GOVERNMENT OF INDIA
MINISTRY OF SCIENCE AND TECHNOLOGY
DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH
LOK SABHA
UNSTARRED QUESTION NO. 3032
(TO BE ANSWERED ON 19.03.2025)

UNMANNED AERIAL VEHICLES (UAVs)

†3032. **SHRI MUKESH RAJPUT:**

Will the Minister of SCIENCE AND TECHNOLOGY be pleased to state:

(a) whether the Government proposes to develop Unmanned Aerial Vehicles (UAVs) or Drones by Council of Scientific and Industrial Research (CSIR);

(b) if so, the details thereof and if not, the reasons therefor;

(c) whether the Government has taken steps to encourage research, development and deployment of technologies enabling efficient electrolysis processes for hydrogen production;

(d) if so, the details thereof;

(e) the CSIR's contribution in the National Green Hydrogen Mission; and

(f) the details of funds allocated by the Government for the same during the last three years and the current year?

ANSWER

MINISTER OF STATE (INDEPENDENT CHARGE) FOR THE MINISTRY OF SCIENCE AND TECHNOLOGY AND EARTH SCIENCES

(DR. JITENDRA SINGH)

(a)&(b) Yes, Sir. Council of Scientific and Industrial Research (CSIR) has already developed multi-copter drones for agriculture-related

applications, last mile medicine delivery and geo-physical explorations studies.

CSIR-National Aerospace Laboratories (CSIR-NAL), a constituent laboratory of CSIR has developed a medium-class BVLOS (Beyond Visual Line of Sight) multi-copter UAV. The UAV is made out of a lightweight carbon fiber foldable structure for ease of transportation and has unique features like autonomous guidance through dual redundant MEMS-based digital Autopilot with advanced flight instrumentation systems. CSIR-NAL's octocopter can carry a payload up to 20 kg with a hovering endurance of 40 minutes. It can fly at an operational altitude of 500 m AGL and a maximum flying speed of 36 kmph. Its regulatory compliance includes DGCA-NPNT, Geo-fencing, and digital sky with 360 degrees Collison avoidance making it one of the best UAVs in its class. The technology has been transferred to many MSMEs.

(c)&(d) Yes, Sir. Council of Scientific & Industrial Research (CSIR) initiated the Hydrogen Technology (H2T) Program in April 2022, focusing on the development of indigenous hydrogen production technologies, particularly three types of electrolyzers:

1. **Solid Oxide Electrolyzer Cells (SOEC): These operate at high temperatures, offering enhanced efficiency in hydrogen production.**
2. **Proton Exchange Membrane (PEM) Electrolyzers: These devices utilize a solid polymer electrolyte to produce hydrogen efficiently. Notably, CSIR's Central Electrochemical Research Institute (CECRI) has developed and commercialized a PEM-based hydrogen generator with a capacity of 5 Nm^3/h.**
3. **Anion Exchange Membrane (AEM) Electrolyzers: These systems employ non-noble metal catalysts, presenting cost-effective solutions for hydrogen production.**

In addition to electrolyzer development, CSIR is advancing hydrogen storage solutions, including high-pressure Type IV cylinders and both solid-state (metal hydride) and liquid-state (Liquid Organic Hydrogen Carriers - LOHC) storage methods. The CSIR H2T Program is also focusing on high-performance fuel cells

for mobility applications. Collaborations with industry partners, such as KPIT, have led to the development of prototypes like hydrogen-powered cars, buses, and catamarans. The first phase of the H2T Program would conclude by March 31, 2025 and the process to develop the second phase of H2T Program has already been initiated.

(e) Aligned with the National Green Hydrogen Mission, the CSIR Hydrogen Technology (H2T) Program focuses on R&D and demonstration projects across three key areas:

1. Production: Development of various electrolyzer technologies;
2. Storage: Advancements in hydrogen storage technologies; and
3. Utilization: Development of high-performance fuel cells for mobility applications.

(f) The details of funds allocated by CSIR for Hydrogen Technology (H2T) Program during the last three years and the current year is as under:

Financial Year	Amount (Rs. in lakh)
2022-2023	4613.65
2023-2024	2169.73
2024-2025	669.42
Total	7452.80

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