Mission Innovation – INDIA

Funding Opportunity Announcement (FoA): Off Grid Access to Electricity

Call for Notification of Intent

(Code :MI-India/IC#2/DST/2017)

June 2017

1. PREAMBLE

Renewable energy technologies are ideally suited to distributed applications, and they have substantial potential to provide a reliable and secure energy supply as an alternative to grid extension or as a supplement to grid-provided power. Energy access is crucial for improving the quality of life for India's citizens and their economic conditions, and 24/7 energy availability remains a priority for the Indian government. Off-grid, clean energy technologies, combined with innovative research models, market-based solutions, and local community involvement have tremendous potential to become a transformative agent for lives of individuals and communities through providing quality of life, modern amenities and economic opportunites for development and prosperity.

2. OBJECTIVES

The objective of this Call is to promote affordable and accessible access to clean energy derived from off grid electricity as set forth in the MI-Innovation challenge document. Specifically, the overarching objectives are :

- For individual homes, the objective is to support significant reduction in price and increase performance of renewable power systems by 2020.

- For remote communities, the objective is to demonstrate in diverse geographic and climate conditions, the robust, reliable, autonomous operation of renewable power systems less than at a significant lower cost than today by 2020.

3. PURPOSE

The purpose is to develop the systems that integrate innovative technologies (components, sub-systems etc.) at high readiness level, demonstrate their technical feasibility and cost effectiveness in diverse social contexts of countries requiring off-grid access to electricity including India. It is expected to evolve technology and develop methodology and business models tunable to local conditions.

4. SCOPE

The funding opportunity will financially support activities towards development, studies, research, standards, capacity building and technical assistance, provided that these activities have strong linkage and potential to improve energy access at affordable cost for individuals and communities with no or limited access to grid connected power.

5. IDENTIFIED RESEARCH PRIORITIES:

The proposals are expected to address one or more of the following research areas**:**

5.1 Power Management- Generation & Hybridization

Addressing technology gaps in hybridization and integration of various local RE sources; Building integrated RE systems; Optimizing generation mix for off-grid applications; Distributed management systems – Remote monitoring and control; Instability issues (Both small signal and transient for diesel generators);Plug & Play Modular and Scalable Generation System; Defining standards for remote areas; Optimum sizing of energy storage; Design, Operation and Maintenance; Modeling, Analysis and Design Tool development; Performance Analysis and Monitoring of off-grid systems and components.

5.2 Power Delivery Systems

Convertors, Protection and Controls: Plug & Play, high efficient, modular and cost effective smart converters; Self Healing Control for community off grid; DC micro grids; Hybrid AC-DC Architectures; Fast acting Protection Schemes and current limiters

Communication: Grid formation (Control co-ordination among distributed generators with/without communication); Intelligent multirole measuring devices; Low cost wireless and wired systems for supervisory control for community off-grid.

Grid readiness (limited grid access): Network Architectures, Net Zero Energy Neighborhood; Demand Side Management

Dynamic Energy Management and controls: Low cost (preferably open source) Energy Management System; Storage Management; Demand response, pricing and billing; Grid connection and Isolation; PCC voltage regulation; Inertial response, voltage transient, transient damping, unbalance management

Standardization: Voltage (DC system); Fault ride through capability; Margin for operation for frequency and Voltage (AC system); Power Quality Issues

5.3 Utilisation (DC & AC systems)

Lighting & device charging;Appliance Standardization ;Irrigation System, Cultivation; E-Rickshaw charging station; Intelligent DC Micro-grids; Integrated application ;Small Cold Storage and Drying; Primary Health Care Centers; Vaccine storage; Addressing specific requirement (occupational specific loads);Efficient appliances and Smart loads; Remote Monitoring; Intelligent Street Lighting; Telecom Power Supply; Renewable powered pumped hydroelectric energy storage systems ; Land use optimization for solar PV systems

5.4 Policy, Regulation, Market, Awareness and Business Models

Localization of manufacturing and maintenance; sustainable business models; Payment security; Capacity building and multi-skill development; Customer awareness and education; Off-grid

complementing not competing; Integrated financing mechanism; Policy encouragement for off-grid solutions

6. ELIGIBILITY

The proposals have to be led by qualified researchers/ professionals from Science, Technology, Engineering and Management disciplines working in permanent position at Indian institutions drawn from Indian Academia and public funded R&D Laboratories. Indian industries having R&D capabilities in the area and credible voluntary groups, industry association, privately funded R&D institution could be partner in the programme. **The institutions/industries of Mission Innovation (MI) member countries (mission-innovation.net) are welcome to join the partnership with Indian institute / organization as lead institute in collaborative work**. While there is no restriction on upper number of participating MI countries, participation of at least one MI countries/institution/industry is mandatory in each proposal. The participating organization from MI countries has to be a legal entity as per country's statute.

7. FUNDING

Total size	US $ 5 millions
Floor limit	US $ 0.1 million
Ceiling limit	US $ 1 million
Number of Awards	10

8. COMPONENTS OF FUNDING

- Research manpower especially hired for the project in India (Existing research manpower not eligible for funding).
- Travel (Domestic and international)
- Dissemination activities and stakeholder workshops
- Contingent expenditure such as stationery, incidentals etc.
- Consumables
- Minor Equipment (not exceeding 10 % of project cost)
- Demonstration Unit in India (upto 50 % of project cost) if proposed.

9. EVALUATION CRITERIA

The proposals are expected to cover issues right from R&D challenge to development and demonstrate at lab and field level, whichever feasible. Stand alone proposal focusing on pressing challenges/issues with clear path to bring out affordability and accessibility advantages will also be welcomed. The following criteria will be used in grant making decisions:

i) Relevance to objectives MI Innovation Challenge # 2 and R&D led breakthroughs for affordable and accessible off grid electricity.

ii) Technical, Business and Social Innovation on improving the viability of off grid clean energy system.

iii) Addressing critical R&D issue requiring early stage grant funding that allow for the development and testing of innovative technological solutions.

iv) Potential for accelerating the commercialization of innovative off-grid clean energy solutions.

v) Contribution of proposed work to enhance cost effectiveness of off grid applications.

10. PROCESS

The evaluation process will be conducted in two stages:

- Stage I: All interested applicants are invited to submit a Notification of Intent (NoI) in Consortium mode
- Stage II: From these initial submissions, Evaluation Committee will short list eligible NoI applications based on conformity to MI IC#2 objectives and intent for submission of detailed proposals. The Preliminary Evaluation Committee will also provide detailed guidelines for submission of proposal to prospective applicants.

11. TIMELINES

• Call for Notification of Intent (NOI)	8th June, 2017
• Last date of submission of NOIs Form	30th September 2017
• Invitation for submission of detailed proposals	15th November 2017
• Receipt of detailed proposal	15th January, 2018
• Evaluation of proposals and due-diligence	upto 31st March 2018
• Announcement of awards	At MI-3

12. GENERAL GUIDANCE ON PROPOSAL FORMULATION

The below guidance is not exhaustive, but is designed to help interested organizations to develop proposals.

- Proposed projects should necessary be based on clean energy and should be truly innovative and transformational. Proposals should make clear how they are adding value and not duplicating an existing solution; multiple forms of innovation are eligible and will be considered. Proposals should also clearly illustrate how the work proposes to overcome fundamental economic, social, or technical barriers to off-grid electricity access.

- Proposed projects should be in the early stages of development, defined broadly as the critical transition phase between concept and scale-up, where access to conventional forms of investment is limited and support from this grant would be most impactful.

- Proposals envisaging development and demonstration of integrated solution need to demonstrate how they would be replicated and scaled up to have wider impact, if successful. Such proposals should also demonstrate that they have considered the long-term sustainability of their proposed intervention. Similarly, R&D proposals aimed at developing components/sub-system need to highlight how the development would be commercialized cost effectively.

- Proposals should demonstrate that the project has sufficient buy in from the necessary stakeholders to deliver the expected outcomes. The letter of intent of support from such beneficiary Committee/organization/village Panchayat is desirable.

- The maximum time period of the project should not be more than 24 months. Each project is subject to review after /at key milestones to continue funding.

- The project administrative costs should be kept to a minimum. The permanent equipment maximum upto 10% of the cost of project may be provided to the organization to develop the solution. The cost of system deployed in the field shall be indicated separately as the Field Model cost in financial requirement.

- In case , the partner is an institute/ organization in MI member countries , a supporting document from them regarding their participation and support to the project will be required. The participating MI entity need to provide supporting document from relevant authority in the country justifying its legal status as per country's statue.
- The grant places strong emphasis on evidence-based results. Proposals must clearly define the indicators of success in the application form to show quantified tangible gain during the project lifecycle.
- The grant also places a strong emphasis on sharing the results more widely. Project implementing organizations will be required to maintain a website of the project and submit progress reports on regular intervals or on the achievement of key milestones for the duration of the project, and submit a project completion report within three months of the project conclusion along with the audited fund utilization certificate.

12. SUBMISSION GUIDELINES

i) Please submit documents in an Envelope marked : **MI / IC#2 /: Name of Principal Investigator**":

ii) 4 copies of complete NOI in prescribed format with enclosures (1 marked original + 2 hard copies) and 1 Soft copy in CD.

(iii) The complete set of documents are to be addressed to: Mr. Vineet Saini, Scientist 'D', Room no 5, Hall- J, S&T Block II, Technology Mission Division, Department of Science &Technology (DST), Technology Bhavan, New Mehrauli Road, New Delhi-110016 and should reach latest **by 30th September 2017**. Soft copy of NoI (MS word) is also to be e-mailed **(Email Subject: MI-IC#2 : Name of Principal Investigator/ Name of Institute)** to sertmd2016@gmail.com

Notification of Intent (NoI)Form

All applicants MUST use this form to apply

Instructions

1. Please review the Call for NOI carefully before completing this form.
2. Do not exceed the word limit where specified.
3. Use 12 point times new roman font to fill the information.
4. All questions should be answered clearly. Incomplete applications will be disqualified.
5. Submit the completed NOI to DST. By submitting this NOI, you are certifying that the answers to the questions are accurate to the full extent of your knowledge.
6. Enclosure (letter of intent from partners / beneficiary)

Section A: General Information

Ref Number (do not fill this field)	
Project Title	
Project Type *Research/Design & Demonstration of innovative Off grid/ Delivery of Technology or product development/ energy services / Business development support/ Research/Other*	

Project Location/s *(District/State)(Must be in India)*		
Stage of development *(initial concept/ proof of concept/ demonstration/scale-up)*		
(I) Total Funding Request *(INR)* *Enter the fund requirement from DST in appropriate category A/B/C*	A. Between INR 65 lakhs upto 3 crore	
	B. Between INR 3 crore - 6.5 crore	
Lead Implementing Organization (Must be an Indian organisation)		
Partnering Organization **In MI Countries**		
In INDIA		
(II) Contribution in Cash /kind from lead/partnering institution ,if any		
Total cost (I + II) =		

Section B: Project Information

Project Description *(max 500 words)*	

Expected Outcomes *(max 200 words)* *Describe the short and long-term outcomes and impacts of the project*	
Expected duration of project activities	*Years* *Months*
Unique advantages of the approach *(max 250 words)* *What are the existing competing solutions that seek to address the same challenge as your project? What makes your project distinctive and unique in comparison with the competing alternatives? Why is it a game-changing intervention?*	
Results Indictors *List specific results and indicators you will use to measure success of this project towards achievement of impacts and outcomes. Examples are given here, you may develop additional indicators as needed that best reflect project goals and performance. Contribution to Cost*	• Increased renewable energy capacity added • Increased access to energy services for un- or under-served populations • Increased energy savings achieved • Increased number of innovative clean energy tools, product, technologies, and methodologies developed, tested, and/or adopted • Increased number of clean energy enterprises with improved business operations

effectiveness and access are of paramount importance	• Increased number of beneficiaries with relevant skills in clean energy technologies, business models, etc. • Increased in proliferation with development of Standards and best practices
Monitoring and Evaluation approach *(max 150 words)*	
Project sustainability and long-term viability *What steps shall be taken to make the project scalable and sustainable in the long-term? (max 200 words)*	
Project Risks *(maximum 200 words)* *What are the main risks and challenges in the execution of the project (market risks, regulatory risks, financial risks, business model risks, etc.)?*	
Impact on women and other vulnerable populations *(max 150 words)*	

Section C: Financial requirement (all figure must be INR in lakhs)

Examples of budget head are given here; you may develop additional budget head as needed that best reflect the proposed activity

S. No	Item Head	1st Year	2nd Year	Total (Rs.in lakh)

Capital Component				
1	Permanent Equipment (*located in lab/ implementing organization)*			
2.	Plant cost /Fabricated systems/ demonstration models *(located at beneficiary location)*			
A'	*Sub total (capital items)*			
General Component				
1.	Manpower			
2.	Consumables			
3.	Contingencies			
4.	Domestic Travel			
5.	International travel to participate MI countries.			
6.	Other Cost ,if any			
7.	Overhead			
B'	*Sub total (General)*			
C	**Total cost of the project (A'+B')**			

I. DST Contribution to Project costs:

II. Contribution of consortium (if any)

Total Budget (I +II) : Rs. _____ Lakh

Total Budget *(INR)*	
Budget Details	

Describe specific activities if any to be supported under this grant, by collaborator share	
Has the applicant received Government of India funding in the past for this or a similar project? (if yes please specify the name of supporting organization, amount and year)	Yes/No
Other sources of funding for the project, if applicable	

Section D: Applicant Details

Name of the Lead Organization		
Address *Please include phone numbers, fax, emails and website*		
Applicant Type *Broad: Government /Non-Government* *Sub entity : Academic or research institution or DSIR recognized Centre or other*		
Primary Point of Contact **Lead Principal investigator (PI)**	Name:	
	Designation	
	Email	

	Telephone:	
	Mobile	
Secondary Point of Contact	Name:	
	Designation	
	Email	
	Telephone:	
	Mobile	
Information on Lead PI *(maximum 250 words)* • *Relevant experience and track record* • *Project team (key personnel, skills & experience)* • *Provide up to 3 past performance references that can speak to ability of applicant to achieve results, successfully implement a project of similar magnitude and complexity*		
Partner institution (in India) * *if applicable, and what skills and experience they will contribute to the implementation and scale of the project:*		
Partner Institution (in Mission Innovation countries) * *if applicable, and what skills and experience they will contribute to the implementation and scale of the project*		

***** The same information as required for lead PI may also be provided for partner organization.

Section E: Enclosure details , if any

(Letter of intent from beneficiary organization and partnering institution)