

GCE



Chief Examiner's and  
Principal Moderator's Report  
**Environmental  
Technology**

Summer Series 2018





## Foreword

This booklet outlines the performance of candidates in all aspects of CCEA's General Certificate of Education (GCE) in Environmental Technology for this series.

CCEA hopes that the Chief Examiner's and/or Principal Moderator's report(s) will be viewed as a helpful and constructive medium to further support teachers and the learning process.

This booklet forms part of the suite of support materials for the specification. Further materials are available from the specification's microsite on our website at [www.ccea.org.uk](http://www.ccea.org.uk).



## Contents

<b>Assessment Unit AS 1</b>	The Earth's Capacity to Support Human Activity	3
<b>Assessment Unit AS 2</b>	Renewable Energy Technologies	4
<b>Assessment Unit A2 1</b>	Building and Managing a Sustainable Future	5
<b>Assessment Unit A2 2</b>	Environmental Building Performance and Measurement	6
<b>Contact details</b>		8



# GCE ENVIRONMENTAL TECHNOLOGY

## Chief Examiner's Report

### Assessment Unit AS 1 The Earth's Capacity to Support Human Activity

There was clear evidence from the responses of the candidates that all questions were accessible. There was no evidence of any particular question providing undue difficulty for the candidature.

There was no evidence that the paper was too long for the time permitted.

- Q1**
- (a) This question was answered correctly by the majority of candidates.
  - (b) Most candidates were able to answer this question correctly.
  - (c) A surprising number of candidates provided the wrong formula for the Coefficient of Performance of a heat pump. Candidates were encouraged in the examination paper to show the working out of the calculation and they are strongly advised to follow this approach.
- Q2**
- (a) This question was well answered by a large number of candidates.
  - (b) This question was generally well answered. Some candidates suggested that use of fossil fuels contributes to damage of the ozone layer which is generally attributed to the release of CFC gases. Some candidates did not provide enough detail in their responses to merit the award of 2 marks. The trigger word in this question was "describe" which requires more than a short one phrase response. Some candidates provided responses which were repetitive.
  - (c) In Parts (i) and (ii) of this question most candidates displayed a good knowledge of the issues involved in carbon trading and why it may not alter greenhouse gas emissions.
- Q3**
- (a) This question was generally well answered. A surprising number of candidates confused the flat plate solar collector shown in Fig 2 with a PV cell.
  - (b) This question was generally well answered with candidates providing a clear explanation of the operation of the flat plate solar collector.
  - (c) This question was generally well answered.
  - (d) This question was generally well answered.
  - (e) There was a variable response to this question with some candidates claiming that the energy from the Sun was concentrated onto a solar PV cell.
  - (f) This question was generally well answered. However, some candidates described the use of active devices such as solar PV cells as passive design techniques.
- Q4**
- (a) This question was generally well answered although some candidates referred only to plant material as biomass.
  - (b) This question was generally well answered.
  - (c) This question was generally well answered although some candidates stated another form of wood rather than another category of biomass.

- (d) (i) (ii) Most candidates were able to provide the correct definition of anaerobic digestion in Part (i) but a surprising number provided incorrect gases as the main constituents present in biogas.
- Q5** (a) This question was generally well answered with candidates providing the main reason why storage facilities are required in order to make optimum use of available wind energy resources.
- (b) Part (i) of this question was generally well answered. In Part (ii) most candidates were able to provide a description of how a compressed air energy storage system operates. However, a number failed to indicate the connection between operation of the system at times of high and low energy demand. Some responses did not refer to the addition of gas to the compressed air to expand its volume before use to drive a turbine.
- (c) This question was generally well answered.
- (d) This question was generally well answered by a large number of candidates.
- Q6** (a) This question was generally well answered although a number of candidates quoted non-toxic gases.
- (b) A variable range of responses was produced to this question. While most candidates were able to identify issues associated with the use of plastics some found it difficult to provide three different factors explained in appropriate detail. Some candidates simply re-stated Part (a) i.e. toxic gases emitted as a result of incineration as a reason for the sustainable manufacture and use of plastics
- (c) This question was generally well answered.
- Q7** A wide range of marks were awarded in response to this question, mostly within bands 2 and 3. Candidates should be encouraged to provide specific balanced arguments and discussions based around the bullet points in the question. This is what is required to access higher band marks. Candidates displayed a good knowledge of the factors affecting the energy output from a wind turbine and the environmental and social issues associated with the location of a wind farm. A surprising number of candidates displayed a superficial knowledge of the costs associated with installations of this type.

## Principal Moderator's Report

### Assessment Unit AS 2 Renewable Energy Technologies

Marking was generally to a good and accurate standard. Most centres marked within tolerance. Annotation was good, detailed and relevant. Most student task responses were well packaged and complete. Some candidates produced high quality work and most candidates showed a very thorough understanding of the scenario and the implementation of renewable energy technologies to it.

**AO1:** Reports were well illustrated and generally a comprehensive and thorough overview of the three renewable technologies was given. The reports, were excellently written using specialist vocabulary. Referencing is still a little erratic with most candidates correctly identifying the reference to the text but a few giving only a bibliography type list with no link to the text at all. It must again be mentioned that the desktop research should be centred on and refer specifically to the requirements of the scenario.

**AO2:** The practical investigations were well carried out. The design used was appropriate and clear. The calculations produced by most candidates were relevant and accurate. Once again it should be mentioned that the practical investigations chosen should have as their basis the requirements of the scenario. Another area for future improvement could include a stronger rationale.

**AO3:** Most physical measurements were accurate with few errors. The data was mostly presented in a range of formats. Most candidates produced a comprehensive recommendation with strong rationale. It must be pointed out, however, that the risks aspect in AO3 should also be referenced to the practical investigations as well as the desktop research issue being discussed. More in-depth interpretation and analysis of results would improve the mark of many candidates.

## Chief Examiner's Report

### Assessment Unit A2 1 Building and Managing a Sustainable Future (A2EA/AET1)

All questions on the examination paper proved to be accessible and there was no evidence of any questions which were not being answered by candidates.

A full range of marks was awarded for all of the questions.

There was no evidence that candidates misunderstood questions due to the language used in the paper.

There was no evidence that the paper was too long for the time allocated.

- Q1** Part (a) of this question was not answered correctly by a significant number of candidates. A number quoted waste types rather than waste streams as required by the question. Part (b) was answered better although a number of candidates suggested reasons for ending the over-reliance on landfill which had more to do with availability of land than environmental concerns.
- Q2** In response to Part (a)(i) of this question candidates displayed a good knowledge of embodied energy. In part (a)(ii) candidates were expected to compare data from table 1. A number simply re-stated the figures in the table and did not draw any conclusions in comparison of the data provided. In response to Part (b) candidates provided suitable discussions for the advantage of incineration. However, in suggesting a disadvantage of incineration a significant number of candidates simply stated that the process results in the emission of carbon dioxide whilst neglecting to mention the other possible gaseous products.
- Q3** In general, all three parts of this question were well answered. However, in response to Part (a) some candidates suggested measures which would have enabled the householder to generate energy rather than to improve the energy efficiency of their home.

- Q4** Part (a) of this question was well answered. However, in response to Part (b) a significant number of candidates provided responses which did not contain either sufficient or correct detail of the four stages in the production of bioethanol. Some candidates simply re-stated the stage names as provided in the question.
- Q5** Part (a) of this question was well answered by a large number of candidates. In Part (b) some candidates were unable to distinguish between the effects of population, affluence and damage caused by technology.
- Q6** Parts (a) and (b) of this question were well answered although in the description of the operation of the wave attenuator some candidates failed to refer to the conversion of kinetic energy to electrical. Part (c) was generally well answered.
- Q7** This question was well answered although some candidates simply quoted the points referred to in the question without adding any supporting detail of how each would contribute to sustainable urban development.
- Q8** Parts (a) and (b) of this question were well answered. In response to Part (c) a significant number of candidates did not provide clear and detailed reasons as to why bioremediation is beneficial. Part (d) was well answered but in response to Part (e) some candidates failed to provide detailed advantages and a disadvantage of phytoremediation. Some candidates repeated their responses to Part (c) for this question.
- Q9** In response to this question a significant number of candidates displayed a detailed knowledge of the use of hydrogen as a transport fuel. There was a wide range of responses to the question, however, with a small number of candidates providing insufficient detail in their answers.

## Principal Moderator's Report

### Assessment Unit A2 2 Environmental Building Performance and Measurement (A2EB/AET2)

Marking was good and accurate and mostly within tolerance. Annotation was good, detailed and relevant. Some of the candidates produced high quality work and most candidates showed a very thorough understanding of CSH and its implementation to the task issues.

**AO1:** The reports were well illustrated and generally showed a comprehensive and thorough overview of CSH within the wider context of sustainability measurement. The quality of the written reports was excellent with clear evidence of the use of specialist vocabulary. Candidates who achieved good marks in this assessment objective provided a good overview of CSH within the wider context of sustainability. Some candidates would have benefitted by providing a more detailed overview of the CSH assessment procedure. Referencing was still a little erratic with many candidates correctly identifying the reference to the body of the text but a few only giving a bibliography type list.

**AO2:** Most candidates identified a range of investigations. Some areas for improvement would include the assessment of their dwelling against the Life Time Homes criteria and the pollution nitrogen oxide criteria. A more detailed methodology and analysis of their findings would have improved some candidates' overall marks. Also some candidates could have improved their mark by identifying the physical measurements for the specified categories. All candidates used more than one source to obtain data for the seven categories. The calculations produced by most candidates were

comprehensive and accurate. It should be pointed out that the case studies chosen should have some relationship with the building under investigation.

**AO3:** Most physical measurements were accurate with few errors. The data was mostly presented in a range of formats. Most candidates produced a comprehensive list of recommendations with strong rationale for each. It should be noted, however, that the health and safety aspect in AO3 should be referenced to the recommendations presented. To improve their work candidates should include an evaluation of the sustainability measurement processes used throughout their investigation and the CSH assessment. candidates simply re-stated the stage names as provided in the question.

## Contact details

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