

Concept Note

Project/Programme Title: **Community-Owned Solar PV in Timor-Leste**

Country(ies): **Timor-Leste**

National Designated Authority(ies) (NDA): **Office of the Vice Prime Minister and Coordinating Minister for Economic Affairs, Minister of Tourism and the Environment - National Designated Authority for Combating Climate Change, Public Institute, AND, I.P.**
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Accredited Entity(ies) (AE): **United Nations Environment Programme (UNEP)**



Date of first submission/
version number: [YYYY-MM-DD] [V.0]

Date of current submission/
version number: [YYYY-MM-DD] [V.0]



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Notes

- The maximum number of pages should **not exceed 12 pages**, excluding annexes. Proposals exceeding the prescribed length will not be assessed within the indicative service standard time of 30 days.
- As per the Information Disclosure Policy, the concept note, and additional documents provided to the Secretariat can be disclosed unless marked by the Accredited Entity(ies) (or NDAs) as confidential.
- The relevant National Designated Authority(ies) will be informed by the Secretariat of the concept note upon receipt.
- NDA can also submit the concept note directly with or without an identified accredited entity at this stage. In this case, they can leave blank the section related to the accredited entity. The Secretariat will inform the accredited entity(ies) nominated by the NDA, if any.
- Accredited Entities and/or NDAs are encouraged to submit a Concept Note before making a request for project preparation support from the Project Preparation Facility (PPF).
- Further information on GCF concept note preparation can be found on GCF website [Funding Projects Fine Print](#).

A. Project/Programme Summary (max. 1 page)			
A.1. Project or programme	<input checked="" type="checkbox"/> Project <input type="checkbox"/> Programme	A.2. Public or private sector	<input checked="" type="checkbox"/> Public sector <input type="checkbox"/> Private sector
A.3. Is the CN submitted in response to an RFP?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> If yes, specify the RFP: _____	A.4. Confidentiality¹	<input type="checkbox"/> Confidential <input checked="" type="checkbox"/> Not confidential
A.5. Indicate the result areas for the project/programme	<p>Mitigation: Reduced emissions from:</p> <input checked="" type="checkbox"/> Energy access and power generation <input type="checkbox"/> Low emission transport <input type="checkbox"/> Buildings, cities and industries and appliances <input type="checkbox"/> Forestry and land use <p>Adaptation: Increased resilience of:</p> <input checked="" type="checkbox"/> Most vulnerable people and communities <input type="checkbox"/> Health and well-being, and food and water security <input checked="" type="checkbox"/> Infrastructure and built environment <input type="checkbox"/> Ecosystem and ecosystem services		
A.6. Estimated mitigation impact (tCO₂e over lifespan)	447,356 t-CO ₂ e over 20-year project lifespan	A.7. Estimated adaptation impact (number of direct beneficiaries and % of population)	Around 204,048 rural households (1,081,457 people total).
A.8. Indicative total project cost (GCF + co-finance)	Amount: USD \$13.9 million	A.9. Indicative GCF funding requested	Amount: USD \$7.1 million
A.10. Mark the type of financial instrument requested for the GCF funding	<input checked="" type="checkbox"/> Grant <input type="checkbox"/> Reimbursable grant <input type="checkbox"/> Guarantees <input type="checkbox"/> Equity <input type="checkbox"/> Subordinated loan <input checked="" type="checkbox"/> Senior Loan <input type="checkbox"/> Other: specify _____		
A.11. Estimated duration of project/ programme:	a) disbursement period: b) repayment period, if applicable:	A.12. Estimated project/ Programme lifespan	This refers to the total period over which the investment is effective.
A.13. Is funding from the Project Preparation Facility requested?²	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Other support received <input type="checkbox"/> If so, by who: _____	A.14. ESS category³	<input type="checkbox"/> A or I-1 <input type="checkbox"/> B or I-2 <input checked="" type="checkbox"/> C or I-3
A.15. Is the CN aligned with your accreditation standard?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	A.16. Has the CN been shared with the NDA?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
A.17. AMA signed (if submitted by AE)	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> If no, specify the status of AMA negotiations and expected date of signing: _____	A.18. Is the CN included in the Entity Work Programme?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
A.19. Project/Programme rationale, objectives and approach of programme/project (max 100 words)	The power sector in Timor-Leste remains reliant on imported fuel oil, generating 511 GWh annually with 280 MW of installed fossil-fuel based capacity. There has been a strong interest in Solar PV development, which is backed by government NDC target of 50% renewable energy by 2030. While full electricity access has been achieved, the quality and reliability of service delivery in rural and remote villages remains low. Community-owned Solar PV identified as an opportunity to improve the quality, reliability, and affordability of electricity access, while abating the potential GHG emissions from fossil-fuel based generation. The goal of this project is to scale		

¹ Concept notes (or sections of) not marked as confidential may be published in accordance with the Information Disclosure Policy ([Decision B.12/35](#)) and the Review of the Initial Proposal Approval Process ([Decision B.17/18](#)).

² See [here](#) for access to project preparation support request template and guidelines

³ Refer to the Fund's environmental and social safeguards ([Decision B.07/02](#))

demonstrated success to 63 small scale Community-Owned Solar PV plants in Timor-Leste to:

- (i) mitigate emissions from growing electricity demand in several large towns across Timor-Leste
- (ii) enhance adaptation and resilience to climate change and livelihoods through providing options for lower cost and higher quality access to energy, and
- (iii) facilitate the development of the Solar PV market in Timor-Leste and support the implementation of NDC targets for renewable energy deployment.

B. Project/Programme Information (max. 8 pages)

B.1. Context and baseline (max. 2 pages)

Describe the climate vulnerabilities and impacts, GHG emissions profile, and mitigation and adaptation needs that the prospective intervention is envisaged to address.

Rising economic and energy demand growth.

Timor-Leste's economic growth outlook for 2025 to 2026 is projected to average 3.9% annually, driven by consumer demand, increased capital investments, and a rise in the service industry⁴. To power this economic growth, the country's electricity demand is expected to reach 800 GWh per annum by 2030, up from 550 GWh in 2025. To date, the country has a total of 280 MW of installed capacity, which is entirely fossil-fuel based generation from two major power stations that burn fuel oil and heavy diesel but can be converted to natural gas.

Electrification

Between 2010-2021, Timor-Leste was ranked amongst the fastest-electrifying countries in the world, with an annualized increase in access of 4.77% over the period and achieving the 100% electricity access milestone in 2021. While this was a remarkable achievement for the country, there remains challenges surrounding the quality, reliability, and affordability of energy access⁵. The distribution network is in poor condition, as there are voltage drops and consistent daily outages. EDTL pays a significant cost for imported diesel, and up to 6% of the governments annual budget goes towards subsidizing diesel consumption. Due to the use of liquid fuels, the grid also operates at a high emissions factor per unit of final consumption. There have been recent efforts made modernize grid infrastructure, rehabilitation, maintenance, construction of new lines and substations⁶. The government has leveraged developing electricity access alongside other infrastructure, including roads and water supply networks, enhancing resilience against natural disasters, floods, and climate risks.

Climate Change

Although Timor-Leste's contributions to climate change remains minimal, at an estimated 0.003% of global emissions, the country is highly vulnerable to extreme weather events, rises in sea level, increased average temperatures, biodiversity losses and flooding⁷. Climate vulnerability ranks Timor-Leste amongst the most vulnerable to impacts of climate change, ranked 139 out of 180 countries. Timor-Leste's revised Nationally Determined Contribution (NDC) in 2022 updated the initial NDC from 2016, setting more stringent qualitative targets to 2030 and including a series of new policy initiatives to strengthen implementation⁸. One of the primary measures for mitigating climate change is to increase the proportion of renewable energy in place of fossil-fuel based generation. Given its vulnerability to climate change, increasing the use of RE in its share of energy generation can aid with Timor-Leste's endeavours to reduce both catastrophic and non-catastrophic impacts on at-risk populations.

Energy Access, Climate Change and Sustainable Development

There is a strong nexus between Energy Access, Climate Change and Sustainable Development in Timor-Leste. The rapid rise of energy demand and energy access resulted in an overall increase of GHG emissions in the sector, primarily due to the rise in fossil-fuel based consumption. Moreover, there are numerous benefits to socio-economic well-being from improving energy access, acting as a catalyst for human development. However, the country is particularly vulnerable to the impacts of climate change and continuing the expansion of electricity access through fossil-fuel based technologies amplifies this challenge. Timor-Leste is in need of support for improving the affordability, reliability, and quality of access to energy, without raising its contributions to climate change. Expanding electricity access through renewables can enable Timor-Leste's under-electrified population to reap the socio-economic catalyst benefits related to energy access, without exacerbating the impacts of climate-change vulnerabilities.

⁴ ADB 2025, Timor-Leste Economic Outlook Remains Optimistic for 2025-2026

⁵ IEA, IRENA, UNSD, World Bank, WHO, 2025. 'Tracking SDG 7: The Energy Progress Report.'

⁶ EDTL 2025, Strengthening Infrastructures to Improve the Quality of Electricity Supply

⁷ Government of Timor-Leste 2022, Revised Nationally Determined Contributions 2022

⁸ Ibid.

Please indicate how the project fits in with the country's national priorities and its full ownership of the concept. Is the project/programme directly contributing to the country's INDC/NDC or national climate strategies or other plans such as NAMAs, NAPs or equivalent? If so, please describe which priorities identified in these documents the proposed project is aiming to address and/or improve.

Timor-Leste's updated NDC in 2022

In 2022, Timor-Leste reaffirmed its commitments to combating climate change through its updated Nationally Determined Contributions (NDC) around the four areas of climate risk governance, nature-positive growth and transition, low-carbon development, and climate change adaptation and resilience building. This update involves establishing GHG inventory for a baseline level of emissions, however, does not set quantified emissions reductions targets. It features a National Adaptation Plan that outlines priorities and implementation approaches.

There are **four activities** set out by Timor-Leste's updated NDC which are directly targeted by this project. The relevance for each action is first summarized below along with key considerations as set out by the NDC:

- **Activity 2.6, Improving livelihoods and environmental resilience through carbon markets** – is closely linked to this project as it targets a community-based resource management approach to aggregating activities to participate in international carbon trading platforms.
- **Activity 3.2a, Investment in renewable energy solutions** – is the core endeavour of this project, as the NDC commitment aims to prioritize renewable energy investments in rural communities.
- **Activity 3.4, Energy Efficiency Improvements** – is achieved through the target goal of improving the overall efficiency of energy sources used by communities, which the project enables by reducing the distribution related network losses.
- **Activity 4.1c, Community Consultation** – as part of the NDC, a community-based consultation mechanism is currently being developed, which can be leveraged to support project implementation needs for arranging Community-owned Solar PV deployment.

Relevant Timor-Leste National Policies

Timor-Leste's 20-year Strategic Plan from 2011-2030 was an official policy document that supported the development of a Rural Electrification Program (REP). Supported the electrification efforts to achieve universal access across the country. Now the goals of the program have shifted towards addressing challenges surrounding the quality, reliability, and affordability of energy access. Also outlined by the 20-year Strategic Plan, the government set a target to achieve 50% of renewable energy in the generation mix by 2030. The impacts of this project are also closely aligned with numerous Sustainable Development Goals (SDGs), including SDG 7 (clean energy access) and SDG 13 (climate mitigation).

Describe the main root causes and barriers (social, gender, fiscal, regulatory, technological, financial, ecological, institutional, etc.) that need to be addressed.

The four primary barriers that require intervention from this project are: Financial, Informational, Administrative, and Regulatory:

Financial Barriers involves the challenges regarding allocating upfront investment from rural towns and communities in Community-Owned Solar PV systems. Although the upfront CAPEX investment requirements of Solar PV systems have continued to decline, allocating funds for investing in Community-Owned Solar plants within rural communities is difficult, considering the lack of available funds and motivation for rural households to engage with. Simulation has shown Community-Owned Solar PV decreases effective tariffs on a per kWh basis. Project addresses these financial barriers through a combination of grants and financial mechanisms, leverage difference in kWh basis and long-term community-ownership after simple payback periods below 6 years in all cases modelled.

Informational Barriers on communities having the knowledge to organize together and establish logistics required to purchase (finance), install, and operate Community-Owned Solar PV systems. This effectively doubles as a market barrier as there are no established private sector companies that offer the services required for deploying community-owned Solar PV projects. At the same time, the proliferation of low-quality Solar Home Systems (SHS) traded has common market goods has driven some false narratives that electrification through off-grid solar is unreliable and can only provide low-tiers of energy access services. The project addresses these barriers by conceptualizing a program for development and spreading information to communities on the potential opportunity for investment.

Administrative Barriers involve the challenges associated with implementing and operating Community-Owned Solar PV systems and other alternative PV technologies. Administering alternative Solar PV and renewable energy options at the household level typically require the installation of individual wiring and metering, plus other administrative arrangements for communication and payment with the utility. There is also a shortage of available technicians required to install and operate systems. As Community-Owned Solar PV plants are installed directly at the distribution level, no additional changes are required at the customers premises (no additional wiring or special metering required).

Regulatory barriers include the absence of a clear policy, legislative, and regulatory framework specifically concerned with the deployment of Community-Owned Solar PV. The project will assist with this barrier by aiding with the development of a regulatory and licensing process for prospective Community-Owned Solar PV developers.

A ‘*Technological barrier*’ was previously of concern for developing distributed Solar PV systems. However, in recent years the remarkable fall in cost of Solar PV systems, in addition to innovations in product efficiency have largely surpassed the technological barrier. Recent advancements in business models and accommodating software infrastructure have reduced the need for high upfront costs, offering more affordable “electricity as a service” subscriptions or “pay-as-you-go” for towns and villages. But this opportunity remains under-utilized and has yet to be mainstreamed within a broader policy strategy for improving the quality of energy access in Timor-Leste.

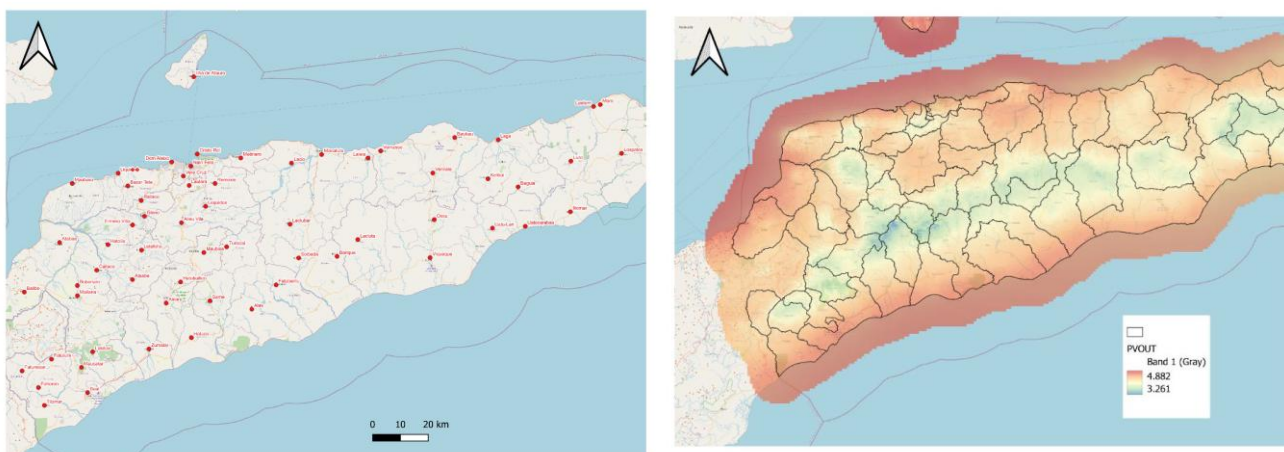
Where relevant, and particularly for private sector project/programme, please describe the key characteristics and dynamics of the sector or market in which the project/programme will operate.

The electricity sector in Timor-Leste operates through a state-owned vertically integrated monopoly, Electricidade de Timor-Leste, Empresa Publica (EDTL, E.P.), responsible for the generation, transmission, distribution, and retailing of electricity in the Country. In 2021, Timor-Leste achieved the milestone of 100% access to electricity and was ranked one of the fastest electrifying countries in the world from 2010-2020. Timor-Leste’s 20-year Strategic Plan from 2011-2030 was an official policy document that supported the development of a Rural Electrification Program (REP).

Although this is a remarkable achievement for Timor-Leste to reach universal energy access throughout its rural communities, there remains significant challenges regarding the affordability, reliability, and quality of energy access. Significant portions of the distribution network is in poor condition, resulting in constant drops in voltage leading to frequent power outages. Moreover, tariff rates for most consumers are as high as \$0.24/kWh, resulting in affordability challenges in the sector.

There are currently several pilot projects demonstrating viability of different Solar PV technologies in Timor-Leste. These include initiatives such as Solar lighting for rural communities that have utilised a pay-as-you go model. Since 2020, UNDP has been implementing the Accelerating Clean Energy Access to Reduce Inequalities (ACCESS) project in 25 villages across 3 municipalities in Timor-Leste (Atauro, Bobonaro, and Manatuto)⁹. Through this initiative, UNDP has been supporting the development of up to 7 community-based Solar Water Pump Systems, as well as installation of over 1,000 Highly Efficiency Solar Lamp Systems, while empowering the local community for long-term energy sustainability¹⁰.

Prospective investments in Solar PV for Timor-Leste have been concentrated around the main load centre in Dili. However, outside of Dili, there are up to 63 large towns in Timor-Leste with over 5,000 in population totalling 16.8 MW of peak demand consumption. The locations of towns and villages are well-distributed across the country, most of them landing within areas identified as having high potential for Solar PV.



Large Villages and Towns across Timor-Leste (left) / Solar PVOU potential in Timor-Leste (right)

(source: UNEP CCTN 2025, Timor-Leste Net-Metering)

An analysis was carried out by UNEP to model the economic and financial viability of deploying up to 63 Solar plants in large towns and villages across Timor Leste (mapped in the above figure to the left) that correspond with high potential Solar PV output areas (mapped in the figure on the right). These Community-Owned plants would range from 0.1 MW to

⁹ UNDP 2024, Timor-Leste Game Changer Rural Communities Solar Water Pump

¹⁰ Access To Energy 2025, Timor-Leste

0.9 MW in size and be deployed across 63 large towns / villages, totalling 16.8 MW. An estimated \$13.6 million in upfront CAPEX would be required to deploy these plants and could save up to 447,356 t/CO₂e over a 20-year project lifespan.

B.2. Project/Programme description (max. 3 pages)

Describe the expected set of components/outputs and subcomponents/activities to address the above barriers identified that will lead to the expected outcomes.

Project Summary

This project endeavours to support the deployment of Community-Owned Solar PV in Timor-Leste for villages outside of Dili, achieving policy goal of 50% renewable energy by 2030, improving the quality, reliability, and affordability of electricity access, while abating the potential GHG emissions from fossil-fuel based generation. Achieving this will primarily involve the channelling of concessional financing from the GCF and other potential donors through EDTL, backed by additional public sector contributions and private sector enterprise. Moreover, the project will also support the emergence of an enabling environment for the distributed Solar PV energy sector, supporting regulatory and institutional reform, raising awareness for community/household recipients and capacity building for technicians and government personnel operating in the sector.

Project Components

The long-term impact of this project is to (i) mitigate emissions from growing electricity demand in several large towns across Timor-Leste that would be supplied by fossil-fuels, (ii) enhance adaptation and resilience to climate change and livelihoods through providing options for lower cost and higher quality access to energy, and (iii) facilitate the development of the Solar PV market in Timor-Leste and support the implementation of NDC targets for renewable energy deployment. These goals are to be implemented by three (3) main project components:

Component 1: Co-financing Community-Owned Solar PV projects in Timor-Leste

- Activity 1.1 Provide technical assistance to EDTL to design a Community-Owned Solar PV program in Timor-Leste.
- Activity 1.2 Formulate Community-Owned Solar PV deployment roadmap, identifying the most suitable villages/households for intervention.
- Activity 1.3 Co-Capitalization of Community-Owned Solar PV program.

Component 2: Technical Assistance on the development of a policy and regulatory framework for Community-Owned Solar PV projects in Timor-Leste

- Activity 2.1 Assist with the design of a short, medium, and long-term policy strategy for Community-Owned Solar PV.
- Activity 2.2 Support the formulation of technical guidelines for Community-Owned Solar PV project developers.
- Activity 2.3 Provide assistance with the development of regulatory and licensing processes for prospective Community-Owned Solar PV developers.

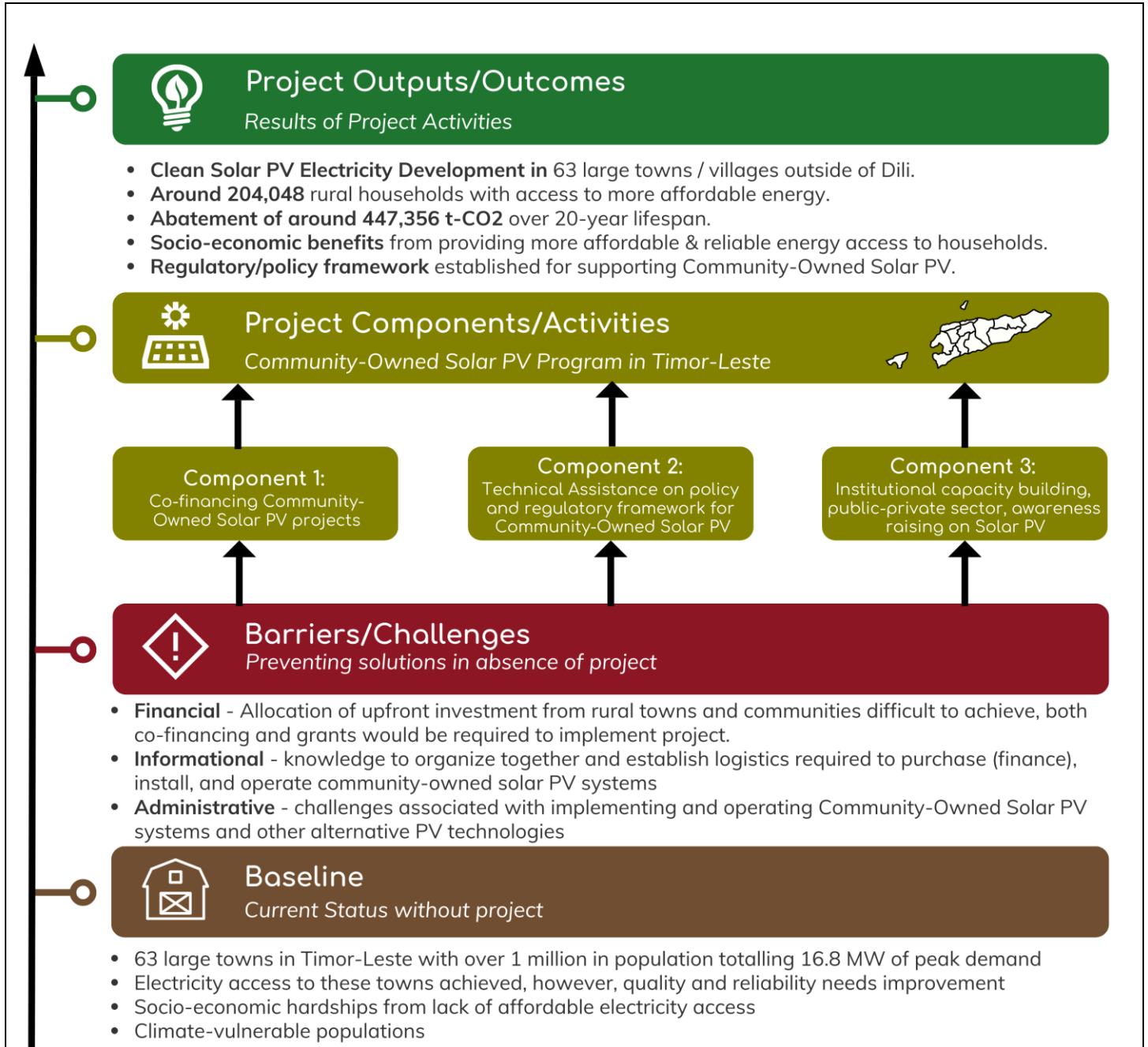
Component 3: Institutional capacity building, promotion of public-private sector engagements, awareness raising on Community-Owned Solar PV market in Timor-Leste.

- Activity 3.1 Provide Technical Assistance training to EDTL and other relevant ministry personnel on technical, operational, economic and regulatory considerations for Community-Owned Solar PV.
- Activity 3.2 Carry out public workshops and dialogue forums on the Community-Owned Solar PV in Timor-Leste, connecting key public and private stakeholders.
- Activity 3.3 Expand pool of available Solar PV technicians operating in the sector.

In terms of rationale, please describe the theory of change and provide information on how it serves to shift the development pathway toward a more low-emissions and/or climate resilient direction, in line with the Fund's goals and objectives.

The theory of change for this project is: **IF** the EDTL designs and implements a GCF-supported Community-Owned Solar PV program in Timor-Leste **THEN** suitable villages and large towns will receive a higher quality and more affordable electricity service with lower emissions **BECAUSE** Community-Owned Solar PV offers Timor-Leste an opportunity to reduce the cost and increase the quality and efficiency of delivering electricity at the local level, while reducing the emissions profile of electrified households.

Project Theory of Change (TOC) diagram:



Describe how activities in the proposal are consistent with national regulatory and legal framework, if applicable.

As detailed in Section B above, the goal of this project is to mitigate greenhouse gas emissions, reduce the impact of climate change, and support the deployment of renewable energy by aligning with commitments under Timor-Leste's updated (2022) NDCs. It is also consistent with broader national strategies, such as the 20-year Strategic Plan (2011-2030) to integrate up to 50% of electricity from renewable sources by 2030, and the Rural Electrification Program to enhance the affordability and quality of electricity service delivery¹¹.

Describe in what way the Accredited Entity(ies) is well placed to undertake the planned activities and what will be the implementation arrangements with the executing entity(ies) and implementing partners.

B.3. Expected project results aligned with the GCF investment criteria (max. 3 pages)

The GCF is directed to make a significant and ambitious contribution to the global efforts towards attaining the goals set by the international community to combat climate change, and promoting the paradigm shift towards low-emission and

¹¹ Government of Timor-Leste 2011, 20-year Strategic Plan 2011-2030

climate-resilient development pathways by limiting or reducing greenhouse gas emissions and adapting to the impacts of climate change.

Provide an estimate of the expected impacts aligned with the GCF investment criteria: impact potential, paradigm shift, sustainable development, needs of recipients, country ownership, and efficiency and effectiveness.

The GCF defines six (6) investment framework criteria for projects: Impact Potential, Paradigm Shift Potential, Sustainable Development Potential, Needs of the Recipient, Country Ownership, and Efficiency and Effectiveness.

1. Impact Potential

There are two types of impact potential measured by the GCF: mitigation (direct and indirect) impact potential and adaptation impact potential. The *direct mitigation* impact potential from this project can be estimated through calculating the emissions abated due to the implementation and operation of Community-Owned Solar PV in a number of towns and villages (considering metrics for average electricity consumption) relative to fossil-fuel based generation. *Indirect mitigation* potential from this project (including market development and awareness raising), and related benefits will be qualitatively evaluated as well.

Adaptation Impact involves assessing the degree to which energy services provided through Community-Owned Solar PV is more climate resilient to climate change impacts relative to the baseline context. In addition, awareness raising efforts from this project builds adaptation through educating potential end-users on potential use of electricity for productive uses and developmental activities, apart from basic lighting and cooling. Field-level analysis demonstrated the need for including a gender-based approach to educating households in these communities on the potential opportunities that improved electricity services can bring them (from lighting and phone charging to rice cooking, pumping, and refrigeration, including those responsive productive applications that generate revenue).

2. Paradigm Shift Potential

This project aims to shift the paradigm in Timor-Leste for reliance on fossil-fuel based energy generation from the national grid towards modular, smart renewable energy-based Community-Owned Solar PV technology that provides a clean, lower-cost, more reliable and scalable option for supporting electricity service delivery to towns and villages outside Dili. The current paradigm for rural electricity access is through the national grid which operates on fuel-oil generators, offering expensive and unreliable electricity, along with various externalities that include GHG emissions and local pollution. This paradigm also features a high reliance on energy fuel imports for generation, exposing both EDTL and consumers to volatile international fuel markets and supply chains.

3. Sustainable Development Potential

The impacts of this project are closely aligned with numerous SDGs, with a particular focus on SDG 7 on achieving universal access to affordable, reliable, and modern energy services (target 7.1), increase the share of renewable energy (target 7.2), improve the rate of energy efficiency (target 7.3), while enhancing international cooperation, promoting investment in energy infrastructure, and upgrading technology for supplying energy services (target 7A and 7B). It also supports SDG 13 by taking action on climate mitigation while strengthening resilience and adaptation (targets 13.1, 13.2, and 13.3). SDG 7 has been identified as a catalyst for human and sustainable development, also indirectly supporting numerous other SDGs. Access to energy unlocks valuable time and money that poorer and vulnerable communities can invest in elsewhere, encouraging new opportunities in agriculture, human health, climate change, education, gender equity, and clean water¹².

4. Needs of Recipient Country

This project addresses several needs in Timor-Leste's energy access endeavours, particularly improving the affordability, quality, and reliability of energy access in rural areas. Although Timor-Leste has achieved universal access to energy, the distribution network is in poor condition marked by daily outages and high losses. The government also utilizes up to 6% of the annual budget towards subsidizing diesel consumption, reflecting the high cost of energy and emissions across the country on a per unit basis. Community-Owned Solar PV has strong potential to address these needs for Timor-Leste, while empowering local stakeholders to retain agency through the process.

5. Country Ownership

Channelling project funds through the EDTL to Community-Owned Solar projects will provide a robust and continued sense of country and local ownership. Along this line, the EDTL has a credible track-record of implementing energy-access initiatives in Timor-Leste with co-capitalization financing from donor partners. Any public-private-donor driven investments for energy access should involve the EDTL as a central actor, in addition to other co-relevant ministries such as the Ministry of Petroleum and Minerals, Ministry of Finance, Ministry of Rural Development and Community Housing, as well as the Ministry of Tourism and Environment. This project endeavours to involve the EDTL and relevant community leaders and stakeholders to ensure both Country and Local ownership over project activities.

¹² Waterloo Institute for Sustainable Energy 2017, Open Access Energy Blueprint

6. Efficiency and Effectiveness

The simulations carried out by UNEP demonstrated high potential for Community-Owned Solar PV to have technical and economic efficiencies over traditional approaches. Outside Dili, the radial nature of distribution network with loads near the end of the 22 kV lines results in high electrical losses. This makes Community-Owned Solar PV more efficient at managing day time load, reducing electrical losses and improving energy efficiency. Achieving lower cost energy access relative to traditional/alternative options while simultaneously mitigating GHG emissions indicates there are potential gains in efficiencies that can be provided by the project. Moreover, smart renewable Community-Owned Solar PV projects can provide a higher tier of energy access relative to traditional grid fossil-fuel based options, demonstrating a strong propensity for the project to be effective in terms of implementation.

B.4. Engagement among the NDA, AE, and/or other relevant stakeholders in the country (max ½ page)

Please describe how engagement among the NDA, AE and/or other relevant stakeholders in the country has taken place and what further engagement will be undertaken as the concept is developed into a funding proposal.

As the Office of the Vice Prime Minister and Coordinating Minister for Economic Affairs, Minister of Tourism and the Environment is the National Designated Authority (NDA) for Timor-Leste at the GCF, we will need to engage the office at MoE to seek their support and input for our proposal. The NDA serves as the primary interface between Timor-Leste and the GCF, in addition to strategic oversight of activities, official communications, engagement of national stakeholders, generation of funding proposals and concept note developments. The NDA also must issue accommodating nomination letters and no-objection letters to approve the submission of GCF proposals in Timor-Leste. The Office of the Vice Prime Minister and Coordinating Minister for Economic Affairs, Minister of Tourism and the Environment in Timor-Leste acts as the inter-ministerial body responsible for leading climate change efforts in the Country and has led as the NDA for coordinating, approving, and managing the GCF portfolio on several projects.

Moreover, at the onset of this project, one of the key considerations is the arrangements of institutional roles, as there are procedural requirements that will take some time to sort out. For example, Timor-Leste's three ongoing GCF funded projects (FP171, FP 109, and SAP 021) all have defined Accrediting Entities (AE), Executive Entities (EE), and implementing entities. During initial phases it will be important that we engage in a process for deciding the most appropriate roles for each entity, responsible ministries and organizations, including UNEP, MoPM, and EDTL, amongst other partners and organizations.

C. Indicative Financing/Cost Information (max. 3 pages)

C.1. Financing by components (max ½ page)

Please provide an estimate of the total cost per component/output and disaggregate by source of financing.

Component/Output	Indicative cost (USD)	GCF financing		Co-financing		
		Amount (USD)	Financial Instrument	Amount (USD)	Financial Instrument	Name of Institutions
Component 1: Co-financing Community-Owned Solar PV projects in Timor-Leste	\$13.6 million	\$3.4 million	Grant	\$6.8 million	Loan	
		\$3.4 million	Concessional Loan			
Component 2: Technical Assistance on the development of a policy and regulatory framework for Community-Owned Solar PV projects in Timor-Leste	\$0.2 million	\$0.2 million	Grant			
Component 3: Institutional capacity building, promotion of public-private sector engagements, awareness raising on Community-	\$0.1 million	\$0.1 million	Grant			

Owned Solar PV market in Timor-Leste.					
Indicative total cost (USD)	\$13.9 million	\$7.1 million	\$6.8 million		

*Concessional loans are intended to include a range of preferential development financing options. Potential role for implementing UNEP financing mechanisms along-side other streams of concessional financing:

- **Performance Based Payments (PBPs)** – Similar to results-based financing, provides an ex-post payment for delivering sustainable development impacts – measured in electrified villages by Solar PV mini-grids.
- **Contingent Repayment Clauses** – Allows UNEP to provide additional financing option through sharing generated revenues (from a Solar PV mini-grid project) and/or savings from alternative means of electrification.
- **On-Granting** – Can include additional grants alongside PBPs to further incentivize successful project implementation through even greater concessions.

C.2. Justification of GCF funding request (max. 1 page)

Explain why the Project/ Programme requires GCF funding, i.e. explaining why this is not financed by the public and/ or private sector(s) of the country.

This program would require GCF funding to support the co-financing, technical assistance, and institutional capacity building required to deploy Community-Owned Solar PV projects in 63 large towns / villages outside of Dili. Community-Owned Solar PV allows local stakeholders to receive direct benefits and retain long term ownership over renewable electricity generating assets in their towns / villages. However, due to the financial, informational, and administrative barriers discussed above in C.1, communities lack the resources and logistical capabilities to organize investments and install / operate plants.

From the public sector standpoint, EDTL has focused its resources on first expanding and now upgrading the distribution network. As demonstrated by our simulation, there is a strong business case with high economic returns for deploying Solar PV at the distribution level in Timor-Leste, due to a range of associated benefits on the reduction of losses and need for upgrading network infrastructure. However, EDTL's role is the power sector's vertically integrated utility and local communities are its customers, so if it made these public sector investments, the ownership of these Solar PV plants would be retained by EDTL.

In terms of the private sector, the strong business case would likely drive some investments by international developers in several towns / villages the long-term. However, these private sector actors would be seeking a higher return on their investment in distributed PV systems (due to risks and other associated factors) and would also be retaining ownership of the projects. Therefore, the long-term benefit potential for local communities would be lower than a Community-Owned structure.

There is currently an ongoing GCF project in Timor-Leste (SAP 021) that focuses on delivering Community-based Natural Resource Management, indicating the country has experience with implementing community-based funding projects from the GCF already.

Describe alternative funding options for the same activities being proposed in the Concept Note, including an analysis of the barriers for the potential beneficiaries to access to finance and the constraints of public and private sources of funding.

As described above, alternative financing options solely from private and public sector sources are very limited and insufficient without support from international donors. Therefore, alternative co-financing options for this project are likely to be proposed to other potential international organizations/funds supporting climate mitigation and sustainable/socio-economic development efforts in developing countries. Some examples include the Global Environmental Facility (GEF), the World Bank Group (WBG), the Asian Development Bank (ADB), the International Finance Corporation (IFC), amongst others. Moreover, there are some development agencies from various nations already operating within Timor-Leste that support both climate and energy-related and socio-economic/sustainable development projects which may provide some partial or co-financing, such as Deutsche Geselle fur Internationale Zusammenarbeit (GIZ), Kreditanstalt fur Wiederaufbau (KfW), the Embassy of Sweden / Swedish international Development Agency (SIDA), and the Australian Department of Foreign Affairs and Trade (DFAT).

With regards to financing from beneficiaries, it is expected there will be some minor contributions from Community members to retain shared long-term ownership of the Solar PV plants.

Justify the rationale and level of concessionality of the GCF financial instrument(s) as well as how this will be passed on to the end-users and beneficiaries. Justify why this is the minimum required to make the investment viable and most efficient considering the incremental cost or risk premium of the Project/ Programme (refer to Decisions B.12/17; B.10/03; and B.09/04 for more details). The justification for grants and reimbursable grants is mandatory.

In the case of private sector proposal, concessional terms should be minimized and justified as per the Guiding principles applicable to the private sector operations (Decision B.05/07).

C.3. Sustainability and replicability of the project (exit strategy) (max. 1 page)

Please explain how the project/programme sustainability will be ensured in the long run and how this will be monitored, after the project/programme is implemented with support from the GCF and other sources.

Component 1 involves the initial co-financing of Community-Owned Solar PV plants, representing the bulk of total system costs involved for the project. Solar PV systems are CAPEX-intensive, due to the components involving investments in equipment and installation requirements. The proposed financing structure has been calculated to factor in the concessions/grants and loans from the GCF, along with loan/equity co-financing from the public sector and international organization partnerships, where the generated revenues from the system can be sufficient for continued operation (with some additional public-sector support), indicating the long-term self-sustainability of the project.

Components 2 and 3 of the projects are designed to implement an enabling environment which can work towards supporting the long-term sustainability of the project and support the PV sector in the Country. This includes activities which formulate technical guidelines for the implementation and operation of Community-Owned Solar PV plants, establish the supportive regulatory/legislative framework for developing the Solar PV market, train and expand the pool of available local technicians to provide maintenance and operations to the Community-Owned Solar PV systems.

For non-grant instruments, explain how the capital invested will be repaid and over what duration of time.

D. Supporting documents submitted (OPTIONAL)

- Map indicating the location of the project/programme
- Diagram of the theory of change
- Economic and financial model with key assumptions and potential stressed scenarios
- Pre-feasibility study
- Evaluation report of previous project
- Results of environmental and social risk screening

Self-awareness check boxes

Are you aware that the full Funding Proposal and Annexes will require these documents? Yes No

- Feasibility Study
- Environmental and social impact assessment or environmental and social management framework
- Stakeholder consultations at national and project level implementation including with indigenous people if relevant
- Gender assessment and action plan
- Operations and maintenance plan if relevant
- Loan or grant operation manual as appropriate
- Co-financing commitment letters

Are you aware that a funding proposal from an accredited entity without a signed AMA will be reviewed but not sent to the Board for consideration? Yes No

Annex 1

Examples of risk factors aligned to the environmental and social safeguards and policies of GCF

The list below provides some examples of environmental and social risk factors that can be used in developing a screening checklist. The risk factors are organized according to the interim ESS of GCF and consider the requirements of the interim ESS, Environmental and Social Policy, Gender Policy, and the Indigenous Peoples Policy of the GCF.

Assessment and management of environmental and social risks and impacts
Will the activities involve transboundary impacts on air, water or other natural resources?
No.
Are the activities likely to contribute to cumulative impacts?
No.
Will the activities involve associated facilities and third-party impacts?
No.
Are the activities likely to induce potential social conflicts?
No.
Do the accredited entities, executing entities and implementing agencies (grantees, sub-borrowers, and proponents) have the capacity to implement the environmental and social management plans/action plans?
Yes
Labour and working conditions
Are the activities likely to affect working conditions, particularly in terms of employment, compliance with labour and other laws pertaining to non-discrimination, equal opportunity, child labour, and forced labour of direct, contracted and third-party workers?
No.
Will the activities pose occupational health and safety risks to workers, including supply chain workers?
There is only a limited risk associated with the installation of Solar PV systems, particularly in rural and remote villages.
Resource efficiency and pollution prevention
Will the activities generate emissions; discharge pollution into water and land; generate activity related greenhouse gas emissions; use hazardous materials; generate noise and vibration; and/or generate waste including hazardous waste?
No.
Are the activities likely to utilize natural resources, including water and energy?
No.
Will there be a need to develop and implement measures to reduce pollution and promote sustainable use of resources?
No.
Community health, safety and security
Will the activities potentially generate risks and impacts on the health and safety of the affected communities, including impacts on ecosystem services affecting the local community health and safety?
No.
Will the activities increase the risk of sexual exploitation, abuse and harassment?
No.
Will there be a need for an emergency preparedness and response plan that also outlines how the affected communities will be assisted in emergencies?
No.
Will there be potential risks posed by the security arrangements and potential conflicts at the project

site between the workers and the affected community?
No.
Land acquisition and involuntary resettlement
Are the activities likely to involve the acquisition of lands, land rights or land-use rights through expropriation or other compulsory procedures in accordance with the legal system of the country?
No.
Are the activities likely to alter existing land use and restrict access to natural resources resulting in loss of livelihoods and other economic activities?
No. Community-Owned Solar PV systems will be located on communal land that belongs to the village committee, without any impact to access to natural resources or other economic activities.
Biodiversity conservation and sustainable management of living natural resources
Is the project or programme likely to be located on modified, natural and/or critical habitats or in protected or internationally recognized ecological areas?
No.
Is the project or programme likely to introduce invasive alien species of flora and fauna, affecting the biodiversity of the area?
No.
Is the project or programme likely to have potential impacts on biodiversity (especially critically endangered and/or endangered species, endemic or restricted-range species, and globally significant migratory or congregatory species) and ecosystem services, including production of living natural resources?
No.
Indigenous peoples
Are the activities likely to have impacts on indigenous peoples and communities, such as impacts on lands and natural resources, land tenure and on cultural resources?
No.
Are the activities likely to lead to physical displacement of indigenous peoples and/or restrict the access of indigenous peoples to lands and resources resulting in loss of livelihood?
No.
Will the activities provide equitable opportunities to indigenous peoples and other vulnerable groups during stakeholder consultation and in decision-making during the preparation, implementation, monitoring and evaluation of the activities?
Yes. The project will be implemented in close consultation with the beneficiary indigenous village/community to response to the energy-access needs of the community.
Will the activities need to obtain free, prior and informed consent (FPIC)? If so, has the project obtained FPIC?
Yes. No, the project will require obtaining FPIC on a case-by-case basis. However, given the developmental impacts provided to the beneficiary community, it is likely this will not be an issue.
Cultural heritage
Will the project or programme be located on areas that are considered to have archaeological (prehistoric), paleontological, historical, cultural, artistic and religious values or contain features considered as critical cultural heritage?
No.