The Big Picture

Topic – Improving higher education

Date – 28th Nov 2020

Topics covered from the syllabus:

- **GS-2:**
  - Indian Economy and issues relating to planning, mobilization, of resources, growth, development and employment.
  - Infrastructure: Energy, Ports, Roads, Airports, Railways etc.
  - Conservation, environmental pollution and degradation, environmental impact assessment.

Note:

- Following is the summary of 'The Big Picture' discussion, which was aired on RSTV.
- Host: Frank Rausan Pereira
- Panellists: BP Yadav, Ministry of New and Renewable Energy; Sunil Jain, Hero Future Energies; Prachi Gupta, NITI Aayog;

Context:

- Prime Minister recently inaugurated the **3rd Global Renewable Energy Investment Meeting and Expo (RE-Invest 2020**), where he stressed on the opportunities in the renewable energy sector.
  - He said that there is a **business opportunity of almost $20 billion every year** for investors, developers and businesses in the renewable energy sector.
  - He also invited the entrepreneurs, while committing the government towards ensuring ease of doing business and facilitating the investors to set up their facilities in India.
- India is currently **ranked 4th in renewable energy capacity globally. Currently, the renewable energy capacity in India is 136 GW, which is 36% of the total energy capacity** in India.

Alternatives sources of energy:

- Solar and Wind energy have hogged the limelight in the context of renewable energy. However, it is important to consider **other alternatives like biomass energy, methanol-based blending and hydrogen**, which is considered as the fuel of the future.
- **Bio-mass energy**: India has one of the **largest cattle population and animal rearing sector** in the world. This translates into adequate availability of biomass to fulfill the energy requirements, especially in rural areas.
  - **High calorific value**: Apart from that, biomass has a high calorific value, i.e. it produces more energy per unit fuel consumed than the other conventional sources of energy
  - **Reliable source of power**: Biomass energy is **available on-demand** i.e. there is no need to create a huge storage infrastructure for biomass energy.
- **Waste to energy projects**: A **large population, along with increasing urbanisation**, means production of a large quantity of solid wastes, which can be utilised in the waste-to-energy projects.
  - **Twin benefits**: Waste to energy projects will not only help in **cleaning the cities, but also in energy generation.**
  - **Waste Segregation**: However, it will need inculcation of a culture of waste segregation, for effective production of energy.
- **Hydrogen as a fuel**: The **challenge in using Hydrogen is its explosive nature**. Therefore, research on its viability as a source of energy is underway in multiple global projects.
  - However, hydrogen is already touted as the fuel of the future because of its **high energy potential**.

- Also, the by-product in the production of energy from hydrogen is **water, which is harmless**. Therefore, it has the added advantage of being a clean source of energy.

Reasons for the growth of renewable energy:

- **Growth of energy demand:**
  - **Expansion of electricity coverage**: Increased coverage of electricity, along with the provision of last-mile connectivity to all households under the **SAUBHAGYA scheme or Sahaj Bijli Har Ghar Yojana** (see inset), has led to higher demand for energy.
  - **Rise in energy demand**: As urbanisation increases, there is also an **Increase in the per capita consumption of energy** leading to the growth of energy demand.
    - However, it is to be noted here that the **average consumption in India has still remained well below the average global consumption of energy**.
  - **Economic growth**: Despite the COVID-induced slowdown, India is one of the few countries which are looking at a substantial growth rate in the future, thus increasing the requirement of energy in the post-COVID world.
  - **Growing acceptance of electric mobility**: Electric and hybrid vehicles have become the technology of choice around the world. This will create additional power **demand for charging** needs of the Electric vehicles.
- **Rise in importance of clean energy**:
  - **India's commitments under the Paris climate deal**: Apart from **decreasing the energy intensity** and **creation of carbon sink**, India has also committed itself to **meet 40% of its total energy demand from non-fossil sources.** Thus, it is imperative to invest in renewable energy to meet this target.
  - **Personal energy invested by the PM**: PM has set the targets and reiterated that the Indian government is committed to increasing the share of renewable energy in India's total energy share. Initially, the target for renewable energy was set at 175 GW, but, now it has been further **revised to 450 GW by 2030**.
    - **International Solar Alliance**: Similarly, the prime minister was instrumental in setting up the International Solar Alliance for creation of a grouping of like-minded countries that are committed to **research and development in solar energy** and sharing its benefits.
  - **Impact of COVID**: COVID has led to people understanding the **importance of cleanliness**. This has also created a favourable perception of clean energy. Therefore, thermal energy, being one of the largest emitters of pollution, will naturally be considered an inferior source of energy.
  - **Air Pollution**: Rise in the levels of air pollution in Delhi and other major cities have led to a change in the policy direction towards clean energy driven growth in India.

Pradhan Mantri Sahaj Bijli Har Ghar Yojana or Saubhagya Scheme: This is a scheme of the government of India to provide **last-mile connectivity** to all households who have applied for it.

- According to the Saubhagya **dashboard**, **all states except Chattisgarh** have been 100% electrified.
- However, according to the reply of the government in the Lok Sabha, 3.2 lakh villages in the 4 states of Uttar Pradesh, Jharkhand, Assam and Chattisgarh are yet to be electrified.

Benefits of renewable energy:

- **Opportunity for the private sector:** PM indicated the possibility of a business of around $20 billion per year in the renewable energy sector. A target of setting up 450 GW of renewable energy sources by 2030 means that we need to augment the renewable energy capacity by **almost 25-30 GW per year**. This can be harnessed as a **high return on investment opportunity** by the private sector.

- **Low maintenance cost**: As compared to the traditional sources of energy like coal-based or oil-based thermal power plants, solar energy has the advantage of almost **no requirement of procurement of fuel as well as lesser wear and tear due to lack of movement of parts**. Therefore, return on investment is higher in the long run.
- **Government incentives**: Solar energy is a sustainable source of energy. Therefore, unlike thermal energy where the government policy is to penalise the usage, renewable energy will always be incentivised to invest additional resources and create more energy capacity.
- **Sustainability**: Renewable energy is a cleaner source of pollution, thus, benefitting the environment in general and **reducing pollution and the associated diseases** in particular.
- **Atmanirbhar Bharat**: Investment by the private sector in renewable energy would also be helpful in fulfilling the Government's objective of self-reliance. It will also **create employment** opportunities in the country.
- **Last-mile connectivity:** As renewable energy can also be **decentralised**, therefore, it is better placed to extend last-mile connectivity in remote areas, where it might **not be financially feasible to stretch the main grid**. This is also **economical** for the government and households as decentralised connectivity **decreases the Transmission and distribution losses**.

Challenges:

- **Reliability**: By their very nature, solar and wind energy are variable in availability **both spatially as well as geographically.** They are not available on-demand, unlike thermal or nuclear energy. Therefore they have to be supplemented with other sources of energy, to maintain the base load.
- **Creation of storage infrastructure**: To overcome the variable nature of renewable sources of energy, it is vital to invest in **affordable batteries of large capacity**. This would require adequate commitment from the government side to inspire confidence in the private sector.
- **Funding**: As already stated, renewable energy requires setting up large projects to harness the economies of scale. This requires a **large initial investment, which can be a deterrent** at the beginning of the project.
    - However, it has to be acknowledged that the newly set up projects have actually achieved and sometimes even **overshot the per unit price parity** in comparison to the thermal energy.
- **Building manufacturing capability**: It is important to set up manufacturing capacity in India to **decrease imports** and promote Atmanirbhar Bharat. More manufacturing would also mean an increase in investments and additional employment generation in India.

Way Forward:

- **Long term Planning**: Since renewable energy requires huge investment to achieve economies of scale, it is necessary to lay down policy direction well in advance so that the private sector can plan accordingly. **Frequent Surprises and changes in the policy are not appreciated** by the private sector. The government should **identify the geographical areas, integrate the grid, and focus on implementation** at the ground level to inspire confidence in the businesses.
- **Variability matching**: To match the variable demand and achieve maximum efficiency in energy utilisation, it is imperative to **find the sectors having the largest energy consumption and match them with production sources.**
    - For e.g. the **agriculture sector needs to be incentivised to draw power at the off-peak hours**, to offset the load of peak requirement in household and industry.
    - This will also have the benefit of rationalising the subsidy, without necessarily taxing the already-stressed agriculture sector.
    - Similarly, as the acceptability of **electric vehicles increases, their charging time can be suitably allocated a**s per the requirement. This can be further incentivised by keeping tariffs lower than the peak time tariffs.

- Experts have also suggested an alternative model where the **storage infrastructure of Electric Vehicles (EVs) can be utilised** by feeding the energy back to the grid at the peak hours, at pre-decided rates.
- **Geography matching** of wind power can be used to solve the variability in its availability. For e.g. In some areas like coastal areas of southern states, the wind potential might be higher in the monsoon season, while in other areas like Ladakh, it might be higher in the winter season.

Conclusion:

- There can be no doubt about the fact that the renewable energy is the **energy of the future**. The current direction indicates the possibility of **elimination of fossil fuels based energy as early as 2050.** This will lead to a **cleaner planet, greener planet** and make the earth a better place to live in. However, it is important that we have a clear policy guideline, wherein we explore the **right mix of energy sources**, integrated into the grid to achieve maximum efficiency.

Practice Question:

- Discuss the significance of India's commitments under the Paris Climate Deal. Also, analyse the challenges associated with sustainability of energy capacity enhancement.