



## Hinchingsbrooke School Science Department

### KS3 Homework Task

#### Energy HW3 – More wind turbines planned

Date set:

Date Due in:

On the following page is information related to the task. You may need to do additional research to achieve the maximum level possible.

- Answer all questions, if you use PowerPoint please print off and stick in your book
- Fill in your details below

Name:	Form:
Teacher:	Science Set:

Feedback from teacher:

Student comment:

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## More wind turbines planned

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The UK government is planning to build an extra 4000 onshore and 3000 wind turbines offshore during the next ten years. It has set a target of using renewable resources 15% of the energy the UK needs by 2020. Up to 160 000 new jobs more would be created, some in encouraging people to use renewable energy and some in manufacturing and setting up the turbines. The government says the plans would help the UK to cut its greenhouse gas emissions by nearly 20% in the next 12 years.

Wind turbines transform the kinetic energy in moving air into electrical energy. The wind turbine blades are turned round by the wind, and the blades turn a shaft. The shaft is connected to an electricity generator, which transforms the mechanical energy in the shaft into electrical energy. The blades are designed so that when the wind direction changes, they turn to face the wind. This way, they can transform as much as possible of the energy in the moving air into electrical energy.

The faster the wind speed, the more electrical energy is generated. Good sites for wind turbines are places that are high up (wind speeds are higher at higher altitudes) and away from barriers such as trees or buildings. Wind speeds are higher offshore due to the lack of obstacles, and larger turbines can be used – which are more efficient. But it is more expensive to build wind turbines offshore, and more expensive to maintain them, because salt water is corrosive, so the electricity they generate costs more than electricity generated by onshore wind turbines.



Wind turbines (iStockphoto)

wind turbines next ten years to supply 160 000 new jobs more setting up the UK to cut its greenhouse gas emissions by nearly 20% in the next 12 years.

into electrical energy.

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### QUESTIONS

- 1 Describe the difference between renewable and non-renewable energy resources.
- 2 Why does the UK government want to use more renewable resources to supply our energy needs?
- 3 Draw a diagram to show the main energy transformations that happen in a wind turbine.
- 4 How does the design of a wind turbine make sure they transform as much as possible of the energy in wind into electrical energy?
- 5 Suggest why the top of a hill might be a good site for a wind turbine.
- 6 List the advantages and disadvantages of placing a wind turbine offshore.

### Challenge

Do you support or oppose the building of more wind turbines? Write a letter to your local newspaper explaining your views.