Environment & Ecology · GS - III

India's transition to clean energy requires substantial investment in renewable generation, battery storage and power infrastructure. Discuss the major financing and implementation challenges in achieving India's non-fossil energy targets.

EXAM YEAR	PAPER	SUBJECT
DAILY PRACTICE 29/10/2026	GS - III	Environment & Ecology

MARKS	WORD LIMIT
10	~150 words

Answer Hint

Green finance; renewable energy capacity; net-zero emissions by 2070; battery storage; grid modernisation; transmission infrastructure; private investment; energy security

Model Answer

Introduction

India's energy transition is central to reducing emissions, improving energy security and meeting rising electricity demand. Achieving its 2030 non-fossil capacity target requires sustained investment in generation, storage and transmission.

Major Challenges

1. Financing Requirements

Renewable projects require substantial upfront capital. High financing costs, uncertainty in power-purchase agreements and the financial stress of distribution companies can discourage investment.

2. Grid Integration

Solar and wind generation vary with weather and time. Battery storage, pumped-storage hydropower, flexible generation and stronger transmission networks are necessary to maintain grid reliability.

3. Land and Infrastructure

Land acquisition, environmental clearances, transmission bottlenecks and uneven renewable resource distribution can delay projects. Domestic manufacturing capacity for solar modules, batteries and critical components also needs strengthening.

Way Forward

India should mobilise domestic and international green finance, expand green bonds and blended finance, improve payment security, and encourage private investment. Stable regulations, competitive procurement, energy-storage incentives and modern grid management can accelerate deployment.

Conclusion

India's transition requires more than installing renewable capacity. Coordinated financing, reliable infrastructure and effective implementation are essential to achieve the 2030 target while progressing towards net-zero emissions by 2070.

BECOME IAS
AI POWERED UPSC PREP