



## 原子力発電は、クリーンエネルギー？ 潜在的脅威？

日本は世界 5 位の電力消費量国ですが、資源の少ない国であるため、そのエネルギーの原料の大部分を輸入に頼らなければなりません。2010 年までは発電量の約 30% を原子力がまかなっており、政府はエネルギーの安定確保と CO<sub>2</sub> 排出削減のために、原子力発電の割合を引き上げる計画をしていました。しかし、2011 年 3 月の福島第一原子力発電所事故以来、稼働している原子炉は激減し、「反原発」「脱原発」を求める国民感情も一気に高まりました。原発停止には電力不足、電力価格上昇、経済の減速というリスクがある一方、原発の利用を続けるには国民が納得する安全対策が不可欠です。国民感情に配慮しつつ、手頃な価格での安定した電力を供給する方法が現在模索されています。

### 原子力発電をめぐる世界の動き

1954 年	ソ連	世界最初の原子力発電所運転開始
1956 年	イギリス	原子力発電所運転開始
1958 年	アメリカ	原子力発電所運転開始
1966 年	日本	国内最初の原子力発電所運転開始（茨城県東海村）
1979 年	アメリカ	スリーマイル島原発事故
1986 年	ソ連（現ウクライナ）	チェルノブイリ原発事故
1999 年	日本	茨城県東海村 JCO 臨界事故
2011 年	日本	福島第一原発事故、ドイツとスイス原発廃止を決定

### Warm-up Questions

- ① Has your view of nuclear power generation changed since the Fukushima nuclear disaster?  
Why? / Why not?
- ② Would you change anything about your lifestyle if electricity prices doubled?  
Why? / Why not?

# New safety laws on nuclear plants go into effect

Based on the harsh lessons learned from the Fukushima Daiichi nuclear accident, new safety standards for reactors came into effect on July 8, 2013. They were set by the Nuclear Regulation Authority (NRA), whose chairman called them the strictest in the world. From that day on, power companies must apply for NRA safety inspections before they are permitted to reactivate their offline reactors. Unlike previous guidelines, the new safety standards are legally binding, meaning that if reactors fail to meet the standards, they cannot **resume** operations.

Under the new regulations, power companies must work out effective measures to deal with **catastrophic** accidents. Such measures include building new defenses that will protect individual power plants from the largest possible tsunami, **installing** filtered vents to help remove radioactive substances, and setting up remote secondary control rooms so that plants can be safely shut down in case of emergency. They also need to examine the ground under their plants carefully for the presence of earthquake **faults**. The chairman of the regulation committee said that the NRA will reject any political pressure and carry out the **screening** in a **transparent** manner.

## Notes

- go into effect 施行される     come into effect 施行される     offline 停止している  
 legally binding 法的に拘束力のある     filtered vent フィルター付きのベント (通気孔)  
 radioactive substance 放射性物質

## Vocabulary Check

上の英文を読み、①～⑥の用語の説明としてふさわしいものを a～f より選びなさい。

- |  |        |
|--|--------|
| ① involving or causing a sudden terrible disaster                            | (    ) |
| ② easy to understand   | (    ) |
| ③ a large crack or break in the layers of rock that form the earth's surface | (    ) |
| ④ to set in place, fix   | (    ) |
| ⑤ to start again   | (    ) |
| ⑥ systematic testing or assessment   | (    ) |

a. catastrophic

b. install

c. fault

d. resume

e. screening

f. transparent

## Read On *The pros and cons of restoring nuclear power generation*

各パラグラフを読み、あとの問題に答えなさい。

### Paragraph 1

#### 日本における原子力発電について



Japan has been using nuclear power generation since 1966, when the first commercial operation started. After the oil shock in 1973, nuclear energy had been given a national strategic <sup>①</sup> priority despite the fact that Japan is an earthquake-prone country. Prior to the Fukushima accident, the country's 50 main reactors generated about one-third of its electricity which was expected to increase further. Since the tragedy, however, the number of operating reactors has been <sup>②</sup> steadily decreasing. With heated debate over future energy policies, Japan has to find a way to maintain a stable energy supply.

**Notes** □ strategic 戦略的な □ earthquake-prone 地震にあいやすい

**Exercise 1** 下線部①②とほぼ同じ意味を表す単語を a ~ d より選びなさい。

- ① a. concern      b. idea      c. precedence      d. popularity  
 ② a. fully      b. intensely      c. constantly      d. slowly

### Paragraph 2

#### 原子力発電のメリット



Nuclear power generation has several advantages over other types of power generation. Firstly, it is clean in that it does not release CO<sub>2</sub> or other gases that pollute the air. Secondly, it is highly efficient and cost-effective. Nuclear power generation using a gram of uranium 235 can generate power equivalent to thermal power generation using three tons of coal. The average price of uranium per gram is about 8.5 yen, while that of three tons of coal is about 26,500 yen. Thirdly, it promises a certain amount of energy security which can be seen in stable prices of uranium imports from Australia and Canada, which are relatively unaffected by political conditions.

**Notes** □ uranium ウラン

**Exercise 2** 英文の内容に合う記述には T を、合わないものは F を書き入れなさい。

- ① Nuclear power generation does not contaminate air. ( )  
 ② Uranium prices can change frequently because of weather conditions. ( )

**Paragraph 3****原子力発電のデメリット**

However, nuclear power generation involves huge risks. When emergency situations such as a meltdown and radiation leakage happen, they can have devastating effects on humans and the environment. The Chernobyl explosion, for example, seriously contaminated about 100,000 km<sup>2</sup> of land, causing extensive damage to the area.



Abandoned city near Chernobyl area, Kiev region, Ukraine

Even with regular operations, it produces high-level radioactive waste. Due to its extremely long half-life, waste even poses threats to future generations. So far, long-term, environmentally safe management of the waste has not yet been established. Another threat is the misuse of the technology. If it is used to create weapons, countless innocent people may die.

**Notes**

- meltdown 炉心溶融  devastating 壊滅的な  half-life 半減期

**Exercise 3** 英文の内容に合う記述には T を、合わないものは F を書き入れなさい。

- ① Nuclear power can pose a big threat to us in a number of ways. ( )  
 ② It took a long time to discover a completely safe way to dispose of radioactive waste. ( )

**Paragraph 4****世界における原子力発電の動向**

Following the Fukushima meltdown, policies on nuclear power, once viewed as a <sup>①</sup> promising energy source, have been under review in many countries. Germany and Switzerland have decided to abandon it within the next few decades. Italians voted against nuclear power plants in a national poll. Nevertheless, global dependency on nuclear energy is expected to grow as emerging countries such as China, India, and Vietnam are promoting it to meet their energy needs for future economic growth. According to a survey conducted in 2012, there were about 430 commercial reactors in 31 countries, which provided <sup>②</sup> approximately 13.5 percent of the world's electricity.

**Notes**

- under review 再検討中で  emerging country 新興国

**Exercise 4** 下線部①②とほぼ同じ意味を表す単語を a ~ d より選びなさい。

- ① a. definite                      b. hoping                      c. potential                      d. satisfactory  
 ② a. accurately                      b. appropriately                      c. generally                      d. roughly

## Listen to Model Opinions

Should nuclear power generation be restored in Japan? (日本は原子力発電を復旧させるべきか) について、以下4人のモデルオピニオンを聞き、空欄を埋めなさい。

### Pro



Definitely yes. I think nuclear power \_\_\_\_\_ is needed in Japan. As a nation poor in energy resources, Japan will suffer financially even more without it. Surging \_\_\_\_\_ costs are already hurting the economy.

Bernard from France



It should be restored. **The reality is that** we need electricity to maintain our convenient lifestyles, but we also need it to slow global \_\_\_\_\_. Nuclear energy is the only \_\_\_\_\_ we have now.



Yosuke from Japan

### Con



I don't think so. Germany decided to \_\_\_\_\_ it. You can **follow suit**. At least, Japan should begin a phase-out plan. I am sure other \_\_\_\_\_ energy sources will be more easily available in the future.

Pascal from Germany



Definitely not. We should abandon it. Nuclear power plants **carry a potential risk of** causing \_\_\_\_\_ accidents such as the Fukushima disaster. We should develop and promote technologies of alternative energy \_\_\_\_\_ instead.



Michiko from Japan

## Useful Expressions

議論に使える表現を覚えましょう。



### 1. The reality is that... 現実的には…、実際のところ…

The reality is that leaving nuclear power reactors offline alone costs a huge amount of money.

(現実的には、原子炉を停止させておくだけでも巨額のお金がかかる)

### 2. follow suit 先例にならう、同様の処置を講じる

If some countries are successfully able to abandon nuclear power, other countries will follow suit.

(もし脱原発に成功する国があれば、ほかの国々もあとに続くことだろう)

### 3. carry a risk of... …する危険性を有している

Radioactive materials carry a potential risk of causing cancer.

(放射性物質は、がんを引き起こす潜在的な危険性を有している)

## Discussion

モデルオピニオンを参考にし、どちらの議論がより説得力があるか考えなさい。またその根拠を話し合ってみましょう。

I [ think /  don't think] that nuclear power generation should be restored in Japan  
because

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