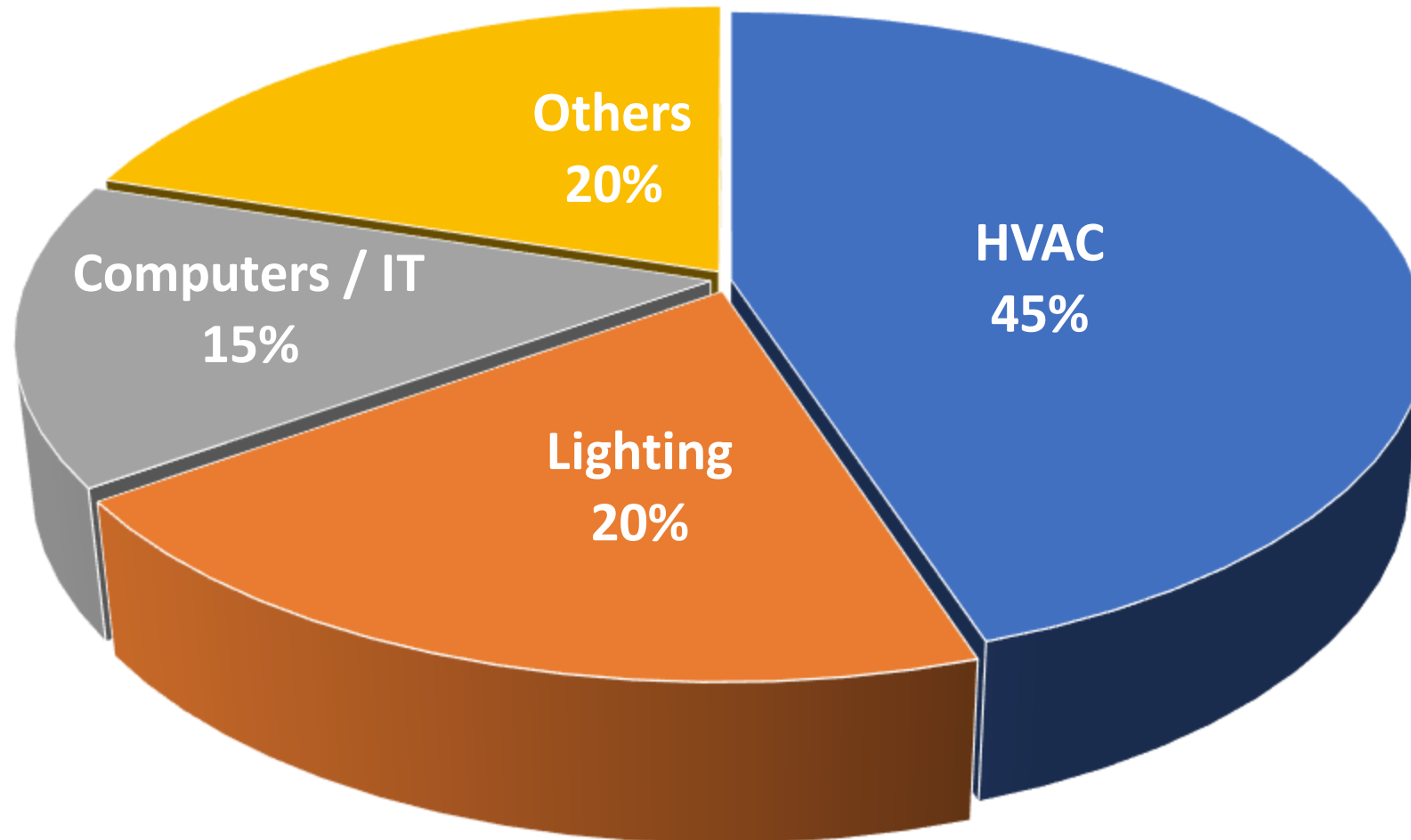




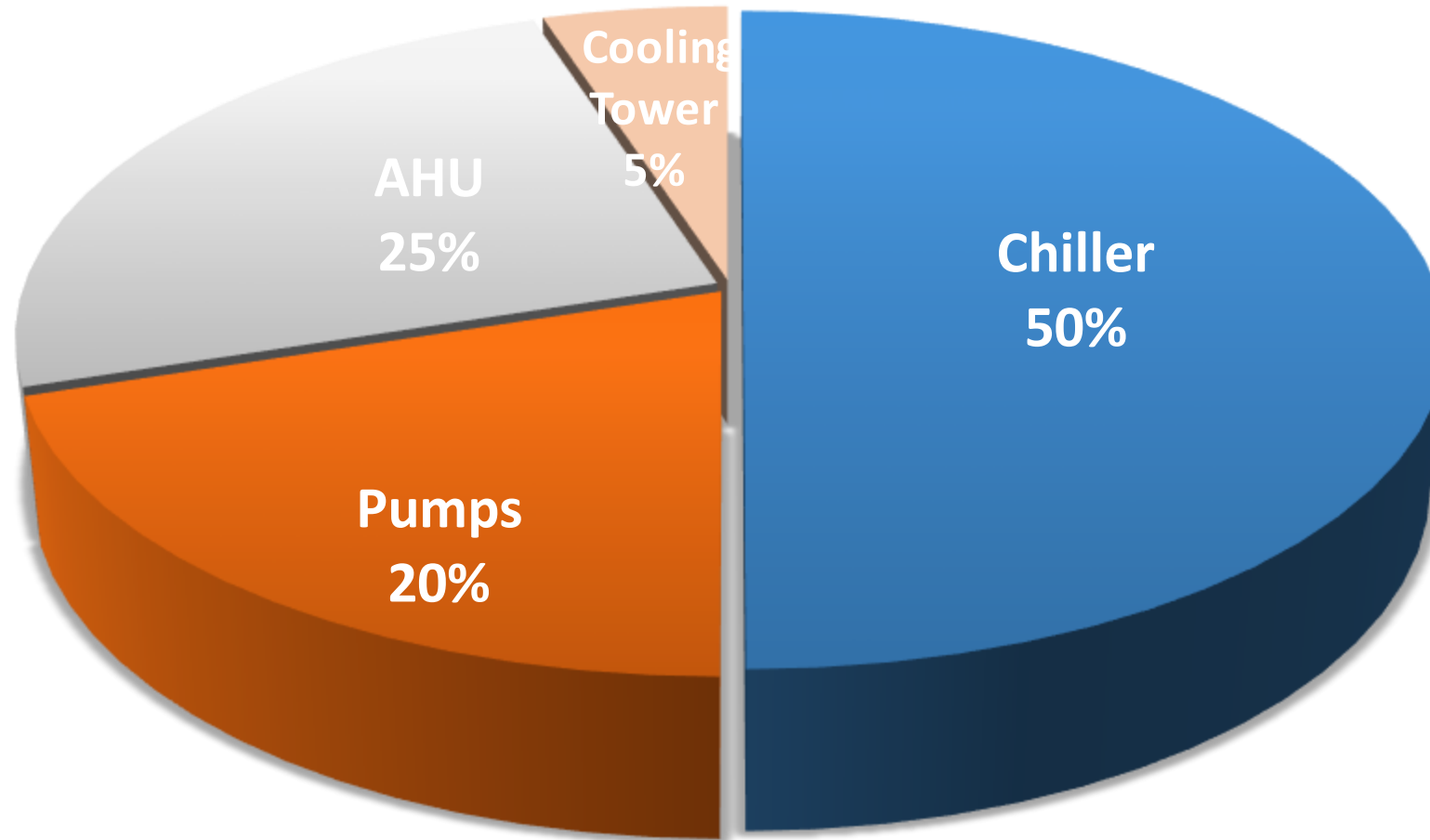
Futuristic Cooling Solutions

Energy Consumption in Commercial Buildings

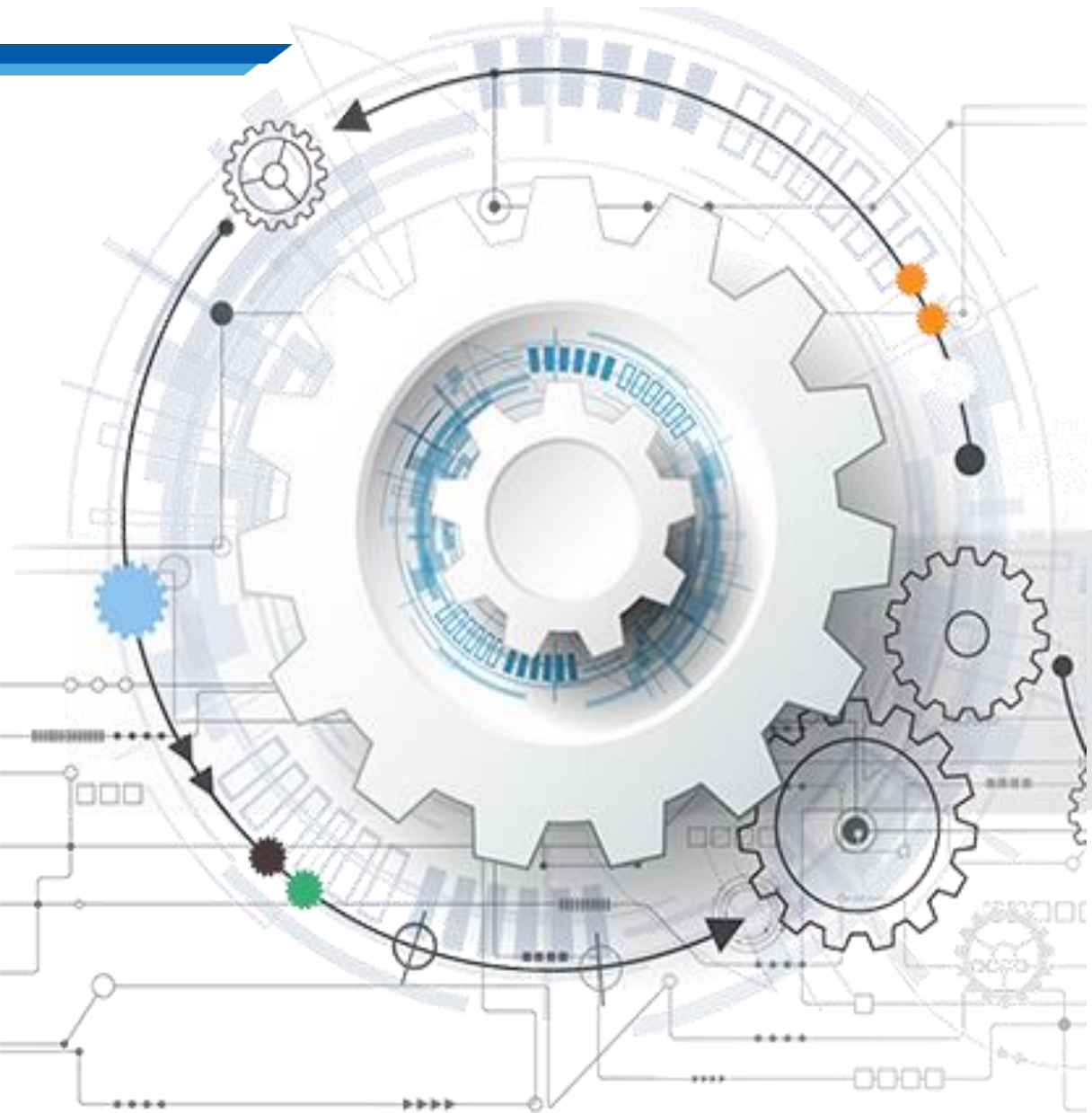


■ HVAC ■ Lighting ■ Computers / IT ■ Others

Building HVAC Energy Distribution

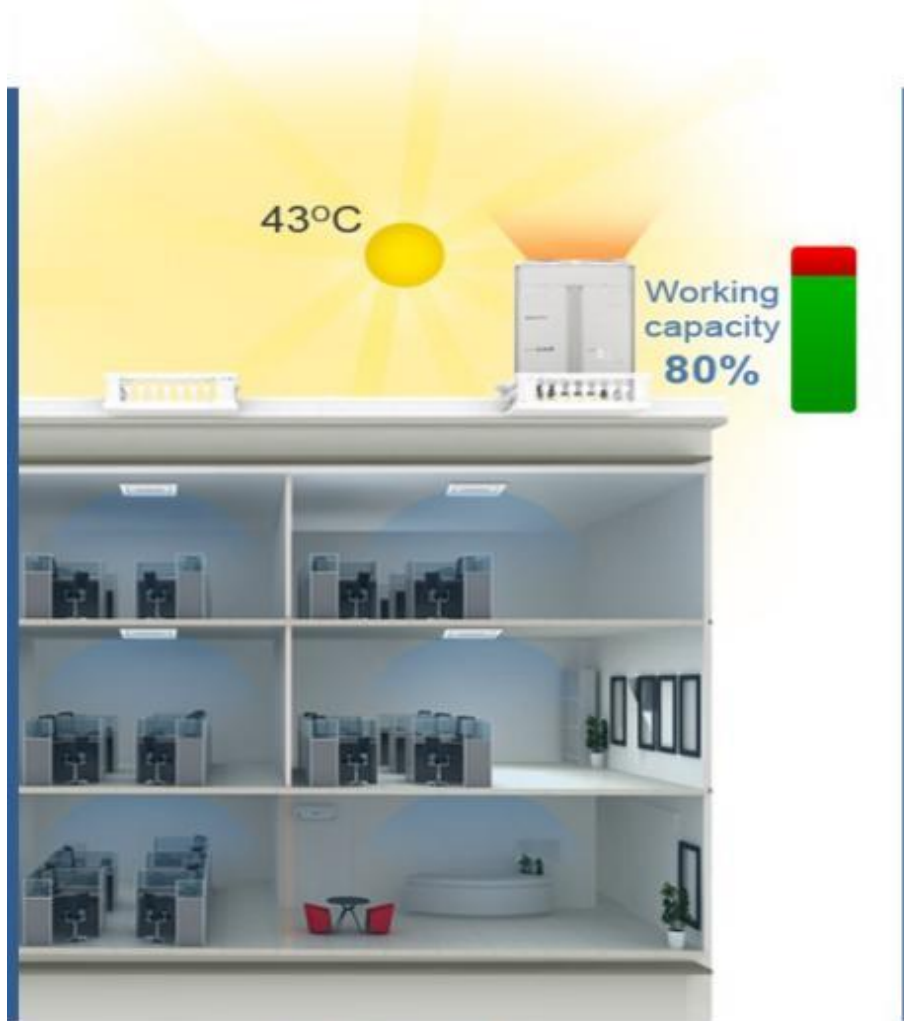


■ Chiller ■ Pumps ■ AHU ■ Cooling Tower

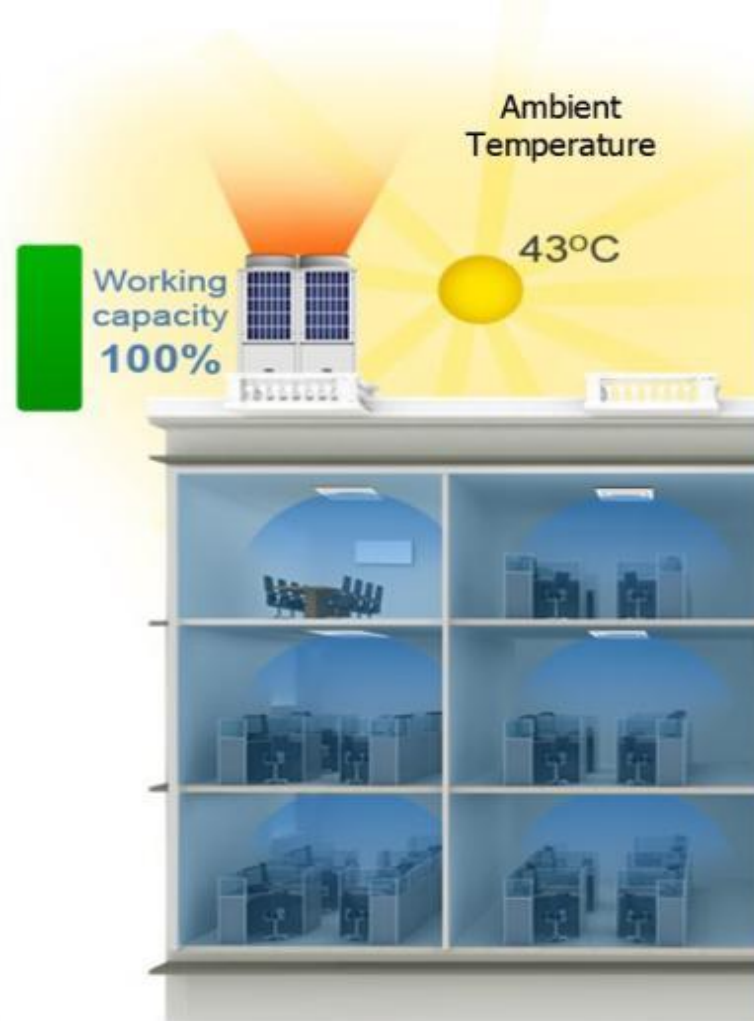


Design

100% CAPACITY EVEN AT 43°C



Conventional System



Ideal System

**Actual
Capacity at
43°C**

Widest Operating Voltage Range



Conventional System

▼ Limited Operating Voltage Range



Ideal System

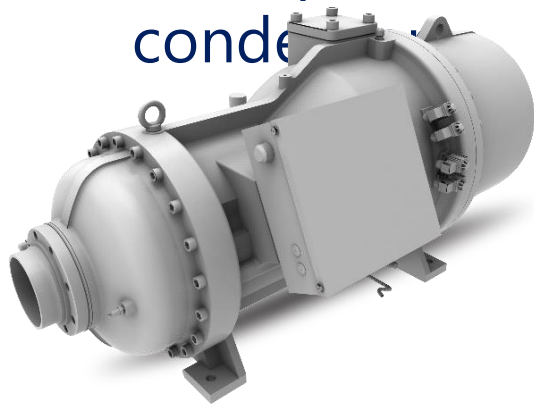
▼ Superior Operating Voltage Range

**Superior
Operating
Voltage Range:
320 to 460 V**

Chillers – Mix & Match Design for India



Designed through combination of coolers, compressors and condenser



Flexible capacity models



Comply exact project requirements



AUTOMATION



INNOVATION



PROCESS



PRODUCTIVITY



TECHNOLOGY



SYSTEM



CONTROL



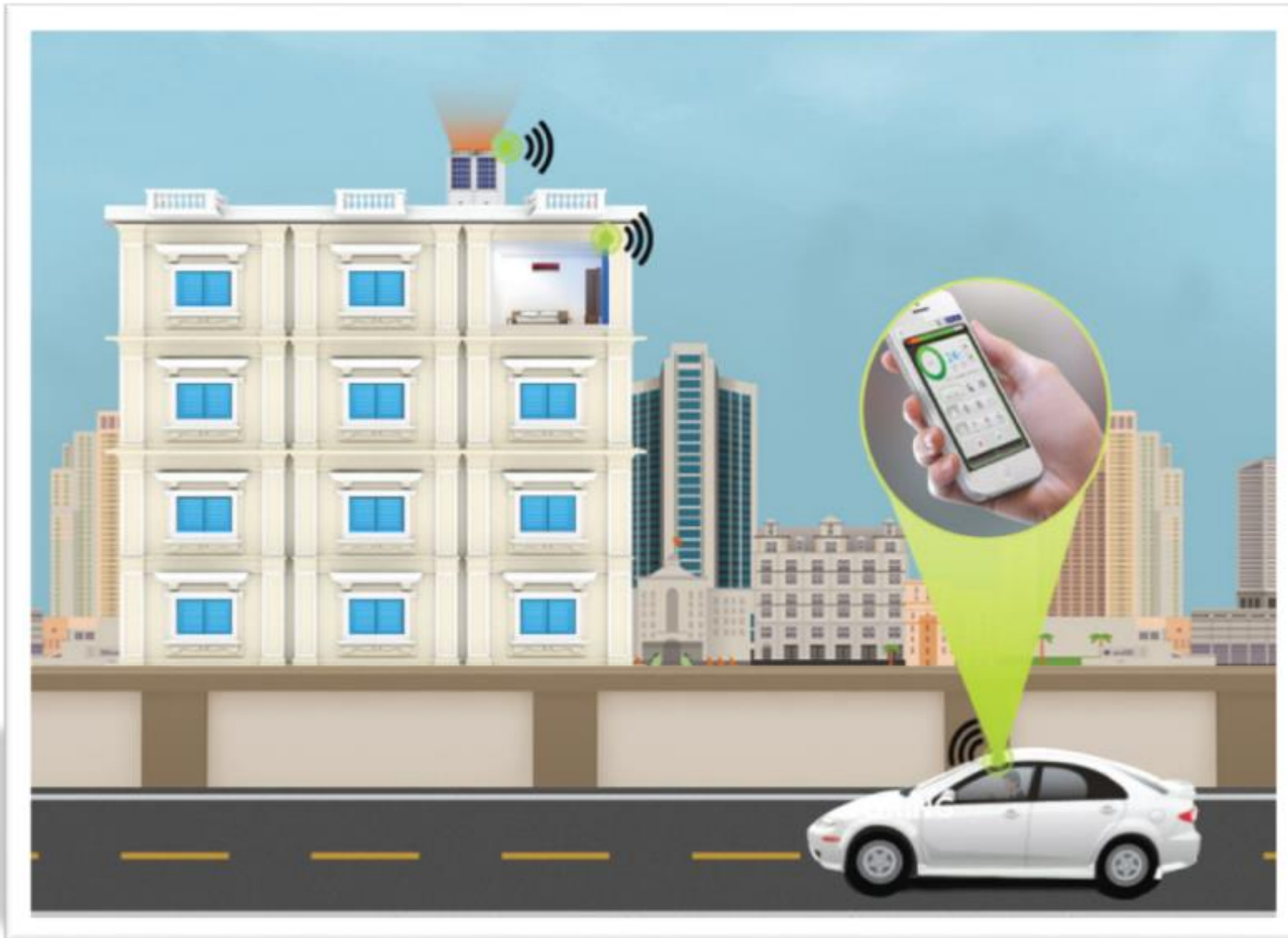
INTEGRATION



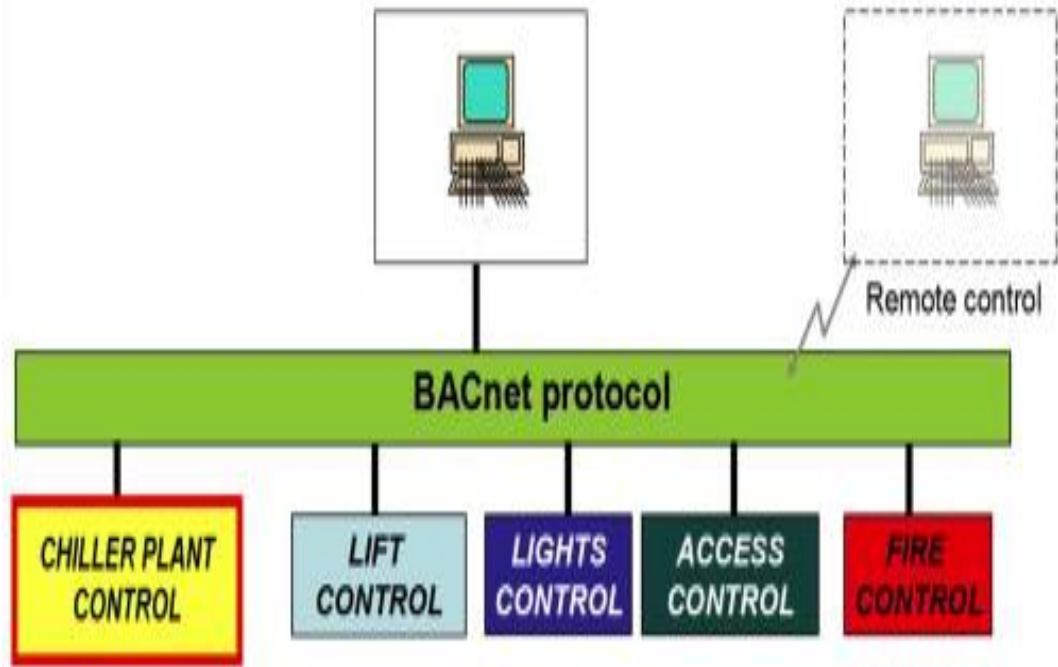
Wifi Based Wireless Controller



Mobile App



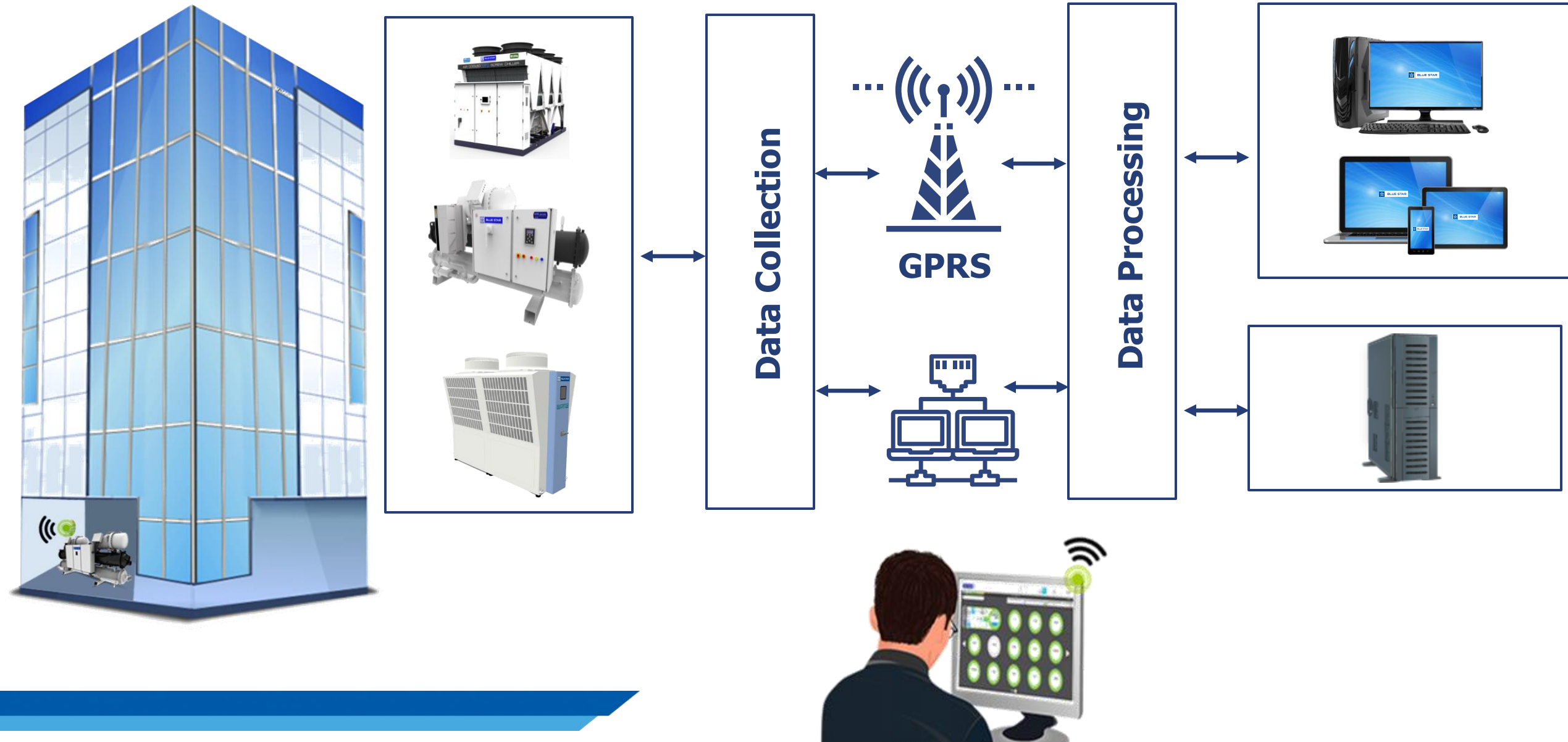
Building Management System



Chillers connected to common BMS

Operation through Remote Computer

Remote Monitoring System



Remote Monitoring System



GPRS-based
remote monitoring



Close
monitoring of
site



Automatic call
login on fault



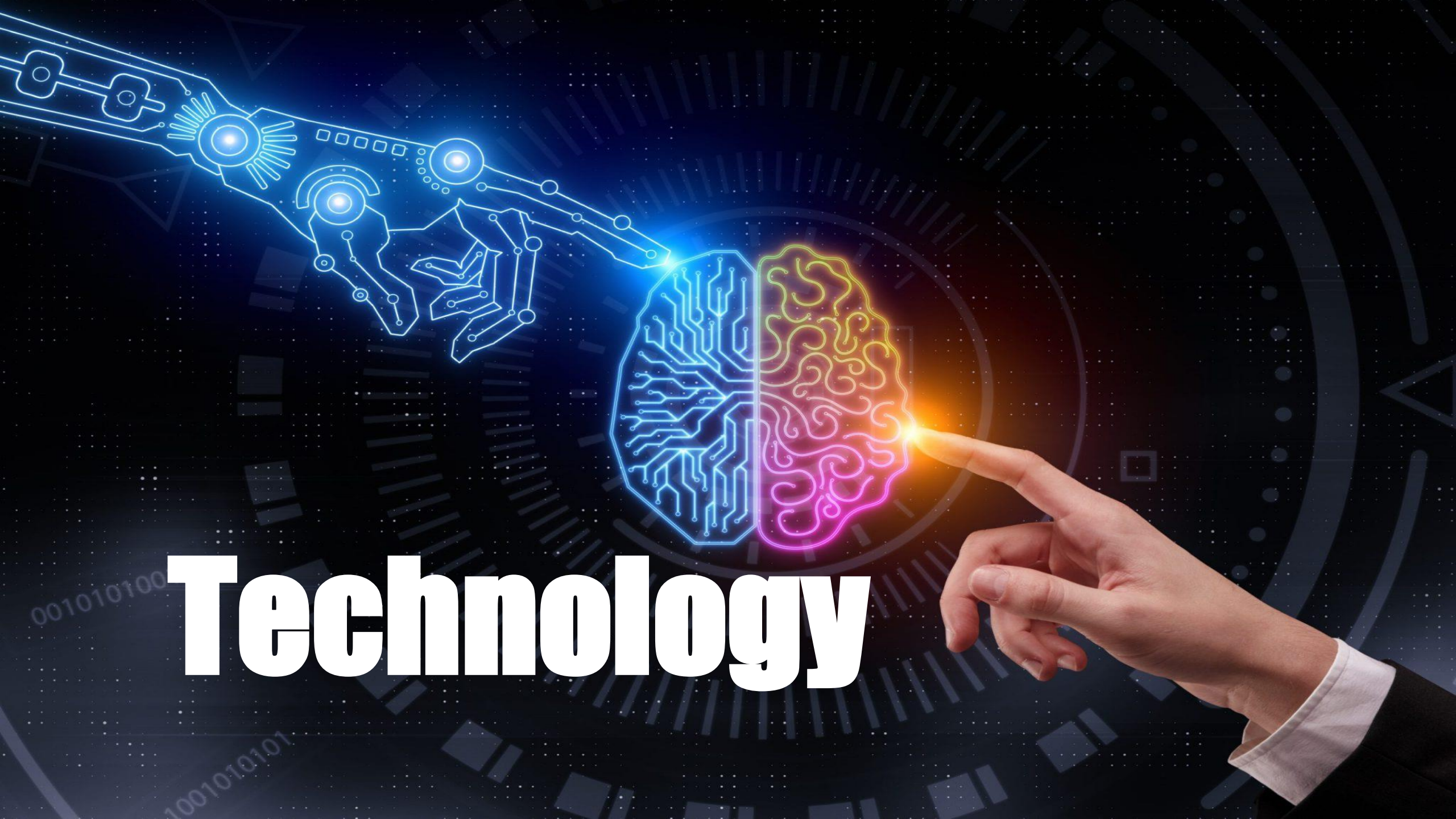
24 x 7 automatic
monitoring



Automatic
SMS/Email to
technician

Advantages:

- ★ Very quick response | Faster turnaround time | Higher uptime of system
- ★ Better service quality even in tier-2 / tier-3 towns



Technology

Ducted Technology



1995

Scroll
Compressor
Ducted System

10% Saving

15% Saving

2003

Tandem Scroll
Compressor
System



Ducted Technology



2008

HiPerformance
Packaged Air
Conditioners

20% Saving

25% Saving

2016

Inverter Ducted
System

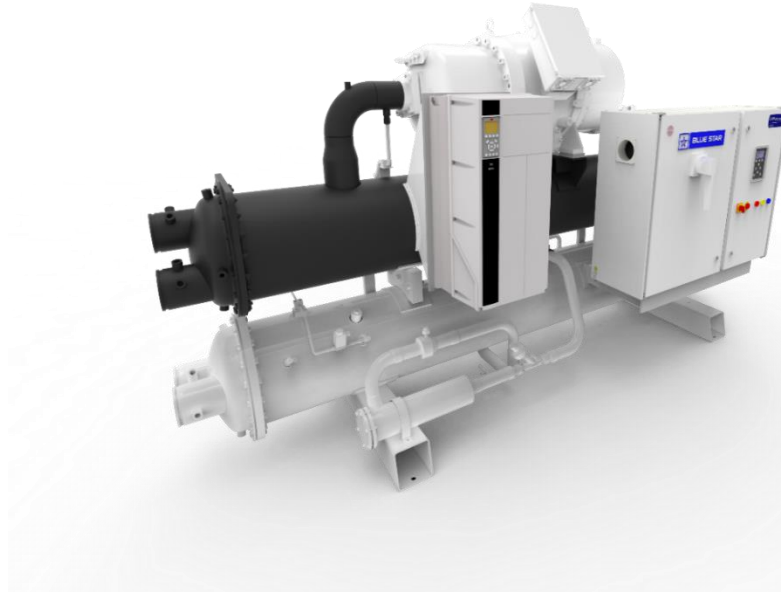


Chiller Technology

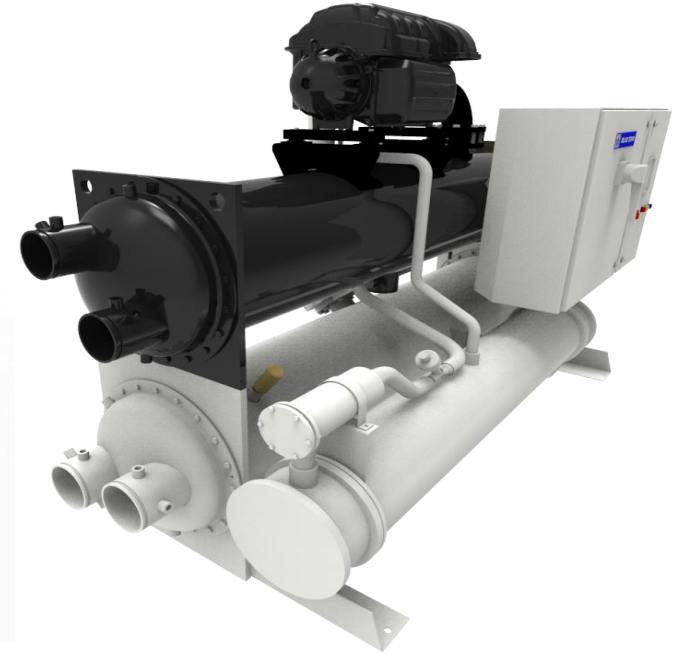
Conventional Chiller



VFD Chiller



Oil Free Chiller



Chiller Performance Improvement through Technology

Conventional Chillers	COP	IPLV
Air cooled	2.8	4.0
Water cooled	4.5	5.7



Mix & Match	COP	IPLV
Air cooled	3.1 – 3.4	4.0 – 4.5
Water cooled	5.5 – 6.3	7.1 – 8.4



Oil Free Water cooled Chillers	COP	IPLV
Water cooled	5.5 – 6.4	9.5 – 11.3



VFD Chillers	COP	IPLV
Air cooled	3.1 – 3.3	4.0 – 5.7
Water cooled	5.4 – 6.2	9.5 – 10.3

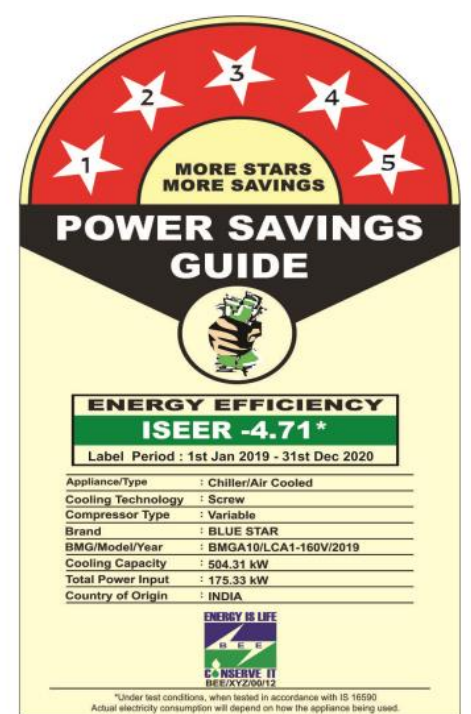
COMPLIANCE

GUIDELINE

STANDARD

CONDUCT

REGULATION



The image shows a star rating guide for chillers. At the top, a red semi-circle contains five white stars numbered 1 to 5. Below this, the text reads "MORE STARS MORE SAVINGS" and "POWER SAVINGS GUIDE". A central logo depicts a green chiller unit. Below the logo, a green box displays "ENERGY EFFICIENCY ISEER -4.71*". The label period is "1st Jan 2019 - 31st Dec 2020". A table lists the following specifications: Appliance/Type: Chiller/Air Cooled; Cooling Technology: Screw; Compressor Type: Variable; Brand: BLUE STAR; BMG/Model/Year: BMGA10/LCA1-160V/2019; Cooling Capacity: 504.31 kW; Total Power Input: 175.33 kW; Country of Origin: INDIA. At the bottom, there is a logo for "ENERGY IS LIFE" and the text "Go INSLAVE IT BE/XYZ/2012". A small disclaimer at the very bottom states: "*Under test conditions, when tested in accordance with IS 16590. Actual electricity consumption will depend on how the appliance being used."

**MORE STARS
MORE SAVINGS**

**POWER SAVINGS
GUIDE**

**ENERGY EFFICIENCY
ISEER -4.71***

Label Period : 1st Jan 2019 - 31st Dec 2020

Appliance/Type	: Chiller/Air Cooled
Cooling Technology	: Screw
Compressor Type	: Variable
Brand	: BLUE STAR
BMG/Model/Year	: BMGA10/LCA1-160V/2019
Cooling Capacity	: 504.31 kW
Total Power Input	: 175.33 kW
Country of Origin	: INDIA

ENERGY IS LIFE
Go INSLAVE IT
BE/XYZ/2012

*Under test conditions, when tested in accordance with IS 16590
Actual electricity consumption will depend on how the appliance being used.

STAR RATING OF CHILLERS BY GOVERNMENT OF INDIA

Indian Chiller Standards

Star rating program will follow Indian Chiller Standards (ICS)

ICS is based on higher ambient, average water quality prevalent in India

ICS more stringent than international standards like AHRI

To be implemented from 01st January 2023



Cost Optimization through technology upgrades

Case Study : 1

Chiller capacity	140TR
Chiller configuration	2 nos. 70TR (Water cooled)
Annual Operating Hours	6000
Power Tariff	Rs.10/Unit of Electricity

Description	Conventional Fixed Speed Screw chiller	Oil Free Chiller (5 Star)
Chiller efficiency (ISEER – Kw/TR)	0.73	0.527
Annual Power consumption - Kwh (Capacity x ISEER x working hrs)	613200	442680
Power savings - Kwh		170520
Annual Energy Savings in Rs.		17,05,200

ROI < 12 months

Cost Optimization through technology upgrades

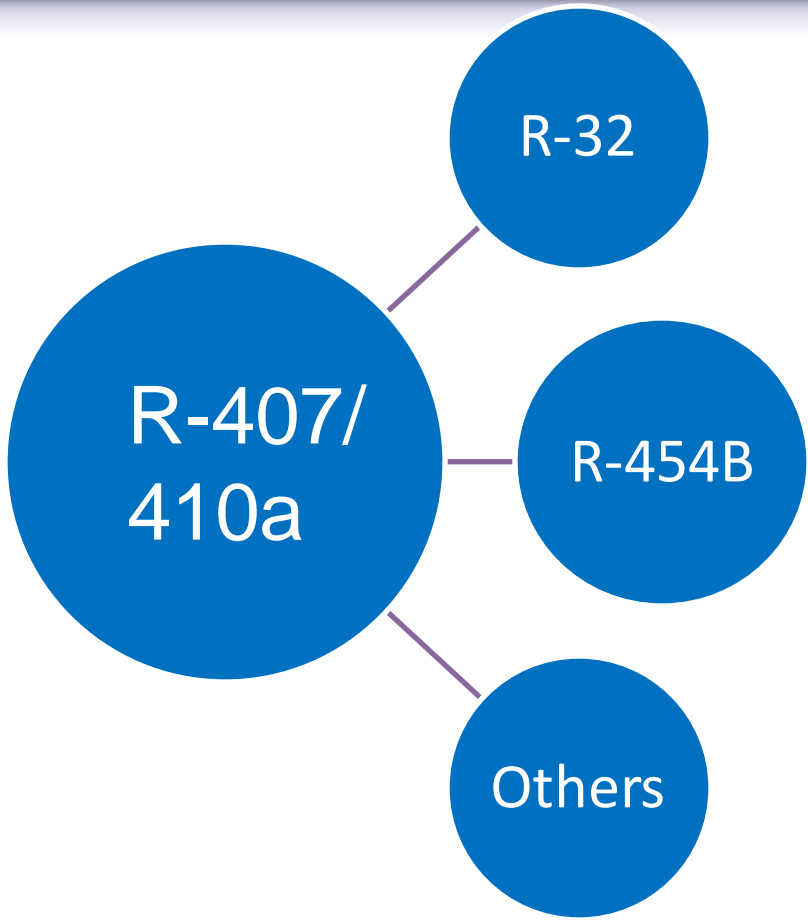
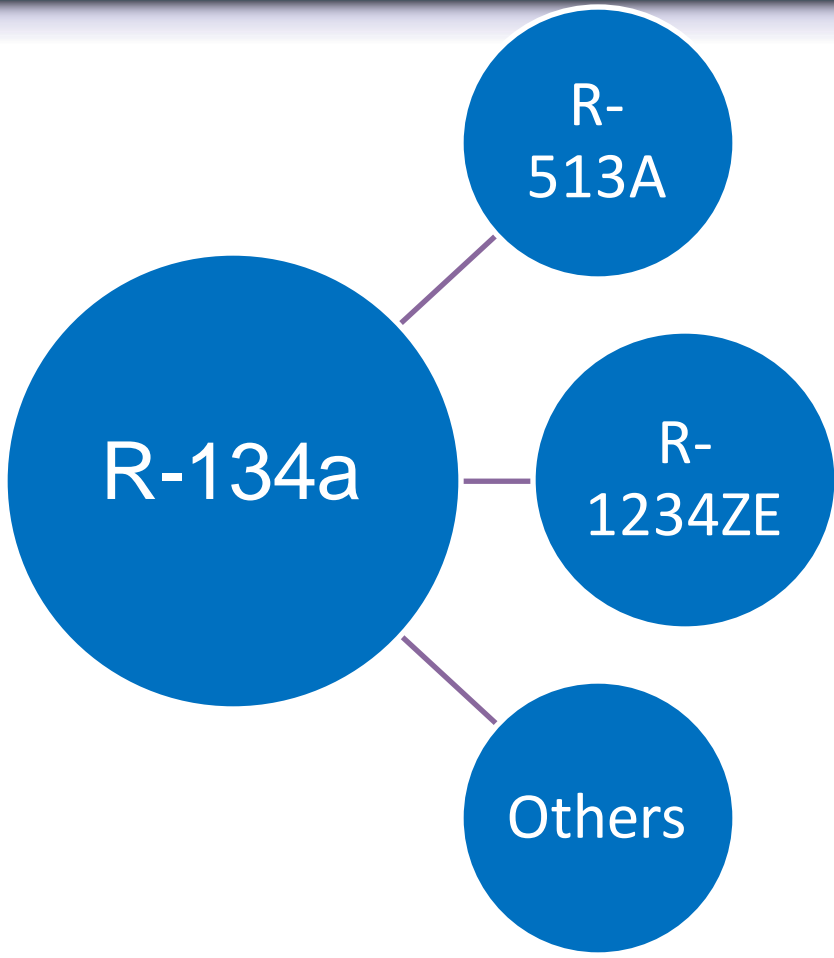
Case Study : 2

Chiller capacity	140TR
Chiller configuration	1 no. 140TR (Air cooled)
Annual Operating Hours	5000
Power Tariff	Rs.10/Unit of Electricity

Description	Conventional Fixed Speed Screw Chiller	Air cooled VFD Chiller (5 Star)
Chiller efficiency (ISEER – Kw/TR)	1.13	0.745
Annual Power consumption - Kwh (Capacity x ISEER x working hrs)	791000	521500
Power savings - Kwh		269500
Annual Energy Savings in Rs.		26,95,000

ROI < 12 months

Refrigerant Trends



Expected Migration Towards Lower GWP

Technological trends in ancillary equipments

Equipment	Conventional System	Latest Technology	Energy Savings
Air Handling Units	Constant Speed	AHU + VFD Fans	25%
Pumps	Constant Speed	Primary + Secondary + VFD	20%
Cooling Tower	Constant Speed	VFD Fan	20%
Air Distribution	Fixed Flow Damper	VAV Damper	15%



Higher efficiencies

Min. Carbon Footprints

Net Zero Energy

Sustainability

A glowing lightbulb with a green leaf inside, symbolizing eco-friendly technology. The lightbulb is tilted and has a bright glow emanating from its top. A green leaf is placed inside the bulb, and another smaller leaf is visible at the bottom. The background is a soft, blue, textured surface. There are several white circular nodes connected by thin lines, suggesting a network or data flow. A bright light source is visible at the top center, creating a lens flare effect.

THANKS
For Your Time & Attention!