduces monitoring costs.

6. The Meth Panel has recommended two options for the revised ACM0019 methodology for approval. One is based on the baseline emission factor from the registered CDM projects which have been proposed by the Meth Panel for consideration at EB 70 and the second option is based on the IPCC default emission factors.

4. Impacts

7. Not applicable.

5. Proposed work and timelines

8. Not applicable.

6. Recommendations to the Board

9. The Meth Panel recommends that the Board considers the rationale provided in this information note when considering the recommendation to incorporated the methodologies AM0028 (the part applicable to nitric acid plants), AM0034 and AM0051 into the revised methodology “ACM0019: N2O abatement from nitric acid production".

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1. Introduction

1.1. Background and mandate

10. During its seventieth meeting, the Executive Board of the clean development mechanism (CDM) (hereinafter referred to as the Board) considered the Methodologies Panel (Meth Panel) recommendation on four methodologies:

    (a) To revise the consolidated methodology "ACM0019: N_2O abatement from nitric acid production";

    (b) To withdraw the methodologies "AM0034: Catalytic reduction of N_2O inside the ammonia burner of nitric acid plants" and "AM0051: Secondary catalytic N_2O destruction in nitric acid plants";

    (c) To revise "AM0028: N_2O destruction in the tail gas of Caprolactam Production Plants".

11. The Board requested the Meth Panel to review all these methodologies in order to assess how this recommendation impacts incentives for project participants to either implement or continue a CDM project activity (EB 70 report, para. 57).

1.2. Project emissions when N_2O abatement is not operating

12. The current version of ACM0019 uses different criteria when accounting for project emissions in using either tertiary or secondary abatement systems:

    (a) Tertiary abatement (destruction at the end of pipe by thermal treatment): when the abatement system is not operating then project emissions are equal to baseline emissions. As a consequence, during the period of time that the abatement system is not working then the project participant cannot claim for any CER;

    (b) Secondary abatement (destruction inside the ammonia burner through installation of a second catalyst): in the situation that the secondary abatement system is not operating, then the monitored project emission factor may be higher than the baseline campaign or default emission factor, whichever is adopted. As a consequence, the project participants are penalized whenever the abatement system is not working and project emission- factor is higher than the baseline emission factor.

13. In order to harmonize the methodologies and have a common approach for the two types of projects, the Meth Panel recommends that the same approach should be applied for both the secondary abatement and the tertiary abatement system when calculating project emissions. This will ensure consistency in the application of the methodology.

1.3. Impact of the baseline emission factors prescribed in the revised version of ACM0019 for existing plants

14. For the nitric acid industry, destruction of N_2O is expected to yield no benefits other than the possible income due to the CDM.

15. Several project developers have indicated that new primary catalysers available in the market could provide better performance in terms of conversion efficiency to nitric acid and leading to lower emissions of N_2O. The modification of the primary catalyser requires a new baseline campaign as per AM0034, increasing the costs. This provision was originally intended to work against perverse incentive of installing catalysers with high N_2O yield, but conversely it could provide an incentive to retain an inefficient catalyser even in cases when a more efficient model becomes available, potentially leading to overestimation of baseline emissions. The proposed solution of withdrawing AM0034 and expanding the applicability of ACM0019 dismisses the need for a baseline campaign, eliminates the historical cap for eligible production and reduces monitoring costs.

16. Since ACM0019 includes a standard benchmark estimated conservatively, the above solution could result in reducing the total amount of CERs. Based on the analysis of registered CDM projects, the Meth Panel expects that about 10 per cent of the plants will be substantially affected (resulting in more than 50 per cent of reduction in emissions reduction). It should be noted that these projects may have performed a baseline campaign with very low conversion efficiency from ammonia to nitric acid (outside the normal range for the industry). Coincidentally these same projects resulted in highest baseline emission factor (up to three times above the IPCC figures).

17. Based on the available data of 78 plants which are having registered projects 18 plants are registered for the fixed crediting period and they will not have any impact.

18. The following impacts are observed to the remaining 78 plants by comparing the present emission factors in the PDD with the proposed baseline emission factor by Meth Panel in last meeting (which are 4.2 kgN_2O/tNA; 5.7 kgN_2O/tNA and 8 kgN_2O/tNA for low, medium and high pressure nitric acid plants respectively):

Table 1. Impact on emission reductions by using the baseline emission factors from registered CDM project activities; proposed as Option 1 in revised ACM0019

Impact on emission reductions (CER)	Number of plant	% of total plants
No Impact	38	49%
0-10%	12	15%
10-50%	22	28%
>50%	6	8%
Total	78	

19. Based on the request from the Board the Meth Panel considered the benchmark emission factor based on the IPCC in different pressure categories have been selected (which are 5 kgN_2O/tNA; 7 kgN_2O/tNA and 9 kgN_2O/tNA for low, medium and high pressure nitric acid plants respectively) and updated in the revision of ACM0019. The impacts of these updated emission factors are presented in the table below:

Table 2. Impact on emission reductions by using the baseline emission factors; proposed as Option 2 in revised ACM0019

Impact on emission reductions (CER)	Number of plant	% of total plants
No Impact	38	49%
0-10%	12	15%
10-50%	22	28%
>50%	6	8%
Total	78	

20. The overall economic impact is difficult to determine, since currently the abatement cost of N_2O (between 0.8 to 1.5 US$/tonne of CO_2e according to several PDDs and direct consultation with project developers) which exceed current CER prices, therefore some project participants may not be compelled to implement the project regardless of change in methodology.

21. In terms of CER, the expected impact in the 60 plants will be approximately 4.8 million/year for the entire group of 78 plants that is 61500 CER/plant. The impact will be more for six plants which were having very high baseline emission factor which is much higher than the similar plants in the same pressure class, but less for others. This calculation disregard any increase in CERs obtained from the increase in production (where the plants were operating below the design capacity) that is incorporated in ACM0019.

2. Conclusion

22. The Meth Panel considers that CDM benefits from adopting the proposed revised methodology ACM0019 still provides incentives to destroy N_2O emitted from nitric acid plants. It is important to mention that the revision also provides benefits to the CDM project activities that are highlighted in the information note provided to the Board at EB 70, since transaction costs are expected to be reduced due to reduction in monitoring requirements, and in many cases project developers will have an incentive to adopt new and more efficient technologies for nitric acid production - this is not allowed in projects adopting AM0034 and AM0051. Finally, more consistency will ensure equitable treatment for different types of projects.

3. Recommendations

23. The Meth Panel recommended having a common approach for both technologies when the abatement system is not working. This is to set the project emissions equal to baseline emissions when the abatement system is not working properly.

24. The Meth Panel recommended to revise the approved methodology AM0028 to limit its applicability to caprolactam plants, to withdraw the approved methodologies AM0034 and AM0051 and to revise the methodology ACM0019 with an objective to provide the project participants more incentive in terms of adopting more efficient technologies and to introduce a cap (default emission factors) for existing plants to preserve environmental integrity and reducing monitoring costs.

25. As indicated in the tables above, the Meth Panel has recommended two options for the revised ACM0019 methodology for approval. One is based on the baseline emission factor from the registered CDM projects which have been proposed by the Meth Panel for consideration at EB 70 and the second option is based on the IPCC default emission factors.

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Document information

Version	*Date*	*Description*
01.0	9 May 2013	MP 59, Annex 4 To be considered at EB 73.

Decision Class: Regulatory
Document Type: Information note
Business Function: Methodology
Keywords: nitrous oxide, nitric acid, ACM0019, AM0028, AM0034, AM0051