Science & Technology · GS - III

Examine the potential of electric aviation in promoting sustainable transportation. Discuss the major technological, economic and infrastructural challenges associated with its large-scale adoption.

EXAM YEAR	PAPER	SUBJECT
DAILY PRACTICE 16/11/2026	GS - III	Science & Technology

MARKS	WORD LIMIT
10	~150 words

Answer Hint

Sustainable aviation, electric propulsion, battery energy density, lifecycle emissions, short-haul connectivity, charging infrastructure, battery technology, aircraft certification, operational costs, renewable energy integration, research and development.

Model Answer

Introduction

Electric aviation uses electric propulsion systems to reduce dependence on conventional aviation fuels. Advances in battery technology and aircraft engineering are creating opportunities for cleaner short-haul transportation.

Potential Benefits

Electric aircraft can reduce operational carbon emissions, local air pollution and noise levels. They may improve regional connectivity through smaller aircraft operating on short routes. Their adoption can also encourage innovation in batteries, power electronics and renewable energy integration.

Major Challenges

Limited battery energy density restricts aircraft range and payload capacity. High battery weight, charging time, infrastructure costs and battery lifecycle management remain significant barriers. Aircraft certification, safety standards and commercial viability also require attention. Moreover, environmental benefits depend on the electricity source and battery manufacturing process.

Way Forward

India should promote research and development, public-private partnerships, renewable-powered charging infrastructure and phased deployment on suitable regional routes.

Conclusion

Electric aviation offers a pathway towards sustainable mobility, but its success depends on technological breakthroughs, supportive infrastructure and economically viable implementation.

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