

Electricity generation

How does your country generate its electricity? What is the largest source of power and the newest source of power?

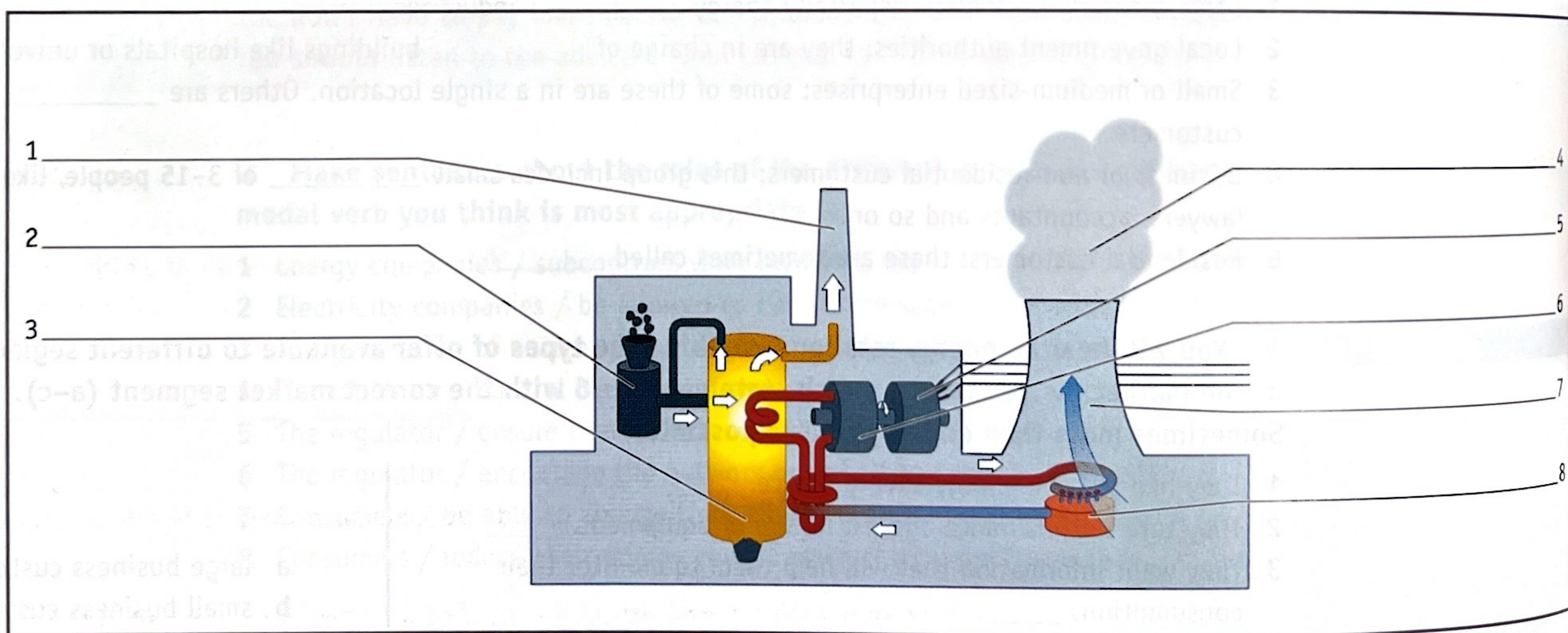
1 Complete the table of energy sources and generating plants. Use these words.

renewables ■ hybrid ■ electric ■ coal ■ fuel ■ farm ■ thermal ■ cycle ■ fired ■ heat

Primary energy source		
Fossil fuels	² _____	Other
oil, gas, ¹ _____	hydro, wind, solar, biomass, geothermal	nuclear ³ _____
Plants		
Conventional ⁴ _____ plant	Alternative energy plants	Other
oil-fired plant gas-fired plant coal- ⁵ _____ plant combined ⁶ _____ gas plant	hydro- ⁷ _____ plant wind ⁸ _____ solar power plant biomass power plant tidal power station	nuclear power plant ⁹ _____ plant (e.g. solar + thermal) CHP plant (combined ¹⁰ _____ and power)

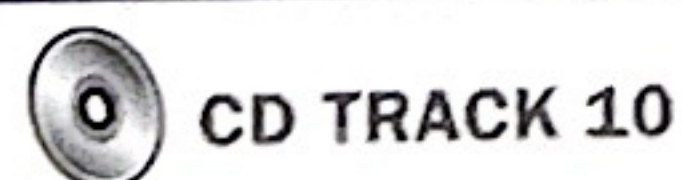
2.1 Label the diagram of a coal-fired plant. Use these words.

generator ■ furnace ■ steam ■ condenser ■ turbine ■ chimney ■ cooling tower ■ mill



PRONUNCIATION

2.2 Listen and repeat the words in 2.1.



Electricity transmission

What factors does a transmission system operator need to take into account when forecasting electricity demand each day?

1.1 Label the photos. Use these words.

dispatching centre ■ substation ■ pylon ■ live-line workers ■ meters
underground cables ■ overhead lines ■ insulators



1



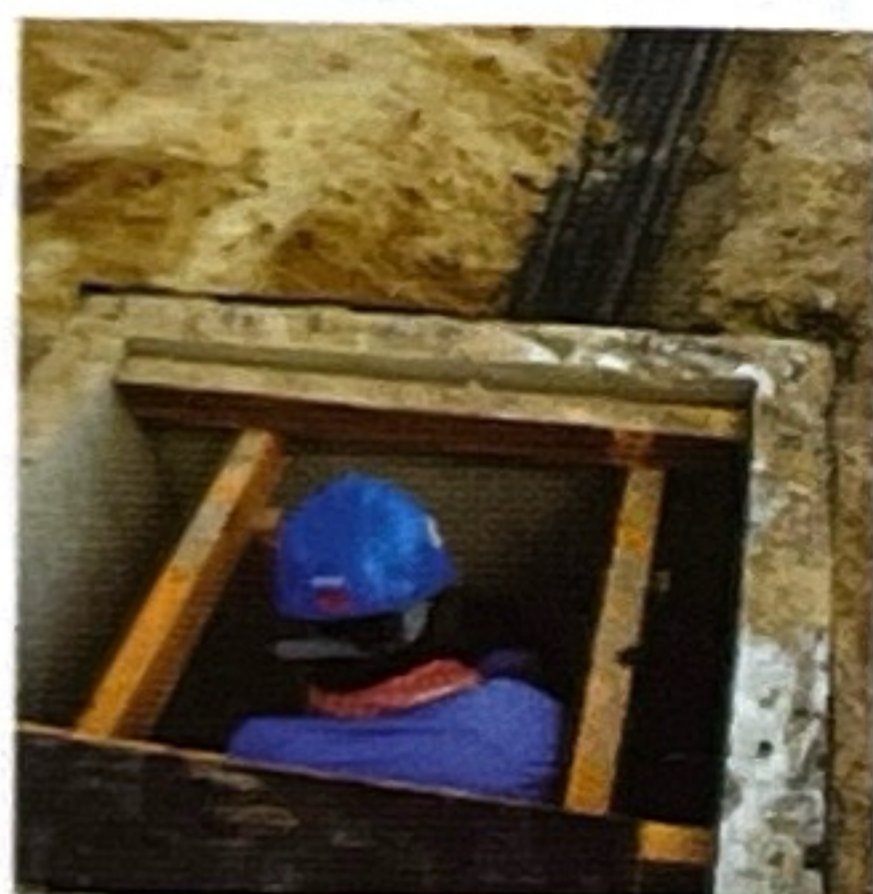
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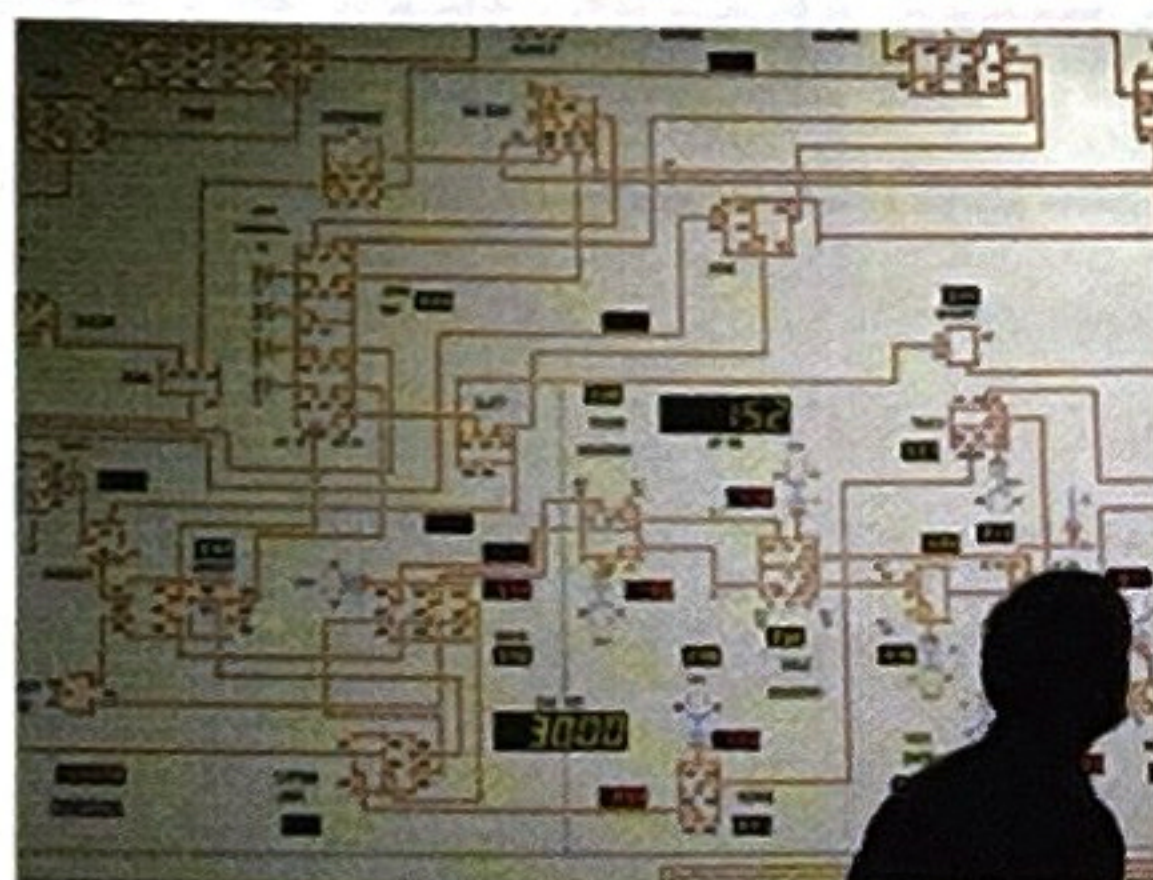
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PRONUNCIATION



CD TRACK 17

GRAMMAR

Further grammar practice
The '-ing' form and infinitive
page 86

1.2 Listen and repeat the words from 1.1.

Look at the use of the -ing form and infinitive in these sentences.

It is easy **to make** mistakes when you are tired.

Would you mind **closing** the door?

There are many verbs, adjectives and phrases in English which are followed by the -ing form or infinitive, and which you will need to learn case by case; for example:
avoid **doing**, be willing **to do**, be permitted **to do**, without **doing**, etc.

2 Complete the sentences. Use these verbs in the -ing form or infinitive.

monitor ■ carry out ■ withstand ■ get ■ read ■ repair ■ transmit ■ lay ■ lower ■ fit

- These days it is difficult _____ permission to build new lines.
- High-voltage overhead lines are designed _____ electric currents over 30 kV.
- The most efficient solution for _____ a meter is remote reading.
- Environmental laws require us _____ underground cables in areas of natural beauty.
- Substations are generally used _____ the voltage.
- The dispatching centre is in charge of _____ the flows of electricity across the grid.
- We recommend _____ polymer insulators, not traditional ceramic ones.
- Live-line working enables us _____ damaged lines without interrupting supply.
- Pylons have to be able _____ wind speeds of above 150 kph.
- Live-line working involves _____ maintenance while the line is still active.

Renewable energy

In your view, what is the most promising form of renewable energy?

LISTENING

CD TRACK 39

1.1 Listen to an energy expert. Which four new alternative technologies does she mention?

1.2 Listen again and complete the sentences.

- 1 There was a lot of excitement about biofuels as a cleaner _____ to _____.
- 2 In some areas biofuels have replaced food _____, causing food _____.
- 3 The cost of capturing and _____ CO₂ makes it uneconomical.
- 4 Carbon capture really needs government _____ to work.
- 5 The benefits of large-scale photovoltaic plants could be _____.
- 6 The electricity would be transmitted through a supergrid _____ across Europe.
- 7 The algae can be _____ daily and its oil extracted to make _____.
- 8 This technology _____ carbon capture with _____ production.



2.1 Complete the descriptions of renewable forms of energy. Use these words.

breaking down ■ producing ■ harnessing ■ pumping ■ burning
turning ■ converting ■ separating ■ generating ■ re-injecting

Wind	¹ <u>generating</u> electricity with onshore or offshore wind turbines
Solar	capturing heat with solar panels or ² _____ solar energy into electricity with photovoltaic cells
Biomass	³ _____ any organic material – wood, animal waste, landfill rubbish, etc. – in a conventional furnace
Biogas	⁴ _____ biodegradable waste in a digester to produce methane gas
Hydro	⁵ _____ turbines with the use of free-falling water
CHP (combined heat and power)	⁶ _____ both heat and power using fossil fuels or renewables
Tidal	⁷ _____ the power of incoming or outgoing ocean tides using barrages in estuaries
Wave	using the rise and fall of the sea to compress air to turn turbines
Geothermal	⁸ _____ water through a system of underground pipes to absorb the Earth's natural heat
Hydrogen	⁹ _____ reformed natural gas into hydrogen and CO ₂ , burning the hydrogen and then ¹⁰ _____ the CO ₂ into the gas field to pump out more gas