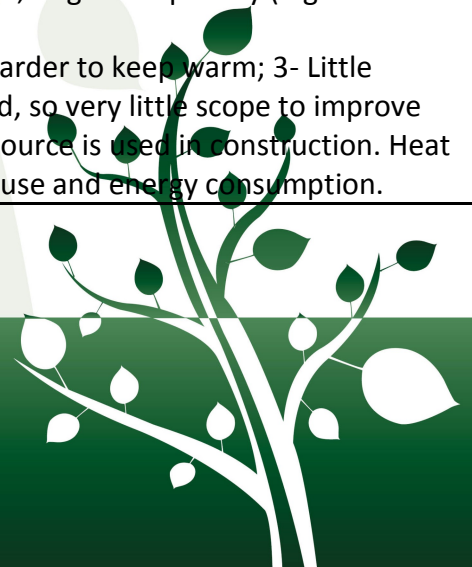


Slide	The Green Deal - Low Carbon Retro-fit of Buildings—Tutors' Guidance
1	Presentation title
2	Presentation outline
3	<p>The presentation will start with a holistic view of the environment: "Our society and our economy are wholly dependent on the quality and sustainability of our environment. Economy exists to serve society and it must not be allowed to grow beyond the boundaries of society. Society depends on the environment for its very survival and must only grow within the boundaries of the environment."</p> <p>Q1: What are the implications of growing the economy beyond social boundaries?</p> <p>Possible A1: Health and well being of citizens are deemed less important than economic growth.</p> <p>Q2: What happens if the society grows beyond the boundaries of the environment?</p> <p>Possible A2: Natural resources are used at a faster rate than they can be replenished. This will lead to food, water and fuel shortages; poor air and water quality; and other such problems.</p>
4	<p>With this slide, the environmental impact of buildings will be introduced: "Buildings can make an impact on the environment in a wide range of ways. This slide gives some examples"</p> <p>A few items will be read out loud and comments will be encouraged around their meaning and implications. E.g.</p> <p>Sourcing of materials: Availability of resources; their carbon footprint; using local resources, etc.</p> <p>Toxicity: Waste disposal issues; materials' effect on human health, etc.</p>
5	<p>"Buildings are created to serve society. They should provide healthy and comfortable living and working environments as well as catering for occupants' preferences and lifestyles."</p> <p>"Problems arise when building practices and occupants' preferences and lifestyles have an adverse effect on buildings' environmental performance."</p> <p>Q. Can you think of any examples where this may happen?</p> <p>Possible A's: Construction waste disposal (reduce, reuse, recycle); toxic waste disposal; heating left on when windows are open; etc.</p>
6	<p>Economic factors relating to buildings include the cost of fuel, water and materials used during their construction, operation, repair, refurbishment or demolition.</p> <p>Q: What would be the social impact of an increase in fuel costs?</p> <p>Possible A: This can lead to fuel poverty.</p>
7	<p>This slide will be used to draw attention to the diversity of existing homes in the UK and their environmental performance issues. Images will be made to appear one at a time.</p> <p>Images 1, 2 and 3 will be introduced with specific emphasis on the years they were built and images 4, 5, 6 with emphasis on their types.</p> <p>"Here are examples of a 1920's (1) building, a 1940's (2) building, and a 1960's (3) building."</p> <p>"(4) is a listed property; (5) terraced homes; (6) a semi-detached house."</p> <p>To encourage audience participation, they will be asked to identify 2 potential performance characteristics; one positive and one negative, for each type of property.</p> <p>Sample answers:</p> <p>Positive: 1- Spacious rooms; 2- More affordable than (1); 3- Housing for large numbers; 4- House with history and character; 5- Easier to keep warm with fewer external walls; 6- greater privacy (e.g. less noise transfer from/to neighbours through only 1 shared wall).</p> <p>Negative: 1 and 2- Likely to be single-brick walls with no cavity, thus harder to keep warm; 3- Little control over the supplies and services to each residential unit; 4- Listed, so very little scope to improve the building's environmental performance; 5- Shared walls, so less resource is used in construction. Heat loss from walls is also reduced; 6- One shared wall, reducing resource use and energy consumption.</p>



8	<p>Q: Can you name these energy efficiency measures?</p> <p>A:</p> <ol style="list-style-type: none"> 1: Double glazing 2: Triple glazing 3: Loft insulation 4: Pipe insulation 5: Cavity wall insulation 6: Internal solid wall insulation 7: External solid wall insulation
9	<p>Images will appear one at a time from 1 to 3.</p> <p>Image 1:</p> <p>Q1: What is the key characteristic of this wall?</p> <p>Expected A1: A single-brick wall with no cavity.</p> <p>Image 2:</p> <p>Q2: What is the key characteristic of this wall?</p> <p>Expected A1: A more recently built wall with cavity.</p> <p>Image 3 will then be used to explain the difference between the two types of walls.</p> <p>Question 3 will prepare the audience for the next slide:</p> <p>Q3: Can you think of any other ways to reduce energy costs in UK homes?</p> <p>Possible A3: Use of technologies such as solar thermal, solar electricity, micro-wind, etc.</p>
10	<p>Having introduced micro-generation systems at the end of the previous slide, technologies used in Brundtland Building will be presented as examples.</p> <p>Images from Bedford College's Brundtland Building will appear, and each technology/process introduced, one at a time:</p> <ol style="list-style-type: none"> 1. The original building with single-brick walls and single glazed windows. 2. External cladding installation process. (emphasising the high levels of insulation being installed which is visible in this picture) 3. Full use made of the roof to install a wide range of technologies. PV panels, solar thermal panels, and ducting for the air-handling unit are visible in this picture. 4. Solar thermal technology. 5. Air handling unit linked to the chilled beam infrastructure. 6. Chilled beam. 7. Energy efficient T5 lighting replaced the original T8's. 8. Intelligent lighting controls. Switching off if room not in use. 9. Rainwater harvesting supplying water to flush toilets in one part of the building 10. Building energy management system. 11. Vertical axis wind turbine.
11	<p>Q: Cladding and rainwater harvesting will not pay-back the investment made. Can you think of any reasons why these technologies should be utilised?</p> <p>Possible A's: Economic and environmental impact of demolishing a building at the end of its useful life; Improved comfort levels lead to improved productivity; safeguarding against water shortages.</p> <p>Further discussion will be directed towards environmental considerations of production, transport, maintenance of technologies as well as their impact on reducing fuel consumption and costs while improving comfort levels.</p> <p>The audience will be asked to work in groups to identify the potential benefits and areas for concern relating to each of the Brundtland Building technologies.</p>
12	<p>Examples of benefits and areas for concern relating to Brundtland Building technologies.</p>