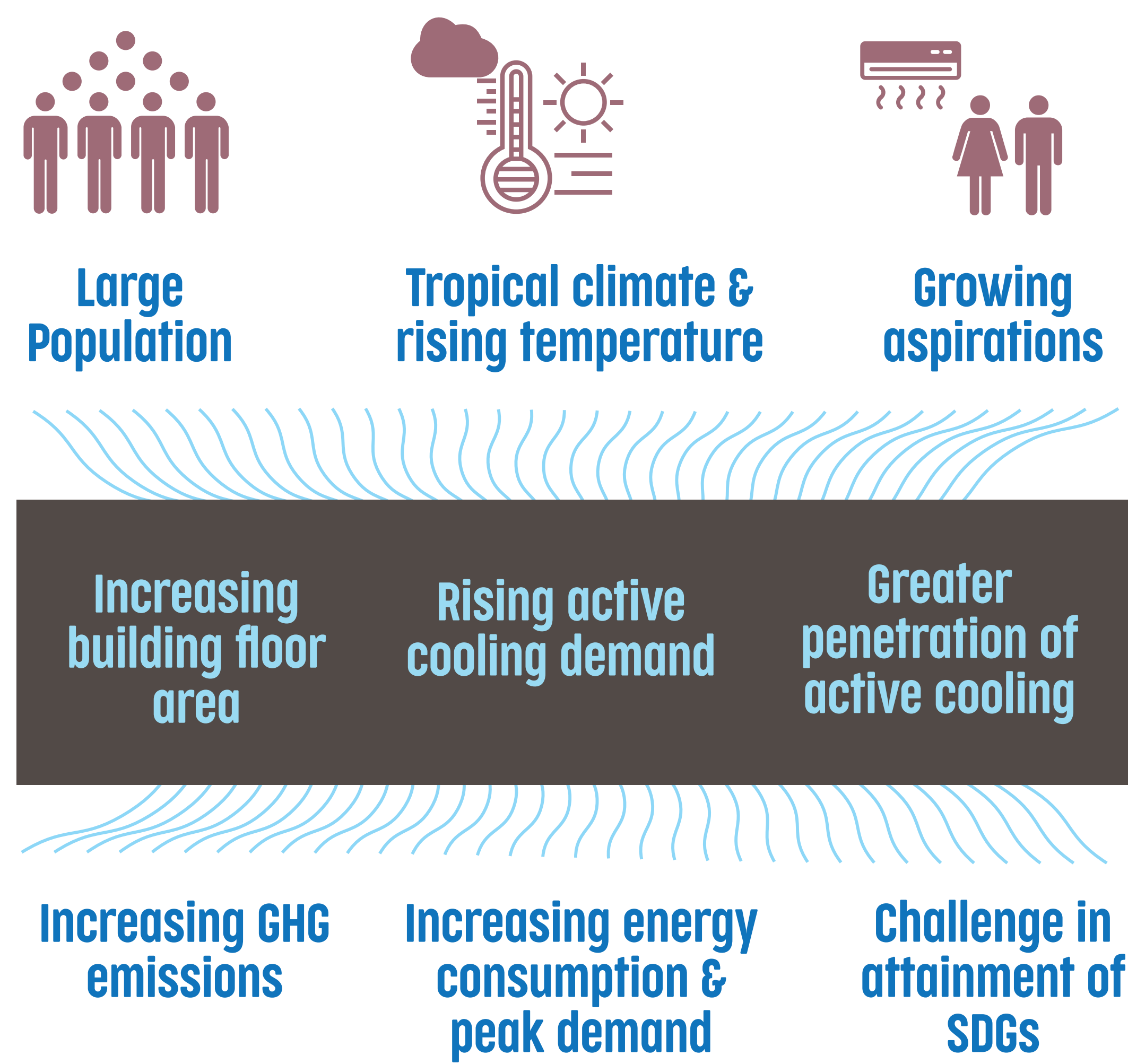


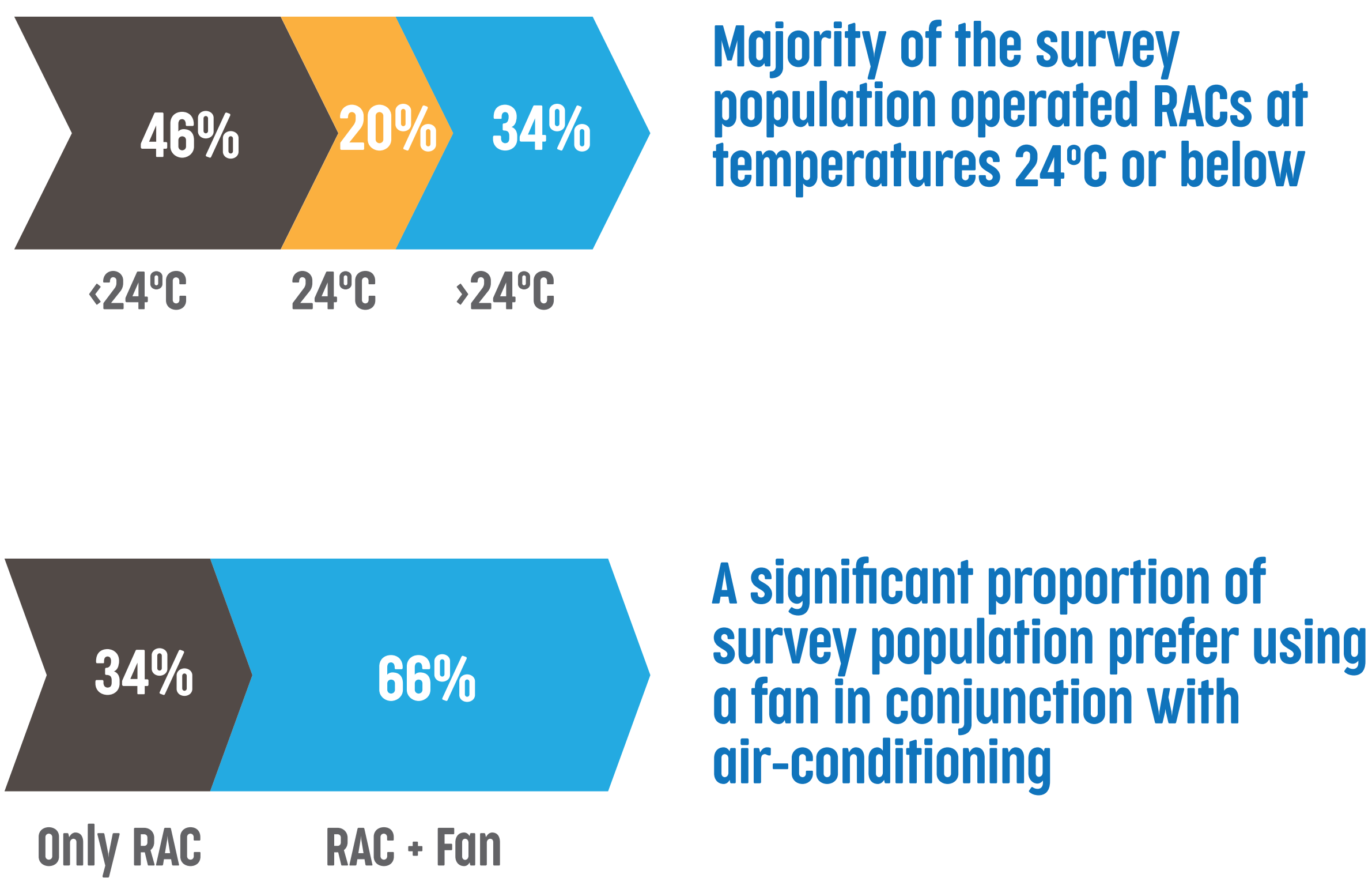
# MAKING A CASE FOR ADAPTIVE THERMAL COMFORT



## Thermal Comfort for All is a social imperative!

Rise in active space cooling needs to be balanced with access to minimum thermal comfort for all sections of the society

## Room Air Conditioner Usage Patterns in India (AEEE Research)



Great Potential for Adaptive Thermal Comfort (ATC) based Energy Savings

India is poised to become one of the largest RAC markets in the world

International Energy Agency (IEA)

RAC stock could see 10X to 15X growth in the next 2 decades

India Cooling Action Plan (ICAP)

Tropically acclimatised people are comfortable to wider temperature range

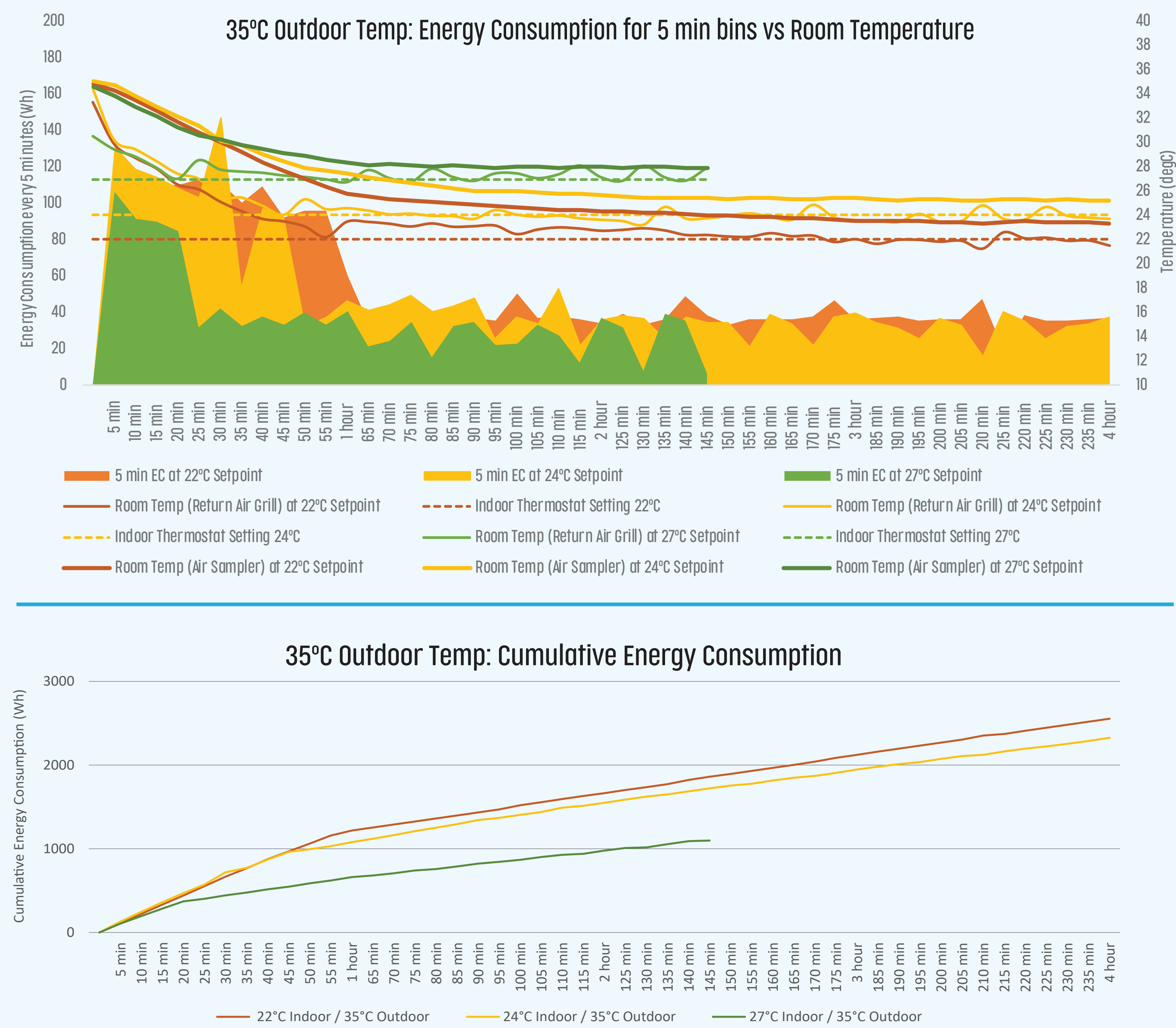
India Model for Adaptive (Thermal) Comfort (IMAC)

## Evidence of ATC Assisted Energy Savings- Customised Testing of RACs in a State of the Art Balanced Ambient Calorimeter Facility

### RAC Selection for Testing

Test Specimen	Cooling Capacity at Full Load	Type	BEE Star Rating	Energy Efficiency	Refrigerant Type
RAC Unit 1 (new)	5.0 kW (~1.4 TR)	Inverter - Split	3 Star (2018)	3.70 ISEER	R-32
RAC Unit 2 (new)	5.3 kW (~1.5 TR)	Inverter - Split	5 Star (2018)	5.20 ISEER	R-290
RAC Unit 3 (used for 3 years)	5.0 kW (~1.4 TR)	Fixed Speed - Split	5 Star (2015)	3.51 EER	R-22

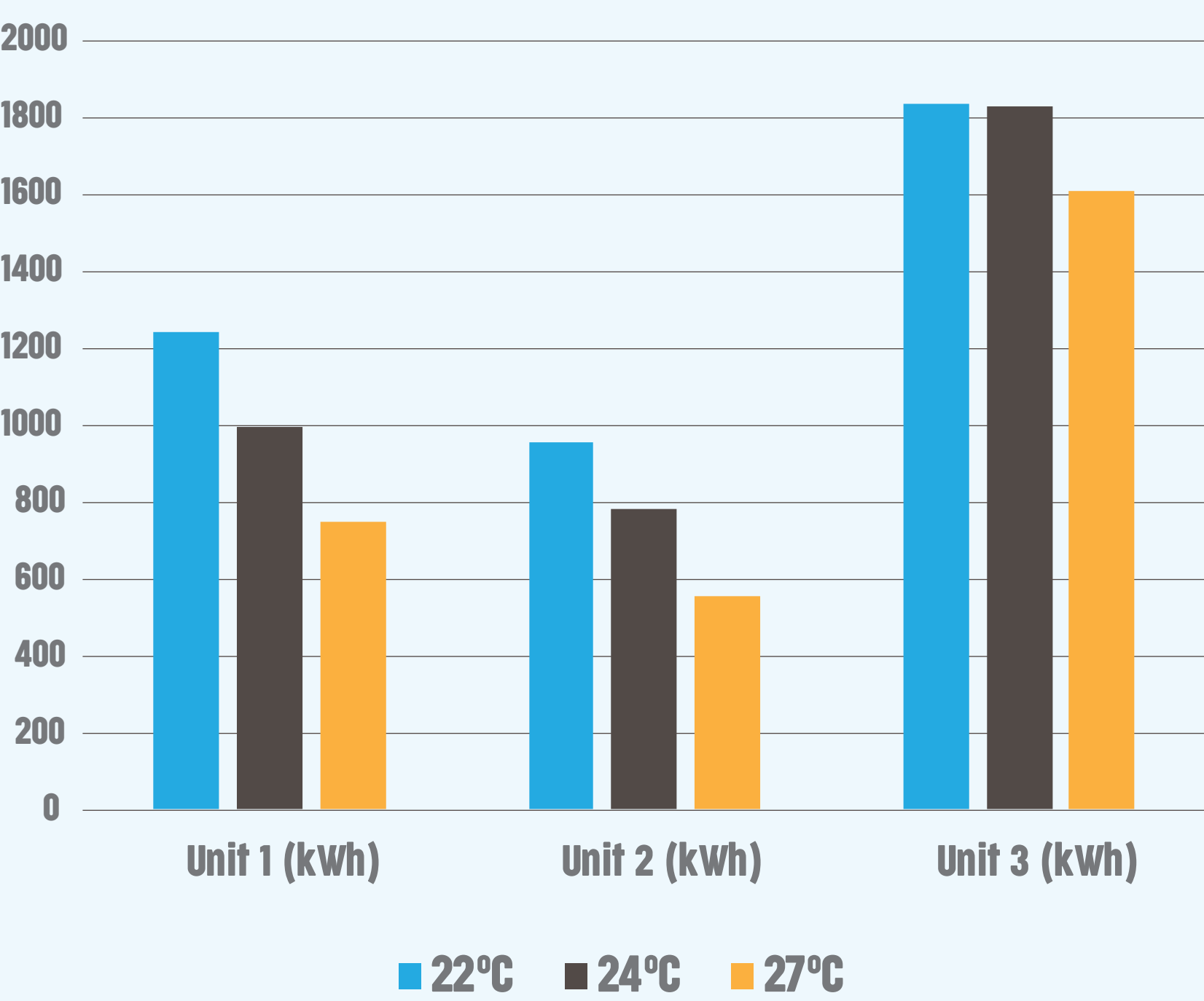
### RESULTS FOR RAC UNIT 2



### SUMMARY OF ANNUAL ENERGY CONSUMPTION OF RACS

**High level findings**  
Energy Saving potential of 8 to 10% per degree Celsius set-point increase for Inverter RACs  
Energy Saving potential in case of used Fixed Speed RACs is only one-third to that of inverter RACs

#### Annual RAC Energy Consumption at different set points



**Implications**  
Apprise climate-responsive policies and O&M practices. Sensitize diverse stakeholders including policy makers, home buyers, facility managers, and AC manufacturers about the potential energy and cost savings

Correlating Room Air Conditioner Energy Consumption with Thermostat Setting to Encourage Occupant Behavioural Change Towards Enhanced Energy Efficiency and Thermal Comfort