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भारत सरकार/ Government of India

नवीन और नवीकरणीय ऊर्जामंत्रालय / Ministry of New & Renewable Energy

(अनुसंधान और विकास विभाग /R&D Division)

Block 14, CGO Complex
Lodhi Road, New Delhi-110003

Dated: 26th May, 2022

OFFICE MEMORANDUM

Subject: "Call for Proposals" under Renewable Energy Research and Technology Development Programme (RE-RTD-2022) - regarding

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. The programme will strengthen research and innovation capacity of the country and will be implemented in accordance with the policy and guidelines.

2.0 Under this programme, the proposals are invited through "Call for Proposals". The details of call for proposal indicating eligibility, financing, application form etc. are given in **Annexure**. The Last date of submission of application is 10th July, 2022.

3.0 The proposals may be submitted online on <https://mnre-research.com>. For any further details, Dr. Anil Kumar, Scientist-D, MNRE (email: anil.kumar.mnre@nic.in) and Mrs. Priya, Scientist-C, MNRE (email: priya.mnre@gov.in) may be contacted.

This has the approval of Secretary MNRE.


(Dr. Anil Kumar)
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Ministry of New and Renewable Energy
भारत सरकार / Govt. of India
नई दिल्ली-110003 / New Delhi-110003

To:

1. All Division of MNRE
2. All the State Nodal Agencies (SNAs)
3. Chairman, All India Council for Technical Education (AICTE), New Delhi
4. Chairman, University Grants Commission (UGC), New Delhi
5. Director, Indian Institute of Technology (IITs)/National Institute of Technology (NITs).
6. MD, CMD and ED of all the concerned Public Sector Units.
7. Director Generals, NISE, Gurugram, NIBE, Kapurthala, NIWE, Chennai.

Copy for information to:

1. Additional Secretary, MNRE
2. AS&FA, MNRE
3. Joint Secretaries/ Advisers/Scientist-G/Economic Advisers
4. Sr. PPS to Secretary (MNRE)
6. NIC Cell (for publishing on the Ministry's website)

Encl. : 1. Call fo Proposals, 2. R&D Guidelines

F. No. 223/90/2017 - R&D

भारत सरकार/ Government of India

नवीन और नवीकरणीय ऊर्जा मंत्रालय / Ministry of New & Renewable Energy

(अनुसंधान और विकास प्रभाग / (R&D Division))

FIRST CALL FOR PROPOSALS:

**RENEWABLE ENERGY RESEARCH AND TECHNOLOGY DEVELOPMENT
PROGRAMME (RE-RTD-2022)**

1. PREAMBLE

The RE-RTD Programme aims at scaling up the R&D effort during the period FY 2021-22 to FY 2025-26 for promoting indigenous technology development for wide spread deployment of new and renewable energy in an efficient and cost effective manner across the country. The programme will strengthen research and innovation capacity of the country and will be implemented in accordance with the policy and guidelines issued from time to time and thrust areas identified by MNRE.

2. OBJECTIVES OF CALL

The objective of the scheme is to support R&D projects for technology development and demonstration in various areas of new and renewable energy such as solar photovoltaic systems, biogas systems, waste to energy systems, wind energy systems, hybrid systems, storage systems, hydrogen and fuels cells, geothermal energy etc. with the ultimate aim of increasing the share of renewables in the energy mix in the country. These are expected to contribute to making industry internationally competitive and renewable energy generation supply self-sustainable/ profitable. Technology development and demonstration will be supported for manufacture of new and renewable energy systems/devices/components for different applications including transportation, portable and stationary applications for rural, urban, industrial and commercial sectors.

3. WHO CAN APPLY

- i) R & D / Academic Institutions including Engineering Colleges (both Public & Private duly accredited by Government bodies),
- ii) Public/Private Industries,
- iii) Societies registered under the Societies Registration Act 1860,
- iv) Trusts registered under the Indian Trusts Act 1882,
- v) NGOs,
- vi) Start Ups duly recognized by Department for Promotion and Internal Trade (DPIIT) and
- vii) Organizations engaged in Research & Development for promotion of new &

4. FUNDING PATTERN

The Ministry encourages research and technology development proposals in collaboration with industry and provides upto 100% financial support to Government/non-profit research organizations/academic institutions/research institutions and upto 50% to Industry/Start-ups/Private Institutes/Entrepreneurs. Ministry may also provide financial support up to 70% of the project cost to Industry/ Private Institutes/ Research Organization/Start-ups for upgrading the technology from Low Technology Readiness Level (TRL) to High TRL with the endorsement of R&D Project Appraisal Committee (RDPAC).

5. SPECTRUM OF ACTIVITIES SUPPORTED

The spectrum of activities focuses on translational research to convert available know how to useful product /process etc. It also includes applied research aimed at performance enhancement of existing devices and systems. The strategy for sustainability of intervention and post intervention also needs to be explicitly stated. The applicants are advised to indicate Technology Readiness Level (TRL) at the beginning and end of the project.

6. CALL STREAMS

Proposals are invited under the broad thrust areas indicated at **Appendix I** of Guidelines for implementation of RE-RTD Programme *vide no.* 223/90/2017-R&D dated 09.12.2021. Those topics are only illustrative and any other topic in the spirit of this call will also be considered. Some possible thematic research topics are listed below:

A) Solar Energy:-

- Re-cycling of PV modules at end of life and processes for segregation/reuse of different components of PV module.
- Development of hybrid inverters suitable for Indian Grid.
- Development of high efficiency (6'x6' or more) perovskite /organic/multijunction solar cell.
- Development of low cost and efficient Photovoltaic based thermal storage systems for refrigeration in cold storages, milk chillers and air conditioners.
- Development of solar cooking system(chulha) with storage.
- Waste water recovery from industrial waste through solar technologies.
- Innovative Solar thermal technologies for cooling/process heating for Industrial applications.
- Study of the environmental impact on development of large scale solar power plants or

solar parks.

- Automatic shadow detection via digital image process for solar rooftops.
- Development of portable solar rooftop power plant with plug and play system.
- Development of high capacity solar pumps and irrigation systems for hilly regions.
- Development of Universal Solar Pump Controller (USPC).
- Sustainable cleaning of PV modules.
- Innovative Agro PV based solar plants.

B) Ocean and Geothermal Energy

- Development of High efficiency Wave Energy conversion system.
- Geothermal energy for heating/cooling applications in buildings.
- Resource assessment for potential of Ocean, Tidal and Geothermal energy.
- Development of Marine energy (Ocean, Wave, Tidal etc.) and Geothermal energy for new multiple and Industrial applications.

C) Renewable Energy Applications for supply of clean water

- Extraction of clean water from brackish/sea water using desalination process
- Harnessing of clean water from atmosphere.

D) Use of Information Technology in the RE sector

- Application of Block Chain Technology, Internet of Things, Big Data Analytics, Machine Learning and Artificial Intelligence in RE sector.

E) Wind Energy

- Cost reduction and indigenization of wind turbine components and sub-systems;
- Development of materials, techniques and technologies for offshore wind energy deployment;
- Modelling and simulation including high-performance computing (HPC) to improve generation forecasting, and performance analysis.
- LiDAR installations and Horizontal/Vertical Axis turbine.

- Off-shore wind installation to power Indian islands as well as drinking water by desalination.

F) Waste to Energy

- Cost effective and environment friendly technologies for utilization of urban, Agricultural, Municipal and Industrial wastes for energy recovery/power generation.

G) Small hydro

- Modular turbines with reduced weight and higher conversion efficiency at lower cost.
- Development of small innovative hydro plant for various applications.

H) Bio Energy

- Development of multi-feed, pre-treatment and cost competitive process for biogas production.
- Temperature control systems for enhancing biogas production.
- Low cost technology for biogas purification and bottling and its business modal.
- Development of multi feed biomass gasifiers for heating and power generation.
- Innovative technologies for drying of digested slurry of biogas plant.
- Innovative technologies for co-digestion of waste (biomass/sewage sludge).
- Production of bio-hydrogen.

I) Hydrogen and Fuel Cells

- Development of efficient, low cost and indigenous electrolyzers for hydrogen production;
- Indigenous development of type III and type IV cylinders, as well as hydride and carbon composite cylinder for hydrogen storage;
- Development of indigenous catalysts, membranes, balance of system components and stack assemblies for fuel cell;
- Development of Fuel cell based applications for power generation, transportation, logistics etc;
- Development of hydrogen distribution networks through pipelines, and dispensing stations.
- Fuel cell-based applications for Heating, Cooling and Power generation.
- Eco system for production, storage, distribution and dispensation of Hydrogen for

stationary and transport applications.

J) Energy Storage (All types)

- Next Generation Energy storage technologies;
- Standardization of controls and interfaces to allow flexible operation; and
- Simulation and Modeling for evaluation of storage requirement for different applications including grid support, ancillary services, e-mobility, peak shifting etc.
- Grid stabilization with energy storage.

K) Impact assessment, techno and socio-economic analysis and performance evaluation of Renewable Energy projects/systems.

7. ASSESSMENT CRITERIA

The project would be assessed as per Guidelines for Implementation of Renewable Energy Research and Technology Development (RE-RTD) Programme *vide no.* 223/90/2017- &D dated 09.12.2021.

8. PROJECT FORMULATION GUIDELINES

The proposals should clearly define the objectives and list the deliverables. For system / component / consumables related proposals, the deliverable should include a target performance. It should also be indicated as how the proposed process/ product/system stands at national and international level in terms of technologies/ performance/ cost.

The CV of the Project Investigators (PI) should be brief and highlight their competence and experience related to the proposed project area. Consortia may be formed wherever required by clearly explaining the need for forming the consortia and the roles and responsibilities of each partner. The industry partner should have proven standing and R&D capability in the area related to Renewable Energy Technologies and should exhibit the potential to commercialize the products / systems developed under the proposal.

The extent of participation and contribution of the industry partner should be clearly defined. Participating Industry would be required to invest within its own system i.e. production/ test lines and/or develop required infrastructure to adopt research leads and is expected to bring design and engineering capability for the benefit of the project.

9. SUBMISSION OF PROJECT PROPOSAL

The interested and competent organizations may submit the proposals, **online in the portal** <https://mnre-research.com>.

Regarding the proposals already received in the Ministry, the PIs are required to re-submit the proposal online for further consideration. In case of any modification/changes in