

Assessment Tool

School/ Department Name	School of Engineering/ Mechanical Engineering
Program Code and Title:	EDEF15 - Diploma of Mechanical Engineering
Course Code and Title:	15FMCE223 Energy Management
Assessment Number and Title:	Assessment 3: Final Assignment
Assessment Type:	Written Assessment
Assessment Location:	Online
Assessment Date:	January 25, 2021 @ 6:00 PM
Assessment Time/Duration:	January 27, 2021 @ 6:00 PM
Student Name & ID:	1. 2.
Section (s):	P4M1, P4M2, and P4M3
Assessment General Instructions:	<ul style="list-style-type: none"> • This is a project report and student should submit their work in group on Moodle and bring hard copy to presentation day. • Deadline is posted on the Moodle page. • Plagiarism more than 25% is not accepted.

DO NOT WRITE IN THE AREA BELOW

Question Number	Maximum Marks	Student Marks
1	10	
2	5	

Total Mark	15	
-------------------	----	--

Assessor Feedback:			
Assessor Name:	Dr. Ghinwa Sleiman Dr. Mohamed Elbadawy Dr. Wisam Al Saadi	Date:	
Assessor Signature:			
Student Name:		Date:	
Student Signature:			

Guidelines:

1. This assignment can be done in groups with a **maximum of two students**.
2. You will participate in a random individual face-to-face **discussion** (via MS Teams) about your submitted work (time TBD by your instructor). Fully understanding all your work, you will get the grade assigned to your submission in full, otherwise you will get deducted in this assignment and may lose the assigned grade.

Question 1: (10 points)

You need to build a global picture for the energy issue around the world, and then compare it to Kuwait. This wide picture requires the knowledge of how the world is generating and consuming energy, and also how this consumption is distributed among different sectors. For this purpose, you need to answer all the following questions for a set of countries/regions mentioned below them:

1. How much energy is consumed in this country per capita?
2. What are the percentage sources of this energy (e.g. fossil fuel%, nuclear energy%, renewables%)?
3. How this energy is consumed by sector (e.g. residential/commercial/industrial/others)?
4. How is the energy demand growing (Provide the total energy consumption in the past, present, and future, e.g. around year 2000, 2020, 2050)?
5. Provide a measure for the development of clean energy in this country, e.g. renewable energy share growth, electric vehicles market share growth, etc.

You have to answer all of the above questions to the following three subjects:

- A) The whole world in general **(2.5 points)**
- B) Kuwait **(2.5 points)**
- C) At least any two countries from the list below: **(2.5 points x 2)**
- Australia
 - Brazil
 - China
 - Germany
 - India
 - Japan
 - Russia
 - South Africa
 - Sweden
 - UK
 - USA

Bonus: (1 point)¹

Provide a real life example for one of the below two scenarios:

- An energy induced economic crisis
- An intensive governmental plan to reduce energy consumption

IMPORTANT NOTES:

- All data you provide for questions 1 to 3 should be recent (maximum of three years old)
- Be consistent, all values you provide have to be in the same units in order to be comparable to each other
- All your answers MUST cite recognized references such as:
 - published books/papers:
 - organizations' websites: US Department of Energy, World Bank, etc.
 - Wikipedia is **NOT** ACCEPTED
- You need to arrange your answers in a report form; an introduction, a body, and a conclusion. Unstructured submissions will be deducted up to **2 points**.

¹ This bonus is related to this assignment only and does not extend to any other assessment

Question 2: (5 points)

Consider a person in a cold location with no source of heat except by physical exercising. Suggest a reasonable exercise/practice this person can follow to warm up. You can neglect the clothing insulation effect and assume only basic convection and radiation heat exchange with the surrounding environment. You need the following information: **(4 points)**

- Person body surface area = 2 m²
- Body surface temperature = 31 °C
- Air temperature = 18 °C
- Average radiant temperature = 15 °C
- Convection heat transfer coefficient = 6 W/m².K
- Air emissivity = 0.95
- Boltzmann's constant = 5.67e-8 W/m².K⁴.

What is the effect of body area on the required exercise? Does the exercise need to be heavier or lighter with the increase of body surface area? **(1 point)**

Good Luck!