

DESCRIBING DATA: NATIONAL RENEWABLES GENERATION

The Describing Data series of resources allows students to practise graph or data interpretation. Topics are predominantly related to electricity or climate, and each resource includes short answer and challenge questions.

TEACHER NOTES

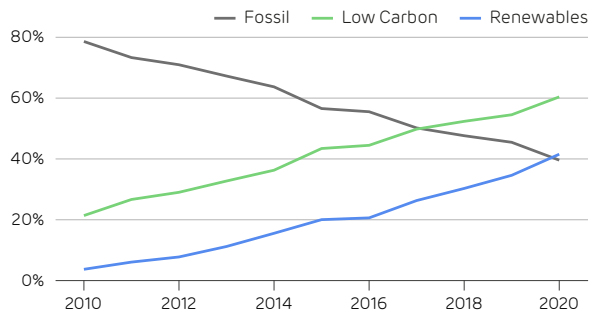
Most suited to	KS3
May be suitable for	KS4
Skills	Using a graph, data interpretation, data visualisation, scientific literacy
Subject	Science/physics/chemistry/maths/geography/environmental issues
Topic	Electricity generation, sources of energy, climate change, resource use
Suggested use	Lesson activity, homework, remote provision, home learning
Resources needed	Optional internet access, paper or electronic copies of data sheet and questions
Mark schemes guidance	Suggested or model answers are given. Numerical values are approximate. Suggested number of marks are given in brackets at the end of each answer

Feedback: <https://forms.office.com/r/VkQ6FF4xxJ>

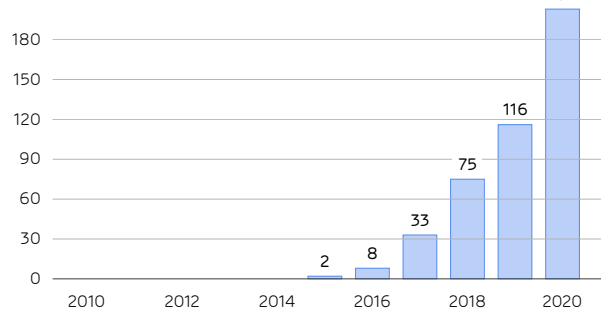
Contact us: educational.resources@drax.com

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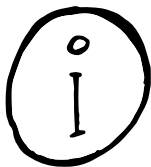
Days per year



The growth of renewable electricity generation in Britain, showing the share of electricity generation over the year [left] and the number of days per year that renewables produced more than fossil fuels [right].

HELP AND HINTS:

- Read the title of the two graphs carefully
- The graphs were originally produced in colour. The legend for the graph on the left has been duplicated next to each trend line.



If you'd like to read the full article on this topic:
<https://reports.electricinsights.co.uk/reports/q4-2020/>

Feedback:



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Answer the following questions on paper or in your book, as requested.

1. What's shown on the x axes of both graphs?
2. What's shown on the y axis of the graph on the left?
3. Look at the graph on the left. In which year was electricity generation from renewable sources more than the electricity generation from fossil fuels?
4. Look at the graph on the right. In 2017, how many days did renewables produce more electricity than fossil fuels?
5. Describe the trend in the share of electricity generated from fossil fuels. Use data from the graph.
6. For how many more days in 2020 did renewables generate more electricity than fossil fuels, compared with 2015?
7. What was the reduction in share of electricity generation from fossil fuels between 2010 and 2020?
8. Describe the trend in the data of the graph on the right. Use data from the graph.
9. Which year had the largest year-to-year increase in the number of days that renewables generated more electricity than fossil fuels?
10. Explain why the trend shown on the graph on the right cannot continue.

CHALLENGE TASKS

1. Explain two reasons for the increase in electricity generation from renewable and low carbon sources in Britain.
2. Use the data points given in the graph on the right to create a line graph. You may be asked to use graph paper or software to complete this task. Make sure you select a sensible scale, include a title, label the axes, and add a line of best fit to the data.

DESCRIBING DATA:

NATIONAL RENEWABLES GENERATION ANSWERS

1. The year (from 2010 to 2020). (1)
2. The percentage share of electricity generated in Britain from each type of fuel. (1)
3. The year 2020. (Hint: the trend line for fossil fuel generation goes below the line for renewables in 2020) (1)
4. 33 days. (1)
5. The share of electricity generation from fossil fuels decreased between 2010 and 2020. It was around 80% in 2010 and around 40% in 2020. The rate of decline was not consistent. It declined more steeply in some years than others and remained around the same share – around 55% - from 2015 to 2016. (Any 2 points including at least one numerical value) (2)
6. 201 more days (hint: 203 days in 2020 but only 2 days in 2015 are given in the graph). (1)
7. Approximately 40% (from just below 80% to just below 40%). (1)
8. The number of days per year that renewables produced more electricity than fossil fuels increased rapidly between 2010 and 2020. In 2010 to 2014, fossil fuels produced more electricity. 2015 was the first year that renewables produced more electricity. The rate of increase accelerated (this is called an exponential curve) until 2020, when renewables produced more electricity for 203 days of the year. (Any 2 points) (2)
9. 2015 (hint: increase was 116 to 203 days). (1)
10. There are only 365 days in a year (or 366 in a leap year!). There was an increase of 87 days from 2019 to 2020. For the trend to continue, the increase to 2021 would need to be larger than 87 days. This could only happen one more time before there would not be enough days left in a year! (2)

CHALLENGE TASKS – SUGGESTED CONTENT

1. You could write a lot here, but a few key bullet points or short statements could cover the main issues. Generation from fossil fuels has reduced due to environmental concerns and to the finite nature of fossil fuels. (They are used far more quickly than they can ever be replaced, so they'll eventually run out.) The main environmental concern is that burning fossil fuels releases carbon dioxide, which in turn contributes to global warming. Generation from low carbon and renewable sources such as wind and solar energy is increasing because it doesn't release carbon dioxide. The cost of renewables technologies has reduced while performance, capability and efficiency have improved. Decisions on the types of power generation used are very complicated. International and national government policies, business decisions, consumer opinions and other issues all influence power generation decisions.
2. Check that you've included all the listed features. Your scale is sensible if it increases by a regular amount each time on both axes and is easy for someone else to use. Your line of best fit should be curved, smooth, and not 'join the dots'. Here's an example:

Number of days per year that renewable sources generated more electricity than fossil fuels

