

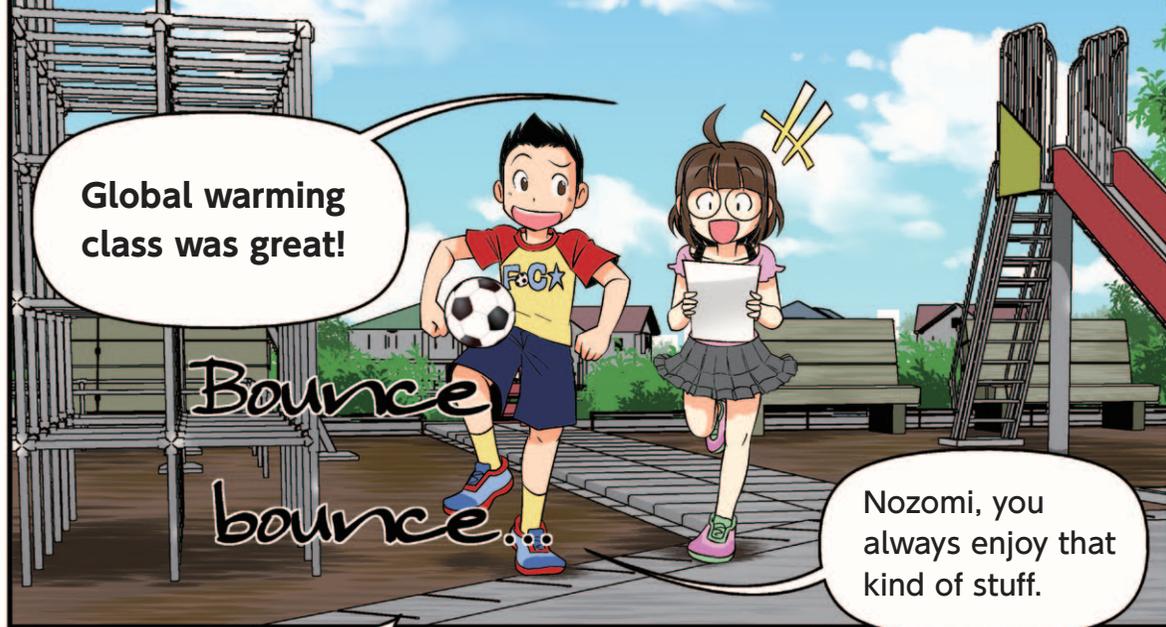


Let's learn with CAP!
**Technology
for the future
of our planet**

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**Technology
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“CCS” Cartoons to
Save Our Earth



Global warming class was great!

Bounce bounce

Nozomi, you always enjoy that kind of stuff.

Seriously! Sho! The Earth is going to be in BIG trouble if we can't stop it!

Sea Level Rise! Floods! Drought!

Ok, ok! But how can we prevent global warming?



Finch

Look, what's this "CCS"?



Ask me!

Who are you?

If you wanna know about CCS...

Slowly...

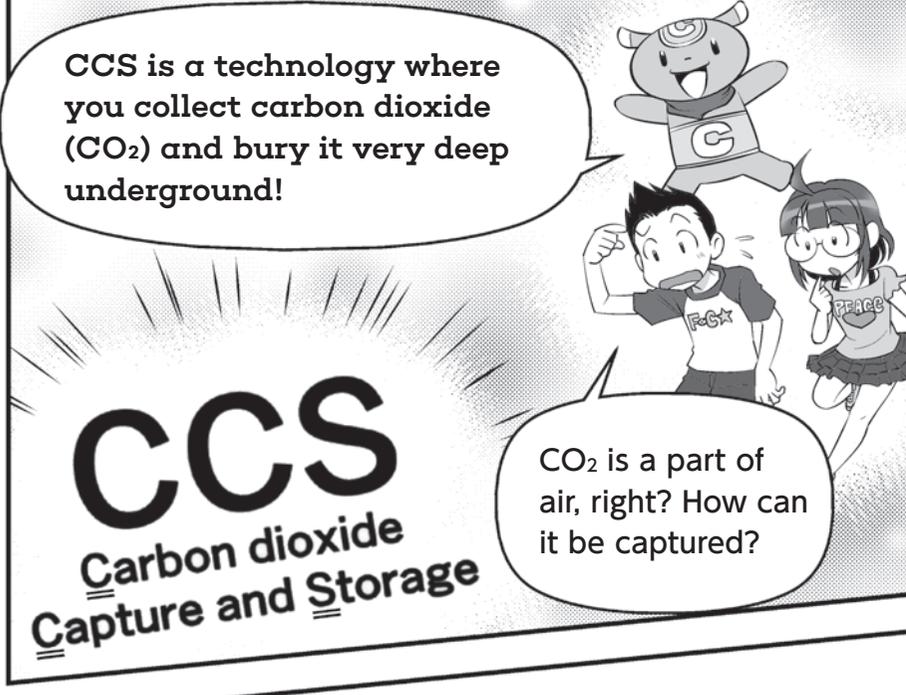


Bam!



What the...!!

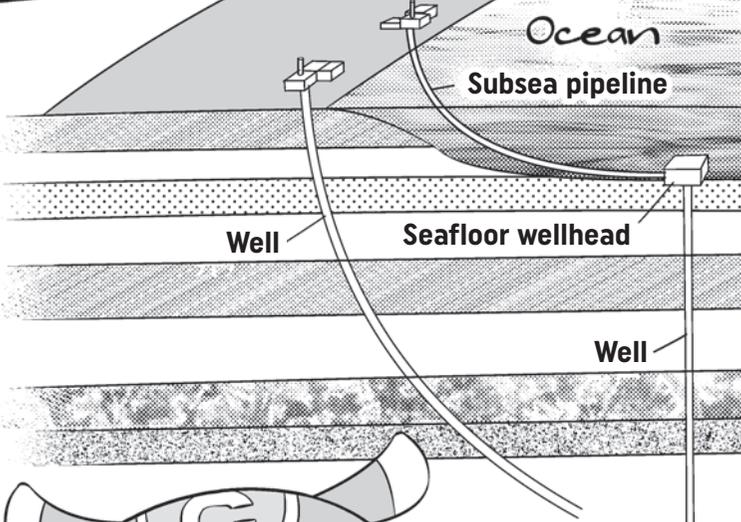
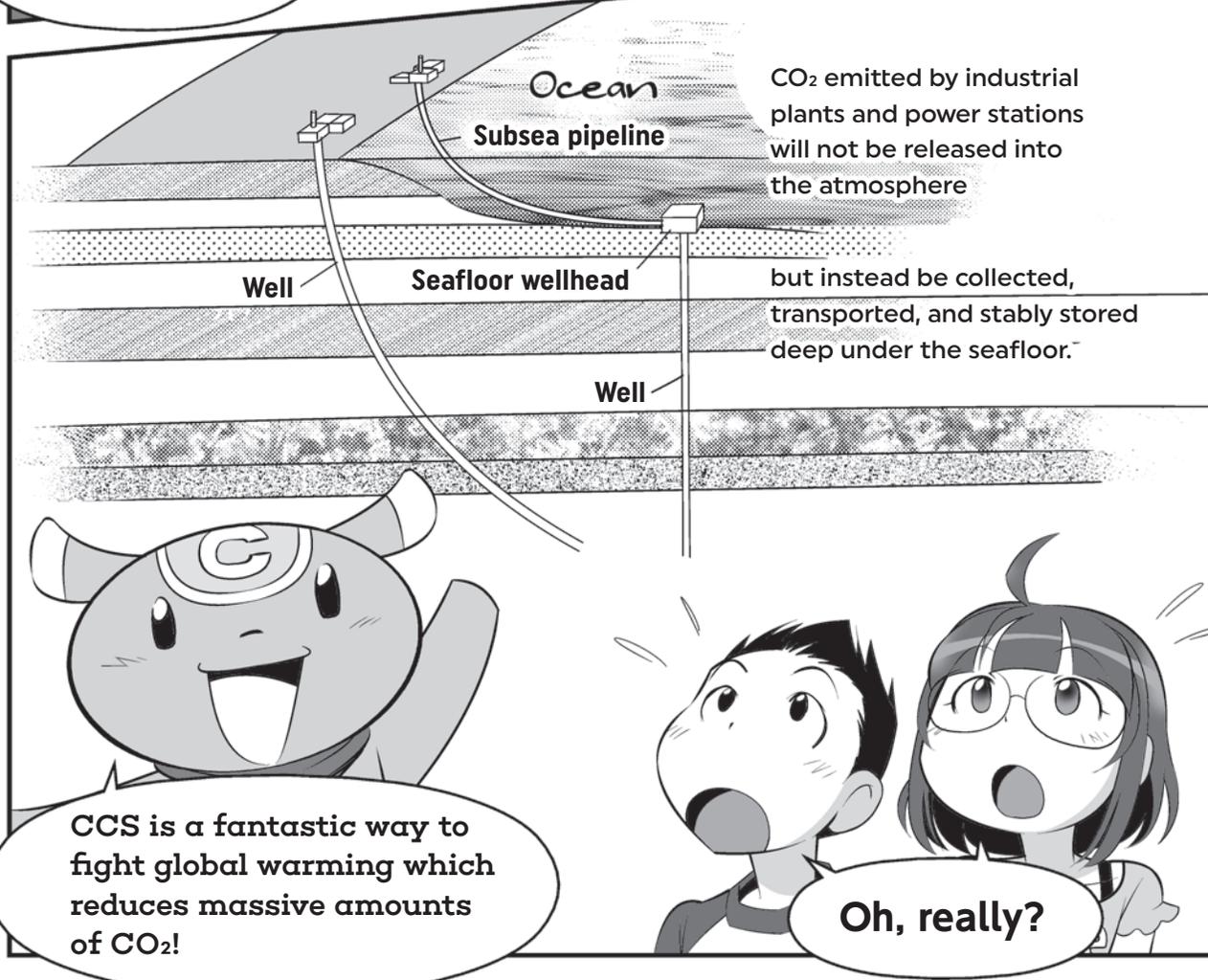
Hi guys! My name is CAP!



CCS is a technology where you collect carbon dioxide (CO₂) and bury it very deep underground!

CCS
Carbon dioxide
Capture and Storage

CO₂ is a part of air, right? How can it be captured?



CO₂ emitted by industrial plants and power stations will not be released into the atmosphere but instead be collected, transported, and stably stored deep under the seafloor.

CCS is a fantastic way to fight global warming which reduces massive amounts of CO₂!

Oh, really?



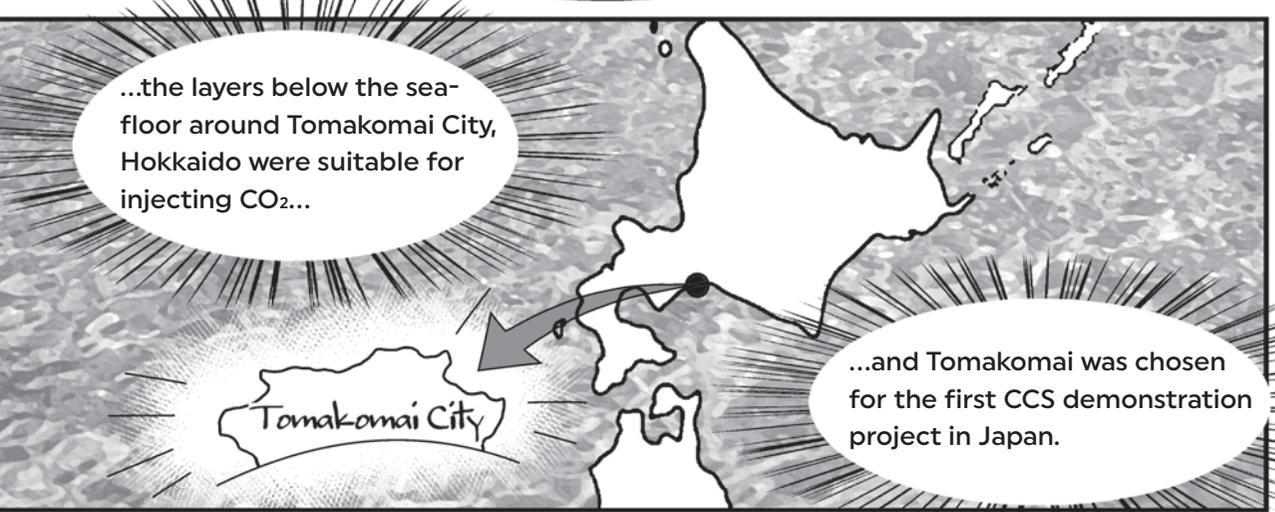
Is there enough information about the underground?

Is there enough CO₂ for conducting tests?

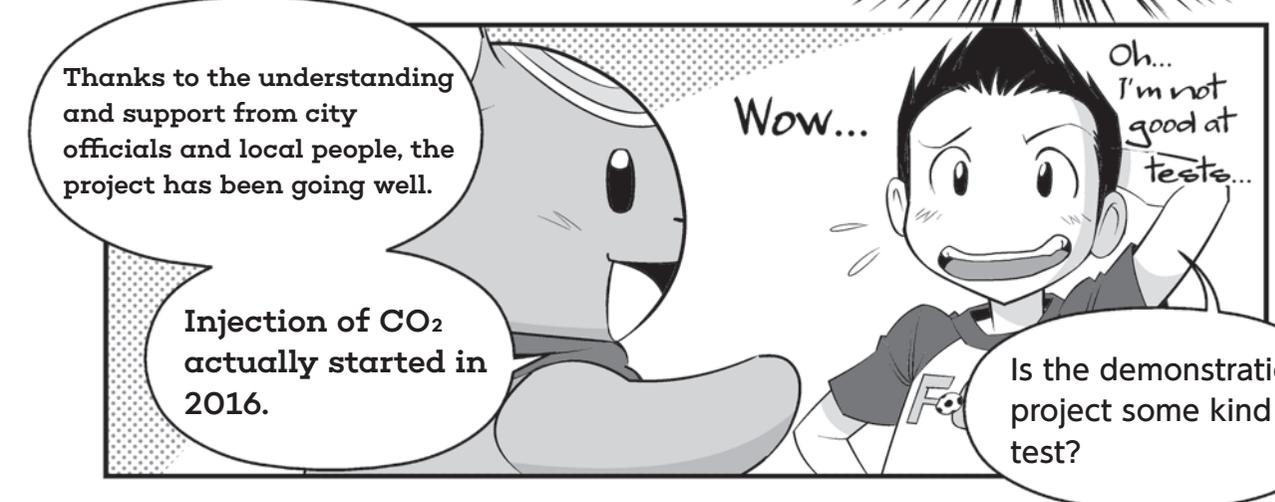
CO₂ CO₂ CO₂ CO₂

Based on surveys conducted on a variety of items,

Yes!
One place in Japan was chosen out of 115 candidates.



...and Tomakomai was chosen for the first CCS demonstration project in Japan.

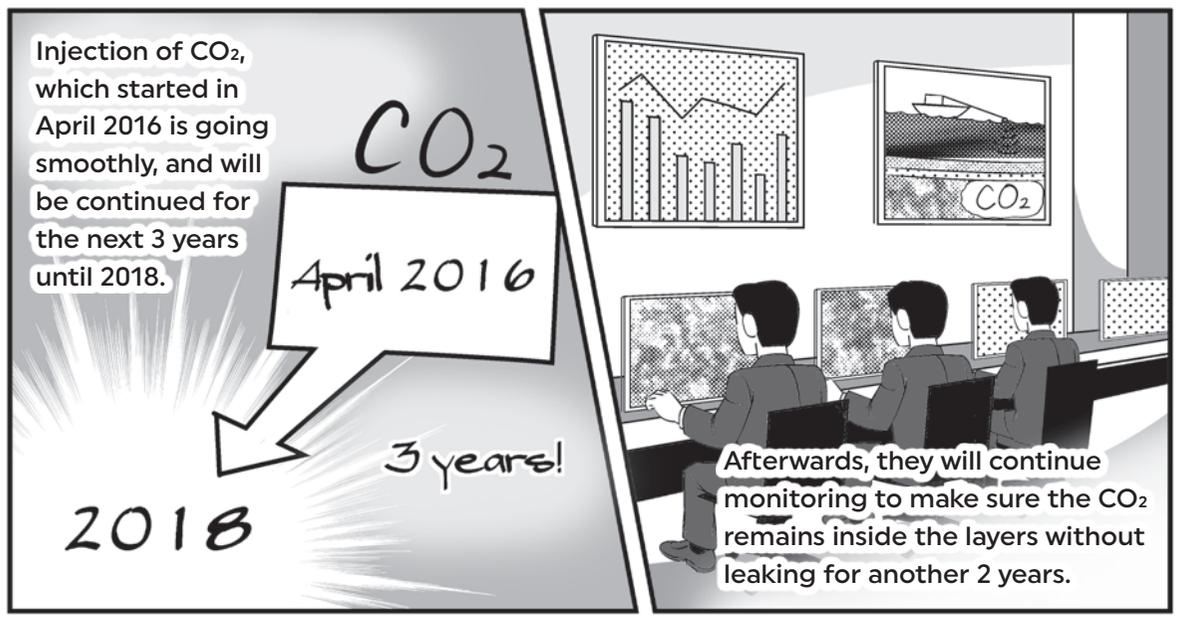
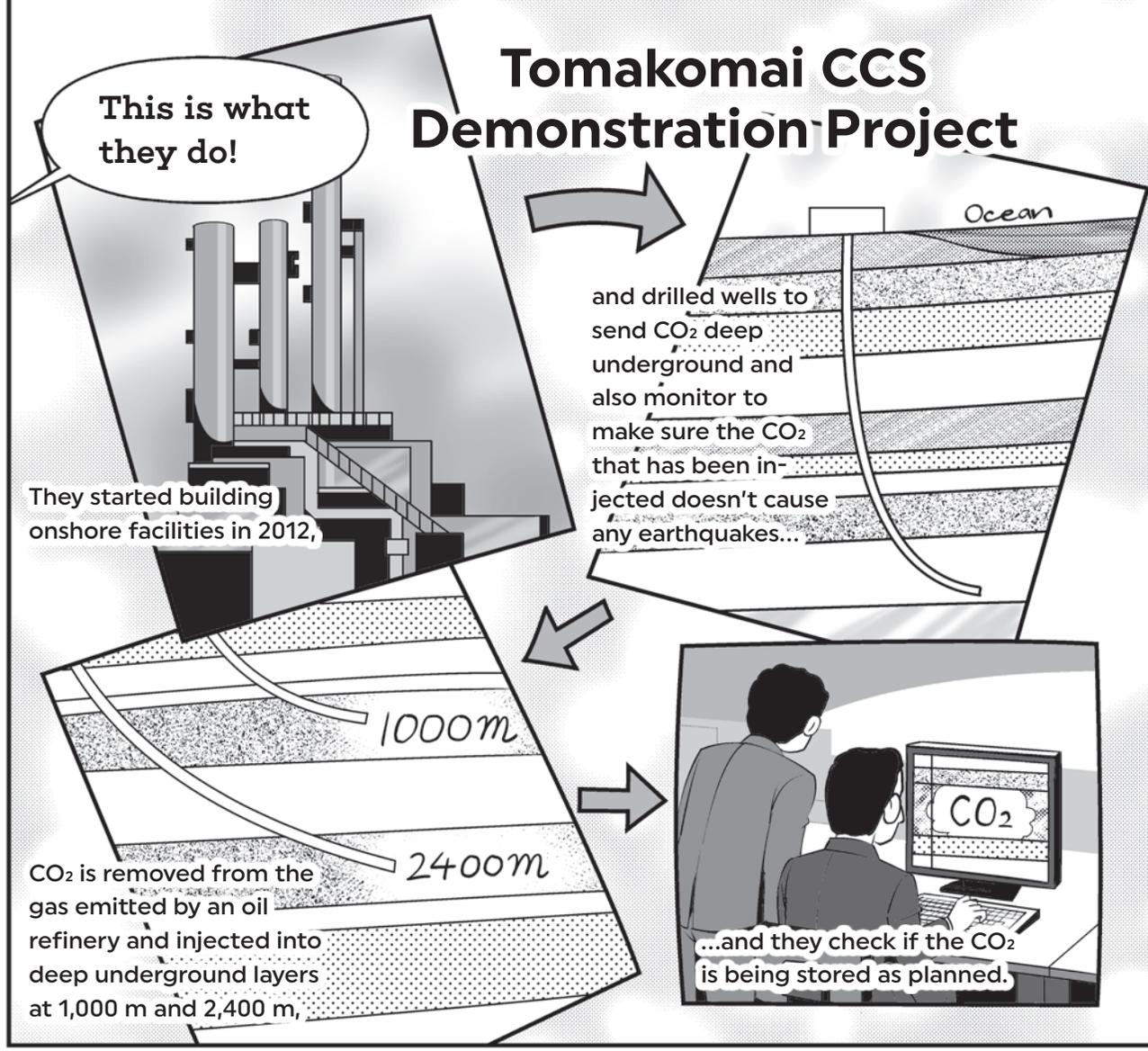


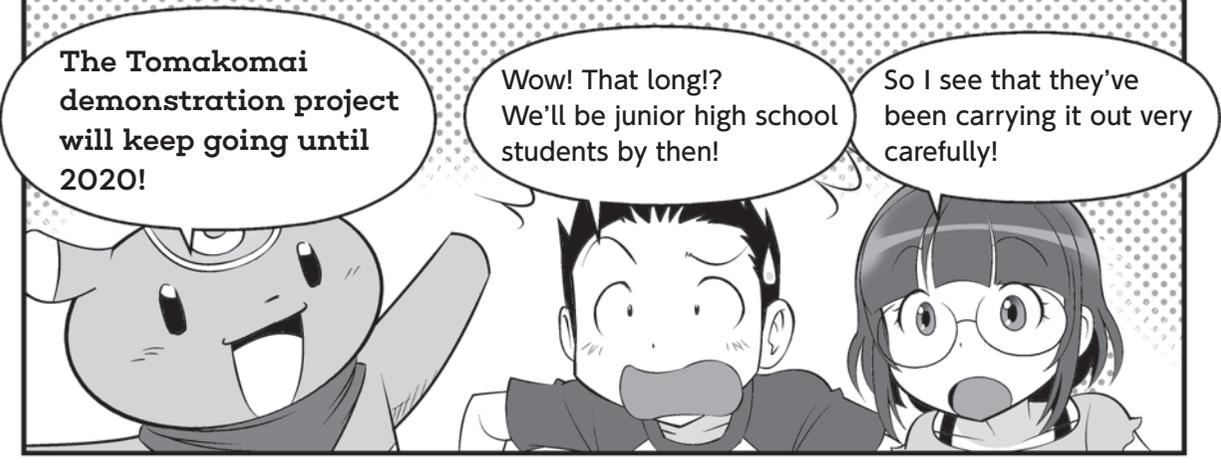
Thanks to the understanding and support from city officials and local people, the project has been going well.

Injection of CO₂ actually started in 2016.

Is the demonstration project some kind of test?

Tomakomai CCS Demonstration Project

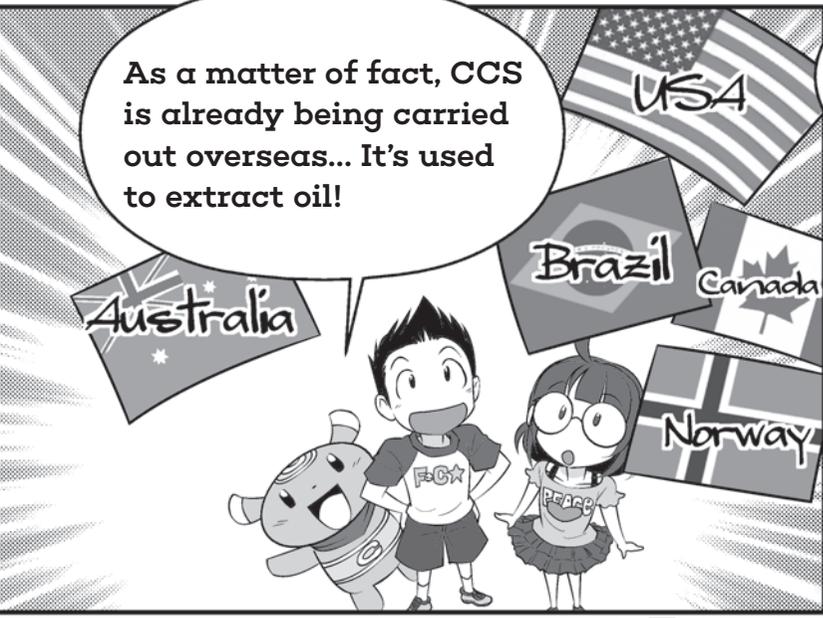




The Tomakomai demonstration project will keep going until 2020!

Wow! That long!? We'll be junior high school students by then!

So I see that they've been carrying it out very carefully!



As a matter of fact, CCS is already being carried out overseas... It's used to extract oil!

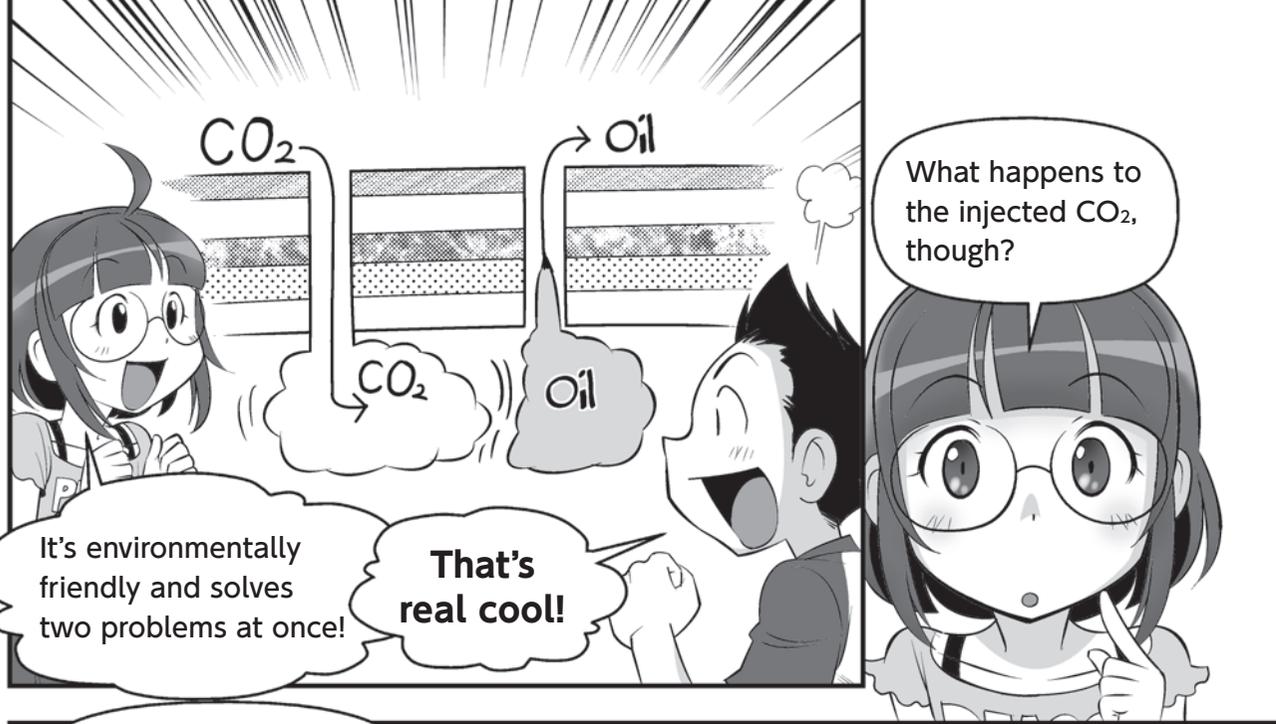
USA
Australia
Brazil
Canada
Norway



You mean like this?

Here we go!
Thud, thud...
Gush, gush!

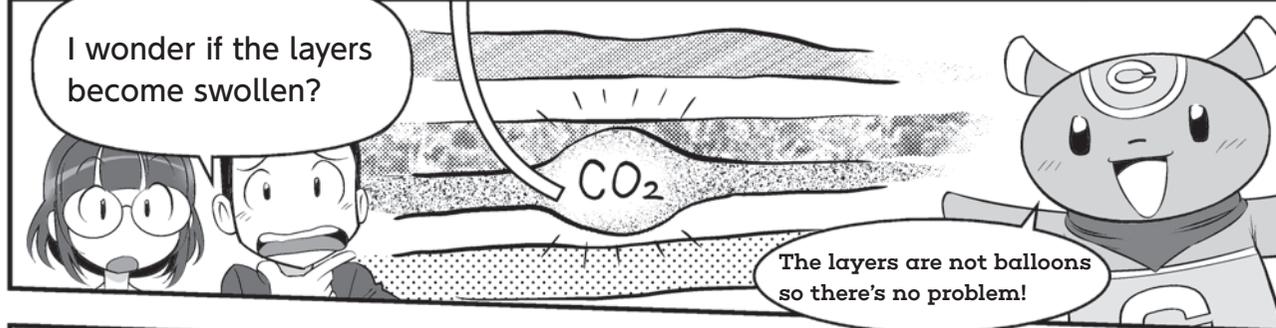
Not that easy!



It's environmentally friendly and solves two problems at once!

That's real cool!

What happens to the injected CO₂, though?



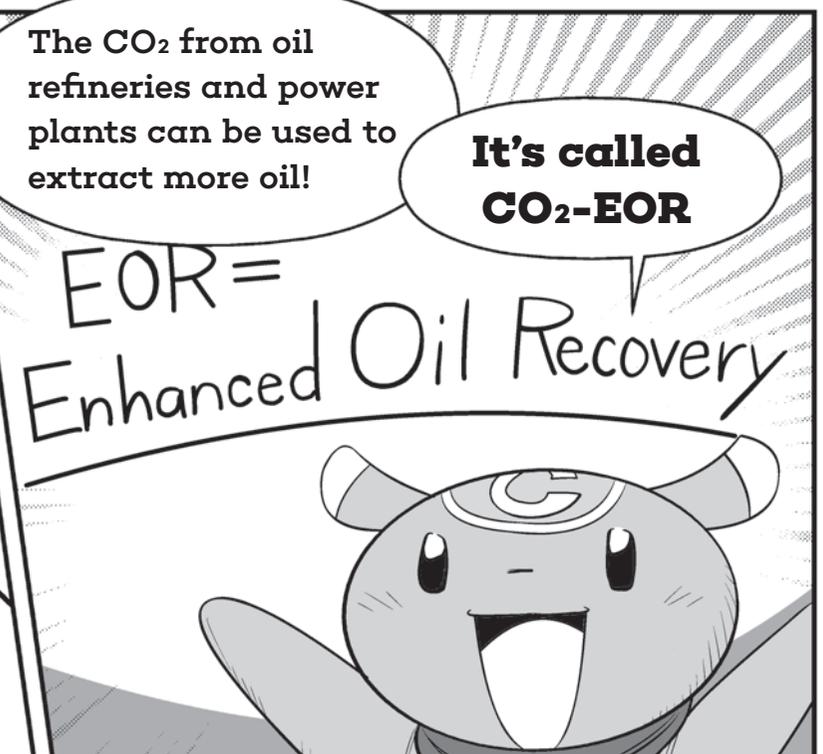
I wonder if the layers become swollen?

CO₂

The layers are not balloons so there's no problem!



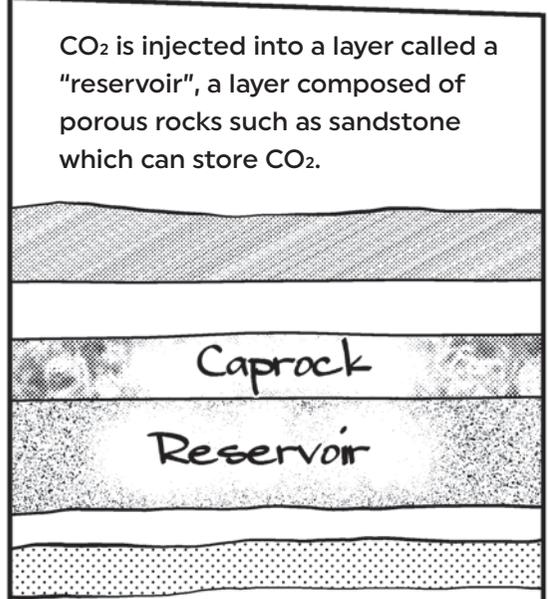
Because oil is trapped in small spaces in rocks, it's very hard to get it out.



The CO₂ from oil refineries and power plants can be used to extract more oil!

It's called CO₂-EOR

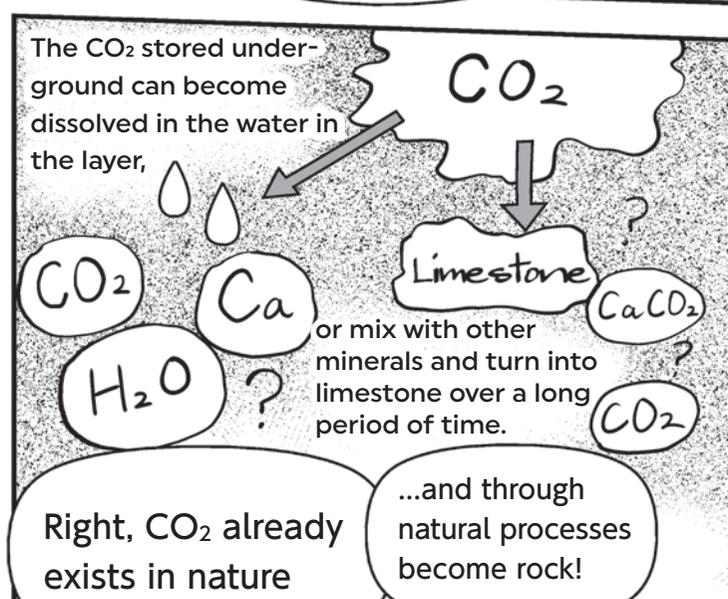
EOR = Enhanced Oil Recovery



CO₂ is injected into a layer called a "reservoir", a layer composed of porous rocks such as sandstone which can store CO₂.

Caprock Reservoir

It's also necessary that above the reservoir there is a "caprock", which is a layer that does not let the CO₂ pass through.



The CO₂ stored underground can become dissolved in the water in the layer,

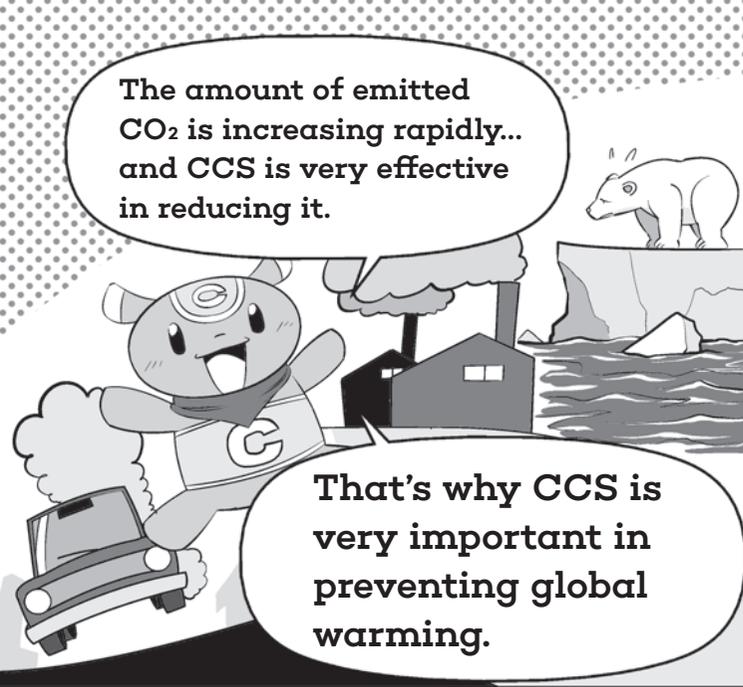
CO₂
Limestone
CaCO₃
or mix with other minerals and turn into limestone over a long period of time.

Right, CO₂ already exists in nature

...and through natural processes become rock!



That's right



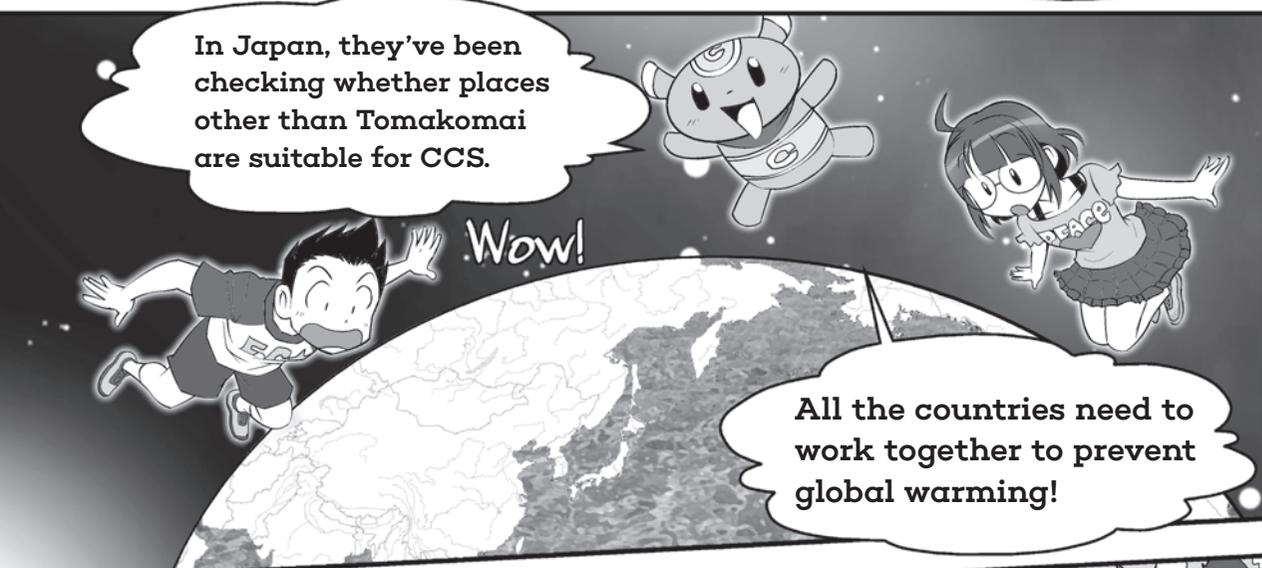
The amount of emitted CO₂ is increasing rapidly... and CCS is very effective in reducing it.

That's why CCS is very important in preventing global warming.



Many people in the world are saying that we won't be able to stop global warming without CCS!

Oh no!
CCS must be an incredible technology!



In Japan, they've been checking whether places other than Tomakomai are suitable for CCS.

Wow!

All the countries need to work together to prevent global warming!



Even when we play soccer, working together is important.



Attack!
You don't have to fight it...
Let's work together to fight CO₂!

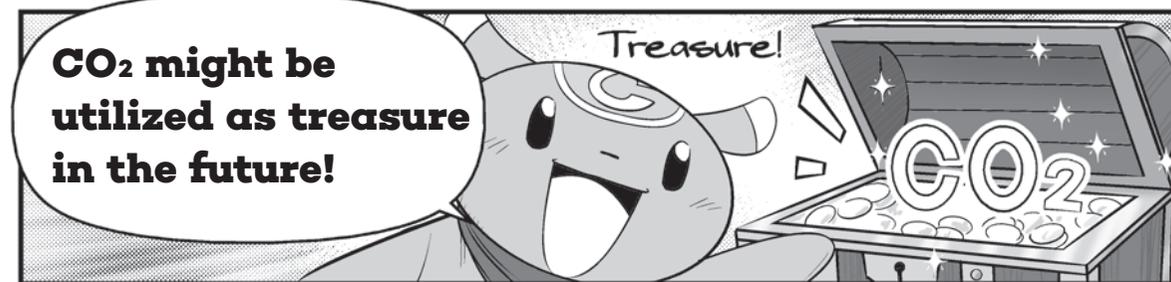
Wait a minute!



He he...
People have started to utilize CO₂ for many new technologies.



In the Netherlands, it's used on farms to boost the tomato harvest...



Treasure!
CO₂ might be utilized as treasure in the future!



I get it. To stop global warming, we need to reduce CO₂ by CCS

and also think of future uses for CO₂!



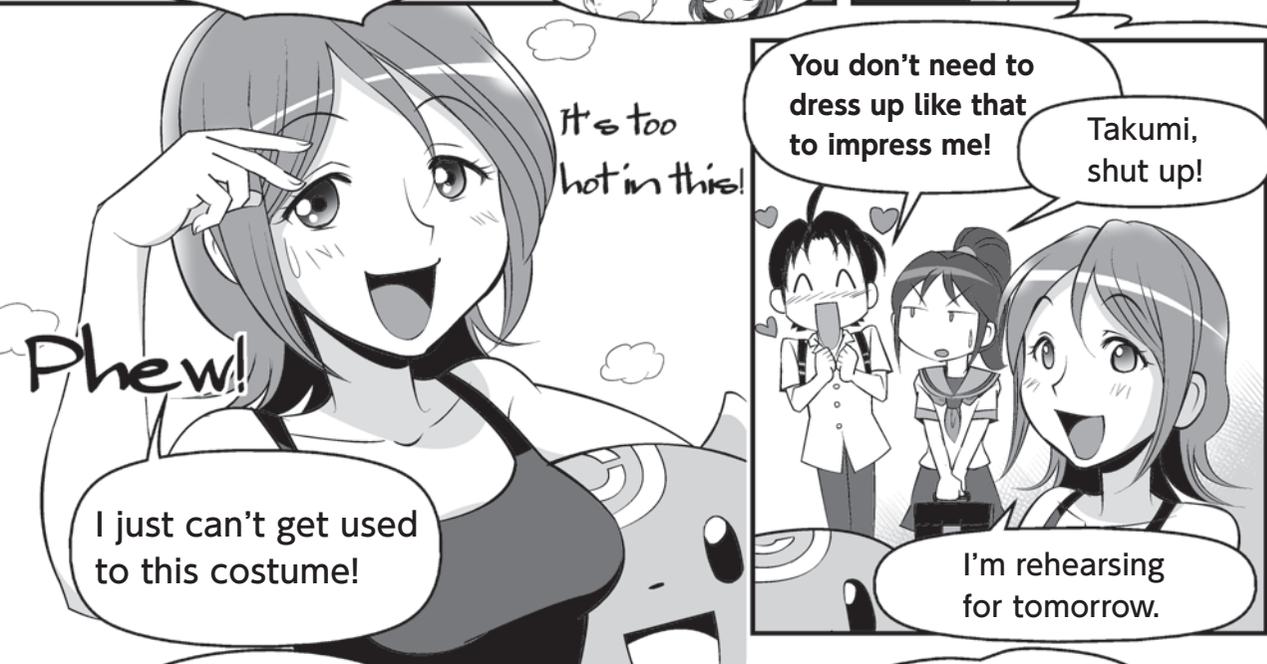
We've been talking for hours and it's gotten dark...

Jet black...



Oh!

W-What?



Tomakomai CCS Demonstration Project

Pipelines transport CO₂-containing gas to the three towers which capture only the CO₂ from the gas.

(Towers from left : Low pressure flash tower, CO₂ stripping tower, CO₂ absorption tower)



Tomakomai CCS Demonstration Project Facility

