

EGT2
ENGINEERING TRIPOS PART IIA

Friday 3 May 2019 2:00pm - 3:40pm

Module 3E11

ENVIRONMENTAL SUSTAINABILITY AND BUSINESS

*Answer not more than **two** questions.*

All questions carry the same number of marks.

*The **approximate** percentage of marks allocated to each part of a question is indicated in the right margin.*

*Write your candidate number **not** your name on the cover sheet.*

STATIONERY REQUIREMENTS

Single-sided script paper

10 minutes reading time is allowed for this paper at the start of the exam.

You may not start to read the questions printed on the subsequent pages of this question paper until instructed to do so.

1 Tetra Pak is a leading food processing and packaging company with headquarters in Switzerland. It is best known for its plastic-coated paper carton packages (originally tetrahedron-shaped) for drinks, but it also processes and packages a wide variety of other food products including dairy, ice cream, fruits and vegetables, and pet food.

Tetra Pak is one of a number of companies from diverse sectors who have committed to setting “science-based targets” for their greenhouse gas emissions. Science-based targets are defined in the following way:

“Targets adopted by companies to reduce greenhouse gas (GHG) emissions are considered “science-based” if they are in line with the level of decarbonization required to keep global temperature increase below 2 degrees Celsius compared to pre-industrial temperatures.”(https://sciencebasedtargets.org/wp-content/uploads/2017/04/Case-study_TetraPak.pdf)

Prior to setting science-based targets for greenhouse gas emissions, companies like Tetra Pak would typically set targets for these emissions based on extrapolation from current levels of performance (e.g., a goal for a 10% reduction in emissions compared to the previous year).

- (a) What generic type of environmental problem does the movement toward science-based targets attempt to address? Explain two typical approaches to such problems. [30%]
- (b) From the perspective of a company such as Tetra Pak, what are the benefits and risks of setting science-based targets for greenhouse gas emissions, compared to targets based on extrapolation? [40%]
- (c) With the increasing attention to plastic pollution and packaging, Tetra Pak’s management is considering if it should set a goal for plastics that is also science-based. Based on the nature of this issue compared to that of greenhouse gas emissions, would you recommend this as a wise move for the company. Why or why not? [30%]

2 Recent articles in respected science and medical journals (e.g., *Nature*, *The Lancet*) have reported the need for dramatic changes in food consumption – reductions of meat consumption on the order of 80-90% and significant increases in the consumption of beans, lentils and seeds – in order to avoid catastrophic environmental impacts. These impacts include climate change, deforestation, and water shortages.

Two of the types of businesses that will need to respond are major grocery retailers (e.g., Sainsbury's, Tesco) and prepared food restaurants (e.g., Pret a Manger, McDonalds).

(a) Explain how this proposed shift in food consumption represents business opportunities *and* threats for i) a major grocery retailer *and* ii) a prepared food restaurant.

[40%]

(b) Your friend proposes to start a prepared food vegan restaurant to capitalize on this new opportunity. Your friend plans to include a life cycle assessment (LCA) for each product, to appear on the menu alongside the nutrition facts. In particular, your friend wants to highlight the greenhouse gas emissions associated with each food item. What advice do you give your friend about how to implement this idea? What should your friend consider in order to give the consumer good information?

[40%]

(c) Any change that either a major grocery retailer or a prepared food restaurant can make in its own business is only part of a broader system that needs to shift to achieve lower meat consumption and/or higher bean/lentil/seed consumption. Suggest one way in which *either* a major grocery retailer *or* a prepared food restaurant could attempt to influence any other aspect of this broader system. Explain how this suggestion could be implemented effectively.

[20%]

3 The concept of the Circular Economy has recently proven very popular with many companies as it appears to offer a way to improve resource efficiency and unlock potential new business opportunities. However, some consider it to be an overly optimistic solution to the various environmental problems the planet faces.

(a) Evaluate the Circular Economy concept in relation to business sustainability. [50%]

(b) The Cook Composites and Polymers (CCP) case illustrates a number of factors that influence the feasibility and success of a material reuse (industrial symbiosis) opportunity. Describe three of these factors and explain to what extent they can be more broadly applicable to other Circular Economy opportunities in various sectors. [50%]

END OF PAPER