News Analysis (07 May, 2020)

Report on Energy Efficiency Measures

Why in News

Recently the Ministry of Power and New & Renewable Energy released a report on the **"Impact of energy efficiency measures for the year 2018-19".**

Key Points

- **Agency Involved:** The report was prepared by a third party **agency PWC Ltd,** who was engaged by Bureau of Energy efficiency (BEE).
- **Methodology:** Since 2017-18, every year BEE has been appointing a **third party expert agency** which compares the estimated and actual energy consumption due to various energy efficiency schemes.
    - The study assesses the **resultant impact of current schemes at national as well as state level** for the financial year and compares it with a situation where the same were not implemented.
- **Objective:** To **evaluate the performance and impact of all the key energy efficiency programmes in India,** in terms of total energy saved and the **related reduction in the CO_2 emissions.**
- **Key Findings**
    - **Electricity Saving: Implementation of various energy efficiency schemes** have led to total electricity savings to the tune of 113.16 Billion Units in 2018-19, which is **9.39% of the net electricity consumption.**
    - **Energy Saving:** The total energy savings achieved in 2018-19 is 23.73 Mtoe (million Tonne of Oil Equivalent), which is 2.69% of the total primary energy supply (estimated to be 879.23 Mtoe in India).
    - **Emission Reduction:** These efforts have also contributed in reducing 151.74 Million Tonnes of CO2 emissions, whereas last year this number was 108 Million Tonnes of CO2.

- **Flagship Programmes:** This year the study has identified the following major programmes, viz. **Perform, Achieve and Trade Scheme, Standards & Labelling Programme, UJALA Programme, Municipal Demand Side Management Programme.**
- **Perform, Achieve and Trade Scheme**
    - It is a **market-based mechanism** to further accelerate as well as incentivize energy efficiency in the large energy-intensive industries.
    - The **Energy Savings Certificates (ESCerts)** were introduced in India in 2011 under the **Perform, Achieve Trade scheme (PAT)** by the Bureau of Energy Efficiency (BEE) under the National Mission of Energy Efficiency.
        > NMEEE is one of the eight national missions under the **National Action Plan on Climate Change (NAPCC)** launched by the Government of India in the year 2008.
    - This market- based mechanism is facilitated through the trading of **Energy Savings Certificates (ESCerts)** which are issued to those plants who have overachieved their targets.
    - Those plants which under achieve their targets are entitled to purchase ESCerts through **two power exchanges - Indian Energy Exchange (IEX) and Power Exchange India Limited (PXIL).**
    - The scheme is unique in many ways, particularly from a developing country's perspective since it creates a **market for energy efficiency** through tradable certificates ESCerts, by allowing them to be used for meeting energy reduction targets.
- **Standards & Labelling Programme**
    - A key objective of this programme by BEE is to provide the consumer an **informed choice about the energy saving** and thereby **the cost saving potential of the relevant marketed product.**
    - The programme targets display of energy performance labels on high energy end use equipment & appliances and lays down minimum energy performance standards.
- **Unnat Jyoti by Affordable LEDs for All (UJALA)**
    - It was launched in **2015** with a target of replacing 77 crore incandescent lamps with LED bulbs and to nullify the high-cost of LEDs that acted as a barrier previously in the adoption of energy-efficient systems.
    - The scheme was implemented to set up a phase-wise LED distribution.
    - The **objective** is to promote efficient lighting, enhance awareness on using efficient equipment that will reduce electricity bills and preserve the environment.
    - It is the **world's largest domestic lighting project.**
- **Municipal Demand Side Management Programme**
    - The Municipality Demand Side Management (Mu-DSM) programme of BEE was initiated during the Eleventh five year plan(2007-2012).
    - The basic objective of the project is to improve the **overall energy efficiency** of the Urban Local Bodies (ULBs), which could lead to substantial savings in the electricity consumption, thereby resulting in cost reduction/savings for the ULBs.

Bureau of Energy Efficiency (BEE)

- The BEE is a **statutory body** established through **Energy Conservation Act, 2001** under the Ministry of Power, Government of India.
- It assists in **developing policies and strategies** with the primary objective of **reducing the energy intensity** of the Indian economy.
- BEE coordinates with designated consumers, designated agencies, and other organizations to identify and utilize the existing resources and infrastructure, in performing its functions.

Background

- Pledge: India has pledged in the **Conference of the Parties (COP21)** of the **United Nations Framework Convention on Climate Change (UNFCCC)** to bring down the energy intensity of its economy by **33 to 35% compared to 2005 levels by 2030.**
  - Energy intensity is the **amount of energy required** to produce one unit of Gross Domestic Product (GDP).
  - High energy intensities indicate a high cost of converting energy into GDP. Whereas, low energy intensity indicates a lower cost of converting energy into GDP.
- **Achievement:** With its energy efficiency initiatives India has already reduced the energy intensity of its economy by **20% compared to 2005 levels.**
- **Significance:** Energy efficiency **reducing greenhouse gas emissions, reducing demand for energy imports, and lowering costs** on a household and economy-wide level.

Source: PIB

Epidemic Disease Act, 1897

Why in News

Recently, the Union government directed States and Union Territories to invoke the **Epidemic Disease Act, 1897** to fight the **Covid-19 outbreak**.

The colonial-era Act empowers the state governments to take special measures and prescribe regulations in an epidemic. It also defines penalties for disobedience of these regulations, and **provides for immunity for actions** taken under the Act **"in good faith".**

Important Provisions

- **Aim:**
  - The **Epidemic Diseases Act** aims to provide for the better prevention of the spread of dangerous epidemic diseases.
  - Under the act, temporary provisions or regulations can be made to be observed by the public to tackle or prevent the outbreak of a disease.

- **Powers to Central Government:**
  - **Section 2A** of the Act empowers the central government to take steps to prevent the spread of an epidemic.
  - **Health is a State subject,** but by invoking **Section 2 of the Epidemic Diseases Act,** advisories and directions of the Ministry of Health & Family Welfare will be enforceable.
  - It allows the government to inspect any ship arriving or leaving any post and the power to detain any person intending to sail or arriving in the country.
- **Penalty for Disobedience:**
  Section 3 provides penalties for disobeying any regulation or order made under the Act. These are according to section 188 of the Indian Penal Code (Disobedience to order duly promulgated by a public servant).
- **Legal Protection to Implementing Officers:**
  Section 4 gives legal protection to the implementing officers acting under the Act.
- **Enforcement of the Act in the Recent Past:**
  - The Epidemics Diseases Act is routinely enforced across the country for dealing with outbreaks of diseases such as Swine Flu, Dengue.
  - For Example in 2009, to tackle the swine flu outbreak in Pune, Section 2 powers were used to open screening centres in civic hospitals across the city, and swine flu was declared a notifiable disease.

Background

- **Context:** The Epidemic Diseases Bill was introduced in 1897, during an outbreak of bubonic plague.
- **Need:** Since the **existing laws were insufficient** to deal with various matters such as "overcrowded houses, neglected latrines and huts, accumulations of filth, insanitary cowsheds and stables, and the disposal of house refuse.
- **Special Powers:** The Bill had called for **special powers for governments of Indian provinces and local bodies,** including to check passengers of trains and sea routes.
- **Global Concern:** The government of the day was also concerned that several countries were alarmed by the situation in India. As **Russia** had speculated that the **whole subcontinent** might be infected due to plague.

Plague

- Plague is caused by the **bacteria Yersinia pestis** usually found in small mammals and their fleas.
- There are **two** main clinical forms of plague infection: **bubonic and pneumonic.**
  - Bubonic plague is the most common form and is characterized by **painful swollen lymph nodes or 'buboes'.**
  - Pneumonic plague is a form of **severe lung infection.**
- Plague is **transmitted between animals and humans** by the bite of infected fleas, direct contact with infected tissues, and inhalation of infected respiratory droplets.

- **Antibiotic treatment is effective** against plague bacteria, so early diagnosis and early treatment can save lives.
- Currently, the three most endemic countries are the Democratic Republic of the Congo, Madagascar, and Peru.

Recent Changes in the Epidemic Diseases Act, 1897

- Recently, the **Cabinet amended the Act through an ordinance** stating that commission or abetment of **acts of violence against healthcare service personnel** shall be punished with imprisonment for a term of three months to five years, and with fine of Rs 50,000 to Rs 2 lakh.
- In case of causing grievous hurt, imprisonment shall be for a term of six months to seven years and a fine of Rs1 lakh to Rs 5 lakh.

Source:IE

Fall in Treatment Under Ayush Bharat Yojana

Why in News

According to recent data provided by the **National Health Authority (NHA),** the number of treatments for non-Covid procedures by both private and government facilities across the country dropped by over 20 % between February, 2020 and April, 2020.

Key Points

- The Covid-19 pandemic and the lockdown have adversely affected the **Ayushman Bharat**-**Pradhan Mantri Jan Arogya Yojana's (AB-PMJAY)** ability to cater to critical patients below the poverty line.
    - Cardiology treatments offered under AB-PMJAY declined by 45%.
    - General Surgeries' declined by 23%.
    - Procedures related to gynaecology and obstetrics declined by 25%.
- The only category of treatment that showed an increase was **'General Medicine'.**
- The treatments available under AB-PMJAY can be accessed at several private care hospitals. However, because of lockdown, private hospitals across the country are largely shut down.
- The government itself is encouraging people with **'non-critical' illness** to access hospitals via **telemedicine** or only partake of essential treatments (dialysis or non-elective surgeries) at hospitals.
- Moreover, with several reports of Covid-19 infections in healthcare workers and doctors across private and public hospitals, the number of visits to hospitals in general saw a decline.

Ayushman Bharat Pradhan Mantri Jan Arogya

- PM-JAY offers a sum insured of **Rs.5 lakh per family** for secondary care (which doesn't involve a super specialist) as well as tertiary care (which involves a super specialist).
- It is an entitlement-based scheme that targets the beneficiaries as identified by latest **Socio-Economic Caste Census (SECC) data.**
  - Once identified by the database, the beneficiary is considered insured and can walk into any empanelled hospital.
- The insurance cost is shared by the **centre and the state mostly in the ratio of 60:40.**
- **Packaged rates (Rates that include everything so that each product or service is not charged for separately):**
  - They also mention the number of average days of hospitalization for a medical procedure and supporting documents that are needed.
  - They are flexible, but they can't charge the beneficiary once fixed by the hospitals.
  - The scheme also has prescribed a daily limit for medical management.
- **The National Health Authority (NHA)** has been constituted as an autonomous entity under the Society Registration Act, 1860 for effective implementation of PM-JAY in alliance with state governments.
- **The State Health Agency (SHA)** is the apex body of the State Government responsible for the implementation of AB PM-JAY in the State.

Source: TH

Development of the Nanomaterials Based Supercapacitors

Why in News

Recently, a group of researchers (including a recipient of the **INSPIRE Faculty Award**) have made significant achievements in **developing nanomaterials based supercapacitors to achieve high energy density and power density of supercapacitors.**

- **Energy density** is the amount of energy that can be stored in a given mass of a substance or system, i.e. a measure of storage of energy.
- **Power density** is the amount of power (time rate of energy transfer) per unit volume, i.e. a measure of release of energy.

Energy: Batteries, Capacitors and Supercapacitors

- Like batteries, Capacitors are also used to **store energy.** While batteries rely on chemical reactions, capacitors use static electricity (electrostatics) to store energy.
- **Capacitors have many advantages over batteries:** they weigh less, generally don't contain harmful chemicals or toxic metals, and they can be charged and discharged many times. However, they cannot store the same amount of electrical energy as batteries.
- Supercapacitors, also known as EDLC (electric double-layer capacitor) or Ultracapacitors, differ from regular capacitors in that they **can store a huge amount of energy.**

- Batteries have a **higher energy density (they store more energy per unit mass)** but supercapacitors have a **higher power density (they can release energy more quickly).** This property makes supercapacitors particularly suitable for **storing and releasing large amounts of power relatively quickly.**
- Supercapacitors deliver **quick bursts of energy during peak power demands** and then quickly store energy and capture excess power that's otherwise lost. In the example of an electric car, a supercapacitor can provide needed power for acceleration, while a battery provides range and recharges the supercapacitor between surges.

Key Points

- **Nanomaterials Based Supercapacitors:**
  - The researchers have been working on **carbon (Carbon Nanotubes, Graphene) nanomaterials** based supercapacitors to achieve **high energy density and power density of supercapacitors.**
  - High energy density of supercapacitors suggests that constant current can be withdrawn for a longer duration without recharging. Hence automobiles can run longer distances without charging.
  - Thus, researchers have developed a **reduced graphene oxide (rGO)** at a moderate temperature of 100°C with high capacitance performance. It is cost-effective and suitable for commercial purposes.
  - The focus on energy devices paves the way for the development of **cost-effective and efficient devices, which can be used for energy storage application.**
- **Optoelectronic Applications of Nanomaterials:**
  - Optoelectronics is the study and application of electronic devices and systems that source, detect and control light, usually considered a sub-field of photonics.
  - The researchers are developing novel nanostructures of carbon for Surface-Enhanced Raman spectroscopy (SERS).
    - Surface-Enhanced Raman spectroscopy or surface-enhanced Raman scattering (SERS) is a surface-sensitive technique that **enhances Raman scattering by molecules adsorbed on rough metal** surfaces or by nanostructures such as plasmonic-magnetic silica nanotubes.
    - The enhancement factor can be as much as 10^{10} to 10^{11}, which means the technique may even detect a single molecule.
  - The SERS can help detect harmful molecules present in water at ultra-low concentrations.
  - The findings make way for materials which can be used as **advanced photodetectors** and also be used as **optical sensors for water pollution control.**

Innovation in Science Pursuit for Inspired Research

- **Innovation in Science Pursuit for Inspired Research (INSPIRE)** intends to attract talent to study science at an early age, and to help the country build the required critical resource pool for strengthening and expanding the Science and Technology base with long term foresight.
- It is an India specific model for attracting talent with an aptitude for research and innovation, for a career in Basic & Natural sciences.
- The scheme has been developed by the **Department of Science & Technology (DST), Ministry of Science and Technology** and **approved in 2008.**
- INSPIRE Scheme has included three programs and five components.The three programmes are:
  - **Scheme for Early Attraction of Talent (SEATS):** It aims to attract talented youth to study science by providing INSPIRE Award of Rs 5000 to one million young learners of the age group 10-15 years.
  - **Scholarship for Higher Education (SHE):** It aims to enhance rates of attachment of talented youth to undertake higher education in science intensive programmes, by providing scholarships and mentorship.
  - **Assured Opportunity for Research Careers (AORC):** It aims to attract, attach, retain and nourish talented young scientific Human Resource for strengthening the R&D foundation and base.
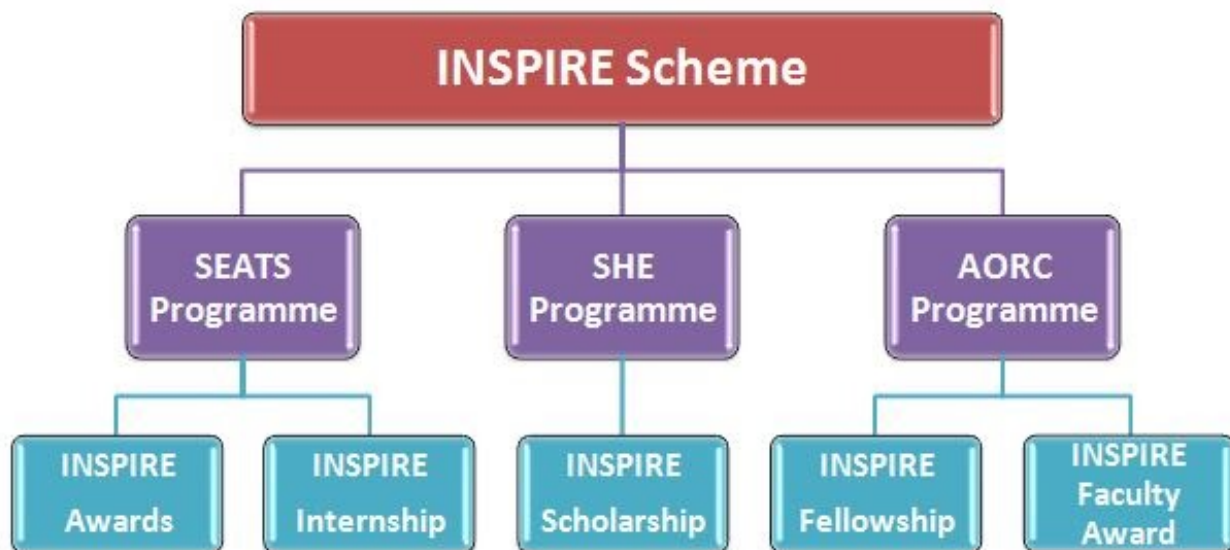
Source:PIB

Buddha Purnima

Why in News

In 2020, **Buddha Purnima** is being celebrated on **7th May.**

Key Points

- The day falls on the *Poornima* (full moon) of the Hindu month *Vaishakha* (April or May).
- It marks the **birth anniversary of Gautam Buddha,** founder of **Buddhism.**

Gautam Buddha

- He was born as **Siddhartha Gautam** in circa **563 BCE,** in a royal family in **Lumbini** which is situated near the **Indo-Nepal border.**
- His family belonged to the **Sakya clan** which ruled from **Kapilvastu,** Lumbini.
- At the age of 29, Gautam left home and rejected his life of riches and **embraced a lifestyle of asceticism** or extreme self-discipline.
- After 49 consecutive days of meditation, Gautam attained Bodhi **(enlightenment)** under a pipal tree at **Bodhgaya, Bihar.**
- Buddha gave his **first sermon** in the village of **Sarnath,** near **Varanasi** in Uttar Pradesh. This event is known as Dharma Chakra Pravartana **(turning of the wheel of law).**
- He **died at the age of 80 in 483 BCE** at **Kushinagara,** Uttar Pradesh. The event is known as *Mahaparinibban or Mahaparinirvana.*
- He is believed to be the **eighth** of the ten incarnations of Lord Vishnu (Dashavatar).

Source: PIB

FlytNow- An Internet of Drones (IoD) Platform

Why in News

Recently, FlytBase, an enterprise drone automation company has built **FlytNow- an Internet of Drones (IoD) platform** that allows **seamless integration** of intelligent fleets of drones with cloud-based business applications.

> FlytNow has been incubated by FlytBase, a Pune-based start-up, funded by the Department of Science and Technology.

Key Points

- The IoD platform assists the Police officials to **stream live multi-video feeds** from multiple drones to their control room, thus providing situational awareness and enabling them to respond quickly to emergencies.
- FlytNow has also enabled police authorities to keep strict vigilance over the lockdown situation due to **Covid-19**.
  - FlytNow is currently being used by Police of many states including Maharashtra, Gujarat, Karnataka and Andhra Pradesh.

Source:PIB

NSafe Mask

Why in News

Recently, an IIT-Delhi start-up 'Nanosafe Solutions' has launched an antimicrobial and washable face mask called **'NSafe'.**

Key Points

- NSafe mask is **reusable up to 50 wash,** thus greatly cutting down the cost of use.
    - It will also provide a solution to disposal issues of single use masks.
- It is a triple-layered product consisting of **inner hydrophilic layer for comfort,** middle layer having **antimicrobial activity** and outer most layer having **water and oil repellent behaviour.**
- The mask has **99.2% bacterial filtration efficiency** along with breathability and splash resistance.

Source: TH