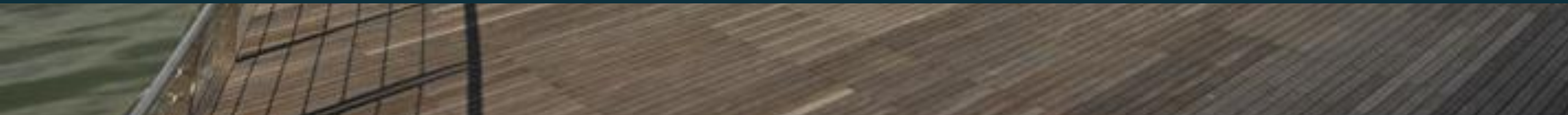





Transforming urban spaces
through innovative deep cooling technology



OUR WORLD IS **CHANGING**

 **34°C**
THE NEW NORM

 **4.6°C**
END OF CENTURY

INCREASING
THERMAL DISCOMFORT & HEAT STRESS

THE PROBLEM WITH EXISTING COOLING SOLUTIONS

Existing technologies are not the solution to improving thermal comfort in the ever-warming climates because they are **energy intensive, unsustainable, impractical** and have **limited cooling impact**



AIR CONDITIONING

- Not tenable for outdoor spaces
- Creates heavy waste heat load
- Adds to urban heat effect in the city



MISTING SYSTEMS

- Condenses instead of cooling
- Limited tangible cooling
- High maintenance

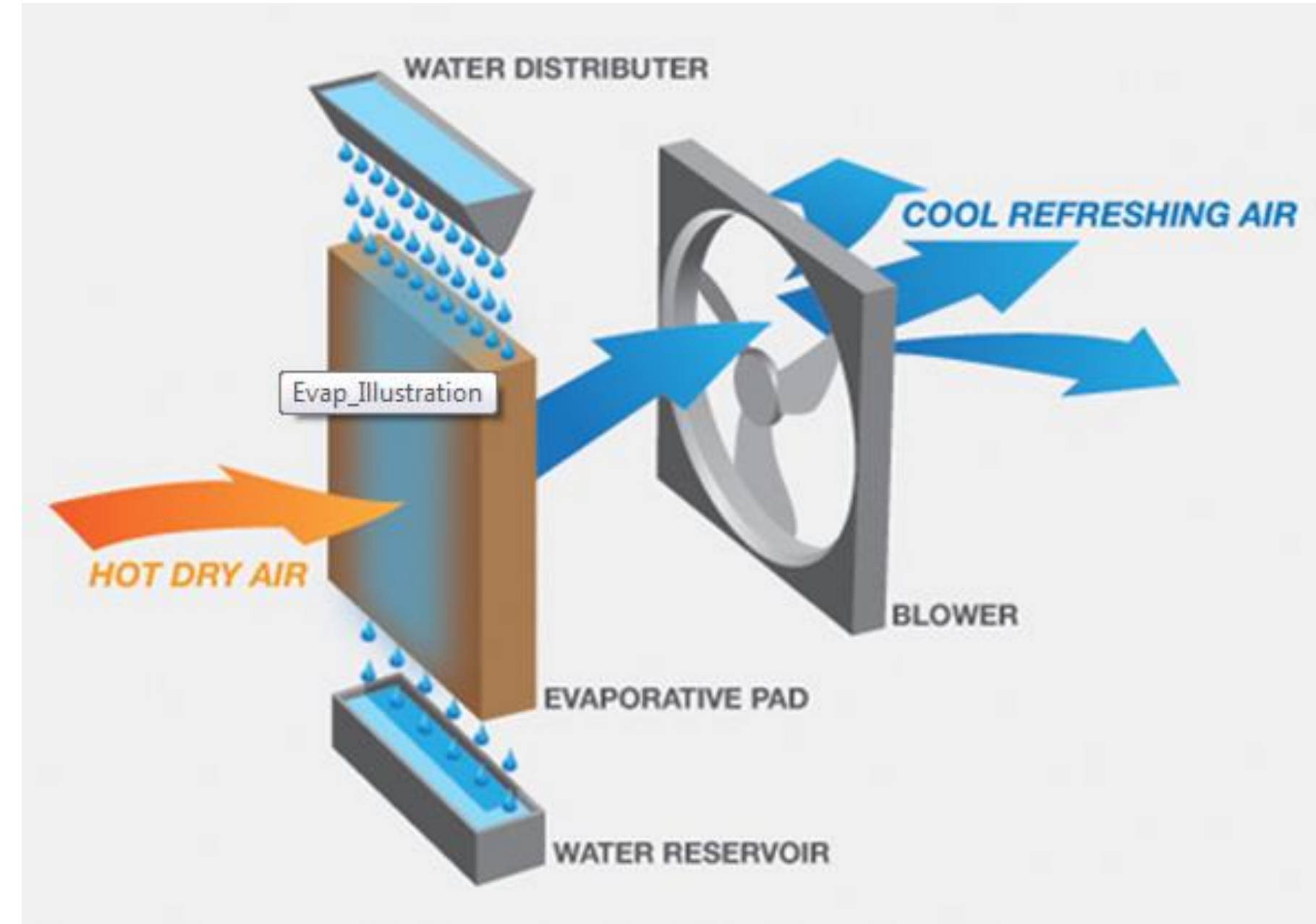


EVAPORATIVE COOLERS

- Limited tangible cooling
- Impractical maintenance in humid conditions
- Poor efficiency material, leading to a bulky footprint

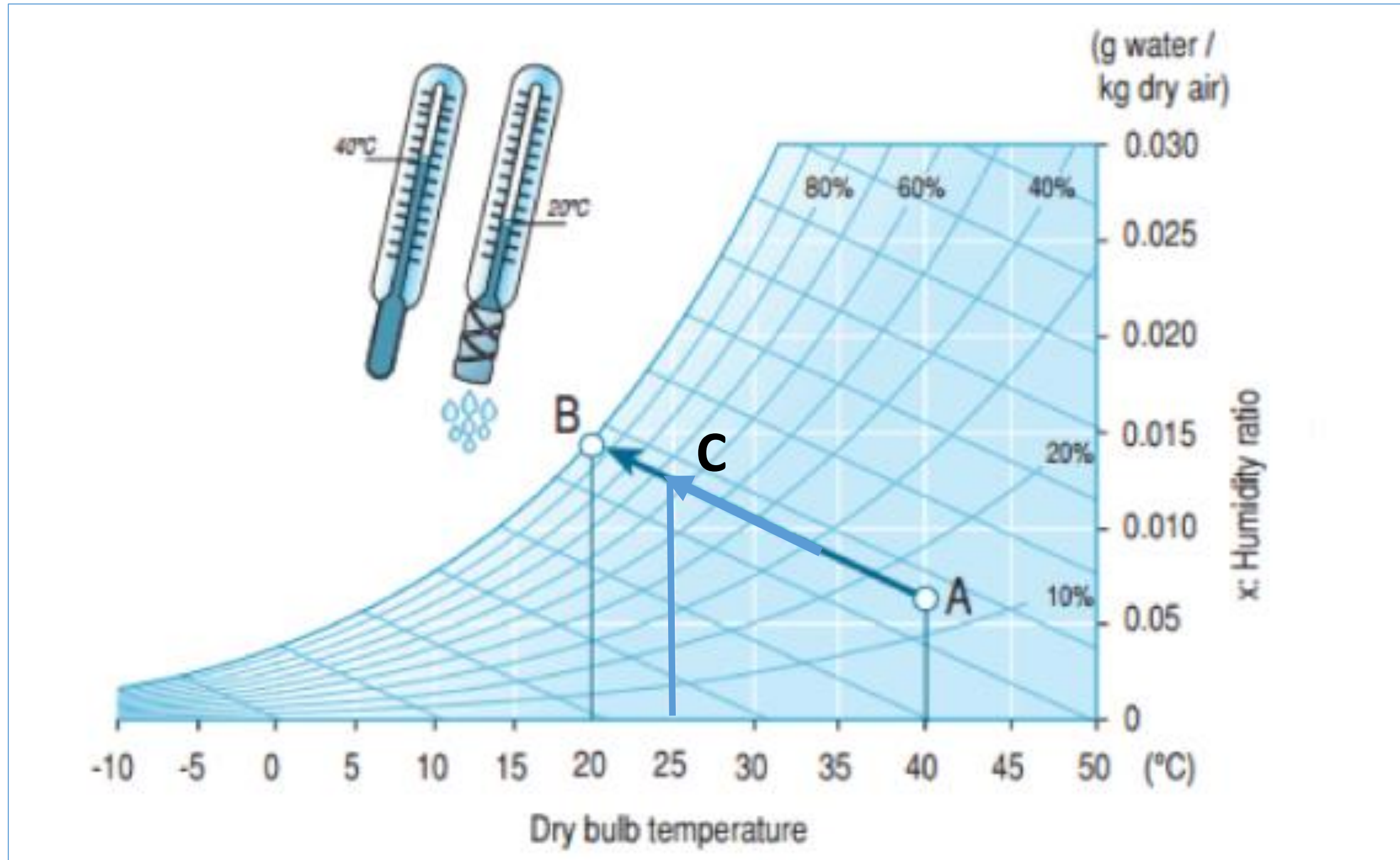
WHAT IS EVAPORATIVE COOLING

Adiabatic cooling through evaporation of water



WHAT IS EVAPORATIVE COOLING

Adiabatic cooling through evaporation of water




Cooling performance:

$$\text{Wet Bulb Efficiency} = \frac{T_A - TC}{T_A - TB}$$

WHAT IS EVAPORATIVE COOLING

Adiabatic cooling through evaporation of water



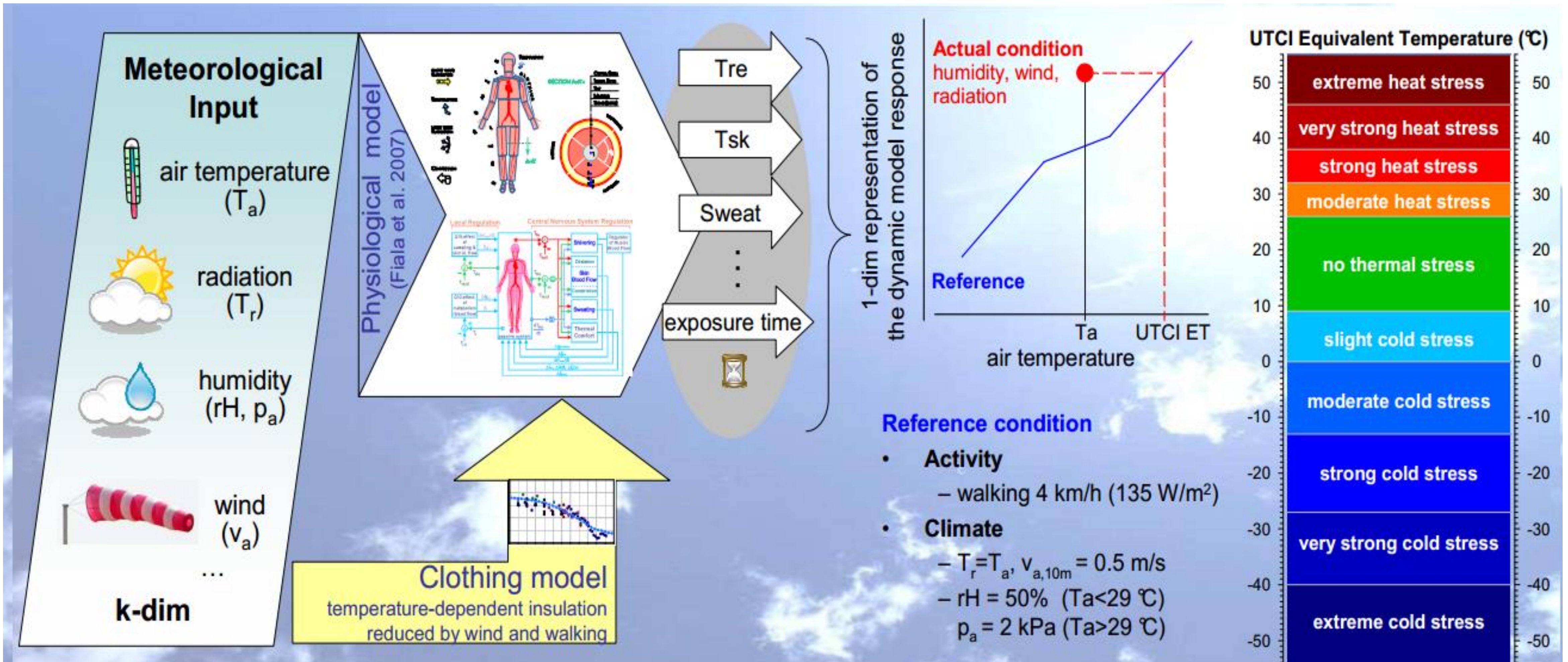
Wet bulb efficiency: 40-60%
(34C/50% RH → 30.5 -27.1C)



Wet bulb efficiency: 60-80%
(34C/50% RH → 28.9 - 27.1 C)

Universal Thermal Comfort Index (UTCI)

Using an advanced thermal-physiological index valid in all climates, seasons and scales, independent of persons' characteristics as a basis for comfort improvement





Deep cooling revolutionised

The world's coldest
portable evaporative cooler



AIRBITAT
SMART COOLER

FEEL THE REVOLUTION

Revolutionary

Cooling performance from 24°C in hot and humid climates

Energy-efficient:

Use up to 80% less energy than air conditioning

Eco-friendly:

Sustainable cooling with negligible waste heat



The Airbitat Advantage

Competitive Advantage (vs. Other Evaporative Coolers)



Utilizes patented cooling technology to achieve:

115% WET-BULB EFFICIENCY
70% FOR EXISTING COOLERS

- Achieving unprecedented outdoor temperatures in drier regions
- The only effective outdoor cooler in tropical regions (Hot & Humid)



AUTOMATED OPERATIONS

WITH SMART CONTROL FUNCTIONS

- Automatic start-up, shut-down
- Self-maintaining capabilities
- Remote monitoring
- Weather-sensitive operations
- Internet-based dash-board control



COOL AIR FROM

24°C

PERFORMANCE COMPARISON

AMBIENT CONDITIONS

34°C **50%**

TEMP RH

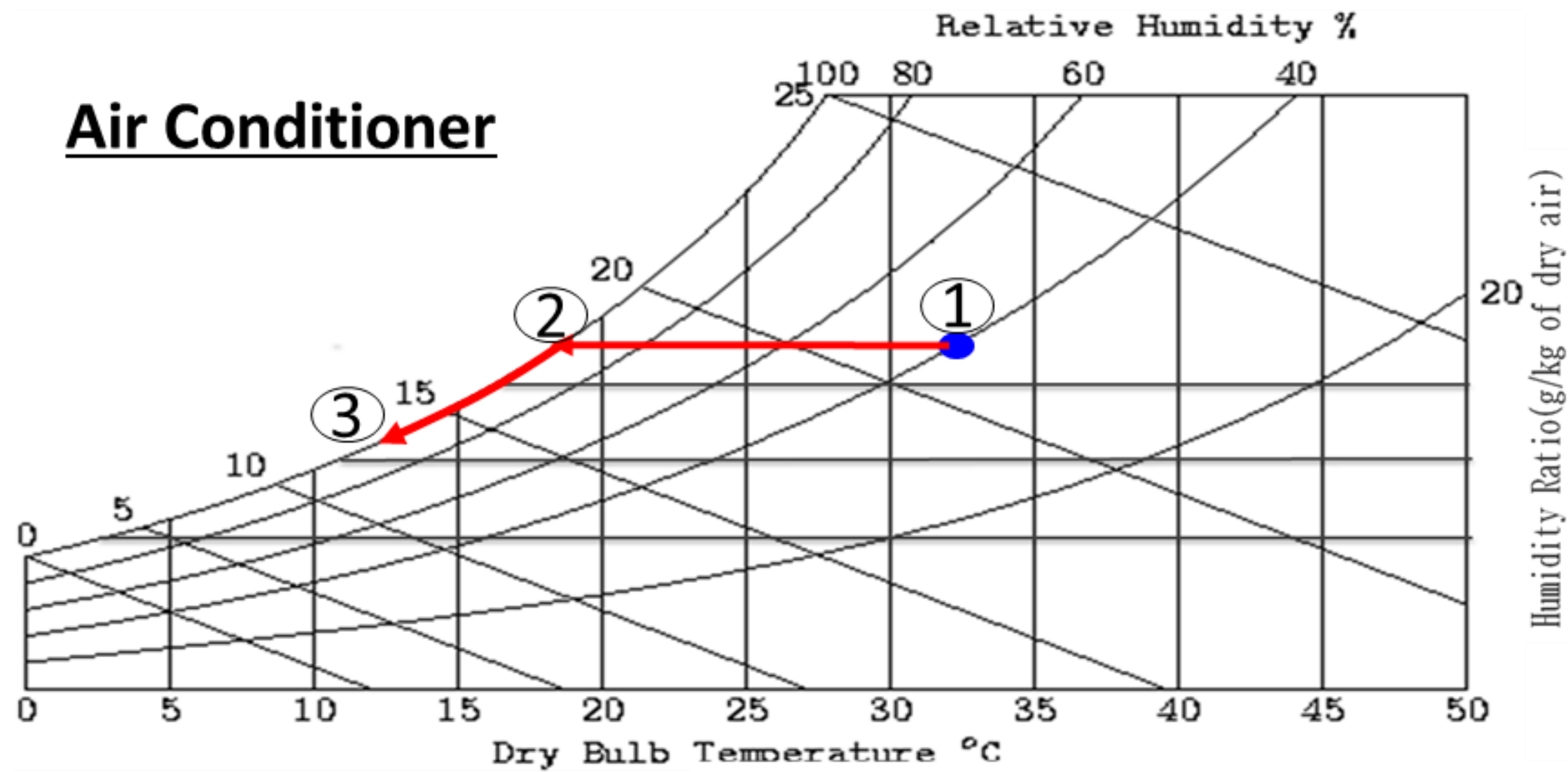
SINGAPORE MIDDAY CONDITIONS

28°C

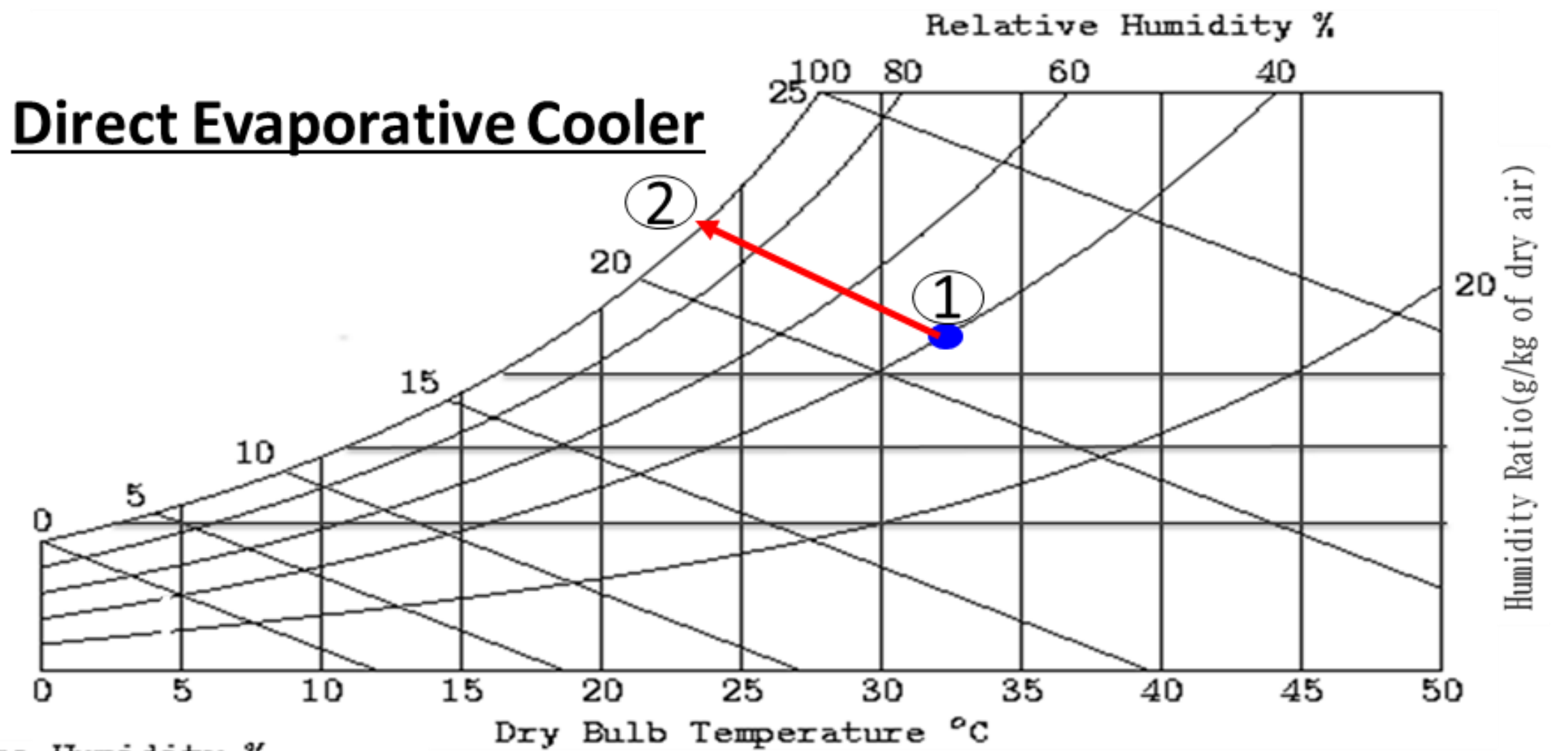
PERFORMANCE OF COMPETITORS UNDER SIMILAR CONDITIONS

Psychrometric Chart -Examples

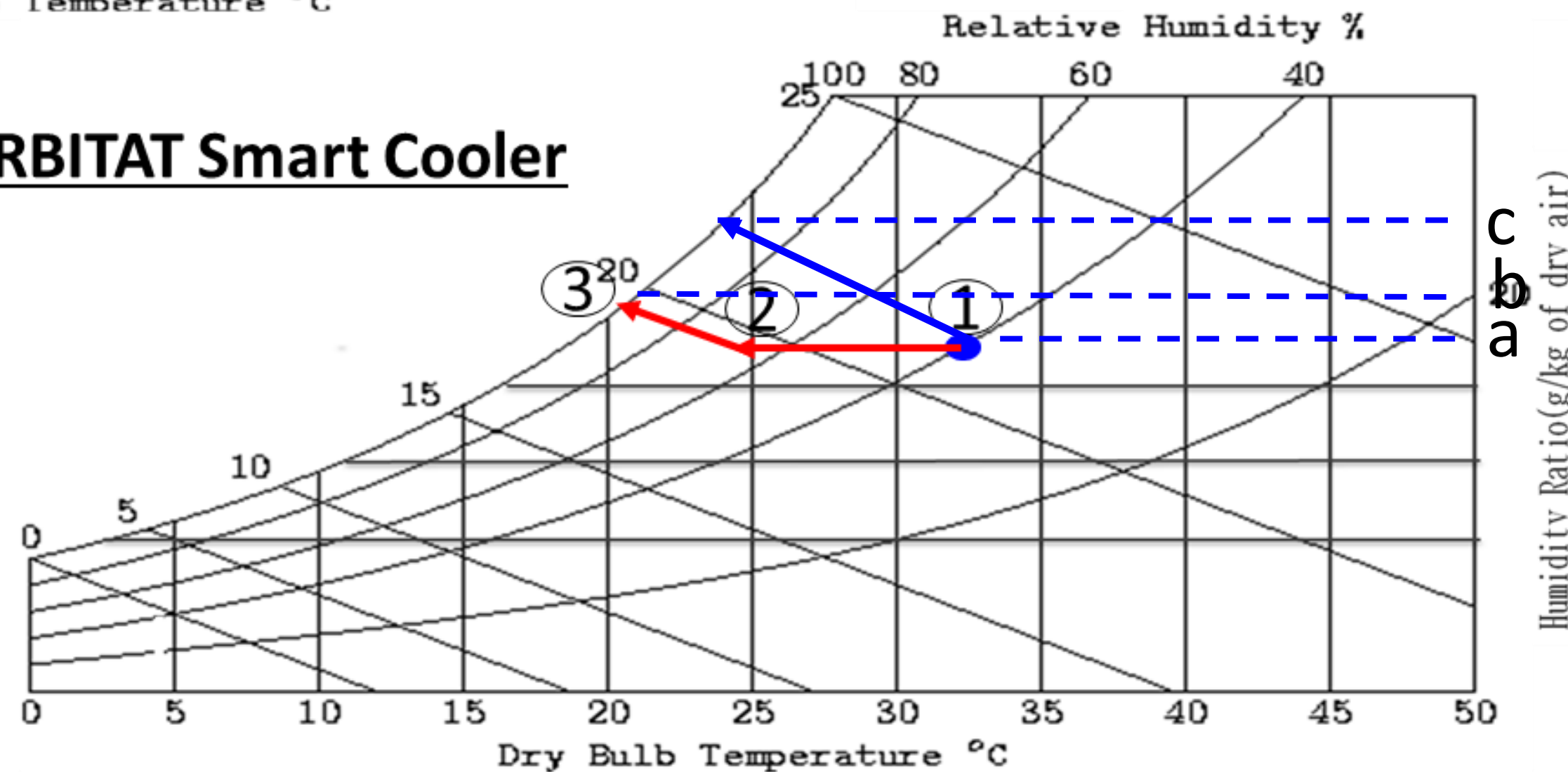
Air Conditioner



Direct Evaporative Cooler



AIRBITAT Smart Cooler



- Produces much colder air than conventional EC
- Adds much less water into the air than conventional EC
- In overall, to produce much better quality air than conventional EC



AIRBITAT IN ACTION

Transforming urban spaces

AIRBITAT CITY COOLER

Transforming working environments



City Cooler @ Industrial Space

- 8 Airbitat Smart Coolers deployed at SATS Aero Laundry
- Existing conditions on the ground averages at 34-36 °C due to heavy heat load from machinery
- Airbitat City Cooler achieved a consistent 8-10°C temperature drop (from 34°C to 24°C)

AIRBITAT CITY COOLER

Transforming outdoor event space with spot cooling

- Cooling of F1 hospitality suites
- 30 over City Coolers deployed
- Very positive feedback



AIRBITAT CITY COOLER

Transforming urban spaces



CHIJMES



Civil Service Club



Gardens by the Bay



Singapore Zoo



Resort World Sentosa



Pioneer Polyclinic



AIRBITAT OASIS SMART BUS STOP

Cool Comfort

Experience cool breezes from **24°C** within the bus stop

Breathe Fresh Air

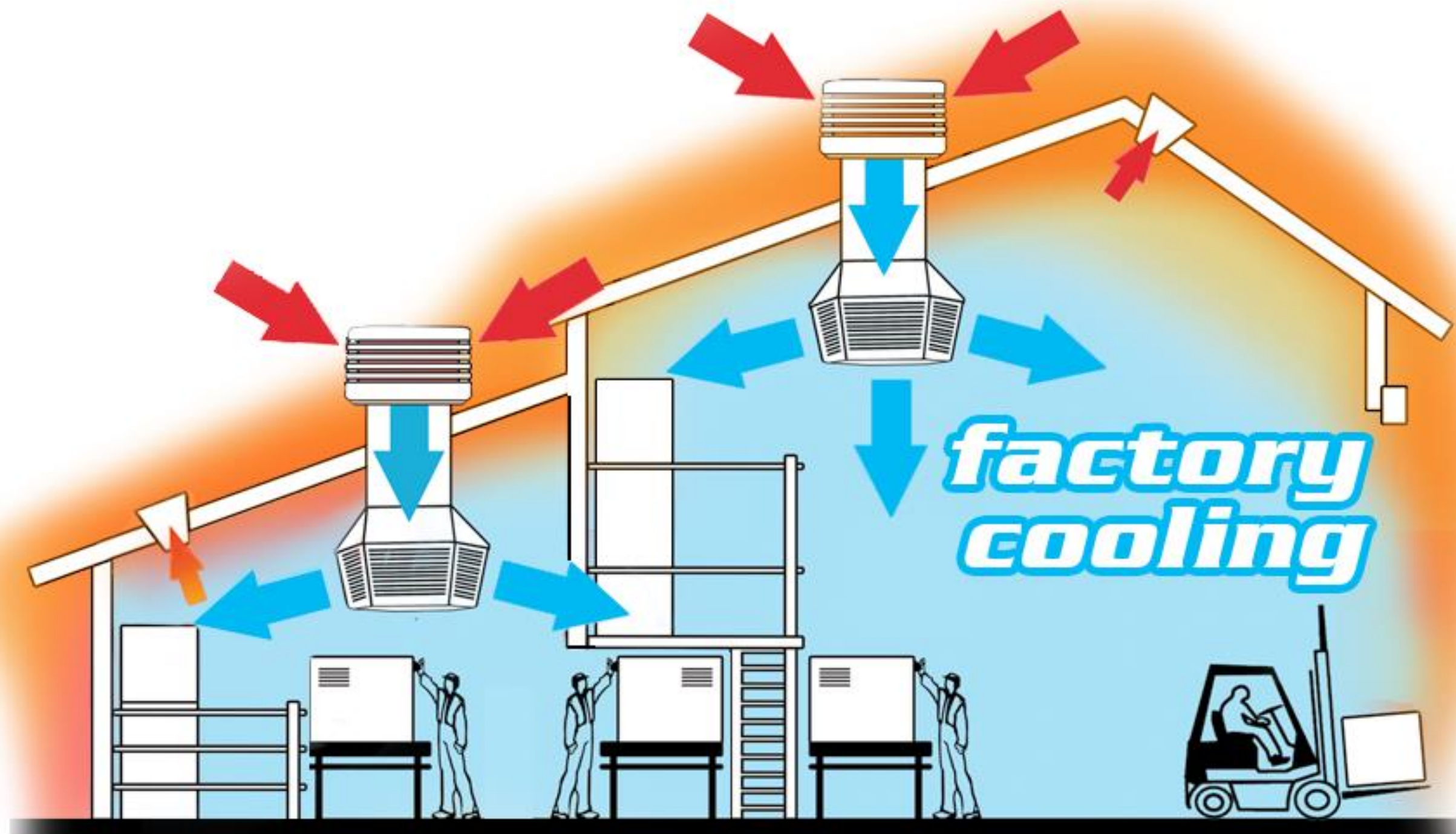
Filters out **harmful airborne particles** and actively supplies fresh air

Smart Sense

Tracks commuter average waiting time and commuter flow to help **better inform bus operations**

OTHER APPLICATIONS & CHALLENGES

EVAPORATIVE COOLING FOR INDOOR



Affordability Ventilation Health Concern

EVAPORATIVE COOLING FOR INDOOR

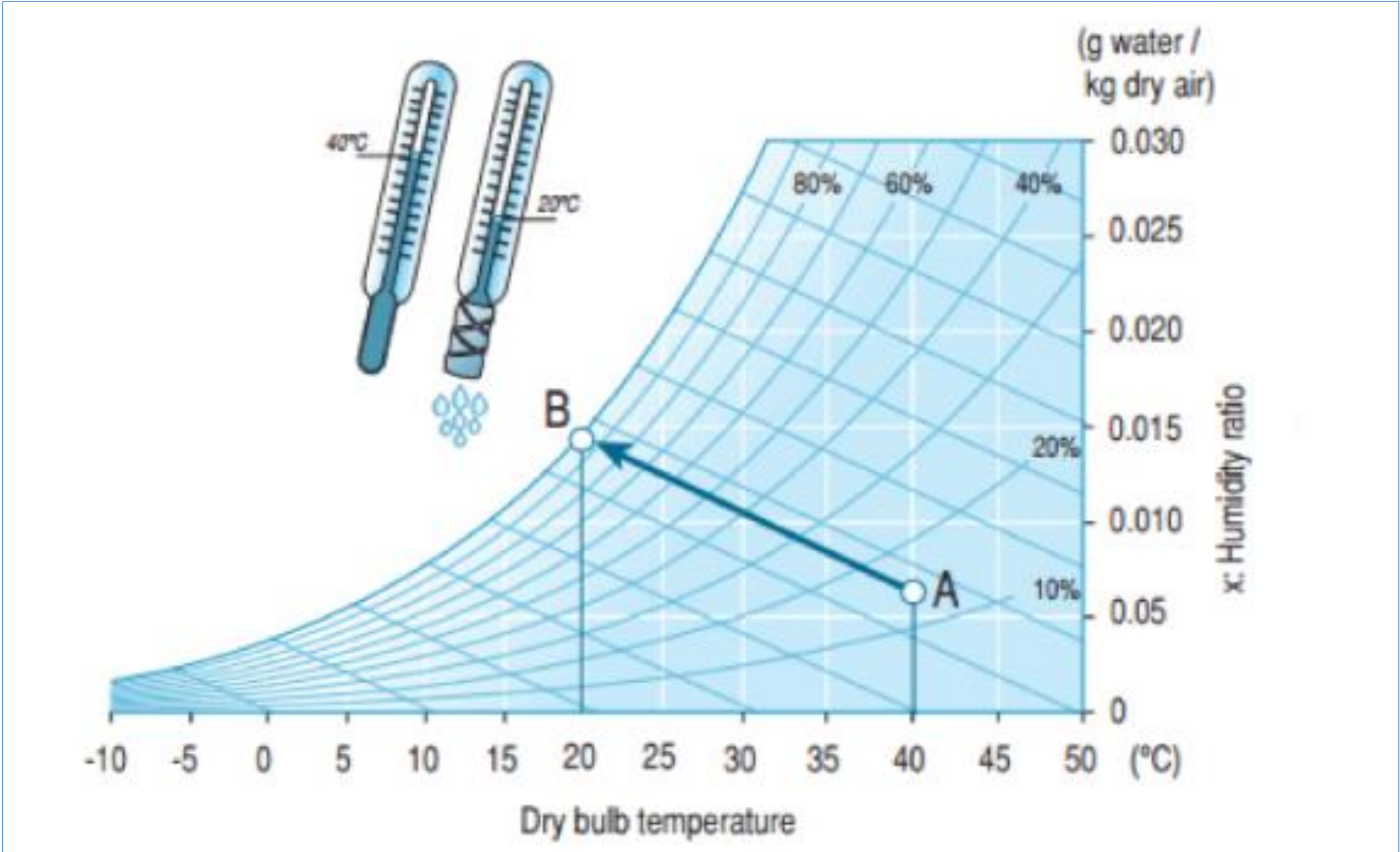
Is it possible to replace air conditioner?



INNOSPARTS

AN ST ENGINEERING OPEN LAB

EVAPORATIVE COOLING FOR INDOOR



Challenge on **humidity removal**



INNOSPARKS

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