AMBATOLAMPY SOLAR PV

Project title	*Ambatolampy Solar PV*
Project ID	*2307*
Monitoring period	*01-January-2022 to 31-December-2023 (both days included)*
Original date of issue	*31-October-2023*
Most recent date of issue	*24-January-2025*
Version	*1.5*
VCS Standard Version	*4.7*
Prepared by	*Aera Group*

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1. PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

Ambatolampy solar PV ("the project") consists of the construction and operation of a greenfield 40 MW solar photovoltaic power plant by New Energy Africa Ambatolampy ("NEA Ambatolampy", previously known as Green Yellow Madagascar) in Ambatolampy, in the South-East of Vakinankaratra region, Madagascar. It involves the setting up of photovoltaic (PV) panels which captures solar energy and convey such energy to the convertor station in order to produce electricity exported to the national grid. Besides the initial capacity of 20 MWp operating since 10/07/2018, the second phase of the Ambatolampy project was commissioned on August 17th, 2022, bringing the total installed capacity to 40 MWp.

Electricity in Madagascar is currently heavily reliant on imported fossil fuels currently consumed by thermal power stations (514 MW) versus hydropower plants (162 MW)[1], thus a baseline scenario also considered as the scenario prior to the implementation of the project activity leading to considerable greenhouse gas (GHG) emissions. The project activity undertaken by project promoter NEA Ambatolampy therefore substitutes grid electricity by clean and renewable energy and cut down GHG emissions.

The project is the first large-scale solar PV power plant on the island is expected to generate approximately 36,362 tCO_2e emission reductions per year and 363,615 tCO_2e of emission reductions over the 10 years crediting period. During this monitoring period from 01-January-2022 to 31-December-2023, the project has operated satisfactorily and generated 87,271 MWh, resulting in emission reductions to 58,394 tCO_2e.

1.2 Audit History

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Audit type	Period	Program	Validation/verification body name	Number of years
Validation	Validation date : 04/11/2020	VCS	ESPL	-
Verification period n°1	10/07/2018 – 30/04/2020	VCS	ESPL	22 months (1 year, 10 months)
Verification period n°2	01/05/2020 – 31/12/2021	VCS	Carbon Check (India) Private Limited	20 months (1 year, 8 months)

[1] IRENA, 2022. "Energy Profile : Madagascar" available online here

Verification period n°3	01/01/2022 – 31/12/2023	VCS	LGAI Technological Center S.A. (Applus+ Certification)	24 months (2 year)
Total	10/07/2018 – 31/12/2023	-	-	68 months (5 years and 6 months)

1.3 Sectoral Scope and Project Type

Sectoral scope[2]	1. Energy Industries (renewable/non-renewable)
Project activity type	Type 1. Renewable energies. Single project activity.

1.4 Project Proponent

Organization name	New Energy Africa Ambatolampy[3] (NEA Ambatolampy)
Contact person	Mairamou HAMAN ADJI
Title	Impact and Sustainability Manager
Address	Building Kube A Zone Galaxy Andraharo 101 Antananarivo Madagascar
Telephone	+ 261 34 00 308 69
Email	Mairamou.Hamanadji@axian-group.com

1.5 Other Entities Involved in the Project

Organization name	AERA Group
Role in the project	Carbon consultant
Contact person	Alexandre Dunod

[2] *Projects, activities, or methodologies may be developed under any of the 16 VCS sectoral scopes: https://verra.org/programs/verified-carbon-standard/vcs-program-details/#sectoral-scopes*

[3] In 2020, the Malagascan company Axian Energy acquired the majority of the shares of Green Yellow Ambatolampy. On January 9, 2023, Green Yellow Ambatolampy, the sole shareholder of Green Yellow Madagascar, changed its corporate name to "New Energy Africa Ambatolampy (NEA Ambatolampy)"

Title	Chief Operating Officer
Address	28 Cours Albert 1er, 75008 Paris, France
Telephone	+33 1 42 18 02 02
Email	*a.dunod@aera-group.fr*

1.6 Project Start Date

Project start date	*10-July-2018*
Justification	date of commissioning, synchronization and start of GHG emission reductions. The extension phase started invoicing production on 17-August-2022

1.7 Project Crediting Period

Crediting period	☐ *Seven years, twice renewable* X *Ten years, fixed*[4] ☐ *Other (state the selected crediting period and justify how it conforms with the VCS Program requirements)*
Start and end date of first or fixed crediting period	*10-July-2018 – 9 July-2028*

1.8 Project Location

Host Party: Madagascar

Region/State/Province: Region of Vakinankaratra, District of Ambatolampy

City/Town/Community: The site is located in Ambatolampy, 90km South of Antananarivo, Madagascar.

The project geo-coordinates are: Latitude: 19°29'22"S; Longitude: 47°26'42"E.

[4] The type of crediting period has been changed due to project deviation, please see revised version of project description dated June 2024

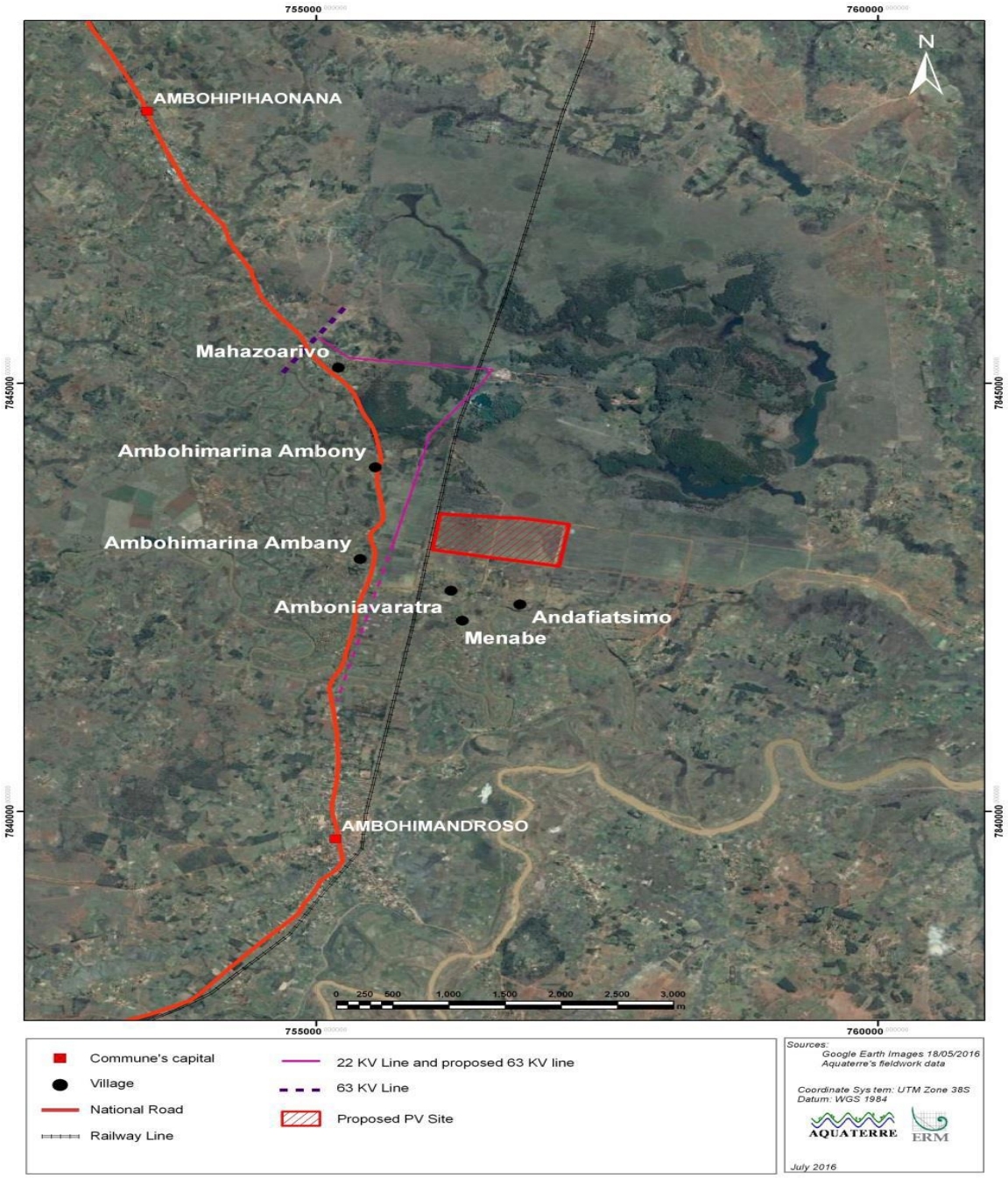

Figure 1: Location of project site

1.9 Title and Reference of Methodology

Type (methodology, tool or module).	Reference ID, if applicable	Title	Version
Methodology	*ACM0002*	*Grid-connected electricity generation from renewable sources*	*22.0*
Tool	*01*	*Tool for the demonstration and assessment of additionality*	*07.0.0*
Tool	*23*	*Additionality of first-of-its-kind activities*	*3.0*
Tool	*07*	*Tool to calculate the emission factor for an electricity system*	*7.0*

1.10 Double Counting and Participation under Other GHG Programs

1.10.1 No Double Issuance

Is the project receiving or seeking credit for reductions and removals from a project activity under another GHG program?

☐ Yes ☒ No

1.10.2 Registration in Other GHG Programs

Is the project registered or seeking registration under any other GHG programs?

☒ Yes ☐ No

The project is registered under the Clean Development Mechanism[5] (Project #10481) on 03-May-2019, although its GHG emission reduction will either be claimed under the VCS programme or the CDM programme, never both.

[5] https://cdm.unfccc.int/Projects/DB/RWTUV1556909746.23/view

1.11 Double Claiming, Other Forms of Credit, and Scope 3 Emissions

1.11.1 No Double Claiming with Emissions Trading Programs or Binding Emission Limits

Are project reductions and removals or project activities also included in an emissions trading program or binding emission limit? See the *VCS Program Definitions* for definitions of emissions trading program and binding emission limit.

☐ Yes ☒ No

If yes, provide all required evidence of no double claiming as outlined by the VCS Standard.

1.11.2 No Double Claiming with Other Forms of Environmental Credit

Has the project activity sought, received, or is planning to receive credit from another GHG-related environmental credit system? See the *VCS Program Definitions* for definition of GHG-related environmental credit system.

☐ Yes ☒ No

If yes, provide all required evidence of no double claiming as outlined by the VCS Standard.

1.11.3 Supply Chain (Scope 3) Emissions

Do the project activities affect the emissions footprint of any product(s) (goods or services) that are part of a supply chain?

☐ Yes ☒ No

1.12 Sustainable Development Contributions

The project participants are confident that the proposed project activity will make significant impact on Madagascar sustainable development, as also confirmed by the host country in its Letter of Approval of January 21st 2019.

Greenhouse Gas emissions reduction

The project will generate electricity from a renewable and clean energy source, thus avoiding the dispatch of the same amount of electricity produced by fossil-fueled power plants to Madagascar grid. Besides, the SOx emissions from coal-fired power plants would also be reduced.

Development of renewable energy

The project will form a major part of the country's approach to sustainable development also in helping to diversify energy supply away from non-renewable sources, in line with the objectives of the Madagascar Action Plan[6] launched in 2006 (see development of the infrastructure and the rural areas, protection of

[6] https://www.imf.org/~/media/Websites/IMF/imported-publications/external/pubs/ft/scr/2007/fra/_cr0759f.ashx

the environment), complemented by the New Energy Policy 2015-2030 vision. The project will improve energy self-sufficiency of the country, alleviating the associated risks of price variations.

Employment opportunities

The project contributes to the local employment throughout its building and operation phases, its workforce consisting of up to 80 workers at the peak of construction phase and approximately 6 workers in the operations phase. It will also induce indirect employment by increasing the competitiveness of local industry from reducing the country's dependency on fossil fuels.

Therefore, Madagascar Government is supportive of the project because the development of solar PV power is in accordance with the national criteria for sustainable development and national policies relating to energy resources and the environment, which will push forward the use of renewable and clean energy across the country – where less than one person out of five currently has access to electricity.

Technology transfer

This type of renewable energy project will assist building capacities in the country, through advanced technology transfer from industrialized countries. The project will introduce solar PV technology, methods and skills in the island and demonstrate its applicability and efficiency, thus widening its accessibility. The technology is manufactured by Jinko Solar. The technology for large scale solar PV power generation is still at starting stage of consideration in the country, Ambatolampy solar PV project being the first large-scale solar PV realization in Madagascar.

Table 1: Sustainable Development Contributions

Row number	SDG target	SDG indicator	Net impact on SDG indicator	Current project contributions	Contributions over project lifetime
1)	7.2	7.2.1 Renewable energy share in the total final energy consumption	Increase of renewable energy delivered to the Namibian grid from the project activity	87,271 MWh net produced during this monitoring period	193,947 MWh produced since the start of the project activity MP1: 56,465 MP2: 47,392 MP3: 87,271
2)	8.5	8.5.2 Unemployment rate, by sex, age, and persons with disabilities	Increase of employment due to implemented activities	6 permanent positions for the operation, maintenance and cleaning of the plant.	80 workers were employed at the peak of the construction phase. During this monitoring period, there was 6 positions for the operation, maintenance and cleaning of the plant (+ various employees for security).
3)	13.0	Tonnes of greenhouse gas emissions avoided or removed	Increase in tonnes of greenhouse gas emissions avoided	58,394 tCO_2 avoided during this monitoring period	128,007 tCO_2 avoided since the start of the project activity MP1: 37,847 MP2: 31,766 MP3: 58,394

1.13 Commercially Sensitive Information

There is no commercially sensitive information that has been excluded from the public version of the monitoring report.

2 SAFEGUARDS AND STAKEHOLDER ENGAGEMENT

2.1 Stakeholder Engagement and Consultation

2.1.1 Stakeholder Identification

Stakeholder Identification	In the context of the project capacity extension, additional consultations took place locally in order to obtain the public's opinion and create a climate of transparency and integration. The identification of such stakeholders was done in collaboration with the local authorities, especially the fokontany of Antevana and Menabe that are situated nearby the project site (a fokontany was originally a traditional Malagasy village. Today, according to the 2010 constitution, "fokontany officials participate in drawing up their commune's development program"). The local authorities were informed of the extension project from the start, and when contact was established; they expressed their willingness to work with GreenYellow Madagascar to develop the project. The local authorities facilitated the identification of vulnerable people and other local stakeholders interested in the project. The stakeholders were invited orally by the project developers, during visits to the fokontany and town, and also by the local authorities. List of stakeholders included in meetings and discussions regarding the extension : - Mayor - Client (JIRAMA) - District chief - Local population

	- Representatives of vulnerable people
Legal or customary tenure/access rights	*N/A as the land acquisition was made before validation of initial PD*
Stakeholder diversity and changes over time	Two lists of stakeholders have been elaborated, first in the context of the initial phase, then in the extension phase. In both lists, most stakeholders were the same categories (local/regional/national authorities, JIRAMA, locals etc) although a few differences can be found : for instances, a brick factory owner was engaged in initial phase and not in extension ; while subcontractors and medias were engaged in extension and not during initial phase.
Expected changes in well-being	Access to social well-being is one of the vulnerable groups expectations. Deterioration of the local stakeholders wellbeing was identified in the initial EIA as a potential impact, due to the physical presence of the project site and the change in landscape. The limited built environment (the PV power plant site is only visible from the roads and areas in its immediate vicinity) made this impact identified as negligeable. No impact on wellbeing was identified in the extension EIA.
Location of stakeholders	The majority of the stakeholders included are living in the nearby communities of the project site
Location of resources	Local communities use of the PV power plant site is limited to pasture for their livestock and access road to the forest resources located north of the PV power plant site. Local communities land use of the PV power plant site is not based on formal or traditional rights and local communities are aware that their land use of the site is forbidden. The initial EIA mentioned the relevance to arrange alternative access road outside of the Project site to maintain communities' access to natural resources north of the PV power plant site.

2.1.2 Stakeholder Consultation and Ongoing Communication

Ongoing consultation	Stakeholder engagement activities undertaken for the initial phase include meetings held during the site visit between the 5th and the 8th of July 2016. Stakeholder engagement involved face to face meetings and consultations with local authorities, key informants and group meetings with local communities. Information regarding technical characteristics of the project, indicative location and indicative duration was disclosed. Stakeholders commented and gave their concerns and expectations, as related in the 2016 EIA. GreenYellow, as part of the conception phase of the Project, has engaged extensively with various stakeholders at the national and regional level including JIRAMA, the government of Madagascar, etc. In the context of the extension, field investigations were carried out in order to agree individual and public consultations with all project stakeholders, with two missions : - Mission 1: meeting with internal stakeholders, the Fokontany chief and subcontractors (held in the offices of GreenYellow) - Mission 2: meetings with the mayor, the client, the district chief, the local population and representatives of vulnerable groups. (held in the municipal premises of the fokontany Lovahinjafy) In the first mission, the main objectives were the identification of the major environmental and social issues of PPs activities, the expectations and concerns of the local population, PPs environmental commitment programme and explaining the project progress including the extension project. In the second mission, face-to-face interviews on the same themes that were mentioned during the first mission were caried out. A formal public hearing, chaired by local authorities, was organized to share general information with the local population and gather their opinions.

	Regarding ongoing communication during monitoring period, there are annual meetings with the community in order to consider the community expectations from the project. This will continue in the future, and will be useful for the selection of projects for NEA ambatolampy's environmental and social program. Ongoing communication also include the presence of grievance logbooks in the plant and also in the 2 fokontany and townhall, which are checked once per month (once per week since autumn 2024). Finally, contact informations (mail and phone number) from two resource persons acting as relays from project developers and proponents NEA Ambatolampy are communicated with stakeholders : • Hery TIANA RASOLOARIVELO (QHSSES supervisor) • Jeremie Harison TATA (Operations Manager Ambatolampy)
Date(s) of stakeholder consultation	Initial phase : • Several face to face meetings and focus group meetings held between the 05 and 08 July 2016 Extension phase : • Mission 1 from 03 to 07 December 2019 • Mission 2 from 10 January to mid-March 2020
Communication of monitored results	Results of the initial project consultations can be read in the EIA where the key concerns and expectations are summarized. Also, minutes of these various consultations were compiled in annexes at the end of the report. Key concerns and feedback from the stakeholders include : • transparency, trust, be informed of environmental and social policies (from Jirama) • social peace and consideration of community's social concerns (from local, regional and national authorities) • Identification of priority sectors to support local development, and access to jobs (from public authorities) • Access to health, educational and social well-being (from vulnerable groups)

	As a response to these concerns, the participation of the local population in the extension project is achieved through local recruitment and the social actions that the project will bring. A list of the fokontany's expectations has been drawn up, and a report has been produced to this effect, in order to substantiate the Environmental and Social Action Plan (ESAP). Expectations range from health and education actions from the vulnerable people representants, to social peace, formulated by the local authorities. A table of all the stakeholders, with entities and expectations identified can be seen on table 16 of the PREE, provided to the VVB. Since the start of the extension phase, the RSE actions taken by GreenYellow and afterwards, NEA Ambatolampy, occurred in this regard. The choice of community projects supported by NEA Ambatolampy are directly decided with the local community, during public consultations, in order to take their concerns and priorities into consideration.
Consultation records	Environmental and Social Action Plan (ESAP)
Stakeholder input	The comments received were duly considered in the project's development and preparation of its Environmental and Social Action Plan (ESAP), which objective is to set out the key actions that need to be undertaken by the Project in order to achieve compliance with the applicable environmental and social standards, and in particular those from the IFC[7]: • IFC Performance Standards 1 - Assessment and Management of Environmental and Social Risks and Impacts • IFC Performance Standard 2 - Labor and Working Conditions • IFC Performance Standard 3 - Resource Efficiency and Pollution Prevention • IFC Performance Standard 4 - Community Health, Safety, and Security • IFC Performance Standard 5 - Land Acquisition and Involuntary Resettlement

[7] https://www.ifc.org/content/dam/ifc/doc/2010/2012-ifc-performance-standards-en.pdf

	• IFC Performance Standard 6 - Biodiversity Conservation and Sustainable Management of Living Natural Resources • IFC Performance Standard 8- Cultural Heritage

2.1.3 Free, Prior, and Informed Consent

Consent	Since 2016, GREENYELLOW MADAGASCAR has acquired 53 hectares of the "1000 ha" estate through a lease. Prior to the project implantation, the land belonged to the state. Although various activities were carried out by the local habitants on the phase 2 site prior to the construction, agreements were concluded and no conflict emerged from the land use, past or current.
Outcome of FPIC	During the operational phase, which began in June 2018, agreements have been reached with local population for the use of land belonging to GYM, in particular for grazing of livestock and cutting/collecting of grass inside the site. An agreement had been signed between the local population through the Fokontany and GREENYELLOW MADAGASCAR on the recognition of the land as belonging to the developer, and the provisional use of the land by the local communities pending construction work on the extension site. No conflict emerged following the start of construction of the extension site. No displacement of population occurred as part of this extension since the phase 2 site was already owned by GYM (now NEA Ambatolampy).

2.1.4 Grievance Redress Procedure

During this monitoring period 01-January-2022 to 31-December-2023, there were two distinct grievance logbooks made available at the plant for any comments or grievance. One concerning the initial phase, and one for the extension phase. Stakeholders only wrote in the extension logbook, which received 8 comments during the monitoring period. The presence of comments on grievance logbooks in the plant and also in the 2 fokontany and townhall are checked once per month (once per week since autumn 2024), in order to be quickly reviewed and addressed by NEA Ambatolampy.

Grievances received	Resolution and outcome
3 requests for community actions as social charity, assistance for the elderly and health center	As a response, PPs have carried out social charity, assistance and health actions in the Ambohipihaonana rural community, as can be seen in NEA Ambolampy's 2022 and 2023 CSR reports: - deployment of mobile clinics - the provision of medical equipment
3 requests for local electrification	Regarding rural electrification, as PPs explained during the audit, although discussions have taken place on the subject, no concrete plans have yet been drawn up.
2 requests for SECALINE, the national community nutrition programme	Also, even though not part of the SECALINE programme, actions on nutrition and food safety have been carried out by NEA Ambatolampy : - agricultural training - fertilizer subsidies canal cleaning and dike maintenance for agriculture

2.1.5 Public Comments

This project was open for public comment from 29/06/2020 to 29/07/2020 on the Verra website, although no comment was raised. Comments during the stakeholder consultations were raised however, and they are listed in the table below :

Summary of comments received	Actions taken
(stakeholder engagement, phase 1) Meeting minutes with stakeholders groups reported the following comments[8] : • Unawareness of the project by commune representatives prior to the meetings • The mayor expects no negative impacts and only benefits	Local employment opportunities have been created by the project No conflict was raised regarding land use. However, due to the potential resource on the acquired land, during the operational phase, which began in June 2018, agreements have been reached with local population for the use of land belonging to GYM, in particular for grazing

[8] Complete meeting minutes are available in the annex A of the EIA

• The commune representatives expect no conflict over the PV site with any communal, regional or national projects • Interest from the local inhabitants regarding the employment opportunities • Absence of conflict regarding the land use, since the local inhabitants said they did not use it beforehand	of livestock and cutting/collecting of grass inside the site.
(stakeholder engagement, phase 2) Mission 1 and mission 2 reported various expectations from the stakeholders, including : • From national, regional and local authorities : law enforcement and social peace, conflict resolution, prioritizing local employment • From vulnerable groups and population : access to health, education and social wellbeing, access to employment	• Project activities comply with all laws applicable to the project • No conflict emerged since the start of the project activity. • Local employment opportunities have been created by the project • Most of the Project developers area of actions in terms of CSR activities concern improvement of health, education and social wellbeing, as it can be seen reported on the CSR activities report. Exemple of activities in the rural community of Ambohipihaonana, in 2022 / 2023 : 1) provision of table-benches for school equipments 2) deployment of mobile clinics for health access, with 357 medical consultations including 340 women and children.

2.2 Risks to Stakeholders and the Environment

Risk identified		Mitigation or preventative measure taken
Risks to stakeholder participation	No risk related to stakeholder engagement was identified	*N/A as reflected in the EIA where risk assessments have been conducted*
Working conditions	Risks on occupational health and safety was considered moderate at construction phase for workers.	• Mitigation & management measure taken such as provision of appropriate PPE to workforce and ensure their

	During operational phase, it is considered negligeable.	consistent use throughout the operational phase.
Safety of women and girls	No risk related to women and girls were identified at the validation, nor during this verification period with employees.	N/A *as reflected in the EIA where risk assessments have been conducted*
Safety of minority and marginalized groups, including children	The major risk identified related to safety of marginalized groups is the increased traffic in the Project Area with associated risk of accident. Such accident between Project's vehicles and other road users and pedestrians was a risk identified with a major impact significance for construction phase, but negligeable for operational phase	• Development and implementation of specific road traffic management procedures and plan • Strictly implement speed limitations including within settlements. • Limit Project's vehicles speed on unpaved road to ensure safe operations.
Pollutants (air, noise, discharges to water, generation of waste, release of hazardous materials)	Non-hazardous waste generated during construction activities have the potential to generate pollutions. The risk is identified at all phases of the project, at minor impact. With mitigation and management measures, the risk becomes negligeable for all phases. Project construction phase carbon emissions have been estimated by GreenYellow at 36 tonnes of CO_2. Overall air quality risk has been assessed as 'negligible' during construction phase, as well as operational phase. Noise and vibrations have been assessed as a minor impact significance during construction, and negligeable with mitigation measures (such as grievance process for noise complaint). It is also negligible for operational phase. Hydrology and water consumption is estimated of minor impact during construction, becoming negligible with appropriate	• Waste Management Plan (WMP) following the principles of waste minimisation at source, segregation for reuse, recycling, and disposal of waste. • Making suitable facilities available for the collection of, segregation and safe disposal of waste. • Creating waste collection area with clearly marked facilities such as colour coded bins and equipment for handling the waste. • Ensure all wastes are managed by a licensed contractor.

	mitigation measure. This implies careful management of water consumption, and good design of on-site well. No other risk related to pollutants other than negligeable are identified during the operational phase.	

2.3 Respect for Human Rights and Equity

2.3.1 Labor and Work

Discrimination and sexual harassment	As per grievance mechanism available as well as HSE reports, no discrimination nor sexual harassment occurred during this monitoring period.
Management experience	Operation and maintenance team has years of experience on the solar electricity sector.
Gender equity in labor and work	The project is located in Madagascar, which is an ILO member state since 01/11/1960, and which ratified the following conventions: C100 - Equal Remuneration Convention, 1951 (No. 100), since 10 August 1962[9] C111 – Discrimination (Employment and Occupation) Convention, 1958 (No. 111) since 11 August 1961.[10]
Human trafficking, forced labor, and child labor	The project aligns with the labour convention and labour rights of Madagascar, which is a member of the International Labour Organisation (ILO).

2.3.2 Human Rights

The project is operated in Madagascar, which is an ILO member state since 01/11/1960, and which ratified the following conventions:

• C029 - Forced Labour Convention, 1930 (No. 29) P029 - Protocol of 2014 to the Forced Labour Convention, 1930 ratified on 06 Nov 2017 (In Force) since 01 Nov 1960

[9] https://normlex.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO:12100:P12100_INSTRUMENT_ID:312245:NO

[10] https://normlex.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO:12100:P12100_INSTRUMENT_ID:312256:NO

• C087 - Freedom of Association and Protection of the Right to Organise Convention, 1948 (No. 87) since 01 Nov 1960

• C098 - Right to Organise and Collective Bargaining Convention, 1949 (No. 98) since 03 Jun 1998

• C100 - Equal Remuneration Convention, 1951 (No. 100) since 10 Aug 1962

• C105 - Abolition of Forced Labour Convention, 1957 (No. 105), since 06 Jun 2007

• C111 - Discrimination (Employment and Occupation) Convention, 1958 (No. 111), since 11 Aug 1961

• C138 - Minimum Age Convention, 1973 (No. 138) Minimum age specified: 14 years, since 31 May 2000

• C182 - Worst Forms of Child Labour Convention, 1999 (No. 182), since 04 Oct 2001

2.3.3 Indigenous Peoples and Cultural Heritage

N/A : as per ESIA, no indigenous people were identified. Also, no impact on cultural heritage was identified during the operational phase.

2.3.4 Property Rights

Disputes over rights to territories and resources	N/A as prior to the project implantation, the land belonged to the state and use was forbidden
Respect for property rights	No agreement has been signed on property rights. No conflict emerged during this monitoring period.

2.3.5 Benefit Sharing

Summary of the benefit sharing plan	No agreement has been signed in the past, nor is currently in use since the start of construction and operation of the project phase 2.
Benefit sharing during the monitoring period	N/A as no agreement was effected during the monitoring period.

2.4 Ecosystem Health

	Risk identified	Mitigation or preventative measure taken during the monitoring period
Impacts on biodiversity and ecosystems	According to the Environmental and Social Impact Assessment (ESIA), the habitats on the project site are of little interest in terms of biodiversity. As a consequence, biodiversity loss is identified as a negligible risk, whether for construction phase increased human activity, noise, etc. or operational phase (physical barrier).	*N/A during monitoring period, as per EIA no risk is identified during operational phase other than negligible.*
Soil degradation and soil erosion	The only impact other than negligible identified on geology and soils concerns the decommissioning phase : a minor significance related to potential land contamination in case of waste storage not managed properly or accidental events.	*N/A during monitoring period, as per EIA no risk is identified during operational phase.*
Water consumption and stress	• Impact of minor significance identified regarding the potential decreased amount of groundwater during construction phase. • Water is consumed during monitoring periods as part of the periodical cleaning of the solar panels. Water is sourced from a well which is on site (inside the premises of the project site, next to the offices as seen during the OSV) which is then loaded on a truck and used for cleaning. The high-pressure device for water cleaning is powered by a small petrol generator unit.	• *N/A* • *Data is collected as KPI since 2023 for good practices and limitation of volumes soncumed (including water, waste and fuel consumption)*
Usage of fertilizers	No risk identified	*N/A, as no risk related to fertilizers were identified.*

2.4.1 Rare, Threatened, and Endangered species

Species or habitat	*As per ESIA, the Project area is composed of modified habitats with no particular interest for biodiversity. The PV power plant site has been heavily modified for large scale farming by previous operators and there is no flora or fauna*

	in the Project area known to have a specific conservation status.

2.4.2 Introduction of species

N/A as the project does not do any planting or species introduction.

2.4.3 Ecosystem conversion

N/A as not an ARR, ALM, WRC or ACoGS project

3 IMPLEMENTATION STATUS

3.1 Implementation Status of the Project Activity

Technical specifications of the equipments :

	Phase 1 (initial)	**Phase 2 (extension)**
Inverter	INGECON SUN 1220TL (15 units)	SUNGROW SG250HX (77 units)
Solar PV	JKM 270 PP-60; JKM 275 PP-60 (73,008 units)	JAM72S30-540/MR; 540 [W] peak power (37,050 units)
Transfo PTRs	800[V]/20[kV]; 3,660 [kVA]; Dy11 (5 units)	• 800[V]/20[kV]; 3,750 [kVA]; Dyn (3 units) • 800[V]/20[kV]; 4,000 [kVA]; Dyn (2 units)
Substation	20[kV] substation equipped with 05 cells	20[kV] substation equipped with 06 cells
- transfo PDL	type SFZ-20000/63; triphase; 63/20 [kV]; 20 [MVA]; 50 [Hz]; YNyn0 ; tap changer 63[kV], +/- 15 [%]; (1 unit)	type SFZ-20000/63; triphase; 63/20 [kV]; 20 [MVA]; 50 [Hz]; YNyn0 ; tap changer 63[kV], +/- 15 [%]; (1 unit)
Project Capacity delivered to Grid (MWC)	20 MWp	20 MWp

Battery Energy Storage System (BESS) :

Name of Project	**GREEN YELLOW PHASE-I**	**GREEN YELLOW PHASE-II (Extension)**
Manufacturer		**SUNGROW**
Energy Storage Technology	NA	LPF : Lithium Phosphate Fer

Battery Applications *(peak shaving/frequency regulation/inertial support etc.)*	NA	Peak shaving
Project Capacity (MW / MWh)	NA	- Battery: 2 x (2 x 1376 [kWh]) - PCS output: 2 x 2500 (kVA]
Equipment supplied	NA	- Battery: type M2L- - PCS (Power Conversion System): type SC1375UD; 550[Vac]/550[Vdc]; number: 04; - transformers PTR-BESS: type : 550[V]/20[kV]; 2500 [kVA]; DynO; number: 02; - transformers auxiliaries: 550[V]/400[V]; 80 [kVA]; DynO; number: 02; - TGBT BESS: 550 [V]; number: 02; - TGBT auxiliaries: 400 [V]; number: 02;

During the monitoring period 01/01/2022 –31/12/2023, the project has operated satisfactorily, generating a total net energy delivered to the grid equal to 87,271 MWh : 47,140 MWh from the initial phase and 40,132 MWh from the extension, respectively. The only noteworthy event is the unavailability of an inverter which lasted from December 10, 2021 until May 5th, 2023 on the initial tranche of the plant. The faulty inverter was sent in Europe for repair, and was sent back on February 22, 2023 ; its return to service was effective on May 5, 2023. This unavailability therefore lasted during most of the monitoring period and impacted the plant's production on its initial phase. Other events of significance, which impacted the production, are summarized in the following table:

June 2023	- Default of a fan during the second half of the month - Annual preventive maintenance was carried out, affecting electricity production (initial phase)
July 2023	Failure of a fan during the first 17 days (initial phase)
October 2023	Failure of a fan (initial phase)
November 2023	Failure of a protection cell during the whole month (initial phase)
December 2023	Failure of a protection cell during the whole month (initial phase)

The project proponents changed their entity name from Green Yellow Madagascar to NEA Ambatolampy, as detailed in section 1.3 above. No changes on applicable legislation have occurred during this third monitoring period.

3.2 Deviations

3.2.1 Methodology Deviations

No methodology deviation has been applied for this monitoring period. Therefore, this section in not applicable to the project.

3.2.2 Project Description Deviations

Deviations applied to this monitoring period and followings from now on. The JPD-MR from VCS validation, dated 24-June-2020, is updated to include these deviations and is assessed by VVB. Such revised JPD-MR will be available on the project webpage of the VCS registry.

• As a consequence to its capacity change, all mentions to “20 MW”, including in the former title of the project “Ambatolampy 20 MW solar PV” are removed or updated to display “40 MW” instead.

- Reason for the change : As the original title comprised the original capacity of the plant, the title needs to be updated in order to match the capacity update.

• On January 9th, 2023, PPs Green Yellow Madagascar changed its company name to “New Energy Africa Ambatolampy (NEA Ambatolampy)”, a subsidiary of the African company Axian. The same is reflected in the MR, section 1.3 ‘project proponent’.

• The project deviates in section 1.1 and 1.11 of the registered VCS-JPD-MR regarding the total capacity of the project. The capacity of the project changed from 20 MWp to 40 MWp as new panels have been added as a phase II to the project in order to increase electricity production. The commercial agreement for this extension was executed on November 27th, 2020, and the commercial operation date of the added capacity occurred during this monitoring period, on August 17th, 2022.

- Reasons for the changes : the phase II of the project enables a greater electricity production, within the same surface of land initially acquired.

• The project deviates in section 1.11 regarding the equipment and technology description for the project activity. While the equipment of phase 1 remain unchanged, the description of the extension equipment, which involves solar PV modules of different models, is added.

- The project’s phase 1 is composed of 14,832 modules JKM 270 PP-60 and 58,176 modules JKM 275 PP-60 that are connected in strings of 24 modules, split between 3 inverters/transformers packs located on 5 Ingeteam skids (PTR1 to PTR5).
- The project’s phase 2, the extension, comprises 37,050 PV modules of type JAM72S30-540/MR that are connected in strings of 24 modules, split between 77 inverters of type SUNGROW SG250HX. These new panels were not in operation during previous monitoring periods. The project extension also features the installation of 5MW/5MWh storage system batteries associated with the RIA (Réseau Interconnecté d'Antananarivo - Antananarivo Interconnected Grid), which will provide sufficient smoothing of the new plant's daily PV output. The aim is to smooth out PV variations due to intermittency over the day.

- Detailed characteristics of the extension solar PV modules :

Manufacturer	JA solar
Model	JAM72S30-540/MR
Quantity	37,050
Peak Power (W)	540
Type of cells	Mono
Rated voltage (Vmpp) (V)	41.64
Rated current (Impp) (A)	12.97
Efficiency (%)	20.9
Dimensions (mm)	2279 x 1134 x 35 mm

- Updated single line diagram of the PV plant can be found in Annex of this monitoring report.

Reason for the change: the extension equipment differs from the original equipment described, hence this description addition.

• The project updates the version of the applied methodology ACM0002, from v20.0 to v22.0, in section 1.2 of the JPD-MR.

Reason for the change : the project extension comprises a BESS battery system, that is not considered in the initial version of the methodology used. In version 21.0 and 22.0 of the same methodology, such were included and account for project emissions. This update enables a more realistic view on the project current state.

• The project updates its description of monitoring equipment in section 1.11 and 6.1 of the JPD-MR :

Reason for the change : electricity meters have been replaced since initial validation, and some others were added in regard to the extension of the project. In relevant sections, meters description including model, accuracy class and serial numbers was revised.

The project deviates from its initial description of monitoring as new project emissions, as per ACM0002 v22 has been observed: project emissions due to diesel used as fuel for water tanker truck and petrol used in electricity generator for water jet pressure. No impact on applicability of methodology, baseline, or additionality. Project emissions monitoring is changed, change reflected in JPD-MR

Dimension	Impact
Applicability of methodology ACM0002, V.22.0	Para 2.2.7 (b) of the methodology : In case the project activity involves the integration of a BESS, the methodology is applicable to grid-connected renewable energy power generation project activities that integrate a BESS The project activity involved the integration of a BESS, together with implementing a capacity addition to an existing solar photovoltaic plant. This applies here as the BESS system has been developed in the context of the capacity addition of the Ambatolampy solar initial plant. Such applicability is confirmed by table 2. of combinations applicable for integration : BESS + capacity addition to existing plant is eligible under solar photovoltaic. Other applicability conditions include, section 2.2.8 : (a) Solar power plant ;

	(b) Is only applicable for projects that are not wind, solar, wave or tidal power capacity addition projects (c) Is not applicable as the BESS is not implemented as part of a greenfield project but a capacity addition (d) The BESS is mainly charged with electricity generated from the associated renewable energy power plant. Grid imported energy is only used on a minority basis, and corresponding GHG emissions shall be accounted for as project emissions. Also, it should not amount to more than 2 per cent of the electricity generated by the project renewable energy plant during a monitoring period. (e) In case the project activity involves PSP, the PSP shall utilize the electricity generated from the renewable energy power plant(s) that is operating in coordination with the PSP during pumping mode.
Additionality	Registered CDM Project Design Document used the presence of solar photovoltaic technologies in the positive list[11] to confirm additionality. Since these technologies were excluded from the list in 2022, another approach is used to confirm additionality for this deviation: According to the methodology, para. 36 of section 5.3.2,the additionality of the project activity shall be demonstrated and assessed using the TOOL01. In the methodological TOOL01 version 07.0.0, the step 0 is the demonstration whether proposed project activity is the first-of-its-kind.. Para 16 of section 4.1 says that if the project activity apply measures that are listed in the definitions section above, the latest version of the "Guidelines on additionality of first-of-its-kind project activities" shall be applied to demonstrate that the project activity is the first-of-its-kind. The latest active tool that enables the demonstration of 'first-of-its-kind status is tool23, version 03.0. "Ambatolampy Solar PV" is a first-of-its-kind project activity, as demonstrated below : In the applicable geographical area – the entire country of Madagascar – Ambatolampy Solar PV is the first solar PV project of this capacity. This fact was valid at the time of its registration as a 20MW solar power plant on May 3rd, 2019, and remains unchanged now that its capacity amounts to 40MW in 2023. Although a few solar power stations projects emerged in Madagascar, several are still under development, and none of them is, or will be able to deliver the same electricity output[12]. Ambatolampy remains the only large-scale plant of this technology. The project is implementing one measure of the mentioned technology : solar PV as power generation based on renewable energy, as described in section 9.b) of the FOIK tool , and crediting period for the project activity is updated to 10 years with no option of renewal.

[11] See https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-32-v1.pdf/history_view

[12] The Electricity Regulatory Office of Madagascar was contacted in order to obtain an updated list of Malagasy plants. They responded in early 2024 and transmitted an updated version, which confirms the inexistence of any solar plant with a similar electricity output. The same list is transmitted to VVB. Same constant status can be seen on the International Energy Agency website, on the profile of Madagascar : https://www.irena.org/-/media/Files/IRENA/Agency/Statistics/Statistical_Profiles/Africa/Madagascar_Africa_RE_SP.pdf

<table>
<tr><td></td><td>
Requirements for FOIK demonstration are summed up in the table below :
<table>
<tr><td rowspan="5">Definitions as per Annex 7 of CDM-EB-69</td><td>Applicable area</td><td>Entire host country of Madagascar</td></tr>
<tr><td>Measure</td><td>Switch of technology with change of energy source (b) power generation based on renewable energy</td></tr>
<tr><td>Output</td><td>Goods/services produced by the project activity: Electricity</td></tr>
<tr><td>Different technologies</td><td>Size of installation (power capacity) (c) Large (iii)</td></tr>
<tr><td>Evidence</td><td>As of project's start date, no other large-scale solar power plant (>15 MW) is in commercial operation in Madagascar</td></tr>
</table>
Therefore, the requirements (a), (b) and (c) are fulfilled, the proposed project is a first-of-its-kind project activity and according to section 5.2.13 of the methodological tool: Additionality of first-of-its-kind project activities v3, the project activity is additional.
As per the methodological tool section 5 (c), the carbon accountability period for this extension activity is limited to 10 years with no option of renewal.
</td></tr>
<tr><td>Appropriateness of the baseline scenario</td><td>The extension is a deviation of the initial registered VCS project, as the second phase of the VCS-registered project, and not a separate new capacity addition project. Therefore, the original baseline context and emission factor still apply.</td></tr>
<tr><td>Compliance with the applied methodology ACM0002, V.22.0</td><td>No impact, as the deviation remains compliant with all provisions of ACM0002.</td></tr>
</table>

3.3 Grouped Projects

This is not a grouped project.

3.4 Baseline Reassessment

Did the project undergo baseline reassessment during the monitoring period?

☐ Yes ☒ No

4 DATA AND PARAMETERS

4.1 Data and Parameters Available at Validation

Data / Parameter	$EF_{grid,CM,y}$
Data unit	tCO_2/MWh
Description	Combined margin CO_2 emission factor for grid connected power generation in year y calculated using the latest version of the "Tool to calculate the emission factor for an electricity system"
Source of data	JIRAMA 2015-2017 data
Value applied	0.6703
Justification of choice of data or description of measurement methods and procedures applied	-
Purpose of Data	Calculation of baseline emissions
Comments	-

Data / Parameter	$EF_{grid,OM,y}$
Data unit	tCO_2/MWh
Description	Operating Margin CO_2 emission factor for grid connected power generation in year y calculated using the latest version of the "Tool to calculate the emission factor for an electricity system"
Source of data	JIRAMA 2015-2017 data
Value applied	0.668
Justification of choice of data or description of measurement methods and procedures applied	-
Purpose of Data	Calculation of baseline emissions
Comments	-

Data / Parameter	$EF_{grid,BM,y}$
Data unit	tCO_2/MWh
Description	Build Margin CO_2 emission factor for grid connected power generation in year y calculated using the latest version of the "Tool to calculate the emission factor for an electricity system"

Source of data	JIRAMA 2015-2017 data
Value applied	0.677
Justification of choice of data or description of measurement methods and procedures applied	-
Purpose of Data	Calculation of baseline emissions
Comments	-

Data / Parameter	The percentage share of total installed capacity of solar PV
Data unit	%
Description	The percentage share of total installed capacity of the solar PV in the total installed grid connected power generation capacity in the host country.
Source of data	https://www.africa-eu-renewables.org/marketinformation/madagascar/energy-sector/
Value applied	0.1
Justification of choice of data or description of measurement methods and procedures applied	-
Purpose of Data	Additionality demonstration
Comments	-

Data / Parameter	The total installed capacity of solar PV
Data unit	MW
Description	The total installed capacity of the solar PV in the host country.
Source of data	
Value applied	0.53
Justification of choice of data or description of measurement methods and procedures applied	-
Purpose of Data	Additionality demonstration
Comments	-

4.2 Data and Parameters Monitored

Data / Parameter	$EG_{facility,y}$
Data unit	MWh/yr
Description	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y
Source of data	Measured directly with electricity meter(s) at JIRAMA sub-station
Description of measurement methods and procedures to be applied	Electricity outputs are electronically recorded, stored and invoiced monthly to JIRAMA by NEA Ambatolampy, based on main meter (or back-up in case of main meter unavailability or default).
Frequency of monitoring/ recording	Continuous measurement and at least monthly recording
Value monitored	
Monitoring equipment	**There are 7 meters in total :** 3 for each phase (1 main, 1 check and 1 back up), measuring the net electrical energy delivered to RI-Tana grid and located before 20/63kV transformer at JIRAMA substation. They also measure the consumption of the plant, including BESS charging from the grid. The 7th meter, measuring office consumption, including lights, cameras, etc. (libeled as 'invoiced imports' on the ER sheet), is located at the JIRAMA VIE base, next to the offices. They feature the following specifications:

	(01-January-2022 to 31-December-2022)	(01-January-2023 to 31-December-2023)	Total
Initial phase	22,515	24,624	47,140
Extension phase	12,015	28,116	40,132
Total	34,531	52,741	87,271

Initial phase			
Meter designation:	Main	Check	Internal control[13]
Meter ownership:	NEA Ambatolampy	JIRAMA	NEA Ambatolampy
Make:	Landis+Gyr	ZTE	Phoenix contact
Model:	E650[14]	DTSD178-M[15]	EEM-MA600[16]

[13] These 'internal control' meters are not part of the PPA, they are for indicative purpose : they serve as internal control meters for NEA Ambatolampy

[14] https://www.landisgyr.eu/product/landisgyr-e650/
[15] https://en.dongfang-wisdom.com/html/ProductDetail_302-0-nul.html#3
[16] https://www.phoenixcontact.com/fr-fr/produits/appareil-de-mesure-eem-ma600-2901366

Accuracy class:	0.2S (±0.2%)	0.5S (±0.5%)	0.2S
Serial Number:	No. 3507387521272	No. 012000005221	No. 17512310044_T
Calibration date:	n/a[17]	02/08/2021	n/a[18]

Extension phase			
Meter designation:	Main	Check	Internal control[19]
Meter ownership:	NEA Ambatolampy	JIRAMA	NEA Ambatolampy
Make:	Landis+Gyr	ZTE	Phoenix contact
Model:	E650[20]	DTSD178-M[21]	EEM-MA770[22]
Accuracy class:	0.2S (±0.2%)	0.5S (±0.5%)	0.2S (±0.2%)
Serial Number:	No. 3507576049226	No. 012000005522	No. 1127052
Calibration date:	n/a[23]	17/08/2022	n/a[24]

JIRAMA VIE base meter:	
Meter designation:	Main
Meter ownership:	JIRAMA
Make:	ZTE
Model:	DTSD178-M[25]
Accuracy class:	0.5S (±0.5%)
Serial Number:	No. 170164261685
Calibration date:	n/a

[17] "As per manufacturer's manual, meters are calibrated at the factory and do not require any further calibration during their entire service life." Ambatolampy 20MW solar PV, PDD section B.7.1

[18] Since these meters are for indicative purpose, and are not included in the PPA nor involved in any facturing/ER calculation purpose, no specific calibration requirements are needed

[19] These 'internal control' meters are not part of the PPA, they are for indicative purpose: they serve as internal control meters for NEA Ambatolampy

[20] https://www.landisgyr.eu/product/landisgyr-e650/
[21] https://en.dongfang-wisdom.com/html/ProductDetail_302-0-nul.html#3
[22] https://www.phoenixcontact.com/fr-fr/produits/appareil-de-mesure-d-energie-eem-ma770-2907945#downloads-link-target
[23] "As per manufacturer's manual, meters are calibrated at the factory and do not require any further calibration during their entire service life." Ambatolampy 20MW solar PV, PDD section B.7.1

[24] Since these meters are for indicative purpose, and are not included in the PPA nor involved in any facturing/ER calculation purpose, no specific calibration requirements are needed

[25] https://en.dongfang-wisdom.com/html/ProductDetail_302-0-nul.html#3

QA/QC procedures to be applied	Cross check of measurement results with records for sold electricity. As per PPA §9.3, meters' testing, inspection, repairs, re-calibration or replacement will be ensured by the Parties according to best practices. Yet as per manufacturer's manual, meters are calibrated at the factory and do not require any further calibration during their entire service life. Calibration by customer is, therefore, not necessary.
Purpose of the data	Calculation of baseline emissions
Calculation method	-
Comments	Since no information regarding the check and internal control meters calibration requirements was available, a conservative factor was applied to the net electricity generation value, corresponding to the accuracy class of the check meters : 0.5S (±0.5%) for both phases

4.3 Monitoring Plan

The proposed project activity monitoring plan complies with the methodology ACM0002 - Grid-connected electricity generation from renewable sources, whereby it is stated that: As per ACM0002 provisions for record handling, all data collected as part of monitoring is archived electronically and kept at least for 2 years after the end of the last crediting period.

All measurements are conducted with calibrated measurement equipment according to relevant industry standards. Indeed, the quantity of net electricity generation supplied by the project plant to the grid is reliably monitored through calibrated electricity meters and cross-checked with sales records as part of quality assurance/quality control measures on top of CEB diligence.

Monitoring organization:

The Country Manager of NEA Ambatolampy coordinates and endorses the overall responsibility for all CDM monitoring of the project, including:

- Develop, approve, execute, and improve the CDM Monitoring/Reporting Procedures;
- Organize in-house seminar to inform and train the company staff to the monitoring procedures;
- Ensure that instrumentations and devices are available and properly suited to efficiently perform the monitoring;
- Communicate and coordinate the monitoring work of all business units;
- Validate and electronically archive all monitoring data on a monthly basis throughout the crediting period (and conserve it at least for 2 further years);
- Calculate and report the emission reductions; and
- Coordinate the DOE work during the verification audit.

The Country Manager might appoint a CDM coordinator to delegate him the above specific tasks of monitoring supervision. The Technical/Engineering/Maintenance Department consisting of plant technicians will undertake the technical actions required by the monitoring plan, under the Country Manager's authority, to collect and record related data.

The Accounting/Sales Department (Chief Financial Officer) will crosscheck, reconcile or consolidate data with multiple sources whenever possible. At minimum, data obtained from the electricity meters is to be crosschecked with the electricity sales receipts. This kind of reconciliation activity will be recorded properly as DOE may request for such information during the verification.

Monitoring team training and emergency preparedness

Data collection, consolidation and results analysis is undertaken by a dedicated team adequately trained, well aware of CDM requirements. O&M workflow manual enforced on-site further includes all updated procedures in case of mistake/break-downs, emergency disconnections and cyclone warnings.

No internal audit was carried out by the project developers during the years 2022 and 2023. However, internal audit process is currently being formalized and implemented, for a first occurrence during the year 2024. This will be reflected in the following monitoring periods.

5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

The monitoring period for which GHG emission reductions were achieved spans from 01/01/2022 to 31/12/2023. Baseline emissions are calculated according to the methodology as the product of (i) the quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the project activity in year y ($EG_{facility,y}$ = Exports – Imports, in MWh/yr) and (ii) the combined margin CO_2 emission factor for grid connected power generation in year y ($EF_{grid,CM,y}$):

$$BE_y = EG_{PJ,y} \times EF_{grid,CM,y}$$

Where:

BE_y	Baseline emissions in year y (t CO_2/yr)
$EG_{PJ,y}$	Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the project activity in year y (MWh/yr)
$EF_{grid,CM,y}$	Combined margin CO_2 emission factor for grid connected power generation in year y calculated using the latest version of the "Tool to calculate the emission factor for an electricity system" (t CO_2/MWh)

$EG_{PJ,y} = EG_{facility,y}$ i.e. the quantity of net electricity generation supplied by the project plant to the grid, as monitored and displayed below on a monthly basis.

$EF_{grid,CM,y}$ = 0.6703 tCO_2/MWh, as the Project Proponent have calculated, the DOE validated and the CDM-EB registered.

Calculation of Baseline Emissions (detailed version available in ex-post ER sheet) :

	Initial phase production (kWh)	*Extension phase production (kWh)*	*$EG_{PJ,y}$ (MWh)*	$EG_{PJ,y}$ (MWh) with error factor adjustment (0.5S)	*BE_Amb1* *(tCO_2)*
Jan-22	1,848,490	0	1,846	1,754	1,175.6
Feb-22	1,912,010	0	1,910	1,814	1,215.9
Mar-22	1,955,890	0	1,953	1,855	1,243.5
Apr-22	1,880,540	0	1,878	1,784	1,195.8
May-22	1,882,690	0	1,881	1,786	1,197.4
Jun-22	1,546,890	0	1,545	1,467	983.5
Jul-22	1,716,690	0	1,715	1,629	1,091.7
Aug-22	2,107,180	1,314,890	3,420	3,248	2,177.3
Sep-22	2,318,630	2,966,450	5,283	5,019	3,363.9
Oct-22	2,564,720	3,345,440	5,902	5,606	3,757.9
Nov-22	2,134,690	2,805,900	4,934	4,687	3,141.4
Dec-22	1,859,920	2,239,710	4,087	3,882	2,601.8
Jan-23	1,748,740	2,272,740	4,005	3,803	2,549.4
Feb-23	1,777,540	2,284,820	4,046	3,842	2,575.2
Mar-23	1,636,790	2,083,900	3,706	3,519	2,358.7
Apr-23	1,777,080	2,314,020	4,086	3,881	2,601.2
May-23	2,373,040	2,663,120	5,023	4,770	3,197.3
Jun-23	2,171,660	2,353,190	4,509	4,282	2,869.9
Jul-23	2,037,420	2,126,430	4,146	3,936	2,638.6
Aug-23	2,549,530	2,516,860	5,056	4,802	3,218.9
Sep-23	3,080,270	3,164,020	6,242	5,929	3,974.4
Oct-23	2,381,540	2,740,150	5,119	4,863	3,259.7
Nov-23	2,154,230	2,505,020	4,657	4,424	2,965.4
Dec-23	2,256,500	2,681,600	4,936	4,689	3,143.1

5.2 Project Emissions

There are project emissions from the extension phase and its associated BESS battery system. The emissions resulting from the use of the electricity grid to charge it outside of daylight is considered thanks to the 'Consumption' data collection. This data includes, but is not limited to, electricity from the grid used during the night to charge the battery system. Using this data for PE(bess) calculations is therefore conservative. During this monitoring period 01-January-2022 to 31-December-2023, 103 tCO_2e have been emitted as project emissions from that source, and

are therefore subtracted from the baseline emissions for final VCUs calculation. Detailed calculations are available on the ER ex-post calculation sheet.

5.3 Leakage Emissions

As stated in the applicable methodology, no leakage emissions are considered.

5.4 GHG Emission Reductions and Carbon Dioxide Removals

The monitoring period for which GHG emission reductions were achieved spans from 01/01/2022 to 31/12/2023, split by vintage as it follows:

Vintage period	Baseline emissions (tCO_2e)	Project emissions (tCO_2e)	Leakage emissions (tCO_2e)	Reduction VCUs (tCO_2e)	Removal VCUs (tCO_2e)	Total VCUs (tCO_2e)
01-Jan-2022 to 31-Dec-2022	23,145	19	0	23,126	0	23,126
01-Jan-2023 to 31-Dec-2023	35,352	84	0	35,268	0	35,268
Total	58,497	103	0	58,394	0	58,394

Vintage period	Ex-ante estimated reductions/ removals	Achieved reductions/ removals	Percent difference	Explanation for the difference
01-Jan-2022 to 31-Dec-2022	31,864	23,126	-27.4%	This difference is mainly due to the inverter repair of the initial phase, which had an impact on production. This unavailability is detailed in section 3.1 of this monitoring report.
01-Jan-2023 to 31-Dec-2023	45,720	35,268	-22.9%	This difference is mainly due to the inverter repair of the initial phase, which had an impact on production. This unavailability is detailed in section 3.1 of this monitoring report.
Total	**77,584**	**58,394**	**-24.7%**	This difference is mainly due to the inverter repair of the initial phase, which had an impact on production. This unavailability is detailed in section 3.1 of this monitoring report.

APPENDIX 1: COMMERCIALLY SENSTITVE INFORMATION

No commercially sensitive information.

Section	Information	Justification

APPENDIX 2: SLD DIAGRAM