F. No. 149/22/2023-MNRE

भारत सरकार / Government of India

नवीन और नवीकरणीय ऊर्जा मंत्रालय **/ Ministry of New & Renewable Energy (MNRE)**

चक्रीय अर्थव्यवस्था प्रभाग / Circular Economy Division

Atal Akshay Urja Bhawan
Lodhi Road, New Delhi-110003
Dated: 11th July, 2025

OFFICE MEMORANDUM

Subject: Extension of Deadline – "Call for Proposals" on Innovation Challenge for Circularity in Renewable Energy Technologies - Batteries and Solar Photovoltaic - Reg.

The Ministry is implementing the RE-RTD Programme, which aims at scaling up the R&D effort for promoting indigenous technology development for wide spread deployment of new and renewable energy in an efficient and cost-effective manner across the country.

2. Under the Programme, proposals are invited through *a call for proposals* under the **"Innovation Challenge for Circularity in Renewable Energy Technologies – Batteries and Solar Photovoltaic."** The proposal aims to promote innovation in recycling and reuse, minimize waste, enhance sustainability and resource efficiency, foster new technologies, strengthen the supply chain, and align with global climate goals while advancing the nation's research and innovation capabilities in the circular economy within the RE sector.

3. Comprehensive details regarding eligibility criteria, funding, application format, and other relevant information are available in the attached *Call for Proposals* document as Annexure. The last date for submission of applications has been extended to **01st August 2025**.

4. Proposals must be submitted online at **https://research.mnre.gov.in/.** For any further details, please contact Dr. Kuldeep Rana, Scientist 'E', MNRE (email: kuldeeprana.mnre@gov.in) or Sh. PNBV Chalapathi Rao, Scientist 'D', MNRE (email: chalapathi.rao@nic.in) or Sh. Arun K Choudhary, Scientist 'C', MNRE (email: akchoudhary.mnre@gov.in).

Encl.: Call for Proposals document

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To:
All concerned

Annexure

Call for proposals on
Innovation Challenge for Circularity in Renewable Energy Technologies - Batteries and Solar Photovoltaic

1. Background

The future demand for clean energy technologies for the world's energy transition will lead to increase in demand for various minerals as these technologies are more mineral-intensive than fossil fuel technologies (World Bank 2020). At the same time, some studies suggest that the total material supply is limited, and the supply chains are highly concentrated in a few geographies, which can be a constraint for the growing speed of RE deployment (IEA 2019, 2021; World Bank 2020). Thus, it is crucial to optimally utilise the available resources to produce clean technologies across the value chain while also scaling innovative technologies with alternative and readily available minerals.

While renewable energy (RE) technologies help in reducing dependence on fossil fuels, they also generate significant waste throughout their lifecycle. Proper waste management is essential to ensure the sustainability of the RE sector. A circular economy approach plays a crucial role in waste management, transitioning from conventional "take-make-dispose" model to a more sustainable reduce-reuse-recycle strategy. Circular economy practices can drive entrepreneurship by fostering innovative business modes that turn waste to wealth. Entrepreneurs can develop new products and services based on recycled materials, repair, and refurbishment, thereby creating new markets and opportunities.

For India, this means the target of achieving 50% of the electricity generation capacity from non-fossil fuel sources by 2030 and achieving Net-Zero by 2070 have to be met through a holistic resource efficiency-based framework, reducing waste generation and improved recycling through innovations across the value chain, where the circular economy approach is at its core. Solar and battery-based storage will also be the key technologies to achieve both these targets. The demand for these will be met through end technologies produced from primary and recycled materials. In both cases, it is crucial to ensure minimal irreversible waste is generated; therefore, a circular economy approach based on a resource efficiency approach is aptly needed.

India's global leadership around the circular economy is well known, and the government has constantly emphasised its role in charting a sustainable development model for the country. India launched Mission LiFE at COP26 as a global mass movement to promote practices leading to mindful utilisation of resources and preserving the environment. In 2021, NITI Aayog constituted 11 committees across ministries to accelerate a transition from a linear to a circular economy. One of the committees was formed with NITI Aayog and the Ministry of New and Renewable Energy (MNRE) as the implementing agency to expedite the transition of the Indian solar industry from a linear to a circular economy. Another committee was created

within NITI Aayog for Lithium-Ion batteries. The committee's action plan identified research, development, and demonstration (RD&D) of various circular economy strategies as priority areas. These strategies include designing, manufacturing, operation and maintenance, refurbishing, reuse and recycling, and innovations that maximise resource efficiency, utilisation and recovery. India's G20 presidency saw the launch of the Resource Efficiency Circular Economy Industry Coalition (RECEIC) and a commitment from leaders to "enhance environmentally sound waste management, substantially reduce waste generation by 2030, and highlight the importance of zero waste initiatives"; in the New Delhi Leaders' Declaration.

However, translating these ambitions into reality requires access to technological and process innovations across the value chain, including but not limited to – designing and manufacturing, approaches for reuse and recycling and operational management.

2. Objectives of the Call

Delivering on the vision of the Government of India and taking steps to bridge the gap between current and sustainable development scenarios and improving penetration of circular economy approaches in clean energy sectors, the Ministry of New and Renewable Energy (MNRE) under its "Renewable Energy Research and Technology Development (RE-RTD) Programme" is launching an "Innovation Challenge for Circularity in Renewable Energy (RE) technologies - Batteries and Solar Photovoltaic". The challenge aims to promote and scale up research and development (R&D) of circular economy approaches in the battery and solar sector. The innovation challenge will help improve process and resource efficiency for solar and batteries and promote circularity in their value chains. This shall also unlock new employment and investment opportunities.

To achieve this, the circularity innovation challenge specifically focuses on identifying innovations which are efficient, reliable and scalable in the following three themes:

- Design and manufacturing innovations
- Second-life use and recycling innovations
- Operational management innovations

Thus, MNRE is inviting proposal from eligible entities involved in R&D related to circular economy in RE – solar and batteries. After appraisal of proposals, MNRE shall select innovations eligible for financial support and pilot implementation of relevant innovative projects. The support will be provided to innovations as per the Terms & Conditions of the Innovation Challenge for Circularity at **Appendix-I.**

3. Important Dates:

Opening date for submission of proposals: **23.06.2025**
Closing date for submission of proposals: **01.08.2025**
Project Duration: Up to 02 years (extension subject to case-to-case basis as per MNRE's discretion).

4. Spectrum of activities supported

The spectrum of activities encompasses translational research to convert knowledge into practical products or processes. It also includes applied research aimed at improving the performance of existing systems. This innovation challenge uses Technology Readiness Level (TRL) to assess the technology maturity of the submitted proposals. Details on TRLs are provided in Table 1 below. The applicants are advised to indicate the Technology Readiness Level (TRL) at the project's initiation and completion by submitting the necessary and supporting documents for evidence such as research methods, analytic studies, hardware prototypes, field testing, etc.

Table 1 Technology Readiness Levels (TRL) scale

Technology Readiness Level (TRL)	**Requisite Conditions**
TRL 1	Basic principles observed and reported
TRL 2	Technology concept and/or application formulated
TRL 3	Analytical and Experimental Critical Function and/or Characteristic Proof-of-Concept
TRL 4	Technology Component / sub-system validation in laboratory environment
TRL 5	Technology Component / sub-system validation in relevant environment (industrially relevant environment in case of key enabling technologies)
TRL 6	Technology sub-system or prototype demonstration in a relevant environment
TRL 7	Technology System Prototype demonstration in an operational environment
TRL 8	Actual Technology System completed and qualified through testing and demonstration
TRL 9	Actual Technology System proven in its operational environment (competitive manufacturing in the case of key enabling technologies)

Disclaimer: Submissions of the project proposals on these topics do not indicate preferential treatment or otherwise. The onus of convincingly establishing the need and demand of the research rests on the proposal through supportive facts and data.

5. Intellectual Property Rights (IPR)

The details related to IPR for the Challenge will be governed as per the Clause-V of the RE-RTD Programme guidelines of the Ministry.

Appendix-I

Terms and Conditions of the Innovation Challenge for Circularity

1. Background

a. The Challenge will focus on supporting innovations for the following aspects (termed as 'Themes of the Challenge') of the circular economy:

i. T**heme 1: Design and manufacturing innovations** that help promote design and manufacturing for circularity for easy dismantling and waste segregation, resource efficiency, alternative materials, chemicals and technology for manufacturing, manufacturing products from recycled materials, and related aspects.
ii. **Theme 2: Second-life use and recycling innovations** that promote reuse, repair, refurbishment, re-manufacturing, recycling, and recovery of materials from waste solar panels and batteries.
iii. **Theme 3: Operational management innovations** that help deployed solar and battery systems achieve optimal life. This can be achieved through efficient monitoring of modules and batteries via enabling predictive maintenance, digitization of supply chain, digital labelling of solar and battery systems providing information on their material composition, installation, handling and storage guidelines, recycling approaches, etc.

b. The innovations will fall under three categories based on the Technology Readiness Levels (TRLs). For purpose of this challenge, these categories are defined as follows:

i. Proof of concept innovations: These are innovations lying between TRLs 1 to 3.
ii. Potential innovations: These are innovations at TRLs 4 and 5.
iii. Proven innovations: These are innovations that are at TRL 6 and above.

The applicants shall provide supporting documents to verify the TRL of their innovations.

2. Eligibility

a. All applicant technologies must be wholly based in India. This will include the siting of the product team and/or company, the siting of the product development and testing facilities, the securing of relevant certifications and approvals, and the complying of market entry regulations.
b. Eligible participants as per the RE-RTD guidelines issued by MNRE vide Order No. 223/90/2017-R&D on 09.12.2021.
c. Participants agree to be bound by these T&Cs and to comply at all times with these T&Cs.
d. The proposal is to be submitted online at **https://research.mnre.gov.in/.**
e. Any person(s) whose participation is restricted by relevant laws of the Indian government or relevant legislations, regulations, and other government is/are not eligible to apply.
f. MNRE reserves the right to verify the eligibility of all participants and not to select a winner if reasonable grounds exist to suspect that a winner is not eligible for any reason whatsoever. In such a case, MNRE reserves the right to select an alternative winner of the Challenge.
g. Technologies must fall under one or more of the themes of the Challenge:

i. Design & manufacturing innovation
ii. Second-life use and recycling innovation
iii. Operational management innovation

3. Recognition and support

a. All applications will be screened by the Secretariat, and by an independent Jury composed of sector experts. The Jury will consist of subject experts empanelled as per MNRE R&D Project Appraisal Committee (RDPAC) guidelines.
b. Winners of the innovation challenge shall receive funding based on the innovation category, proposed cost and category based on TRLs that they fall under. The distribution has been detailed out in the table below:

Innovation category	**Maximum financial support for each winner***	**Financial support for each category**
Proof of concept	Up to INR 10 lakh or 50% of the total project cost (whichever is lower)	INR 50 lakh
Potential	Up to INR 30 lakh or 50% of the total project cost (whichever is lower)	INR 1.5 crore
Proven	Up to INR 2 crore or 50% of the total project cost (whichever is lower)	INR 8 crore
Total		**INR 10 crore**

* A winner may receive financial support that is lower than the maximum support allowed under each innovation category depending upon the final decision taken by the Jury.

c. For details on the disbursement of funds and other terms and conditions for sanctioning and releasing funds, section F of the RE-RTD Programme issued vide Order No. 223/90/2017 - R&D dated 09 December 2021 may be referred to. MNRE reserves the right to terminate the project and financial support at any stage if it is convinced that the grant has not been properly utilized, or sufficient progress has not been reported.

d. Utilisation of this financial support shall be used only for purpose of:

i. Upgrading of TRLs for proof of concept and potential innovations category of the challenge
ii. Pilot implementation and demonstration for proven innovations category of the challenge.

The winning innovator will need to submit documentary proof of utilisation of funds towards the mentioned purpose whenever requested by the Secretariat.

4. Monitoring, reporting & validation

a. Monitoring and evaluation of the pilot projects will be undertaken through Project Monitoring Committees (PMCs) composed of subject matter experts empanelled by MNRE.
b. Winners of the Challenge will be required to submit periodic technical and financial reporting on the progress for review by the PMCs.

c. Additional details on the role of the PMCs are available in the RE-RTD Programme Guidelines.

5. Evaluation criteria

The shortlisting of applicants will be completed in two stages. The first stage will involve initial screening of applications done by the Secretariat of the Challenge. The second stage will involve the shortlisting of those applicants that have cleared the initial screening. This will be done by the Jury of the challenge. Both stages shall include a shortlisting criterion for the Secretariat and the Jury respectively. Key considerations are as follows –

a. Complete and thorough submission of the application form and other associated procedures as per the call for proposals
b. Relevance of the proposal
c. Technical competency or merit
d. Technology innovation
e. Potential for scalability and commercialisation
f. Sustainability
g. Additional benefits of the project outcome

6. General

a. Applicants must fill out a complete online application with required attachments on the website https://research.mnre.gov.in/. No paper applications will be accepted.
b. Applications containing false or unverifiable information may be considered incomplete and disqualified. The decision of MNRE in this regard will be final and non-contestable.
c. The challenge organisers reserve the right to reject any application and change the terms and conditions of participation. Any such changes will be binding on all applicants.
d. For any queries that are not answered in the available resources on the challenge website, please use the contact details provided on the website. Individual queries to the challenge organizers will not be entertained.
e. Please note that due to the volume of participation, the challenge organisers will be unable to provide specific feedback on applications.
f. Please ensure that you check all communication channels, including the Spam folder of your email inbox, for communication from the challenge organize.