

353/61/2023-NT
Government of India
Ministry of New and Renewable Energy
(Hydrogen Division)

Atal Akshay Urja Bhawan, Lodhi
Road, New Delhi 110003

Date: 15 March 2024

To

The Pay & Accounts Officer,
Ministry of New and Renewable Energy
New Delhi- 110003

Subject: Scheme Guidelines for the implementation of the R&D Scheme under the National Green Hydrogen Mission

Sir/Madam,

I am directed to convey the sanction of the President of India for the implementation of the Research & Development (R&D) Scheme under the National Green Hydrogen Mission (NGHM).

2. **Objectives:** The Scheme has following objectives:
 - (i) To increase the affordability of Green Hydrogen production, storage, transportation, and utilization, and to enhance the efficiency, safety and reliability of the relevant systems and processes.
 - (ii) To build industry-academia-government partnerships to leverage the opportunity to establish an innovation ecosystem for Green Hydrogen technologies.
 - (iii) To facilitate scaling up and commercialization of the technological advancements by providing requisite policy and regulatory support.
3. The Scheme will be implemented as per the detailed Guidelines given at **Annexure**.
4. The expenditure on this scheme will be met from the budget provisions made under the National Green Hydrogen Mission Head.
5. This issues in exercise of the powers conferred on this Ministry and with the concurrence of IFD vide their Diary. No. 458 dated 15.03.2024.
6. This has the approval of Hon'ble Minister of Power and New and Renewable Energy.

Yours faithfully,



(Sujit Pillai)
Scientist-F

Enclosed: Annexure

Copy to:

1. All Central Government Ministries and Departments
2. All Members of the Empowered Group under the Mission
3. All Members of the Advisory Group under the Mission
4. CEO, NITI Aayog, Sansad Marg, New Delhi
5. Scientist-G & Head, Climate, Energy and Sustainable Technology (GEST) Division, Department of Science & Technology (DST)
6. State Nodal Agencies (SNAs) of all States/UTs
7. Major Public Sector Enterprises operating in Renewable Energy/Power Sector
8. Principal Director of Audit, Scientific Audit-II, DGCAR, I.P. Estate, Delhi-11002
9. Director General (Local Bodies), Office of the Comptroller & Auditor General, Deendayal Upadhyay Marg, New Delhi
10. Solar Energy Corporation of India (SECI), 6th floor, Plate-B, NBCC office, Block tower-2, East Kidwai Nagar, New Delhi. 110023
11. Shipping Corporation of India, Shipping House, 245 Madame Cama Road, Mumbai - 400021.
12. Indian Renewable Energy Development Agency Limited (IREDA), 3rd floor, August Kranti Bhavan, Bhikaji Cama place, New Delhi-110066

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(Sujit Pillai)
Scientist-F

Ministry of New & Renewable Energy (MNRE)

Government of India

Guidelines for the implementation of the R&D Scheme under the National Green Hydrogen Mission.

1. Introduction

1.1. The National Green Hydrogen Mission, hereafter mentioned as the 'Mission', was launched on 4th January 2023 with an outlay of Rs. 19,744 Crore with an aim to make India a Global Hub for production, usage and export of Green Hydrogen and its derivatives. It will contribute to India's goal to become Aatmanirbhar (self-reliant) through clean energy and serve as an inspiration for the global Clean Energy Transition. The Mission will lead to significant decarbonisation of the economy, reduced dependence on fossil fuel imports, and enable India to assume technology and market leadership in Green Hydrogen. Under the Mission, along with other initiatives, the Ministry of New & Renewable Energy (MNRE) proposes to promote research on Green Hydrogen and its derivatives based technologies and applications. This scheme provides detailed provisions, terms, and conditions for the approval and implementation of R&D projects under the Mission.

2. Objectives

- i. To increase the affordability of Green Hydrogen production, storage, transportation, and utilization, and to enhance the efficiency, safety and reliability of the relevant systems and processes.
- ii. To build industry-academia-government partnerships to leverage the opportunity to establish an innovation ecosystem for Green Hydrogen technologies.
- iii. To facilitate scaling up and commercialization of the technological advancements by providing requisite policy and regulatory support.

3. Budgetary Outlay: Rs. 400 Crore till FY 2025-26

4. Components of the Scheme

4.1. Broad areas for support under the R&D program inter-alia include Hydrogen production, storage, compression, transportation, utilization, testing and techno-

economic analysis. The R&D projects supported under the Mission will be goal-oriented, time bound, and suitable to be scaled up to achieve quantifiable returns. Support will be provided under the Mission for the following type of projects:

- (i) **Mission Mode Projects with short term (0-5 years) horizon:** Under this mode focus will be on end-product development in partnership with the industry. Efforts will be made to aggregate and leverage existing capabilities and infrastructure during this phase. Projects likely to be taken up under this mode may include, among others, development of indigenous modular electrolysers and PEM based fuel cells. Biomass based hydrogen generation will also be scaled-up for commercial applications.
- (ii) **Grand Challenge Projects with a mid-term (0 - 8 years) impact horizon:** These projects will be initiated with a focus on critical technologies to overcome licensing challenges and supply constraints. These projects are proposed to be taken up in consortium mode and would require augmentation of existing capabilities and infrastructure. Component-specific research focus will be critical to further upscale existing domestic manufacturing capabilities, improve efficiencies and drive down costs of critical technologies. Likely Grand Challenge projects will be built around manufacturing of critical electrolyser and fuel cell components like Membrane Electrode Assemblies (MEAs), electrocatalysts, Catalyst Coated Membranes (CCMs), Gas Diffusion Layers (GDLs), bipolar plates etc. Component-specific research focus will be critical to further upscale existing domestic manufacturing capabilities, improve efficiencies and drive down costs of critical technologies.
- (iii) **Blue Sky Projects having a long term (0-15 years) horizon:** These projects will focus on establishing technical prowess and competitive advantage for the Indian industry. Blue Sky Projects will aim to develop and demonstrate capabilities of the Indian R&D sector in the green hydrogen sector. Blue Sky projects will aim to develop capabilities of the Indian R&D sector within an array of subjects like development of 3rd generation electrocatalysts, reversible Solid Oxide Electrolysers (SOECs) and Solid Oxide Fuel Cells (SOFCs), seawater electrolysis, thermo-catalytic pyrolysis, plasma pyrolysis, salt cavern surveys, high entropy alloys for reversible hydrogen storage etc.
- (iv) **Centers of Excellence:** The R&D program will also focus on identifying and supporting Centers of Excellence, by building subject expertise and research infrastructure. A network approach will be undertaken involving the academia-industry-government to ensure seamless transfer and commercialization of new

technology.

- 4.2. In addition to industrial and institutional research, innovative MSMEs and start-ups working on indigenous technology development and adaptation will be encouraged under the Mission.
- 4.3. The prioritization of the research areas is specified in the R&D Roadmap for Green Hydrogen, released by MNRE on October 7, 2023 and as amended from time to time.

5. Implementation Methodology

- 5.1. MNRE will hold an annual conference with research institutions and the industry to identify areas of research. Areas of research identified in these conferences will set the priorities.
- 5.2. **Submission of Proposals:** Research and Development project proposals in the area of Green Hydrogen can be submitted for financial support by Academic Institutions / R&D Institutions/ Government Institutions / PSUs / Private Research Institutions/ Industries having adequate infrastructure/facilities. Consortium of two or more entities mentioned above can also submit proposal for funding. Proposals may be submitted through any of the following four routes for consideration by the Ministry:
 - (i) MNRE will, from time to time, notify "Call for Proposals" for Research and Development projects through advertisement in scientific / technological journals and the MNRE website. Proposals will be invited against identified challenges, research problems in fostering green hydrogen ecosystem for R&D areas.
 - (ii) Besides Calls for Proposals, the interested institutions/ individuals may also submit proposals in relevant areas of research at any time to the MNRE. Such proposals will be evaluated for financial support on a case-to-case basis according to their relevance to the Ministry's research priorities and suitability for financial support;
 - (iii) Based on the need, Ministry may also consider soliciting proposals from identified experts, institutions and industry capable of implementing technology development activities in relevant areas.
 - (iv) The Ministry will also support setting up of Centres of Excellence for strengthening the Green Hydrogen ecosystem in the country, on a case-to-case basis.



5.3. **Appraisal of the Proposals:** Initial Screening of the proposals will be done by the MNRE to check relevance of the proposals with the priority areas identified in the consultation with the industry and the research institutions. Proposals shortlisted by MNRE will be placed before the Sectoral Sub-Committees (SSCs) constituted under the Advisory Group chaired by the Principal Scientific Advisor, Government of India. The experts in any of the committees shall not evaluate those projects which pertain to their organisation. Conflicts of interest, if any will be clearly disclosed. Projects recommended by the SSCs, will be considered for final assessment by the Advisory Group.

5.4. **Evaluation Criteria:** The proposals will be evaluated by SSCs based on the following criteria:

- a) Relevance and quality of the proposal;
- b) Availability of clear statement of quantified objectives and deliverables;
- c) Technical feasibility of the proposal;
- d) Technology Readiness Level of the proposed proposal/project.

5.5. **Project Approval:** Proposals recommended by the Advisory Group will be put up for the standard financial approval process. Sanction will be issued by MNRE upon obtaining financial concurrence and administrative approvals as per procedure. The sanction letter will clearly mention the approved objectives, head-wise budget with yearly break-up, duration, terms and conditions, deliverables/output and other condition of Grant; and the project grant shall be utilized as per the "General Terms & Conditions of the grant for Research and Technology Development projects" at **Appendix.**

6. **Financial Support:**

6.1. The MNRE will release financial support under the Scheme based on the following provisions:

6.1.1. **Quantum of Financial Support**

- (i) Academic Institutions, Universities, Government/Non-profit research organizations would be eligible for financial support up to 100% of the total project cost, subject to a cap as decided by the concerned Sectoral Sub-Committee/Advisory Group under the Mission. The financial support to the private institutes/research organizations and industries would be limited up to 80% of the

total project cost, subject to a cap as decided by the concerned Sectoral Sub-Committee/ Advisory Group under the Mission.

- (ii) However, having focus on applied research, the Ministry will encourage research and development proposals from consortia comprising of academic institutes/R&D labs and industry. The academia/ National R&D lab partner will be provided up to 100% funding of its share of the project, subject to a cap as decided by the concerned Sectoral Sub-Committee/ Advisory Group under the Mission. Industrial partner should contribute to the project with their own contributions.

6.1.2. Disbursement of Funds

- (i) The project proponents of the approved projects will receive financial support as per the approval letter issued by MNRE upon submitting necessary documentation.
- (ii) The Pattern of release of CFA will be on milestone basis, up to 30% of the total assistance excluding the institutional overheads would be released along with the sanction depending on the requirement of equipment in the project. The balance assistance excluding the institutional overheads would be sanctioned as per the annual allocation based on the progress/milestone achieved in the project. The utilization certificate of the grants released towards purchase of equipment should be submitted within 1 year of date of release; milestone based installments of grant would be released after full utilization of previous release and submission of required documents.
- (iii) The overhead charges will be restricted up to 8% of the project cost for the projects costing up to Rs. 1 Crore. In case of the project cost of Rs. 1 to 5 Crore, the overhead charges will be 8% of the project cost or Rs. 15 lakh whichever is less. In case of the projects cost of more than Rs. 5 Crore, the quantum and overhead charges will be decided/ approved by the MNRE on a case-to-case basis.
- (iv) Contingencies and Consumables amounts will be provided in the projects where research work involves field work or/and project has many investigators/institutions and need large manpower, based on the recommendations of the concerned SSC.
- (v) The institutional overheads would be released only after successful completion of the project and review by the concerned SSC and on receipt of the project completion report and financial due diligence as per GFR.

6.1.3. Other Terms & Conditions for Release of Funds

- (i) In a collaborative project, the partners will submit a joint application and the project will be funded in accordance with the agreed funding pattern by different collaborators.
- (ii) For implementation of the project, the temporary manpower i.e., SRF, JRF and RA etc. may be hired in the R&D project based on their expertise/professional qualification in the relevant field. The hiring of the manpower will be purely on temporary basis as per DST guidelines with a condition that there will be no liability, what-so-ever, of such staff on MNRE. The staff services shall discontinue immediately after the project duration expires. The emoluments of personnel on the regular roles in the participating institution(s)/organization(s) will not be borne under the project.
- (iii) No re-appropriation of funds is allowed between Capital Assets and Grant-in-aid heads and any underutilized funds under these heads need to be refunded to the MNRE at the end of financial year.
- (iv) Honorarium, sitting fees and TA/DA to the members/experts will be applicable as per the extant instructions/guidelines of Ministry of Finance, as amended from time to time.

7. Intellectual Property Rights (IPR)

- 7.1. The grantee institution(s)/ Inventor(s) shall be responsible to protect the Intellectual Property Rights (IPR) being generated through the research projects under the Scheme as per the provisions given in **Appendix** to this document, including amendments, if any.

8. Monitoring, Reporting and Validation

- 8.1. Monitoring and evaluation of the research and development activities will be undertaken through the SSCs of the respective stream. IFD representative may also participate in SSC meetings, if required. The SSCs will be responsible for:
- (i) Continuously monitoring project implementation.
 - (ii) Recommending release of funds, mid-course corrections, budget revisions, realignment of objectives to enable delivery of the envisaged project outcomes in a timely manner.

- (iii) Assessing the performance of the supported projects, and appraising the annual work plan for the current year on the basis of the deliverables/outcomes.
- (iv) Evaluation of the achievements of completed projects and give recommendations for corrections and further work, if any.

9. Project Completion Process

- 9.1. All efforts shall be made to complete the projects in time through rigorous monitoring and feedback. However, extension, subject to conditions, may be granted as follows:
- (i) Extension up to 1 year based on justification, without any increase in financial assistance, can be granted with the approval of the concerned SSC.
 - (ii) Extension up to 1 year based on justification, with requirement of additional financial assistance, can be granted with approval of MNRE, on recommendation of the concerned SSC.
 - (iii) On completion of the project, the Principal Investigators shall make a presentation before the concerned SSC, followed by a presentation before the Advisory Group of the Mission.

10. Awards for Innovation

- 10.1. In order to encourage innovation in Hydrogen R&D, the Mission will award prizes on an annual basis. The award will consist of a citation and cash prize Rs. 5 lakh, Rs. 3 lakh and Rs. 2 lakh. A committee will be constituted under the chairmanship of Secretary, MNRE to formulate guidelines for the awards and act as a jury for the selection of candidates for the award.

11. Power to amend Scheme Guidelines

- 11.1. MNRE may make the necessary amendments in the Scheme Guidelines, as and when required, with the approval of the Hon'ble Minister of New & Renewable Energy.



GENERAL TERMS & CONDITIONS OF THE GRANT FOR R&D PROJECTS

1. Approval of the R&D/ technology development project and the grant being released is for the specific project sanctioned and should be exclusively spent on the project within the approved time duration. The grantee organization is not permitted to seek or utilize funds from any other organization (government, semi-government, autonomous and private bodies) for this research project, unless specifically approved for joint funding by the SSC. Any un-spent balance out of the amount sanctioned must be surrendered to the Government of India through an ECS/ crossed Demand Draft drawn in favour of Drawing & Disbursing Officer, MNRE payable at New Delhi.
2. Full infrastructure facilities by way of accommodation, water, electricity, communication etc. for smooth implementation of the project shall be given by the grantee organization at their cost.
3. For permanent, semi-permanent assets acquired solely or mainly out of the project grants, an audited record in the form of a register must be maintained. The term "Assets" include (a) the immovable property acquired out of the grant; and, (b) movable property of capital nature where the value exceeds Rs. 50,000/-. The grantee organization is required to send to MNRE a list of assets acquired from the grant. The grant shall not be utilized for construction of any building unless specific provision is made for that purpose.
4. Assets acquired in the project shall be shared proportionately between Government of India and grantee organization(s) in accordance with the cost sharing pattern of the project. The assets should not be disposed of or encumbered or utilized for purpose other than those for which the grant had been sanctioned, without the prior permission of this MNRE.
5. On conclusion/termination of a project, the Government of India will be free to sell or otherwise dispose of its share of the assets, which are the property of the Government. The grantee organization shall render to the Government necessary facilities for arranging the sale of these assets. The Government may exercise discretion to gift its share of assets to the grantee organization or transfer them to any other organization if it is considered appropriate.

6. The grantee organization/ Principal Investigator will furnish Progress Report of the work carried out under the project on six monthly basis in the months of April and October during the project implementation period in a prescribed format given at MNRE portal.
7. Officer(s) of MNRE and MNRE designated Scientist/ Specialist/ Expert Panel(s)/Committee(s) may visit the organization periodically to review the progress of the work being carried out and to suggest suitable measures to ensure realization of the objectives of the project. During implementation of the project, the grantee organization will provide facilities to such visitors in the form of accommodation, site visits, etc.
8. On completion of the project, final consolidated 'Project Completion Report' on the work done on the project will be prepared after incorporating suggestions, if any, from the reviewers of the project and 5 copies of the same will be submitted to the MNRE, in the prescribed format given at MNRE portal.
9. The 'Project Completion Report' shall include all relevant technical details/specifications, design drawings of the systems/equipment, and an inventory of materials required, etc.
10. At the time of seeking further installment of grant and closure/ termination of the project, the grantee organization / Principal Investigator has to furnish the following documents:
 - (i) Utilization Certificate (U.C) for MNRE grant and 'Statement of Expenditure' (S.O.E.) for the total expenditure for the previous financial year (in original or copy if sent earlier) in enclosed formats given at MNRE portal.
 - (ii) Latest authenticated 'Statement of Expenditure' including Committed Expenditure, for the expenditure on the project including cost shared by any other organization since 1st April of that financial year till the previous month; and
 - (iii) Project Completion Report/ Progress Report.
11. Comptroller & Auditor General of India, at his discretion, shall have the right of access to the books and accounts of the grantee organization maintained in respect of the grant received from the Government of India.
12. The grantee organization will maintain separate saving accounts for the project in a Bank. If it is found expedient to keep a part or whole of the grant in a bank



account earning interest, the interest thus earned should be reported to the MNRE and should be reflected in the 'Statement of Expenditure'. The interest thus earned will be refunded to Ministry at the end of every financial year.

13. The grantee organization will neither entrust the implementation of the work which the grant is sanctioned to another institution nor will it divert the grant receipts to other institute as assistance. In case the grantee organization is not in a position to implement or complete the project, it should, forthwith intimate the same to MNRE and refund the entire grant released under the project within a month of such intimation.
14. All the personnel including Research personnel appointed under the project, for the full/ part duration of the project, are to be treated as project personnel on contract to the organization and will be governed by the administrative rules/ service conditions (for leave, TA/DA etc.) of the implementing Institute. They are not to be treated as employees of the Government of India under any circumstances and the MNRE will have no liability, whatsoever, for the project personnel after completion of the project duration.
15. The Ministry reserves the right to terminate the project at any stage if it is convinced that the grant has not been properly utilized or sufficient progress has not been reported under the project or sufficient efforts have not been devoted.
16. The project becomes operative with immediate effect or within a maximum of one month from the date on which the ECS/ Draft, / Cheque is received by the implementing Institution. This date should be intimated by the grantee authorities/ Principal Investigator to this Ministry.
17. The grantee organization shall associate a co-Principal Investigator with the project, if not already part of the project team. The co-principal investigator shall function as Principal Investigator in his absence and should be fully conversant with the activities under the project.
18. If the Principal Investigator to whom a grant for a project has been sanctioned wishes to leave the grantee organization where the project is sanctioned, the grantee organization/ Principal Investigator will inform the same to the MNRE and ensure successful completion of the project through co-Principal

Investigator, before relieving the Principal Investigator or appointing another employee as Principal Investigator.

19. Investigator(s) wishing to publish technical/ scientific papers based on the research work done under the project should acknowledge the assistance received from MNRE, indicating the project sanction no. under which grant has been given to the grantee organization. The Principal Investigator will submit a copy of the paper to the Ministry as soon as it is published.
20. If the results of research are to be legally protected under IPR, the results should not be published without action being taken to secure legal protection for the research results.
21. If the results of the work carried out under the grant require preparation of a technical booklet/ guides/ software/ CD etc.; in such cases the grantee organization will publish/prepare sufficient copies (number of copies to be decided in consultation with MNRE) and keep a portion for their use/ dissemination and submit the remaining copies to the Ministry for its use and distribution.
22. If the result is in the form of a survey report/product performance evaluation or other such activities which have commercial implications, the grantee organization shall not publish the results without specific written approval of this Ministry.
23. The grantee institution(s)/ Inventor(s) are required to seek protection of Intellectual Property Rights for the results/ output of the sanctioned R&D projects and shall share royalty/ proceeds of sale of IPR in accordance with the guidelines given below:
 - i. The IPR will belong to the contributing parties (including the MNRE) in proportion to their contributions.
 - ii. The Government of India/Govt. bodies (including its PSUs, Govt. autonomous societies & section 25 companies) shall have right to obtain a royalty-free license for the Intellectual Property for deployment/use of the same.



- iii. The Union Government shall have a royalty-free license/ March-in Rights for the use of the Intellectual Property. Accordingly, MNRE may grant the patent license(s) to other parties as decided by MNRE. Entities having license to market the developed product in India shall manufacture the product domestically.
- iv. In case, the grantee institution is unable to file a patent, MNRE or its nominated institution may file the patent.
- v. The grantee institution(s) shall provide a copy of the 'Full Text Document' of the Patent within one month of its publication.
- vi. A portion of the benefits and earnings arising out of the IPR may be retained for plough back to pursue research/research related activities in the Green Hydrogen sector.
- vii. The grantee institution(s) may submit the financial requirements for filing of IPR as part of the R&D proposal. The contingency head under the grant may be used, with approval of MNRE, for provisioning of the expenditure for filing of IPR with a ceiling of Rs. 15 lakh for the cost of initial filing, but excluding the annual fee. International Patent filing will be permitted.
- viii. The IP Rights to use the technology may be sold to another institution/industry, for commercialization, on terms and conditions as mutually agreed to between the parties. such transactions shall be done through a formal agreement between the joint owners of the IPR and the proposed licensee and intimated to MNRE within a period of 6 weeks from conclusion of the agreement.
- ix. Notwithstanding the above, MNRE reserves the right to take over ownership of the rights of the Intellectual property arising out of the projects under the Scheme, in the national interest, without any compensation to the grantee institution.

24. In case of any dispute the decision of the Secretary, Ministry of New and Renewable Energy shall be final.

