

DEVOIR DE FIN DE SEMESTRE N°1

The Text :

1-It sounds like science fiction: giant solar power stations floating in space that beam down enormous amounts of energy to Earth. And for a long time, the concept – first developed by the Russian scientist, Konstantin Tsiolkovsky, in the 1920s – was mainly an inspiration for writers. A century later, however, scientists are making huge strides in turning the concept into reality. The European Space Agency has realised the potential of these efforts and is now looking to fund such projects, predicting that the first industrial resource we will get from space is “beamed power”.

2-Climate change is the greatest challenge of our time, so there's a lot at stake. From rising global temperatures to shifting weather patterns, the impacts of climate change are already being felt around the globe. Overcoming this challenge will require radical changes to how we generate and consume energy. Renewable energy technologies have developed drastically in recent years, with improved efficiency and lower cost. But one major barrier to their uptake is the fact that they don't provide a constant supply of energy. Wind and solar farms only produce energy when the wind is blowing or the sun is shining – but we need electricity around the clock, every day. Ultimately, we need a way to store energy on a large scale before we can make the switch to renewable sources.

3-A possible way around this would be to generate solar energy in space. There are many advantages to this. A space-based solar power station could orbit to face the Sun 24 hours a day. The Earth's atmosphere also absorbs and reflects some of the Sun's light, so solar cells above the atmosphere will receive more sunlight and produce more energy. But one of the key challenges to overcome is how to assemble, launch and deploy such large structures. A single solar power station may have to be as much as 10 kilometres squared in area – equivalent to 1,400 football pitches. Using lightweight materials will also be critical, as the biggest expense.

4-One proposed solution is to develop a swarm of thousands of smaller satellites that will come together and configure to form a single, large solar generator. In 2017, researchers at the California Institute of Technology outlined designs for a modular power station, consisting of thousands of ultralight solar cell tiles. They also demonstrated a prototype tile weighing just 280 grams per square metre, similar to the weight of card.

5-Recently, developments in manufacturing, such as 3D printing, are also being looked at for this application. At the University of Liverpool, we are exploring new manufacturing techniques for printing ultralight solar cells on to solar sails. A solar sail is a foldable, lightweight and highly reflective membrane capable of harnessing the effect of the Sun's radiation pressure to propel a spacecraft forward without fuel. We are exploring how to embed solar cells on solar sail structures to create large, fuel-free solar power stations.

6-These methods would enable us to construct the power stations in space. Indeed, it could one day be possible to manufacture and deploy units in space from the International Space Station or the future lunar

gateway station that will orbit the Moon. Such devices could in fact help provide power on the Moon. The possibilities don't end there. While we are currently reliant on materials from Earth to build power stations, scientists are also considering using resources from space for manufacturing, such as materials found on the Moon.

7-Another major challenge will be getting the power transmitted back to Earth. The plan is to convert electricity from the solar cells into energy waves and use electromagnetic fields to transfer them down to an antenna on the Earth's surface. The antenna would then convert the waves back into electricity. Researchers led by the Japan Aerospace Exploration Agency have already developed designs and demonstrated an orbiter system which should be able to do this. There is still a lot of work to be done in this field, but the aim is that solar power stations in space will become a reality in the coming decades.

By Amanda Jane Hughes

The Conversation(adapted)

November 19, 2020

PART ONE: READING COMPREHENSION (25 mks):

I-Say what type of text it is and justify your choice on the answer sheet (1.5mks) :

- a) Narrative b) Descriptive c) Argumentative d) Instructive

II-Select the statement that best relates to the text(1mk) :

- 1- The way we consume energy decides our future in terms of energy supplies.
- 2- Solar power stations in space could be the answer to our future energy needs.
- 3- Building solar power stations on Earth remains the most efficient solution to satisfy our needs of energy in the coming decades.

III- Say whether the statements below are True or False and justify from the text (4.5mks):

- 1- If we want to fight climate change, we should review the way we harness energy.
- 2- The biggest challenge to our reliance on renewable energies is that they do not provide us with enough quantities to store and use whenever we need.
- 3- To meet our needs of everlasting energy, we should resort to electricity networks.

IV Sort out 2 benefits behind switching to solar power(2mks):

V- Find out 3 obstacles hindering the establishment of a space-based solar station (3mks):

VI- Mention 3 possible alternatives, worked out by researchers, to overcome such obstacles (3mks):

VII- Explain the sentence below in your own words on the answer sheet(1mk):

“we need electricity around the clock, every day”.(§2)

VIII- To beam down energy to Earth from the space-based solar station, the procedure should go through four main steps. On your answer sheet complete the table with the 3 missing steps (Step one is done for you). (3mks)

IX -Find words in the text having nearly the same meaning as the following (3mks):

- 1- in a way that is likely to have a strong or far-reaching effect. (§2)
- 2- controlling and making use of.(§5)
- 3- bring into effective action.(§6)

X-What do the underlined words in the text refer to? (3mks):

- 1- "these efforts" (§1)
- 2- "this"(§3)
- 3- "They"(§4)

PART TWO: WRITING (15 mks):

TASK1: Reorder the following sentences to get a coherent paragraph(2.5mks):

- a- new infrastructure adapted to new technologies.
- b- which must contribute to the achievement of the EU's emission reduction targets for 2030.
- c- Europe's progress towards a climate neutral economy powered by clean energy requires
- d- through projects of common interest (PCIs),
- e- The TEN-E(Trans-European Networks for Energy) policy supports this transformation

TASK2: Sort out the 5 mistakes in the paragraph below then correct them on your answer sheet(2.5mks):

Fossil fuels principally consist on carbon and hydrogen bonds. There are three types of fossil fuels which can all be using for energy provision: coal, oil and natural gas. Coal is a solid fossil fuel formed over millions of years by decay of land vegetation. the United States gets 81% of its total energy from oil, coal, and natural gas. all of who are fossil fuels. We depend on those fuels to heat our homes, run our vehicles, industry power and manufacturing, and provide us with electricity.

TASK3: ESSAY(10mks):

COVID-19 has so far caused over 190.000 recorded infections and more than 6000 deaths in Tunisia. In reaction to this critical situation, write a letter to the Prime Minister to persuade him to take more effective measures to contain the pandemic and stop its spread. Use solid examples (No more than 15 lines).

DEVOIR DE CONTROLE N°1:

Task1: Complete the paragraph below with the appropriate word (the first 2 letters the word begins with and a synonym of that word are provided to help you) (7.5mks):

Today few scientists doubt the atmosphere is warming. Most also agree that the rate of (1) **he...** (= **warming**) is accelerating and that the (2) **ef...** (= **consequences**) of this temperature change could become (3) **in...** (= **progressively**) disruptive. Even high school students can reel off some projected (4) **ou...** (= **conclusions**): the oceans will warm and glaciers will (5) **me...** (= **liquefy**), causing sea levels to rise and salt water to (6) **fl...** (= **inundate**) settlements along many low-lying coasts. Meanwhile, the regions (7) **su...** (= **adequate**) for farming will shift. Weather patterns should also become more erratic and storms more (8) **se...** (= **serious**). Notably, computer models (9) **fo...** (= **predict**) that global warming and other climate alterations it (10) **ca...** (= **induces**), will expand the incidence and distribution of many serious medical disorders.

Task2: Put the words in brackets in the right tense or form (7.5mks):

France faces some tough decisions on nuclear power that crystallize the dilemma of how to balance 1 (**prosper**) with the environment, the core issue at the World Summit on Sustainable Development in Johannesburg. France is 2 (**depend**) on nuclear power than any nation in the world. It 3 (**derive**) three-quarters of its electricity from 59 nuclear reactors under a crash program started in the 1970s when oil prices 4 (**surge**). The plants 5 (**operate/so far**) with a clean safety record and provided gigawatts of power, 6 (**make**) France not only self-sufficient in electricity but a major 7 (**export**) of it to its neighbors. The next few years 8 (**determine**) the future of this \$160-billion investment. For France has to decide whether 9 (**replace**) its current generation of nuclear plants and where to store 10 (**high**) dangerous long-term wastes.

TASK 3: Express differently starting as given on the answer sheet (Keep the same meaning) (5mks) :

- 1) There has been a world energy crisis because renewable sources of energy have not been sufficiently developed.
- 2) I 'm sorry because I told her her naked truth.
- 3) Jane is too young to take the driving test.
- 4) Scientists are striving to find ways to curb emissions that trap the heat.
- 5) They believe the manager of this company died of Covid-19.
- 6) In the USA black parents homeschool their kids because of white racism.
- 7) Perhaps she forgot to pay her Internet bill.
- 8) Despite most nations' attempts to reduce their CO2 emissions, no tangible results have been achieved.
- 9) She seldom gets up early on Sundays.
- 10) They said: "Tunisia will slash its imports from Turkey next year."

GOOD LUCK !

<p align="center">INSTITUT PREPARATOIRE</p> <p align="center">AUX</p> <p align="center">ETUDES D'INGENIEUR DE SFAX</p>		<p>A.U. : 2020/2021</p> <p>Niveau : 2ème année</p> <p>Epreuve : Anglais</p> <p>Durée : 2heures</p> <p>Date : 29 janvier 2021</p> <p>Nom:.....</p> <p>Prénom:.....</p> <p>Groupe:.....N°/Place:.....</p> <p>Matricule:.....Salle:.....</p>
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DEVOIR DE FIN DE SEMESTRE N°1

ANSWER SHEET

PART ONE: COMPREHENSION QUESTIONS (25mks) :

I / Text type (1.5mks) :

(-----) Justification:-----

II /The statement that best relates to the text (1mk) :

III/ True or False Statements (4.5mks) :

1) (-----) Justification:-----

2) (-----) Justification:-----

3) (-----) Justification:-----

IV/ The 2 benefits behind switching to solar power(2mks):

1)-----

2)-----

V/ The 3 obstacles hindering the establishment of a space-based solar station (3mks):

1)-----

2)-----

3)-----

VI/ The 3 possible alternatives, worked out by researchers, to overcome such obstacles (3mks):

1)-----

2)-----

3)-----

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VII / Sentence explanation (1mk) :

VIII / The 3 missing steps(3mks) :

<u>Step1 :</u>	Solar cells receive sunlight.
<u>Step2 :</u>	
<u>Step3 :</u>	
<u>Step4 :</u>	

IX / Vocabulary Items (3mks) :

- 1)
- 2)
- 3)

X / References (3mks) :

- 1)
- 2)
- 3)

PART TWO: WRITING (15mks) :

TASK1 : REORDERING(2.5mks) :

1	2	3	4	5

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TASK2 : MISTAKE CORRECTION(2.5mks) :

Mistake		Correction	
1.		1.	
2.		2.	
3.		3.	
4.		4.	
5.		5.	

TASK 3: LETTER WRITING (10mks) :

Dear Prime Minister,

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DEVOIR DE CONTROLE N°1 (20mks) :

TASK ONE (7.5mks) :

1		6	
2		7	
3		8	
4		9	
5		10	

TASK TWO (7.5mks) :

1		6	
2		7	
3		8	
4		9	
5		10	

TASK THREE (5mks) :

- 1) Had-----
- 2) If only-----
- 3) Jane isn't-----
- 4) Scientists are striving to find ways to curb-----emissions.
- 5) The manager of this company-----
- 6) Since-----
- 7) She might-----
- 8) Although-----
- 9) Seldom-----
- 10) They said that-----