GOVERNMENT OF INDIA
MINISTRY OF SCIENCE AND TECHNOLOGY
DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH
LOK SABHA
UNSTARRED QUESTION NO. 153
(TO BE ANSWERED ON 02.02.2022)

'MAKE IN INDIA' INITIATIVES OF CSIR

153. SHRI DIBYENDU ADHIKARI:

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

(a) whether it is a fact that CSIR and its laboratories are trying their best in 'Make in India' initiatives; and
(b) if so, the proposal of the Union Government to use and award the research projects of the CSIR laboratories with the State Governments for technology transfer and applications of the products thereof?

ANSWER

MINISTER OF STATE (INDEPENDENT CHARGE) OF SCIENCE AND TECHNOLOGY & EARTH SCIENCES (DR. JITENDRA SINGH)

(a) & (b) **Yes, Sir. CSIR through its R&D efforts is contributing to Make in India initiatives. CSIR being a research organization undertake research and development activities focused at the unmet need and deliver knowledgebase/ technology to benefit the masses and Indian industry. CSIR has put in place a new R&D management strategy for planning and participative performance of R&D projects through the formation of sector specific theme based clusters. CSIR constituent laboratories across the Country have been grouped under the following eight Theme based Clusters:**

(i) Aerospace, Electronics, Instrumentation & Strategic Sectors (AEISS);
(ii) Civil, Infrastructure & Engineering (CIE);
(iii) Ecology, Environment Earth & Ocean Sciences and Water (E3OW);
(iv) Mining, Minerals, Metals and Materials (4M);
(v) Chemicals (including leather) and Petrochemicals (CIP);

(vi) Energy (Conventional & Non Conventional) and Energy Devices (EED);
(vii) Agri., Nutrition & Biotech (ANB); and
(viii) Healthcare (HTC)

CSIR undertakes Mission Mode and translational projects under the aforesaid themes besides NMITLI Projects to develop technologies to support Make in India initiatives. Brief details of some of the recent technologies developed by CSIR to support Make in India Initiative is at Annexure.

Further, CSIR has entered into knowledge partnership with State / UT Governments to promote science and technology-led development of the State/UT through deployment of identified technologies / knowhow as per the State/UT requirement. It has recently entered into such partnership with UT Administration of Ladakh and Manipur State.

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Annexure

Some of recent successful Make in India initiatives by CSIR are as under

SNo	Technology Developed	Application of Technology	Commercialization status
1.	Distillery spent wash management technology	• Industrial grade salt with reduced iodide and bromide impurities • High purity (edible grade salt and sodium sulphate) • K-S fertilizer from spent wash ash, Eichhornia, tobacco wase, tapioca waste and temple flower	Licensed to Aurangabad distilleries Ltd.
2.	Indigenous pilot plant scale reactor with a capacity of producing 24lit/day of DME alongwith stable catalysts for conversion of methanol to DME and optimized process for catalytic conversion of Methenol to DME	Conversion of methanol to DME	Pilot plant has set up at CSIR-CIMFR, Dhanbad
3.	Three Seaweed based animal feed additives were developed (AF-KWP, AFRD-5, AFRD-7)	Cattle and poultry feed	Licensed to M/S Aquagri Ltd.
4.	Technology (knowhow) for indigenous fluorescent dyes and quenchers for gene based diagnostic assays	These fluorescent dyes and quenchers are used in RT PCR for detection of COVID-19	Licensed to Biotech Desk, Hyderabad
5.	Technology for dental implants and its accessories	In edentulous indications	Licensed to Kamal Medtech; Commercialized in the name of ifix
6.	A product for management of sepsis due to gram negative bacterial infections	In sepsis indications due to Gram negative bacterial infections.	Cadila Pharmaceuticals, Ahmedabad Commercialised as Sepsivac
7.	• Bioactive extract, fraction of *Cassia occidentalis* and formulation • Gastroretentive sustained release formulations of *Bergenia ciliata* • Pharmaceutical formulation	• For bone regeneration • For Arthritis • Management of cancers	Licensed to Pharmanza Herbal Pvt. Ltd. Licensed to Virdis BioPharma Pvt. Ltd.

	• Sustained release formulation for *Dysoxylum binectariferum* • The process for isolation of active constituents from *Cissampelos pareira* extract and fractions	• For Arthritis • Antimicrobial activity	
8.	"SwasthVayu" Non-Invasive BiPAP Ventilation Device for COVID-19	Non-invasive ventilation outside ICU for managing respiratory distress	1) Apollo Computing Labs, Hyderabad – 1200 units to New Delhi govt. 2) Paras Defence and Space Technologies, Mumbai 3) Kavitul Technologies – Vadodara 4) Datasol pvt. Ltd. Bengaluru 5) NFOTech digital Engg. Pvt. Ltd., Bengaluru 6) Unimech Aerospace Mfg. pvt. Ltd. Bengaluru 7) Analgic Controls India Ltd. Hyderabad.
9.	FELUDA (FNCAS9 Editor-Linked Uniform Detection Assay)	**CRISPR Cas-9 based diagnostic tool for** detection of SARS-CoV-2 (COVID-19 Diagnostics)	Technology has been licensed to TATA Sons
10.	10 kWe automotive grade Low Temperature-Proton Exchange Membrane (LT-PEM) Fuel Cell Stack	Automotive applications	Trial run of indigenously developed fuel cell stack-based vehicle was carried out in the month of October 2020 on the platform of battery powered 5 seaters electric sedan car which was retrofitted with the CSIR's developed hydrogen fuel cell stack.
11.	Portable Personal Air Purifying Respiratory Device	Self-protection from COVID	Prototype developed.
12.	Solar Energy Based Cooking System (Solar Chulha)	Domestic uses for cooking	Prototypes developed
13.	Mechanized Sewage Cleaning Prototypes developed	Sewage cleaning system	Few companies have shown interest and discussion are on for possible commercialization
14.	UV-C duct disinfection system	Mitigating the effect of Coronavirus in large buildings/halls etc.	The technology transferred to ~30 companies.
15.	Low cost, high resolution and high end Raman Spectrometer with	Useful for academic institutes and laboratories in India and industry	The prototype has been developed, tested, calibrated and demonstrated recently.

	additional capabilities of carrying out photo-luminescence spectroscopy and optical emission spectroscopy	related to Material Science, Geology and Mineralogy, Pharmaceuticals and Cosmetics, Carbon Materials, Semiconductors, Life-sciences, Polymers, Thin-Films, Forensics, Petrochemical, etc.	
16.	Wax Deoiling Technology	Production of high value paraffin wax and micro-crystalline wax	The plant based on CSIR-Indian Institute of Petroleum (CSIR-IIP) is dedicated to the Nation by Hon'ble Prime Minister. It will be producing 50,000 MTPA of high value paraffin wax and 4500 MTPA of micro-crystalline wax that will help cut down the wax import.
17.	Simultaneous Production of US Grade Gasoline and Pure Benzene	Simultaneous Production of US Grade Gasoline and Pure Benzene from FCC C6 Heart Cut-6,00,000 MTPA	A Unit costing Rs.160.00 crore has been set up by Reliance Industries Limited, based on CSIR technology;
18.	Essential technologies for India's First Light Combat Aircraft LCA Tejas	Strategic applications	2 of 5 critical technologies for the LCA are from CSIR. Also, CSIR-NAL developed and fabricated 165 composite parts for this aircraft.
19.	Hansa-New Generation (NG) aircraft	2 seater aircraft useful for Flying Clubs	Hansa-NG aircraft has successfully made its maiden flight in September 2021. The aircraft took off from HAL airport and flew at an altitude of 4000 ft. and gained a speed of 80 knots before it made a successful landing after about 20 minutes.
20.	Head Up Display (HUD)	Strategic applications	The HUD was developed and deployed by CSIR-Central Scientific Instruments Organisation (CSIR-CSIO) for Air Force Fighter, Air Force Trainer and Naval variant of the LCA;
21.	Ksheer Scanner – System for Detection of Adulteration in Milk to Reduce Public Health Risk	Detection of Adulteration in Milk to Reduce Public Health Risk	Over 150 Systems have been deployed