ULTRA-MEGA SOLAR PARK

Prelims: Economics- Infrastructure

Mains: GS-III- Infrastructure: Energy, Ports, Roads, Airports, Railways, etc.

- **Context:** National energy major NTPC is planning to set up an ultra-mega solar park in the Kutch region of Gujarat that will produce up to 5,000 megawatts and involve an investment of Rs20,000 crore or more.
- **Objective:** This move is aimed at scaling up the renewable portfolio of India's largest power producer with 55,786 MW of installed capacity.

Background:

- The National Solar Mission (NSM) was launched in 2010 as a major initiative of the Government of India with active participation from states to promote ecologically sustainable growth while addressing India's energy security challenges.
- It will also constitute a major contribution by India to the global effort to meet the challenges of climate change

Aim:

- The mission targets include deployment of 20,000 MW of grid-connected solar power by 2022 to be achieved in three phases which include 2,000 MW of off-grid solar applications including 20 million solar lights by 2022 and 20 million sq. m. solar thermal collector area.

Major Schemes of The Central Government:

- The government of India has launched several schemes to achieve the target of 100 GW
- Grid Connected:
  - Scheme for setting up of over 300 MW of Grid connected solar PV projects by Defence establishments and para military forces
  - Scheme for development of Solar parks and Ultra Mega Solar power projects of 40,000 MW
  - 750 MW VGF scheme under JNNSMM Phase II Batch I
  - 2,000 MW VGF scheme of NSM Phase II Batch III
  - 5,000 MW VGF Scheme Batch IV Phase II

- Setting up of 1000 MW of Grid connected solar PV Power project by CPSUs, Government organizations
- 15,000 MW grid connected solar PV power plants through NTPC
- Grid connected rooftop and small solar plants of 4,200 MW
- Development of 100 MW Grid connected solar PV power plants on canal banks and tops

- Off Grid
  - Capital subsidy scheme for providing basic lighting needs through solar charging stations (with lanterns) to be implemented in 100 villages in each of 60 LWE affected districts
  - Off grid & Decentralized solar application scheme in 2nd phase of JNNSM-Solar cooker programme.
  - Capital subsidy scheme for installation of solar thermal systems
  - Solar water heating Solar air heating
  - Solar steam generation/ pressurized hot water/air systems
  - Solar thermal refrigeration/cooling
  - Solar Thermal Power Park (including hybrid with Solar PV)
  - Installation of 10,000 nos. of solar photovoltaic water pumping systems for irrigation purpose implemented through NABARD

The Current Status of Solar Park Development in India:

- The Ministry of New and Renewable Energy (MNRE), Government of India, is already implementing a scheme for development of solar parks which was launched in December 2014. The capacity of the solar park scheme has been stages of development. Solar projects of aggregate capacity 2,151 MW have already been commissioned in 5 Solar Parks up to August 31, 2017
- The total capacity when operational will generate 64 billion units of electricity per year which will lead to abatement of around 55 million tonnes of CO_2 per year over its life cycle.
- It would also contribute to the long-term energy security of the country and promote ecologically sustainable growth by a reduction in carbon emissions and carbon footprint, as well as generate large direct and indirect employment opportunities in solar and allied industries, such as glass, metals, heavy industrial equipment, etc.

Challenges & Way Forward:

- Solar irradiance in the State, availability of conducive State policy for solar, and business environment, such as the willingness of DISCOMs to purchase the solar power, payment security, power evacuation infrastructure, etc., are the challenges envisaged.

- In India, one of the biggest challenges faced is land allotment.
- Then, there is the revenue department, the issue of private land conversion, all these are time-consuming and challenges.
- The other challenges are matching the timelines between the development of solar parks including power evacuation arrangements of central transmission utility (CTU) or state transmission utilities (STU) and setting up of solar projects.
- However, with active involvement and making concerted efforts in consultation with State Governments and different stakeholders these challenges are getting easier to deal with. Overall, the solar parks project has been very positive and the response from developers has been encouraging.
- As a result, energy storage, hybrid project, and large grid connected wind–solar PV system in India for optimal and efficient utilization of transmission infrastructure and land; there has been reduction of the variability in renewable power generation and thus achieving better grid stability and improved power quality projects initiated