Mission on Advanced and High-Impact Research (MAHIR)

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Why is in news? Mission on Advanced and High-Impact Research (MAHIR) launched to leverage Emerging Technologies in Power Sector

- The **Ministry of Power and the Ministry of New and Renewable Energy** have **jointly launched** a National Mission to **quickly identify emerging technologies in the power sector and develop them indigenously**, at scale, for deployment within and outside India.
- The National Mission, titled "**Mission on Advanced and High-Impact Research (MAHIR)"** aims to **facilitate indigenous research, development and demonstration** of the latest and emerging technologies in the power sector.
- By identifying emerging technologies and taking them to the implementation stage, the Mission seeks to leverage them as the main fuel for future economic growth and thus make India a manufacturing hub of the world.
- The Mission will be **funded by pooling financial resources** of the Ministry of Power, Ministry of New and Renewable Energy and the Central Public Sector Enterprises under the two Ministries. Any additional funding needed will be mobilized from Government of India's budgetary resources.
- It is planned for an initial period of five years **from 2023-24 to 2027-28**, the Mission will **follow the technology life cycle approach** of Idea to Product.
- The Union Power & NRE Ministry said that the Mission will serve as a catalyst for national priorities such as achieving Net Zero emissions and promoting initiatives like Make in India and Start-up India.
- It will also contribute towards achieving the United Nation's Sustainable Development Goals (SDGs).
- Also added: "In last nine years, the Indian Power Sector has transformed into a vibrant and a financially viable sector. Given that India is going to grow at more than 7% in coming years, the electricity demand is going to increase at close to 10%.
- In addition, India is aiming for energy transition following Prime Minister's vision of LiFE. This requires not only massive investment but also a transformational approach driven by research & innovation."
- **Key objectives of the Mission**:
- To identify emerging technologies and areas of future relevance for the Global Power Sector and take up indigenous end-to-end development of relevant technologies
- To provide a common platform for Power Sector Stakeholders for collective brainstorming, synergetic technology development and devise pathways for smooth transfer of technology
- To support pilot projects of indigenous technologies (developed especially by Indian Start-ups) and facilitate their commercialization
- To leverage foreign alliances and partnerships to accelerate research & development of advanced technologies and to build competencies, capabilities and access to advanced technologies through bilateral or multilateral collaborations, thereby facilitating exchange of knowhow and Technology Transfer.
- To seed, nurture and scale up scientific and industrial R&D and to create vibrant & innovative ecosystem in the Power Sector of the country
- To make our Nation among the leading Countries in Power System related Technologies & Applications development

Areas Identified for Research:

- Alternatives to Lithium-Ion storage batteries
- Modifying electric cookers / pans to suit Indian cooking methods
- Green hydrogen for mobility (High Efficiency Fuel Cell)
- Carbon capture
- Geo-thermal energy
- Solid state refrigeration.
- Nano technology for EV battery
- Indigenous CRGO technology

The Mission will have a **two-tier structure** - a **Technical Scoping Committee and an Apex Committee**.

- The Technical Scoping Committee, **chaired by the Chairperson of Central Electricity Authority**, will **identify ongoing and emerging research areas globally**, recommend potential technologies for development under the Mission, justify the techno-economic advantages, provide research outlines, and conduct periodic monitoring of approved research projects.
- The Technical Scoping Committee (TSC) will survey and identify the on-going and emerging areas of research globally and will make recommendations to the Apex Committee. The TSC shall identify the potential technologies that can be considered for development under the Mission.
- The Apex Committee, **chaired by the Union Minister for Power & New and Renewable Energy** will **deliberate on the technology and products to be developed** and approve the research proposals. The Apex committee **will look also into international collaborations**.
- The Apex Committee will approve the research proposals and monitor the progress of research. The technology / product to be developed under the Mission will be deliberated by the Apex Committee. The final approval of all the research proposals / projects shall be given by the Apex Committee.
- The Mission shall **also fund pilot projects of technologies developed by Indian Start-ups** and facilitate their commercialization through the Central Public Sector Enterprises under both the Ministries. The start-ups will have to share the IPR with the Government of India / Central Power Research Institute.
- The Mission will **also facilitate international collaboration for smooth exchange of know-how and Technology Transfer**. The Mission will also seek collaboration with the best laboratories of the world for joint development of technologies.