

Structures

To describe systems and procedures, we often use the style in B, below:

A: Mills **produce** flour.

Water **drives** hydroelectric stations.

B: Flour **is produced** by mills.

Hydroelectric stations **are driven** by water.

To describe **past** systems and procedures, we use **was/were** instead of **is/are**.

In the past, flour **was produced** by windmills.

Watermills **were driven** by rivers.

Reading 12.2



16 FORCES OF NATURE

Wind, hydro and solar energy: There's nothing new under the sun

It's easy to think that renewable energy is a recent idea. That's probably because systems such as wind turbines, hydroelectric generators and solar panels are used to produce electricity – a relatively modern form of power. In fact, a lot of the "green" electricity which is produced today is generated by systems that were invented long ago.

The idea of exploiting the power of the wind was thought of by the Greek engineer Heron of Alexandria, about 2,000 years ago. At the time, his system was given the name "wind wheel". From the 12th century, wind became one of the main ways to drive flour mills – the places where flour is made from wheat. In past centuries, mills were powered by water, too. Watermills were

built next to rivers, and used waterwheels that were driven by the pressure of the flowing water. Today, hydroelectric stations use exactly the same principle.

Even solar energy is a relatively old idea. The non-electrical "Climax Solar Water Heater" was invented by the American Clarence Kemp in 1891. It was successful, too. In California, 1,600 heaters were sold within a few years.



12.2 Follow-up

Answer these questions about the article in Reading 12.2.

- 1 When was the idea of using the wind to power machines thought of first?

- 2 What name was given to the first windmills?

- 3 What were windmills used for?

- 4 Where were watermills built?

- 5 When was the first solar water heater invented?

- 6 What shows how successful the first water heaters were?

Practice Exercise 1

Audio Link: <https://www.inlingua.com/audios>

12.2 Listening (Track 45-46)



Part A You're going to hear Ben Haber, a historian, talking about the "Climax Solar Water Heater", which was invented in 1891 by Clarence Kemp. Listen, then answer the questions below.

- 1 Where was the water tank located?
- 2 What was put on the tank to help it absorb heat from the sun?
- 3 What was the problem with the system?

Part B In 1909, the inventor William Bailey found a solution to the "Climax Solar Water Heater's" problem. You're going to hear Ben Haber talking about Bailey's idea. Listen, then explain how the system worked.



Part C Rephrase the sentences below to make them the same as they were said in the recording.

- 1 They installed the tank on the top.
"The tank _____."
- 2 They painted it black.
"It _____."
- 3 William Bailey solved this problem.
"This problem _____."
- 4 They connected that to a tank.
"That _____."



Practice Exercise 2

Rewrite the sentences below. The first one is done for you.

- 1 The wind drives the turbine.
The turbine is driven by the wind
- 2 Two pilots fly the plane.
The plane
- 3 Trains carry the freight.
The freight
- 4 In the past, steam powered trains.
In the past, trains
- 5 The Wright Brothers made the first flight in a plane.
The first flight in a plane

ANSWERS

Follow up 12.2

1. The idea of using wind to power machine was thought of 2000 years ago.
2. The first windmills were called “wind wheels.”
3. The windmills were used to drive flour mills.
4. The water mills were built next to rivers.
5. The first solar water heater was invented in 1891.
6. We know these were successful because in California, 1600 heaters were sold in the first few years.

Practice Exercise 1

Part A

1. The tank was installed on the top of the house
2. Black paint was put on the tank to help it absorb heat from the sun.
3. The water turned cold at night.

Part C

1. The tank was installed on the top.
2. It was painted black.
3. This problem was solved by William Bailey.
4. That was connected to a tank.

Practice Exercise 2

1. The turbine is driven by the wind.
2. The plane is flown by two pilots.
3. The freight is carried by trains.
4. In the past, trains were powered by steam.
5. The first flight in a plane was made by the Wright brothers