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Hydrogen Fuel Cell

- A fuel cell is an electrochemical cell that converts the chemical energy of a fuel (often hydrogen) and an oxidizing agent (often oxygen) into electricity through a pair of redox reactions.
- Fuel cells are different from most batteries in requiring a continuous source of fuel and oxygen (usually from air) to sustain the chemical reaction, whereas in a battery the chemical energy usually comes from metals and their ions or oxides that are commonly already present in the battery, except in flow batteries.
- Fuel cells can produce electricity continuously for as long as fuel and oxygen are supplied.
- **Hydrogen + Oxygen = Electricity + Water Vapor**
- The products of the reaction in the cell are water, electricity, and heat.
- This is a big improvement over internal combustion engines, coal burning power plants, and nuclear power plants, all of which produce harmful by-products.
- Recently NTPC has invited global Expression of Interest (EoI) to provide 10 Hydrogen Fuel Cell (FC) based electric buses in Delhi and an equal number of Hydrogen Fuel Cell based electric cars for Leh.
- The move to procure Hydrogen Fuel Cell based vehicles is first of its kind project in the country, wherein a complete solution from green energy to the fuel cell vehicle would be developed.

NTCP

- NTPC Limited, formerly known as National Thermal Power Corporation Limited, is an Indian Public Sector Undertaking, engaged in the business of generation of electricity and allied activities.
- It is a company incorporated under the Companies Act 1956 and is promoted by the Government of India, HQ at New Delhi.
- NTPC's core business is generation and sale of electricity to state-owned power distribution companies and State Electricity Boards in India.
- The company has also ventured into oil and gas exploration and coal mining activities.

- It is the largest power company in India with an electric power generating capacity of 58,156 MW.
- NTPC currently produces 25 billion units of electricity per month.
- In May 2010, NTPC was conferred Maharatna status by the Union Government of India.
- Other three Maharatna companies are

1. National Thermal Power Corporation (NTPC)
2. Oil and Natural Gas Corporation (ONGC)
3. Steel Authority of India Limited (SAIL)
4. Bharat Heavy Electricals Limited (BHEL)
5. Indian Oil Corporation Limited (IOCL)
6. Hindustan Petroleum Corporation Limited (HPCL)
7. Coal India Limited (CIL)
8. Gas Authority of India Limited (GAIL)
9. Bharat Petroleum Corporation Limited (BPCL)
10. Power Grid Corporation of India (POWERGRID)

NETRA

- NTPC is particularly sensitive to Research & Development and the paradigm shift which it can make.
- NETRA (NTPC Energy Technology Research Alliance) set up in 2009 is the outcome of this vision.
- NETRA's emphasis is on developing cutting edge technologies by carrying out applied research which will translate into cost reductions as well as a greener & cleaner tomorrow.
- NETRA has networking with Institutes/organizations for research related to development of cost economic technologies in the field of climate change, new & renewable energy, efficiency & reliability enhancement of thermal power generation and CO2 mitigation/fixation, development of micro grids, etc.

Devanahalli Pomelo

- The Devanahalli pomelo (also called Devanahalli Pomello in official documents) is a variety of the citrus fruit pomelo (Citrus maxima) of the family Rutaceae.
- It is exclusively grown in the region around Devanahalli taluk, Bangalore Rural District, India, as an exotic crop variety.
- The Devanahalli pomelo is protected under the Geographical Indications of Goods (Registration & Protection) Act (GI Act) 1999 of the Government

of India.
- Its sweet taste and flavour are considered to be better than those of other varieties in the market.
- Armed with its unique taste and flavour and a Geographical Indication tag, the Devanahalli Pomelo, the fruit popularly known as chakota, is set to get a push from various quarters.
- Number of farmers growing the fruit had come down owing to urbanization and change in landscape
- The Horticulture Department plans to provide the plant to interested farmers in Devanahalli and Doddaballapur regions.



Pitch Black 2020

- Pitch Black is a multilateral air combat training exercise of Australia.
- Pitch Black 2020 scheduled from July 27 to August 14 has been cancelled due to the COVID-19 situation.
- The exercise is also an opportunity to interact with forces from across the globe, a second defence.
- The next edition of Pitch Black is scheduled in 2022.
- In the last edition of Pitch Black in 2018, the Indian Air Force for the first time deployed fighter aircraft which it had said would “provide a unique opportunity for exchange of knowledge and experience with these nations in a dynamic warfare environment”.
- The bilateral naval exercise between Australia and India is known as AUSINDEX.
- The defence cooperation between India and Australia is underpinned on the

1. Memorandum on Defence Cooperation 2006,
2. Joint Declaration on Security Cooperation 2009
3. Bilateral Framework for Security Cooperation 2014.

- India - Australia Mutual Logistics Support Agreement (MLSA) has been long pending and is expected to be concluded soon as well as a broader maritime cooperation agreement including the Maritime Domain Awareness (MDA) to elevate the existing strategic partnership.

Ruhdaar Ventilator

- A team of engineering students from IIT Bombay, NIT Srinagar and is one

such group of creative individuals who have come forward to solve the problem of ventilator requirement.

- The team has come up with a low-cost ventilator using locally available materials, named Ruhdaar.
- Ruhdaar provides necessary functionalities which can provide adequate breathing support necessary to save the life of a critically ill COVID-19 patient.
- The ventilator is functional from the engineering perspective but requires clearance and validation by the medical community.
- The ventilator has been designed by taking assistance from the Design Innovation Centre (DIC) at Islamic University of Science & Technology (IUST), J&K.
- Facilities at the Centre such as 3-D printing and laser-cutting technologies also were instrumental in the success of the prototype.
- The Centre is an initiative of the Ministry of Human Resource Development, Government of India.

Source: The Hindu, PIB

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