

# ELECTRICAL INSTALLATIONS

SUMMER PROJECTS  
**YEAR 11 STUDENTS**

A DIY HOME ELECTRICAL  
GENERATION SYSTEM



HEART OF  
WORCESTERSHIRE  
COLLEGE

## KICK START YOUR STUDY AT HOW COLLEGE WITH ONE OF OUR CURRICULUM BRIDGING PROJECTS

### **Background:**

As part of your electrical studies you will need to understand and apply your knowledge about the ways in which electricity is generated in the UK.

You may have touched upon it during your environmental studies, and may be aware of national plans for, the electrification of road and rail transport.

So, to prepare you for your electrical course at Worcester HoW College we are asking you to investigate the ways that electricity is generated and how renewable technologies contribute to our electricity needs, now and into the future. You will provide a report on your findings. Once you have completed the task you will need to prepare a report based on your findings

### **Time plan:**

Task research and completion time estimates are shown with each task.

### **Resources:**

Choose sources wisely and make sure they talk about UK supplies. You can use school notes and textbooks, trade magazines, personal contacts in the trade, websites (particularly Western Power and Eon supplier sites).

### **Evaluation:**

All The work should be your own. Complete the tasks in order listed.

The report should be type written (\*.Word format & font: Arial/Time New Roman, 12pt). Diagrams/pictures should support your report and be large enough to read. Hand drawings/sketches can be included as pictures or scanned/photocopied as a \*.pdf document.

### **Feedback:**

Reports delivered late may not be evaluated by the tutor. Report feedback will be given prior to the topic being formally taught.

### **Guidance:**

Research the topic as outlined on page 3, extracting information applicable to the UK electrical industry. Then, in your own words, SUMMARISE your findings and identify and state the key points of your research. Use pictures, drawings and sketches to help explain your findings.

### **Important:**

If you copy information from published resources or the internet..., you MUST reference the source. If you don't do this, you are committing an offence of Plagiarism under the Publication Copyright Laws.

So, copy the www\* link (very top LH corner long box) of your source and place it underneath your copied text block, table or picture or under a 'References' title at the end of your report.

## TASKS:

### Task 1 - Electricity Generation [Research - 5hr; Write-up -5 hr]

Identify and describe the different ways of generating electricity in the UK using fossil fuels, their key design features and electrical characteristics such as voltage and frequency. (200 words)

State how existing electrical generation methods can be made more environmentally friendly? [Do not include renewable technologies here] (200 words)

Identify the different types of renewable electrical generation technologies and, for each, outline how they generate electricity and what form it takes (e.g. Alternating Current (AC) or Direct Current (DC)).(150-200 words plus pictures for each)

From your analysis above select 3 different technologies and identify some

- Limitations of using these renewable methods
- And state how they might be applied in homes to offset energy costs (300 words )

In the form of a table, graph or Pie Chart, show how the use of renewable electrical energy sources has increased since the 1990s to date.

What can you deduce from this information about future use of fossil fuels? (100 words)

### Task 2 - A DIY home electrical generation system

Using suitable resources for guidance (**do not copy and paste**), outline a design that you might wish to use to generate enough electricity (either in AC or DC form) to supply some, or all, of your home needs.

Use sketches and pictures to illustrate your design.

Building your design is not essential, but, if you do, include pictures of your models in the report. (500w)

## **Suggested Materials**

As part of your research you may find the following websites/films helpful. There are, of course other websites or sources of information, such as text books you or your school may have, which may be useful.

[www.evwind.es/2020/01/07/wind-energy-set-a-new-record-of-26-5-for-december-2019s-generation-in-the-uk/72961](http://www.evwind.es/2020/01/07/wind-energy-set-a-new-record-of-26-5-for-december-2019s-generation-in-the-uk/72961)

[fortune.com/2019/10/15/uk-renewable-energy-40-percent-fossil-fuel/](http://fortune.com/2019/10/15/uk-renewable-energy-40-percent-fossil-fuel/)

[www.energy-uk.org.uk/energy-industry/energy-in-the-uk.html](http://www.energy-uk.org.uk/energy-industry/energy-in-the-uk.html)

[www.gov.uk/government/collections/electricity-statistics](http://www.gov.uk/government/collections/electricity-statistics)

[energysavingtrust.org.uk/renewable-energy/electricity/solar-panels](http://energysavingtrust.org.uk/renewable-energy/electricity/solar-panels)

[www.explainthatstuff.com/powerplants.html](http://www.explainthatstuff.com/powerplants.html)

[www.nationalgrid.com/britains-clean-energy-system-achieves-historic-milestone-2019](http://www.nationalgrid.com/britains-clean-energy-system-achieves-historic-milestone-2019)

[www.bbc.co.uk/bitesize/guides/z3qd7p3/revision/8](http://www.bbc.co.uk/bitesize/guides/z3qd7p3/revision/8)

## **Instructions on how to submit this:**

Once you have completed your research project you can forward it to your course tutor James Brennan

e. [jbrennan@howcollege.ac.uk](mailto:jbrennan@howcollege.ac.uk)

## **How will I benefit from this project:**

The work you complete and submit will be used to form part of your course notes and will be used for revision in your Electrical Principles unit.

## **What can I expect to get back after I submit my project work:**

Once you have completed and submitted you work, you will get feedback and instruction on how and where it fits into your qualification.

## **Key information you should include:**

Your name

Your email address

A contact telephone number