ENERGY MANAGERS ASSOCIATION

Serving Energy Management Professionals

KNOWLEDGE TEST SPECIFICATION

JUNIOR ENERGY MANGER APPRENTICESHIP STANDARD – LEVEL 3 – ST0161

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INTRODUCTION - JUNIOR ENERGY MANAGER END POINT ASSESSMENT METHODS

There are three aspects to End-point Assessment in the Junior Energy Manager Apprenticeship End-point Assessment Programme.

1. Knowledge Test –The Apprentice's will complete a structured series of multiple-choice questions to check their knowledge of the Standard. The knowledge test could be undertaken in class or online, is time restricted to 90 minutes and must be completed once the Apprentice has passed Gateway. A successful completion of the Knowledge Test will enable the apprentice to proceed onto the Practical Task.

2. Practical Assessment - Energy Audit and Report - represents and demonstrates the application of knowledge, skills and behaviours. It should be conducted in the Apprentice's normal work set up and the Employer should make allowance, in terms of time and resource, for the practical task to be undertaken.

The completed collected information, data and completed report will be submitted to the EPA Assessor who will ensure that it demonstrates the required competence of the standard.

3. Professional Conversation / Interview - The Apprentice will discuss the outcomes of the Practical Assessment and demonstrates:

- What they set out to achieve?

- What they have produced in the report

- How they approached the practical task, identified opportunities and dealt with any issues

A set of competency-based questions will also enable the apprentice to draw on their experiences throughout their apprenticeship.

The purpose of this document is to specify the Knowledge Test.

KNOWLEDGE TEST

Purpose

The Knowledge Test is an onscreen or on paper test that will assess the apprentice's knowledge and understanding across all areas of the Apprenticeship Standard, in line with the Assessment Plan requirements. It will assess the mapped-out knowledge outcomes from the Junior Energy Manager Apprenticeship Standard.

MAPPING OF KNOWLEDGE AND SKILLS (KS) IN THE KNOWLEDGE TEST

Technical Knowledge	
TK1	Relevant level of theory and practices at Junior Energy Manager level that underpins how energy flows in an out of buildings, equipment and processes and how key energy systems operate
TK2	Relevant level of theory and practices that underpin the energy efficient use of equipment, processes and IT systems
TK3	Energy performance, water measurement and verification of measured data
TK4	Understand the economics of energy consumption, supply and demand of energy, sustainability issues and role of the organisation in tackling them
TK5	Understand the principles of energy loss assessment
TK6	Understand the principles of industry regulations, and environmental and regulatory requirements, and EU directives relevant to energy and climate change within the context of the Junior Energy Manager's workplace
TK7	Test and maintain procedures of equipment and processes used to determine energy performance and how inefficiencies arise and how to improve energy performance
TK8	Know how to read meters and sub-meters, collect, record and analyse metered data and interpret manufacturer's installation and maintenance requirements
TK9	Understand how to estimate energy used from solid or liquid fuels that are not metered
TK10	Know how to understand a bill, set an energy baseline and identify variables that affect energy consumption in organisations, and how to query and challenge bills with suppliers
TK11	Understand energy tariffs

TK12	Know relevant initiatives/policies associated with transport, travel planning and logistics operational system within the context of the Junior Energy Manager's workplace
TK14	Understand the importance of water management to the business' utility costs and carbon emissions
TK15	Understand and continually improve an energy management contribution to strategic planning based on energy, carbon and water and key performance indicators for measuring and verifying success

Skills	
S1	Complete template reports and ensure records are maintained for audit and reporting purposes
S2	Relate the workings of plant, processes and equipment to energy consumption
S3	Identify and explain variables that vary the energy consumption of a building and process (Building operation: summer/winter; day/night, etc.)
S4	Identify and explain suitable and measurable energy performance indicators (energy use, consumption, efficiency)
S5	Implement and/or maintain metering and measurement plans and undertake basic analysis of the outputs
S6	Carry out basic checks on bills and other recorded data to verify accuracy and repeatability
S7	Contribute to all aspects of the energy and water use audits: conduct energy and water assessments and/or audits, and identify products', systems' and processes' solutions that reduce energy and water consumption
S8	Contribute to the organisation's procurement process/products/services

S9	Assist with the gathering of energy performance data and administration and implementation of energy awareness and motivation programmes and their associated communication strategies for reduced energy use
S11	Carry out basic financial calculations relating to energy costs and savings

KNOWLEDGE TEST FORMAT

The Knowledge Test is a combination of multiple-choice and structured questions to assess an apprentice's bulk of technical knowledge relevant to the Junior Energy Manager apprenticeship standard.

The Test will consist of 60 questions required to be completed within 90 minutes under closed book conditions.

Questions may draw on any combination of the subject areas which might be encountered in energy management practice or relate to the core energy management principles. Apprentices will be asked to apply their knowledge by answering questions identified by subject area below.

Section	**Number of questions/marks**	**Weighting**
01 Understand the roles, responsibilities and reporting of a Junior Energy Manager	10	17%
02 Understand how a building, processes and transport behaves, how energy and water is used, and, how to assess, plan and implement CAPEX and Revenue improvement actions	10	17%
03 Understand how to implement an appropriate auditing system, measurement and verification	6	10%
04 Understand what legislation, regulations and orders are relevant to the Junior Energy Manager's organization and what may impact it in the future	5	8%
05 Know how to plan an awareness campaign and motivate colleagues to reduce energy consumption and cost	5	8%

06 Understand how energy is purchased, and understand the current and anticipated drivers of cost that affect: the energy, its delivery, and taxes and subsidies	10	17%
07 Understand and be able to describe the Junior Energy Manager's organization in terms of energy and water usage by ICT	3	5%
08 Understand the importance of water in the Junior Energy Manager's workplace and the wider context	3	5%
09 Know how transport/travel planning and logistics operation system impact the Junior Energy Manager's workplace	3	5%
10 Understand an energy management contribution to strategic planning based on energy, carbon and water and key performance indicators for measuring and verifying success	5	8%

Apprentices should be able to apply these fundamental energy management principles appropriately and effectively at the level required of a competent newly qualified energy manager in practice. Each single multiple-choice question will be followed by three possible answers. Apprentices should mark only one answer for each question.

The questions in the assessment are designed to test the application of energy management principles which can be expected of a newly qualified energy manager of England and Wales without reference to books and notes. They are not designed to test matters of detail which a newly qualified energy manager would be expected to look up.

Application of energy management principles and rules

The following illustrations of the range of question style used to test the JEM apprenticeship are not intended to be exhaustive:

1. A question may require the apprentice to both identify and apply a fundamental energy management principle or rule.
2. A question may identify the relevant energy management principle or rule and require the apprentice to identify how it should be properly applied, and/or the outcome of that proper application.
3. An apprentice may be required to demonstrate that they understand whether their organisation or a client can achieve a desired energy management outcome and offer appropriate support to meet energy and cost reduction objectives and targets.
4. A question may require an apprentice to perform a calculation by applying rules, rates or percentages to identify a correct figure. The figures required to work out an answer to any calculation would normally be provided.

Example of questions:

- Newton's law states "energy cannot be created or destroyed; it converts from one form to another". When you boil water in an electric kettle, energy is converted from electricity into what forms?
- Assuming that you are boiling 1.5 Litres of water in an electric kettle. The initial temperature of water is 15 °C and boils at 100 °C. What is the electricity consumption?
- In a building, name where can you find a pump and a fan?
- In a night time energy audit of an office, 100 4ft T12 lights (40 W each) and 160 17-inch LCD screens (35 W each) were left ON. Assuming the office is occupied between 9am and 5pm five days per week, how much electricity could be saved in 30 days?
- What is a coefficient of performance and what might it apply to?

Knowledge Test Format Summary

The table below sums up information about the nature of the test items, duration, number of questions and grading of the knowledge test.

Test items	The Test consists of 60 multiple-choice questions.
Duration	90 minutes
Number of questions	60
Grading	Fail/Pass/Distinction

GRADING

The EPAO will review the completed knowledge test against the correct answer sheet. Any incorrect or missing answers will be assigned 0 marks and all questions are worth 1 mark each.

The following grades: Pass, Distinction or Fail will be applied to mark the overall Knowledge Test. The minimum pass mark is 37 correct answers distributed across 10 sections listed in the End Point Assessment Plan document. The Distinction mark is 51 correct answers distributed across 10 sections listed in the End Point Assessment Plan document. All 10 sections have to be passed in order to achieve PASS in the Knowledge Test.

MOCK ASSESSMENT MATERIALS (MOCKS)

Mock assessment materials will be provided for the Knowledge Test by the EPAO. Mock papers provide an example of what the actual test will look like in terms of the feel and level of demand. The mock papers show the range of possible question types that may appear in the actual tests

and give a good indication of how the tests will be structured. While mock papers can be used for practice with apprentices as with any assessment the content covered and specific details of the questions asked will change in each version of the Knowledge Test.

DELIVERY AND CONDUCT

Tests are available through in class on paper testing or onscreen virtual testing systems. The EPAO will discuss the set up and delivery of the tests with the employer/training provider, as part of their planning discussions.

The employer/training provider should ensure that apprentices are adequately prepared before each test attempt.

Those invigilating the tests should familiarise themselves with the screen and ensure that there is time for apprentices to fully explore the information on the help screen before starting the test.

Onscreen assessments must comply with the requirements set out in Junior Energy Manager Assessment Plan document.