Controls over Renewable energy technology

What is the issue?

The concentration of technology and tacit knowledge related to renewable energy can emerge as an additional constraint to its wider adoption

What is the share of electricity from different sources of renewable energy?

- At present, renewable energy accounts for only around 12% of all energy sources in the world.
- Wind and solar energy have grown exponentially in the two decades.
- However hydropower has dominated other renewable energy sources accounting for 58% of all renewable energy generation.
- The shares of solar and wind power in total renewable energy still remain so small.
- This is despite the fact that many countries are able to benefit from the sun and wind.

What prevents the greater use of solar energy?

- Levels of investment required and developing it as sources of power generation.
- Requirement of complementary infrastructure like storage and distribution, which in turn requires large-scale investment.
- Access to the required technologies. Profit orientation of large companies, geopolitical considerations affects knowledge transfers.
- Stranglehold of intellectual property rights and the monopolisation of knowledge by a few countries and corporations.
- Distribution of world's rare earths which are critical for green transition.

Which countries hold most patents for solar energy?

- Earlier only few countries of the Global North, particularly Germany, Japan and the US dominated the renewable energy technologies.
- Later China began to be a major player in developing renewable energy, particularly solar and wind sources.
- Between 2008 and 2014 these countries showed increased patenting activity in energy innovations.
- This was due to public investment in R&D and in related infrastructure investments, direct subsidies and credit guarantees provided to producers of solar and wind energy.
- India also became a more important developer of such technologies and production over this period.

- Today US, China and Japan accounts for 62% of all the renewable energy patents. China alone accounts for around one-third of all such patents.
- After 2014 there was a dip in patenting the technologies.
- This is because the basic technologies involved in both solar and wind energy have become off-patent and is widely known for years now.
- New patents involve only incremental improvements, and many of these can effectively be designed around.

How the concentration of patents hampers the adaption of green technologies?

- Patents and investments made in the major countries has meant a serious concentration of knowledge relating to green energy sources.
- The bigger complication comes from trade secrets.
- Trade secrets are information about how a particular product is made. It is known only to the company that makes it.
- Legal mechanisms exists to prevent such tacit knowledge from being used.
- Rich countries have used these to prevent the dissemination of green technology. For example US government took action against Chinese renewable energy companies.
- All these makes it critical to adapt green technologies to specific local conditions.
- This remains a concern for low and middle income countries.

What are the geographical constraints?

- China currently provides more than 85 per cent of the world's rare earths.
- They are critical for the green energy transition.
- Around two-thirds of the global supply of rare metals and minerals like antimony and barite essential for the manufacture of electric car batteries, satellites, weapons, wind turbines and solar panels comes from China.

Reference

1. https://www.thehindubusinessline.com/opinion/who-controls-renewable-energy-technology/article65420294.ece