

Year 8 Offshore Wind Farm Lessons Withernsea High School

Lesson Title	Possible lesson activities	resources
<p>Lesson 1</p> <p><u>What's the Big Energy Issue? And what's Britain's answer?</u></p> <p>Key concepts:</p> <p>There are different types of energy – renewable and non-renewable. Britain relies on non-renewable</p> <p>We facing an energy crisis as North Sea oil and gas run out</p> <p>We have lots of coal supplies but don't want to contribute to the effects of global warming.</p> <p>Britain is opting for a renewable energy solution in the form of wind farms.</p> <p>Two of the largest offshore wind farms will be off the NE coast of England and impact on this area a lot.</p>	<ol style="list-style-type: none"> 1. Introduce the energy issue with the Energy ppt. Remind students how electricity is generated and our current fuel sources we use. 2. Starter: Classifying exercise – different sources of energy – which are renewable and which are non-renewable energy supplies (ppt slide). 3. Examine Britain's growing energy gap – rising demand but falling oil and gas supplies (ppt slide). Students list all the items in homes which are contributing to our rising demand for energy (smart phones, ipads, 3D TVs, hair straighteners.....) 4. Why not use more coal? – Look at causes of global warming (ppt slides) then the consequences for the planet using nasa climate website: http://climate.nasa.gov/ClimateTimeMachine/climateTimeMachine.cfm and the global consequences with the national geographic website: http://environment.nationalgeographic.com/environment/global-warming/gw-impacts-interactive/ 5. Issue global warming effect cards (classify those that might impact on Britain / those that are most serious / those that might affect the widest number of people on the planet). Students then choose 4 to write about – giving a 'Reason' for the change as a result of global warming, and also a linked 'Consequence' of that effect. 6. Government preferred option – lots of offshore wind turbines. (explain via Europe wind speed ppt) 7. Students draw a bar graph to show the energy production of the 9 offshore wind farms. Note the ones close to us. 8. Complete the summary sheet either as a class, or students put down their own responses to demonstrate their learning from this lesson. 9. What is their own opinion about this strategy? What will it mean for this area? 	<p>Card-sort on impacts of global warming.</p> <p>Base graph sheet for offshore wind farms</p> <p>Summary sheet (optional)</p>

<p>Lesson 2</p> <p><u>Careers and offshore wind farms</u></p> <p>Key Concepts:</p> <p>Different jobs and skills are needed in the making and construction of wind turbines.</p> <p>Many jobs are shore-based and support the operation of wind farms</p> <p>The more skills and qualifications a person has, the wider the range of possible jobs available in the offshore wind industry.</p> <p>You should start thinking soon about which subjects, skills and qualities will help you become employable in the wind energy industry.</p>	<ol style="list-style-type: none"> 1. Starter : In pairs sequence the Photos of stages in the construction of wind turbines (designing/manufacture/construction/maintenance....new design....). Then list the range of jobs involved. (see ppt – all photos on one slide - then individual ones. For full list go to guardian website http://www.guardian.co.uk/environment/gallery/2012/feb/28/world-of-wind-in-pictures#/?picture=385833078&index=0 2. Then encourage students to think about the wider range of jobs involved in offshore wind farms. Issue sheets of 3 stages of process and students to annotate with all the possible jobs involved. (see ppt) . Complete note sheet of job / skills / useful subjects. For interactive source : (and click on info symbols) http://www.thinkpowersector.co.uk/learn_about_power/offshore_wind_farm_interactive_illustration/ 3. Read profiles of 5 graduates involved in offshore wind industry (see ppt & print off). Students underline/highlight/note down their degree subjects and what they think they do. 4. Students create a job advert for any 4 of 12 jobs : (see publisher document) <ul style="list-style-type: none"> • Job title • Qualifications (useful) • What the job entails • Pros and cons of the job • Job description <p>(groups of 3 to work on)</p> 5. Plenary : What jobs could you do in the offshore wind industry with Just GCSEs – leaving school at 16 A levels – leaving school at 18 Degrees – starting work at 21 (see ppt slide) <p>They have to imagine they're giving career advice to someone aged 14-16 at school. What combination of subjects would they suggest they study, to what level, and what job-type would it fit them for in the wind energy industry?</p> <p>Homework : To work with an adult to record their views on offshore wind plans on SurveyMonkey questionnaire. Results will form the basis of a later lesson.</p>	<p>Guardian special report on wind energy – in pictures, the making of wind turbines.</p> <p>'Think Power' website – offshore wind farm interactive</p> <p>Pack of 12 job advert sheets</p>
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<p>Lesson 3</p> <p><u>The arguments for and against offshore wind farms</u></p> <p>Key Concepts:</p> <p>Some groups see benefits in new offshore wind farms</p> <p>Some groups see problems with new offshore wind farms</p> <p>Points are more persuasive if you can present reasoned arguments to support them.</p> <p>Points are more persuasive if you have examples, statistics, data and evidence to back up your points.</p> <p>You may be able to predict the points an opposing group might make and prepare a defence against them.</p>	<ol style="list-style-type: none"> 1. Starter : Photos of on-shore wind farms: pose 3 Qs on ppt slide: <ul style="list-style-type: none"> • Which groups are likely to object offshore wind farms • Which groups are likely to be in favour of offshore wind farms • How might those who object show their protest? 2. Present Group Task (slide 2 of ppt) : you will be allocated a role in your group. You have to research your group and produce arguments, supported by evidence, to give a presentation on why your group is in favour or against the Dogger Bank offshore wind farm. 3. Put students into Interest Groups (5 'for', 5 'against') and hand out Resource Packs of Group Info. (portrait sheets have a lower reading level) (landscape sheets for) (landscape sheets against) <ul style="list-style-type: none"> • Landscape sheets have web links so students can research additional information on behalf of their group. 4. Recording sheet for different groups given to specific groups of students out. <ul style="list-style-type: none"> • Basic reasons why they are 'for' or 'against' • Data/evidence to support their position • Try and predict the arguments likely to be put forward by your opponent group – and try to pre-empt them. <p><u>The Groups & Opponents:</u></p> <ul style="list-style-type: none"> • Fishing industry v Greenspace • Whale & Dolphin Preservation Group v Marine Preservation Group • Drax & gas power stations v Acid rain victims • Taxpayers Together v the government • An industrial energy user v local unemployed group <ol style="list-style-type: none"> 5. Students prepare and rehearse their assigned role, identifying whether they are in favour or against, and what their Economic, Social and Environmental arguments are. 6. Share the task – next lesson to have a planning meeting to see if the offshore wind farm should go ahead. Share the criteria they will be judged by when they make their presentation (ppt slide 3 – first 3 columns to assess group in their 'preparation' phase; next 4 columns to assess them as they give their presentation). 7. Groups prepare their presentation for next lesson: <ul style="list-style-type: none"> ○ Who are you ○ Are you for or against the Dogger Bank wind farm? ○ Main reasons for your point of view (Ec/soc/Env) ○ Evidence/data to support your arguments ○ Quote from an article or research. 	<p>Group response sheet</p> <p>Group information packs</p>
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<p>Lesson 4</p> <p><u>Controversy Group presentation</u></p> <p>Key Concepts:</p> <p>What makes a persuasive presentation?</p> <p>How do you decide which are the most persuasive arguments?</p>	<ol style="list-style-type: none"> 1. Remind groups of the mark criteria they will be judged by (see ppt slide 3) 2. Rehearsal of presentation. 3. Presentations. Paired group has to put a question(s) to their opposite number. All other groups marks the Presentation group, and the quality of the Opponent question. 4. Individual exercise : Students record (on recording sheet) the 2 key points from each group's presentation. Then prioritise which is the strongest arguments 'for' and 'against' out of the 2 noted – and why. Then complete the 3rd column with which side gave the most convincing presentation (both what they said, how they justified it, and how they dealt with any questions). 5. Students suggest what makes for a) an effective presentation and b) an effective argument. Which groups made the most persuasive arguments – and why. Which side had the most persuasive arguments in total – the groups 'against' or the groups 'for'. 	<p>Recording sheet for presentations</p>
<p>Lesson 5</p> <p><u>Offshore Wind Farm Issue Resolution</u></p> <p>Key Concepts:</p> <p>People have legitimate concerns about offshore wind farms.</p> <p>Some opposition is more legitimate than other.</p> <p>Creative solutions can be found to give a win-win outcome.</p>	<ol style="list-style-type: none"> 1. Starter : discuss what might happen if controversial developments are left unresolved using ppt slide intro. 2. Identify the arguments 'against' Dogger bank wind farm from lesson 3 & 4. Which do they think are the most 'legitimate concerns' (prioritising exercise) 3. Issue student pairs blank compromise A3 sheet (slide 2 of ppt) and cards of the points made against the wind farm, and possible compromise solutions (slide 3). Students sort cards into appropriate panel on A3 blank : <ul style="list-style-type: none"> • Subsidies needed → sell surplus electricity to other countries. • Far from mainland/live on offshore platforms → offer higher pay like oil and gas rigs do. • Problems for fishing → fishermen could transport materials, workers & tourists on boats. • Wind's not always blowing → Norway pumped storage plan. • Fewer jobs at Drax & other coal-fired plants → retrain to manufacture turbines/absailing courses 4. Student pairs come up with a 2nd compromise solution in case the one on the card is not acceptable. 5. Present next task : Film news report. Mix students in each pair of 'opponent' groups (so – 1 or 2 'Greenpeace' group go to the 'Fishing' group and vice versa. They are to prepare a summary of the controversy as a filmed report. There needs to be a compromise solution acceptable to the 'against' representative(s) – either the one off the card sort, or the new one the pairs have come up with. 6. Film documentary : groups prepare a film report (see slide 4 of lesson ppt) <ul style="list-style-type: none"> • Reporter : presents the Dogger Bank wind farm idea • For rep : says why they're in favour of the plan • Anti rep : says why they're opposed to the plan. • Expert : describes the compromise solution • Reporter asks Anti rep if they're happy with this. If they're not, a different 	<p>A3 controversy sheet</p> <p>Card-sort of key problems & possible solutions</p>

	<p>compromise solution has to be offered from within the group.</p> <ul style="list-style-type: none"> Reporter : summarises how the issue has been resolved and emphasises the benefits the area will get from the developments. (groups also require a researcher & camera-operator) 	
<p>Lesson 6</p> <p><u>Finding the best Solutions</u></p> <p><u>Key concepts:</u></p> <p>Solutions can be found for a range of problems.</p> <p>Some solutions are more successful than others.</p> <p>Some solutions may create other problems down the line.</p>	<ol style="list-style-type: none"> Rehearsal time for news-reporting groups. (remind them of roles with slide 4 of lesson ppt) Perform and flip-video each performance Watch performances back. Students judge – which is likely to be the most ‘successful’ compromise solution by ticking: the ‘easiest to put into place’; the ‘cheapest’; the ‘most popular’ – and their opposites. (see slide 5 of lesson ppt) Discuss why some ‘solutions’ are better than others. Why some ‘solutions’ don’t always work – and how they may store up other problems in the future. 	<p>Flip camera</p> <p>Solutions recording sheet</p>
<p>Lesson 7</p> <p><u>What does the public think?</u></p> <p><u>Key concepts:</u></p> <p>Survey results can be shown in different ways.</p> <p>Survey results need a written comment to analyse them.</p> <p>There are key messages we should be able to learn from the survey results.</p>	<ol style="list-style-type: none"> Look at the questionnaire results from Survey Monkey, carried out earlier Students should produce annotated graphs of the full set of results in small groups. This can be done using excel packages or hand-drawn, but each student should experience constructing different forms of graph: <ul style="list-style-type: none"> Vertical bar chart Horizontal bar chart Pie chart (see examples on lesson ppt) Annotations should take the form of : <ol style="list-style-type: none"> A description of the result for each question A possible explanation for the result obtained A personal comment on the result (surprised by it / not surprised / bigger than expected / fewer than expected.....etc). (practice these on the ppt slides – slide 2 done; slide 3 students decide which annotation is a description/explanation/comment); slide 4 – practice themselves on the pie chart giving 3 annotations). The group should then produce a concluding statement (slide 5) summarising the whole set of responses using the headings: <ul style="list-style-type: none"> What most people think Will the area benefit? What messages for the Wind Farm Industry and companies. Groups give feedback 	<p>Survey results summary</p> <p>Pie chart measures</p>