



1. Special Assistance to States for Capital Investment 2023-24



Topic: Government Schemes

In News: The Department of Expenditure, Ministry of Finance, Government of India, has approved capital investment proposals of Rs. 56,415 crore in 16 States in the current financial year.

More on the Topic

- Capital investment projects in diverse sectors have been approved including health, education, irrigation, water supply, power, roads, bridges and railways.
- Funds for meeting the State share of Jal Jeevan Mission and *Pradhan Mantri Gram Sadak Yojana* have also been provided to the States under this scheme to enhance pace of the projects in these sectors.

Why the Scheme has been envisaged?

- In view of a **higher multiplier effect of capital expenditure and in order to provide boost to capital spending by States**, the scheme 'Special Assistance to States for Capital Investment 2023-24' was announced in the Union Budget 2023-24.
- Under the scheme, special assistance is being provided to the State Governments in the form of **50-year interest free loan up to an overall sum of Rs. 1.3 lakh crore** during the financial year 2023-24.
- **Importance of Capital expenditure:** generates revenue, generate demand in the economy, attract private investments, enhances labour participation, enhances productive capacity of the economy etc.

More About the Scheme:

- The scheme has eight parts, Part-I being the largest with allocation of Rs. 1 lakh crore.
- This amount has been allocated amongst States **in proportion to their share of central taxes & duties as per the award of the 15th Finance Commission.**
- Other parts of the scheme are either **linked to reforms or are for sector specific projects.**
- In Part-II of the scheme, an amount of Rs. 3,000 crore has been set aside for providing incentives to States for scrapping of State Government vehicles and ambulances, waiver of liabilities on old vehicles, providing tax concessions to individuals for **scrapping of old vehicles and setting up of automated vehicle testing facilities.**
- Part-III & IV of the scheme aim at providing **incentives to States for reforms in Urban Planning and Urban Finance.**
- The scheme also aims at **increasing the housing stock for the police personnel and their families** within the police stations in urban areas. (Part-V of the scheme.)
- Another objective of the Scheme is to promote national integration, carry forward the concept of “Make in India” and promote the concept of “One District, One Product (ODOP)” through construction of Unity Mall in each State. (Part VI of the scheme)
- Part-VII of the Scheme, is for **providing financial assistance to States for setting up libraries with digital infrastructure** at Panchayat and Ward level for children and adolescents.

Source: PIB

2. Lithium-ion battery

Topic: Science and Technology



In News: John B. Goodenough, professor at The University of Texas at Austin and a Nobel Laureate for the development of the lithium-ion battery, has passed away recently.

More on the Topic:

- Lithium-ion batteries were the first truly portable and rechargeable batteries, and they took more than a decade to develop.
- A battery is made up of **an anode, cathode, separator, electrolyte, and two current collectors (positive and negative).**
- **A Li-ion battery is a family of rechargeable battery types in which lithium ions move from the negative electrode to positive electrode during discharge and back when charging.**
- **In Li ion batteries,** the anode and cathode store the lithium.
- The **electrolyte carries positively charged lithium ions from the anode to the cathode** and vice versa through the separator.
- Li-ion batteries typically use **ether (a class of organic compounds) as an electrolyte.**
- The movement of the lithium ions creates free electrons in the anode which creates a charge at the positive current collector.
- The electrical current then flows from the current collector through a device being powered (cell phone, computer, etc.) to the negative current collector.
- The separator blocks the flow of electrons inside the battery.

Advantages of Li ion Batteries:

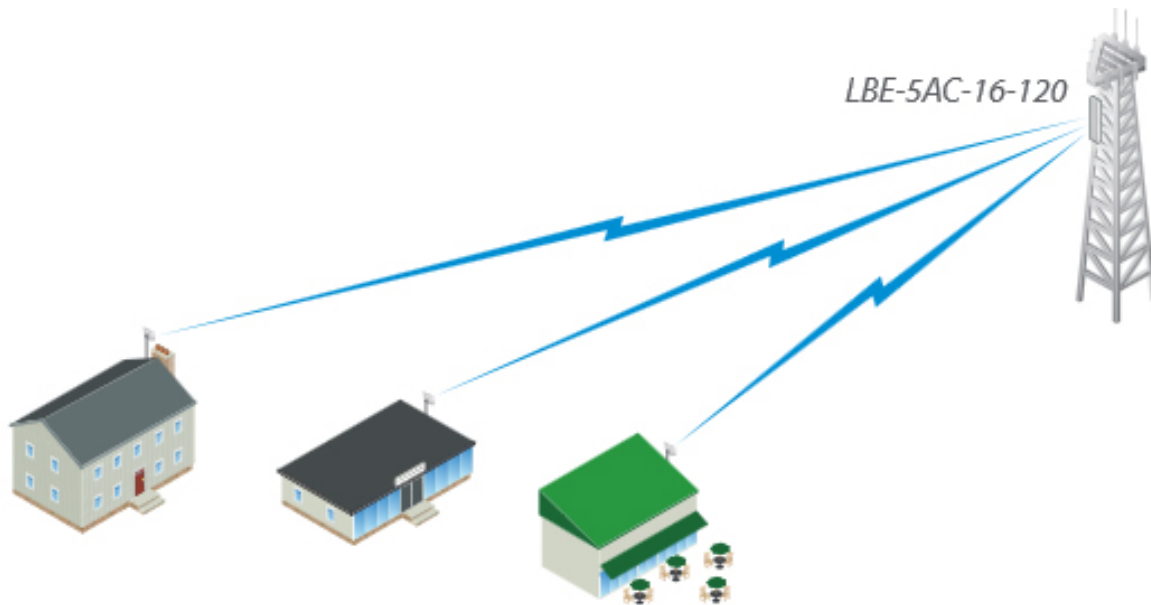
- It is **light weighted and is one-third the weight of lead acid batteries.**
- It is nearly **100% efficient in both charging and discharging as compared to lead battery which has 70% efficiency.**
- It **completely discharges** i.e. 100% as compared to 80% for lead acid.
- It has **life cycle of 5000 time or more** compared to just 400-500 cycles in lead acid.
- It also maintains **constant voltage throughout entire discharge cycle** whereas voltage in lead acid battery drops consistently throughout its discharge cycle.
- It is much **cleaner technology** and is safer for environment as it does not have environmental impact as lead acid battery.
- It can power any electrical application without the need of physical wires-means **wireless.**

Disadvantages of Li ion Batteries:

- Long charging times, Safety issues as instances of batteries catching fires have been there, It is also expensive to manufacture.

Source: IE

1. Light beam Internet Technology



LiteBeam as a cost-effective WISP deployment in an airMAX ac Point-to-MultiPoint network.

Topic: Science and Technology

In News: Google is preparing to use light beams to bring rural areas of the planet online after it announced to a planned rollout in India.

More on the Topic:

- Alphabet's X — the company formerly known as Google X — is working with a telecom operator in Indian state Andhra Pradesh, home to over 50 million people, to use **Free Space Optical Communications (FSOC)**, a technology that uses beams of light to deliver high-speed, high-capacity connectivity over long distances.

About the New Technology:

- The project is internally known as Taara. This technology uses light beams to deliver fast internet services.
- Alphabet's website claims that just like fibre (without cables) Project Taara uses **light to transmit information at super high speeds through air** in the form of a very narrow, invisible beam.

- With a clear line of sight, wireless optical communications technology can transmit data at speeds up to 20 Gbps.
- Experts consider that this system will be effective in tough locations **where connections using fibre cables are difficult or locations that are facing congestion on terrestrial radio network systems.**

Advantages of FSOC technology:

- The main advantages of FSOC are a high speed, cost savings, compact structures, low power, energy efficiency, a maximal transfer capacity, and applicability.
- The rapid development of the high-speed connection technology allows one to **reduce the repair downtime and gives the ability to quickly establish a backup network** in an emergency.

Disadvantages:

- Susceptible to disruption due to **atmospheric conditions or direct sunlight.**
- Signal reliability is compromised by **conditions like fog and haze, or interruptions like birds flying** in front of the signal;
- requires better mirror controls and motion detection capabilities etc.

Source: Hindu

4. Chennai-Vladivostok Maritime Route

Topic: International Relations



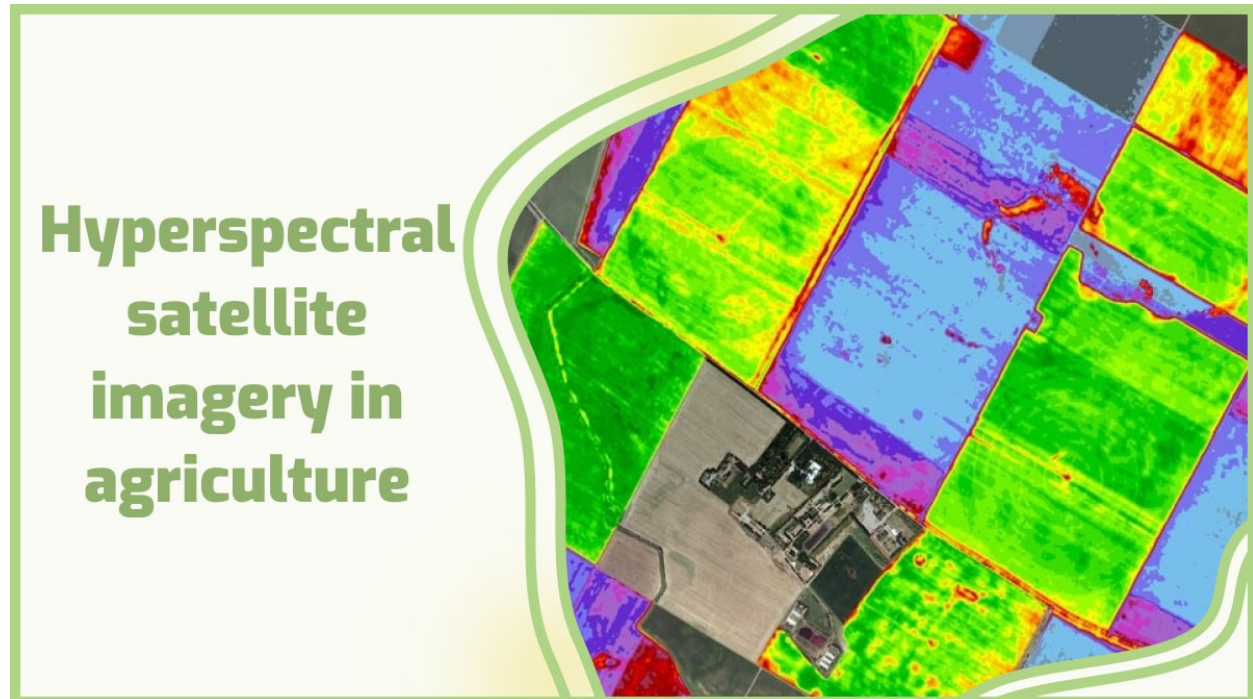
In News: India and Russia have scheduled a stakeholder meeting in September to work out the details for operationalising the Chennai-Vladivostok maritime route.

More on the Topic:

- The Chennai-Vladivostok Maritime route connects Chennai on India's east coast with Vladivostok, Russia's eastern port city, opening a plethora of opportunities for trade and investment for both countries.
- The Vladivostok-Chennai route passes through the **Sea of Japan past the Korean peninsula, Taiwan and the Philippines in the South China Sea, past Singapore and through the Strait of Malacca**, to emerge into the Bay of Bengal and then cuts across through the Andaman and Nicobar archipelago to Chennai.
- It will **bring down transport time to 12 days**, almost a third of what is taken under the existing St. Petersburg to Mumbai route.
- Also, costs are expected to come down by about 30%.

Source: PIB

5.Hyper Spectral Data



Topic: Science and Technology



In News: Ministry of Agriculture has signed an MoU with a private firm for usage of HRS data for crop mapping, crop stage discrimination, crop health monitoring.

More on the Topic:

- The project focuses on leveraging sample hyper spectral data from **Pixxel's path finder satellites** to develop analytics models focused on crop mapping, crop stage discrimination, crop health monitoring, and soil organic carbon assessments.
- This will enable the government to develop use cases with hyperspectral data provided by Pixxel.
- Hyperspectral remote sensing technology includes spectral measurements in narrow wavelength bands by satellites and such measurements offer certain unique indices to monitor and assess the health of crops and soils.
- Crop health monitoring by detecting the changes in chlorophyll content and canopy moisture status, using hyperspectral data would be **beneficial to find crop risk management solutions for farmers.**
- **Soil nutrient mapping** including soil organic carbon assessments is one of the important applications of hyperspectral technology.

Source: Business Standard

6. Kharchi Puja



Topic: Culture

In News: Kharchi Puja was celebrated in the Northeastern state of Tripura.

More on the Topic:

- Also called the 'Festival of 14 Gods', Kharchi Puja is observed on the eighth day of the new moon in July or August every year.
- The festival is centred around the **worship of Chaturdasa Devata**, the ancestral deity of the Tripuri people.
- It holds immense religious and cultural importance and showcases the rich history and traditions of the community.
- It is also believed that Kharchi Puja is observed **to ritualistically clean the Earth after her menstruation is over.**

Source: Business Standard

7. Modern Portfolio Theory (MPT)



Modern Portfolio Theory

[ˈmā-dern port-ˈfō-lē-,ō thē-e-rē]

A practical method for selecting investments in order to maximize their overall returns within an acceptable level of risk.



Topic: Economy

In News: Harry Markowitz, pioneer of modern portfolio theory passed away.

More on the Topic:

- The modern portfolio theory (MPT) is a practical method for selecting investments in order to maximize their overall returns within an acceptable level of risk.
- This mathematical framework is used to build a portfolio of investments that maximize the amount of expected return for the collective given level of risk.
- Markowitz also did ground-breaking work in mathematical programming and computer simulations.
- He developed Simscript, a language used to write simulation software.

Source: Business Standard