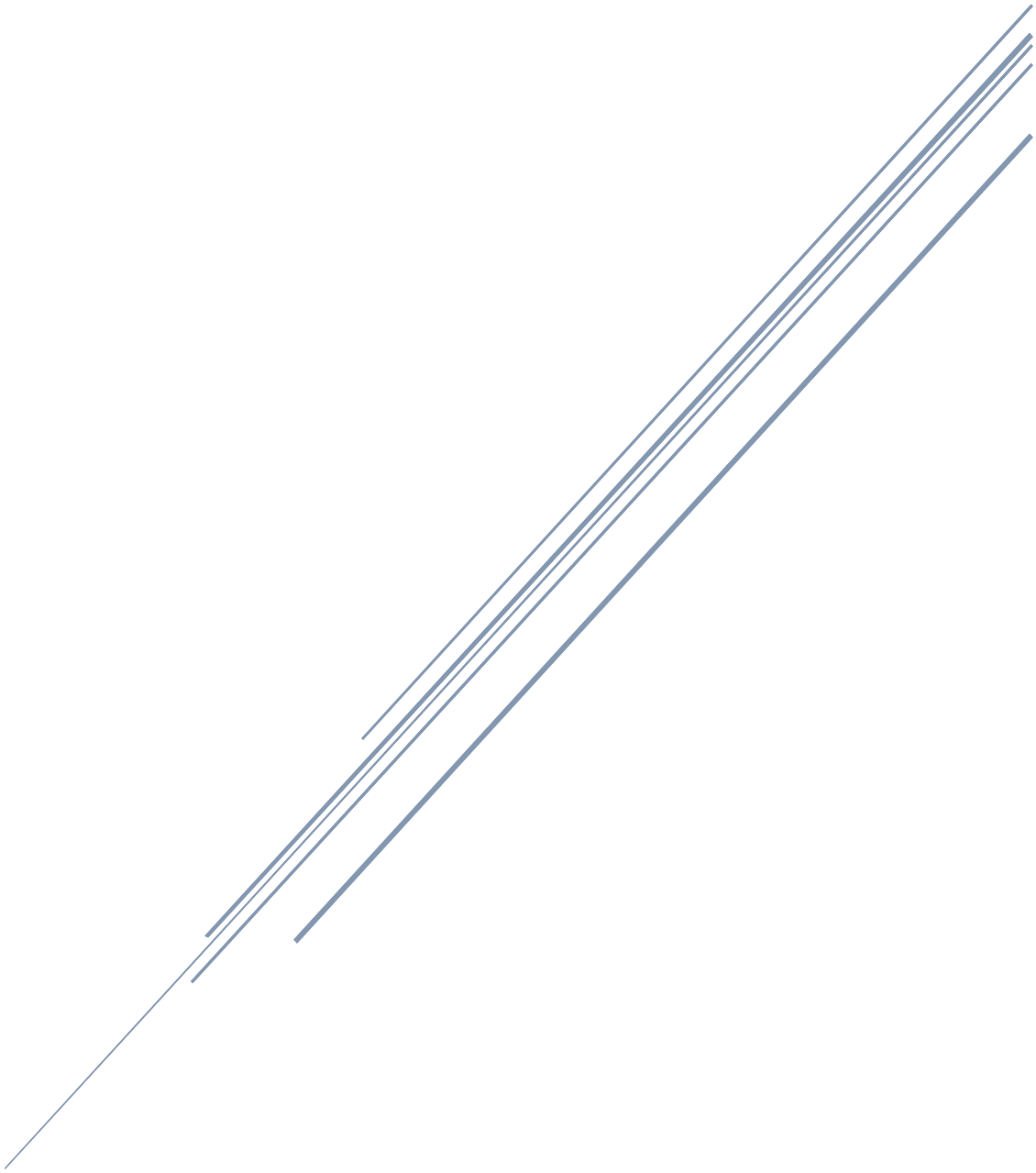
OPEN CALL FOR PROPOSAL

DIGITALISATION FOR FLEXIBLE AND RESILIENT ENERGY SYSTEMS

ON THE GROUND CONTRIBUTION TO DIGITAL DEMAND-DRIVEN ELECTRICITY NETWORK (3DEN) INITIATIVE



UN environment programme 1972-2022

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1/ INTRODUCTION

The power sector landscape is changing. Historically, the supply-side (generation and networks) was adapted to meet demand. In the power system of the future the role of supply and demand will change with demand being modulated to adapt to the higher variability of renewable resources. Digital technologies enable power systems to forecast demand side resource availability, and to leverage these to provide benefit for climate, power system resilience and consumers.

The theoretical benefits are well understood but there is a need for concrete pilot experiments to quantify the impacts of policies aiming at digitalising demand and identify technical and behavioural bottlenecks.

In September 2021, the Italian Government in collaboration with the United Nations Environment Programme (UNEP) is launching a call for pilot projects that will provide an opportunity to gain on-the-ground insights, test new approaches and disseminate learnings that will feed into the International Energy Agency (IEA)'s "Digital Demand-Driven Electricity Networks (3DEN)" Initiative, which is a 4-year cross agency initiative focusing on the policy, regulatory, technology and investment context needed to accelerate progress on power system modernisation and effective utilisation of demand-side resources.

The project has a global focus, with initial priorities being Brazil, Colombia, Morocco, Tunisia, India, Indonesia and South Africa. Building on analysis, case studies and experiences worldwide, the IEA will develop tools and guidance drawing upon research from across the IEA and engage with relevant organisations, bringing together stakeholders to foster dialogue and experience sharing. Based on UNEP's track record in pilot implementation, UNEP will be the executing agency for the realisation of the pilot projects.

The Open Call for Proposal

The objective of this document is to provide information regarding the application process and an overview of the prerequisites and assessment criteria applied for the selection of the pilot project(s). The open call for proposals intends to support the implementation of one (or more) pilot project(s) across the prioritised countries, namely Brazil, Colombia, Morocco, Tunisia, India, Indonesia and South Africa.

UNEP is pleased to announce this competitive open call for proposals for pilot projects. Proposals are expected to showcase innovative business and regulatory models for the uptake of smarter digital power infrastructure.

Main selection criteria and expected benefits

The project caters to an increasingly urgent need to ensure **efficiency and resilience** of power systems to enable **cost-effective clean energy transitions, mainly based on renewables**. Expected benefits include:

- **Enable transformational impacts:** Pilot projects should be highly innovative and add a smart digital layer to existing energy infrastructure, and preferably building on top of existing initiatives or projects. The digital layer should show how it enables demand-side integration. This could include, among others, unlocking end-use energy

efficiency from existing infrastructures, demand-side response, electric vehicle integration, storage control or other distributed energy resource monitoring and control.

- **Embed replicability and scalability:** pilot projects should develop innovative solutions, replicate them in a broad range of contexts and system conditions, and show how these solutions could reach mass-market scale.
- **Innovation and visibility**: pilot projects should take stock of the latest innovation in market design (e.g. aggregation, VPPs) and regulatory and policy approaches to utilise the opportunities that digitalisation and demand-side resources offer (e.g. regulatory sandboxes).
- **Quantify sustainable development benefits:** pilot projects should include a quantification of benefits associated with smarter grids, including power system benefits, environmental benefits such as improvements to GHG emissions, local air quality, affordability and facilitating access to electricity or other social benefits. In order to quantify their sustainability, projects will have to demonstrate which and how relevant SDGs and corresponding indicators are involved.

Types of application

Taking these criteria into account to showcase innovative business and regulatory models for the uptake of smarter digital power infrastructure, the call for proposals will be open to three types of applications:

- **Type 1: Urban smart energy:** Projects of this type will be developed in a local neighbourhood or a part of a city, where digitalisation can be applied to existing infrastructure (preferably already undergoing modernisation or under an existing project initiative). The solutions proposed include demand-side and distributed energy resources.
- **Type 2: Islanded systems**[1]**:** Projects of this type will address power systems already enabled for islanding or off-grid/isolated/remote systems (e.g., at the end of a long feeder), where digitalisation would have demand-side integration benefits. Preferably the assets are already under an existing pilot scheme or grid modernisation initiative.
- **Type 3: Existing asset enhancement:** Projects of this broad type will be developed in contexts with existing network assets (a large number of substations, conventional lines or power electronics) on an existing grid that can be digitalised through digital twinning, or advanced metering, and control to improve efficiency, operating conditions or reduce emissions and will have a demand-side component. Preferably the assets are already under an existing pilot scheme or grid modernisation initiative.

[1] Islanding here is meant to be a condition in which a distribution grid is operated isolated from the main grid. Intentional islanding offers the potential to maximise the level of generation that can be connected at the lower voltage levels of the distribution network and at the same time could provide consumers with improved levels of supply security.

2/ APPLICATION PROCESS

The **open call for proposal will launch on the 22nd of September 2021**. An announcement will be made during the Pre-COP26 (the 26th session of the Conference of the Parties to the UNFCCC) in Milan.

As COVID-19 restrictions continue, the launch of the open call for proposals will happen in a dedicated webinar. The webinar will focus on explaining the framework conditions, themes and other elements of the proposal. Please refer to the project website for more information.

The application procedure is a one-step process

Applicants are requested to submit completed proposals in English, using the application form and attaching supporting documentation where required.

Applications may be submitted by a consortium, joint venture or association, and the pilot project may be implemented by one or more key partners. In all cases, one entity shall be designated as the lead for communication and, if successful, be awarded with grant contracting.

An applicant can submit a project for a maximum of **euro 1.800.000 (excluding co-funding)**.

Co-funding requirements: Pilots would target 30% co-funding from external sources.

The eligible costs with maximum percentage limits and ineligible costs are listed in Table 1.

Table 1. List of eligible and ineligible costs with corresponding maximum percentage limits

Eligible costs	**Ineligible costs**
Overhead (20% maximum)	Basic research
Project management (7% maximum)	Investments in individual companies
Hard-ware purchase (15% maximum)	Independent freelance activities
Software costs (for permits, if any)	Writing applications
Installation costs	Overtime costs
Working hours	Salary increases
Travel costs	Indirect taxes and duties including VAT
Meeting costs	"Return on capital employed" including dividends and other distributions of profits
Communication	Provisions for possible future losses and charges
External services	Costs related to any interests
Other eligible pre-operative expenses approved	Provisions for doubtful debts
	Unnecessary or ill-considered expenses

	Marketing, sales and distribution costs for products and services
	Leasing costs (or part thereof) where the leasing arrangement has the effect of unnecessarily increasing the charge made to the project (e.g. where the cost without interest of the leased equipment is higher than if purchased).

Pilot projects must be implemented within the **24 months' timeframe.**

Applications must be submitted electronically by email ensuring that the submission is done before the **deadline on 15th February 2022.**

Information provided by applicants will be kept confidential and used solely for the assessment, selection and implementation of pilot projects under the 3DEN Initiative.

Selection process schedule

The application and selection process is expected as shown in Table 1. For more information on the selection process see section 3 below.

Table 2. Application and selection process schedule

Date	**Process**
22 September 2021	Launch of open call for proposal
15 February 2022	Application deadline
March to April 2022	Screening and assessment
April 2022	Communication to short-listed applicants
May to June 2022	Due diligence for the short-listed applicants
July 2022	Announcement of applicant receiving grants
August 2022	Expected signing date of grant agreements

Please note the above timelines are tentative and may be subject to delays.

3/ SELECTION AND IMPLEMENTATION PROCESS

- **Screening**

Applications will go through the initial screening that has a set of minimum prerequisites that the applications need to pass. This step ensures that the pilot project proposals meet fundamental criteria to the open call for proposal objectives and requirements, including showcasing innovation and replication potential (amongst other prerequisites as mentioned in **Annex1**). Screening against prerequisites is based on a pass/fail scoring and will be performed by a review panel.

- **Assessment**

Applications that pass the initial prerequisite step will then undergo evaluation by the review panel members. The proposed projects will be scored based on the assessment criteria (see **Annex 2**) and ranked in order from highest to lowest. Applications for all eligible cost's categories/project types (Type 1, Type 2 and Type 3) will be evaluated together. During the assessment phase, the review panel may communicate with applicants if further clarification is needed on proposals.

- **Shortlisting and due diligence**

Depending on the amount of funding requested by the highest-scoring projects, applicants will be shortlisted and notified of potential grant award. The short-listed applications will be subject to due diligence by the review panel members. Requests for and review of supporting documentation not yet provided may be made. The project team may also request meeting(s) with the applicant and/or project site visit. Due to the outbreak of COVID-19 physical site visits and meetings will be limited and conducted virtually. Applicants that successfully pass due diligence will be considered for grant award. If an applicant fails due diligence, the next highest ranked applicant will be moved up to the short-list and notified of potential grant award.

- **Grant award decision**

Once due diligence of short-listed applicants is completed satisfactorily, the process of signing grant agreements with chosen pilot project parties will start. Successful pilot projects will be publicly announced. Unsuccessful applicants will be notified once contracts with successful applicants have been signed. No feedback will be provided on applications.

- **Signature of agreement**

After successfully passing a thorough due diligence, UNEP will start the process of signing grant agreements with successful applicants. Chosen pilot projects will be publicly announced. Unsuccessful applicants will be notified once contracts with successful applicants have been signed. No feedback will be provided on applications.

- **Reporting**

Once the agreement is signed, the grants will be disbursed to successful applicants as

agreed accordingly in the grant agreement. Data and information sharing, periodic site visits (if applicable) and progress/monitoring updates will be required from successful applicants. Successful applicants will be required to report on their progress through bi-annual (twice a year) progress reports and regular conference calls. Furthermore, UNEP also requires audited financial statements and confirmation letters from auditors for project-financed expenses.

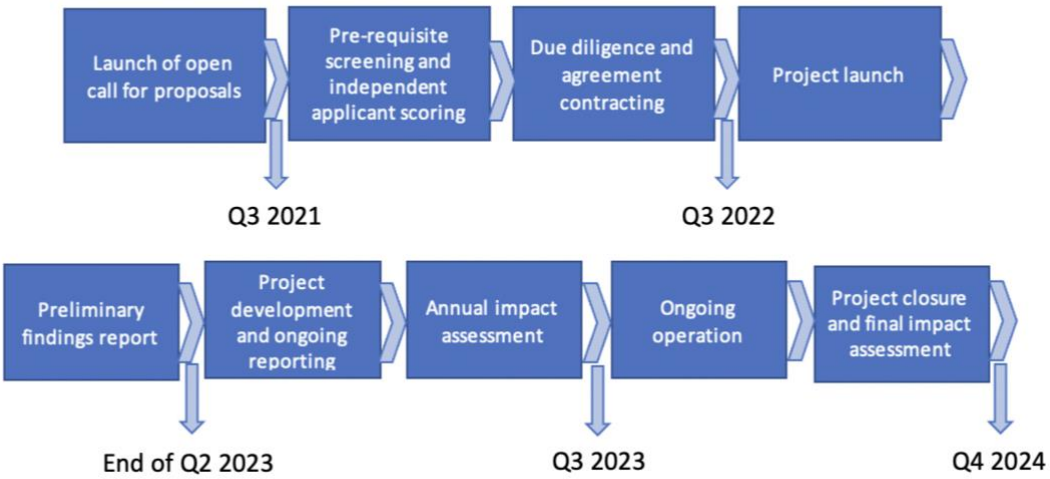

Figure 1 Project selection and implementation process

4/ CONTEXT OF THE PROJECT

Digitalisation consists of **three main elements**:

- Increase the availability of a huge set of data and connectivity that allows the exchange of large amounts of data.
- Facilitating data analytics by tools and methods to extract useful information from data.
- Promoting data-driven decision making that can be further supported by advanced controls and automation.

Advanced applications of these three main aspects make the digitalisation process able to unlock several opportunities for the energy sector. In particular, the following main aspects strongly benefits from the digitalisation process:

- **Enhanced system operation thanks to advanced measurement and monitoring systems:**
    - By implementing real-time digital measurements, the total energy system observability and operational efficiency can be significantly increased.
    - Advanced monitoring systems able to gather the increasing amount of data that the energy sector generates along with innovative data analytics solutions allow increased optimisation and higher overall system efficiency.

- **Enhanced forecasts and predictive maintenance:**
    - Digitalisation can enhance variable renewable energies (VRE) and load forecast, especially short-term ones, by making available real-time field data.
    - Digitalisation can reduce operational and maintenance costs of the whole energy system by enabling predictive maintenance through detailed device and component level real-time information.

- **Demand-side opportunities:** Digitalization has the potential to maximise benefits in all energy-consuming sectors while also addressing the challenges related to data security and accessibility.
    - **Building sector**

        (1) Digitalised building can also bring more flexibility to the power system through load shifting or reduce flexibility need through increased energy efficiency at peak.

- **Industry sector**

  (1) Also, the deep integration of digital technologies will increase flexibility and resilience to the often-severe impact of outages.
  (2) Today digitalisation can encourage the participation of smaller industries in flexibility (large industry sites already contribute to power system balancing).

- **Transport sector**

  (1) The deployment of suitable ICT platforms and Internet of things (IoT) devices when integrated into urban infrastructures can significantly improve the efficiency and effectiveness of transport, and support the integration of larger share of VRE for flexibility and a better understanding of charging patterns.

- **Cyber security concerns:** Deploying digital infrastructures and solutions should not lower or hinder security and reliability of the energy system.

  - Additional crucial aspects include data exchange protocols, data privacy, property and security and data sharing methods.
  - We need efficient data sharing and suitable data management as a prerequisite to guaranteeing an effective management of the energy system.

5/ ACTIVITIES ELIGIBLE FOR GRANT SUPPORT

The project provides funding support in the form of grants to share the cost of eligible activities.

Type 1: Urban smart energy
Projects of this type will be developed in a local neighbourhood or a part of a city, where digitalisation can be applied to existing infrastructure (preferably already undergoing modernisation or under an existing project initiative). The solutions proposed include demand-side and distributed energy resources management.

Example of Type 1 Projects:

(1) Testing the impacts of EV charging on the distribution grid.

- Technologies – EV, charging stations, digital monitoring and management platform, grid sensors.

(2) Testing flexibility options in constrained grid.

- E.g., where grid upgrade is needed and measures are needed to ensure security of supply.
- Technologies – smart meters, grid sensors, monitoring and/or management platform/app, behind the meter sensors.

(3) Testing local energy markets.

- Technologies – smart meters, grid sensors, rooftop solar, storage

(4) Testing various behavioural nudging instruments by providing simple smart meter devices.

- Incentives and behavioural change: using consumption data to find what type of consumer can give flexibility in various situations (various types of flexibility products with or without automation).
- Testing nudges or incentives to make consumer offer their flexibility (eg: comparing the overall effectiveness of two different instruments in the emerging country environments – e.g., implicit demand response (DR) using some time-varying retail rates vs. explicit DR using mobile phone text messages).

(5) Testing of technologies and measures to enable socially vulnerable communities to derive benefits from distributed energy resources.

- E.g., through demand response programmes, grid-connected distributed renewables generation.

Type 2: Islanded systems
Projects of this type will address remote/isolated/off-grid systems with existing assets (e.g., at the end of a long feeder) where digitalisation would have demand-side integration benefits. Preferably the assets are already under an existing pilot scheme or grid modernisation initiative.

Example of Type 2 Projects:

(1) Hybridisation of small islands with existing assets or remote/isolated/off-grid diesel-fuelled systems with rooftop solar.

- Technologies – solar PV, smart inverters, digital monitoring and management platform, sensors on the grid.

(2) Digital twinn (associated with other geographical datasets) to help optimise renewable location.

- The interest of the pilot project would be in the lessons learned about how best to plan for renewable when various needs cross (network, available production, urban planning …).

(3) Testing a micro-grid in a remote town with diverse distributed energy resources (DERs) including solar PV, battery storage and load control technologies.

- The point is testing which benefits are the most relevant to the emerging country environments.

(4) Local energy community related projects could be an upgrading of an existing system.

- E.g., enhanced data exchange and coordination to ensure further benefits for the community as well as the electricity system.

Type 3: Existing asset enhancement
Projects of this broad type will be developed in contexts with existing network assets (a large number of substations, conventional lines or power electronics) on an existing grid that can be digitalised through digital twinning or advanced metering and control to improve efficiency, operating conditions or reduce emissions and will have a demand-side component. Preferably the assets are already under an existing pilot scheme, or grid modernisation initiative, and reach beyond a local neighbourhood or a part of a city.

Example of Type 3 Projects:

(1) Digital twin associated with consumption data to enhance operations

- E.g., detecting low quality and power outages.

(2) Digital twin associated with consumption data to better target investment in a constrained area

- Big data and AI to enhance forecasting.
- E.g., planning the grid for expected surge in EV charging.

(3) A pilot project on local vs zonal constraints.

- E.g., Digital twin to model grid resynchronisation issues in high flexibility scenarios

(4) Testing automated demand response technologies.

- E.g., testing of interoperability of devices and systems, testing of system reliability and evaluation of control strategies

ANNEX 1 – CRITERIA FOR SELECTION

Applicants will duly complete the relevant Application Form (attaching all requested and relevant documents) in the English language and ensuring that the submission is done before the **deadline date of the 15th of February 2022.**

1.1. Prerequisites

Applicants and their proposals need to pass each screening criteria listed below in order for the proposal to qualify for the thorough assessment stage. The application form has been designed to provide the necessary information to assess the fulfilment of the eligibility.

- **Eligibility** - Applicants need to demonstrate their expertise and competence in order to assure the review panel of the implementation and completion of the proposed pilot project. The following provides examples of expected minimum evidence of capabilities:

Table 3. Minimum evidence of capabilities expected from applicants

Criteria for eligibility	Explanation
Geographical scope	○ Projects should be rewarded if the target country is a priority region, namely: Brazil, Colombia, India, Indonesia, Morocco, South Africa and Tunisia.
Pilot size and budget	○ Pilots should be one large neighbourhood in one large city, or isolated systems of network with rated capacities in the [10-100 MW+] range, or rated by the number of customers, or a comparably sized system for asset enhancement; AND ○ A budget range is set in agreement with the Donor, with a cap amounting to 1.8 million Euros for each project (excluded the co-funding).
Project duration	○ Pilot projects must be implemented within the 24 months' timeframe; AND ○ Pilots that show technical and financial ability and willingness to continue operating beyond the two-year mark are desirable; AND ○ Showing a viable business model through a plan for securing funding from development funds or local financial institutions are desirable, including for continuing operations post pilot.
Project consortium	○ Successful candidates will need to be part of a consortium that may include public (including

	universities or research centres) and/or private actors
Co-funding	○ Projects would target a minimum of 30% co-funding. In-kind contributions from project partners would be allowed as a form of co-funding.

- **Demonstration effects** – Applicants need to show the project's characteristics such as replicability/scalability, innovativeness and learning potential that would result from the realisation of the proposed project. Pilots should demonstrate the added value of digitalising existing assets through advanced metering and advanced solutions. Pilots will be rewarded for the inclusion of distributed resources, comprising demand-side flexibility, energy storage or distributed generation.

- **Additionality** – Applicants should justify the requested grant support in regards to facilitating the project's realisation. This may be but not limited to actualisation of the project earlier than expected, showing the benefits of digitalising assets, inclusion of market component, supporting the project in financing additional funding, supporting and contributing to the overall environmental, social and governance (ESG) standards or other non-financial conditions, increasing the development impact of the project that would not have happened otherwise.

- **Technical viability** – Applicants need to present the technical aspects of the project through the quality of the components. These are assessed through the advanced digital solutions provided by the project, the technologies included and the manufacturer of the equipment.

- **Financial viability** – Applicants should show the financial feasibility of the project with regards to its profitability (with grant support for eligible costs). Through illustrating the project funding, applicants will be expected to show competence in financial management or have adequate financial management procedures to manage and report on funding received.

- **Monitoring, reporting and verification (MRV)** – Applicants should agree on the monitoring process planned to ensure the successful implementation of the project. Furthermore, certain data will need to be provided to the project team throughout the various stages of the projects to ensure proper alignment with the project's team and to facilitate knowledge dissemination following the project's implementation. The information sharing requirement involves sharing data related to the financial and technical development of the project, allowing physical or remote visits of the project team, allowing project's photos or videos to be taken and made publically available, amongst others.

- **Environmental and social impact** – Applicants should ensure the project's compliance with local/national or international E&S standards (such as IFC standards). Furthermore, the environmental considerations of the project need to

be illustrated in terms of CO2 emission reductions as a result of the project. Information should also be provided with regards to the safety standards and measures insured during the project's implementation. Social aspects are reviewed through the impact of the project on several beneficiaries and is assessed through various parameters such as gender, benefit to the neighbourhood and nearby community, alignment with national/government goals, etc.

1.2. Assessment Criteria

After passing the eligibility test, pilot project applications will be scored based on assessment criteria. In the assessment process, the review panel will consider further information provided in the application form, score the application against the assessment criteria and rank applications from highest to lowest, to establish a short list of the 2-3 best proposals. Assessment criteria fall under the following six categories as reflected in the application forms.

Demonstration effects
• **Innovativeness** - Is the solution highly innovative and with a strong digital component (e.g. application of digital twinning, smart control algorithms, big data analytics from real-time monitoring)? • **Replicability/Scalability** - Does the project propose replicability of the solutions offered, including under various operating conditions or different build-outs and different systems? • **Learning outcomes** - What is the level of potential learning outcomes for the project?

Additionality

• **Existence** - Is the project overlaying an existing system or is it proposing an entirely new infrastructure?
  o Priority will be on pilot projects that add a digital layer to existing infrastructure and show its benefits. This could include: adding control algorithms, creating digital twins of energy system assets or demonstrating how data collected through advanced monitoring and control can be used to optimise existing assets or facilitate the integration of new ones.
  o Pilot projects may also build upon new infrastructure being realised through different sources of financing.
• **Benefit of digitalising assets** - Does the project adequately show the benefit of digitalising assets by e.g., showing its impact on grid services, improvement of technical parameters like energy efficiency, user comfort (e.g. thermal comfort), utilisation, asset lifetime, or grid operating conditions, and/or by allowing for flexibility and decarbonisation elsewhere in the system?
• **Regulatory component** - Does the project incorporate a sandbox or experimental regulatory framework within the jurisdiction of focus?
  o Have the necessary permits and licences for the project been obtained or is in the process of being obtained?

- **Market component** - Does the project include a market component through flexibility services provision e.g. aggregation of generation and load, EVs? Is the market composed by single-buyer or multiple buyers and sellers?

Technical viability

- **Consortium** - Does the project include a viables range of partners?
- **Proven experience** - Does the consortium have proven experience in years or months, including key personnel, in the area of smart energy system implementation?
- **Partnerships** - Has the partnership appropriately been formalised and do the partners have experience working together or on similar projects?
- **Assessment of the TRL** - Does the project include an assessment of the TRL of the technical solutions proposed?
- **Digital component** - Does the project add a digital layer to existing infrastructure?
- **Advanced solutions** - Does the project include advanced metering solutions or does it have distributed resources that include demand-side flexibility, energy storage or distributed generation?
- **Technologies and manufacturers used** – What kind of technologies does the project use? What is the manufacturer of the equipment?

Financial viability

- **Funding resources** - Does the project have a plan for securing funding from development funds / local financial institutions?
    - Does this project rely on subsidies, grants or any other public money (not including the grant funding provided by the project)
- **Financial capability** - Has the project shown a financial capability to continue operating beyond the 1-year timeline?
    - What is the amount of equity that the applicant will raise and the associated costs this will cover?
    - What is the debt that the applicant will raise and the associated costs this will cover?
    - What is the grant funding that is required by the project and what this will help cover (see table 1 for the list of eligible and ineligible costs)?
- **Assessment availability** - Is the assessment of project profitability and financial metrics available?
    - What is the expected financial close for the project?

Monitoring, reporting and verification (MRV)

- **Monitoring planning -** Does the project have a process and capacity to calculate the project's economic, social and environmental impact?
    - Does the project have a monitoring plan in place?
- **Data collecting and reporting** - How much commitment has the applicant shown to share data? Is the applicant in a position to produce a public deliverable with adequate coverage of project findings and results?

  - Does the applicant agree to share project data such as information on the project development, technical and financial aspects and implementation with the project team on the timeline agreed or whenever reasonably requested?
  - Does the applicant agree to allow physical or remote site visits of the project team whenever reasonably requested (approximately 2-3 times)?
  - Does the applicant agree to allow lessons learnt from the project implementation (including relevant data) to be published and made public?
  - Is there any data that the applicant forsees as not being willing to make publicly available?
- **Verification planning** – What is the monitoring and verification process planned for the project?
- **Data component** – Do learnings also include data needs, collecting the data, processing, filtering and access?
- **Cyber-security and data privacy** – Does the project duly address cyber-security and data privacy issues?

Environmental and social impact

- **CO2 benefits** – What is the estimated CO2 emissions reduction in tons of CO2 equivalent of the project?
  - Is a CO2 calculation included of the impact of the measure if scale-up?
  - Does the CO2 emission calculation follow a proper methodology where the baseline emissions are illustrated and used for comparison and references are correctly sourced?
  - Does the CO2 calculation include a forecast of the future potential of the solution or is it carried out at different significant levels of penetration of the solution?
  - Does the CO2 calculation include the life cycle of the equipment?
- **SDGs involvement** - Which and how relevant SDGs and corresponding indicators are involved in the project?
- **Government priority alignment** – Does the project align with government/national development priorities?
  - Does the project show that the approach is in line with the country's energy and climate policy?
- **Environmental & Social standards** - Does your firm and/or proposed pilot project comply with applicable local/national/international environmental and social standards?
- **Gender equality** – Does the firm have the gender policy?
  - What is the balanced gender ratio of employees (full and part time)?
  - How would the firm target the gender balance in the implementation of this project?
- **Non-discrimination** – Does the firm implement no discrimination against clients for product or service and preferably gender-focus for products and services?
- **Community benefits** – What are the general benefits that the project has on the neighbourhood and community residing nearby?

- **Power system benefits** - What is the overall potential of the solution to improve the reliability, stability and security of networks?
    - Does the project show benefits in terms of avoided lost load or avoided investments in peak generation and grid infrastructure?
    - Does the solution promote power system transformation on a level consistent with the country's decarbonisation ambitions?

ANNEX 2 – APPLICATION FORM

There is one application form provided for all types of applicants. Applicants are required to complete all parts of the application form.

If the applicant is unsure of the contents in the application form or any questions regarding the application, the applicant may contact the project team's contact person at myriem.touhami@un.org and carolina.merighi@un.org. The team will then guide the applicant based on the specific questions.

Please refer to application form documents.

ANNEX 3 - EXAMPLES

Applicants may propose projects that combine a mix of the below opportunities on cleaner electricity systems, energy efficiency and renewable energy for an innovative proposal of a business and regulatory model for the uptake of smarter digital power infrastructure.

Examples of opportunities on cleaner electricity systems

Area of Operation	Digital technology	Improvement opportunities
Grid operation and management	Data and analytics, including digital electricity infrastructure and software	Reducing system operation and maintenance costs
		Improving network efficiency by improved planning and operation, lower network losses and better project design throughout the overall power system
		Enabling predictive maintenance in order to reduce unplanned outages and downtime and to improve system resilience and reliability
		Extending operational lifetime of system assets
		Advanced digital assisted aids in control rooms to allow operator to manage an increasingly more complex system
	Remote monitoring	Equipment to be operated more efficiently and closer to its optimal conditions and flows and bottlenecks to be better managed by grid operators
		Greater system observability with special focus on distributed energy resources
		Increasing system flexibility by demand response
	Behind the meter demand response	Allow small costumer's appliances to participate in demand response programs
	Digital tools for distributed energy sources	Integration of variable renewable energy sources. Energy demand matching, baseload reduction)
		Enables storing/selling surplus electricity (decentralised)
	Digital Technologies for virtual power plants	Enhance higher renewables penetration by managing virtual aggregation of energy resources
Power systems/ transports	Uptake of electric (and connected) mobility	Shape energy and emissions trajectory of transport sector
	Smart EV charging for EV	Avoid new grid infrastructure, investments deferral
		EV provision of flexibility services by smart charging and vehicle to grid functionalities
		Optimal smart charging management considering both user and grid needs
Market	Smart demand response	Improved system flexibility
		Real-time energy pricing

	ICT platforms	Allow new market services by distributed energy resources mainly by VRE
		Local energy markets
	Behind the meter demand response	Allow small costumer to participate in demand response programs
	Energy management systems for small-scale storage	Foster the deployment of end-users storage systems by enabling their participation to markets through aggregators.
		Development of energy management systems (EMS) for energy storage that enable the provision of multiple services
Advanced forecasts	Enhanced weather and local conditions monitoring	Lower level of flexibility reserves needed to deal with renewable variability
		More efficient energy dispatching
Standards	Device interoperability	Foster new technology uptake

Examples of opportunities for energy efficiency

Area of Operation	*Digital technology*	*Improvement opportunities*
Industry: process controls and automation	Smart sensors and data analytics	Condition based maintenance to anticipate equipment failure
Buildings: intelligent home systems	Smart thermostats, lighting	Reduce energy use in residential and commercial buildings
		Allow demand response programs to provide system flexibility
	Sensors and data platforms	Predict, measure, monitor and manage the energy performance of buildings in real time
		Inform about maintenance requirements, investment performance, energy saving potential, etc.
	User behaviour and AI learning algorithms	Improving responsiveness of energy services for energy is provided when and where it is needed
Transports	Big data analytics and data sharing to optimise route planning	Reduce energy use (intensity) and maintenance costs
		Assess the potentialities of smart EV charging solutions to promote transport electrification and support renewables penetration
	Advanced sensing and automated decision-making capabilities	Uptake of automated, connected, electric and shared mobility (highly uncertain: changes in consumer behaviour, policy)
		Intervention, technological progress and vehicle technology, etc.)
		Shape energy and emissions trajectory of transport sector

	ICT platform for EV charging management	Optimal smart EV charging management considering both user and grid needs

Example of opportunities for renewable energy

Area of Operation	*Digital technology*	*Improvement opportunities*
Production and data analytics	Remote sensing, modelling and simulations	Information to determine solar and wind energy production potential, GPS and GIS tools for positioning
		Computer-aided simulations for optimised performance
		Modelling and simulations of reciprocal cross-flow of electric energy
System	Distributed energy sources	Integration of variable renewable energy sources. Energy demand matching, baseload reduction,
		Enables storing/selling surplus (decentralised) electricity
Market	Smart demand response	Improved system flexibility
		Real-time energy pricing
	Tools and platforms to aggregate small generator	Market participation of distributed energy resources through aggregation/aggregators
	Digital tools to support local energy communities	Supporting local energy communities aimed to exploit local renewable energy sources