VERIFICATION REPORT

Indonesia - Norway Verification of reduced emissions from deforestation and forest degradation

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Document prepared by AENOR INTERNACIONAL S.A.U.

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1. INTRODUCTION

1.1. Objective

The objective of the verification audit was the independent evaluation of the results in reducing emissions from deforestation and forest degradation in Indonesia at national level for the period 2016/2017 in comparison to the results based payment (RBP) baseline (period 2006/2007-2015/2016), reported in the document *Emission Reduction Report for the Indonesia-Norway Partnership.*

1.2. Scope

The scope of the verification was limited to the following indicators:

- Emissions from gross deforestation at the national level 2006/2007-2015/2016 and 2016/2017.

- Emissions from gross forest degradation at the national level 2006/2007-2015/2016 and 2016/2017.

- Emission reductions measured as tones CO_2e, including all sources of emissions included in the RBP.

1.3. Criteria

The criteria for assessing the reported results were the correct application of the methodology used for the definition of the First Indonesia Forest Reference Emission Level (FREL), applied to the periods 2006/2007-2015/2016 and 2016/2017, under the framework outlined by the bilateral agreements of the Indonesia-Norway partnership. These criteria are specified in the following documents:

- National Forest Reference Emission Level for Deforestation and Forest Degradation: In the Context of Decision 1/CP.16 para 70 UNFCCC (Encourages developing country Parties to contribute to mitigation actions in the forest sector). (2016).

- MRV protocol for the Indonesia-Norway partnership on climate, forests and peat.

- Annex: Detailed steps for calculating results based payments under the Indonesia-Norway forest partnership

Additionally, the following documents were used as guidance:

- Report on the technical assessment of the proposed forest reference emission level of Indonesia submitted in 2016. (2016).

- Indonesia Second Biennial Update Report Under the United Nations Framework Convention on Climate Change. (2018).

- Technical report on the technical analysis of the technical annex to the second biennial update report of Indonesia submitted in accordance with decision 14/CP.19, paragraph 7, on 21 December 2018. (2018).

- 2006 IPCC Guidelines for National Greenhouse Gas Inventories.

- 2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands

- 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories

- Good Practice Guidance for Land Use Land-Use Change and Forestry. (2003).

- Good Practice Guidance and Uncertainty Management in National GHG Inventories. (2000).

- Global Observation of Forest and Land Cover Dynamics (GOFC-GOLD) REDD+ Source Book. (2015)

- GFOI Methods and Guidance Documents (2013&2016) and supplementary modules.

- ISO 14064-3:2019 Part 3: Specification with guidance for the verification and validation of greenhouse gas statements (2019).

1.4. Level of assurance and materiality

The assessment was conducted to provide a reasonable level of assurance of conformance against the defined audit criteria within the audit scope. Based on the audit findings, a positive evaluation statement reasonably assures that the greenhouse gas (GHG) assertion is materially correct and credible.

The threshold for materiality with respect to the aggregate of errors, omissions and misrepresentations relative to the total reported GHG emission reductions was five percent.

2. AUDIT PROCESS

2.1. Audit team

The audit team consisted of the following members:

Role	Name	Attending site visit
Project Manager	Jose Luis Fuentes	No
Verifier Team Leader	Juan Carlos Gómez	Yes
Verifier 1	Carlos Jiménez	Yes
Verifier 2	Richard Gonzales	No
Technical Reviewer	Elena Llorente	No

José Luis Fuentes is the manager of the Climate Change Unit of AENOR. He is a Forestry Engineer and has a Master's in Business Administration and a Post-Graduate in Environmental Management. He has more than 15 years of experience in auditing, consulting and training activities related to environmental and carbon management projects. Jose Luis has actively participated in the audit of international sustainable development projects in several carbon schemes, such as the Clean Development Mechanisms (CDM), Verified Carbon Standard (VCS), Climate, Community and Biodiversity Standards (CCB), Gold Standard (GS) and carbon footprints (ISO 14067 and ISO 14064). Jose Luis has extensive technical knowledge about the regulatory framework, policies and technical provisions emanating from the Paris Agreement, the Kyoto Protocol and the Conferences of the Parties.

Juan Carlos Gómez has more than 5 years of professional experience in climate change. He is a Forestry Engineer and holds Master in Sustainable Development and Corporate. He has developed his entire career in the field of climate change. He is an expert in the development of climate change mitigation and adaptation policies and has worked in LATAM countries and Africa, auditing REDD+ under VCS and CCB, and forestry projects under the CDM and JI.

Carlos Jimenez is a Forestry Engineer and holds Master in Rural Development. He has 8 years of experience in natural resources management and sustainable development. His experience covers working with public and private sector, as well as civil society organizations; with focus in forest-risk commodities, community-based development projects, and consultancy on ecosystem services. Since 2016 he works as an auditor of sustainable forest management (FSC) and forest carbon certification schemes (VCS, CCB) in Latin America and Asia.

Richard Gonzales is an Industrial Engineer and Lead auditor in emission reduction projects since 2011, mainly CDM projects, GS and VCS+CCB. Likewise, he is qualified as Auditor in Carbon Footprint of Organization and products and auditor in Environmental Management Systems under ISO 14001.

He has developed skills to work and lead multidisciplinary teams and to interact with different types of institutions and with local and indigenous cultures, auditing activities in environmental issues

Elena Llorente has a degree in Environmental Sciences and more than 14 years of professional experience in climate change and sustainability projects. She has worked for the UNFCCC, specifically in the management of carbon and climate change as an auditor and technical reviewer of projects and programs of mitigation activities under different types of carbon standards such as CDM and JI of the UNFCCC, VCS and Gold Standard.

Annex 3 contains the certificates of qualification of the members of the audit team for the verification and technical review of the Indonesia - Norway Verification of reduced emissions from deforestation and forest degradation.

2.2.Method and considerations

The verification was performed through a combination of document review, interviews and communications with relevant personnel. The conformity of the determination of emission reductions was evaluated against the criteria set forth in Section 1.3. As described below, findings were issued to ensure that all requirements were met.

The audit team carried out a risk-based assessment for the assurance of gross deforestation, gross forest degradation and the estimated emissions reductions. In accordance with ISO 14064-3:2019, the risk assessment is based on:

- The inherent risks of discrepancies for each variable used to estimate emission source and the GHG reporting system.
- The risk that controls are insufficient to detect and prevent each inherent risk from causing a discrepancy in the GHG assertion
- The potential magnitude of each inherent and control risk described above resulting from the contribution of the associated emission source.

This information was used to develop an appropriate verification procedure for each identified risk. Each procedure was designed to reduce the probability that the verification would not detect a discrepancy that has not been corrected by the technical team responsible for the control.

Although there may be a level of risk inherently related to remote estimation processes and the development of the deforestation and forest degradation emission factors used the estimation, the audit team did not focus on this since this risk was already been defined with the use of the 1st FREL as a guide and main criterion for verification. For this reason, the following elements included in the *Emission Reduction Report for the Indonesia-Norway Partnership* constitute a risk classified as low, where it is not expected to have further findings or discrepancies regarding the procedures followed since these simply must comply with the established in the 1st FREL:

- Area and geographical boundaries
- Carbon pools and types of GHG included
- Forest, deforestation and forest degradation definition
- Emission factors

The next aspects were considered of medium risk. Therefore, they were assessed more thoroughly:

- Land use and land use change maps elaboration
- Gross deforestation calculation
- Gross forest degradation calculation
- Emissions from deforestation and forest degradation calculation

In AENOR's opinion, the verification has turned out to be of low-medium risk taking into account that: 1) the Indonesia-Norway partnership on climate, forests and peat has standardized processes for cartographic management and calculation, under the responsibility of the National Forest Monitoring System (NFMS), 2) that the Ministry of Environment and Forestry (MoEF) technical team involved in the MRV and the elaboration the report have the appropriate knowledge, and 3) that the elaboration of **Indonesia's** 1st FREL and 2nd BUR, prior to this process, have allowed the learning and improvement of the processes, protocols, etc. Therefore, the risk of errors, discrepancies or omissions is considered low-medium.

The audit team focused its activity during the verification process on ensuring that the procedures carried out for the calculation of gross deforestation, gross forest degradation and the reduction of deforestation and forest degradation emissions have been carried out following the same methodology as the used in Indonesia's 1st FREL, as agreed by the parties of the Indonesia-Norway partnership.

AENOR reproduced and verified 100% of the calculations in the calculation spreadsheet *Spreadsheet_REDD Performance_Norway_Final* for the estimation of emissions from deforestation and forest degradation for the period 2006/2007-2015/2016 and 2016/2017 and emissions reductions from avoided deforestation and forest degradation for the period 2016/2017. It was verified that the data necessary to calculate GHG reductions were adequately provided and reproducible

The geographical boundaries and the deforested and degraded areas during the monitoring period were verified using the land cover maps from 2006/2007-2015/2016 and 2016/2017 by the NFMS through the analysis of the data obtained by remote sensing. The accuracy assessment of the land cover maps was reviewed to determine their level of accuracy.

Carbon pools and forest classes were 100% verified and checked against Indonesia's 1st FREL and the *Annex: Detailed steps for calculating results based payments under the Indonesia-Norway forest partnership*.

Some errors were identified and subsequently corrected. These findings are detailed in Annex 7. All non-conformities have been successfully closed.

An in-country visit was conducted between January 22nd and 24th, 2020, in which members of the audit team interviewed relevant staff of the MoEF responsible for the monitoring and reporting of the reduced emissions from deforestation and forest degradation.

Based on the assessment carried out, AENOR confirms with a reasonable level of assurance that the claimed GHG emission for the period 2006/2007-2015/2016 and the claimed GHG emissions reductions for the period 2016/2017 are free from material errors, omissions or misstatements.

In addition, AENOR confirms that sufficient evidence was presented and that there is a clear audit trail that contains the evidence and records that validate the stated figures in this Verification Report since:

- The evidence available and presented to AENOR is sufficient. 100% of the data used in the calculations have been provided to achieve the final amount of GHG emissions and GHG emissions reduction reported

- The nature of the evidence is adequate. The raw data were collected from reliable sources. They are detailed in the *Emission Reduction Report for the Indonesia-Norway Partnership* and have been provided to the verification team. The most relevant are appropriately detailed in Annex 4.

- Evidence were cross-checked. AENOR verified the information provided and reproduced the calculations.

Hence, AENOR confirms that the stated figures in the *Emission Reduction Report for the Indonesia-Norway Partnership* are correct and confirms that is able to certify the deforestation and forest degradation emissions reductions based on verifiable and reliable evidence.

2.3. Document review

AENOR carried out a thorough review of the documentation provided by the Directorate General of Climate Change of the MoEF to verify compliance with the verification criteria. The reviewed documentation includes, among others:

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- Emission Reduction Report for the Indonesia-Norway Partnership.

- National Forest Reference Emission Level for Deforestation and Forest Degradation: In the Context of Decision 1/CP.16 para 70 UNFCCC (Encourages developing country Parties to contribute to mitigation actions in the forest sector).

- Report on the technical assessment of the proposed forest reference emission level of Indonesia submitted in 2016.

- Indonesia Second Biennial Update Report Under the United Nations Framework Convention on Climate Change.

- Technical report on the technical analysis of the technical annex to the second biennial update report of Indonesia submitted in accordance with decision 14/CP.19, paragraph 7, on 21 December 2018.

- Land cover maps: 1990, 1996, 2000, 2003, 2006, 2009, 2011, 2012, 2013, 2015, 2016 and 2017.

- Land cover changes database *PIVOTDB.*

- Emissions calculation spreadsheet *Spreadsheet_REDD Performance_Norway_Final.*

- Uncertainty calculation spreadsheet *Uncertainty Calculation_verification.*

- Indonesia Report on REDD+ Performance.

Annex 4 contains the complete list of the documentation reviewed during the verification process.

2.4. In-country visit

An in-country visit was conducted between January 22nd and 24th, 2020. The main objectives of the site visit were to:

- Understand in practice the estimation of gross deforestation and gross forest degradation at the national level: choice satellite images and pre-processing, image processing, accuracy assessments and activity data reporting.

- Understand the methodological steps for the determination of emissions from deforestation and forest degradation, the emissions reductions and the results reported under the RBP system.

- Understand the uncertainty estimation methods and the QA/QC procedures used.

- Understand the institutional arrangements put in place for the monitoring and reporting of the reduced emissions from deforestation and forest degradation.

During the visit, the audit team had the opportunity to listen and raise their questions to the technical team responsible for processing and preparing the land cover maps and for the calculation of emission and emissions reductions.

Annex 6 contains the lists of the attendants to the meetings held during the in-country visit.

2.5. Resolution of non-conformities

As a result of the verification process, the audit team identified a several findings, raised as non-conformities (NC). NC can be issued due to:

- Failure to comply with the criteria established in Section 1.3.

- Insufficient evidence provided to prove compliance.

- Errors when applying assumptions, data or calculations that would affect the estimation of emission reductions.

The findings raised during the verification process, and the responses for their closure, are described in Annex 7.

All findings issued by the AENOR audit team during the verification process have been closed.

2.6. Internal quality control

The Verification Report has undergone an internal quality control process through a technical review, once the assigned verification team issued its final opinion. The technical reviewer is a qualified member of AENOR, independent of the team that carried out the verification. The technical reviewer or the team assigned for such review are qualified in the relevant technical areas.

3. VERIFICATION FINDINGS

3.1. Area and geographical boundaries

The geographical boundary and area covered by RBP under the Indonesia-Norway partnership on climate, forests and peat is clearly defined in the *Emission Reduction Report* as the whole natural forest (primary and secondary) in the territory of the Republic of Indonesia, including dryland, mangrove and swamp forest. Only areas with forest classes existing in the year 1990 that were not deforest up to 2006 were considered.

The audit team verified that the definition of boundaries is consistent with the *MRV protocol for the Indonesia-Norway partnership on climate, forests and peat* and its *Annex: Detailed steps for*

calculating results based payments under the Indonesia-Norway forest partnership. The AENOR team verified, through the land cover maps, that boundaries and areas considered for the determination of the RBP baseline and the emissions reductions are correct.

3.2. Activities covered, carbon pools and GHG

The REDD+ activities considered for the RBP were those related to deforestation and forest degradation, both on mineral and peat soil. The only carbon pool included as part of the RBP baseline and reductions is aboveground biomass (AGB) and the only considers changes in carbon stocks, reported as CO_2e.

AENOR verified that the activities, carbon pools and GHGs considered are in accordance with the *Annex: Detailed steps for calculating results based payments under the Indonesia-Norway forest partnership.*

Emissions from peat decomposition and peat fires are included in the *Emission Reduction Report* as an annex and, for the current time, excluded from the RBP, in conformity the *Annex: Detailed steps for calculating results based payments under the Indonesia-Norway forest partnership.*

3.3. Forest, deforestation and forest degradation definitions

The AENOR team verified that the definitions used for forest, deforestation and forest degradation are consistent with those used in Indonesia's 1st FREL.

Forest

Land area of more than 6.25 hectares with trees higher than 5 meters at maturity and a canopy cover of more than 30 percent. Six classes of natural forest are considered in the RBP, in line with Indonesia's 1st FREL:

- Primary dryland forest
- Secondary dryland forest
- Primary mangrove forest
- Secondary mangrove forest
- Primary swamp forest
- Secondary swamp forest

Only the existing natural forest in 1990 are considered. Plantation forests are excluded.

Deforestation

One-time conversion of natural forest cover to other land-cover categories that occurred in the same area. Deforestation occurred in regenerated forest, that previously deforested, is not considered.

Forest degradation

Transition of primary forest classes to secondary classes, which reduce the quantity of carbon stocks as a result of human activities.

3.4. Reference period

AENOR verified that the reference period considered for the elaboration of the RBP baseline was 2006/2007-2015/2016, as agreed in the Annex: *Detailed steps for calculating results based payments under the Indonesia-Norway forest partnership.*

3.5. Gross deforestation and gross forest degradation

AENOR verified that the methodology used for the quantification of the gross deforestation and gross forest degradation for the periods 2006/2007-2015/2016 and 2016-2017 was consistent **with the methodology used for in Indonesia's 1**st **FREL.** This was based in annual cover change analysis, overlaying land cover maps developed by the NFMS, for the period 1990-2017. As mentioned above, only forest areas existing in 1990 and not altered until 2006 were considered.

During the in-country visit, the audit team was able to follow in an exhaustive manner, together with the responsible technicians, the process of preparing the land cover maps. Detailed explanations of each of the steps were made and examples of the process were shown.

AENOR verified that the personnel responsible for deforestation and forest degradation monitoring activities are fully trained and that the quality control and quality assurance procedures to identify, review and manage the inconsistencies found are comprehensive and properly implemented.

The audit team cross-checked the land cover data contained in the spreadsheet *Pivot DB GIS_DD_Norway 2006-2017* (data retrieved from the land cover maps for the years 1990, 1996, 2000, 2003, 2006, 2009, 2011-2017) with the activity data (deforested and degraded area) reported in the *Emissions Reduction Report* and used in the calculation spreadsheet *Spreadsheet_REDD Performance_Norway*. No discrepancy was found.

AENOR reviewed the evaluation of the accuracy assessment of the land cover maps for the years 1990, 1996, 2000, 2003, 2006, 2009, 2011-2016, as part of the document *Indonesia Report on REDD+ Performance*. The overall accuracy result is not lower than 85,58 % (1990). AENOR considers that the overall accuracy is sufficient in accordance with the international jurisdictional guidance of REDD+ (VCS-JNR), which requires a forest/non-forest accuracy of at least 75%, and taking into account that the Warsaw Framework for REDD does not set thresholds for thematic accuracy.

The following table summarizes total deforestation and forest degradation in the monitored periods and the annual rate per year:

		2006-2009	2009-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017
Deforestation	Total (ha)	2,741,459	1,101,040	786,052	883,986	363,056	736,285	825,766	673,838
	Annual rate (ha/year)	913,820	550,520	786,052	883,986	363,056	736,285	825,766	673,838
Degradation	Total (ha)	1,558,707	322,009	43,218	197,235	95,256	698,738	596,533	257,682
	Annual rate (ha/year)	519,569	161,005	43,218	197,235	95,256	698,738	596,533	257,682

AENOR found no inconsistencies between the *Emission Report* and the spreadsheets.

3.6. Emissions from deforestation and forest degradation for the period 2006/2009-2015/2016 and 2016/2017

Deforestation and forest degradation emissions were calculated using the same methodology used in for Indonesia's 1st FREL, as explained in Annex 1 of the *Emissions Reduction Report*. The deforested or degraded areas are multiplied by the relevant deforestation or degradation emission factor per forest class. In accordance with IPCC literature, the simplest and most conservative method was used to calculate the emissions, which involves the oxidation of 100% of the carbon stock immediately after deforestation/degradation.

The equations used were:

$$GE_{ij} = A_{ij} \; x \; EF_i$$

Where:

GE_{ij} emissions from deforested or forest degraded area-i at forest change class-j; tCO_2e.

A_{ij} deforested or forest degradation area-i in forest change class j; ha.

EF_i emission factor from the loss of carbon stock due to change of forest class-j, owing to deforestation or forest degradation; tCO_2e/ha.

$$GE_t = \sum_{i=1}^{N} \sum_{j=1}^{P} GE_{ij}$$

Where:

GE_t emission from deforestation and forest degradation at period t; tCO_2e.

GE_{ij} emissions from deforested or forest degraded area-i at forest change class-j; tCO_2e.

N number of deforested or degraded forest area unit at period t (from t_0 to t_1)

P number of forest classes, which meet natural forest criterion.

The audit team verified that the emission factors for deforestation and forest degradation used **were the same of Indonesia's 1st FREL**, which were derived from the National Forest Inventory, and consider only AGB. The following tables summarize the emission factors.

Forest Classes	Emission factors of deforestation (tCO_2e/ha)						
	JAWA	KALIMANTAN	MALUKU	NUSA BALI	PAPUA	SULAWESI	SUMATERA
Primary Dryland Forest	458.8	464.7	519.9	473.3	412.4	474.7	463.3
Secondary Dryland Forest	294.1	350.7	383.1	280.6	311.2	356.2	314.3
Primary Mangrove Forest	455.2	455.2	455.2	455.2	455.2	455.2	455.2
Secondary Mangrove Forest	347.9	347.9	347.9	347.9	347.9	347.9	347.9
Primary Swamp Forest	332.4	474.0	332.4	332.4	308.4	369.8	380.9
Secondary Swamp Forest	274.8	294.1	274.8	274.8	251.3	221.3	261.1

Forest Classes	Emission factors of forest degradation (tCO_2e/ha)						
	JAWA	KALIMANTAN	MALUKU	NUSA BALI	PAPUA	SULAWESI	SUMATERA
Primary Dryland Forest	164.7	114.0	136.8	192.7	101.3	118.5	149.0
Primary Mangrove Forest	107.3	107.3	107.3	107.3	107.3	107.3	107.3
Primary Swamp Forest	57.6	179.9	57.6	57.6	57.1	148.5	119.7

AENOR reviewed the methodology for the quantification of the emissions from deforestation and forest degradation for the period 2006/2009-2015/2016 and 2016/2017 and found that it is used is in compliance with the criteria set in Section 1.3. AENOR reproduced all the calculations and obtained the same results, so it is considered that they are clearly and correctly represented in the spreadsheet and in the results report provided.

The deforestation and forest degradation emissions results reported in the *Emissions Reduction Report* and verified by AENOR are summarized in the following table.

		2006-2009	2009-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017
Deforestation	Total (tCO$_2$e)	859,199,342	347,781,714	248,936,401	285,586,539	116,066,230	232,677,053	279,220,589	228,348,899
Deforestation	Annual rate (tCO$_2$e /year)	286,399,781	173,890,857	248,936,401	285,586,539	116,066,230	232,677,053	279,220,589	228,348,899
Degradation	Total (tCO$_2$e)	177,154,851	37,021,039	5,805,289	19,833,885	9,515,931	85,190,736	75,225,065	32,294,223
Degradation	Annual rate (tCO$_2$e /year)	59,051,617	18,510,520	5,805,289	19,833,885	9,515,931	85,190,736	75,225,065	32,294,223

3.7. RBP baseline and emission reduction

The RBP baseline was calculated as the average yearly deforestation and forest degradation emissions of the period 2006/2007-2015/2016, as agreed by the parts in the *MRV protocol for the Indonesia-Norway partnership on climate, forests and peat*, being valid up to the period 2019/2020.

The reported values of the RBP baseline verified by the audit team are summarized in the following table.

RBP baseline (tCO$_2$e/year)	
Deforestation	236,946,787
Forest degradation	40,974,680
Total RBP baseline	277,921,466

AENOR reproduced the calculations to achieve the same results and deems the calculated RBP baseline of 277,921,466 tCO$_2$e/year (236,946,787 tCO$_2$e/year from deforestation and 40,974,680 tCO$_2$e/year from forest degradation) is correct.

The emission reduction in the period 2016/2017 were calculated by deducting the actual 2016/2017 estimated emission to the RBP baseline, in accordance with the *MRV protocol for the Indonesia-Norway partnership on climate, forests and peat*:

$$Emission\ reduction_{2016/2017} = RBP\ baseline - GE_{2016/2017}$$

The reported emission reduction for 2016/2017 and verified by the audit team are summarized in the following table.

	RBP baseline (tCO$_2$e/year)	Emissions 2016/2017 (tCO$_2$e)	Reduction 2016/2017 (tCO$_2$e)
Deforestation	236,946,787	228,348,899	8,597,888
Forest degradation	40,974,680	32,294,223	8,680,457
Total	277,921,466	260,643,121	17,278,345

The audit team reproduced the calculations to achieve the same results and deems they are clearly and correctly depicted in the spreadsheet and the *Emission Reduction Report*. AENOR considers that the formula is used in compliance with the criteria defined in Section 1.3. Therefore, AENOR deems that the calculated emission reduction for the period 2016/2017 of 17,278,345 tCO$_2$e (8,597,888 tCO$_2$e from avoided deforestation and 8,680,457 tCO$_2$e from avoided forest degradation) is correct.

AENOR verified the parameters used in the calculation and references to documents where they are used or explained, through the review, reproduction and cross-checking of the evidence provided by the MoEF. AENOR checked that the values of these parameters are appropriate and are used correctly in the equations.

AENOR found no inconsistencies between the information reported in the *Emission Reduction Report for the Indonesia-Norway and* the spreadsheets.

After a thorough and comprehensive review and replication of calculations, AENOR considers that the monitored parameters available are correct, credible and consistent. Therefore, AENOR deems that the reported results are credible, consistent and accurate.

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4. VERIFICATION CONCLUSION

AENOR has verified that the estimation of the emissions from gross deforestation and from gross forest degradation at national level for the period 2006/2007-2015/2016 and 2016/2017 and the emission reduction from avoided deforestation and avoided forest degradation for the period 2016/2017 have been carried out in compliance with the criteria set in Section 1.3.

Therefore, AENOR is able to confirm that the RBP baseline and 2016/2017 emission reduction have been determined in a consistent, transparent and reproducible way and that are correct, credible and free from material errors, omissions and / or false statements.

The verification process was carried out in the following phases: i) a documentary review of all the material provided by the MoEF; ii) in-country interviews with the team responsible for monitoring and reporting; iii) reproduction of the calculations; iv) the resolution of pending issues and v) the issuance of the report and final verification opinion. In the course of the verification process, non-conformities were found and properly closed.

AENOR is able to issue a positive verification opinion for the **RBP baseline of 277,921,466 tCO_2e/year** (236,946,787 tCO_2e/year from deforestation and 40,974,680 tCO_2e/year from forest degradation) and for the **2016/2017 emission reduction of 17,278,345 tCO_2e** (8,597,888 tCO_2e from avoided deforestation and 8,680,457 tCO_2e from avoided forest degradation), as reported in the *Emission Reduction Report for the Indonesia-Norway Partnership*.

In accordance with the *MRV protocol for the Indonesia-Norway partnership on climate, forests and peat* and the *Annex: Detailed steps for calculating results based payments under the Indonesia-Norway forest partnership* and the application a 35% set-asides/deductions, AENOR is able to issue a positive verification opinion with a reasonable level of assurance for the Indonesia proposed net results of **11,230,924 tCO_2e** to be awarded for the first RBP.

Madrid, **March 26th**, 2020.

Juan Carlos Gomez
Verifier Team Leader

Jose Luis Fuentes
Project Manager

ANNEXES

Annex 1: Recommendations for improvements in MRV system

During the verification process several improvement opportunities were identified for Indonesia-Norway MRV system by the audit team. This improvement options are to be considered additional to those stated in the Plan of the improvement of the *Emission Reduction Report for the Indonesia-Norway Partnership.* The recommendations are listed according to the suggested implementation priority in opinion of the audit team:

1. Update figures and final version documents in: 1) Lima REDD+ Hub Website (UNFCC), 2) Norway and Indonesia corresponding websites reporting on Partnership results.

2. Enforce the registration of both public and private REDD+ initiatives in the National Registry System on Climate Change and integrate the double-counting preventive measures into the MRV system.

3. Include the carbon pools of below-ground biomass (BGB) and dead organic matter (dead wood and litter) in deforestation and forest degradation emissions calculation. According to Indonesia 1st FREL, the emission factors only account for above-ground biomass. The measurement of below-ground biomass (or the use of shoot-to-root ratio), dead wood and litter in future national forest inventories and the accounting of their carbon content as part of the emission factor of the natural forest classes would increase the comprehensiveness of the deforestation and forest degradation emission estimation.

4. Implement peat fire emission accountability considering a double baseline, in accordance with *Annex: Detailed steps for calculating results based payments under the Indonesia-Norway forest partnership*. Consider including peat fire emission estimates in future RBP by using advanced remote sensing technology to improve burned scar and peat depth mapping.

5. Develop and give public access to forest degradation maps, in the same way as the already published deforestation maps. This would enhance transparency, traceability and replicability of the GHG emissions and reductions calculations.

6. Compile and translate to English the procedures followed for the elaboration of the land cover maps, land forest cover change analysis and QA/QC. Providing public access in English to the procedures and methodologies followed would facilitate future verification process and would improve transparency towards third parties.

Annex 2: Analysis of the Plan of improvement

The auditor team has analysed the Plan of improvement for the Indonesia-Norway partnership MRV, included in the *Emission Reduction Report for the Indonesia-Norway Partnership*, and has the following comments regarding the planned improvements:

- Inclusion of other significant carbon pools (organic soils) and sources of emissions (peat fires, peatland degradation and mangrove conversion). The audit team deems that the inclusion of other carbon pools and sources emissions is key for the development of a comprehensive MRV system for the RBP. Specially, considering that peat decomposition **accounted for more than one third of annual emissions in Indonesia's 1**st FREL (along with emissions from deforestation and forest degradation). However, the inclusion of these carbon pools and sources of emission should only be carried out once the monitoring system has been properly refined to have acceptable levels of uncertainty **that don't** compromise the accuracy of the global GHG accounting.

- Develop sampling design that represent better all forest and non-forest classes. In order to prevent the risk of low number of sampling plots allocated to forest and non-forests classes with small areas, the audit team advices the adoption of stratified sampling systems (either simple or systematic) and the setting a minimum number of sampling plots per class.

- Inclusion of error from the use of allometric equations in the uncertainty analysis of the emission factors. The audit team considers that all errors should be included in order to have a more precise estimation of the uncertainty.

- Accuracy assessment for forest cover changes related to deforestation and forest degradation. The audit team agrees that accuracy assessment should be carried to evaluate the precision in the changes from forest class to non-forest class, and primary forest class to secondary forest class.

- Improvement of MRV system to avoid double counting and double reporting. As mentioned in Annex 1, the audit team considers that it is necessary to improve the National Registry System on Climate Change and enforce the registration requirements for private REDD+ initiatives. In addition, clear procedures for the treatment of claimed reductions in the registry should be develop.

VERIFICATION REPORT	Indonesia - Norway Verification of reduced emissions from deforestation and forest degradation

Annex 3: Competence of team members and technical reviewers

CERTIFICATE OF QUALIFICATION

Subject: Verification and Technical Review Team for Emission Reduction Report for the Indonesia – Norway Partnership.

Madrid, March 26th, 2020

I hereby confirm the following records of qualification for the validation, verification and certification of greenhouse gas declarations.

Name: Juan Carlos Gómez

Team Leader: Yes

Verifier: Yes

Technical Reviewer: N/A

Technical Expert: Yes

Technical areas related with the project activity: REDD+

Jose Luis Fuentes Pérez
Authorised person

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VERIFICATION REPORT	Indonesia - Norway Verification of reduced emissions from deforestation and forest degradation

CERTIFICATE OF QUALIFICATION

Subject: Verification and Technical Review Team for Emission Reduction Report for the Indonesia – Norway Partnership.

Madrid, March 26th, 2020

I hereby confirm the following records of qualification for the validation, verification and certification of greenhouse gas declarations.

Name: Carlos Jiménez

Team Leader: N/A

Verifier: Yes

Technical Reviewer: N/A

Technical Expert: Yes

Technical areas related with the project activity: REDD+

Jose Luis Fuentes Pérez
Authorised person

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| VERIFICATION REPORT | Indonesia - Norway Verification of reduced emissions from deforestation and forest degradation |

CERTIFICATE OF QUALIFICATION

Subject: Verification and Technical Review Team for Emission Reduction Report for the Indonesia – Norway Partnership.

Madrid, March 26th, 2020

I hereby confirm the following records of qualification for the validation, verification and certification of greenhouse gas declarations.

Name: Richard Gonzales

Team Leader: N/A

Verifier: Yes

Technical Reviewer: N/A

Technical Expert: Yes

Technical areas related with the project activity: REDD+

Jose Luis Fuentes Pérez
Authorised person

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VERIFICATION REPORT	Indonesia - Norway Verification of reduced emissions from deforestation and forest degradation

CERTIFICATE OF QUALIFICATION

Subject: Verification and Technical Review Team for Emission Reduction Report for the Indonesia – Norway Partnership.

Madrid, March 26th, 2020

I hereby confirm the following records of qualification for the validation, verification and certification of greenhouse gas declarations.

Name: Elena Llorente

Team Leader: N/A

Verifier: N/A

Technical Reviewer: Yes

Technical Expert: Yes

Technical areas related with the project activity: REDD+

Jose Luis Fuentes Pérez
Authorised person

VERIFICATION REPORT	Indonesia - Norway Verification of reduced emissions from deforestation and forest degradation

Annex 4: List of evidence provided

No.	Evidence
1	Emission Reduction Report for the Indonesia-Norway Partnership
2	MRV protocol for the Indonesia-Norway partnership on climate, forests and peat
3	Annex: Detailed steps for calculating results based payments under the Indonesia-Norway forest partnership
4	National Forest Reference Emission Level for Deforestation and Forest Degradation In the Context of Decision 1/CP.16 para 70 UNFCCC
5	Report on the technical assessment of the proposed forest reference emission level of Indonesia submitted in 2016
6	Indonesia Second Biennial Update Report
7	Technical report on the technical analysis of the technical annex to the second biennial update report of Indonesia submitted in accordance with decision 14/CP.19, paragraph 7, on 21 December 2018
8	Calculation spreadsheet *Spreadsheet_REDD Performance_Norway*
9	Database spreadsheet *Pivot DB GIS*
10	Calculation spreadsheet Uncertainty Calculation_verification
11	Land cover maps at the NFMS webGIS (online)
12	Indonesia Report on REDD+ Performance
13	Indonesia National Registry System on Climate Change
14	National Forest Monitoring System (NFMS) for Land Based Sector
15	Margono, B.A., et al. (2016). Indonesia's Forest Resource Monitoring
16	NOMOR P.70/MENLHK/SETJEN/KUM.1/12/2017 tentang tata cara pelaksanaan reducing emissions from deforestation and forest degradation, role of conservation, sustainable management of forest and enhancement of forest carbon stocks
17	NOMOR P.72/MENLHK/SETJEN/KUM.1/12/2017 tentang pedoman pelaksanaan pengukuran, pelaporan dan verifikasi aksi dan sumberdaya pengendalian perubahan iklim
18	Pedoman Pengukuran, Pelaporan, dan Verifikasi (Measurement, Reporting, and Verification) REDD+ Indonesia
19	Pedoman Penjaminan dan Pengendalian Mutu (QA/QC) Inventarisasi Gas Rumah Kaca Indonesia

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| VERIFICATION REPORT | Indonesia - Norway Verification of reduced emissions from deforestation and forest degradation |

Annex 5: Reference documentation

No.	Document
1	ISO 14064-3:2019 Part 3: Specification with guidance for the verification and validation of greenhouse gas statements (2019)
2	IPCC Good Practice Guidance for Land Use, Land-Use Change and Forestry (2003)
3	2006 IPCC Guidelines for National Greenhouse Gas Inventories (2006)
4	2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands (2013)
5	2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories (2006)
6	IPCC Good Practice Guidance and Uncertainty Management in National GHG Inventories (2000)
7	Global Forest Observations Initiative: Methods and Guidance Document (2016)
8	GOFC-GOLD REDD Source Book (2015)
9	GFOI Integrating remote-sensing and ground-based observations for estimation of emissions and removals of greenhouse gases in forests: Methods and Guidance from the Global Forest Observations Initiative (2014)

VERIFICATION REPORT	Indonesia - Norway Verification of reduced emissions from deforestation and forest degradation

Annex 6: Attendance lists

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ATTENDACE LIST

PROJECT: INDONESIA - NERWAY PARTNERSHIP

MEETING:
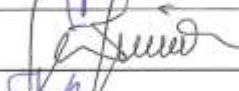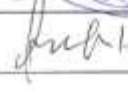
DATE: 22/01/2020

	NAME & SURNAME	ROLE	SIGNATURE
1	IRAWAN AKAD	Deputy Director GHG Inventory	
2	Gamma Nur M.S.	Kenitroon	
3	Wawan Gunawan	Dit. IGRK & MrV	
4	Delon M.	Technical team MoEF	
5	Solichin Manuri	Technical team MoEF	
6	Franky Zamzani	REDD MPI	
7	JUAN CARLOS GÓMEZ	AENOR AUDITOR	
8	Carlos Jiménez	AENOR AUDITOR	
9	SUSILO ADY. K	Norwegian Embassy, JKT	
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VERIFICATION REPORT	Indonesia - Norway Verification of reduced emissions from deforestation and forest degradation

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ATTENDACE LIST

PROJECT: INDONESIA - NORWAY PARTNERSHIP

MEETING:

DATE: 28/01/2020

	NAME & SURNAME	ROLE	SIGNATURE
1	Joko Prihatno	MRO & PMEL	
2	Belinda A Mangono	Dir IPSDH	
3	IRAWAN AJABN	GHG Inventory	
4	Judin Purwanto	IPSDH	
5	Gomma Nur M.S.	Kemitraan	
6	JUAN CARLOS GÓMEZ	AENOR AUDITOR	
7	CARLOS JIMÉNEZ BARROS	AENOR AUDITOR	
8	Aditya Perdana P	PI REDD+ Governance	
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VERIFICATION REPORT	Indonesia - Norway Verification of reduced emissions from deforestation and forest degradation

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ATTENDACE LIST

PROJECT: INDONESIA - NORWAY PARTNERSHIP

MEETING:

DATE: 24/01/2020

	NAME & SURNAME	ROLE	SIGNATURE
1	IRAWAN ASADO	GHG Inventory	
2	Franky Zamzani	Dit. Mitigation	
3	Solichin Manuri	Daenet Conalty	
4	Wawan Gunawan	GHG Inventory & MRV	
5	Delon Marthinus	Expert	
6	Yudin Purwanto	IPSPH	
7	Bamma Nur M.S	Kemitraan	
8	JUAN CARLOS GOMEZ	AENOR AUDITOR	
9	CARLOS JIMENEZ	AENOR AUDITOR	
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VERIFICATION REPORT	Indonesia - Norway Verification of reduced emissions from deforestation and forest degradation

Annex 7: Findings

Indicator	Type	Requirement	Response	Closed
2.1 MRV Protocol Main principles - methodologies - The data sets, methods, models and assumptions ensure transparency, completeness, consistency, accuracy and comprehensiveness.	CAR	24th January 2020: No consistency in Emission Factor for Secondary Dryland Forest in Java, according to the methodology described (Table 2 in Emission Reduction Report).	30th January 2020: The Emission Factors used in this calculation is consistent with the Emission Factors used in the 1st FREL. The Emission Factor for Secondary Forest in Java was derived from a plot data measured in Java, thus we did not used the national average, as suggested by the reviewer.	Yes
	CAR	24th January 2020: The estimation of Forest Degradation area is not referenced to 1990 forest cover.	30th January 2020: The estimation of Forest Degradation area has been filtered by 1990 forest cover. This will affect to changes entire calculation related to forest degradation including figure 2 in Section 2.5.2 in the ER revised report.	Yes
	CAR	24th January 2020: For the calculation of emissions from forest degradation (Spreadsheet_REDD Performance_Norway_Ori.xlsx/Table anx 1.7-1.8), the degradation of Primary Swamp Forest in Sulawesi, Jawa and Maluku is not been taken into account.	30th January 2020: The emission from forest degradation of Primary Swamp Forest in Sulawesi, Jawa and Maluku has been taken into account. We have revised the calculation and affect entire calculation related to forest degradation.	Yes
	CAR	24th January 2020: Table Annex 1.4 and Annex 1.5 figures do not correspond to the methodology	30th January 2020: Table Annex 1.4 and Annex 1.5 have been revised. This is just an example of application of land use	Yes

Indicator	Type	Requirement	Response	Closed
		implemented (land use change reference to 1990).	transition matrix of one island (Kalimantan)	
2.1, 3.4 MRV Protocol: - 2.1 All significant pools and sources of greenhouse gas emission associated with relevant performance indicators are included in the results based payment baseline. If a major carbon pool/ or gas is excluded, this will be explained and justified, provided it is not a significant pool. Excluded pools and gases must collectively represent less than 10% of overall emissions that are included in the performance indicators of the Indonesia-Norway bilateral agreement. If a significant pool or gas cannot be included due to lack of data, steps will be taken to include it over time. Once a pool or gas is included in the results based payment baseline, it shall not be excluded at a later stage or period. - 3.4 Reporting shall cover: All carbon pools and sources of greenhouse gas	Clarification	24th January 2020: The 1st National FREL submitted to the UNFCCC included AGB and soil carbon in peatland experiencing deforestation and forest degradation as carbon pool. However, the Emissions Reduction Report lacks explanation and justification for the exclusion as carbon pool of soil carbon in peatland for the RBP baseline.	30th January 2020: We excluded the soil carbon calculation in the RBP baseline following the MRV Protocol (see annex section: Activities, pools and gases included in the results based payment baseline). The soil carbon on peatland are reported in the annex of the ER Report. Norway and Indonesia have agreed that in first reporting period only focused on emission from deforestation and forest degradation. We have revised the Section 2.2.2 accordingly. We have ongoing discussion with Norway to explore a suitable method for calculating peat decomposition experiencing deforestation and forest degradation.	Yes

Indicator	Type	Requirement	Response	Closed
emission as reported in the FREL associated with relevant performance indicators, for the purpose of results-based payments; forest definition applied				
2.8 MRV Protocol A national system of accounting will be in place, to provide transparency and certainty that no double counting to emission reductions delivered under other agreements or partnerships occurs.	Clarification	24th January 2020: No mention is provided in Reduction Emissions report on the national registry system.	30th January 2020: The explanation included in the revised ER Report are about SRN PPI, its objective to avoid duplication and double counting in term of REDD+, and the system development and progress (briefly). The inclusion has been provided in Section 4.2.	Yes
3.1 MRV Protocol General principles - Reporting will be in the form of one	Clarification	24th January 2020: Missing reference to SOPs: - Land use maps, land use change maps, transition matrix	30th January 2020: The reference to SOPs regarding the land use maps, land use change maps, and transition matrix can be referred to the link[1] below. The reference to SOPs regarding QA/QC can be referred to the	Yes

[1]

http://appgis.menlhk.go.id/appgis/download.aspx?status=view&filename=SNI_2014_8033_Metoda_Penghitungan_Perubahan_Tutupan_Hutan.pdf&fileFullName=E:\webgisapp\Download\Pemantauan%20Hutan%20Nasional\SNI_2014_8033_Metoda_Penghitungan_Perubahan_Tutupan_Hutan.pdf

http://appgis.menlhk.go.id/appgis/download.aspx?status=view&filename=SNI-7645-1-2014_Klasifikasi_Penutup_Llahan.pdf&fileFullName=E:\webgisapp\Download\Pemantauan%20Hutan%20Nasional\SNI-7645-1-2014_Klasifikasi_Penutup_Llahan.pdf

http://appgis.menlhk.go.id/appgis/download.aspx?status=view&filename=Indonesia%20Forest%20Resource%20Monitoring.pdf&fileFullName=E:\webgisapp\Download\Pemantauan%20Hutan%20Nasional\Indonesia%20Forest%20Resource%20Monitoring.pdf

Indicator	Type	Requirement	Response	Closed
consolidated report, covering all necessary elements described below and according to the reporting format.		- QA/QC 21st February 2020: The links to the SOPs should be included in the Emission Reduction Report; and in the case of QA/QC procedure, at least a brief explanation of its consideration for this process.	link[2]. The reference of SOP for QA/QC for land use change maps can be referred to the link[3] (Section B page 8). 6th March 2020: The links of the SOPs have been included and brief explanation on the QA/QC process has been added in the report in Section 4.1. of the report.	
3.5 MRV Protocol Description of methodologies will include: - Descriptions of the methodological details of the applied steps for calculating emission reductions, in a manner that allows reproduction of the calculation of emission reductions.	CAR	24th January 2020: No mention to the use of 1990 as reference year for the forest covers change analysis.	30th January 2020: We have revised the paragraph in Section 2.1.4 to explain the use of 1990 as reference year for the forest covers change analysis.	Yes
	Clarification	24th January 2020: No mention to the methodology and primary source for Emission Factor Uncertainty for Deforestation and Degradation.	30th January 2020: We have revised the paragraph in Section 7.1 and Annex 4 in the ER Report revised version to include explanation regarding uncertainty analysis for Emission Factor. In addition, we provided the detail calculation in excel sheet form (Uncertainty_Calculation_Norway_Final 20200207 .xlsx).	Yes

[2] http://ditjenppi.menlhk.go.id/reddplus/images/adminppi/dokumen/Pedoman_QA_QC_FULL_ISBN.pdf

[3]
http://appgis.menlhk.go.id/appgis/download.aspx?status=view&filename=Rekalkulasi%20Penutupan%20Lahan%202018.pdf&fileFullName=E:\webgisapp\Download\1.1.%20Buku%20REKALKULASI%20PENUTUPAN%20LAHAN%20INDONESIA\Rekalkulasi%20Penutupan%20Lahan%202018.pdf

		VERIFICATION REPORT	Indonesia - Norway Verification of reduced emissions from deforestation and forest degradation

Indicator	Type	Requirement	Response	Closed
3.6 MRV Protocol Reporting on uncertainty and bias - Estimation of accuracy, precision and/or confidence level for sources, activity data (including user and producer accuracies for forest area categories and potential area change biases) and emission factors.	Clarifi cation	24th January 2020: Emission Reduction Report does not include specific information and results of the field check and accuracy assessment for forest land maps. 21st February 2020: The links to the reports should be included in the Emission Reduction Report, as well as a summary table of the results of the accuracy assessment.	30th January 2020: We have amended the paragraph of Section 4.1 NFMS, to explain specific information and results of the field check and accuracy assessment for forest land maps. More detail explanation can refer to Indonesia REDD+ Performance Report, (2018)4 and link5 with specific Section B page 8 in the Land Cover Analysis (2018). 6th March 2020: We have included the links and the summary table of the accuracy assessment result (Table 7) in Section 4.1 of the report. Please also note slight changes in Section 7.1 on the uncertainty calculation to conform with the accuracy assessment results and allow 2 decimal digits.	Yes
3.6 MRV Protocol Reporting on uncertainty and bias - Discussion of key uncertainties, their sources and impacts. - Discussion on, and implications of,	CAR	This information is missing in the Emissions Reduction Report.	30th January 2020: We have amended explanations regarding to: - Discussion of key uncertainties, their sources and impacts. - Potential bias that could come from inappropriate sampling design which not consider the variation;	Yes

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4 http://ditjenppi.menlhk.go.id/reddplus/images/adminppi/dokumen/Book_IRPR_KLHK_B5_revisi_4_opt.pdf
5
http://appgis.menlhk.go.id/appgis/download.aspx?status=view&filename=Rekalkulasi%20Penutupan%20Lahan%202018.pdf&fileFullName=E:\webgisapp\Download\1.1.%20Buku%20REKALKULASI%20PENUTUPAN%20LAHAN%20INDONESIA\Rekalkulasi%20Penutupan%20Lahan%202018.pdf

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Indicator	Type	Requirement	Response	Closed
potential biases in the estimations. - Description of planned and implemented improvements to the MRV and NFM system.			- Description of planned and implemented improvements to the MRV and NFM system, as explained in the Section 7 Uncertainty Analysis and Plan of Improvement in the revised report.	
NA	CAR	24th January 2020: Typos in Emission reduction report: a) Forest classes' names are not correct in Table 3 and Table Annex 1.2 b) Figure 1 and Figure 4 mentioned in Section 4 are missing. 21st February 2020: Reference to Figure 1 and Figure 4 in Section 4 are still incorrect.	30th January 2020: We have revised the typos as seen in the Table Annex 1.2 and Figure 1 and Figure 4 in Section 4. 6th March 2020: We have added figure in section 4 to correct the references of figure.	Yes

Analysing how each of the CAR had impacted on the emission estimates, the following table shows increase or decrease with regard of the estimates of the first version of the report (2019):

		CAR1: degradation of Primary Swamp Forest in Sulawesi, Jawa and Maluku was not been taken into account	CAR2: estimation of Forest Degradation area was not referenced to 1990 forest cover
		Increase/decrease in annual rate (tCO₂e /year)	
Forest Degradation	2006-2009	0	-175,337
	2009-2011	0	-1,040
	2011-2012	0	-115,514
	2012-2013	0	-561,313
	2013-2014	0	-324,322
	2014-2015	+93,374	-892,570
	2015-2016	+10,509	-3,450,091
	2016-2017	+10,899	-10,459,716
Forest degradation RBP baseline		+10,389	-587,190
Emission reduction from forest degradation		-510	+9,872,526

The bulk of the changes in emissions estimates came from the change of criterion regarding the establishment of the year 1990 as a reference year of forest cover for forest degradation, in the same line it was been doing for deforestation. This has the bigger impact on the emission estimates of year 2016-2017. In previous versions of the *Emissions reduction report,* forest degradation from non-existing forests in 1990 and/or forests already degraded once but that would have regrown was being accounted.

The opinion of the audit team to establish the 1990 forest cover as reference year was based in the two following arguments:

- It is also the reference year used for deforestation. The deforestation of regrown forests after 1990 is not accounted. It is the opinion of the audit team that the same reference year should be applied to for forest degradation, in order to keep the coherence of the accounting methodology. In the future, both the regrowth of deforested lands and degraded forests could be included in the MRV system and carbon absorption accounted, as an improvement of the system, considering readjusting the methodology for this case.

- The approach of 1990 as a base year allows considering only degradation of primary forests and monitoring the change of behaviour on this regard, without the distortion of also accounting the degradation of regrown non-primary forests. The accounting of emissions from degradation of regrown primary forests would be an overestimation of emissions, since it is biogenic carbon. From a net point of view of carbon stock in the atmosphere, the emissions from regrown degraded forests are carbon that was already emitted when the degradation of the primary forest took place. The regrowth of the degraded forest absorbs part of these emissions. When considering emissions and absorption, the later reduce the amount of carbon on the atmosphere, as regrowing forests act as carbon sinks (woody matter).

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VERIFICATION REPORT	Indonesia - Norway Verification of reduced emissions from deforestation and forest degradation

Annex 9: Comments on the draft of the Verification Report

Norway comment/requirement (06/03/2020)	AENOR response (12/03/2020)	Norway response (24/03/2020)	AENOR response (26/03/2020)
We encourage you to expand the report with a more detailed narrative, particularly on the verifiers' explanation of their summary of risks.	The risk assessment will be further detailed.	Thank you.	-
We would appreciate if the report more clearly identified recalculations of the various estimates: • identify the difference between the estimates provided in the "Emission reduction report" by the Government of Indonesia and estimates provided by Aenor in the verification report, and • outline reasons for discrepancies between initial estimates as stated in the "Emission reduction report" by the Government of Indonesia and estimates in the Verification report by Aenor. In cases where the differences are large, we would welcome a more detailed explanation.	An annex will be add explaining the magnitude and reasons of the emission reduction estimates differences between the first and the last version of the Emission reduction report.	Thank you.	-

Norway comment/requirement (06/03/2020)	AENOR response (12/03/2020)	Norway response (24/03/2020)	AENOR response (26/03/2020)
Regarding estimates of (gross) degradation: The difference between the estimate in the "Emission reduction report" and the Verification report is quite large and has a significant impact on the results available for payment from Norway. Please elaborate further on the various causes of the differences between the estimates of gross degradation provided in the "Emission reduction report" by the Government of Indonesia and estimates provided by Aenor in the verification report, and how these have been addressed (when relevant). Including a table of how much each methodological change to each specific estimate has contributed to the difference between the estimate in the "Emission reductions report" and the "verification report" could be clarifying.	An annex will be add explaining the magnitude and reasons of the emission reduction estimates differences between the first and the last version of the Emission reduction report.	Thank you.	-
Our understanding is that Aenor has advised using an approach with 1990 as a base year. With this approach, a	Yes, that was the initial approach regarding forest degradation	OK.	-

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VERIFICATION REPORT	Indonesia - Norway Verification of reduced emissions from deforestation and forest degradation

Norway comment/requirement (06/03/2020)	AENOR response (12/03/2020)	Norway response (24/03/2020)	AENOR response (26/03/2020)
specific area can only be degraded once. Our understanding is that Indonesia's initial approach allowed a specific area to be degraded (move from primary to secondary forest) – and then, if this area had sufficient regrowth, this specific area could at a later point in time be classified as primary forest – which could then be degraded again at a yet later stage. Do you share this understanding?	accounting.		
Whilst we see merit of both approaches, we are concerned that using 1990 as a base year will "hide" degradation activities in forest that has been degraded – regrown – and degraded again. Would the approach of having 1990 as a "base year" lead to underestimation of emissions? Aenor's reflections on how these two approaches influences errors of interpretation, respectively, is also welcome.	The advised for using 1990 as a base year comes from two main reasons: • It is also the base year used for deforestation. The deforestation of forests regrown after 1990 is not accounted. It is the opinion of the audit team that the same base year should be applied to for degradation, in order to keep the coherence of the accounting methodology. • The accounting of emissions	Thank you. To the first bullet point: We recognize your point. However, would you agree that there is also benefits in both methodologies moving towards a dynamic approach to emissions from land use (ie over time, incorporating regrowth also on deforested land)? Our understanding is that the approach you suggest would "hide" degradation actions in the activity	To the first bullet point: Certainly, a dynamic approach that accounts also regrowth of deforested land and degraded forest is preferable. This will be included as recommendation for the future improvement of the MRV system. The approach with 1990 as a base year allows to consider only degradation of primary forests and monitor the change of behaviour on this regard, without of the distortion of also accounting the degradation of

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VERIFICATION REPORT	Indonesia - Norway Verification of reduced emissions from deforestation and forest degradation

Norway comment/requirement (06/03/2020)	AENOR response (12/03/2020)	Norway response (24/03/2020)	AENOR response (26/03/2020)
	from degradation of regrown primary forests would be an overestimation of emissions, since it is biogenic carbon. If forest is degraded and its emissions accounted and, after a period of time, the forest is regrown and degraded again, **the accounting of these "second degradation" emissions would** suppose to count again the **emissions of the "first degradation".**	data, as degradation actions that take place in areas that have been degraded previously would not be included in the activity data. Is this understanding correct? Our intention is to reward changes in behaviour, it would therefore be helpful if the verification report would include language that explains your reasoning behind this clearly, including explaining whether the approach with 1990 as base year makes it more difficult to know if the behaviour that leads to forest degradation is reduced or not. To the second bullet point: Your point regarding biogenic carbon is not fully clear to us. Are you suggesting that regrowth cancels out degradation emissions?	regrown non-primary forests. This explanation will be added to the annex. To the second bullet point: From a net point of view of carbon stock in the atmosphere, the emissions from regrown degraded forests are carbon that was already emitted when the degradation of the primary forest took place. The regrowth of the degraded forest absorbs part of these emissions. When considering emissions and absorptions, the later reduce the amount of carbon on the atmosphere, as regrowing forests act as carbon sinks (woody matter). We agree that it is unlikely that a degraded forest can reach the carbon stock of primary forest in the time span considered and that this could cause overestimation of emissions if

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VERIFICATION REPORT	Indonesia - Norway Verification of reduced emissions from deforestation and forest degradation

Norway comment/requirement (06/03/2020)	AENOR response (12/03/2020)	Norway response (24/03/2020)	AENOR response (26/03/2020)
		As we see it, if degradation to happens twice on the same area, you risk overestimation because of the EF: if you use carbon stocks of primary forest that have not recovered to this level (unlikely within the timeframe), this will be an overestimation of emissions for the second degradation event. However, we do not see that emissions are counted twice because emissions are estimated from the same area at two separate points in time: the atmosphere does receive emissions both the first time this forest area is degraded and the second time. As we see it, that there has been regrowth (removals) in between is not relevant for the estimation of emissions and the accounting.

Our understanding of the basis for the accounting is that it does not differentiate between "biogenic carbon" and "carbon". Both should be | the 1990 is not used as a reference year.

A discussion will be included in the annex. |

Norway comment/requirement (06/03/2020)	AENOR response (12/03/2020)	Norway response (24/03/2020)	AENOR response (26/03/2020)
		accounted for. It would be welcome if the verification report would include detailed language on the reasoning behind the choice of approach for estimating emissions from forest degradation, and also on the consequences of this approach. Perhaps it could be useful to include a discussion of the original Indonesian approach, and the approach suggested by the Verifier, to illuminate the differences and effects of both approaches? Have you or Indonesia made estimates to see how much of the degradation takes place on areas that have been previously classified as degraded? This could shed light on the magnitude of the issue. The MRV Protocol and annex agreed between Indonesia and Norway	

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Norway comment/requirement (06/03/2020)	AENOR response (12/03/2020)	Norway response (24/03/2020)	AENOR response (26/03/2020)
		states that "emissions from forest degradation" is one of the performance indicators. It does not specify whether this is only degradation in primary forest or not. The documents als emphasises consistency with the FREL. As you see from our questions and comments, understanding this recommendation, its effects, and the reasons behind it, is very important to us. Thank you.	
If the approach is changed to Aenor's suggestion of using 1990 as a base map for estimating emissions from degradation, would it, in your opinion, still be precise to say that there is methodological consistency in the estimation of emissions and removals, between the forest reference emissions level submitted to the UNFCCC and the results based payment baseline applied	The FREL considered the period 1990-2012. The difference between the estimated degradation emissions for the period 2006-2012 in the FREL and the last version of the Emission reduction report is less than 0.3%. Although the methodology has been changed with regard to the FREL, this should be considered a methodological	OK, referring to the questions and comments above.	-

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Norway comment/requirement (06/03/2020)	AENOR response (12/03/2020)	Norway response (24/03/2020)	AENOR response (26/03/2020)
in the Indonesia-Norway bilateral agreement?	improvement.		
Annex 1 & 2: Have you examined the improvement recommendations in the FREL Technical Assessment?	The FREL Technical Assessment was reviewed and the improvement recommendations were considered when suggesting improvements for the monitoring and estimation of emissions from deforestation and forest degradation. Improvements regarding peat degradation and peat fires were not considered, since these where out of the scope of the verification.	OK	-
Would Aenor be comfortable including advice on prioritization in your recommendations for areas of future improvement of the NFMS?	Yes, we will prioritize the improvement recommendations.	OK	-
We would welcome an explanation as to why you have not commented on current activity data generation methods (pixel counting) in potential areas of improvement.	The monitoring system for activity data generation was considered robust and efficient. Taking into **account also the "one**-map-**policy"** of the Government of Indonesia and that the system is out of the competencies of the Directorate of Climate Change.	OK	-

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VERIFICATION REPORT	Indonesia - Norway Verification of reduced emissions from deforestation and forest degradation

Norway comment/requirement (06/03/2020)	AENOR response (12/03/2020)	Norway response (24/03/2020)	AENOR response (26/03/2020)
Minor comment: the two tables on the top of p 15 has the same heading ("emission factor of deforestation (tCO2e/ha)") – is this correct?	It is a mistake. It will be corrected.	OK	-

Ministry of Environment and Forestry of Indonesia comment/requirement (06/03/2020)	AENOR response (26/03/2020)
In section 3.1 you wrote "RMP baseline", I think it should be "RBP baseline".	It was a typo. Corrected.
In section 7.1 you wrote "The reported emission reduction for 2016/2019 ..." also in the table below you write "Emissions 2016/2019" please double check for these typos.	They were typos. Corrected.