

azbil



HOW TO OPTIMIZE ACMV AIR HANDLING UNIT SYSTEM

Airside Optimization by Azbil



Energy Efficiency

“Building Management System (BMS), standalone Energy Monitoring System (EMS) or local sequential controller has the capability to compute and display key indicators such as **water-side, air-side, total system efficiency** and calculated heat balance of the chilled water system.”



Intelligence

“Development of a digital twin of the project that represents the full asset virtually and includes geometric data, asset attributes, management data, asset performance and utilization data. ... **System Digital Twin** – detailed model based on operational data of individual systems to deep dive into its performance, conduct virtual stress tests and detailed analytics.”

Green Mark requires Energy Efficiency and Intelligence

BCA Green Mark Certification in Singapore

BCA: Building and Construction Authority in Singapore

Airside Environment Optimization by Azbil

3 Airside Digital Twin

Air Handling Unit Simulation by Digital Model in Cyber World to optimize entire airside environmental operation

2 Advanced Energy Saving Apps for Airside

Energy saving applications specially designed for AHU and VAV to further reduce energy consumption

1 Basic Airside Environment Control

Controls fan speed, supply air temperature and each zone's air volume to improve thermal environment and overall performance

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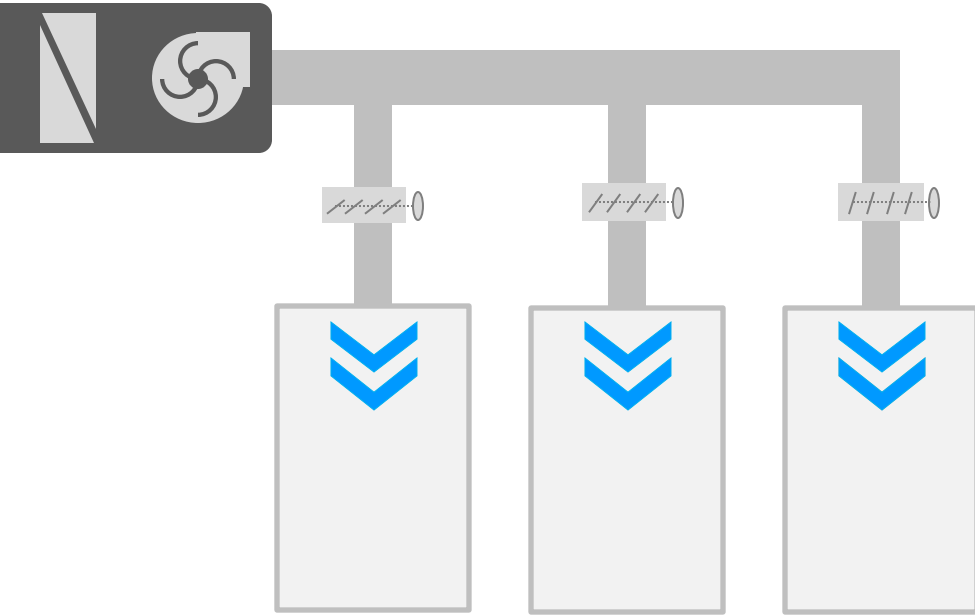
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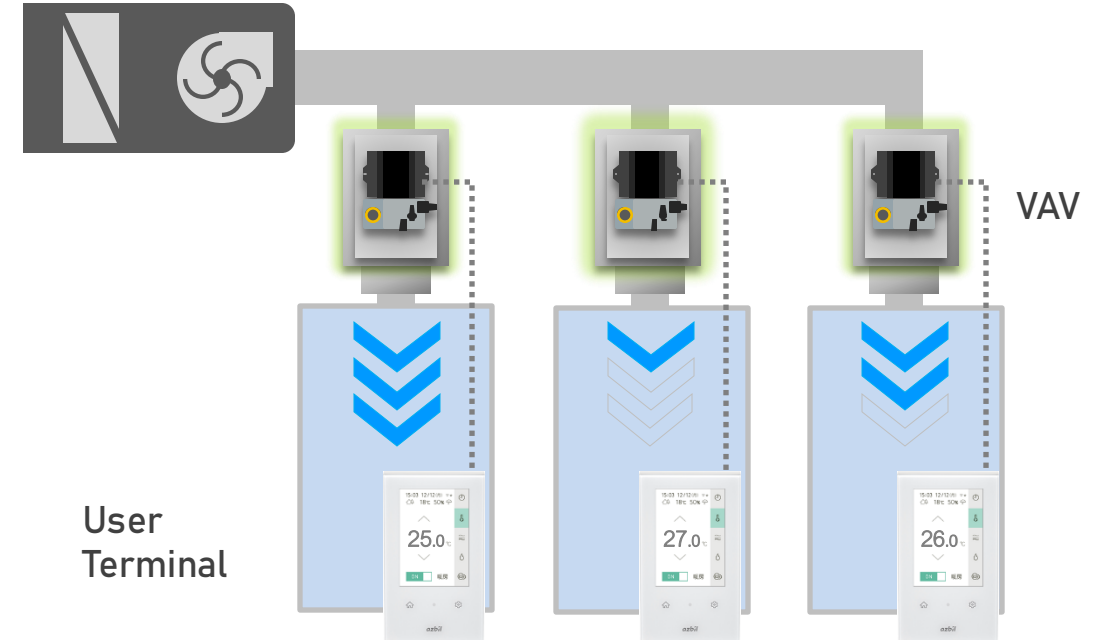
Without VAV

No airflow control



With VAV

Airflow is controlled by room temperature



Control Air Volume as Each Zone Needs

Every zone or room has different requirements.
Azbil controls let each VAV fine-tune air volume on a per-room basis.

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Cooling Tower

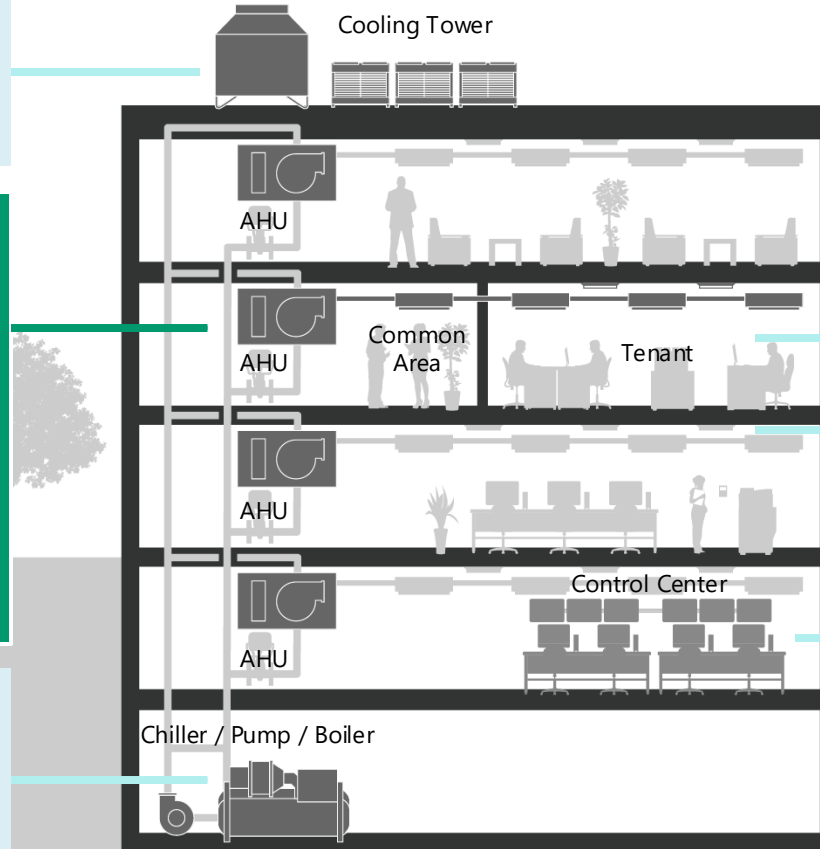
- Condenser Water Pump Variable Control
- Free Cooling Control

AHU

- VAV Control
- AHU Fan VSD Control
- Supply Air Temp. Load Reset Control
- Outdoor Air-Cooling Control
- Demand Based Control (CO2 Control)
- AHU Coil Flow Control with ACTIVAL +
- Parking Lot Ventilation Control

Chiller Plant

- Number of Chiller Unit Control
- Chiller Optimum Start Stop Control
- Chiller Full Stop Control
- VWT Control
- Number of Pump Control
- VWV Control



Interior Control

- On/Off Schedule Control
- Setpoint Schedule Control
- AHU Optimum Start Stop Control
- Duty Cycle Control
- Zero Energy Band Control
- Mixture Loss Prevention Control

Lighting Control

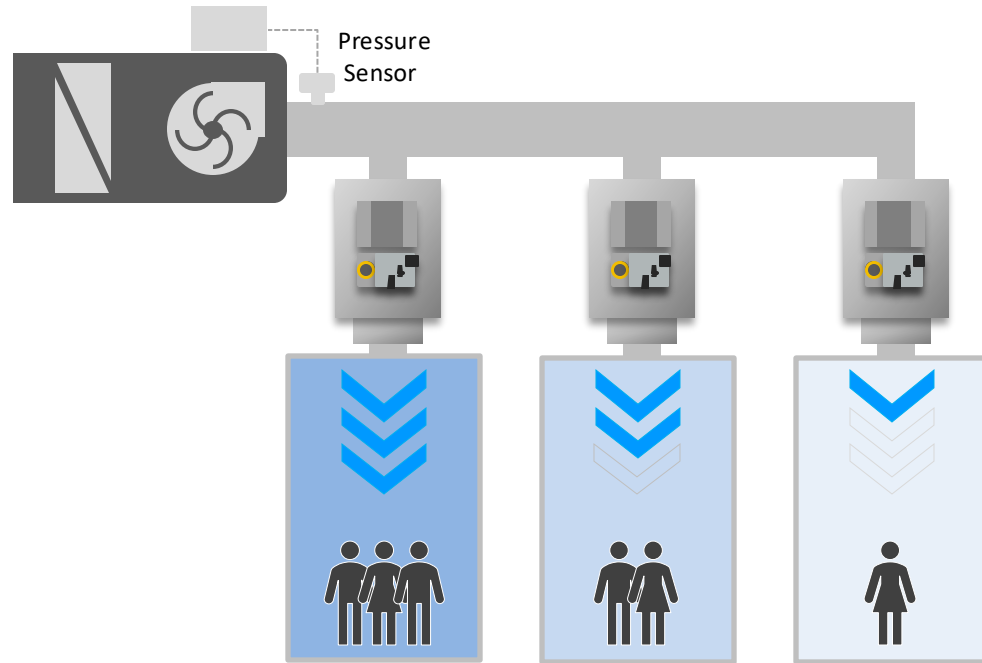
- Power Demand Control
- Power Factor Control
- All/Half Lighting Schedule Control

BMS by Azbil

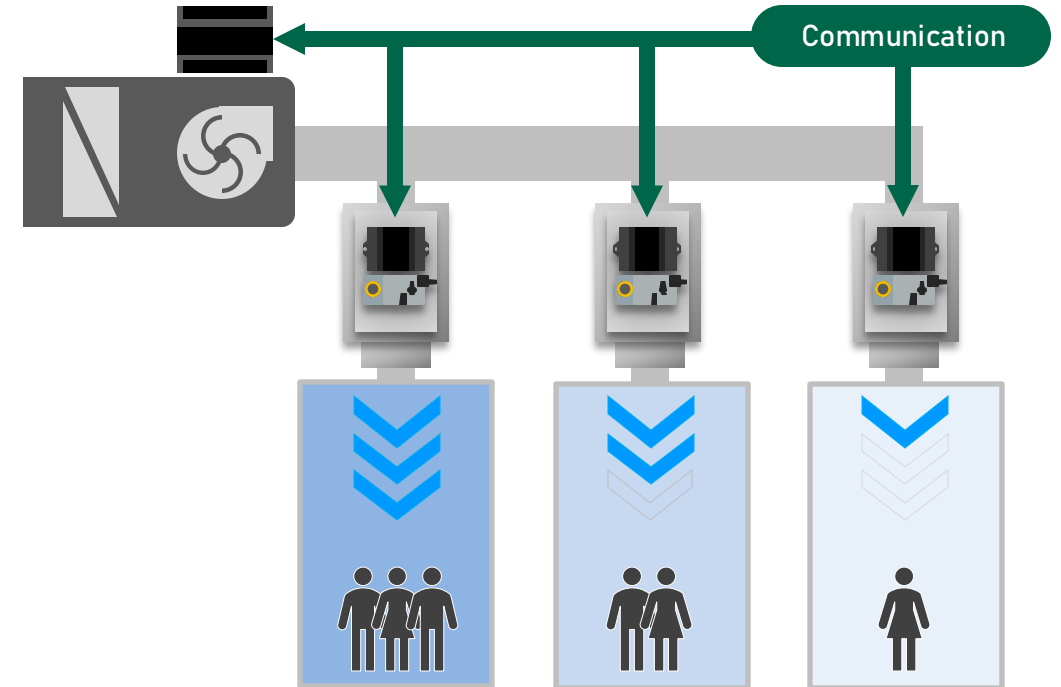
- Running Status Monitoring
- Alarm Monitoring
- Conditional Calculation
- Daily Monthly Yearly Report
- Chart Display

Variety of Energy Saving Apps Available

Conventional VAV



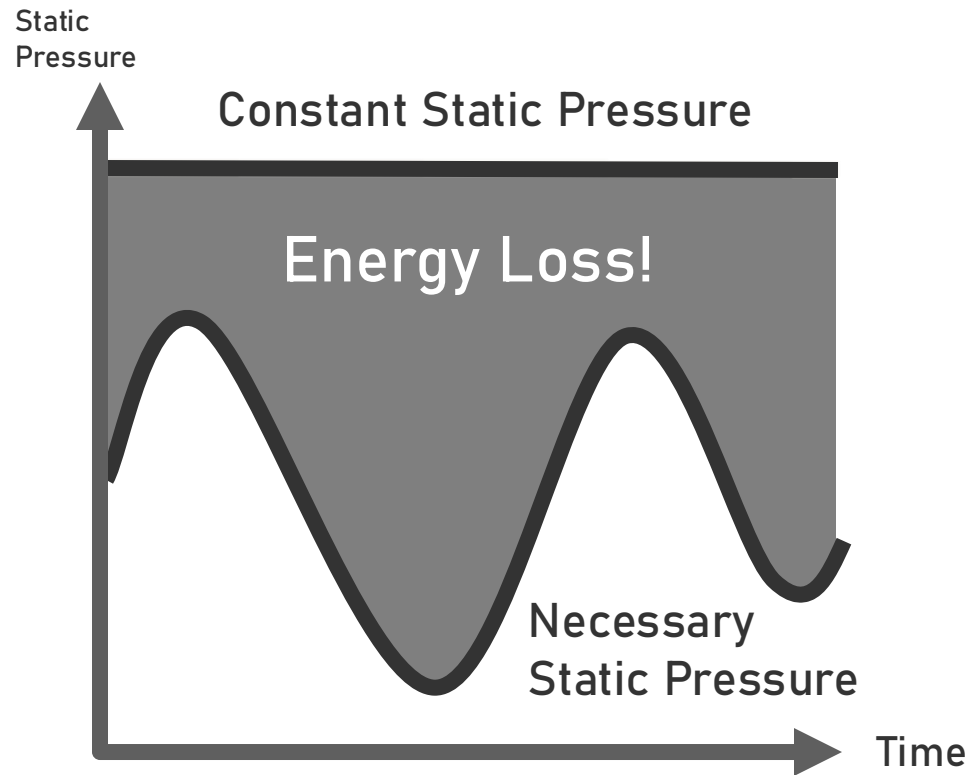
Azbil VAV



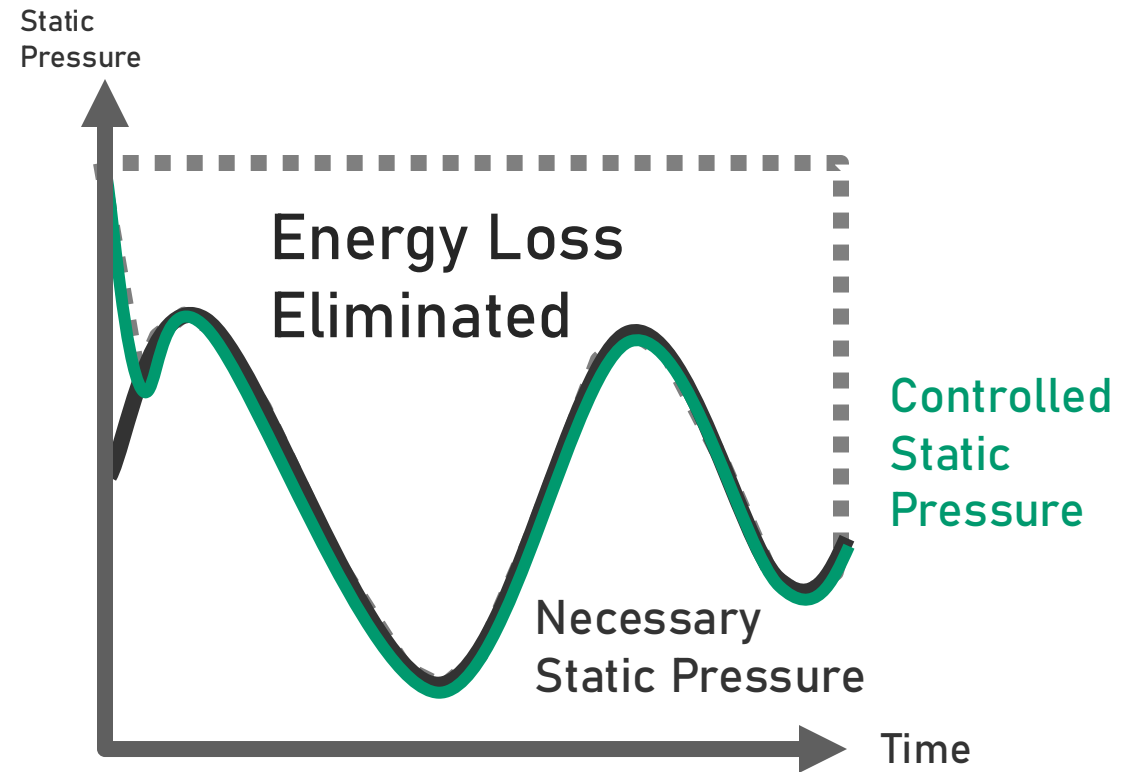
Comfort and Energy Savings for your workplace

Azbil's cutting-edge VAV Control provides maximum comfort for office users

Conventional VAV

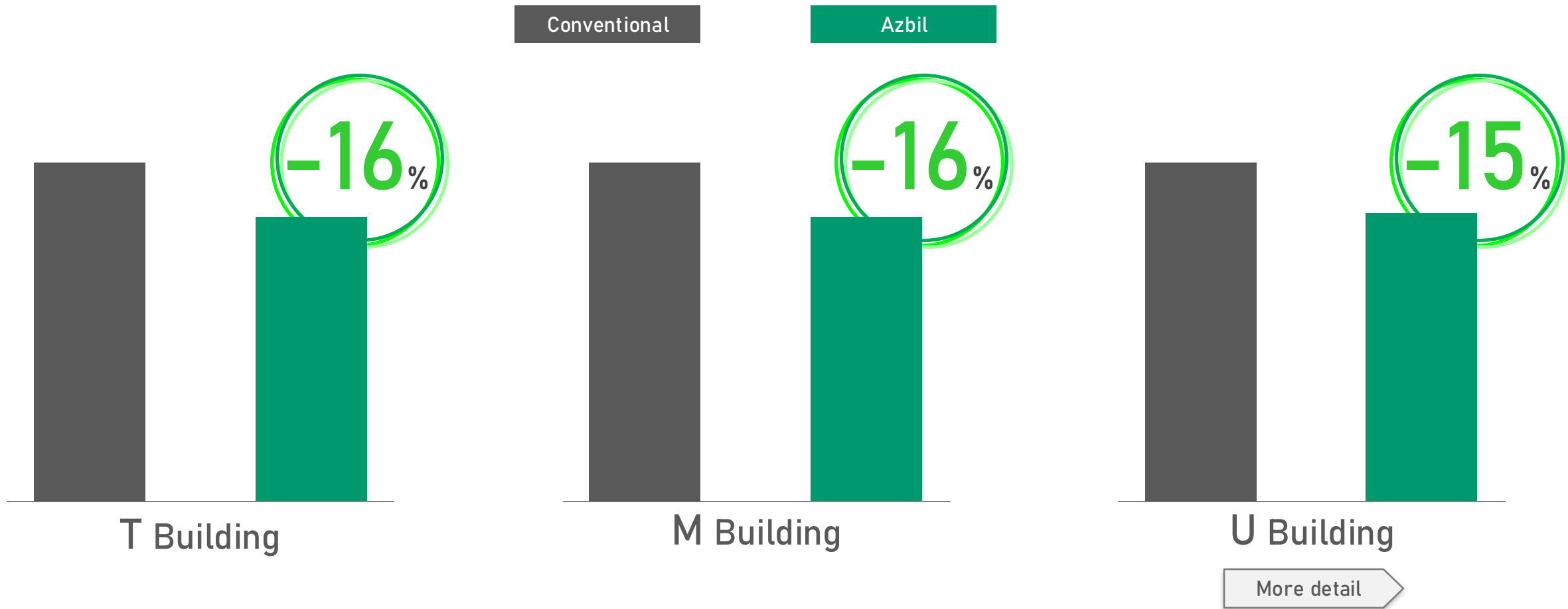


Azbil VAV



Necessary Static Pressure is fluctuating

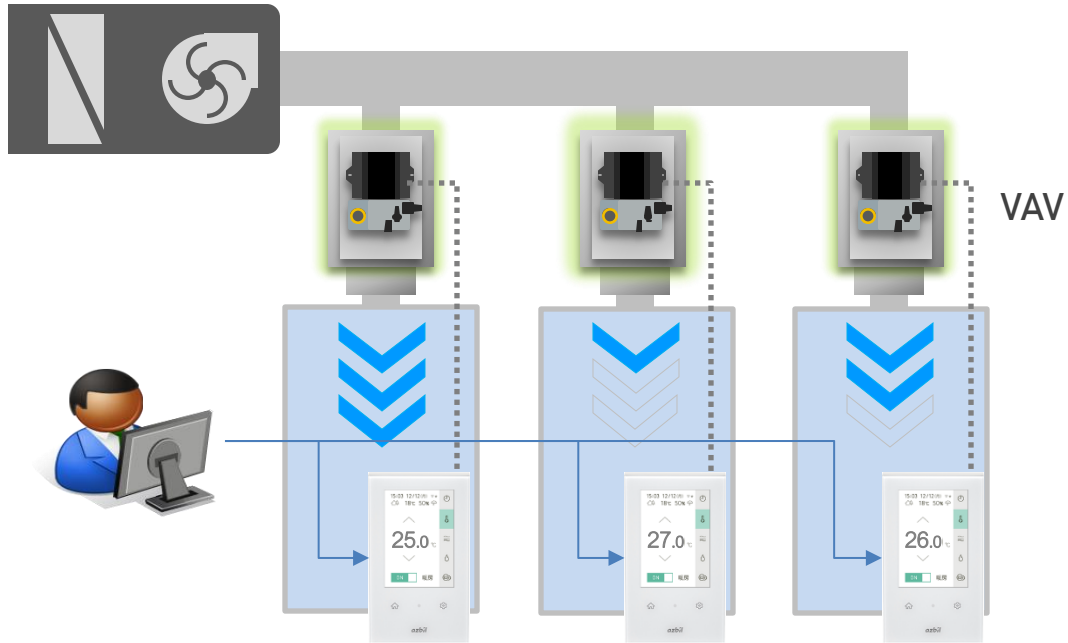
Constant Static Pressure control generates so much energy loss.



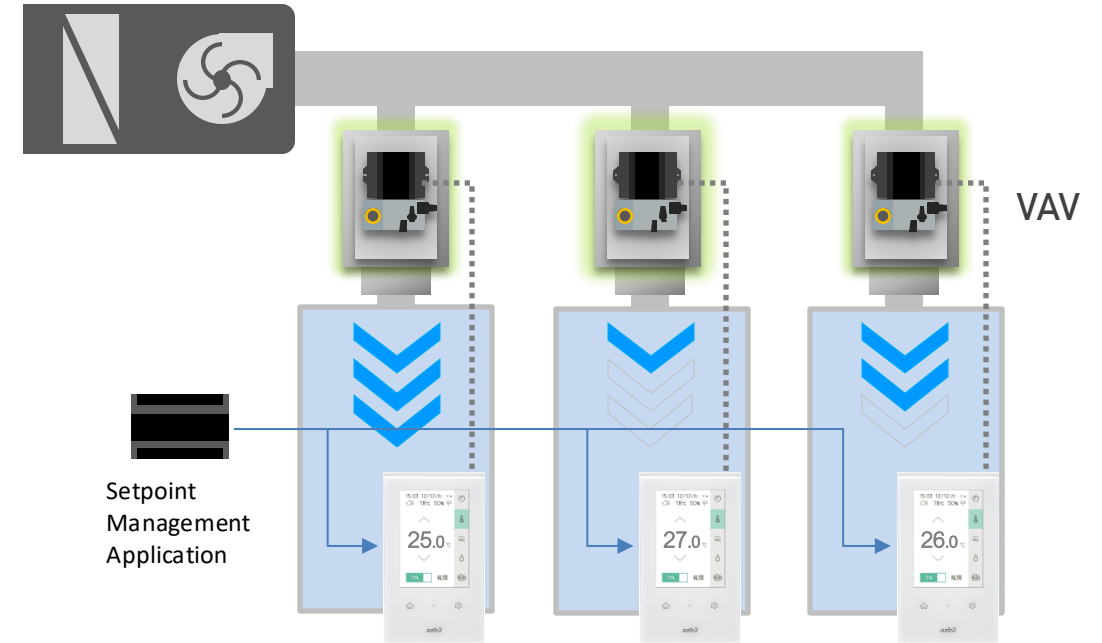
Cases in Singapore

Azbil VAV achieved energy savings in each building

Human Operation



Azbil's Setpoint Management



Eliminating Energy Waste by Operation

Setpoint management program to appropriately manage the thermal environment.

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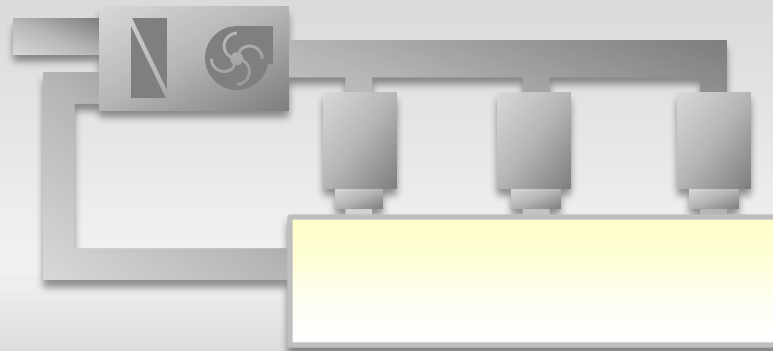
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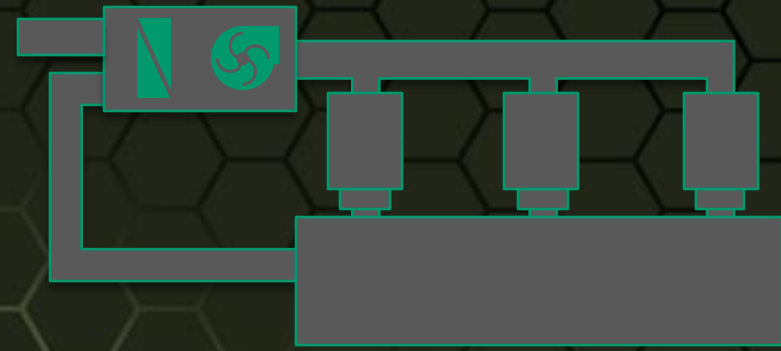
Air Handling Unit

Real AHU in Physical World



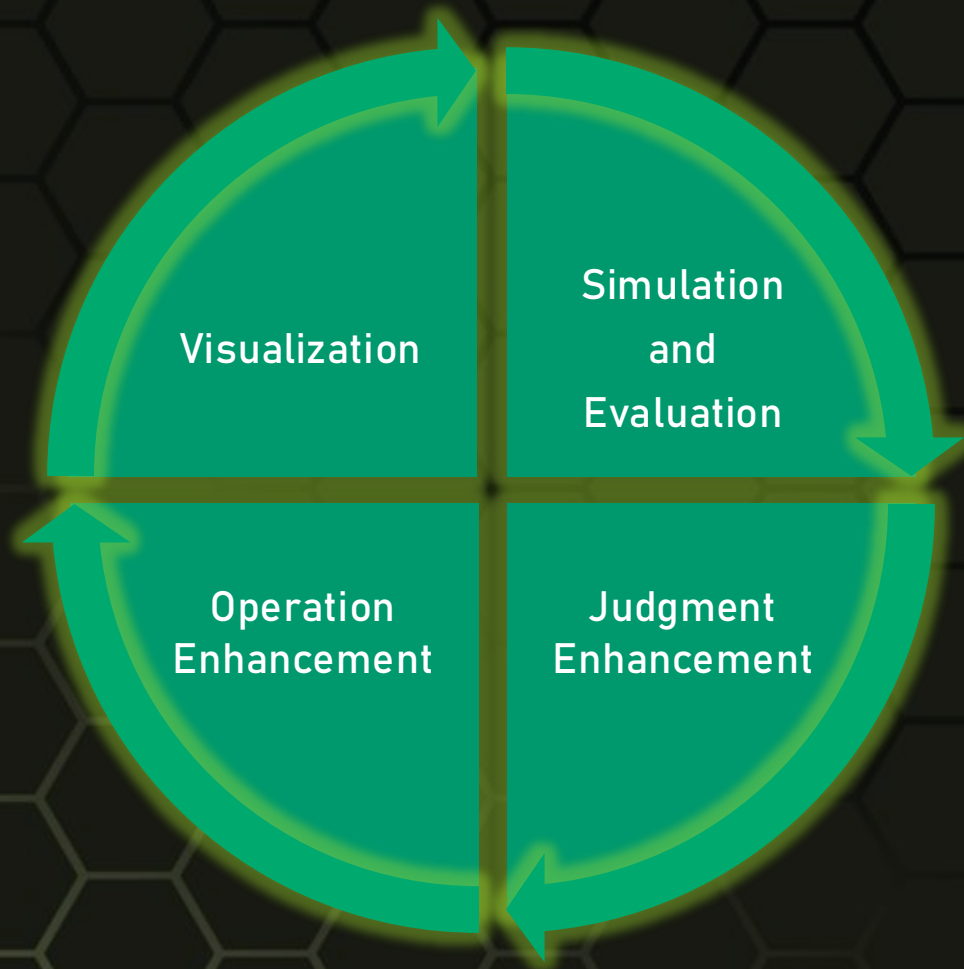
Airside Digital Twin

Digital Twin Model in Cyber World



Metaverse of Air Handling Unit

Creates the Digital Copy of air handling unit in the Cyber World by utilizing information in the Physical World



Visualization

Identify current usage status
with various Dash Boards

Simulation and Evaluation

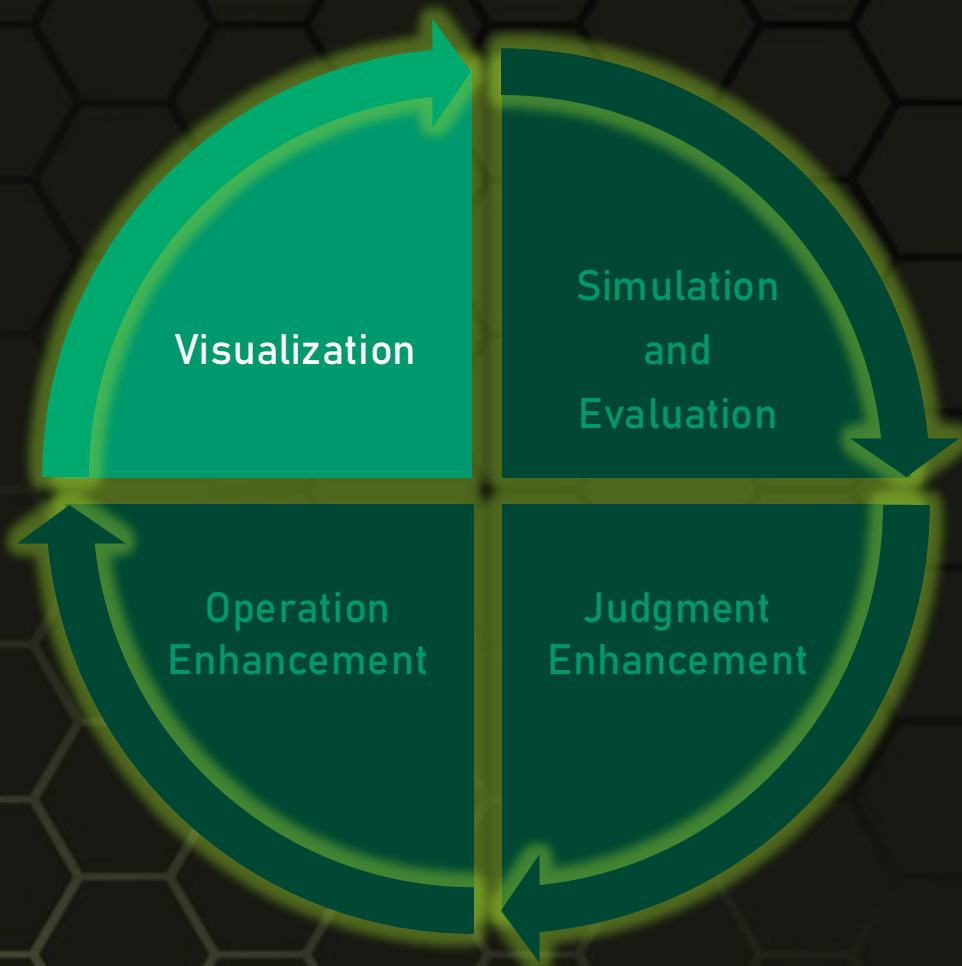
Trial & Error in the cyber space
Energy optimization

Judgment Enhancement

Operational fault detection

Operation Enhancement

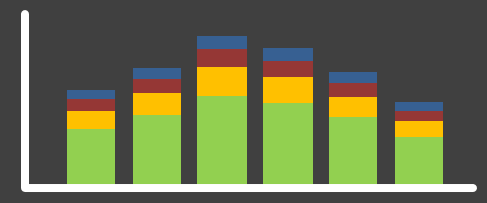
Actionable insights
Operational Advice



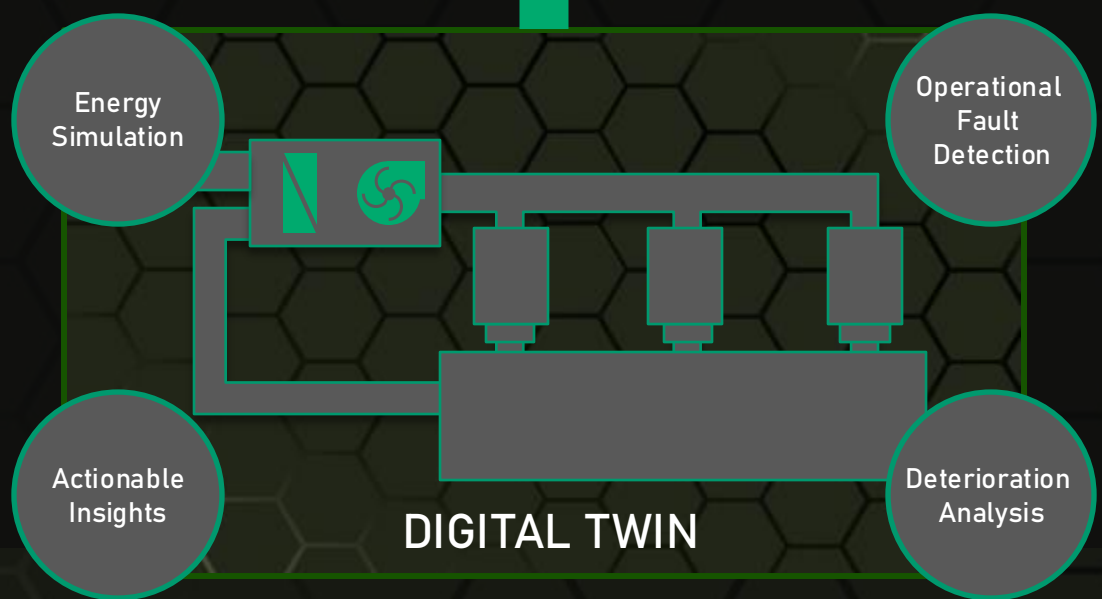
Visualization

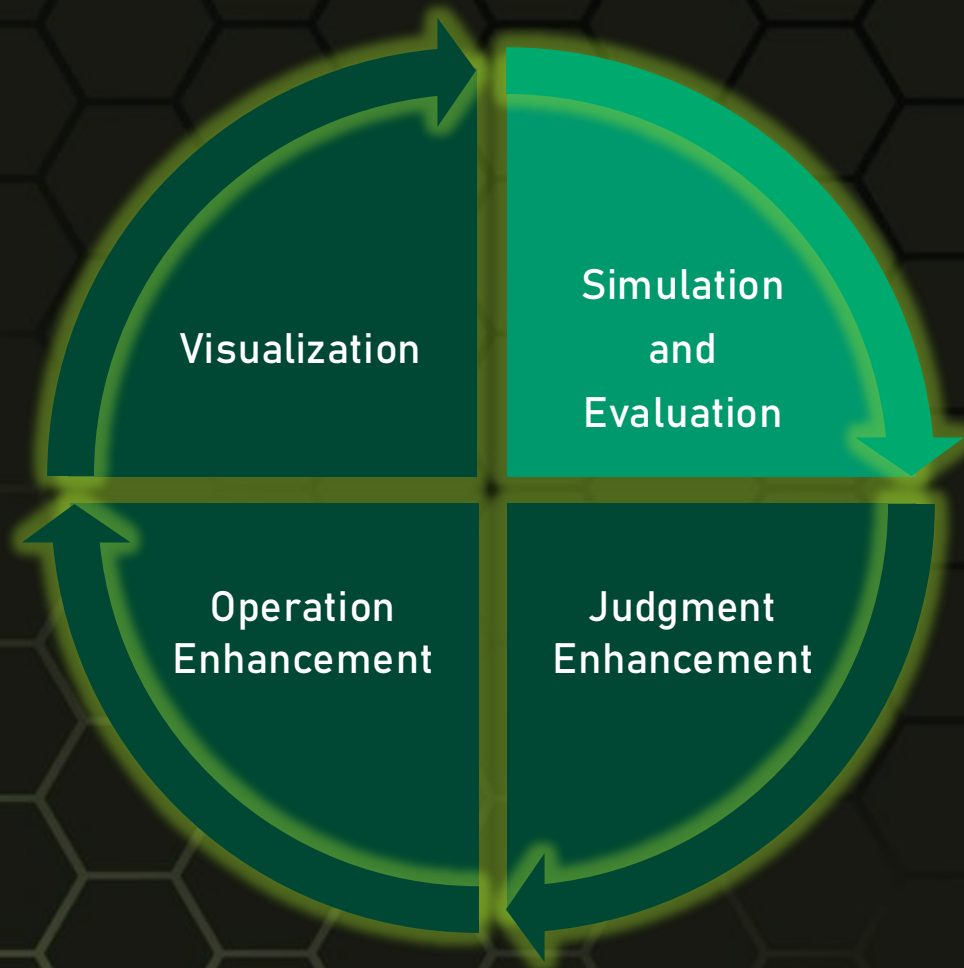
Identify current usage status with various Dash Boards

Estimated Energy Consumption



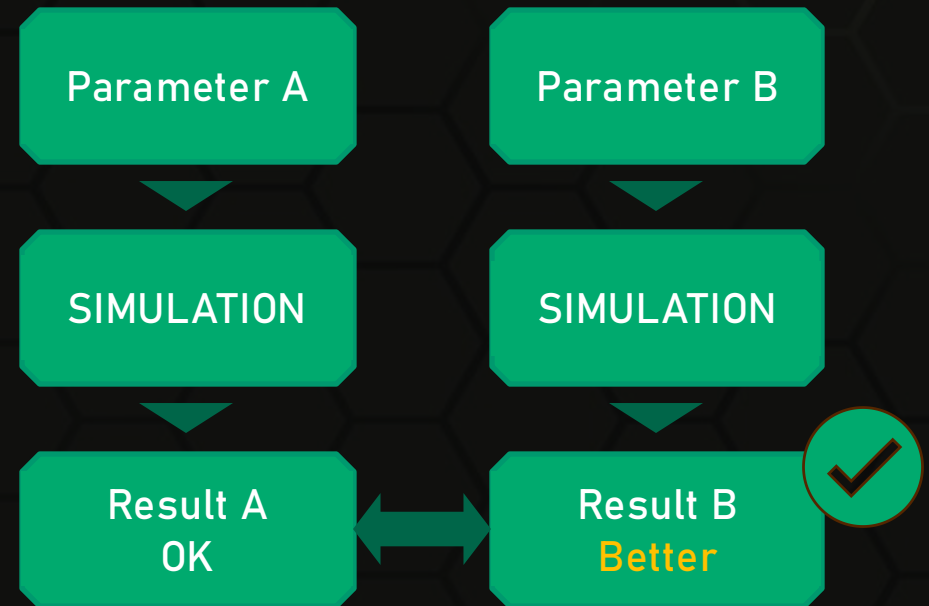
Simulated Result



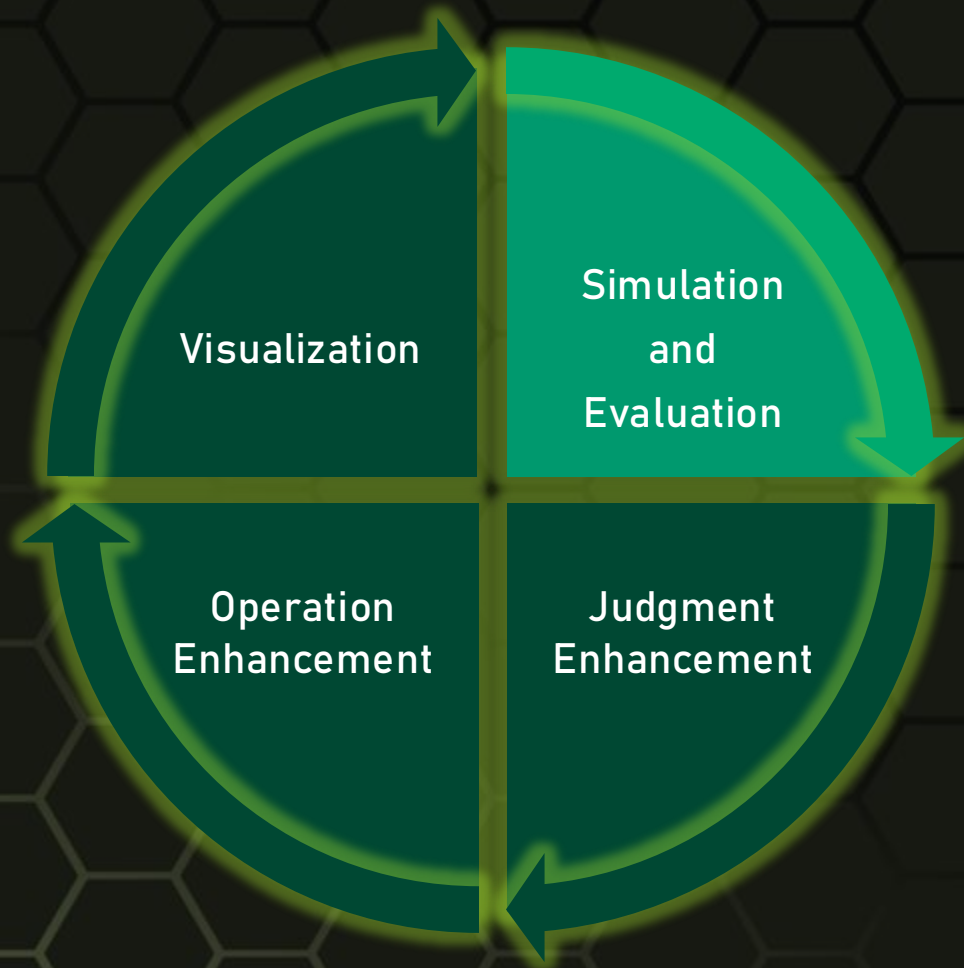


Simulation and Evaluation

Trial & Error in the cyber space
Energy optimization



Compare with actual Simulation result
to show the effectiveness of program



Simulation and Evaluation

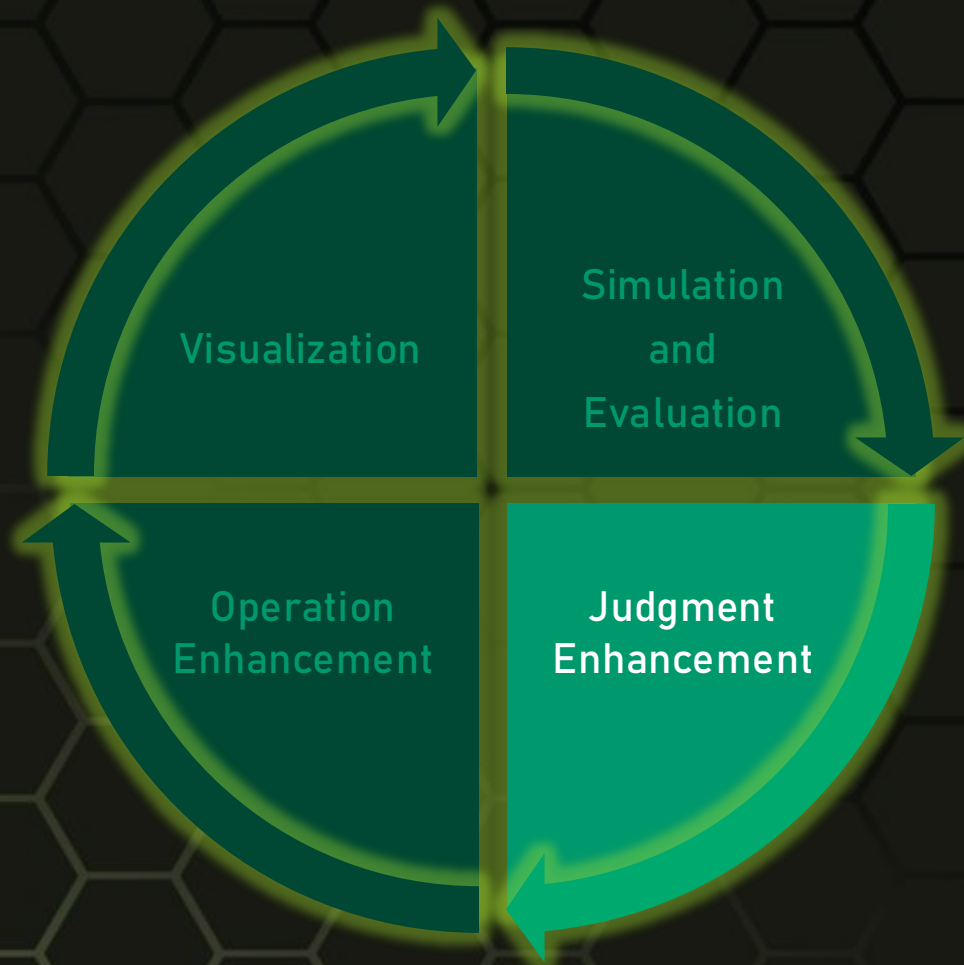
Trial & Error in the cyber space
Energy optimization

Set a target result

SIMULATION

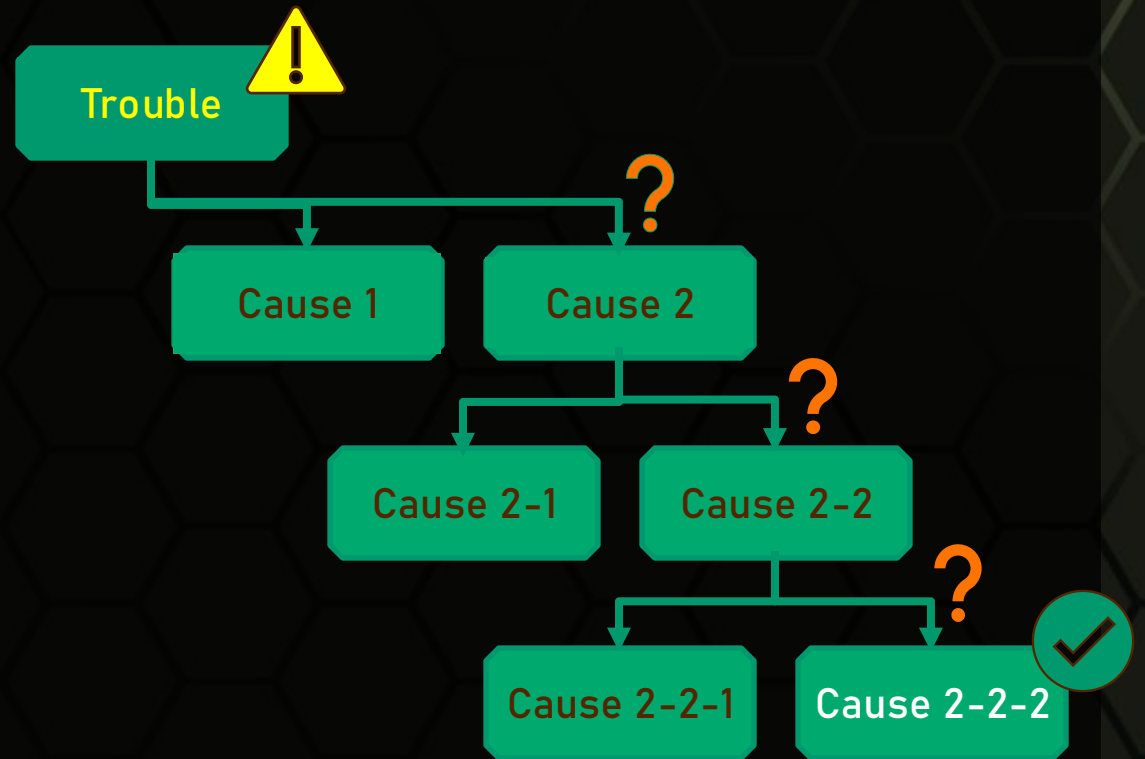
Recommend parameters
to realize the target

Find parameters which can realize
the target result by simulation
and recommend the parameters

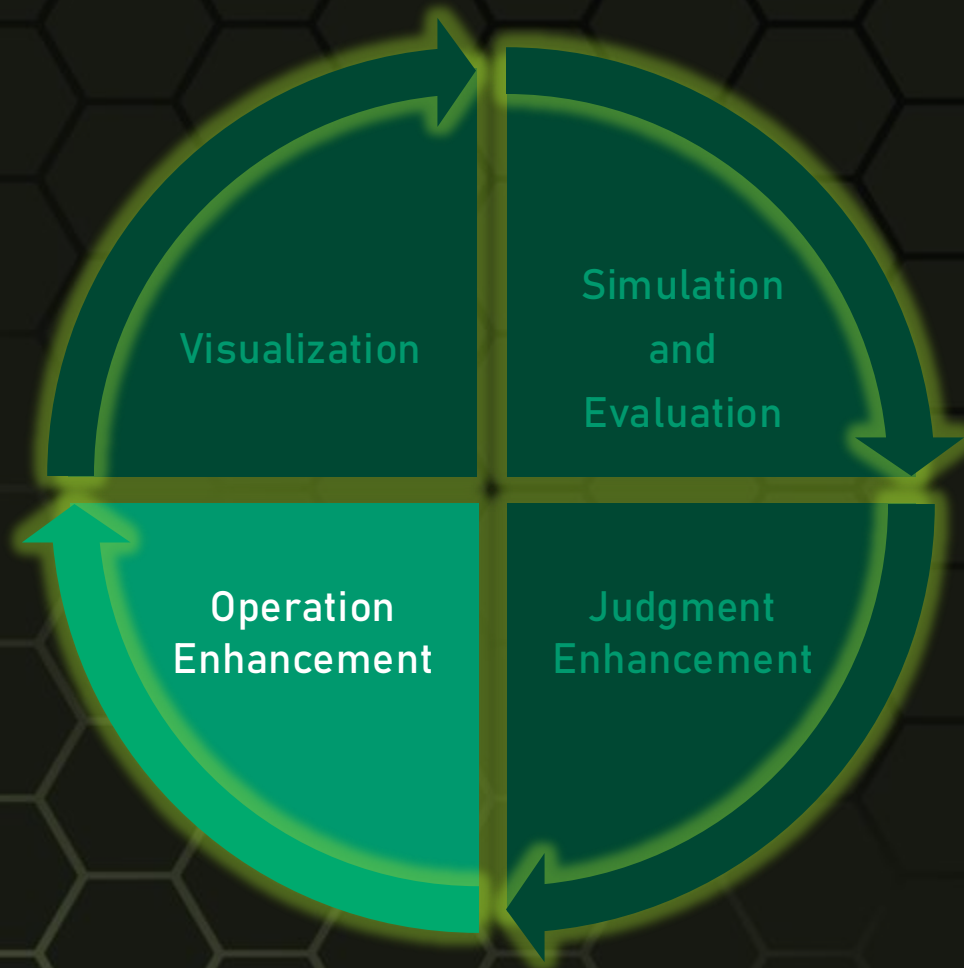


Judgment Enhancement

Operational fault detection



Provide steps to navigate operator for rectification
Show wastage amount if fault is not rectified



Operation Enhancement

Actionable insights
Operational Advice



Recommendation

Guide operator to improve operations by assessing actual equipment performance
Indicate saving amount of each measure



Deterioration Analysis

Compare original performance with current performance to verify the deterioration rate
Notify operator to provide recommendation of servicing equipment

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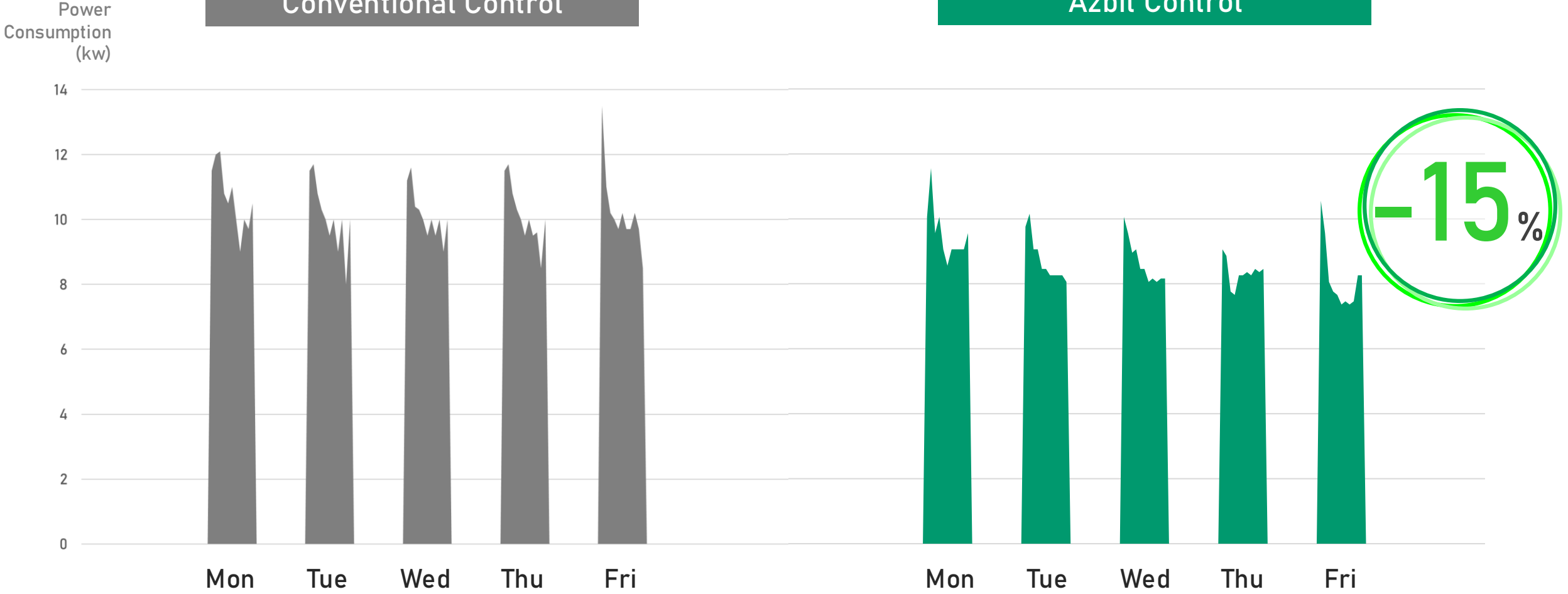


THANK YOU

Back

Conventional Control

Azbil Control



Actual on-site measured data for 5 days at U Building, Singapore