



PART 1

Read the text below and answer questions 1–13.

POWERING THE FUTURE: THE RISE OF RENEWABLE ENERGY

A Renewable energy has moved from the periphery of national electricity planning to the centre of long-term strategy. Wind and solar, once dismissed as expensive experiments suited to niche applications, are now treated in many systems as standard infrastructure capable of competing with fossil fuels on both cost and speed of deployment. This shift reflects more than environmental ambition. Governments and utilities value renewables for their price predictability: once built, they avoid fuel-price volatility and reduce exposure to geopolitically fragile supply lines. In addition, learning-by-doing has improved performance and reliability at scale, turning what were once pilot technologies into mature assets with established operating practices and rapidly expanding investment pipelines.

B The central technical challenge is intermittency. Renewable output varies with weather patterns and the diurnal cycle, creating a mismatch between when electricity is produced and when it is demanded. Conventional grids were designed around dispatchable generation—large thermal plants whose output could be adjusted on demand—and the supporting architecture of transmission, protection systems, and scheduling rules assumed controllability. High penetrations of variable renewables therefore require new approaches to balancing supply and demand, including better forecasting, modernised transmission corridors, and digital controls that can respond quickly to changes in output. Grid operators also face issues of system stability, including reduced grid inertia as rotating machines are displaced by inverter-based resources, which makes the management of frequency and voltage more complex.

C Energy storage has become a decisive tool for managing this variability, but it is not a single technology with a universal answer. Batteries are well suited to short-duration balancing: they absorb excess generation during sunny or windy periods and release it when output falls, smoothing fluctuations over minutes or hours. Longer gaps—multi-day lulls or seasonal differences—require different options. Pumped hydro can store large volumes of energy where geography permits, while compressed air is being revisited in certain contexts as a bulk storage method. Hydrogen produced from renewable electricity is also being explored for long-duration storage and for sectors that are difficult to electrify directly, though efficiency losses and infrastructure costs remain significant constraints. The emerging consensus is pluralistic: storage portfolios will differ by geography, demand patterns, and the existing generation mix.



D The rise of renewables has also shifted attention to material intensity and supply chain resilience. Solar panels, wind turbines, and batteries depend on minerals and refined components—lithium, nickel, cobalt, and rare earth elements—whose extraction and processing are geographically concentrated. Even when resources are not scarce in absolute terms, bottlenecks can arise from limited refining capacity, trade restrictions, and price shocks. Moreover, mining and processing can carry social and environmental risks, ranging from habitat disruption to water pollution and labour concerns. A “clean” energy system therefore depends not only on low-carbon generation but on transparent sourcing, improved recycling, and design choices that reduce material intensity without compromising safety or performance.

E At the level of cities and households, renewables are changing the relationship between consumers and the grid. Rooftop solar, smart meters, and demand-response programmes allow users to shift electricity consumption toward periods when power is cheaper or cleaner, helping systems reduce peak load and integrate more variable generation. Some homes and businesses also supply electricity back into the network at peak times, becoming “prosumers” rather than passive customers. This two-way flow can reduce strain on local infrastructure, but it complicates market rules and technical standards: grids must accommodate distributed generation, ensure voltage stability, and reward flexibility without undermining reliability. As a result, regulatory reform and digital coordination increasingly matter as much as new generation capacity.

F Renewable deployment also raises land-use questions and can face local opposition. Large wind farms alter landscapes and may trigger concerns about noise, wildlife impacts, or visual intrusion; utility-scale solar can compete with agriculture or conservation goals if siting is poorly planned. Developers increasingly respond by engaging communities early, offering benefit-sharing arrangements, and selecting sites that minimise conflict. In some regions, agrivoltaics—combining solar generation with farming practices such as grazing livestock beneath panels—has helped address concerns by preserving agricultural use while producing electricity. However, these arrangements are not suitable everywhere: local crops, terrain, water availability, and operational constraints can make co-location impractical or uneconomic in certain settings.

G A further complication is that electrification is expanding beyond electricity generation itself. Electric vehicles, heat pumps, and industrial electrification can reduce emissions, but they also increase demand for power and may intensify peak loads if charging and heating coincide with existing demand peaks. Systems therefore require coordinated charging, time-of-use pricing, and expanded distribution networks to avoid creating new reliability risks. Despite these challenges, the direction of travel is clear. The most



successful transitions combine multiple measures: falling levelized cost of renewables, stronger grids, diverse storage portfolios, flexible demand, and policy frameworks that align private investment with public goals. In this sense, the rise of renewables is less a single breakthrough than a coordinated redesign of the energy system.

Questions 1–5

The text has seven paragraphs, **A–G**. Which paragraph contains the following information? Choose the correct letter, **A–G**. **NB** You may use any letter more than once.

- 1** Examples of storage options intended to deal with longer-term gaps in supply.
- 2** Concerns linked to minerals and the geographic concentration of processing.
- 3** An explanation of how consumers can both adjust demand and supply electricity back to the grid.
- 4** A reason why renewables can be attractive even aside from environmental concerns.
- 5** A problem created by variable output and the way grids were originally designed.

Questions 6–9

Choose **TRUE** if the statement agrees with the information given in the text, choose **FALSE** if the statement contradicts the information, or choose **NOT GIVEN** if there is no information on this.

- 6** The passage provides the exact year when renewable energy became cheaper than coal in most regions.
- 7** The passage states that electricity networks were originally designed for power sources that could be controlled on demand.
- 8** The passage suggests that hydrogen is already the dominant solution for dealing with seasonal differences in electricity supply.
- 9** The passage states that combining solar generation with farming is suitable in every location.

Questions 10–13

Complete the summary below. Choose **NO MORE THAN TWO WORDS** from the text for each answer.

Adapting to a new energy landscape



Integrating variable renewable generation requires grids to adapt, using measures such as better **10**, updated transmission corridors and digital **11** One option that can store large volumes of energy where geography permits is **12** The passage also notes that successful transitions depend on flexible demand, for example through **13** pricing.

Answer Key

1. C
2. D
3. E
4. A
5. B
6. NOT GIVEN
7. TRUE
8. FALSE
9. FALSE
10. forecasting
11. controls
12. pumped hydro
13. time-of-use