Mains Practice Question

Q. What do you understand by 'curtailment of power' in the energy sector? How is it affecting the generation of renewable energy in India? (250 words)

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Approach

- Explain the meaning of 'curtailment of power' in the energy sector.
- Explain how is it affecting the generation of renewable energy in India.
- Give conclusion.

Introduction

- ‘Curtailment’ refers to an action under which off-take (flow) of the generated power is restricted or denied, resulting in a decrease of a plant's output.
- ‘Curtailment’ of power generated by wind and solar projects is a persistent problem for renewable energy (RE) developers in India.
- Curtailment typically occurs because of transmission congestion or lack of transmission access, but it can occur for a variety of other reasons, such as excess generation during low load periods. Market-based protocols that dispatch generation based on economics can also result in curtailment.

Body

Effect of Curtailment on the generation of renewable energy in India:

- Curtailment affects the attractiveness of the RE sector for developers and investors. Unanticipated curtailment negatively impacts returns on investment and project viability.
- Curtailment leads to substantial losses as developers do not fully account for them while bidding for projects. In the absence of a restitution mechanism for such losses, the viability of projects becomes challenging, especially as RE companies operate with thin margins and small capital.
- It increases the probability of generation curtailment and adds to the operation risk of projects, discouraging investments.
- Curtailment is expected to increase along with the growth in the proportion of renewable energy in the energy mix due to technical reasons.

Way Forward

- The government has taken several positives in this direction. Some of them are:
    - To increase grid flexibility to prepare for increased RE penetration.
    - Increasing flexibility of coal-based power plants.
    - Enlarging geographic and electrical balancing areas.
    - Expanding transmission in strategic locations.
    - Installing grid-scale storage systems.
- Automation can reduce curtailment levels. Therefore, attention has to be given to developing real-

time market (RTM) for electricity to improve grid reliability and optimise operations.
- Investment for Research and Development in storage technologies can curb this curtailment problem.
- Smart grid technologies need to be installed, that employ digital technology to more efficiently manage energy resources. It will extend the reach of the grid to access remote sources of renewable energy like geothermal power and wind farms.
- Curtailment challenge is directly related to the financial weakness of the discoms, which requires strong structural reforms.

Conclusion

Curtailment is likely to have a significant impact on the pace and feasibility of RE deployment going forward. Since grid upgrading efforts will require a longer horizon to implement, immediate solutions to address the impacts of curtailment are the need of the hour.