Cool Conclave 2024

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International Forum for Environment, Sustainability & Technology (iFOREST)
New Delhi, India

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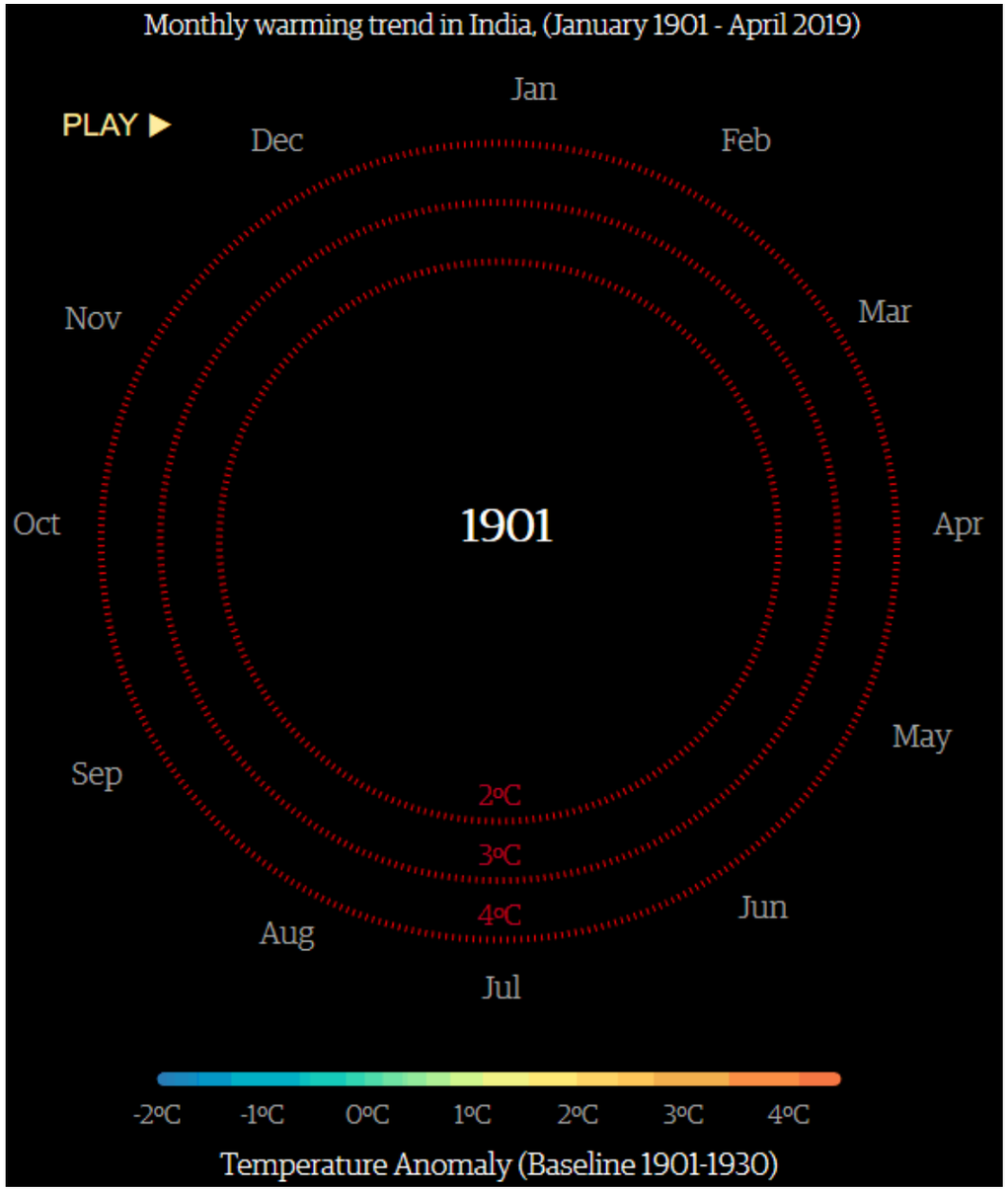
INTERNATIONAL FORUM FOR ENVIRONMENT, SUSTAINABILITY & TECHNOLOGY

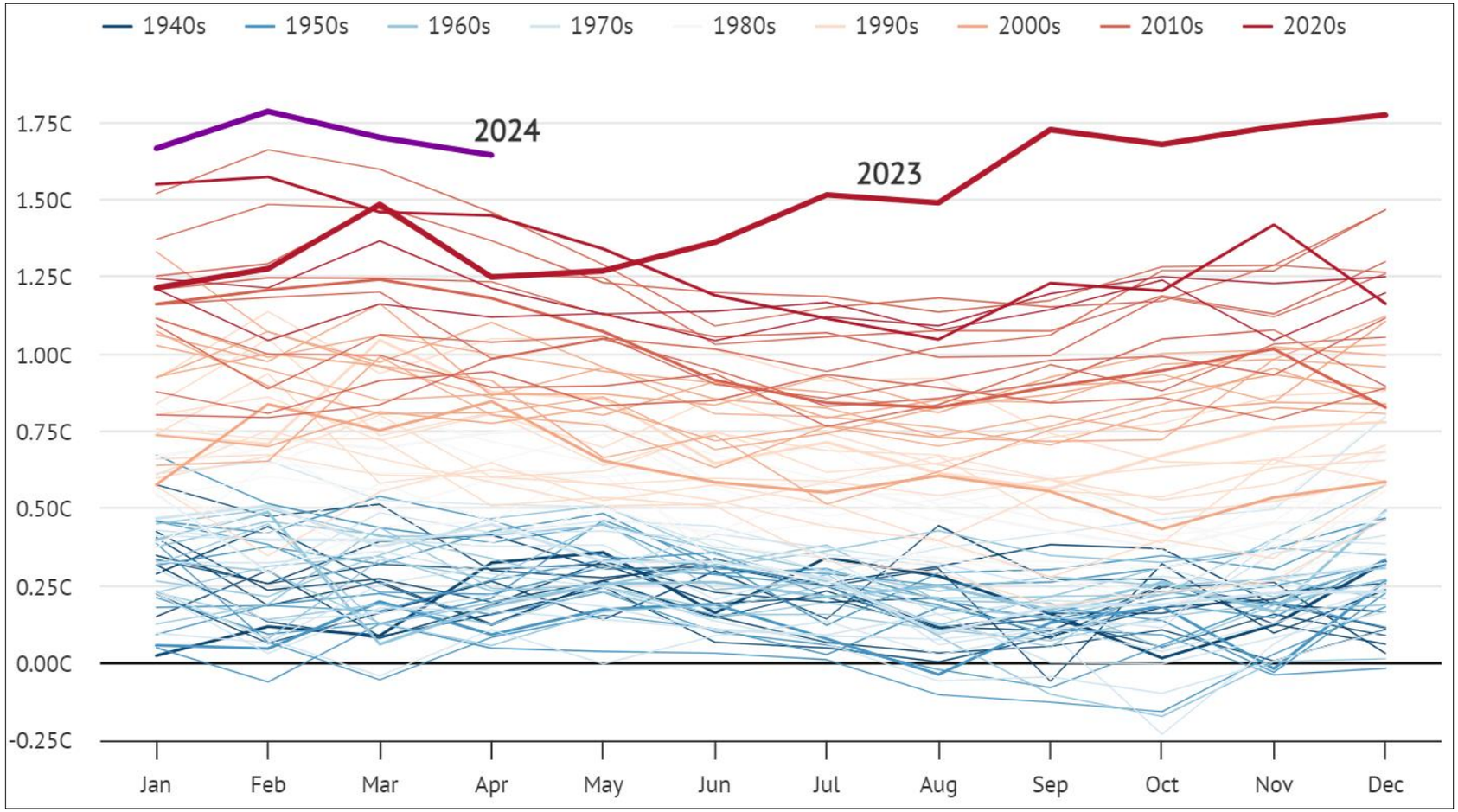
Spiraling Temperatures



Increasing Global Temperatures

2023
1.45°C above the pre-industrial baseline, the hottest year on record.

2024 – 2030
High probability of surpassing the 1.5°C guardrail.

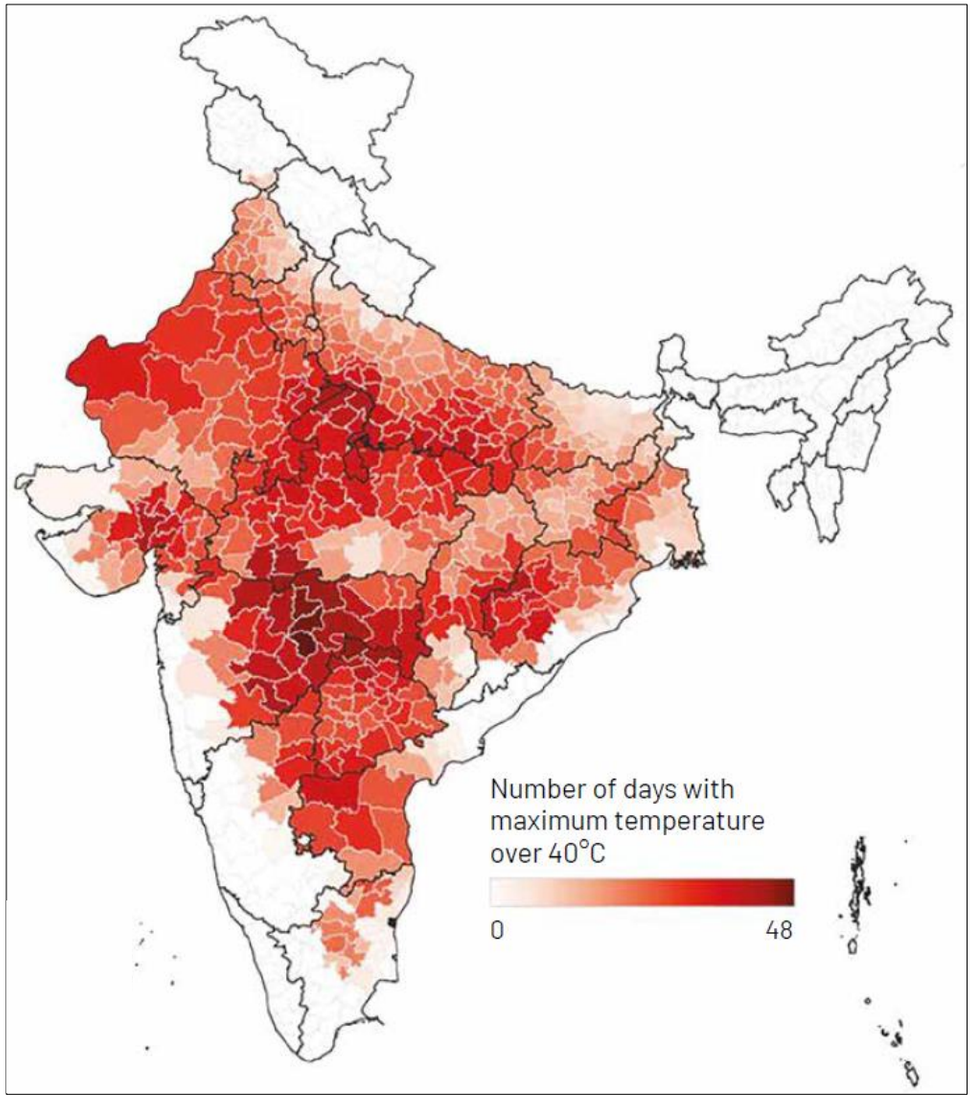


Monthly global average temperature anomaly from the 1940s to 2024

Increasing Temperatures in India

Unprecedented Heat Extreme in India in April-July 2024

- Temperatures during this period reached 50°C, with a night-time low of 37°C, the highest ever recorded.
- It left at least 40,000 people with heatstroke and over 100 dead (an underestimation).
- During April and May, over 500 of the 741 districts in India, 70% of the total districts, reported a daily maximum temperature of 40°C at least once.



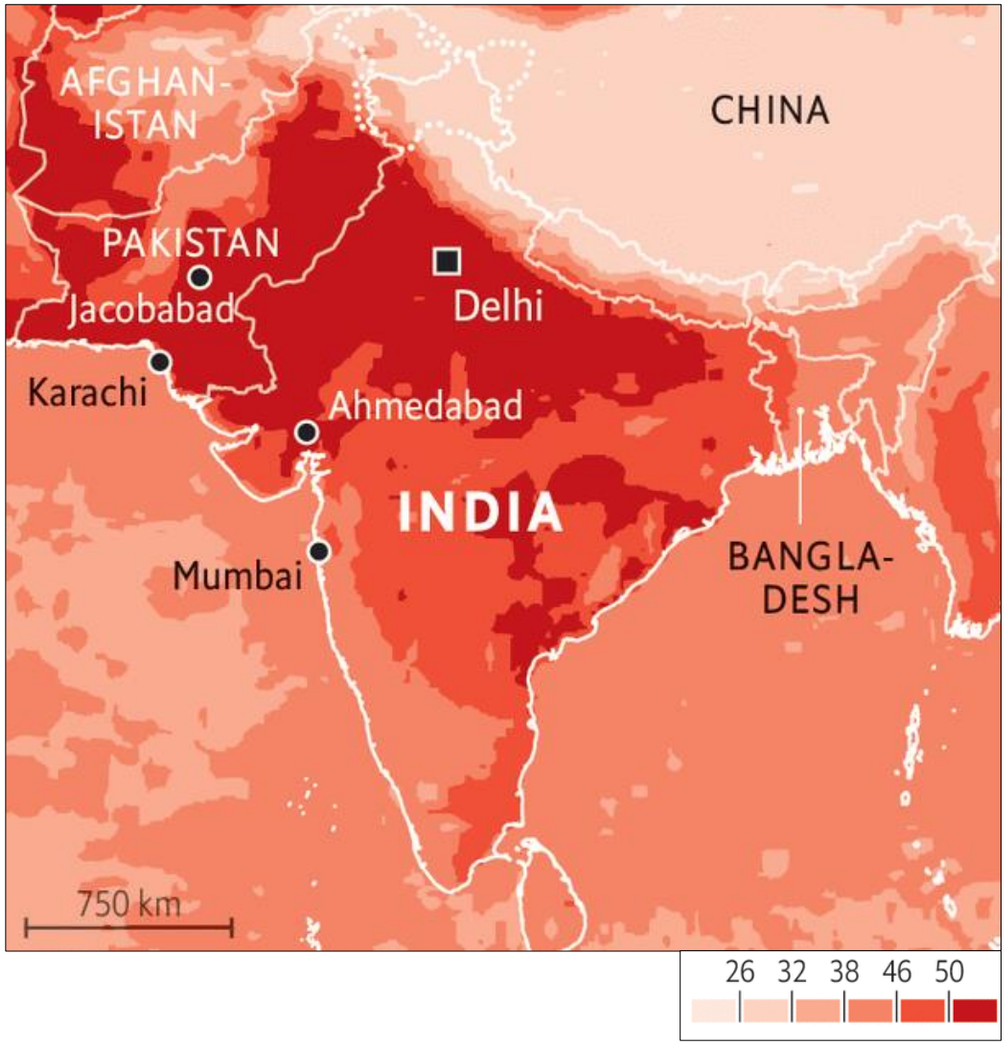
Number of days with maximum temperature over 40°C

Increasing ‘Feels Like’ Temperature in India

Sustained exposure to a wet-bulb temperature of 35°C is considered fatal.

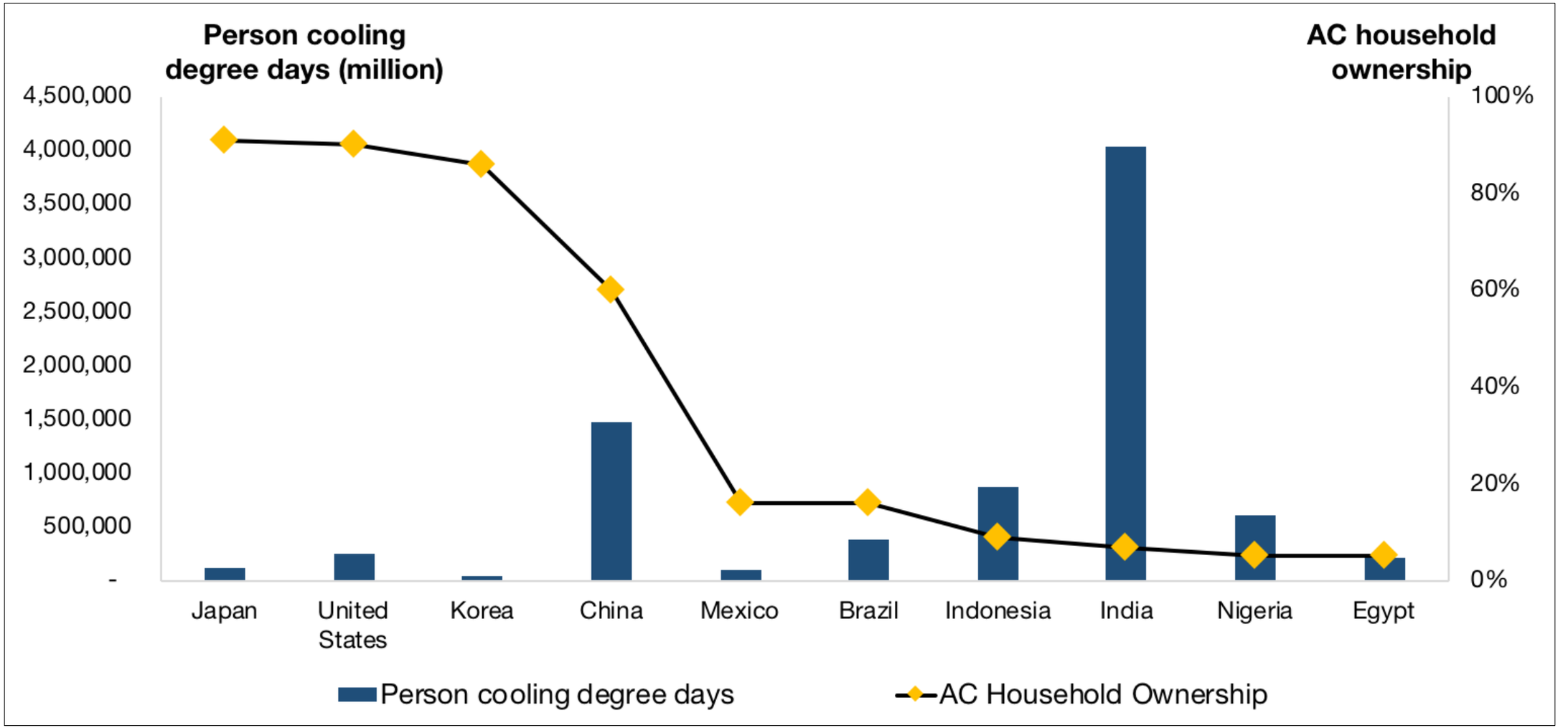
India could become one of the first places where wet-bulb temperatures routinely exceed the 35°C survivability threshold.

Due to high temperatures and high humidity in several regions of India, the heat index repeatedly reaches up to 50°C, which is well above the survivability threshold.



Maximum ‘Feels Like’ Temperature, 1980-2021 in °C

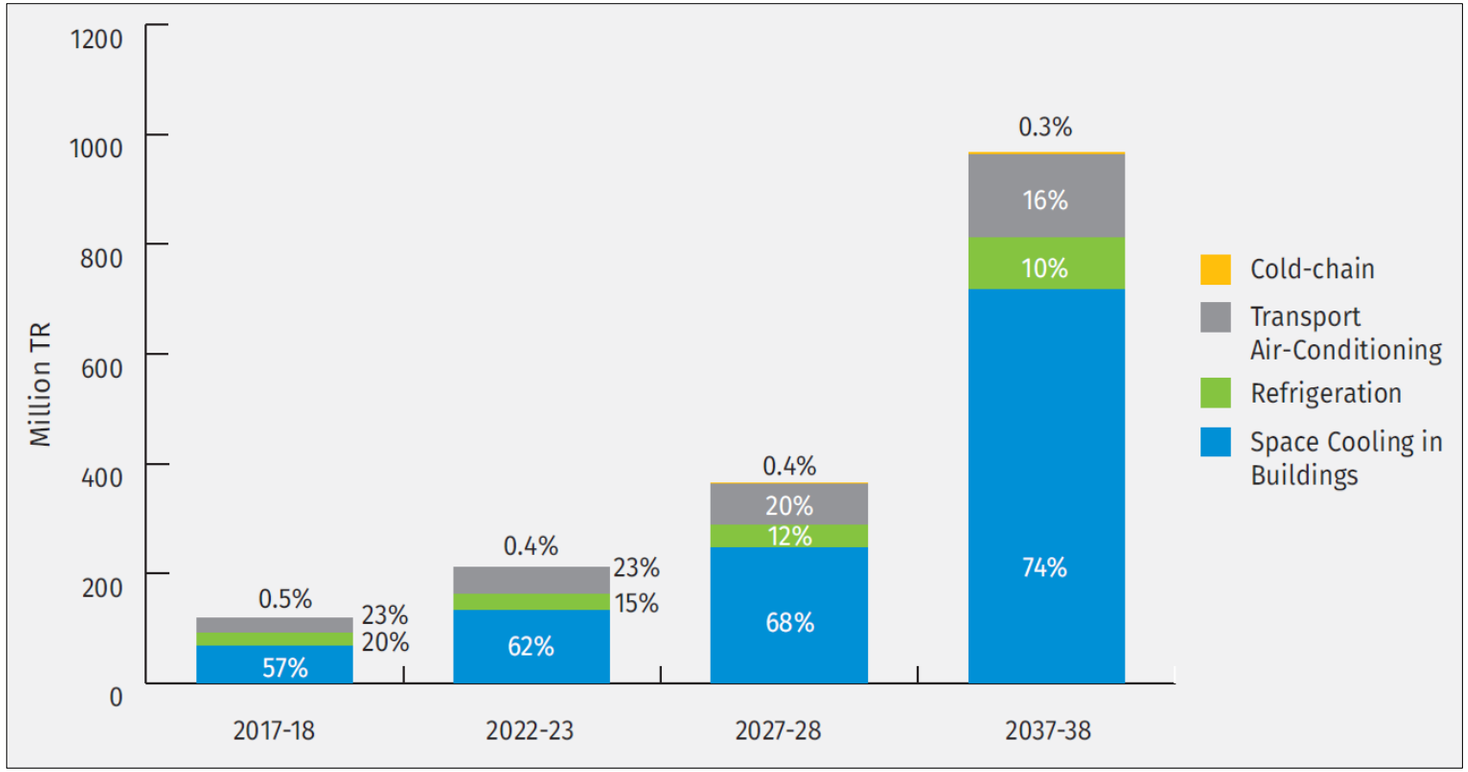
Cooling Requirements in India



The Cooling Challenge – India

The aggregate cooling demand is projected to grow around **8 times** by 2037-38 as compared to the 2017-18 baseline.

- The space cooling in buildings shows the most significant growth at nearly **11 times**
- The cold-chain and refrigeration sectors will grow around **4 times**
- The transport air-conditioning will grow around **5 times** the 2017-18 levels.



Sector-wise Growth in Cooling Demand

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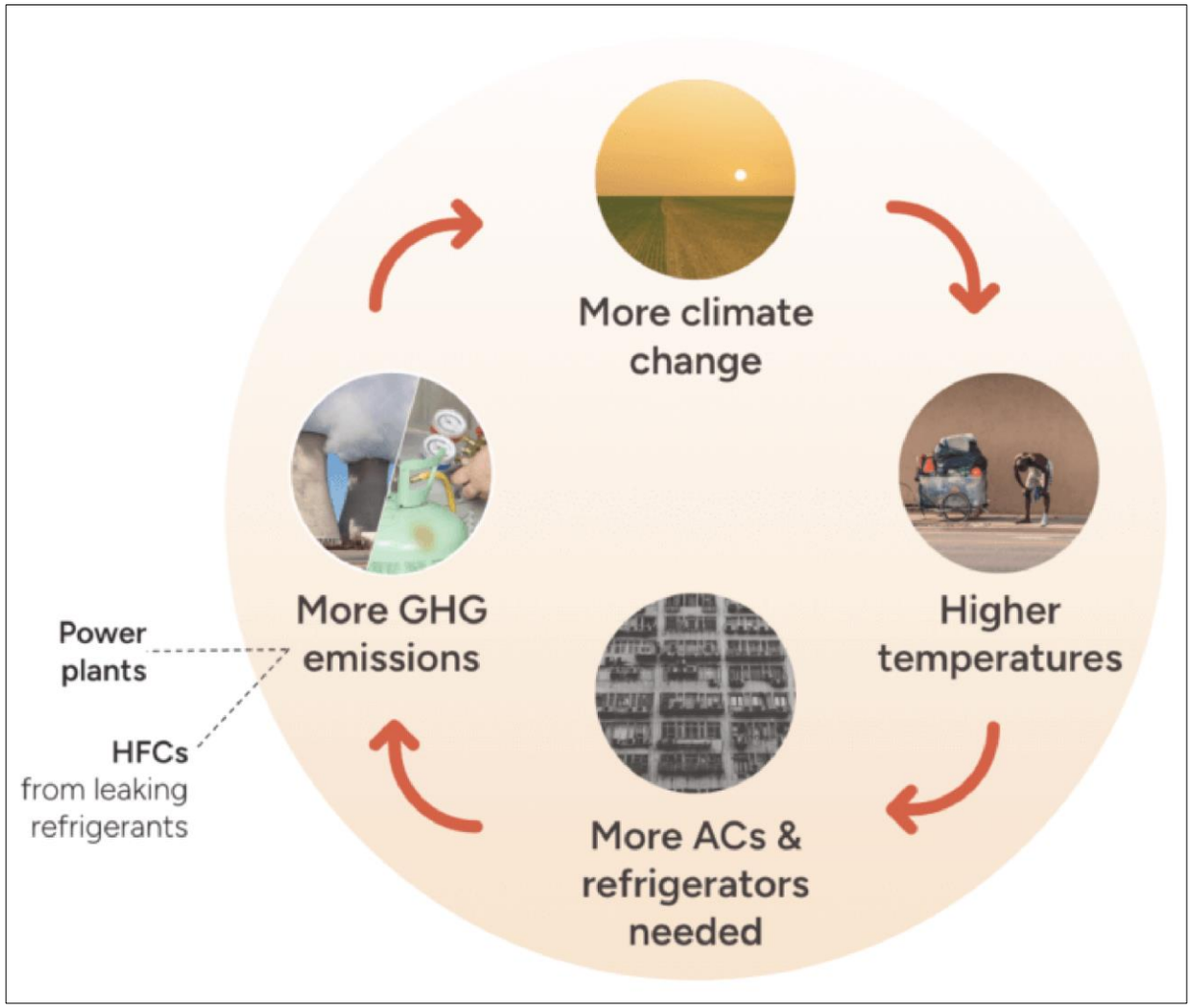
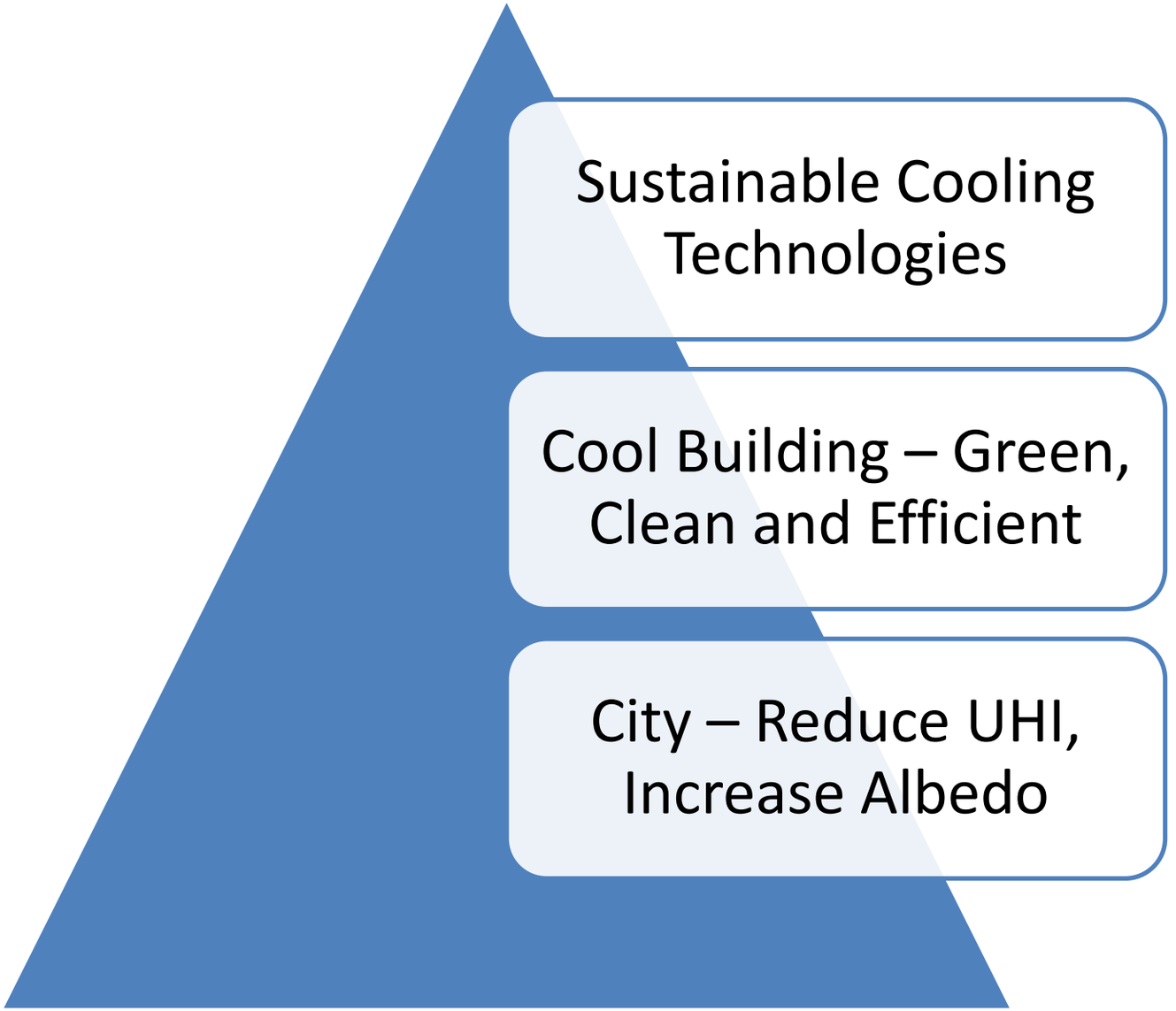
Vicious Cycle of Heat and Cooling

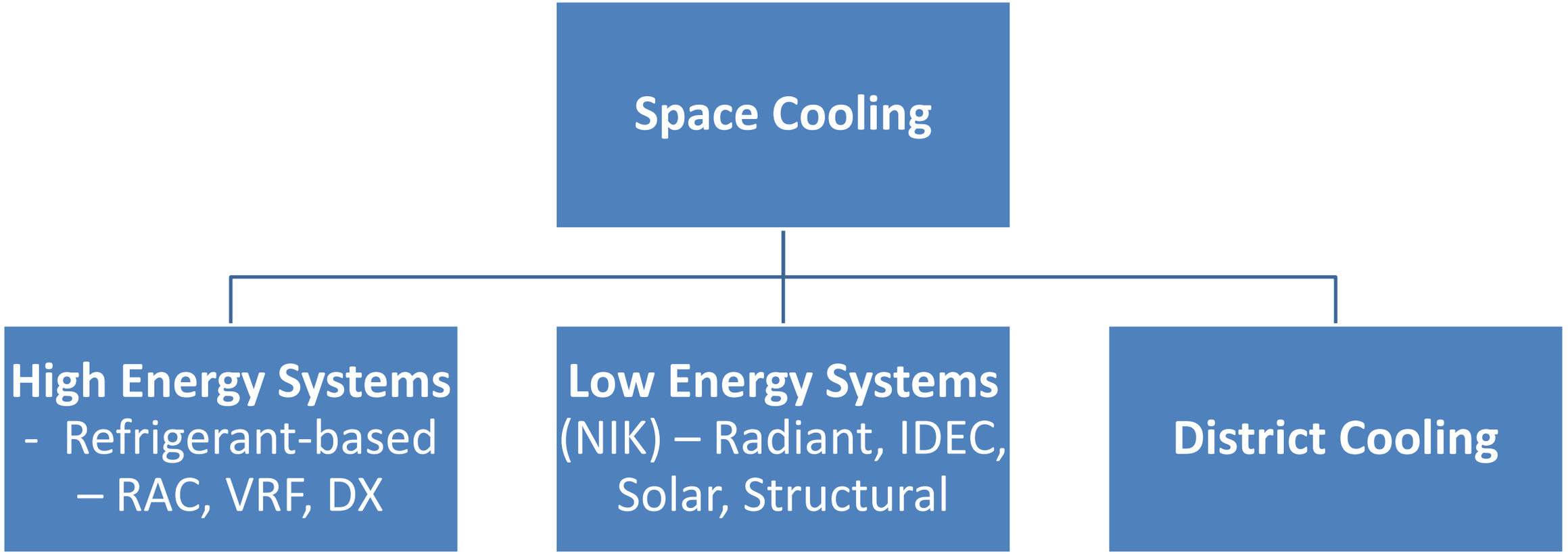


We must break this cycle and transform how we cool.

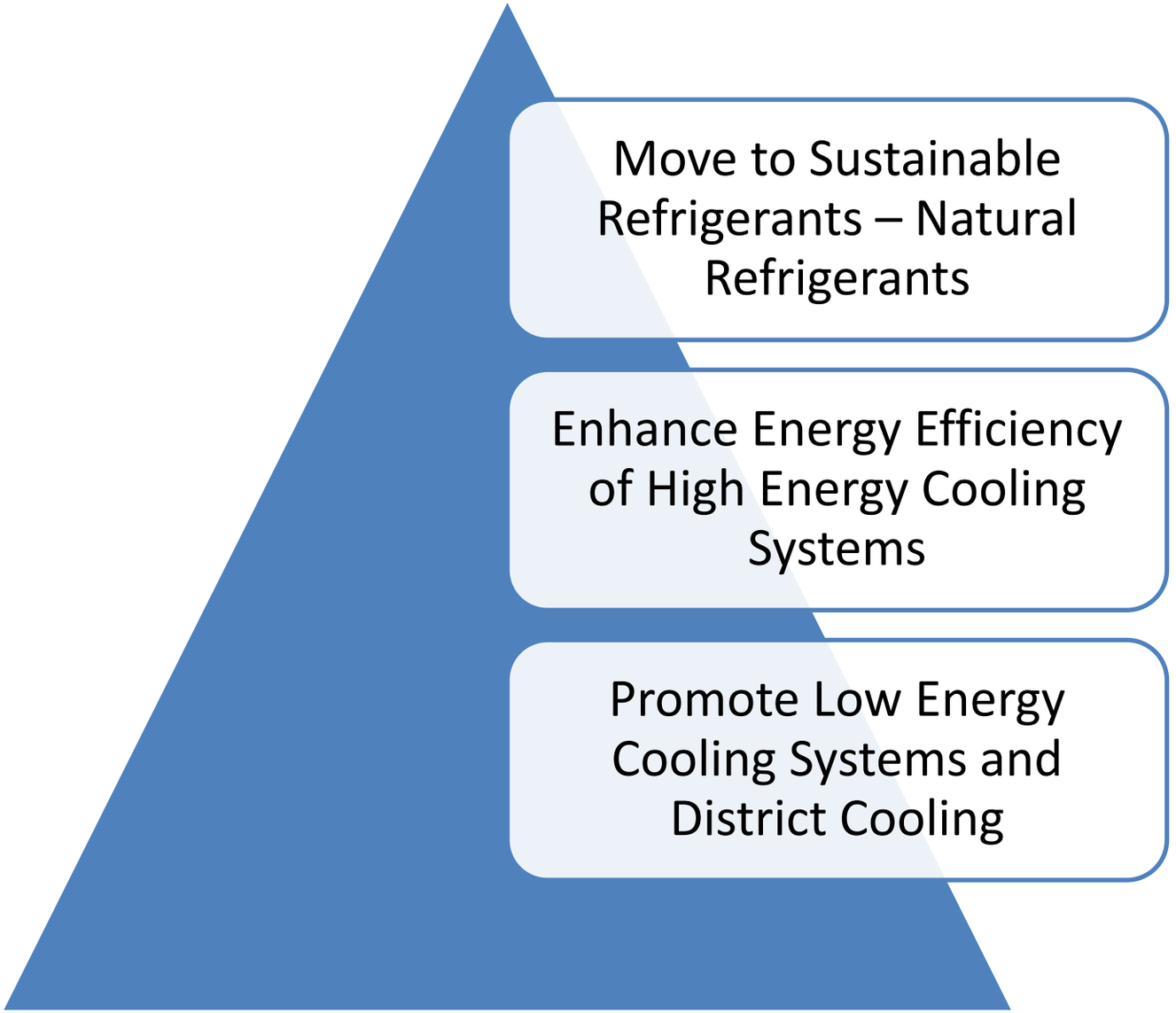
Cooling Strategy



Cooling Technologies



Sustainable Cooling Technologies



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Why Natural Refrigerants?

- Low-GWP values, typically less than 10.
- Little to no effect on the environment, unlike HFOs whose degradation products persist in water bodies - TFAs.
- Patent-free technology, that prevent monopoly and drive down costs.
- Safety standards for R-290 and Ammonia released by BIS.
- 77% ACs can be converted to natural refrigerant with the existing technology = emission saving of 50 $MTCO_2e$/ year between 2025 and 2030.

A Make in India Agenda

Green Cooling Agenda

- **Cool through interventions at city and building levels**
  - City Heat and Cooling Action Plans
  - Green building bye-laws

- **Diversify cooling technologies**
  - Continued reliance on High Energy Cooling Systems has huge resource and ecological costs

- **Recognize cooling as an equity issue**
  - Cooling for everyone