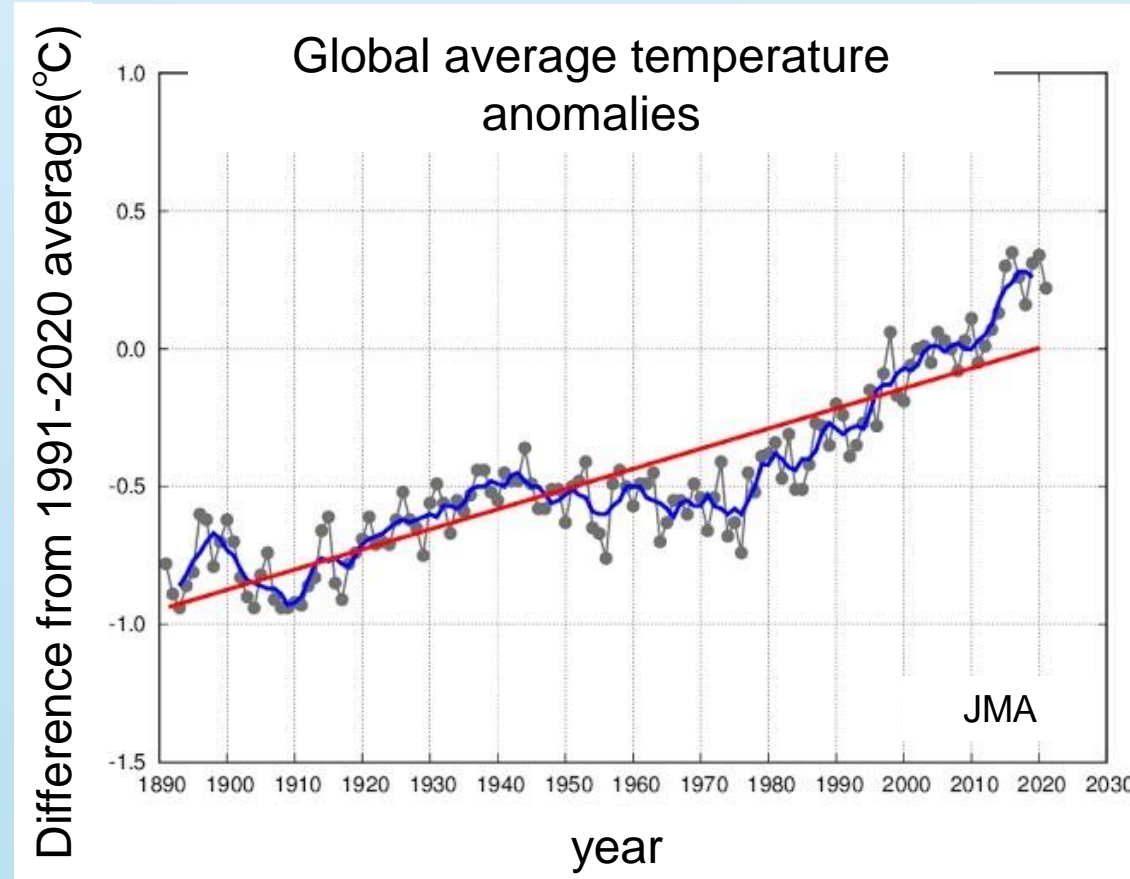


How to Use Air-Conditioner Efficiently

W202005-3

Tennoji High School Attached to
Osaka Kyoiku University

Posing a Problem

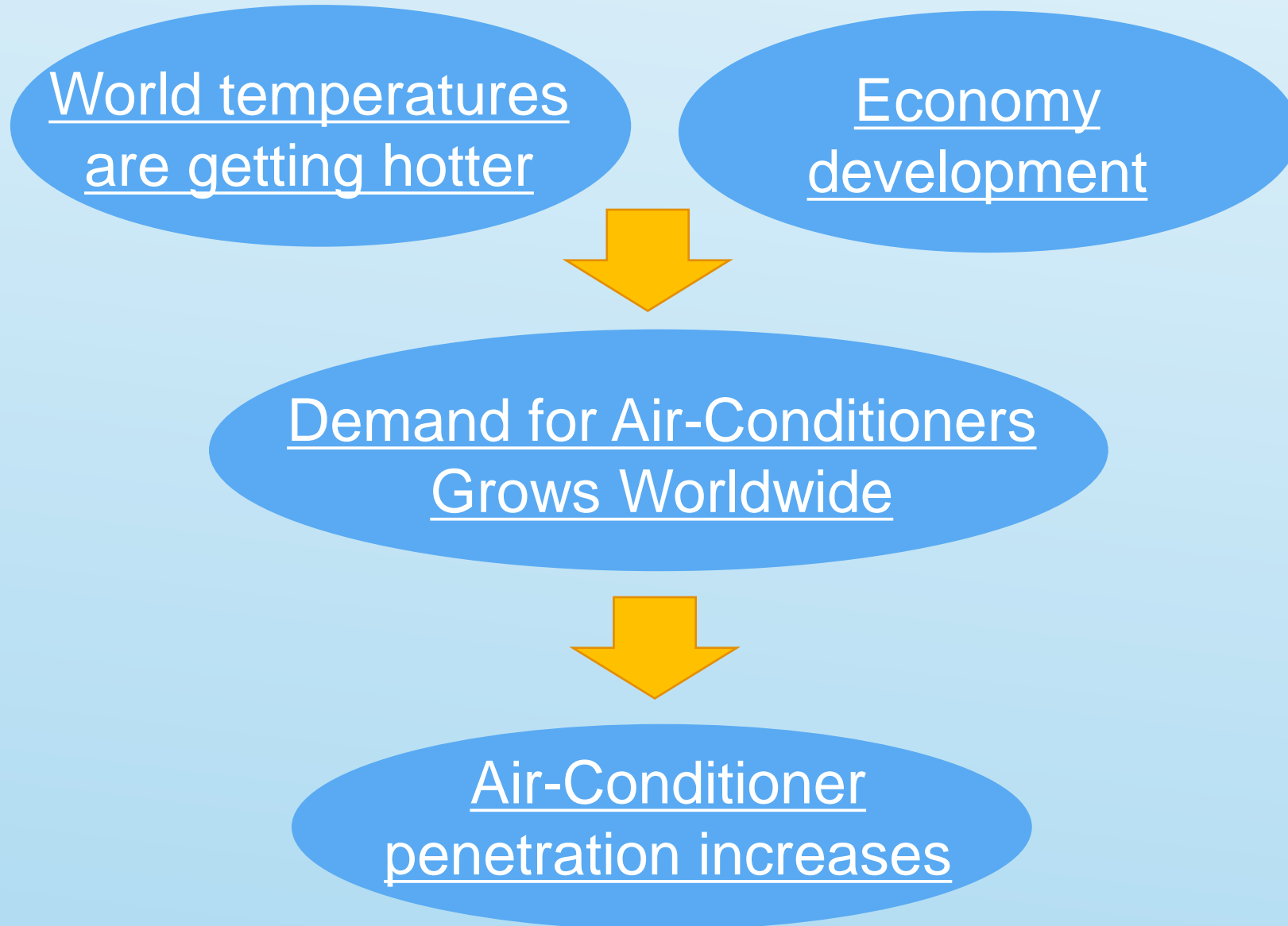


- Thin line (black): average temperature deviation from the base value for each year
 - Thick line (blue): 5-year moving average of deviation
 - Straight line (red): long-term change trend.
- The base value is the 30-year average for the period 1991-2020.

figure : Global average temperature anomalies

authority : Japan Meteorological Agency, Various data and materials,2022 https://www.data.jma.go.jp/cpdinfo/temp/an_wld.html

Posing a Problem



Electricity Supply

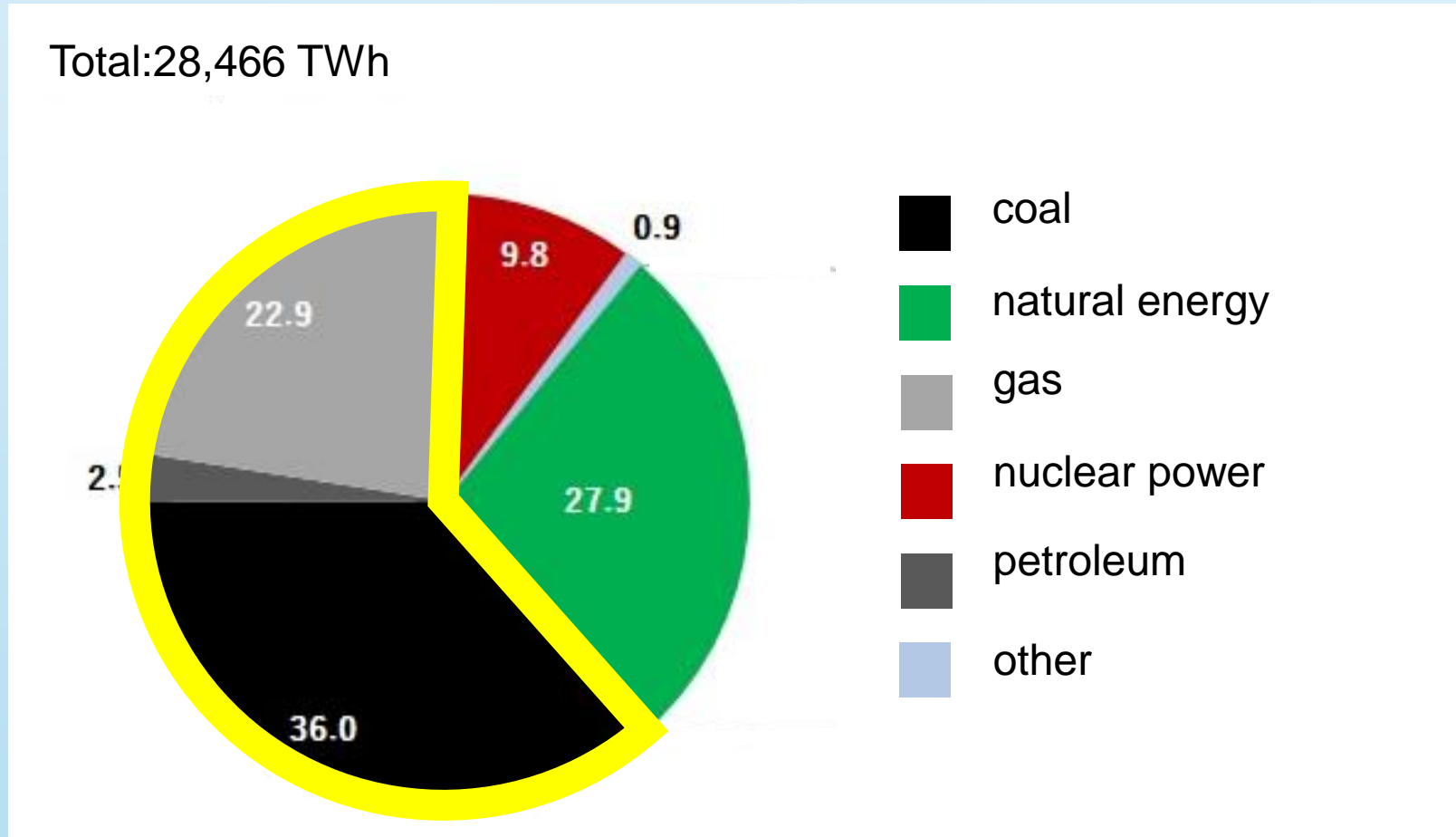
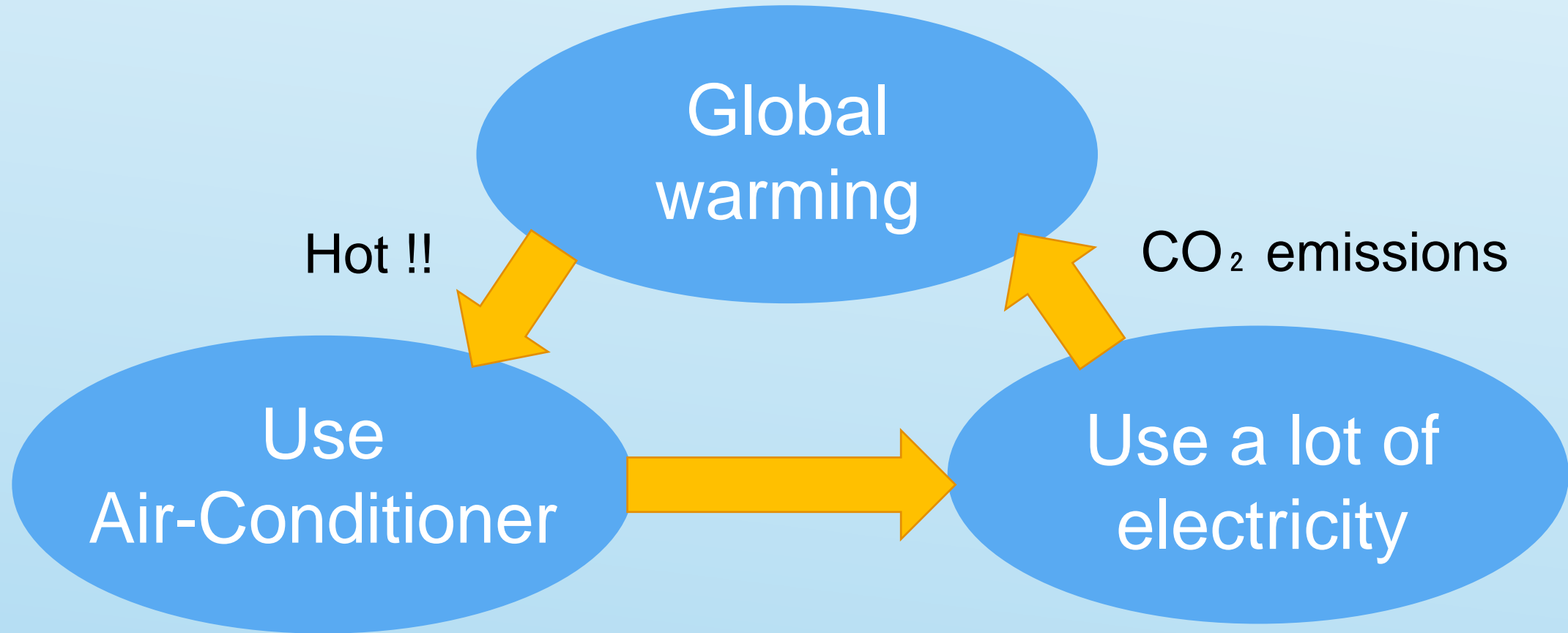


figure : Global Power Supply Composition 2021

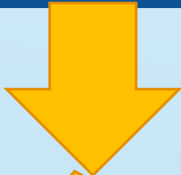
authority : Renewable Energy Foundation, Statistics, International Energy, 2020, <https://www.renewable-ei.org/statistics/energy/?cat=electricity>

Negative Cycle



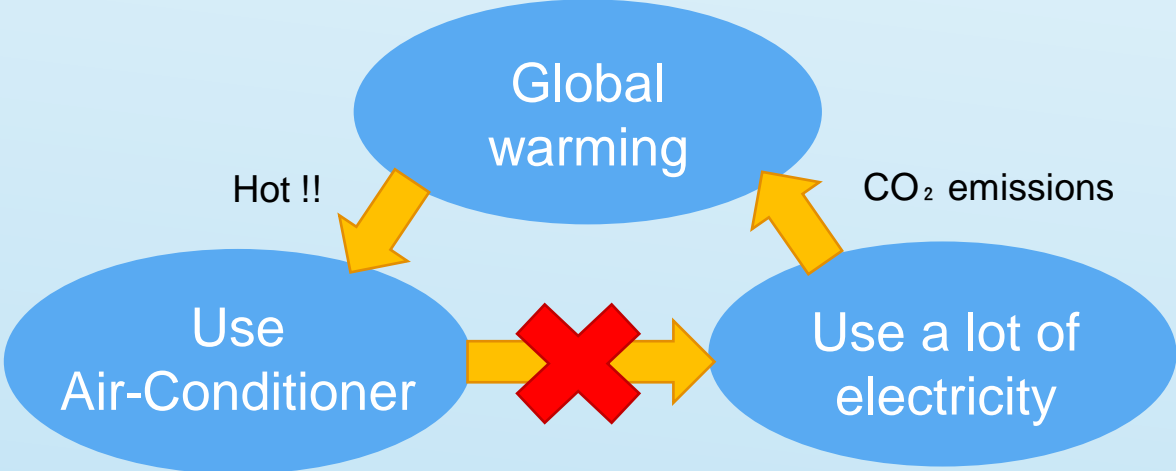
To Stop the Negative Cycle

Individuals need to save electricity



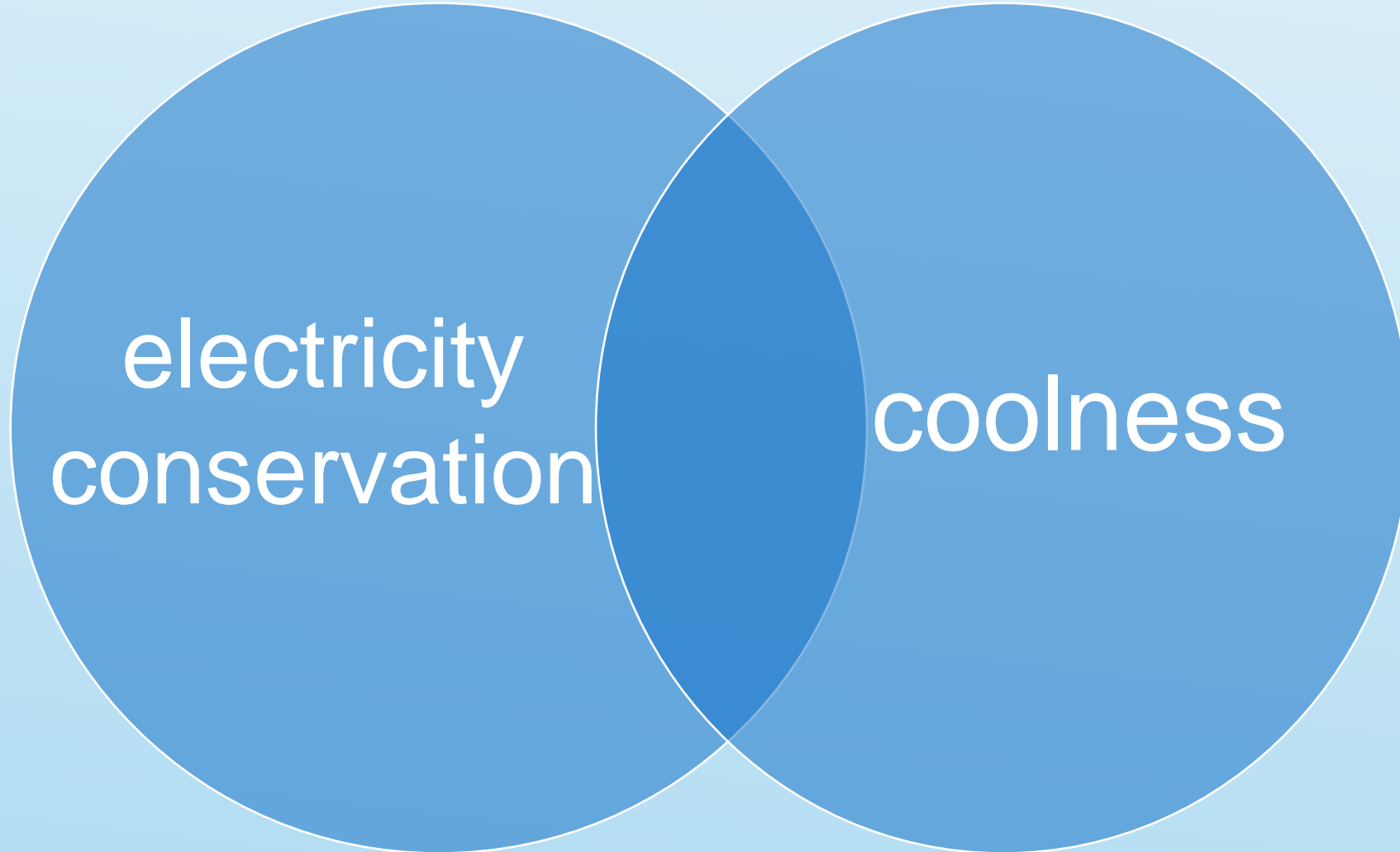
10% power consumption when
set to 26°C **BUT** it goes up ↻

Want to keep cool in terms of heat stroke !



authority: ITmediaNEWS,
<https://www.itmedia.co.jp/news/articles/2203/22/news114.html#:~:text=%E3%82%A8%E3%82%A2%E3%82%B3%E3%83%B3%E3%81%AE%E7%AF%80%E9%9B%BB%E6%96%B9%E6%B3%95%E3%81%A8%E3%81%97%E3%81%A6,%E3%81%AE%E5%AF%BE%E7%AD%96%E3%82%92%E7%B4%B9%E4%BB%8B%E3%81%97%E3%81%9F%E3%80%82>

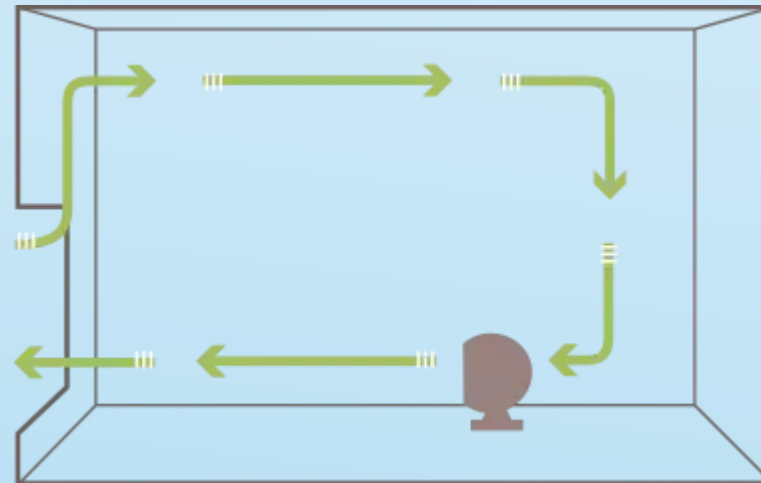
Target



Experiments in Japan

[Hypothesis]

① The circulator should be facing outward



authority : Iris Plaza
<https://www.irisplaza.co.jp/media/A13904790995>

② The placebo effect may make you feel cooler

Experiments in Japan

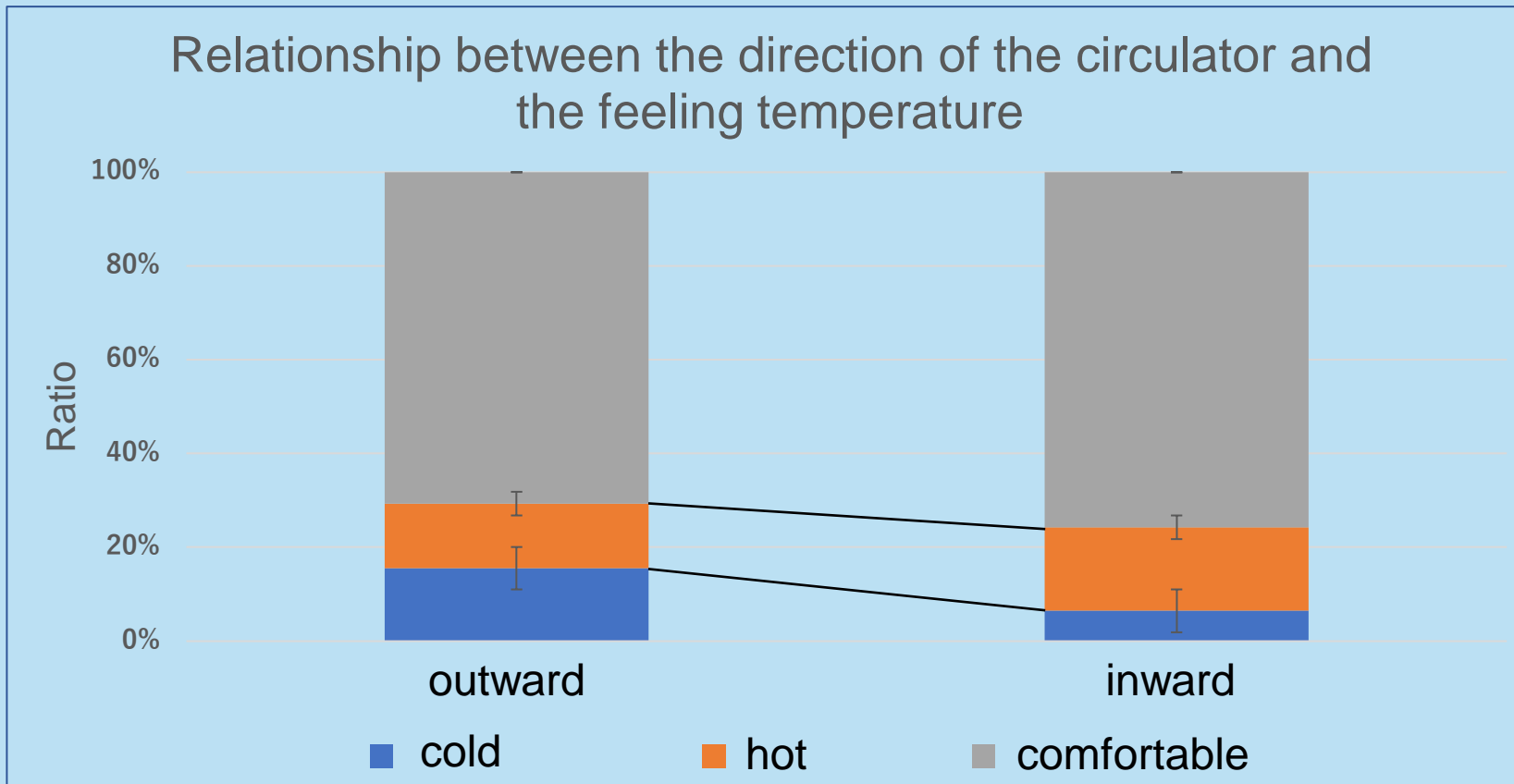
[method]

We set the room temperature at 26°C or 28°C in five of our classrooms.

- ① Place a circulator near the window facing outward or inward.
- ② The room temperature was not told or was told as 26 or 28°C. (Only setting at 28°C)

A control experiment was conducted under these conditions, and the participants responded to a questionnaire.

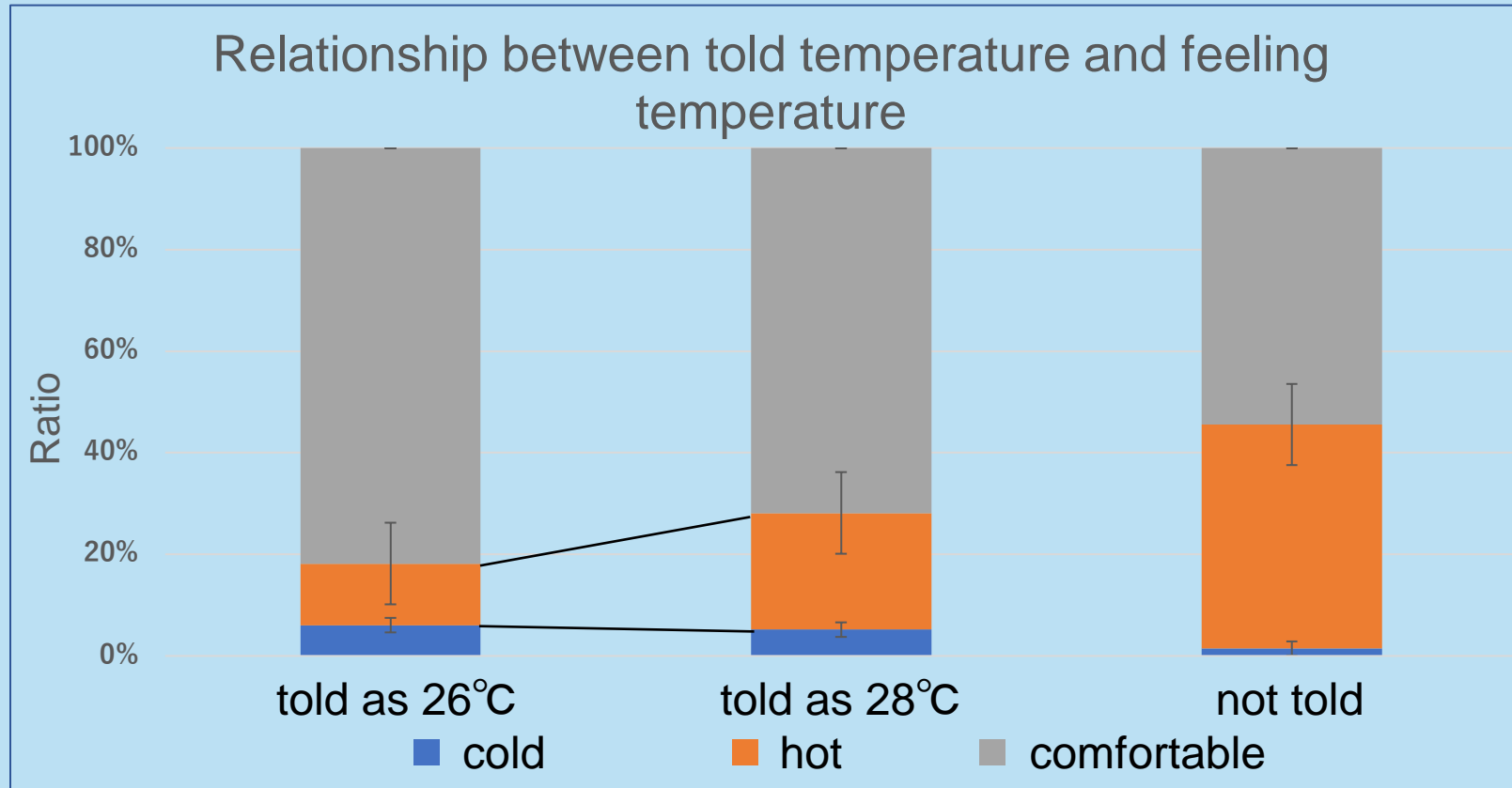
Results and Discussion①



Outward : "hot" people decreased and "cold" people increased

→ Cooler if the circulator is facing outward

Results and Discussion②



When told as 28°C, “hot” people increase and “comfortable” people decrease compared to 26°C
→ When the told temperature is low, more people feel [comfortable](#)

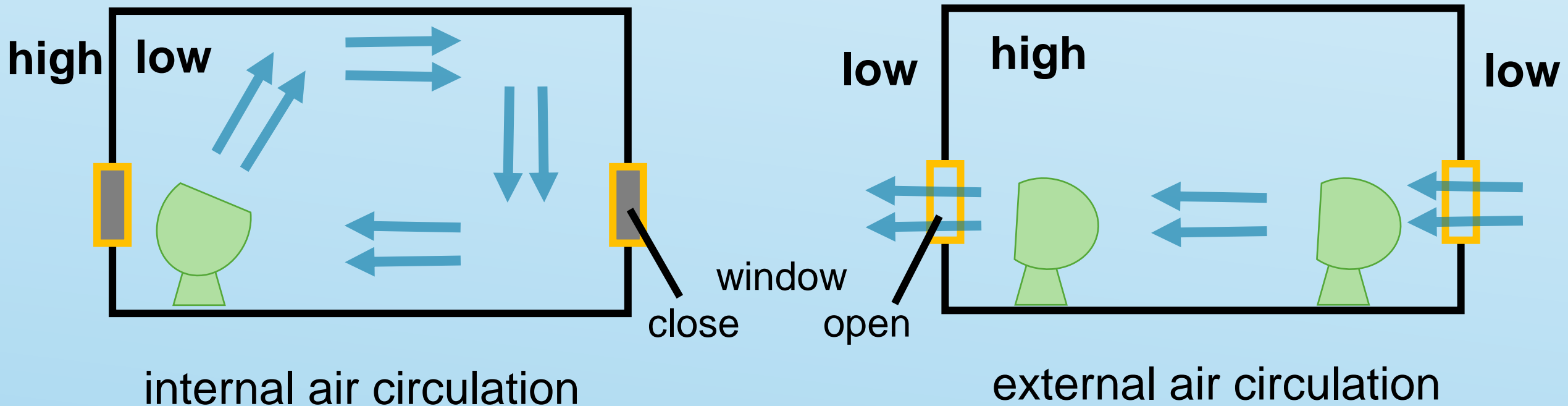
The placebo effect may be observed.

Conclusion in Japan

- ① Cooler if the circulator is facing outward
- ② Placebo effect likely to make you feel cooler

Application to the World

- ① Circulate air {
- internal air circulation (outside > inside)
 - external air circulation (inside > outside)



Application to the World

② Placebo effect

Adopt and effective in any region

③ Use dry function in humid area

Low humidity

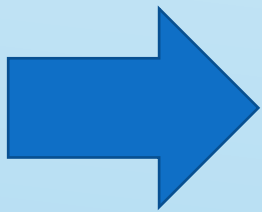
→ Low feeling temperature

authority: Panasonic,
<https://panasonic.jp/life/air/170014.html>

Future Outlook

We don't yet know if its application to the world will be effective

→Conduct experiments in areas with different humidity, daylight and wind levels.



Create role models

Thank you for listening