

めざせ 1 級！ 英語上級者への道 ～Listen and Speak II～

第 4 回 ソーラーエネルギー

**Script**

■ Dialogue for Introduction

E: How is your new car? It's a hybrid, isn't it?

T: Yes, it is! It runs a little more than 18 kilometers per liter of gas, so I've lessened the burden of gasoline expenses.

E: I applaud your commitment to a cleaner environment as well! We should all think more about saving energy. I am thinking of upping the energy efficiency of my home with a rack of solar cells.

T: You and I do indeed consume a lot of energy. We use our computers, cell-phones, and printers, all of which consume electricity.

E: True. Therefore the solar cells!

T: Wow. Solar panels? They cost a lot. You really must consider the time it will take before you get a return on your investment for those costly solar panels. It may take many years. They also have a downside. The manufacturing process is far from eco-friendly.

E: Well, let's listen to this month's passage. You may agree with me later.

T: OK! Shall we?

E&T: Let's begin!

■ Listen to the passage and answer the two questions that follow.

**Solar Energy** (2013-1-1 B, Q:No.13, 14)

The use of solar cells is a promising way to produce renewable energy. The cells run silently, require little maintenance, and most importantly, do not emit greenhouse gases during use. There is a downside, however. Both the manufacture and disposal of solar cells involve highly toxic metals that can pollute soil and groundwater. Also, the cells are manufactured using silicon, which is produced by heating sand to extremely high temperatures. This process is energy intensive and generates significant amounts of greenhouse gases.

Proponents of solar energy point out that greenhouse gases emitted during its production are less than those for coal or natural gas. They also say there are strategies that can reduce the ecological burden of solar cells. Programs have been set up to use materials from discarded cells for other purposes, for example, and new cells can be manufactured using energy produced by existing cells. Furthermore, the energy payback period for a solar cell, which is the time needed for it to generate the amount of energy required to produce it, is just five years. Since the projected lifetime of solar cells is 30 years, they are highly efficient in the long term.

**【Questions】** Answer the following 2 questions, spending 30 seconds on each.

No. 1 (No. 13) What is one problem with solar cells?

No. 2 (No. 14) What do supporters of solar energy say?

(The choices below are just for reference.)

No. 13 1 Manufacturing them takes too long.

2 They are made using harmful materials.

3 Maintaining them costs a lot.

4 They release toxic metals when in use.

No. 14 1 Solar cells can be made from recycled materials.

2 Newly developed solar cells produce more energy.

3 The projected lifetime of solar cells has increased.

4 The environmental damage solar cells cause can be reduced.

**■Let's study vocabulary and expressions**

Listen to my Japanese and repeat after Edward

1	太陽電池	solar cell
2	再生可能エネルギー	renewable energy
3	不都合な点	downside
4	製造と廃棄	manufacture and disposal
5	毒性の強い	highly toxic
6	地下水	groundwater
7	エネルギーを大量に消費する	energy intensive
8	支持者	proponent
9	生態系への負荷	ecological burden
10	廃棄された	discarded
11	回収	payback
12	推定される	projected

■ Listen to the passage and once more answer the two questions that follow.

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■ **Repetition and Interpretation Drill**

The passage is read with pauses and Japanese interpretation.

- 1) Repeat during each pause. Practice again and again until your repetition becomes perfect.
- 2) Listen and interpret during the pauses. You should finish your interpretation before the model interpretation starts. Practice again and again.
- 3) Shadowing and Interpretation. While listening to English, shadow the part in English. During the pauses, interpret into Japanese.

The use of solar cells is a promising way /  
to produce renewable energy. //

The cells run silently, require little maintenance, /  
and most importantly, do not emit greenhouse gases during use.//

There is a downside, however. //

Both the manufacture and disposal of solar cells involve highly toxic metals/

that can pollute soil and groundwater. //  
Also, the cells are manufactured using silicon, /  
which is produced by heating sand to extremely high temperatures.//  
This process is energy intensive /  
and generates significant amounts of greenhouse gases.//  
Proponents of solar energy point out /  
that greenhouse gases emitted during its production are less /  
than those for coal or natural gas. //  
They also say there are strategies /  
that can reduce the ecological burden of solar cells. //  
Programs have been set up to use materials from discarded cells for other purposes, for  
example,/  
and new cells can be manufactured using energy produced by existing cells.//  
Furthermore, the energy payback period for a solar cell, /  
which is the time needed for it to generate the amount of energy required to produce it,/  
is just five years. //  
Since the projected lifetime of solar cells is 30 years, /  
they are highly efficient in the long term.

### ■ Model answers

Listen to the models and compare with your answers

T: Now Edward, what are your answers? No.1: 'What is one problem with solar cells?'

E: The manufacture of solar cells requires the use of highly toxic metals that could pose a serious threat to the environment.

T: Thank you. What is your answer for question No.2: 'What do supporters of solar energy say?'

E: Supporters say that strategies can be found to offset such environmental risks, such as recycling materials from spent cells.

T: Thank you.

### ■ Challenge 1

T: Now, Edward is going to make a statement about the article. Please express your agreement or disagreement with this statement. You should continue to speak for at least 30 seconds.

E: The use of solar cells offers a perfect solution to our energy problems. They run silently, require little maintenance and are perfectly friendly to our environment.

E: Model

Now, let's listen to Tets. He will show you a model. Listen and compare with your answer.

T: It is true that they run silently and need little maintenance. But they are not entirely friendly to the environment. The manufacture and disposal of the cells involve highly toxic metals. They may pollute soil and the groundwater. Also, a lot of energy is used in their production because they require silicon, the production of which involves heating sand to extremely high temperatures.

## ■ Challenge 2

E: Please listen. Disagree with the following statement for at least one minute. Your statement should include some points introduced in the passage that you have listened to. Ready?

T: One of my close friends just moved into a wonderful new house. He and his family are committed environmentalists and have spared no expense to make their home as "green" as possible. As my friend is also a realist, he is quite happy with the prospect of actually making a profit on the large bank of solar cells he installed on the roof. I really don't believe, however, he has thought this through. First, he had to pay a lot for those cells! More importantly, he hasn't helped the planet at all! The factory that produced those cells expended a huge amount of energy in their creation and probably poisoned the earth with toxic metals as well! Is this really a green way to live?

T: Model. Now let's listen to Edward. He is going to show you a model. Listen and compare with your statement.

(Model)

E: It is true that the manufacturing and disposal process of solar cells both require a lot of energy. Toxic metals unfortunately do play a role in their creation as well. Hence, they are not entirely eco-friendly. However, it is worth subsidizing families that install solar panels. Though the manufacture and disposal process involve toxic metals and consume a lot of energy, it is also true that the energy payback period for a solar cell comes after just five years. The projected lifetime of a solar cell is 30 years. Also, scientists have set up programs to use materials from discarded solar cells for other purposes, and the new cells can be produced with energy generated by existing solar cells. The use of solar cells is a promising way to produce clean, renewable energy. I think more people should think about investing money on

home solar panels. Local governments as well should enact measures to help families that are planning to install solar panels for their homes.

### ■ Closing Dialogue

T: That was a very informative article, wasn't it Edward?

E: Very much so!

T: Unfortunately, the data on solar cell efficiency and the information on the manufacturing process are open to various interpretations. What to do? Should I buy some panels now?

E: That is actually a very good question, Tets! Speaking for myself, I favor immediate action over complacency. I don't think we have the luxury to wait for perfect environmental solutions. Global warming is now and global warming is real. The old saying is correct! "He who hesitates is lost."

T: Right, but another old saying is "Look before you leap!" With all the problems in producing solar cells, perhaps we should study the problem a bit more.

E: It is a conundrum! I am happy to be involved in discussions like this. Whatever opinions people hold on environmental issues, the discussions must go on now!

T: A fine point to leave with our listeners! What do all of you think of solar cells and their production? Think it over!

E: And think it over in English for a dual benefit!

T: On that note we will say:

T&E: See You Next Time!!

#### ★講師陣プロフィール★

##### ◇中西 哲彦 (Tets Nakanishi)

日本福祉大学国際福祉開発学部准教授、アルファ英語会顧問、NPO 愛知善意ガイドネットワーク理事。

愛知教育大学出身。三重県立高校、大手英語学校を経て、現在、小学生～社会人まで幅広い層を対象に英語を指導している。英検セミナー派遣講師として各地の特別授業や英語教育セミナーにて活躍。2007年度まで、5年間にわたって三重県英語教員集中研修講師も務めた。

##### ◇エドワード・スクラグス (Edward Scruggs)

テネシー出身。比較文学の分野で博士号、音楽の分野で修士号。

翻訳、英語教授に大活躍し、現在、相山女学園大学国際コミュニケーション学部准教授を務めるほかアルファ英語会(津市)アドバイザーとしても活躍中。