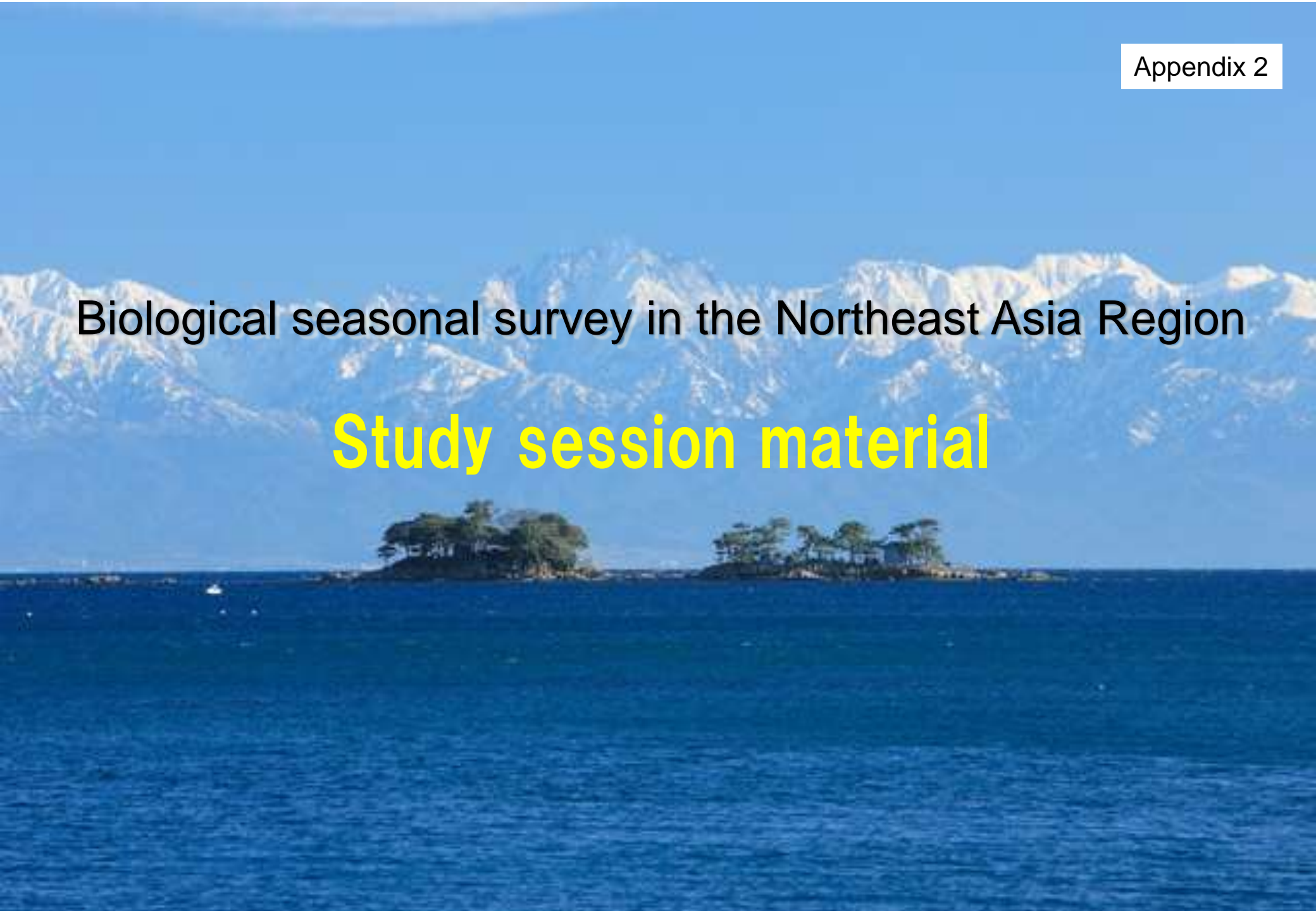


Biological seasonal survey in the Northeast Asia Region

**Study session material**



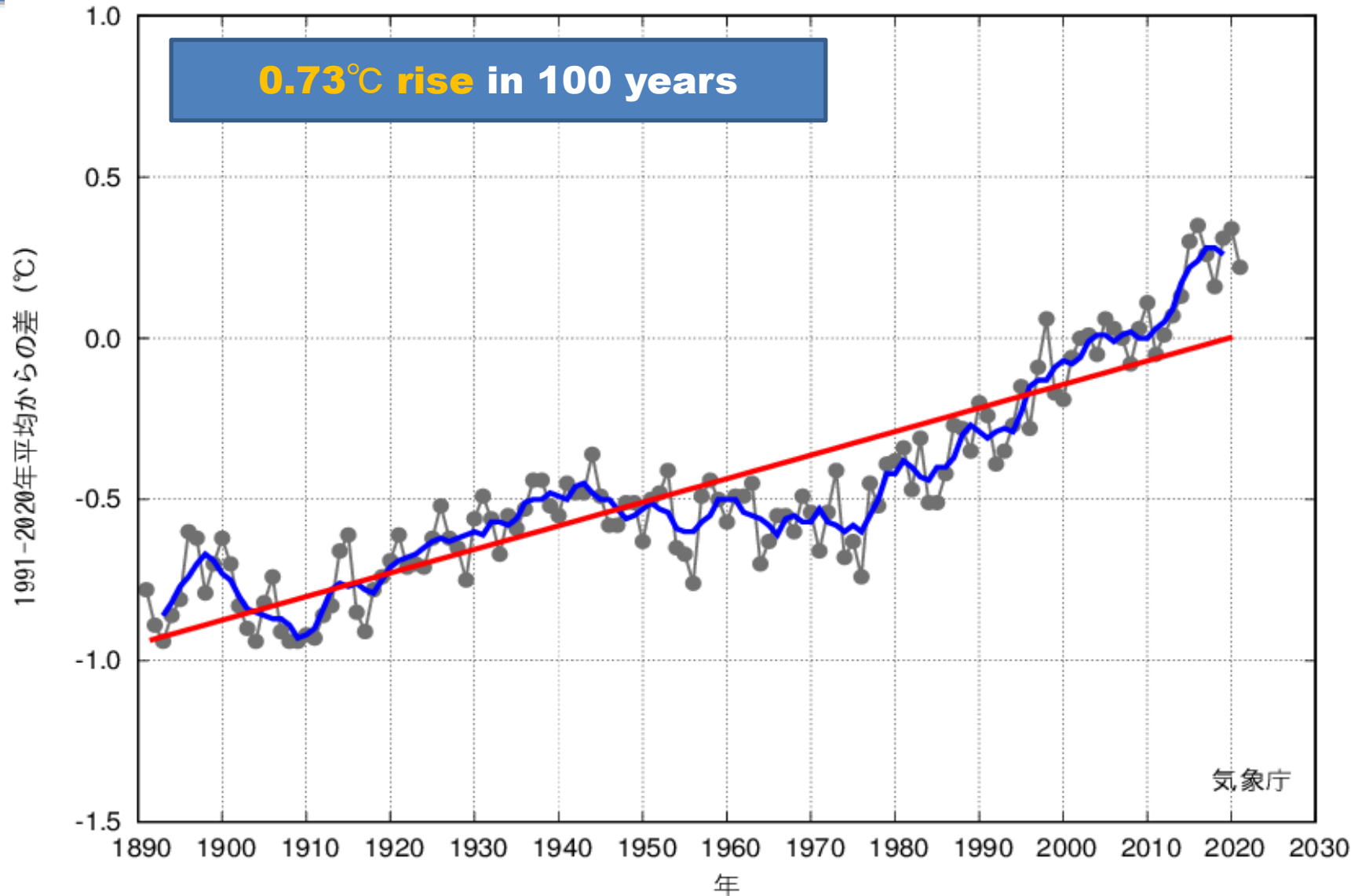
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- 1. Current status and forecast of global warming**
- 2. Impact of global warming**
- 3. Mechanism of global warming**
- 4. Current status of greenhouse gas (CO<sub>2</sub>) emissions**
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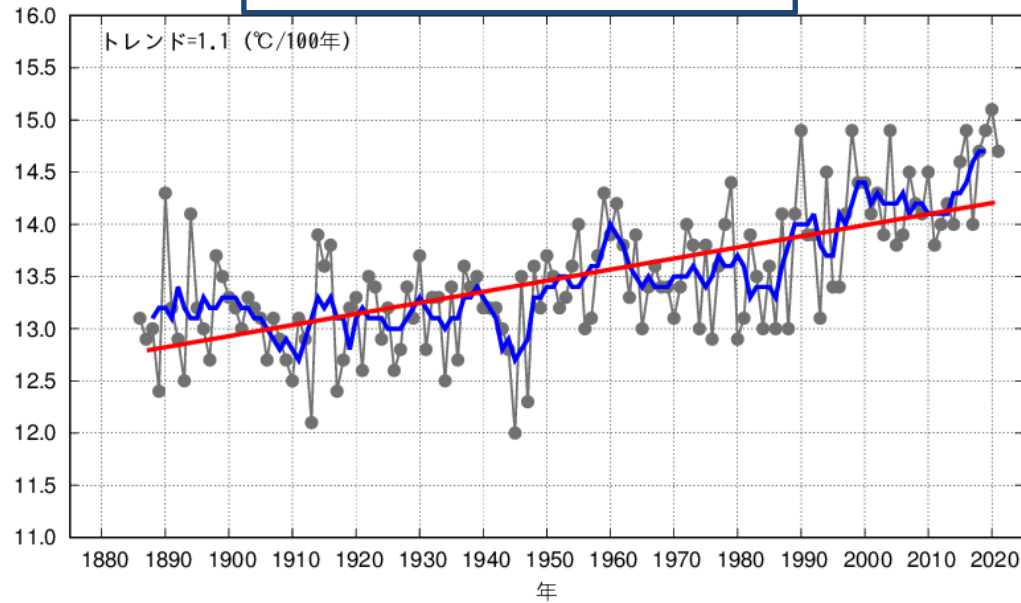
# 1. Current status and forecast of global warming (Changes in the annual average **temperature** of the **world** )



Source : [https://www.data.jma.go.jp/cpdinfo/temp/an\\_wld.html](https://www.data.jma.go.jp/cpdinfo/temp/an_wld.html)

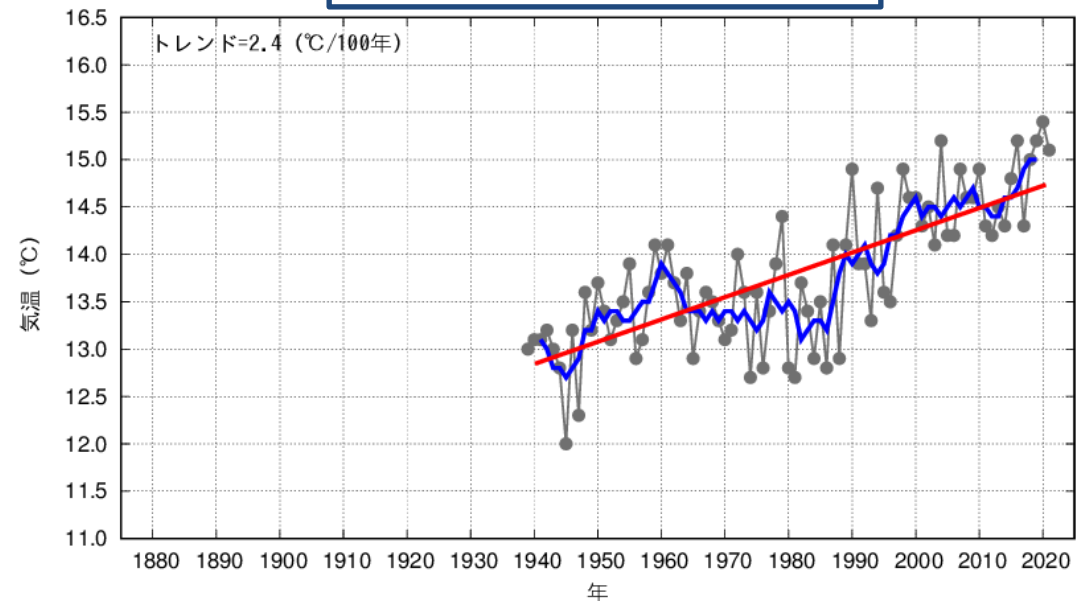
# Changes in the annual average **temperature** of the **Toyama Pref.**

**In Fushiki area**

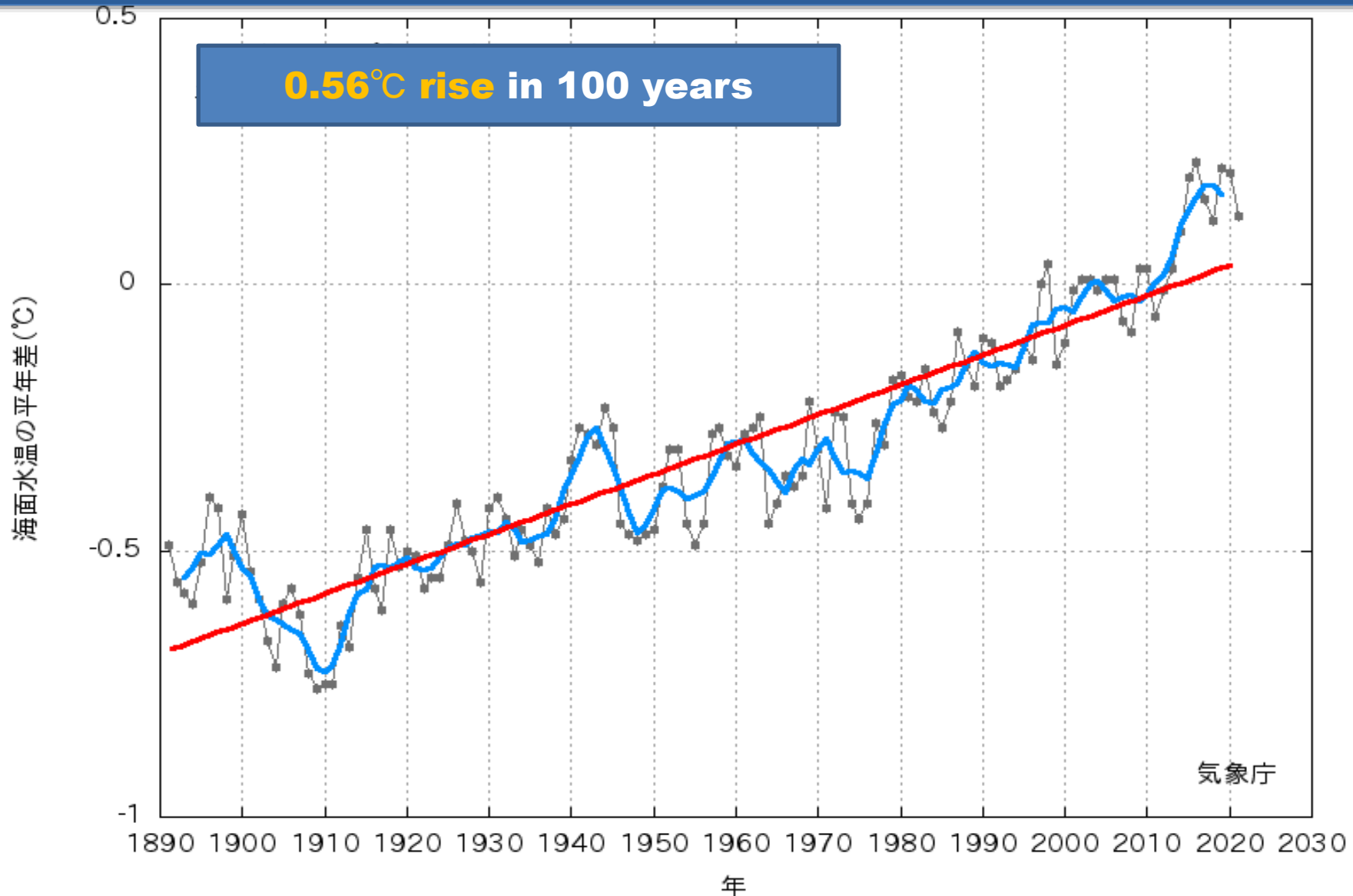


It is observed the **highest average temperature in the history** both in Fushiki and Toyama-city in 2020

**In Toyama-city area**

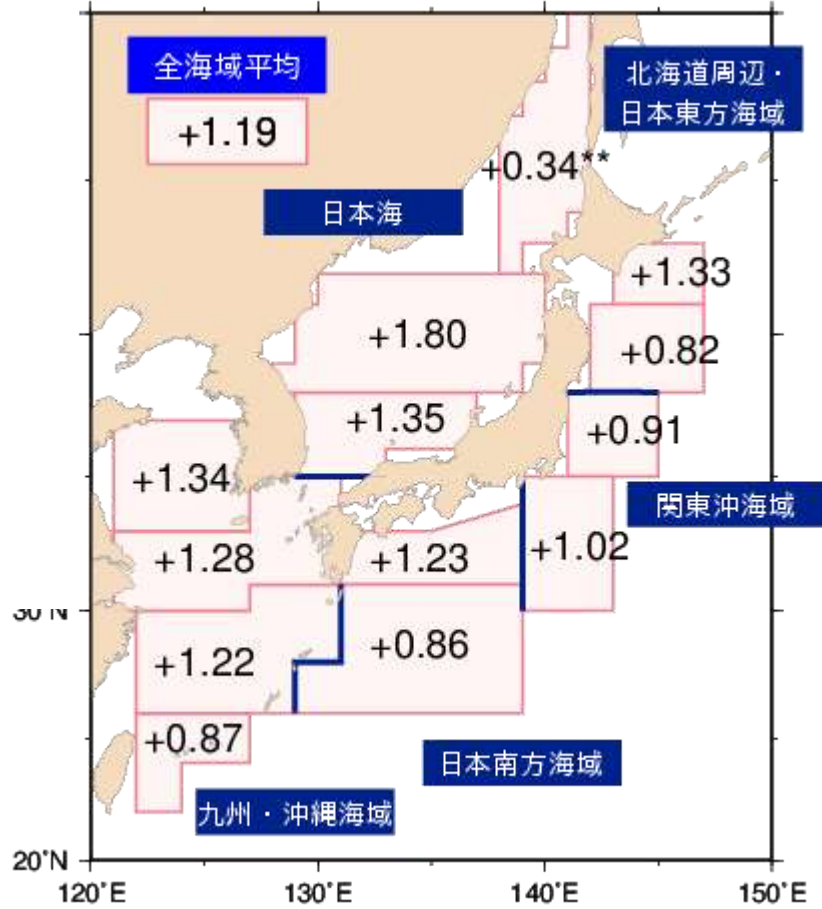
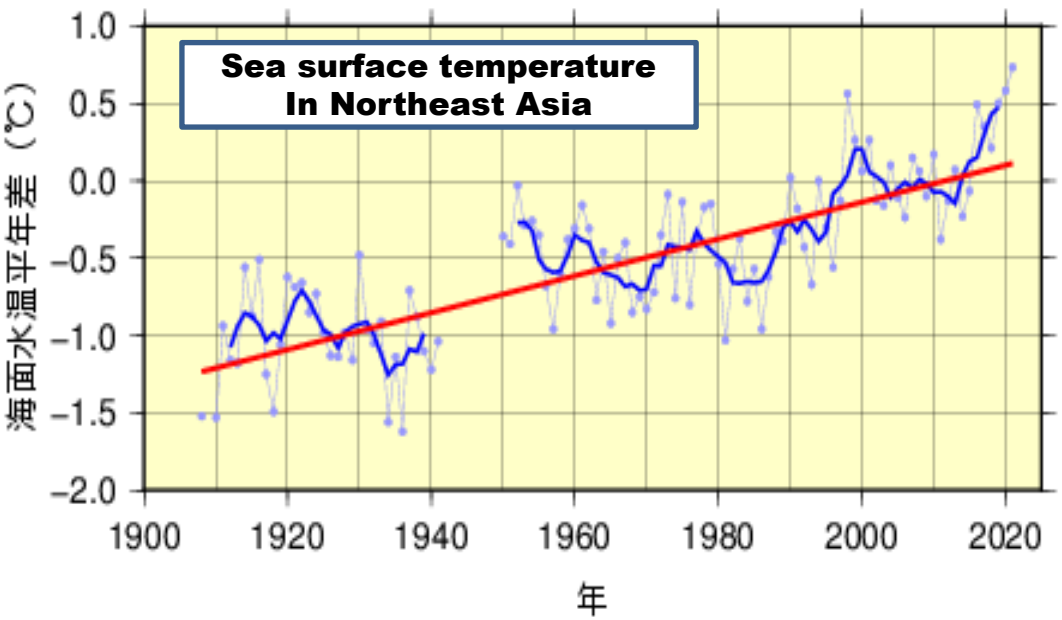


# 1. Current status and forecast of global warming (Long-term changes in **global sea surface temperature**)



# 1. Current status and forecast of global warming (Long-term changes in **sea surface temperature in Northeast Asia**)

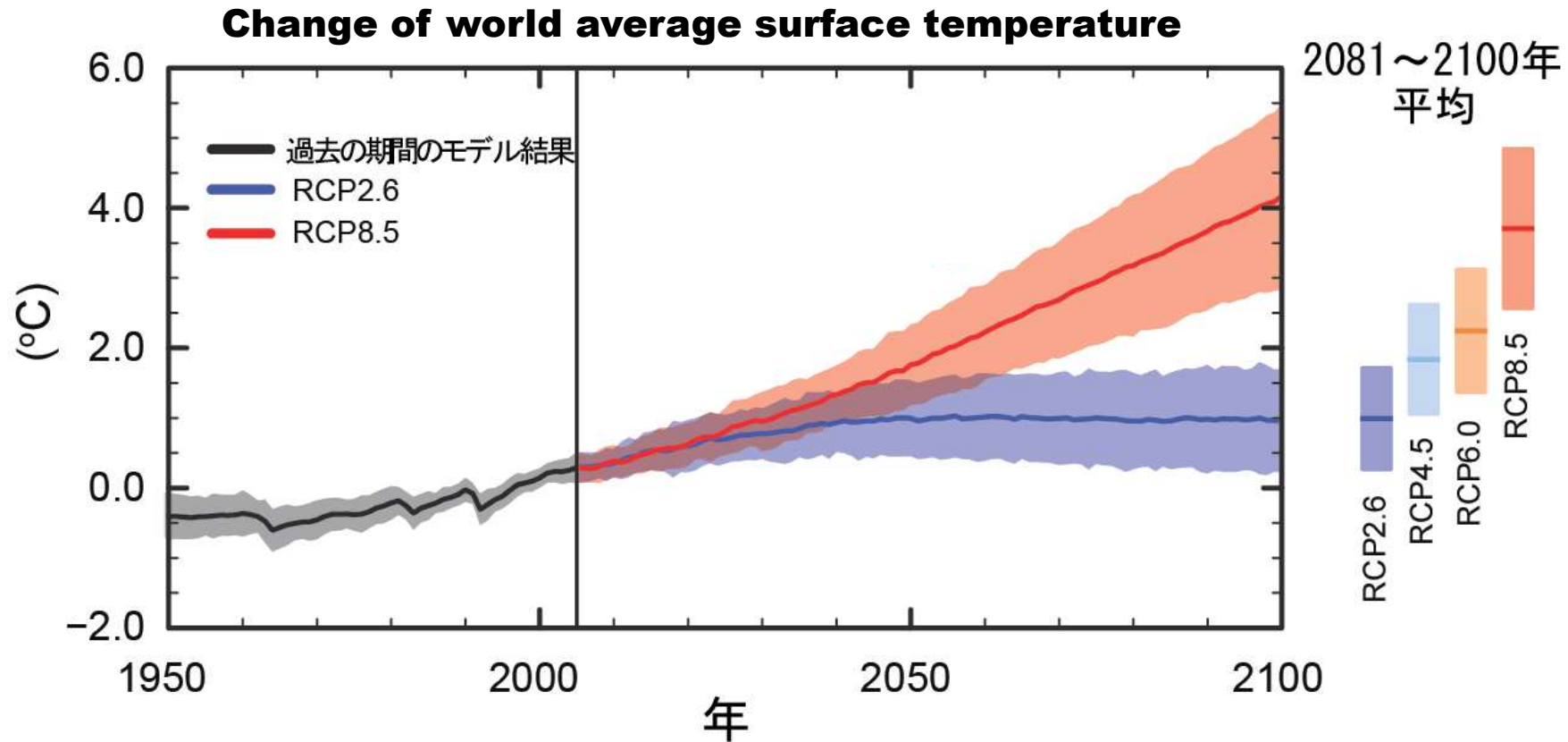
**1.19°C rise in 100 years**



Source : [https://www.data.jma.go.jp/gmd/kaiyou/data/shindan/a\\_1/japan\\_warm/japan\\_warm.html](https://www.data.jma.go.jp/gmd/kaiyou/data/shindan/a_1/japan_warm/japan_warm.html)

# 1. Current status and forecast of global warming (Forecast of temperature (from 6<sup>th</sup> IPCC report))

The world average surface temperature is **projected to rise above 2°C by the middle of this century** at the current level of countermeasures.



RCP8.5 : High reference scenario (max emission)  
RCP2.6 : Low reference scenario (minimum emission)



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## 2. Impact of global warming

If global warming continues as it is, it is expected to rise above 2 °C by the middle of this century.

**What will happen to the earth if that happens?**

### ① Sea level rise

It has a great impact on the lives of people on the coast, lowlands, and small islands!



### ② Increased risk of animal and plant extinction

There will be no place where our familiar organisms (animals and plants) can live comfortably!



## 2. Impact of global warming

### ③ Increased risk of infection

The range of tropical infections diseases such as malaria spreads.



### ④ Food shortage

In addition to climate change, the rise in pests can significantly reduce grain production, leading to serious global food shortages!



### ⑤ Increased abnormal weather

Due to the intensification and frequent occurrence of tropical low pressure, disasters such as floods and high tides are likely to occur, and damage may especially in coastal areas!



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# 3. Mechanism of global warming

The energy from the sun warms the ground surface. The greenhouse gas absorbs and re-radiates the heat radiated from the ground surface, warming the atmosphere.

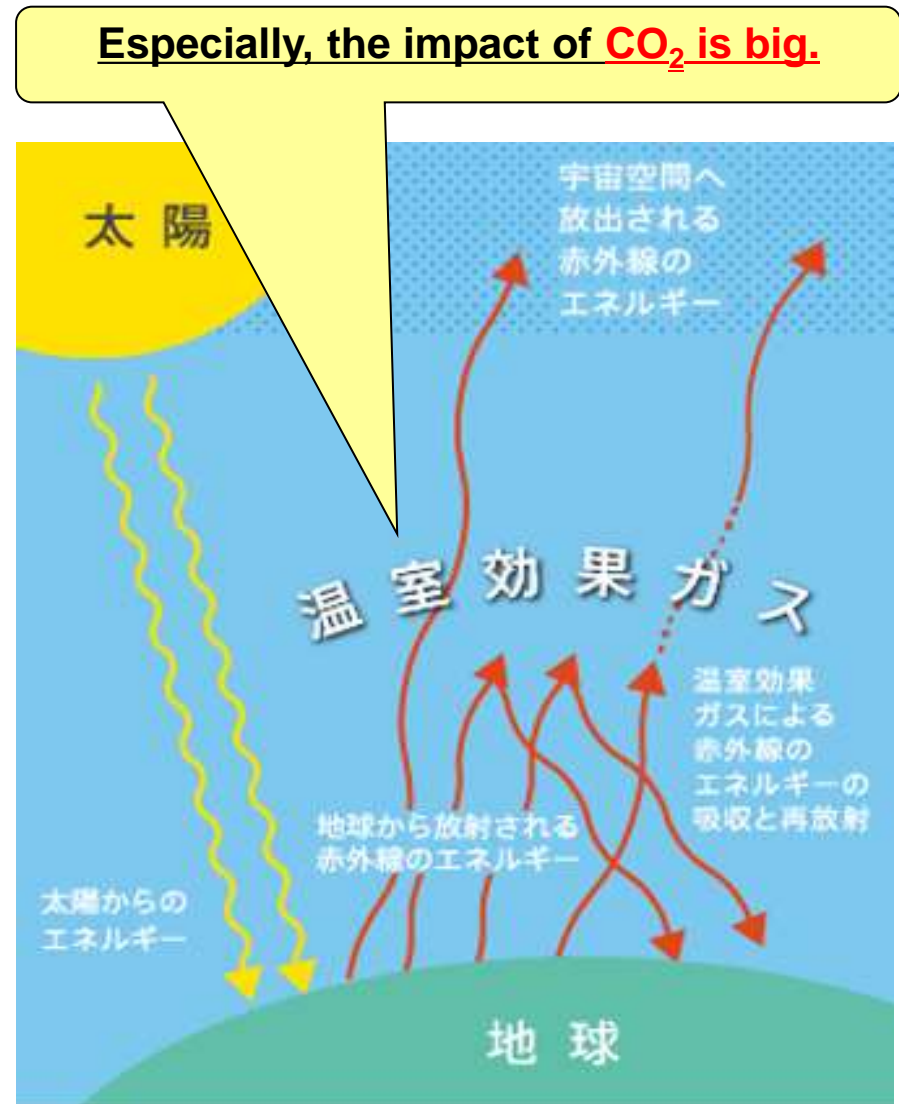
When the atmospheric **concentration** of greenhouse gases such as **CO2 rises** ....



The greenhouse effect will be stronger than before, and the **temperature of the ground surface will rise!**



This is **“Global warming”**

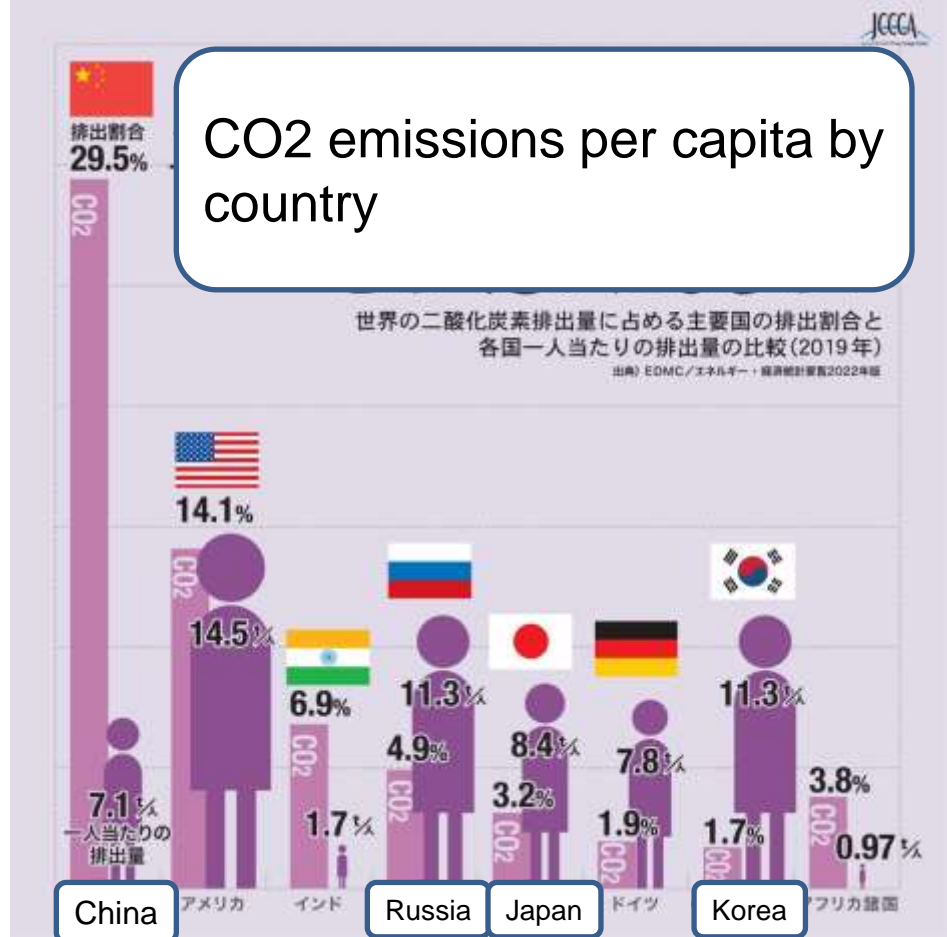
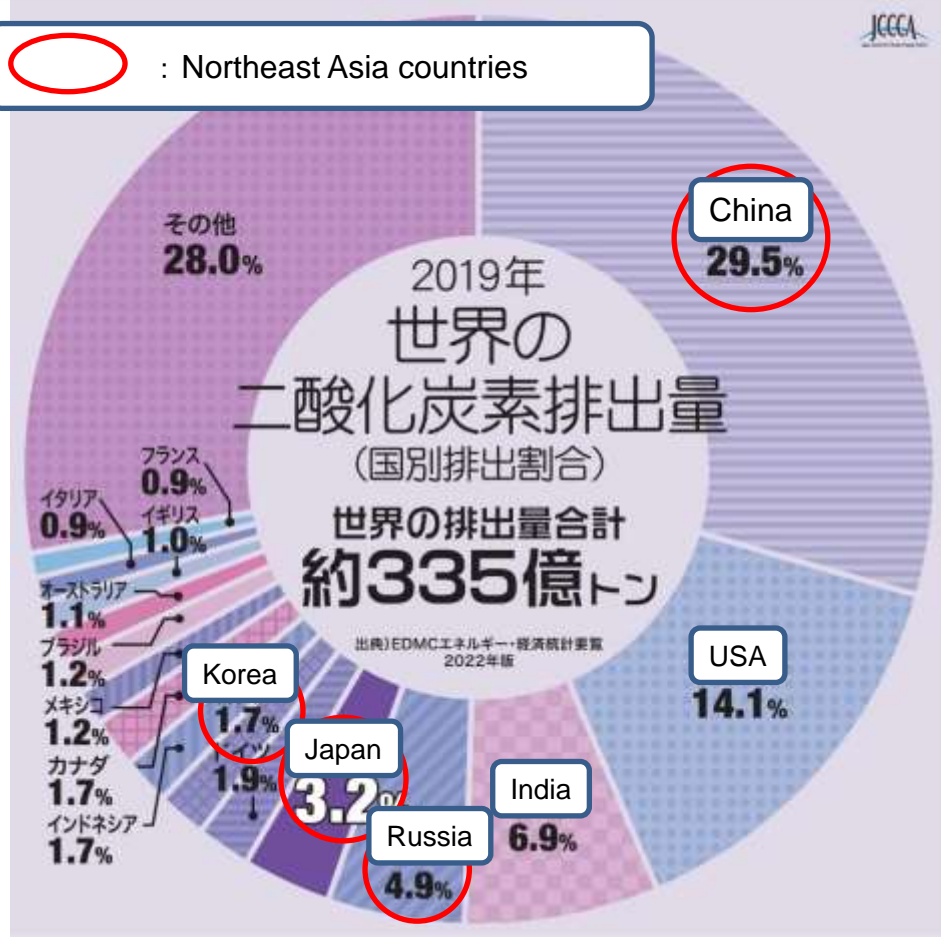


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# 4. Current status of greenhouse gas (CO2) emission

○ : Northeast Asia countries



• CO<sub>2</sub> emissions from countries related to the Northeast Asian region are relatively large in the world  
⇒ Let's try to control CO<sub>2</sub> emissions!

# Specific CO2 source

## ① Lighting, home appliances

The use of home appliances such as lights, TV and refrigerators is a major source of CO2 emissions from homes.



## ② Automotive fuel

Although car is an indispensable for daily life, it is a large source of CO2 emissions from homes.



## ③ Air conditioning

The use of air conditioners is a factor in CO2 emissions from homes. The air conditioner emits CO2 by consuming electricity, fan heater emits it by consuming gas and kerosene.



## ④ hot water supply

It accounts for about 1/7 of the power consumption in the home. To boil a bath-tub of hot water (200 liters), 1.3kg-CO2 is emitted (gas hot water supply).





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# Global warming countermeasures that can be practiced at home ①

## Spend time with the family gathered

If the family turns on the lights or watches TV in different rooms, you consume more energy.



By spending time with family in one room, you can reduce the amount of energy consumption.



## Turn off the dead light

If you leave the lights in an empty room or hallway on, electricity will continue to be used during that time.



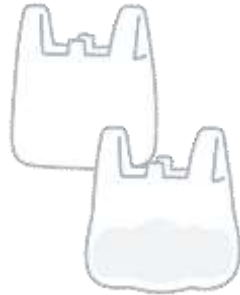
Turn off the lights during the bright day, and turn off the lights in unused rooms frequently.



# Global warming countermeasures that can be practiced at home ②

## Bring your own bag for shopping

Plastic bags use oil to manufacture.  
In addition, it is thrown away and emits CO<sub>2</sub> when burned as garbage.



Always carry your own bag with you so that you can use it at anytime.  
Also, let's use this initiative as an opportunity to think about reducing disposable plastics.



## Eat without leaving food



We use a lot of oil to burn garbage.  
In addition, in order to reduce CO<sub>2</sub> when burning waste, it is necessary to reduce the waste itself.



For the perspective of reducing food loss, eat all the food.  
If you have a large amount, ask if anyone else can eat it before you eat it.

