Project Information	
Project Title	NaviRex Distributed Hybrid Solar-BESS Aggregation Pilot
Name of the non-obligated entity (legal entity name)	Navirex India Private Limited
PDD version number	1
PDD completion date	10.05.2026
Sectoral Scope	01: Energy
Applied methodologies and tools	• BM EN01.001: Grid-connected electricity generation from renewable sources • BM-T-001: Combined tool to identify the baseline scenario and demonstrate additionality • BM-T-003: Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation
Estimated annual emission reductions or net	2,130 tCo2
Date of PDD Submission	04.08.2026

A.1. Title of Project Activity

NaviRex Distributed Hybrid Solar-BESS Aggregation Pilot

A.2. Compliance with minimum project eligibility

A.2.1. Regulatory Compliance

The proposed project activity involves the installation and operation of grid-connected distributed Solar Photovoltaic with Battery Energy Storage System (Solar-BESS) hybrid systems across Kerala, India, aggregated under a unified monitoring, reporting, and verification framework.

The project activity qualifies as a grid-connected renewable energy generation project activity with integrated BESS under Section 3.2 of methodology BM EN01.001, applicable to Solar Photovoltaic systems with BESS integration across the eligible modes of installation as set out in Table 2 of the methodology.

All participating systems are installed and operated in compliance with applicable regulations of the Government of India, guidelines issued by the Ministry of New and Renewable Energy (MNRE), Kerala State Electricity Board Limited (KSEB) interconnection and metering requirements, and relevant national electrical safety standards. The project activity does not contravene any applicable legal, environmental, ecological, or social regulations in India and is consistent with all host country requirements for project activities registered under India's Carbon Credit Trading Scheme (CCTS).

A.2.2. Project Start Date

28 July 2025

A.2.3. Sector Scope(s)

01: Energy

A.2.4. Exclusivity

The project activity is not registered, nor will it be registered, under any other compliance or voluntary carbon crediting programme for the duration of the crediting period.

Participating system owners execute binding end-user agreements with NaviRex India Pvt Ltd prior to enrollment, through which they confirm the exclusive transfer of carbon rights arising from electricity generation at their premises to NaviRex India Pvt Ltd, and declare that the relevant systems are not enrolled in, and will not be enrolled in, Renewable Energy Certificate (REC) schemes or any other domestic or international carbon crediting mechanism for the duration of their participation in the project activity.

These contractual arrangements ensure that no emission reductions claimed under this project activity are subject to dual ownership or concurrent claim under any other mechanism.

A.2.5. Prevention of Double Counting

Each participating system is assigned a unique NaviRex asset identification number and recorded in a centralized project database including consumer number, meter number, capacity, and installation details. Monitoring data are uniquely tagged to each asset and linked to a single project reference within the NaviRex digital MRV platform. These procedures ensure traceability and prevent duplication of emission reductions across projects or registries.

The project activity will be registered under India's Carbon Credit Trading Scheme (CCTS), and emission reductions will be used exclusively within India's domestic compliance market. Participating systems are not enrolled in Renewable Energy Certificate (REC) schemes or any voluntary or international carbon crediting mechanisms, as confirmed through participant agreements.

The project does not involve international transfer of mitigation outcomes and therefore does not create double counting concerns with respect to India's Nationally Determined Contributions under the Paris Agreement.

Government subsidy programs applicable to distributed solar in India do not confer ownership or claim over carbon credits or environmental attributes unless explicitly stated. In absence of such provisions, carbon rights remain with the system owner and are contractually transferred to the project entity. In case of future regulatory clarification assigning carbon ownership to subsidy providers, affected systems will be addressed in accordance with applicable regulatory guidance.

A.3 Non-obligated entity

A.3.1. Ownership of Project

Participating Solar-BESS hybrid systems are owned by individual households, MSMEs, or institutions at whose premises the systems are installed. NaviRex India Pvt Ltd does not claim ownership of the physical assets.

However, participating system owners sign end-user agreements transferring carbon credit rights from the generation of electricity from their systems to NaviRex India Pvt Ltd for the purpose of aggregation and issuance of carbon credits under the applicable carbon market mechanism.

NaviRex India Pvt Ltd is responsible for project registration, monitoring, data management, and facilitates the issuance of carbon credits through the relevant regulatory authorities under the applicable carbon market mechanism.

A.3.2. Non-obligated entity

Navirex India Private Limited

A.3.3. Managing Entity

Navirex India Private Limited

A.3.4. Roles and Responsibilities of Participants

The non-obligated entity and Managing Entity involved in this project is the same, Navirex India Private Limited. Navirex shall be responsible for registration and monitoring of the proposed project activity.

Authorized Contact Person

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Designation: Director
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Organization Details
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A.4. Detailed Description of Project Activity

A.4.1 Title

NaviRex Distributed Hybrid Solar-BESS Aggregation Pilot

A.4.2. Objective and Purpose

The proposed project activity establishes a technology-enabled framework for aggregating grid-connected distributed Solar-BESS hybrid systems across Kerala, India, into a unified monitoring, reporting, and verification (MRV) infrastructure, enabling systematic quantification and monetisation of greenhouse gas emission reductions under India's Carbon Credit Trading Scheme (CCTS).

The project addresses a structural gap in the accessibility of carbon markets. Distributed energy assets like Solar-BESS systems at residential, MSME, and institutional premises, generating verifiable emission reductions equivalent in environmental integrity to those produced by utility-scale renewable energy projects, yet their owners have remained outside the reach of formal carbon finance. High transaction costs, the absence of standardized monitoring infrastructure, and the administrative complexity of registry participation have collectively precluded individual small-scale system owners from accessing carbon markets. The NaviRex aggregation framework is designed to overcome these barriers by consolidating geographically dispersed, technically heterogeneous assets into a single verifiable project activity under the NaviRex digital MRV platform.

Beyond carbon accounting, the project generates broader systemic value. At portfolio scale, the aggregated operation of BESS-equipped distributed

systems increases on-site solar self-consumption, reduces grid import during peak demand periods, and supports distribution network stability outcomes that complement Kerala's transition to a higher share of variable renewable generation. Carbon revenue provides a stable, performance-linked income stream that strengthens the financial case for Solar-BESS investment among households, MSMEs, and institutions, supporting the sustained deployment of distributed clean energy without exclusive dependence on capital subsidies.

The project thereby pursues three reinforcing objectives: direct reduction of greenhouse gas emissions through renewable electricity generation displacing grid supply; expanding access to climate finance for distributed asset owners currently excluded from carbon markets; and establishing a scalable digital infrastructure for verified distributed energy aggregation that can support future grid management and clean energy financing mechanisms in India.

A.4.3. Project Location

A.4.3.1. State

Kerala, India

A.4.3.2. City/Town

The project activity is implemented across multiple districts in Kerala through distributed Solar-BESS hybrid systems installed at residential, MSME, and institutional premises. Specific site locations are recorded in the NaviRex project database and will be provided during validation and verification.

A.4.3.3. District

Multiple districts across Kerala

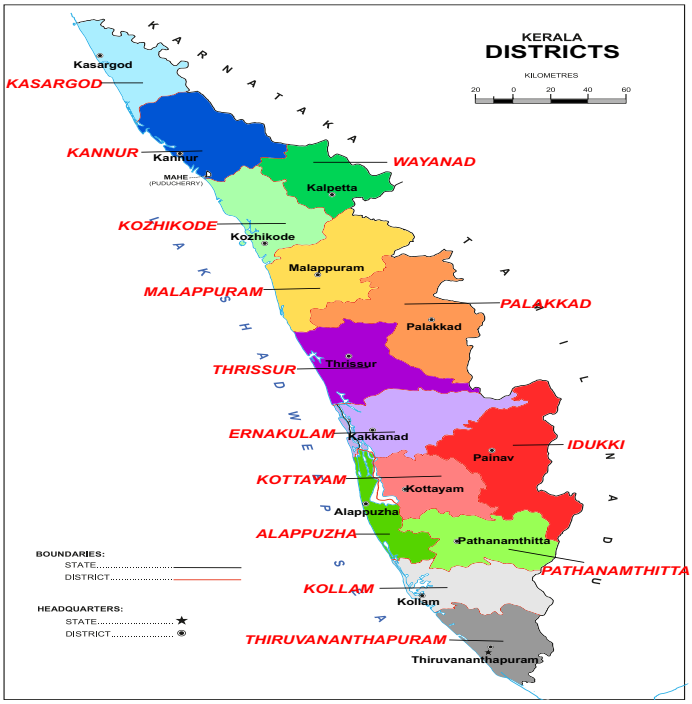
A.4.3.4. Geographical Coordinates

The project will be implemented across multiple districts in the state of Kerala, India. The geographical boundary of the project is given below:

Latitude: 8°18’ N to 12°48’ N

Longitude: 74°52’ E to 77°22’ E.

A.4.3.5. Local Map



A.4.4 Technologies/measures to be employed and/or implemented

The project activity encompasses grid-connected distributed Solar-BESS hybrid systems installed at residential, MSME, and institutional premises across Kerala, India. Systems are rooftop-mounted, ground-mounted, or installed on other built structures at participating premises, within an installed capacity range of 1 kWp to 1,000 kWp per system.

Each participating system comprises the following integrated components:

- Solar PV modules compliant with applicable BIS specifications and MNRE technical requirements
- Battery Energy Storage System (BESS) using Lithium Iron Phosphate (LFP), lead-acid, or similar electrochemical storage chemistry, configured to support solar self-consumption
- Hybrid inverter configured with solar-priority charging
- DC and AC cabling, switchgear, and overcurrent protection devices
- Earthing and surge protection systems compliant with applicable Indian electrical standards
- KSEB-approved bi-directional net meter
- KSEB solar generation meter, utility-administered with multiplying factor, recording electricity produced by the solar array

Participating systems generate renewable electricity for on-site loads, with surplus electricity exported to the KSEB distribution network under applicable net-metering or equivalent regulatory arrangements. Electricity generation is recorded by the KSEB solar meter at each system and constitutes the primary measurement basis for emission reduction calculations.

The NaviRex digital MRV platform collects, validates, and archives generation data across all participating systems, ensuring traceability and supporting periodic emission reduction calculations. Inverter telemetry serves as a secondary cross-check and as the data source for BESS grid-charging compliance monitoring.

The project activity is structured as a grouped project activity in accordance with Section B4.3 of the Detailed Procedure for Offset Mechanism. All participating systems employ the same technology, apply the same approved methodology, operate under the NaviRex unified MRV framework, and are connected to the KSEB distribution network, satisfying the similarity requirements of Section B4.3.3. The portfolio is constituted at the time of project registration, with details of all enrolled systems submitted to BEE prior to registration in accordance with Sections B4.3.2 and B4.3.5. All participating systems share a common crediting period commencing from the date of project registration. The grouping rationale- aggregating individually unviable distributed assets under a unified digital MRV platform to achieve carbon market participation satisfies the requirements of Section B4.3.4.

A.4.5 Technologies/measures existing prior to the implementation of the project (if applicable)

Prior to the implementation of the project activity, electricity demand at participating sites was met in whole or in part by electricity supplied by the Kerala State Electricity Board (KSEB) grid. No participating system was enrolled in any carbon crediting or Renewable Energy Certificate mechanism prior to its inclusion in the project activity.

A.4.6 Description of how the project activity will achieve GHG emission reductions and/ or removals

Electricity generated by participating grid-connected distributed Solar-BESS hybrid systems displaces electricity that would otherwise be supplied by the Kerala State Electricity Board (KSEB) grid, which includes generation from fossil-fuel-based power plants. Emission reductions are calculated in accordance with methodology BM EN01.001 as the product of the quantity of net electricity generation produced and supplied to the grid as a result of

the project activity, and the Grid Emission Factor for the Indian electricity grid as published by the Central Electricity Authority (CEA).

Electricity generation at each participating system is measured using the KSEB solar generation meter, a utility-administered instrument recording cumulative electricity produced by the solar array. The BESS stores excess solar generation for later self-consumption, increasing total solar utilisation and displacing grid electricity that would otherwise be drawn during low-generation periods, thereby contributing to the overall emission reductions achieved by the project activity.

A.4.7. GHG Reduction

A.4.7.1 Explanation on GHG Reduction

Participating grid-connected distributed Solar-BESS hybrid systems generate renewable electricity that displaces electricity otherwise supplied by the KSEB grid. Emission reductions are calculated as the product of the quantity of net electricity generation produced as a result of the project activity and the Grid Emission Factor for the Indian electricity grid, as published by the Central Electricity Authority (CEA). The integrated BESS increases solar utilisation by storing excess generation for later self-consumption, thereby contributing to overall grid displacement across the portfolio.

A.4.7.2 Justification of How Reductions are Above Business-as-Usual

In the absence of the project activity, electricity demand at participating sites would continue to be met by the KSEB grid. Individual small-scale Solar-BESS systems do not participate in carbon markets due to prohibitive transaction costs, absence of standardised MRV infrastructure, and limited institutional capacity among system owners. The NaviRex aggregation framework overcomes these barriers, enabling emission reductions that would otherwise remain unquantified and uncredited to be measured, verified, and monetised under the CCTS.

A.4.7.3 Estimated Annual GHG Reduction

The project aggregates distributed Solar-BESS hybrid systems across Kerala within an installed capacity range of 1 kWp to 1,000 kWp per system. As the final portfolio composition is not fixed at the time of submission, a representative system size of 10 kWp is applied for estimation purposes, with an expected annual generation of 1,500

kWh/kWp/year under Kerala solar resource conditions. A Grid Emission Factor of 0.710 tCO_2/MWh, sourced from the latest published CO_2 Baseline Database for the Indian Power Sector by the CEA, is applied. For an initial aggregation cohort of approximately 200 systems, estimated annual emission reductions are in the range of 2,000- 2,500 tCO_2e, subject to actual system capacities, generation performance, and applicable grid emission factor values at the time of verification.

A.4.7.4 Estimated GHG Reduction Over the Crediting Period

The project has selected a 10-year fixed crediting period. Total emission reductions over the crediting period are conservatively estimated in the range of 20,000–25,000 tCO_2e based on representative system assumptions and expected solar resource conditions in Kerala. This ex-ante estimate is indicative and subject to actual monitored generation data and applicable grid emission factors at each periodic verification. Actual ex-post issuance of Carbon Credit Certificates will be determined strictly from metered generation data for each participating system.

A.4.8 Project Implementation Timeline

- Project Start Date: 28 July 2025.
- Pilot System Identification and Agreements: 28 July 2025-ongoing through the enrollment window.
- Eligibility of Distributed Solar-BESS Systems: Systems commissioned from January 2025 onward are eligible for inclusion in the project activity, in accordance with applicable CCTS provisions. Systems installed prior to the commencement of the NaviRex aggregation programme were not enrolled in any carbon crediting mechanism at the time of installation and had no accessible pathway to carbon market participation in the absence of the project activity, consistent with the programme-level additionality demonstrated in Section C.3.
- Monitoring Period: Commences from the commissioning date of each participating system, subject to a common crediting period start date from project registration
- Portfolio Finalisation: Details of all enrolled systems submitted to BEE prior to project registration in accordance with the grouped project requirements of the Detailed Procedure for Offset Mechanism

- Crediting Period Start: Date of project registration under CCTS, common to all participating systems.
- Crediting Period Length: 10 years from the date of registration.

A.4.9 Details of Project Funding

Participating distributed Solar-BESS systems are financed and owned by individual households, MSMEs, and institutions under commercial or subsidised solar installation programmes. NaviRex India Pvt Ltd funds its project aggregation, monitoring, reporting, and verification responsibilities through its own capital and operational resources. No carbon finance or emission reduction funding from external sources is received for the project activity.

Government incentives and capital subsidies applicable to Solar-BESS installations are not carbon finance instruments and do not constitute a claim over the environmental attributes of electricity generation. Participation in the project activity is permitted where such subsidies are availed, provided that no regulatory provision explicitly assigns ownership of carbon credits or environmental attributes to the subsidy provider. Where applicable regulations are silent on this matter, carbon rights are treated as vesting with the system owner and are transferred to NaviRex India Pvt Ltd through the participant agreement executed at enrollment. In the event of future regulatory clarification assigning environmental attribute ownership to a subsidy provider, affected systems will be addressed in accordance with that guidance and excluded from crediting where necessary to maintain the integrity of the project activity.

A.4.10 Project Bundling (if applicable)

Not applicable.

Section II : Project – Crediting Period

B.1. Project Development Cycle

B.1.1. Date on Decision on implementation of Project.

01 June 2025.

B.1.2. Project Start Date

28 July 2025.

B.1.3. Expected Lifetime of the project

20 years, based on standard manufacturer performance warranties for solar PV modules and inverters compliant with applicable BIS and MNRE specifications. Battery Energy Storage Systems using LFP or equivalent chemistry carry manufacturer warranties typically in the range of 10 years.

B.2. Crediting Period

B.2.1. Type of Crediting period opted

Fixed crediting period.

B.2.2. Fixed Crediting Period

B.2.2.1. Start date of Crediting Period

The crediting period commences from the date of project registration under CCTS in accordance with the definition of Crediting Period Start Date under Section V(VI) of the Detailed Procedure for Offset Mechanism.

B.2.2.2. End Date of Crediting Period

Ten years from the crediting period start date as defined in B.2.2.1 above.

B.3.3. Renewable Crediting Period

Not Applicable.

Section III : Methodology

C.1. Selection of Methodology

C.1.1. Details on approved methodology applied

BM EN01.001 - Grid-connected electricity generation from renewable sources, issued by the Bureau of Energy Efficiency (BEE) under India's Carbon Credit Trading Scheme (CCTS), Version 1.0

C.1.2. Justification of application of methodology

The project activity meets the applicability conditions of methodology BM EN01.001 as a grid-connected renewable energy generation project activity integrating Battery Energy Storage System (BESS) with solar photovoltaic generation, eligible under the applicable modes of BESS integration set out in Table 2 of the methodology.

Paragraph 9 of BM EN01.001 excludes standalone grid-connected solar PV installations from eligibility. Participating systems in this project activity are not standalone solar PV installations each integrates a BESS with the solar array, satisfying the conditions of paragraph 11(c) and qualifying under the BESS integration pathway of the methodology.

All participating systems are configured to charge the BESS primarily from solar generation, with grid-to-BESS charging restricted in accordance with paragraph 11(d) of the methodology. The project monitors compliance with this condition through inverter energy flow data reviewed at each monitoring period, with non-compliant systems excluded from crediting in accordance with paragraph 43 of the methodology.

All participating systems are connected to the Kerala State Electricity Board (KSEB) distribution network under net-metering or equivalent arrangements, and electricity generation is measured using utility-administered metering at each system. The project activity therefore qualifies for application of methodology BM EN01.001 for grid-connected renewable electricity generation with integrated BESS.

C.2. Application of Methodology

C.2.1. Details on Application of Methodology

The project applies methodology BM EN01.001 v1.0 for grid-connected renewable electricity generation. Emission reductions are calculated in accordance with Equation 17 of the methodology:

$$\mathbf{ER_y = BE_y - PE_y}$$

Where: ER_y = Emission reductions in year y (tCO_2e/yr), BE_y = Baseline emissions in year y (tCO_2/yr), PE_y = Project emissions in year y (tCO_2e/yr)

Project Emissions

Project emissions (PE_y) for this project activity are considered negligible and are conservatively treated as zero.

No fossil fuels are consumed for electricity generation within the project boundary. Auxiliary electricity consumption attributable to inverter standby, monitoring equipment, and balance-of-system control loads (Aux_y as defined in BM EN01.001) is negligible relative to annual solar generation across all participating systems, consistent with the negligible auxiliary consumption established for rooftop Solar-BESS systems.

Accordingly:

$$\mathbf{PE_y = 0}$$

Baseline Emissions

Baseline emissions are calculated in accordance with Equation 11 of the methodology:

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

Where: BE_y = Baseline emissions in year y (tCO_2/yr) $EG_{pj,y}$ = Quantity of net electricity generation produced and supplied to the grid as a result of the project activity in year y (MWh/yr) EFgrid,CM,$_y$ = Grid Emission Factor for grid-connected power generation in year y, as published by the Central Electricity Authority (CEA) in the CO_2 Baseline Database for the Indian Power Sector

Leakage emissions are not applicable to this project activity in accordance with the applied methodology.

Calculation of $EG_{pj,y}$

For Greenfield project activities under the applicable provisions of the methodology, $EG_{pj,y}$ is calculated as:

$$\mathbf{EG_{pj,y} = EG_{facility,y}}$$

Where $EG_{facility,y}$ is the quantity of net electricity generation supplied by the project plant to the grid in year y (MWh/yr).

Each participating system operates under Scenario III of methodological tool BM-T-003, supplying electricity both to on-site loads and to the KSEB distribution network, with generation monitoring consistent with the measurement procedures specified in Table 12 of BM-T-003. Table 14 of the methodology specifies that $EG_{pj,y}$ may be measured directly by an on-site electricity meter, or alternatively calculated as $EG_{pj,y} = TEG_y - Aux_y$, with the table note confirming that where an on-site meter provides direct values for $EG_{pj,y}$, that meter may be used and the formula calculation is not required.

KSEB installs a dedicated solar generation meter at each net-metered solar connection, utility-administered with multiplying factor MF=1, recording cumulative total electricity produced by the solar array. Aux_y, as defined in Table 15 of the methodology, represents the plant's own auxiliary and parasitic operational consumption inverter standby, monitoring equipment, and control system loads.

For rooftop Solar-BESS systems, these parasitic losses are negligible relative to annual generation. Accordingly:

$$\mathbf{EG_{pj,y} = TEG_y - Aux_y \approx TEG_y}$$

Under Scenario III of BM-T-003, $EG_{pj,y}$ represents the total quantity of renewable electricity generated by the project plant that displaces grid electricity supply encompassing both electricity directly exported to the KSEB distribution network and electricity generated by the solar array, stored in the BESS, and subsequently self-consumed on-site. Both streams equally displace electricity that would otherwise be drawn from the KSEB grid, and both are captured by the KSEB solar generation meter, which records cumulative total electricity produced by the solar array irrespective of its downstream routing. Since Aux_y is negligible for rooftop Solar-BESS systems as established above, total solar generation recorded by the KSEB meter constitutes $EG_{pj,y}$ within the meaning of the methodology. The KSEB solar generation meter provides direct values for $EG_{pj,y}$ and is used as the primary measurement instrument for crediting calculations, consistent with the Table 14 note of BM EN01.001 and the Scenario III measurement provisions of Table 12 of BM-T-003. Annual generation for each system is determined

from consecutive cumulative meter readings converted to MWh. Portfolio $EG_{pj,y}$ is the sum of per-system values for all enrolled systems passing NaviRex QA/QC validation in the monitoring period.

C.2.2 Description of baseline scenario

In the absence of the project activity, electricity demand at participating sites would continue to be met in whole or in part by electricity supplied by the Kerala State Electricity Board (KSEB) grid, which includes generation from fossil-fuel-based power plants. No aggregation of distributed Solar-BESS systems for carbon crediting would occur, and electricity consumed from the grid at participating sites would continue to result in greenhouse gas emissions associated with grid electricity generation.

C.2.3 Justification of selection of baseline scenario

The baseline scenario is electricity supplied by the Kerala State Electricity Board (KSEB) grid, as participating sites would continue to meet their electricity demand in whole or in part from the regional grid in the absence of the project activity. This is consistent with methodology BM EN01.001, which defines the baseline as grid electricity displaced by renewable electricity generation from grid-connected renewable energy projects. The identification of the baseline scenario follows the procedure applicable to Greenfield project activities under Section 4.2.1 of the methodology.

Any captive fossil-fuel generation present at participating sites is excluded from the project boundary. All baseline emission reductions are calculated strictly against the grid emission factor, and no emission reductions are claimed for the potential displacement of captive fossil-fuel generation. This approach is conservative and consistent with the methodology.

C.2.4. Description of how emission in project scenario is reduced as compared to baseline

Under the baseline scenario, electricity demand at participating sites would be met in whole or in part by the Kerala State Electricity Board (KSEB) grid, which includes fossil-fuel-based electricity generation. Under the project scenario, distributed Solar-BESS hybrid systems generate renewable electricity that displaces electricity otherwise supplied by the KSEB grid, resulting in avoided greenhouse gas emissions calculated in accordance with methodology BM EN01.001 using the quantity of net electricity generation produced as a result of the project activity and the applicable grid emission factor.

The integrated BESS stores excess solar generation for later self-consumption, increasing total solar utilisation and displacing grid electricity

that would otherwise be drawn during low-generation and evening peak periods, thereby supporting distribution network stability and contributing to overall emission reductions achieved across the portfolio.

C.2.5. Description of Project Boundary

The project boundary encompasses distributed grid-connected Solar-BESS hybrid systems installed at residential, MSME, and institutional sites across Kerala, India. Each participating system consists of solar PV modules, BESS, hybrid inverter, associated electrical equipment, and utility-administered metering connected to the KSEB distribution network.

The project boundary includes all equipment involved in renewable electricity generation, storage, and measurement at each participating site. Greenhouse gas emission reductions occur through displacement of grid electricity generation outside the project boundary. Any pre-existing or backup fossil-fuel generation equipment at participating sites is excluded from the project boundary, consistent with the conservative baseline approach described in Section C.2.3.

The project is structured as a grouped project activity under the applicable provisions of the Detailed Procedure for Offset Mechanism. The spatial extent and monitoring data for all participating systems are maintained in the NaviRex platform.

C.3 Demonstration of Additionality

C.3.1 Approach to Additionality

The grouped project activity is demonstrated to be additional through a financial barrier analysis applied at programme level, in accordance with methodological tool BM-T-001, as referenced by methodology BM EN01.001. The analysis establishes that neither the prosumer-level investment in the BESS-integrated hybrid system, nor the programme developer's investment in the digital MRV platform and carbon credit aggregation infrastructure, would proceed without carbon credit revenue from the CCTS offset mechanism.

The additionality demonstration applies to all systems enrolled in the grouped project on the basis that each constituent system employs the same technology, operates under the same KSERC net-metering regulatory framework, and faces the same financial barrier. A 3 kWp hybrid system is used as the representative unit the smallest residential category in the portfolio and therefore the most conservative basis. Larger systems carry proportionally higher BESS capital expenditure with comparable revenue structures and are no more commercially viable; the financial barrier demonstrated for the representative unit applies across the portfolio.

C.3.2 Programme Structure and Investment Context

The programme aggregates rooftop hybrid Solar-BESS installations across residential, MSME, and institutional premises in Kerala under the NaviRex digital MRV platform. The financial barrier analysis operates at two levels: the prosumer investment decision to install a BESS-integrated hybrid system rather than a standalone solar system, and the programme developer's investment in the aggregation and MRV infrastructure necessary to enable carbon market participation for distributed assets.

Both layers independently satisfy the financial barrier test, as demonstrated below.

C.3.3 Revenue Methodology

Revenue is modelled using a dual-stream framework applied uniformly to all enrolled systems. On-site self-consumed electricity is valued at the applicable KSEB residential retail tariff, escalating annually in line with historical KSEB tariff revision trends. Surplus electricity exported to the grid is monetised at the applicable Avoided Purchase of Power Cost (APPC) rate published by KSERC, net of the applicable banking deduction over the average settlement cycle. The dual-stream model is directly auditable against the applicable KSERC tariff order. Full cash flow inputs and assumptions are documented in the financial model submitted as supporting documentation to the Accredited Carbon Verification Agency.

C.3.4 Benchmark Return

The project-specific benchmark is the post-tax WACC of 10.48%, derived using the CAPM methodology in accordance with BM-T-001. Inputs: risk-free rate 7.10% (RBI 10-year G-Sec weekly bulletin); equity beta 1.00 (Indian RE listed sector average: Adani Green, Tata Power RE, Greenko); equity risk premium 6.00% (Damodaran India ERP); cost of debt 10.50% (RBI MCLR plus spread); debt-to-equity 50:50 (CDM Tool 27 Section 16 default); effective corporate tax rate 25.20%.

C.3.5 Financial Barrier Analysis Scenario Results

The financial barrier analysis evaluates six scenarios covering the relevant combinations of technology choice, government subsidy, and carbon credit income for a representative 3 kWp system. Results are summarised below.

Scenario	**Technology**	**Subsidy**	**Carbon Credits**	**IRR**	**Vs Benchmark**	**Verdict**
1	Pure Solar	No	No	9.71%	Below	Additional
2	Pure Solar	Yes	No	15.41%	Above	Not additional

3	Hybrid Solar-BESS	No	No	2.95%	Below	Additional
4	Hybrid Solar-BESS	No	Yes	3.51%	Below	Additional
5	Hybrid Solar-BESS	Yes	No	4.54%	Below	Additional
6	Hybrid Solar-BESS	Yes	Yes	5.20%	Below	Additional

Scenario 2 establishes the commercial baseline: a pure solar system eligible for the PM Surya Ghar capital subsidy clears the benchmark return and proceeds commercially without carbon credit income. This is consistent with the common practice finding in Section C.3.7 majority of registered Kerala rooftop connections are pure grid-tied solar, confirming that the subsidy-supported pure solar configuration represents the activity that occurs in the absence of this project.

The project activity is the incremental BESS-integrated hybrid configuration. Under every combination of subsidy and carbon credit income tested (Scenarios 3 through 6), the hybrid system fails to reach the benchmark return by a margin of between 5.2 and 7.5 percentage points. Carbon credit income improves the hybrid IRR by approximately 0.66 percentage points across tested scenarios a necessary contribution to programme viability but insufficient to make the investment commercially attractive. Even in the most favourable scenario combining full subsidy and carbon credits (Scenario 6), the hybrid system remains 5.2 percentage points below the WACC benchmark.

C.3.6 Programme Developer - Second-Tier Financial Analysis

The additionality of the programme is independently corroborated by the financial position of NaviRex India Pvt Ltd as programme developer. The investment required to develop and operate the NaviRex digital MRV platform, complete regulatory registration, prepare the PDD, and sustain ongoing verification infrastructure represents a capital commitment that cannot be recovered from carbon credit revenue at current market prices across the enrolled portfolio at this scale.

NaviRex's programme developer investment therefore fails the financial barrier test independently of the prosumer-level analysis. The programme infrastructure enabling the grouped project activity would not be developed or sustained without a functioning CCTS carbon credit market at viable scale. The programme is additional at both the prosumer and developer level.

C.3.7 Common Practice Analysis

The installation of BESS integrated with rooftop solar PV for the purpose of carbon credit generation is not standard practice among residential and small commercial consumers in Kerala. Available KSEB net-metering registration data and MNRE's PM Surya Ghar portal indicate that the substantial majority of registered rooftop solar connections in Kerala are grid-tied systems without battery storage. Of the remaining installations with battery storage, substantially all are off-grid or backup-power configurations rather than grid-integrated hybrid systems oriented toward carbon credit participation.

The absence of comparable hybrid Solar-BESS carbon crediting projects in the region, combined with the demonstrated financial unviability at prevailing economics, confirms that the project activity would not occur in the absence of the CCTS programme incentive.

C.3.8 Conclusion on Additionality

The grouped project activity satisfies the financial barrier test at both the prosumer and programme developer level. At the representative unit level, the hybrid configuration yields an IRR ranging from 2.95% (no subsidy, no carbon credits) to 5.20% (with subsidy and carbon credits), remaining well below the WACC benchmark of 10.48% under all six scenarios tested. Carbon credit income contributes approximately 55- 66 basis points of IRR uplift across tested scenarios, a necessary but insufficient contribution to commercial viability. At the developer level, the programme investment is irrecoverable at current portfolio scale and market prices without a functioning CCTS mechanism. No credible investment scenario exists under which the programme would be implemented in the absence of CCTS carbon credit income. The programme is additional within the meaning of BM EN01.001 and BM-T-001.

C.4 Addressing non-permanence and risks of reversals

C.4.1 Identification of risk or reversal

A range of potential risks that could lead to temporary or permanent reduction in emission reductions has been identified. These risks are grouped as follows:

a) Technical risks

- Failure of PV modules, inverters, BESS, or balance-of-system components
- Loss of grid connection or malfunction of net-metering or solar generation metering equipment
- BESS degradation reducing storage capacity over time
- Structural damage to rooftop installations

b) Operational risks

- Project participants discontinuing system operation.
- Lack of maintenance leading to reduced performance.

c) Data and monitoring risks

- Missing or inaccurate generation data.
- Failure of inverter telemetry or communication systems.
- Errors in manual reporting or billing records.

d) Regulatory risks

- Changes in net-metering rules or export tariff.
- Revision of grid emission factors.

e) Natural risks

- Cyclone, flooding, lightning, or fire damage.

C.4.2 Reversal risk assessment

The identified risks were evaluated in terms of probability and potential impact on emission reductions across the aggregated distributed-solar portfolio. The assessment considers residential systems (e.g., 3 kW installations monitored via net-meter data) and institutional installations such as hospitals.

Risk Category	**Example**	**Probability**	**Impact**	**Overall Risk**
Technical	Inverter or BESS failure	Medium	Low	Low
Technical	Panel damage	Low	Medium	Low
Operational	Owner stops system	Low	Medium	Low
Data	Missing telemetry/API failure	Medium	Low	Low
Data	Fraudulent reporting	Low	High	Medium
Regulatory	Net-meter rule change	Low	Medium	Low
Natural	Flood/cyclone damage	Low	Medium	Low

The overall reversal risk of the project activity is assessed as low. Emission reductions cease when systems are not operational and are excluded from crediting, ensuring environmental integrity.

C.4.3 Reversals risk mitigation plan

NaviRex India Pvt Ltd has established technical, operational, contractual, and monitoring measures to minimize the likelihood of reversals

and maintain environmental integrity across the aggregated distributed Solar-BESS portfolio.

a) Technical Measures

Participating systems are installed in accordance with applicable Indian electrical and structural safety standards. Remote monitoring through inverter telemetry and utility billing data enables detection of underperformance or system failure across the portfolio. Automated alerts are generated where system generation falls below expected thresholds for a defined period. Failed components are repaired or replaced within reasonable timeframes to restore system operation. BESS grid-charging compliance is monitored through annual inverter energy flow reporting, with non-compliant systems excluded from crediting by the NaviRex platform until compliance is restored.

b) Monitoring and Data Integrity Measures

Dual-source monitoring is applied using inverter telemetry and utility billing data where available. Automated validation checks identify data gaps, inconsistencies, and anomalies across the portfolio. Monitoring data is timestamped and archived in secure digital systems with audit trails. Periodic cross-checks are performed using utility bills and participant confirmations. Data access is restricted to authorised personnel.

c) Operational and Contractual Measures

Participation agreements require system owners to operate and maintain their systems in good working condition and to notify NaviRex of system failures, dismantling, or ownership changes. NaviRex retains the right to request supporting documentation or inspections where performance anomalies are identified. Systems that are permanently decommissioned or cease operation are excluded from crediting.

d) Regulatory Measures

NaviRex periodically reviews applicable net-metering regulations, grid emission factors, and CCTS requirements. Monitoring and crediting calculations are updated as required to remain consistent with current regulatory frameworks. Any regulatory change materially affecting project performance is documented and reflected in subsequent monitoring reports.

e) Natural Hazard Mitigation

Systems are installed with appropriate protection against lightning, flooding, and wind loads in accordance with applicable

Indian standards. Post-event inspections are conducted following extreme weather events where feasible. Systems confirmed as non-operational following a natural hazard event are excluded from crediting until restoration is verified.

C.4.4 Remediation of reversals

In the event that a potential reversal or reduction in emission reductions is detected, NaviRex India Pvt Ltd shall implement the following remediation procedure.

a) Detection

Automated monitoring systems identify abnormal performance including prolonged zero generation, sudden output reductions, or inconsistencies between inverter telemetry and utility billing data. Alerts are reviewed by the NaviRex platform operator on a priority basis. Project participants may also report system failures or operational issues directly to NaviRex.

b) Investigation

NaviRex verifies the anomaly by reviewing available inverter data, utility bills, net-meter records, and participant confirmation. Where necessary, supporting documentation or site inspection is requested. The cause is classified as technical, operational, regulatory, data-related, or natural-hazard-related to determine the appropriate remediation pathway.

c) Adjustment of Crediting

Emission reductions are not claimed for periods during which systems are non-operational or monitoring data are unreliable. Where previously issued emission reductions are affected, appropriate deductions are made in subsequent monitoring periods. The Environmental Integrity Buffer Reserve established under Section C.4.3 may be applied to compensate for verified reversals in accordance with the buffer reserve provisions.

d) Corrective Action

System owners are required under participant agreements to repair or replace faulty equipment within a reasonable timeframe. Monitoring data integrity is verified before emission reductions are resumed for the affected system.

e) Documentation

All detected reversals, investigations, corrective actions, and crediting adjustments are recorded in the NaviRex monitoring database. Supporting evidence including utility bills, telemetry logs,

and inspection records is archived electronically. Records are retained for a minimum of two years after the end of the last crediting period in accordance with the monitoring provisions of BM EN01.001.

f) Follow-up Monitoring

Following corrective action, system performance is monitored against expected generation benchmarks before emission reductions are resumed. Persistent underperformance triggers further investigation or permanent exclusion of the system from the project activity.

Environmental Integrity Buffer Reserve

NaviRex India Pvt Ltd shall maintain an Environmental Integrity Buffer Reserve as a safeguard against data errors, monitoring discrepancies, or recalculation adjustments identified during validation, verification, or post-issuance review.

A buffer reserve equivalent to 5% of the total Carbon Credit Certificates (CCCs) issued in each monitoring period shall be withheld from circulation and held within the NaviRex project registry account. The applicable buffer percentage shall be determined prior to registration in accordance with applicable CCTS guidance and documented in the first monitoring report.

The buffer reserve may be drawn upon in the following circumstances:

(a) Recalculation of emission reductions for one or more participating systems as a result of identification of a data error, monitoring gap, or revised eligibility classification during verification;

(b) Compensating for any negative emission reductions arising from grid-to-BESS charging exceeding the 2% threshold under paragraph 11(d) of BM EN01.001, where such compensation is not recoverable from subsequent monitoring period issuances within a reasonable timeframe;

(c) Any other adjustment required by the Accredited Carbon Verification Agency (ACVA) or BEE to maintain the environmental integrity of the aggregated project activity.

In the event that a recalculation results in a reduction in attributed emission reductions for any participating system or group of systems, the corresponding CCCs shall first be deducted from the buffer reserve. Where the buffer reserve is insufficient to cover the full deduction, the shortfall shall be recovered from the next periodic issuance prior to release of any CCCs to the project account.

The buffer reserve shall be replenished to the target level at each periodic verification. Records of buffer reserve movements, including the basis for any draw, shall be maintained in the NaviRex MRV platform and disclosed in each monitoring report submitted for verification.

Section IV: Estimation of GHG Emission Reduction

D.1. GHG Emission from Baseline and Project Activity

D.1.1. Estimate of GHG emissions

The project activity aggregates multiple grid-connected distributed Solar-BESS hybrid systems across Kerala, India. Electricity generated by participating systems displaces electricity that would otherwise be supplied by the regional grid, which includes fossil-fuel-based generation. Baseline greenhouse gas emissions are associated with grid electricity generation displaced by the project activity and are calculated as:

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

Where: BE_y = Baseline emissions in year y (tCO_2/yr) $EG_{pj,y}$ = Quantity of net electricity generation produced and supplied to the grid as a result of the project activity in year y (MWh/yr) $EFgrid,CM,_y$ = Grid Emission Factor for grid-connected power generation in year y, as published by the CEA in the CO_2 Baseline Database for the Indian Power Sector

For the initial aggregation cohort of approximately 200 distributed Solar-BESS hybrid systems with a representative installed capacity of 10 kWp per system, total aggregated capacity is approximately 2 MWp. Applying an annual generation factor of 1,500 kWh/kWp/year under Kerala solar resource conditions and a grid emission factor of 0.710 tCO_2/MWh, estimated annual baseline emissions are approximately 2,130 tCO_2/year, conservatively expressed as a range of 2,000–2,500 tCO_2e/year to reflect variation in actual system capacities and generation performance.

Actual baseline emissions will be determined ex-post from monitored generation data for each participating system, with grid emission factors updated in accordance with the latest CEA published values at each monitoring period.

D.1.2. Estimated Leakage Emissions

The project activity does not involve relocation of existing equipment, fuel switching, diversion of renewable equipment from other users, or land use changes that would increase emissions outside the project boundary. The project does not increase demand for fossil fuels or displace electricity generation to higher-emission sources. Manufacturing and installation emissions associated with Solar-BESS equipment are excluded from the

project boundary in accordance with the applied methodology. Leakage emissions are conservatively assumed to be zero.

D.1.3. Estimated Project Emissions

No fossil fuels are consumed for electricity generation within the project boundary. Auxiliary electricity consumption for inverters, monitoring equipment, and balance-of-system loads is negligible relative to annual generation, consistent with the treatment of Aux_y in Section C.2.1. Project emissions are conservatively assumed to be zero.

D.1.4. Estimated GHG Reductions

Emission reductions in year y are calculated as:

$$\mathbf{ER_y = BE_y - PE_y - LE_y}$$

Where: ER_y = Emission reductions in year y (tCO_2e/yr), BE_y = Baseline emissions in year y (tCO_2/yr), PE_y = Project emissions in year y (tCO_2e/yr), LE_y = Leakage emissions in year y (tCO_2e/yr)

As established in Sections D.1.2 and D.1.3, both leakage and project emissions are conservatively assumed to be zero. Therefore:

$$\mathbf{ER_y = BE_y}$$

Estimated emission reductions for the initial cohort over the crediting period are presented below. A conservative annual degradation factor of 0.5% is applied to reflect typical solar PV module performance decline over time. These values are ex-ante estimates and will be finalised based on monitored generation data and applicable grid emission factors at each periodic verification.

Year	**Estimated Generation (MWh)**	**Emission Reductions (tCO_2e)**
Year 1	3,000	2,130
Year 2	2,985	2,119
Year 3	2,970	2,108
Year 4	2,955	2,098
Year 5	2,940	2,087
Year 6	2,926	2,077
Year 7	2,911	2,066
Year 8	2,897	2,056

Year 9	2,882	2,046
Year 10	2,868	2,036
Total	**29,334**	**20,827**

These estimates apply to the initial portfolio constituted at project registration. The NaviRex digital MRV platform supports measurement, aggregation, and reporting of generation data across all participating systems, ensuring consistent and transparent calculation of emission reductions at each periodic verification.

Section V: Data Parameters Monitoring

E.1. Data Parameters fixed ex ante

Parameter #1

Data/parameter	$EF_{grid,CM,y}$
Description	Grid Emission Factor for electricity displaced by the project activity in year y, representing the CO_2 emissions associated with electricity supplied by the Indian electricity grid
Data Unit	tCO_2/MWh
Equations Referred	$BE_y = EG_{PJ,y} \times EF_{grid,CM,y}$ (Equation 11, BM EN01.001)
Purpose of Data	Baseline emissions calculation
Value(s) applied	0.71 tCO_2/MWh
Source of data	Central Electricity Authority. CO_2 Baseline Database for the Indian Power Sector, Version 21.0 Ministry of Power, Government of India
Comments/Remarks (if any)	NIL

E2. **Data & Parameter to be monitored**

Parameter #1

Net Electricity Generated

E.2.1 Data/parameter	$EG_{PJ,y}$
E.2.2 Description	Quantity of net electricity generation produced and supplied to the grid as a result of the implementation of the project activity in year y, determined in accordance

	with Table 14 of BM EN01.001 and the Scenario III measurement provisions of Table 12 of BM-T-003	
E.2.3 Data Unit	MWh/year	
E.2.4 Equations Referred	Used in baseline emission equation: $BE_y = EG_y \times EF_{grid,y}$ (Equation 11, BM EN01.001)	
E.2.5 Purpose of Data	E.2.5.1 Baseline emission/ removals	Used to calculate baseline emissions from displaced grid electricity
	E.2.5.2 Project emission/ removals	Not applicable.
	E.2.5.3 Leakage emissions	Not applicable.
E.2.6 Value(s) applied	Measured values recorded during each monitoring period.	
E.2.7 Source of data	Primary source: KSEB solar generation meter readings as recorded in official KSEB billing records. Secondary source: Inverter telemetry data used as cross-check only and not for primary crediting calculations	
E.2.8 Measurement/ calculation methods and procedures	Annual electricity generation for each participating system is determined from consecutive cumulative readings of the KSEB solar generation meter, converted to MWh. Each participating system operates under Scenario III of BM-T-003, supplying electricity both to on-site loads and to the KSEB distribution network. As established in Section C.2.1, auxiliary consumption (Aux_y) for rooftop Solar-BESS systems is negligible, and the KSEB solar generation meter provides direct values for $EG_{pj,y}$ in accordance with the Table 14 note of BM EN01.001. Portfolio $EG_{pj,y}$ is the sum of per-system values for all enrolled systems passing NaviRex QA/QC validation in the monitoring period	
E.2.9 Entity/ person responsible for the measurement	Primary measurement is performed by KSEB through utility-administered metering systems operating under regulatory oversight. NaviRex is responsible for collection, validation, aggregation, and archival of generation data for emission reduction calculations	
E.2.10 Measuring instrument(s)	E.2.10.1 Type	KSEB solar generation meter, utility-administered with multiplying factor MF=1

	E.2.10.2 Accuracy	As per KSEB and applicable electricity distribution company standards
	E.2.10.3 Calibration Requirements	Calibration and maintenance performed by KSEB in accordance with applicable regulatory requirements
E.2.11 QA/QC Procedures Applied	Generation data is subject to automated consistency checks in NaviRex, including comparison against capacity-normalised generation benchmarks, to identify data entry errors or system anomalies requiring investigation prior to crediting. Anomalous values are verified using supporting utility billing documentation or available telemetry data before crediting is confirmed. Duplicate registrations and inconsistent readings are investigated prior to crediting. BESS grid-charging compliance is monitored as described in E.2.12 below	
E.2.12 Comments/Remarks (if any)	KSEB solar generation meter readings from official billing records constitute the primary evidence for emission reduction calculations. Inverter telemetry is used solely as a secondary verification tool. All data is archived electronically in the NaviRex platform in accordance with the monitoring provisions of BM EN01.001	

BESS Grid-Charging Compliance

Participating systems are configured with solar-priority charging at firmware level as a design parameter. Overriding this configuration requires deliberate manual intervention at the inverter settings level and cannot occur through normal system operation. Given the ratio of BESS capacity to annual solar generation across enrolled systems, grid-to-BESS charging exceeding 2% of annual solar generation is not achievable under normal operating conditions without deliberate reconfiguration.

Compliance with paragraph 11(d) is therefore maintained primarily through system design in accordance with paragraph 11(c).

As periodic confirmation, NaviRex collects a cumulative energy flow report from the manufacturer's inverter monitoring platform at the close of each monitoring period. Where the platform report confirms grid-to-BESS charging below 2% of total solar generation for the monitoring period, the system is treated as compliant for that period. Where the inverter platform report is unavailable for a given monitoring period due to connectivity loss or portal outage, NaviRex applies the following fallback hierarchy in order: (i) utility billing import data is reviewed for the affected system to confirm the

absence of anomalous grid import volumes inconsistent with normal residential or MSME consumption patterns; (ii) where utility billing data is also unavailable or inconclusive, a participant self-certification with supporting documentary evidence (such as inverter display screenshots or installer confirmation of firmware configuration) is obtained. A system for which neither the platform report nor a satisfactory fallback can be obtained within a monitoring period is excluded from crediting for that monitoring period. Compliance is reinstated in the subsequent period upon confirmation of data availability.

E.3 Sampling

The project applies a full census monitoring approach for all parameters that directly affect emission reduction calculations. The quantity of net electricity generation ($EG_{pj,y}$) is monitored for 100% of participating systems using the KSEB solar generation meter and official KSEB billing records. Statistical sampling is not required for the quantification of emission reductions.

Where sampling is applied for parameters that do not directly affect emission reduction calculations such as physical site inspections or document verification the ACVA will determine the appropriate sampling approach, sample size, and verification method in accordance with applicable CCTS standards. Remote verification through NaviRex platform data and utility billing records may substitute for physical site inspection where the ACVA determines that sufficient documentary evidence exists.

Section VI: Sustainable Development

F.1 Environment and Social safeguards (as per A6.4 SD Tool)

Safeguard	Elements	Assessment
Environment	Energy	No harm, the project installs rooftop solar systems that generate clean electricity for on-site use, with surplus power fed into the grid under approved net-metering arrangements. These systems operate within existing infrastructure and comply with all safety and grid standards. Rather than affecting other user energy supply, the project adds renewable electricity to the grid and supports overall reliability.
Environment	Air, Land and Water	No harm, the project installs solar panels mainly on rooftops and existing structures, so no land clearing or excavation is required. The systems do not release pollutants during

		operation and do not affect soil, groundwater, or surrounding land. Installation and maintenance follow standard safety and environmental practices, and any equipment at end-of-life will be handled under applicable e-waste rules.
	Ecology and Natural resources	No impact, the project installs solar panels on existing rooftops and built structures, so it does not disturb forests, wildlife habitats, or natural ecosystems. No land clearing, or resource extraction is involved. The activity operates within developed areas and does not affect biodiversity, protected areas, or ecosystem services.
Social	Human rights	No impact, the project is implemented through voluntary participation and does not involve land acquisition, displacement, or restriction of rights. All installations are carried out by MNRE-approved EPC contractors, ensuring compliance with national labour, safety, and environmental regulations. Regular training is provided to EPC partners and project staff to uphold worker safety, fair practices, and responsible engagement.
	Labour	No impact, the project supports and work exclusively with MNRE-approved EPC contractors, ensuring compliance with national labour laws, occupational health and safety standards. Regular training is provided to reinforce safe working conditions and responsible labour practices. There is no use of forced or child labour, and workers are treated fairly and without discrimination.
	Health and Safety	No harm, the project involves rooftop solar systems installed on existing buildings, with no large construction or hazardous activities, Installations are carried out by MNRE-approved EPC contractors following strict safety standards and regular training protocols. The project does not create additional health or safety risks for communities, including vulnerable groups.

Social	Gender Equality	No harm, we work only with MNRE-approved EPC contractors, who are required to comply with Indian labour laws, including provisions on non-discrimination, equal opportunity, and equal pay. Employment and project-related opportunities are accessible without bias based on gender, marital status, or background.
	Land acquisition and involuntary resettlement	No impact, the project involves rooftop solar installations on existing residential, commercial, and institutional buildings. It does not require land acquisition, changes in land use, or access restrictions. Participation is entirely voluntary, and systems are installed only on premises owned or legally occupied by the participants. The project does not cause physical or economic displacement and does not affect livelihoods or shelter.
	Indigenous People	Not applicable, the project does not interact with or impact the collective rights, lands, livelihoods, or cultural heritage of Indigenous or tribal communities.
	Corruption	Anti-corruption compliance is ensured. The project formally declares that it will be developed and operated in full compliance with all applicable laws. It does not involve any illegal practices, including fraud, bribery, money laundering, or tax evasion. Clear agreements, documented procedures, and proper financial and monitoring records are maintained to ensure transparency, accountability, and integrity throughout the project lifecycle.
Social	Cultural heritage	No impact, the project does not affect any cultural, historical, or religious sites, objects, or traditions. It is implemented within existing, legally permitted premises and does not involve land disturbance, relocation, or use of traditional knowledge.

F.2 Quantification of impact due to project Activity (as per NIF Framework by MoSPI)

Under the MoSPI SDG National Indicator Framework (NIF), the project contributes directly to SDG 7 (Target 7.2) and SDG 9 (Target 9.4). For an initial

cohort of approximately 200 grid-connected distributed Solar-BESS systems, with a representative system size of 10 kW, annual renewable electricity generation is estimated at approximately 3,000 MWh/year (3 GWh/year), corresponding to about 2 MW of aggregated distributed Solar-BESS capacity. Using a conservative grid emission factor of 0.710 tCO_2/MWh, the project is expected to avoid approximately 2,130 tCO_2/year of power-sector emissions (≈ 21,480 tCO_2 over 10 years, subject to monitoring, verification, and applicable grid emission factors).

These quantified outcomes contribute to increased renewable electricity generation consistent with NIF Indicator 7.2.1, and to reduced power-sector CO_2 emissions relevant to NIF Indicator 9.4.1. While SDG 13 indicators in the NIF primarily track disaster resilience and national climate-policy implementation, the project's verified mitigation outcomes are aligned with India's broader climate-action commitments under its Nationally Determined Contributions (NDCs). The integrated BESS component contributes to grid stability and enables higher renewable self-consumption, supporting SDG 9 on sustainable industry and infrastructure.

In addition, the NaviRex digital MRV platform reduces structural barriers to participation in climate finance. By aggregating micro-scale assets into a standardized, aggregated project with digital measurement, reporting, and verification, the project expands equitable access to climate-finance mechanisms that are typically inaccessible to small system owners due to high transaction costs. This supports inclusive participation in the low-carbon energy transition, structurally aligning with the objectives of SDG 10 (Reduced Inequalities). Participant-level physical data, such as system size and geographic distribution, will be monitored to verify these distributional equity outcomes.

Participant-level data such as system size, geographic distribution, ownership category, and carbon-revenue disbursement will be monitored to assess distributional equity outcomes where feasible.

Section VII: Local Stakeholder Consultation

G.1. Local Stakeholder Consultation

G.1.1 Stakeholder Mapping

Stakeholders were identified based on their direct involvement in distributed rooftop solar ownership, system installation, project financing, institutional solar deployment, electricity distribution, and carbon market policy within Kerala and at the national level. The objective was to engage stakeholders who may participate in, be directly affected by, or influence the implementation of the NaviRex aggregation project activity.

The following stakeholder groups were mapped and consulted:

Electricity Distribution Authority

- Kerala State Electricity Board (KSEB)

Residential Solar Prosumer Community

- Rooftop solar prosumer community networks across Kerala
- Individual rooftop solar system owners

EPC Installers and Project Developers

- Solar EPC installers operating in Kerala *(names available in supporting documentation)*

Institutional Solar Prosumer

- Educational institutions with rooftop solar installations in Kerala
- Public sector undertakings with solar installations in Kerala

Financial Institution

- National Bank for Agriculture and Rural Development (NABARD)

G.1.2 Mode of conducting stakeholder consultation

Consultations were conducted through the following methods:

- Online meetings via Google Meet, conducted in Malayalam and English
- In-person meetings, presentations, and site visits
- Telephone discussions
- Seminars and awareness sessions
- Email correspondence
- Digital communication channels including vernacular Malayalam communication with prosumer community networks

Consultations were carried out between July 2025 and are ongoing, spanning project design, methodology development, and pilot onboarding phases. Stakeholders were informed about project objectives, monitoring and data collection processes, carbon credit mechanisms, and expected benefits from participation. A physical community awareness event is planned for May 2026 in Ernakulam.

G.1.3 Details on Consultation

a) *Institutional Consultation- NABARD, Thiruvananthapuram*

NaviRex's project representative presented the aggregation project to officials of the National Bank for Agriculture and Rural Development (NABARD) at their Thiruvananthapuram office on 15 December 2025.

The presentation covered the project's design, aggregation methodology, and the role of carbon credit monetisation in supporting distributed solar adoption among small and household-level system owners. NABARD officials provided feedback on financial inclusion dimensions of the project and the importance of transparent benefit-sharing mechanisms for small participants.

b) *Institutional Consultation- KSEB, Thiruvananthapuram*

NaviRex's project representative met with Kerala State Electricity Board (KSEB) officials at Vydyuthi Bhavanam, Pattom, Thiruvananthapuram office during the consultation period. Discussions covered KSEB's solar prosumer framework, data access considerations relevant to project monitoring, and the regulatory context for distributed solar aggregation in Kerala.

c) *Online Community Consultation- Google Meet*

NaviRex's project representative conducted an online awareness and consultation session with rooftop solar owners and community representatives on 13 February 2026 via Google Meet. The session was attended by over 50 participants including residential solar owners and solar sector professionals from across Kerala. The session was conducted primarily in Malayalam, the local vernacular language, ensuring accessibility for all participants.

d) *Individual User Consultations*

Structured consultations were conducted with individual solar system owners across Kerala. Participants represented a cross-section of Kerala's domestic solar prosumer base including various professional backgrounds and system sizes. Consultations explored awareness of carbon crediting mechanisms, willingness to participate, data sharing concerns, and preferred onboarding channels. Discussions were conducted in Malayalam and English.

e) *EPC Installer and Institutional Stakeholder Consultations*

NaviRex engaged EPC installers and institutional stakeholders through in-person meetings, telephone discussions, and email correspondence between 2025 and 2026. Discussions focused on aggregation structure, monitoring requirements, and participation expectations.

f) *Positive and Negative Impacts Identified*

Positive Impacts:

- Additional income stream for residential and institutional solar owners through carbon revenue participation
- Reduced effective payback period for solar system investment
- Expanded access to carbon markets for small-scale asset owners previously excluded due to high transaction costs
- Contribution to Kerala's renewable energy transition and grid stability

Potential Negative Impacts:

- Data privacy concerns regarding sharing of system and generation data with a private company
- Risk of administrative burden on micro-scale participants
- Concern about equitable distribution of carbon benefits to small household owners
- Uncertainty among participants regarding the government approval status of the carbon credit program.

G.1.4 Summary of comments

Stakeholders broadly supported the environmental and economic objectives of the project. The following key comments and concerns were raised:

Government Approval and Program Authenticity: Multiple stakeholders questioned whether the carbon credit program is officially approved by the Government of India and what NaviRex's role is as a private entity within a government-linked mechanism. Several stakeholders requested references and case studies prior to committing to participation.

Data Security and Privacy: Stakeholders expressed concern about sharing system and generation data with a private company, including questions about what data is collected, how it is stored, and who has access.

Equitable Access for Small Holders: Stakeholders raised the concern that carbon market benefits should meaningfully reach individual small household solar owners and not be concentrated among large institutional participants.

Onboarding Channel Preference: A strong majority of stakeholders expressed preference for onboarding through trusted intermediaries rather than direct enrollment.

Technical Concerns: Stakeholders raised questions about data access, potential conflicts with equipment warranties, and compliance monitoring requirements.

Revenue Transparency: Stakeholders requested clear and transparent participation agreements with no hidden charges or penalties for discontinuation.

G.1.5 Summary on how comments are addressed.

Stakeholder Comment	**How Addressed in Project Design**
Government approval and program authenticity	The project is developed under India's Carbon Credit Trading Scheme (CCTS) administered by the Bureau of Energy Efficiency (BEE). NaviRex's role as the non-obligated entity and aggregator is defined under the Detailed Procedure for Offset Mechanism. All participant communications reference the applicable regulatory framework.
Data security and privacy	Data collected from participants is limited to what is necessary for MRV and program administration purposes. Data is stored securely on NaviRex's MRV platform in compliance with applicable Indian data protection provisions.
Benefits reaching small holders	The aggregation model is specifically designed to enable household-level participation that would otherwise be inaccessible due to transaction costs. Carbon revenue is allocated to participating system owners in accordance with their individual participation agreements.
Onboarding channel preference	The project prioritises onboarding through established EPC partners and institutions, with NaviRex providing backend support.
Technical concerns	Monitoring relies primarily on regulatory-grade utility data, minimising implications for equipment warranties. Technical requirements are clearly communicated to participants prior to enrollment.

	Revenue transparency	Standardised participation agreements with transparent terms are used. No upfront charges apply to participants. Discontinuation provisions are clearly defined.
	Awareness and understanding	Awareness sessions have been conducted in Malayalam through community channels and direct consultations. Ongoing outreach and a planned physical community event in Ernakulam will further deepen engagement ahead of verification.
Date: 04.08.2026 Version: 1.0		