

Ärikinnisvara tehnosüsteemide diagnostika ja mudelipõhine juhtimine

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R8 TECHNOLOGIES



R8tech in numbers



16

team members



477 257

datapoints



605 000+ m²

portfolio size



9 810 000 kg

CO₂ savings



2017

founded

* portfolio information updated: 30.08.2020



R8 Digital Operator integrates securely with all common and modern BMS without any additional hardware.

Global Perspectives

Buildings and construction together account for **36%** of global final energy use and **39%** of energy-related carbon dioxide (CO₂) emissions when upstream power generation is included¹.

Progress towards sustainable buildings and construction is advancing, but improvements are still not keeping up with a growing buildings sector and rising demand for energy services. The energy intensity per square meter (m²) of the global buildings sector needs to improve on average by **30% by 2030** (compared to 2015) to be on track to meet global climate ambitions set forth in the Paris Agreement.

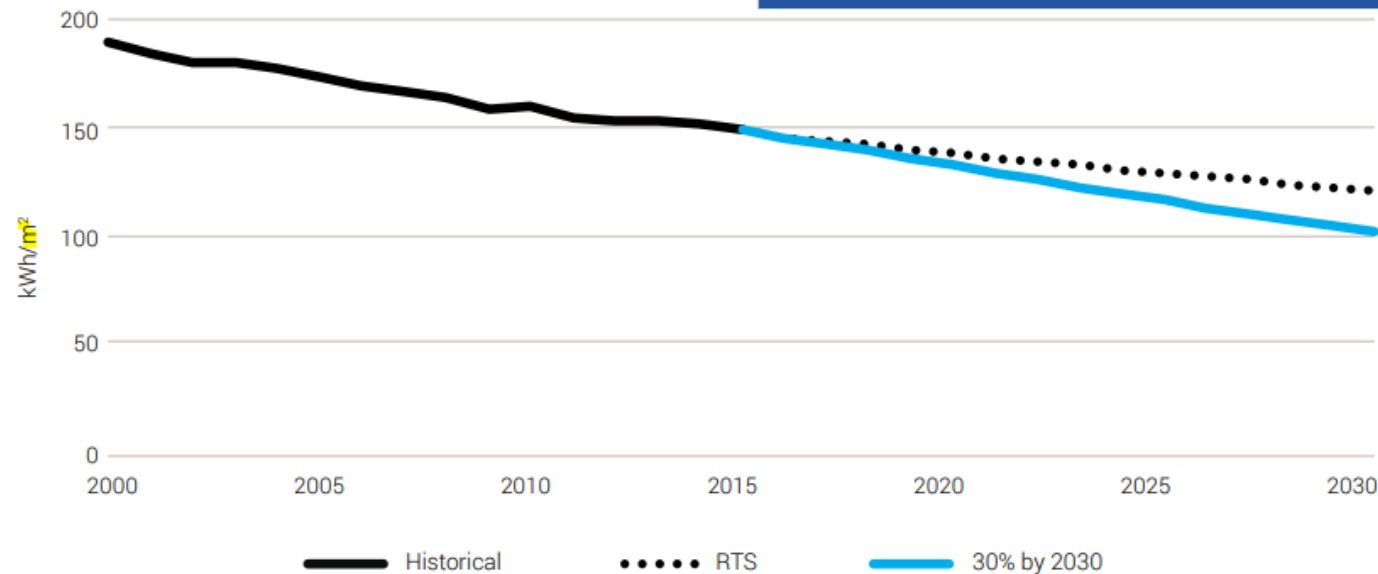
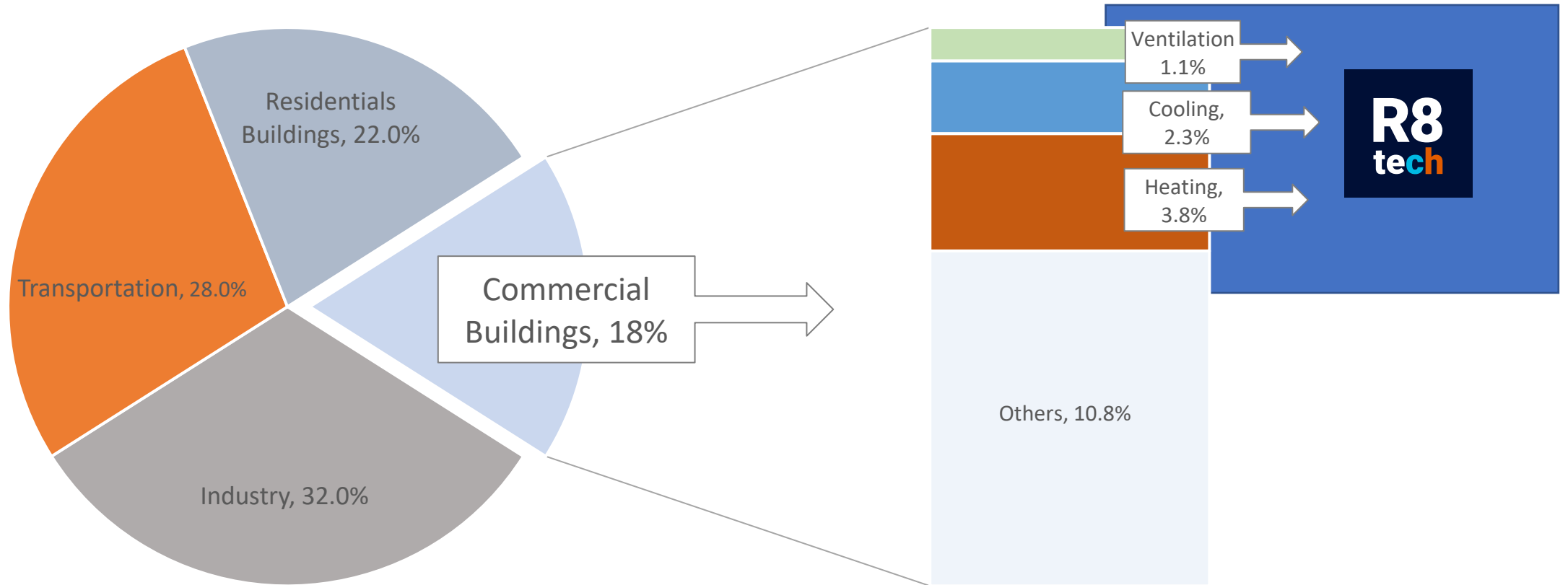


Figure 1. Global final energy use per square meter.

Source: IEA (2017), Energy Technology Perspectives 2017, IEA/OECD, Paris, www.iea.org/etp

Energy Consumption by Sector

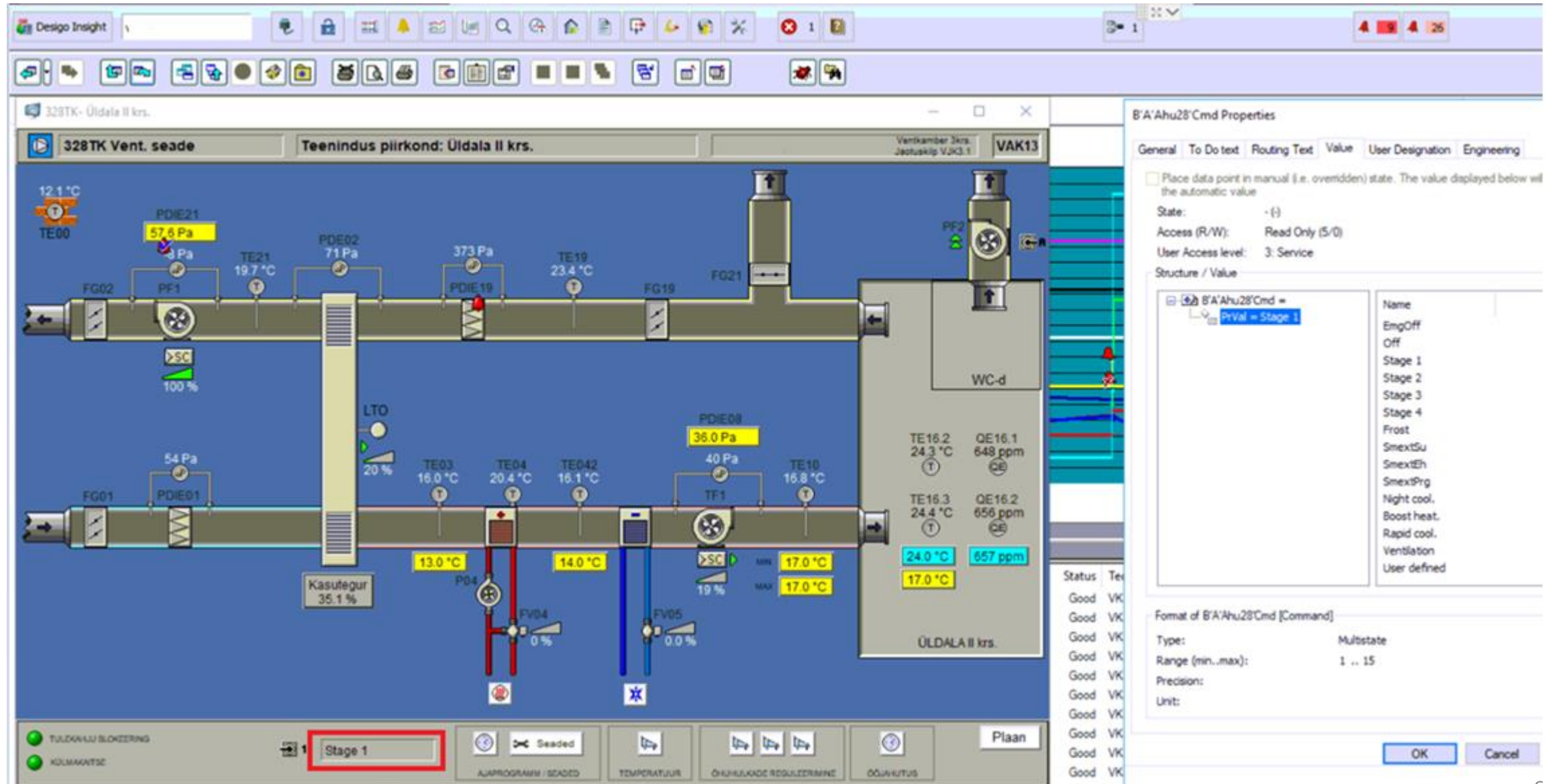


Buildings account for **40%** of energy-related CO₂ emissions

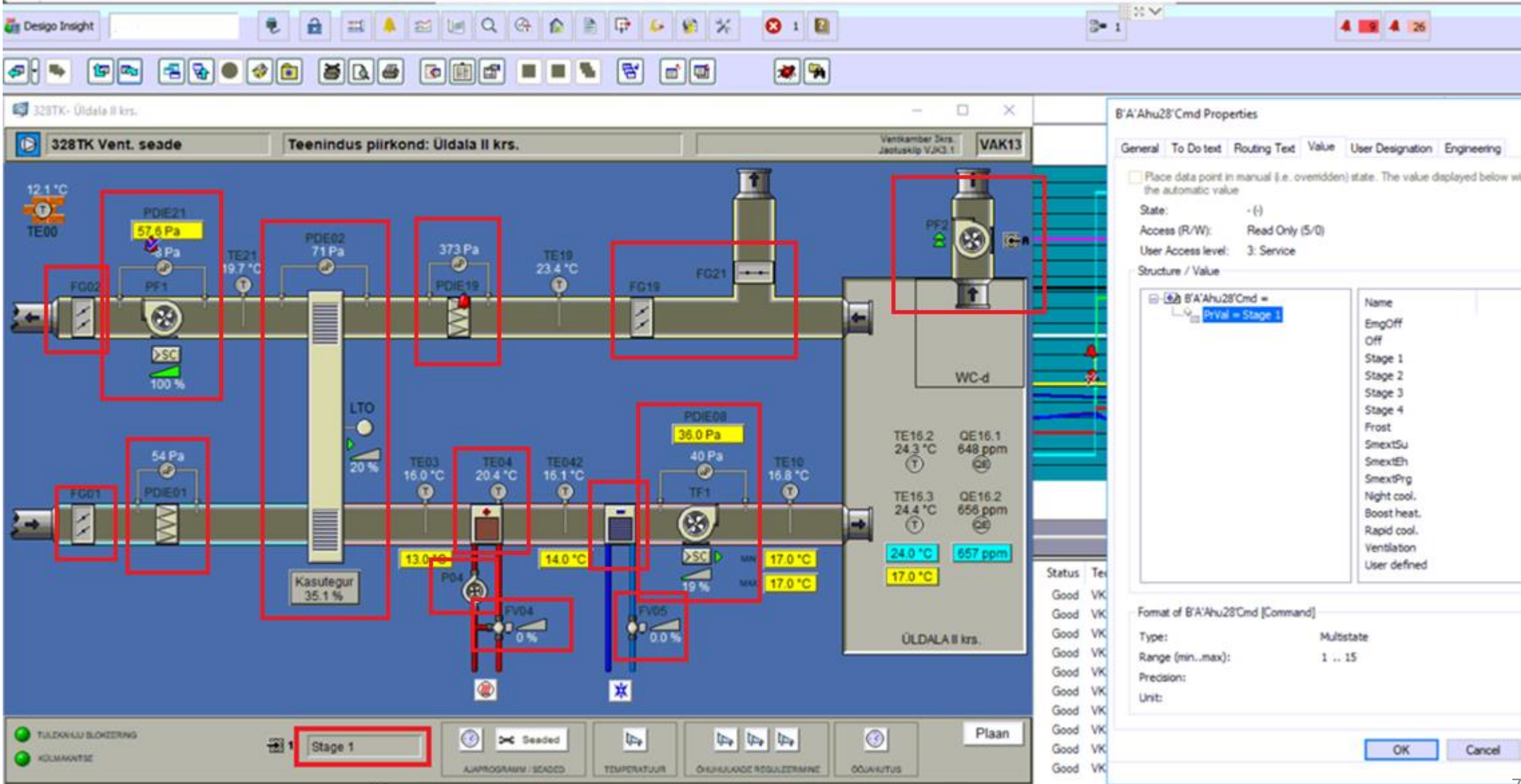
Kuidas juhtida hoonet efektiivselt tagades
mugava sisekliima
ja vältides ülekulu reaajas?

How to control building efficiently by ensuring
comfortable indoor climate
and avoid overconsumption at the same time?

Sample for BMS ventilation machine view

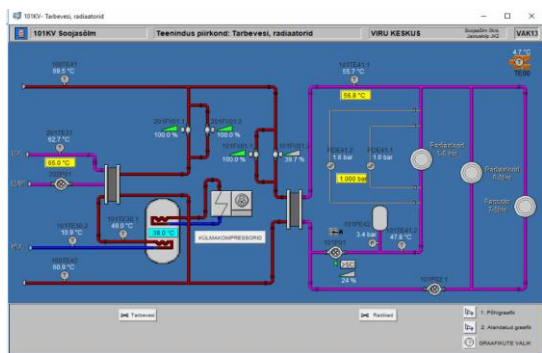


BMS ventilation machine operational complexity

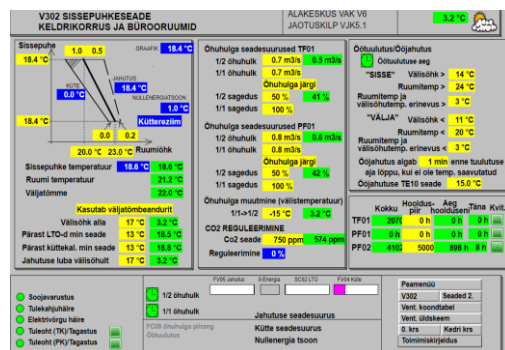
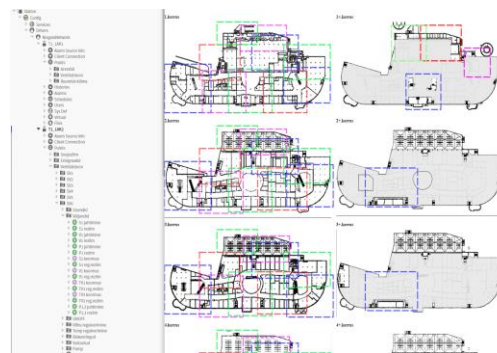


BMS are too complex to manage and are full of human errors

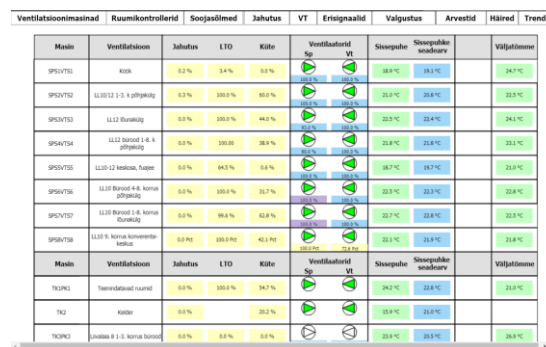
Building Automation Management Systems (BMS):



SIEMENS



Schneider
Electric

niagara
framework®

**“Achieving most optimal calibrations”
is over complicated.**



No data driven decisions



Limited features



Thousands of parameters



Difficult to track performance



Lubja 4, Tallinn, ESTONIA



25 304
m² office building



48 813
datapoints
SIEMENS

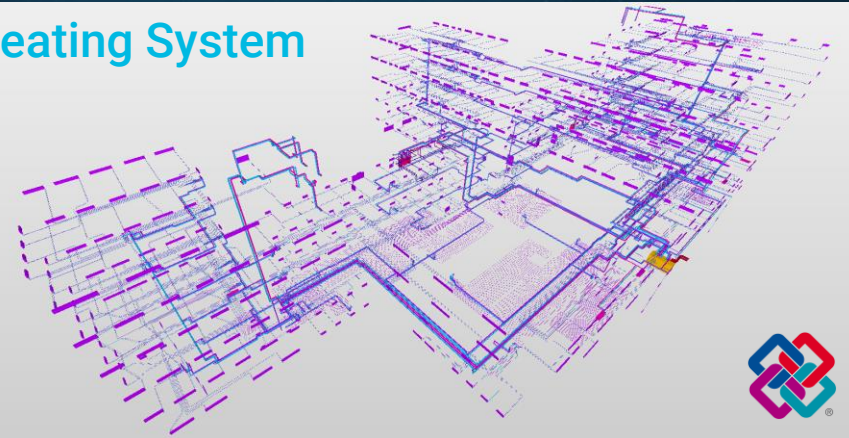


2018
construction year

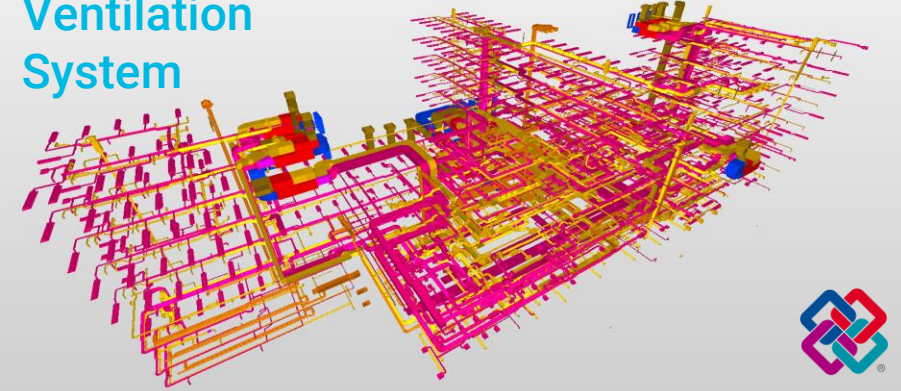


2 898
controllable
HVAC components

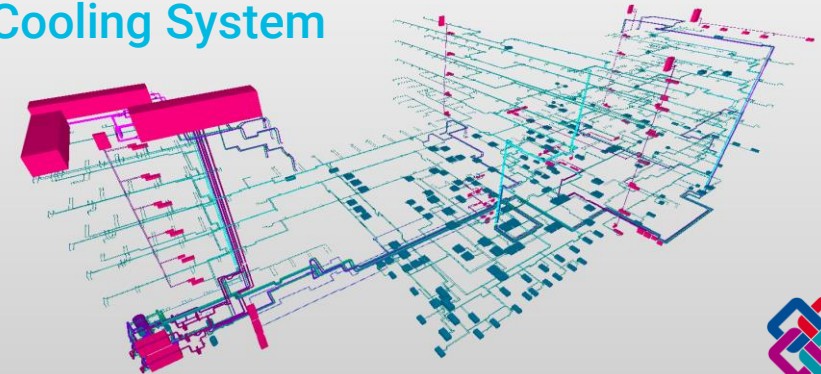
Heating System

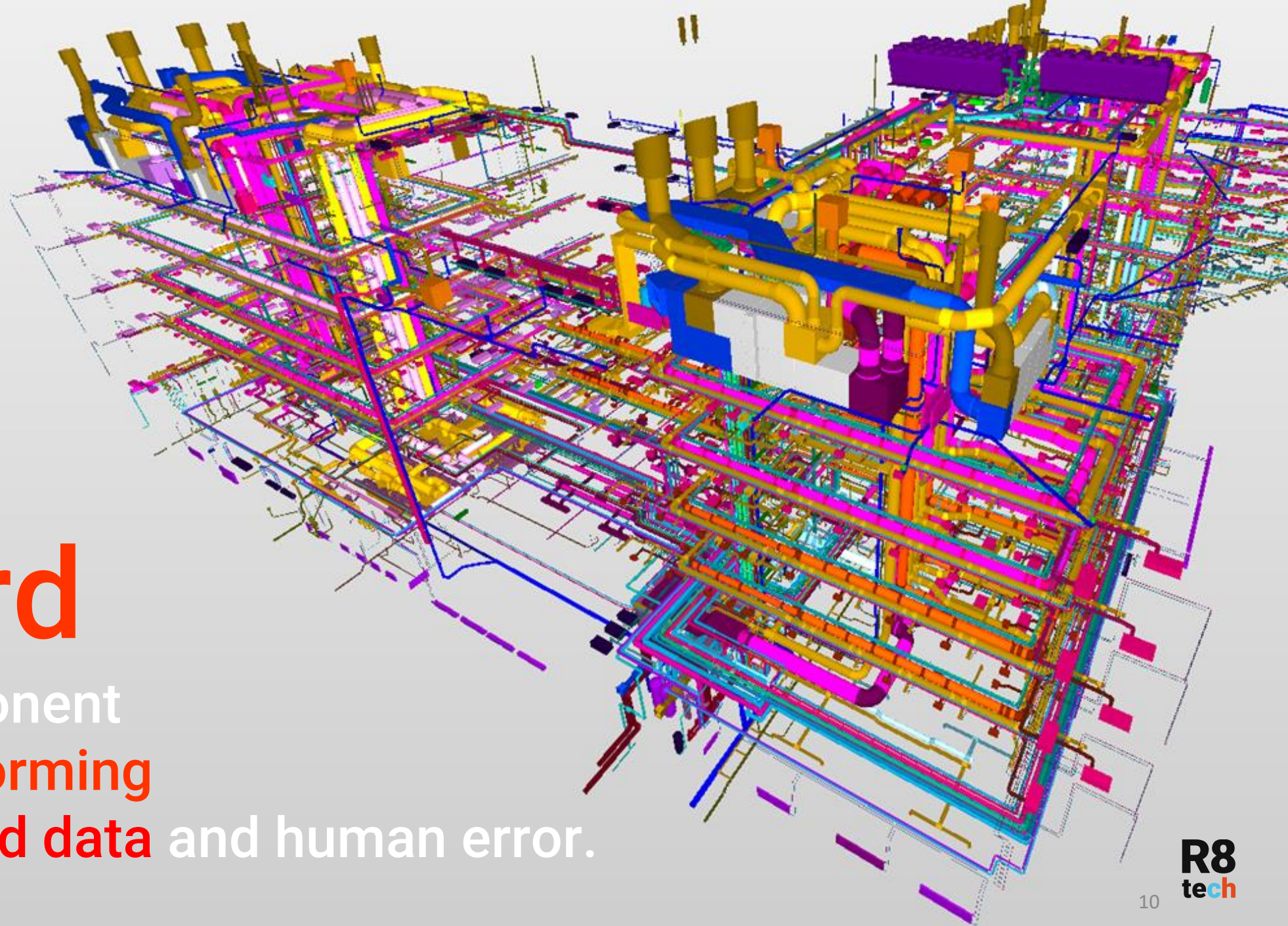


Ventilation System



Cooling System



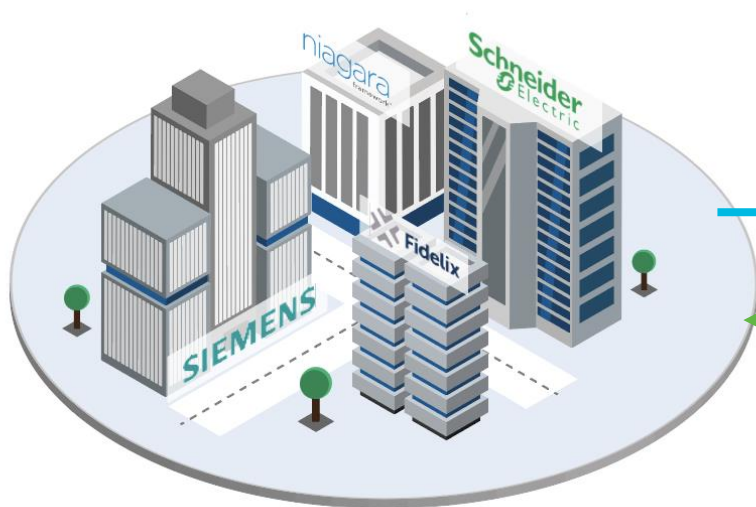


Every **third**
HVAC component
is **underperforming**
due to **unused data** and human error.

Use the building data in real time

to ensure highly performing buildings

Remote Set Up



Cloud solution



R8
tech

R8 Digital Operator
powered by AI



Every 15
minutes

Key Performance Indicators



Energy Efficiency



Comfortable
Indoor Climate



Technical
Condition

Autonomous data usage in automation

to ensure highly performing buildings



Autopilot

Model-based control maximizes
HVAC systems operational efficiency

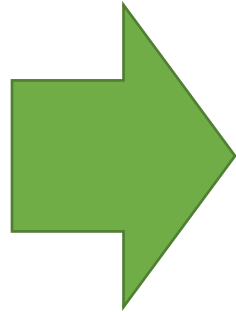
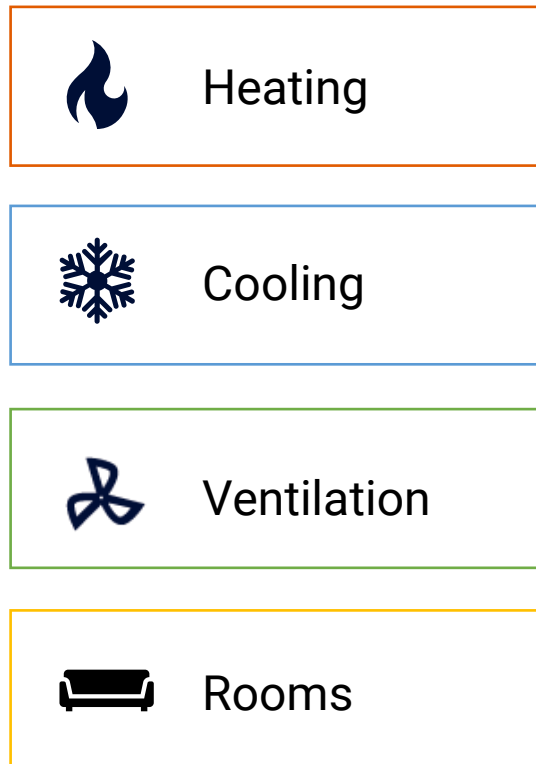


Diagnostics

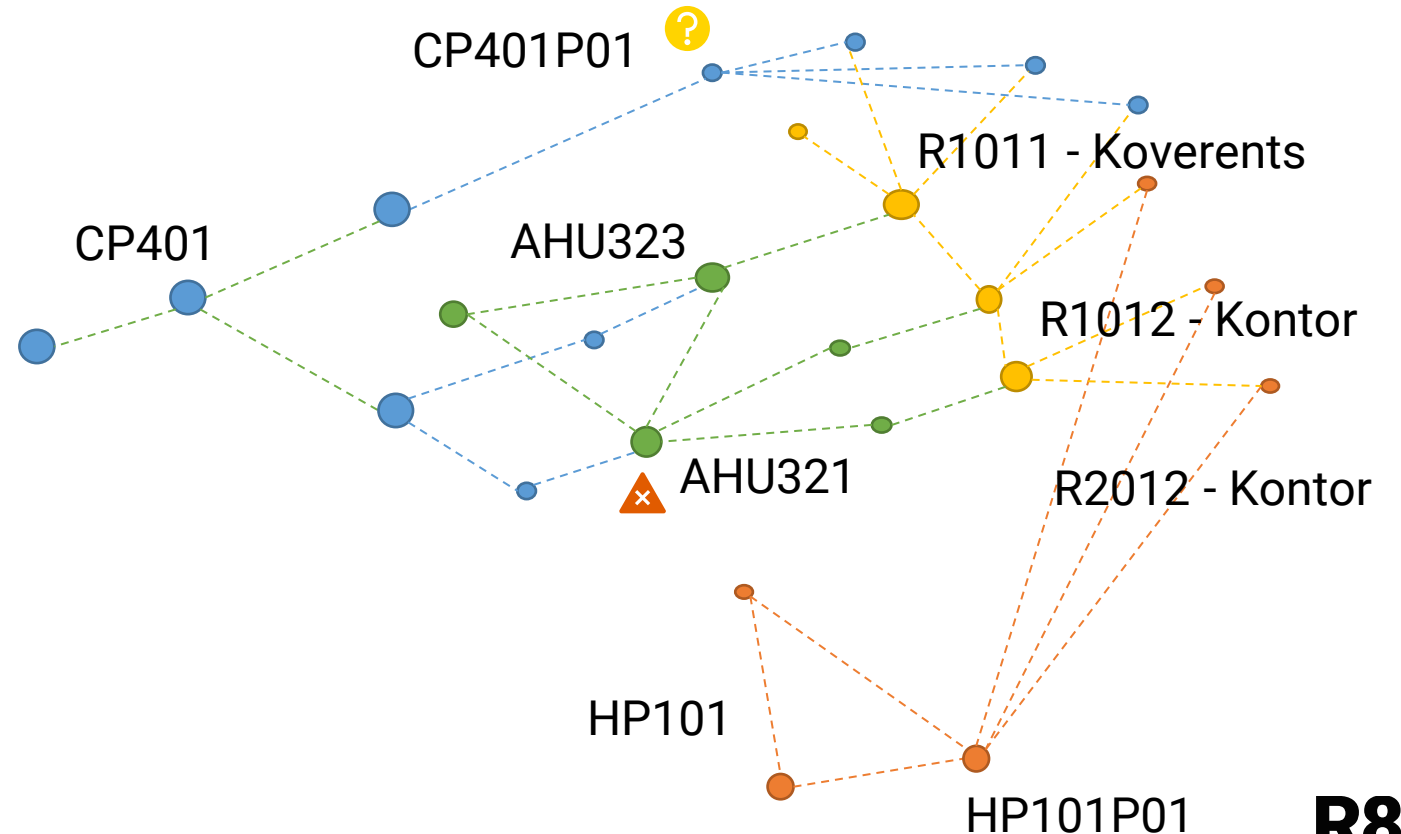
Data driven automated analytics detect
HVAC systems faults

Building's connected machine-readable system's architecture

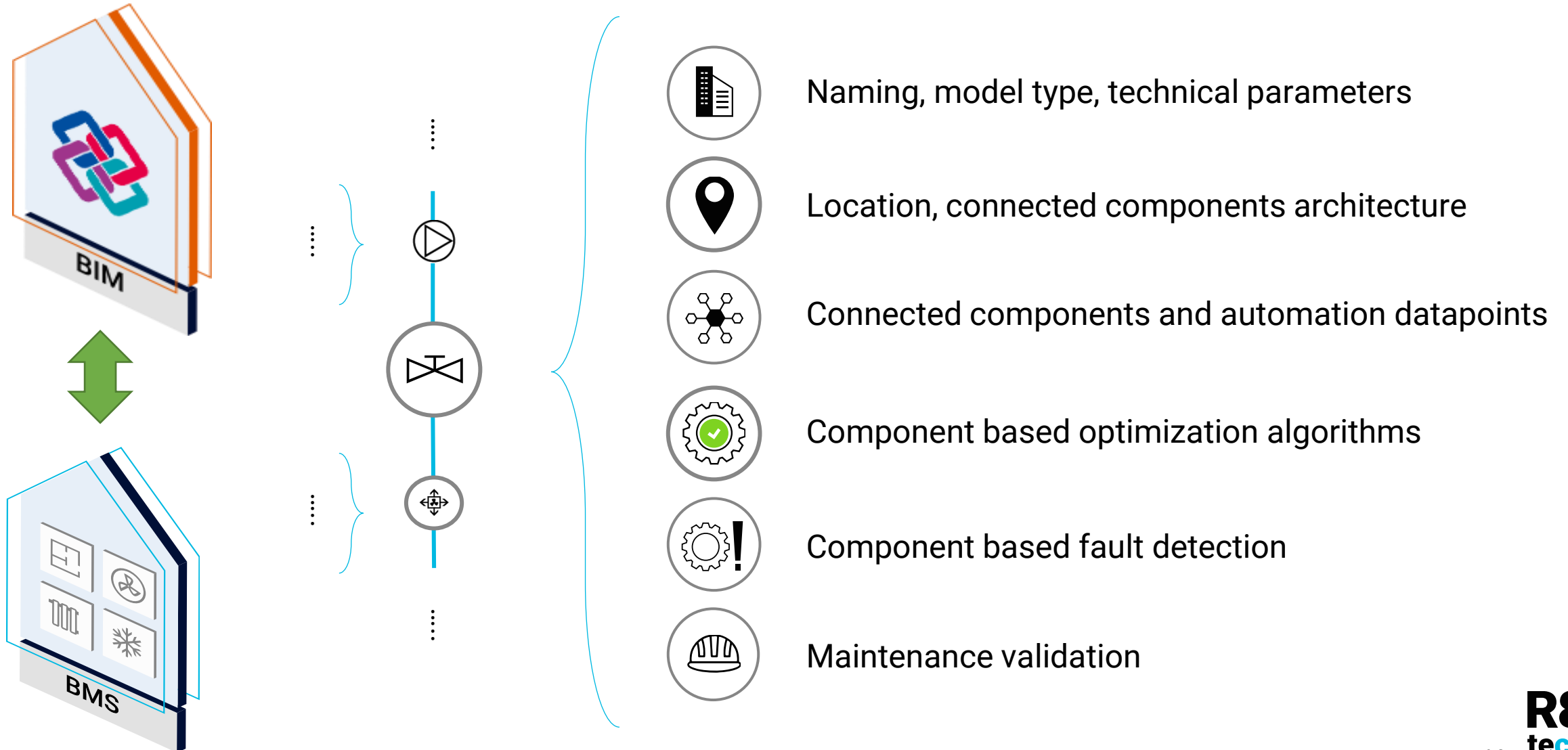
Building automation systems are **sub-isolated** and “managed” independently.



Modelling enables to look at the system as whole and use the connections between related systems to understand relations between components is running efficiently and without faults.

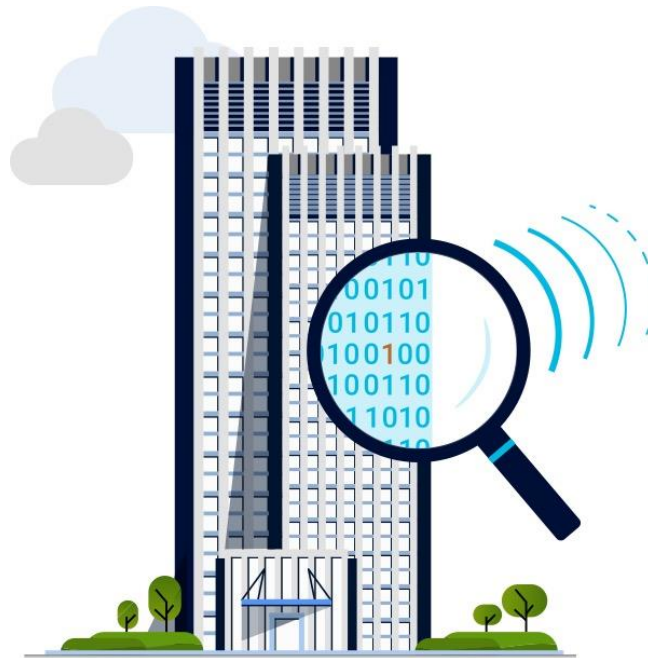


Use the systems information for operations



Diagnostics

- < **Data driven** fault detection with ticketing and validation.
- < **10 times** more precise HVAC systems fault detection compared to specialists.
- < **-20%** maintenance and renewal cost reduction over the HVAC systems life cycle of 20 years.
- < **59 000+** faults and anomalies detected.



Room temperature is too high, and fan-coil has been working 97.6% of the time past 3 days. Check fan-coil.



The room switches frequently between cooling and heating (35 times during the last 2 days). Calibrate room controller.



Ventilation unit valve leakage has caused overconsumption of 500 €/week



Cooling circuit pump is not following the pressure set point. Check the pump and hydraulics.



Heating plant supply temperature set point is not achieved 75.2% of the time, average temperature difference 14.2°C. Check valve and heat exchanger.

Data driven diagnostics analyses operational performance

Default alarms made by contractor

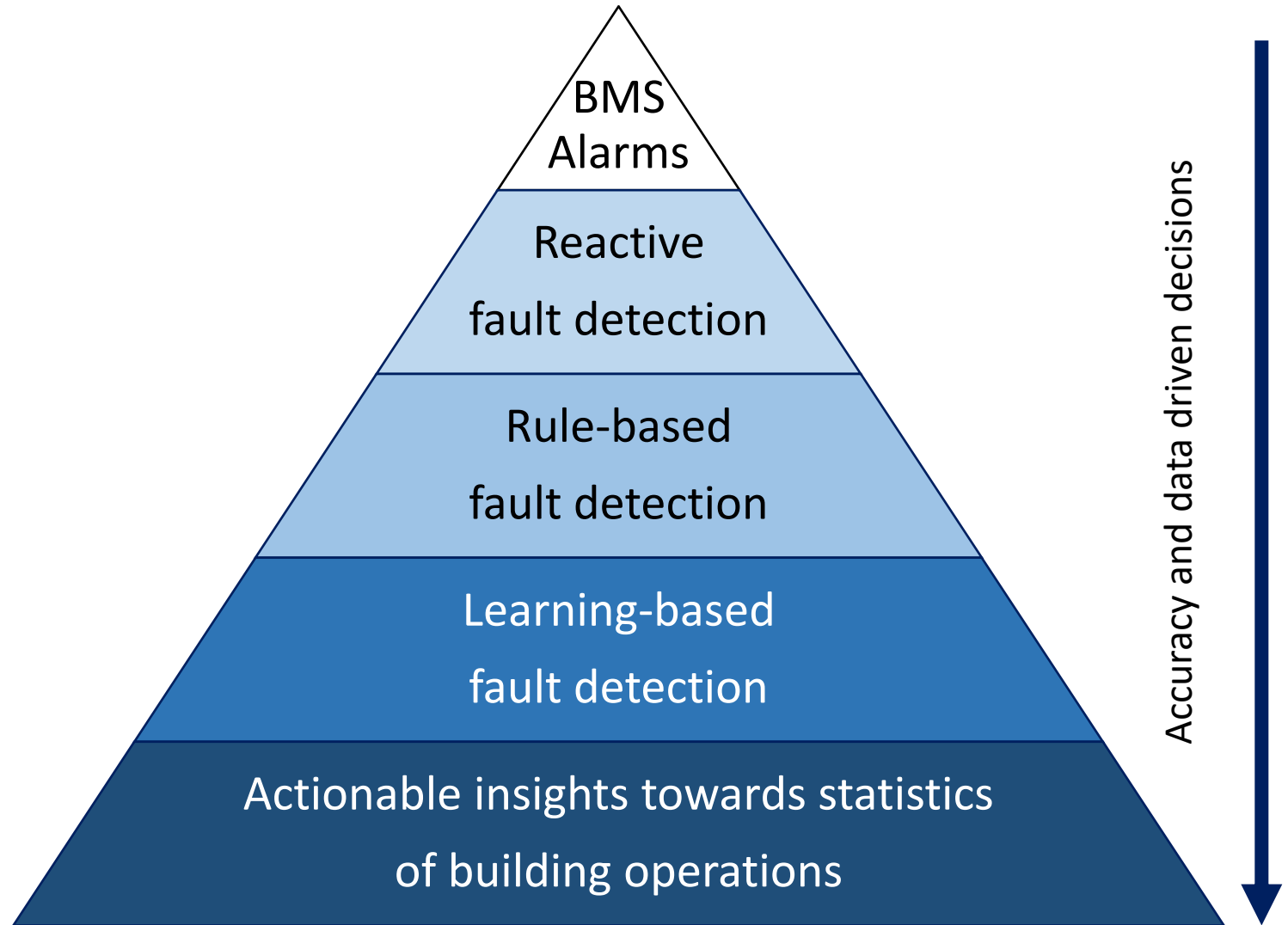
Frequent mode switching,
oscillations, flat lines, sensor faults etc.

Simultaneous heating and cooling,
leaking valves, narrow dead-bands etc.

Stuck dampers and valves, pressure and
temperature control faults impacts to
terminal units etc.

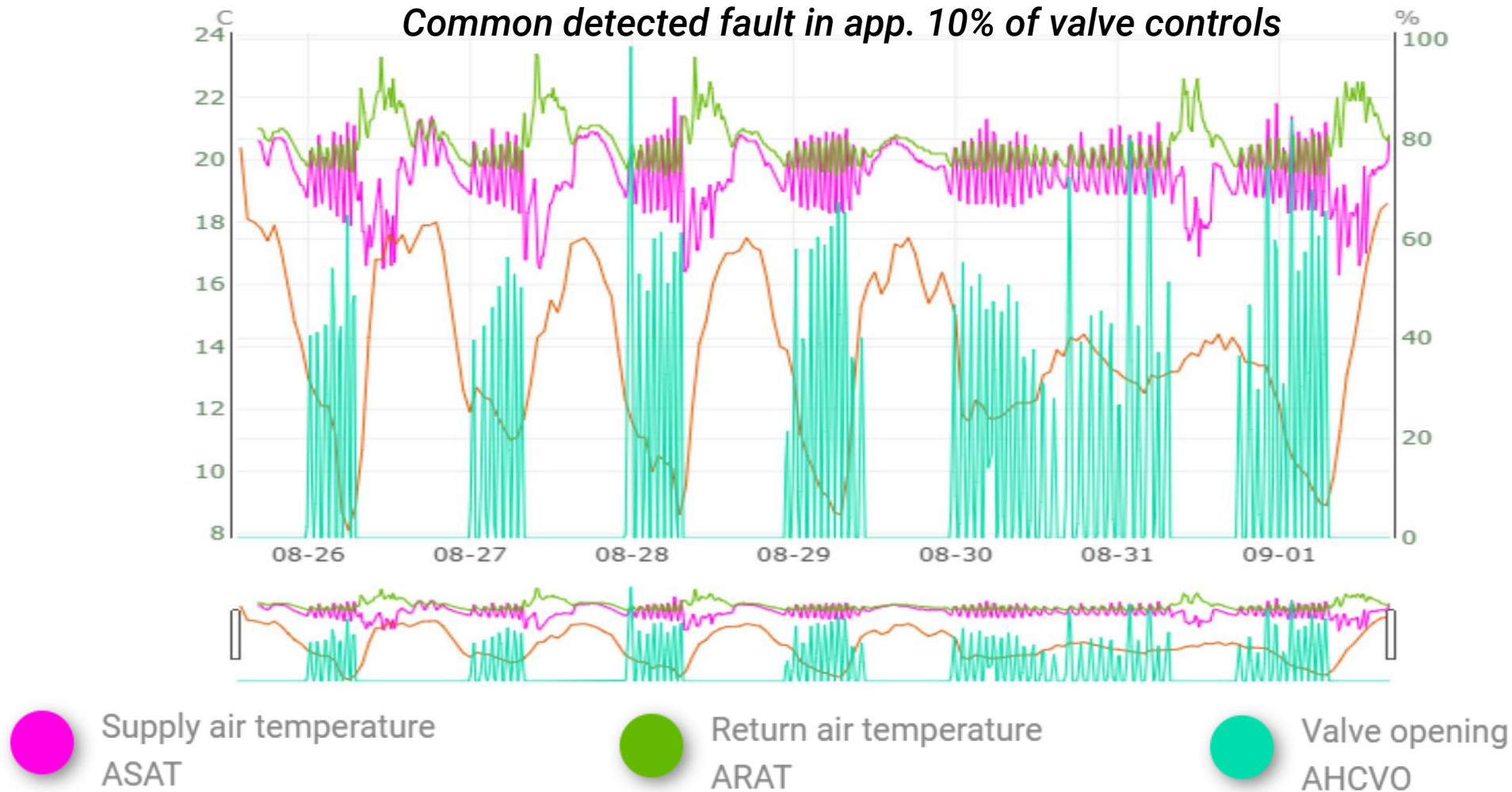
Identifies performance deviations and
underperforming components.

Predictive maintenance.



Example 1/2:

Reason: Inaccurate PID calibration
Result: Supply temperature oscillation



Example 2/2:

Reason: Wrong dead-zone selection

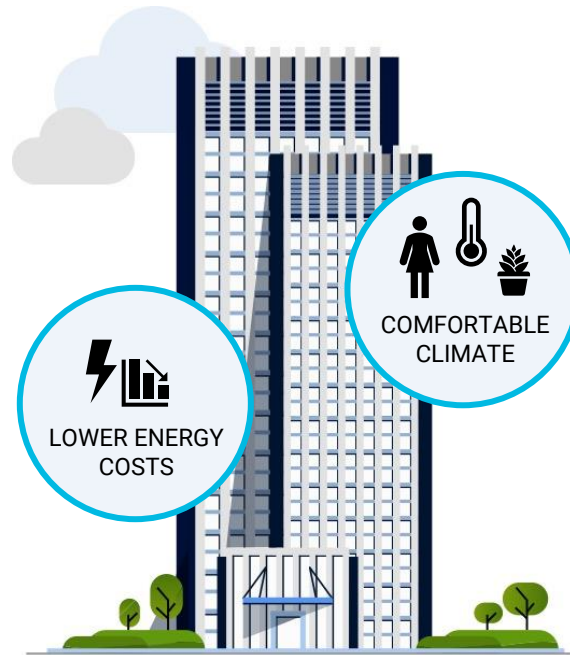
Result: Temperature oscillation and frequent mode switching

Common detected fault in app. 2% of rooms



Autopilot

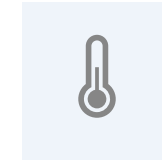
- < **Autonomous** AI-driven control optimization that ensures indoor climate quality with minimal energy costs.
- < **4 times per hour** checks all the parameters and adjusts accordingly.
- < **Up to 30%** savings on total energy cost.
(in average: 13.5%)
- < **9 000 000 +** kg of CO₂ reduced.



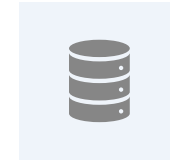
Real time feedback



Users'
interactions

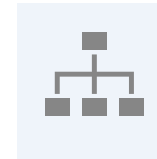


Indoor Climate
Preferences



Other ecosystems'
data silos

Supervised learning from historical data



Systems
behavior



Building
usage

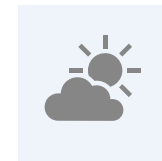


Energy
consumers

Predictions



Control Scenarios

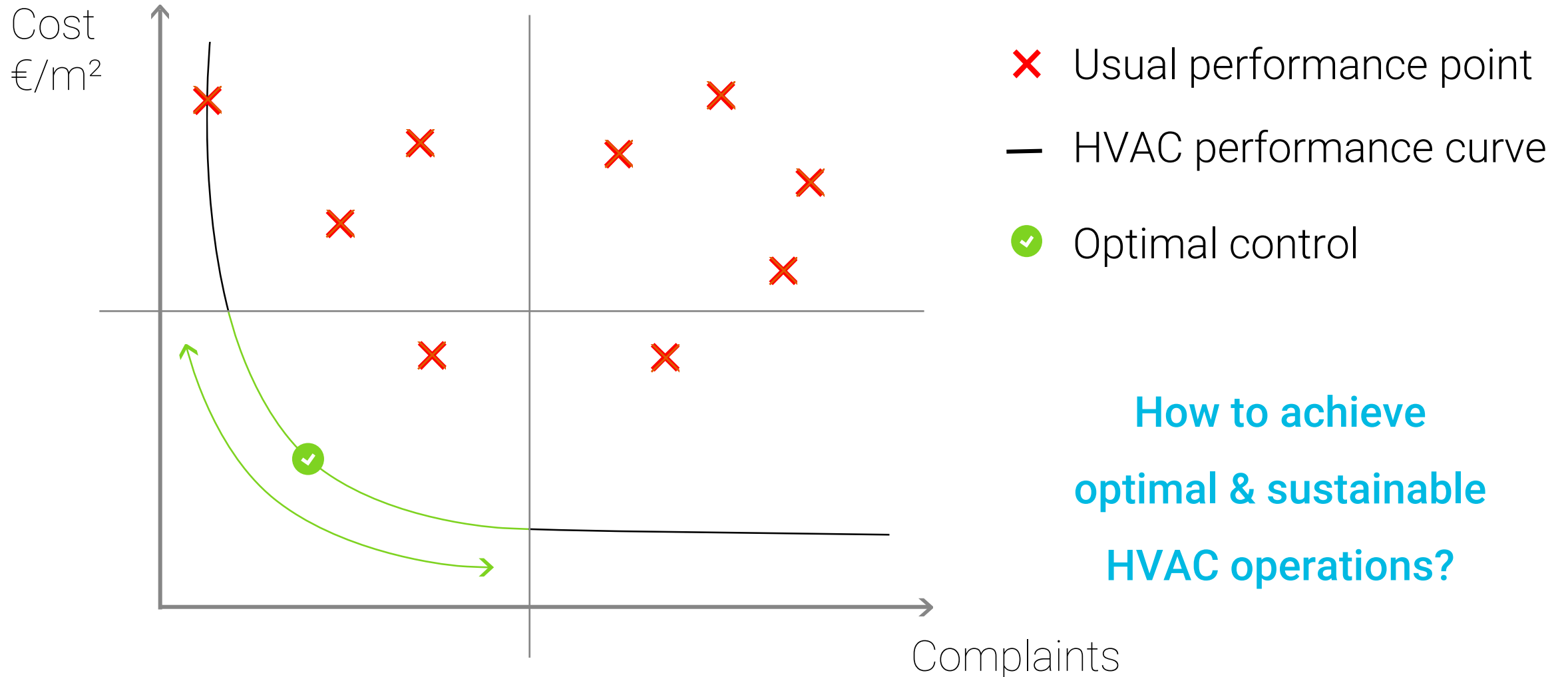


Weather

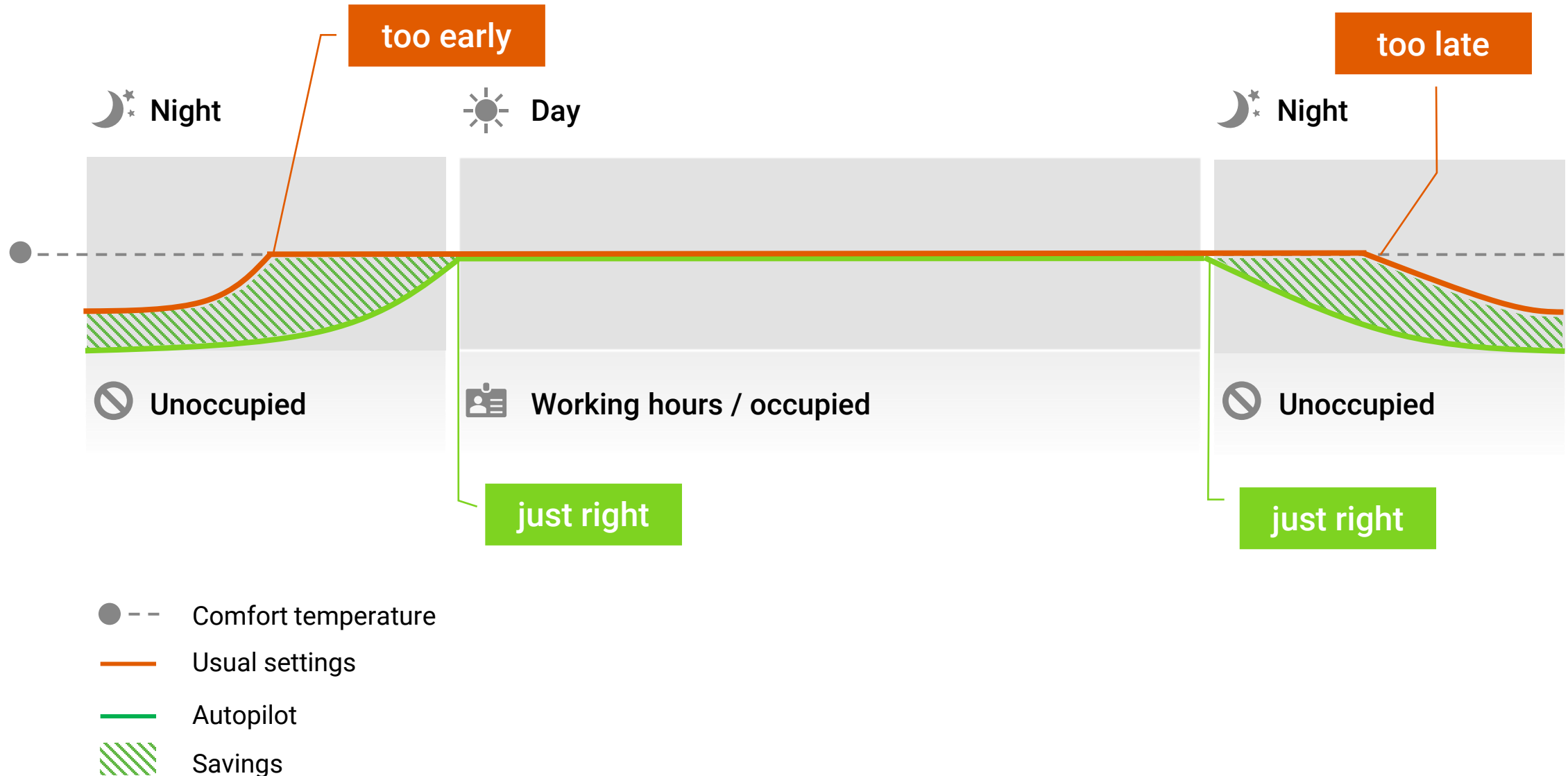


Energy prices

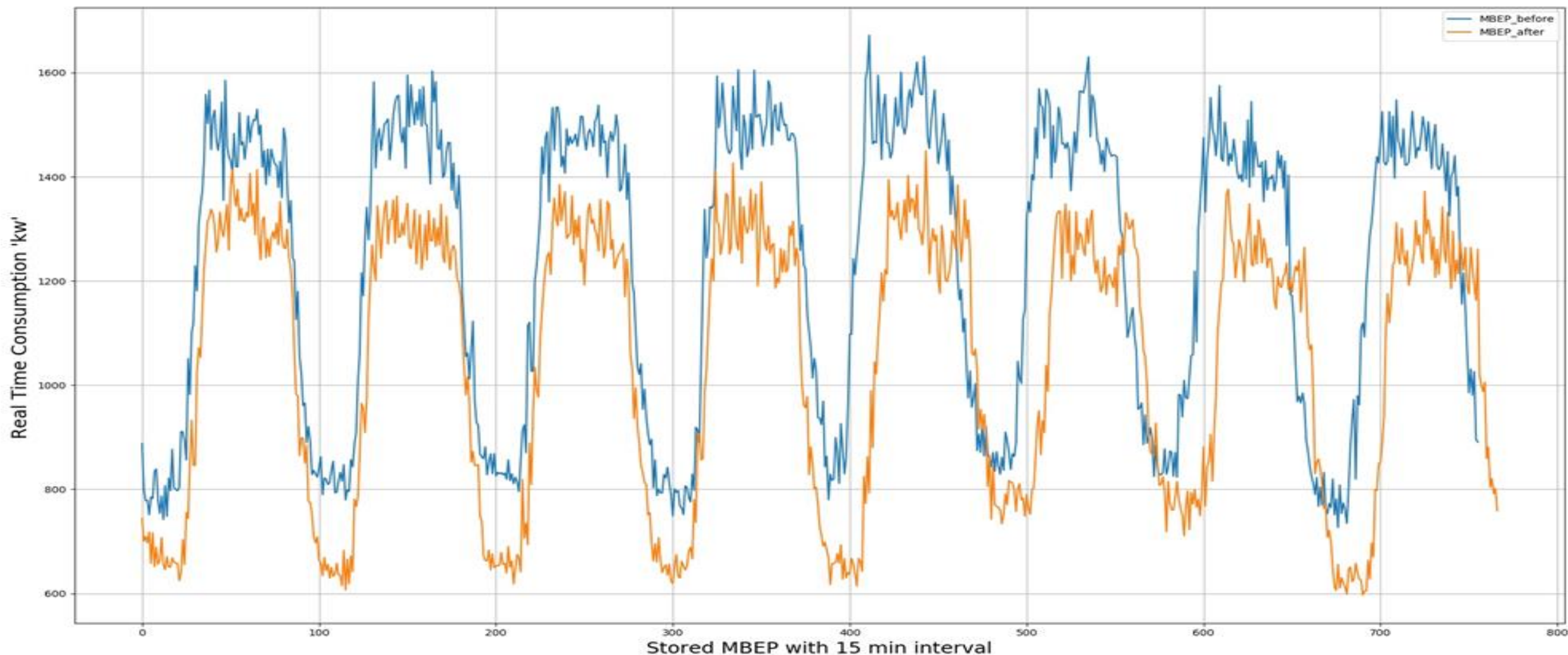
Autopilot ensures operational efficiency



Example 1/2: Start of cooling and heating at the right time.



Example 2/2: Decrease in daily overconsumption in summer period



— Elektritarbimine enne

— Elektritarbimine pärast

Lubja 4, Tallinn



25 304
m² office building



2018
construction year



48 813
datapoints
SIEMENS



2 898
Controllable
HVAC components



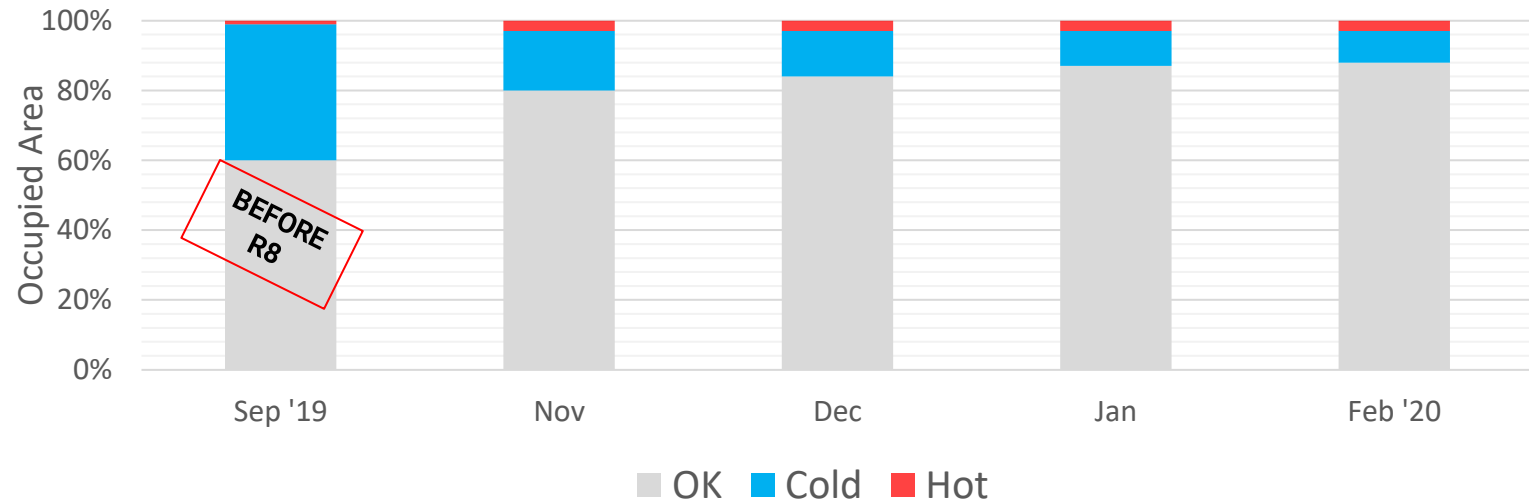
900+
faults and anomalies
detected



225 000+ kg
CO₂ savings

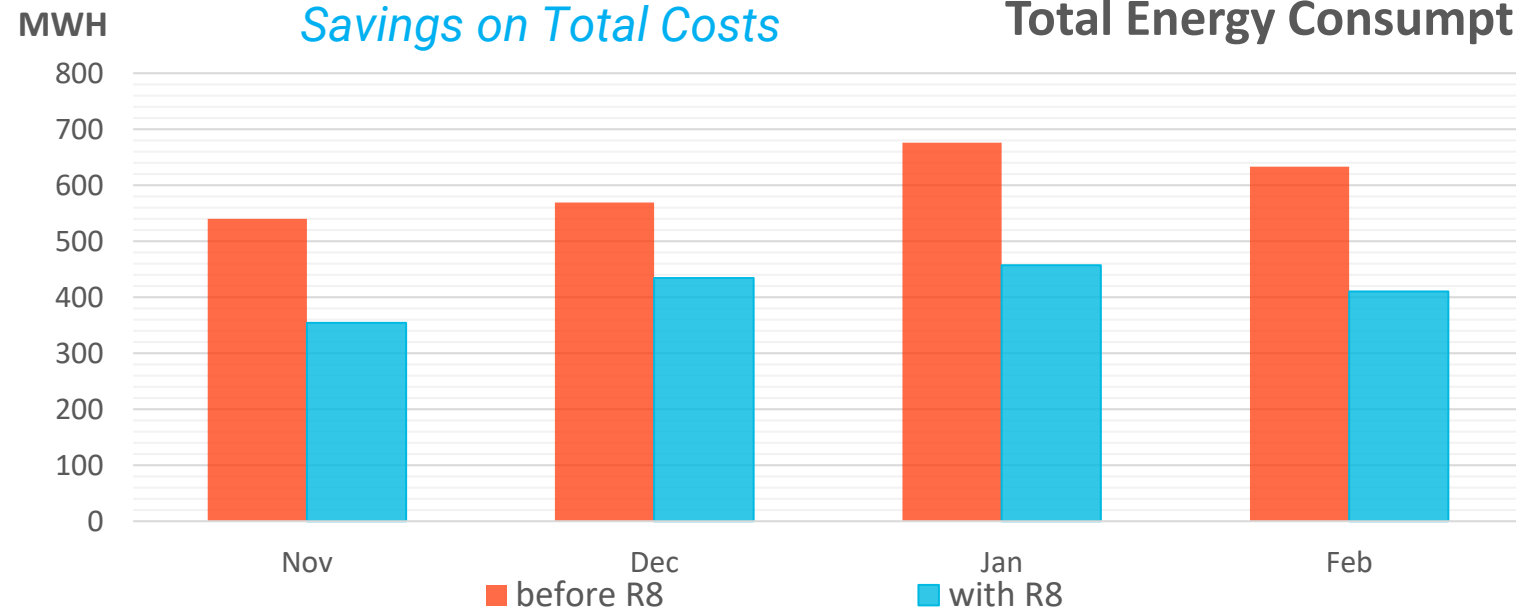
*Thermal comfort increase from
60% to 90%*

Thermal Comfort



*31.5% Energy
Savings on Total Costs*

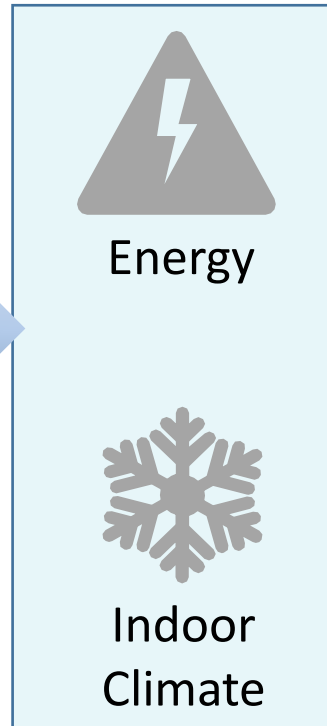
Total Energy Consumption



Our Portfolio (some of customers)

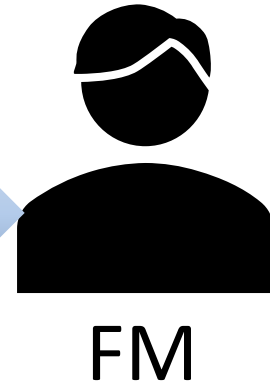


Diagnostics & Management



*Transparency &
Actionable Insights*

Priority	Location	Description	Create time	Assignee	Status
HIGH	AHU nr 378, 1st, 2nd and 3rd floor in West-wing	Sensor fault. Value constant and not changing at 0.00 C.	2019-09-07 10:36	JS	New
HIGH	Charli pizza, 2nd floor, room nr 2890A	Room temp sensor is giving constant or unrealistic readings. Check sensor and network connection.	2019-09-11 16:43	JS	New
MED	30RB0342 CHILLER3	Sensor is giving constant readings.	2019-09-12 06:55	MS	Done
MED	AHU 6	The heating and cooling valves have been open at the same 19 times during last week. Reconfigure controls.	2019-08-19 12:01	MS	On hold
MED	AHU 3	Sensor is giving constant readings.	2019-09-14 22:16	MS	In progress
MED	Technical staff, 3rd floor, room nr 378C	the Aranet wireless sensor (Serial = 300086) has low battery level (22%). Change battery.	2019-08-22 07:32	MS	In progress



Autopilot & Management

Real-time Interaction



FM
Preferences

8

Shopping Mall >

Juhan Sill JS

ROOM TYPE SETUP

ENERGY MANAGEMENT

TASK ASSIGNEES

COMPONENT TREE

Room Type	Rooms	Lowest °C	Highest °C	Max allowed temp change when room is occupied (in comfort mode)		
Kitchen	LIST	21	25	Smaller temp change	<input type="range"/>	More savings SAVE
Public Space	LIST	21	25	Smaller temp change	<input type="range"/>	More savings SAVE
Restaurant	LIST	22	25	Smaller temp change	<input type="range"/>	More savings SAVE
Security	LIST	22	24	Smaller temp change	<input type="range"/>	More savings SAVE
Shopping	LIST	21.5	24	Smaller temp change	<input type="range"/>	More savings SAVE
Storage	LIST	20	25	Smaller temp change	<input type="range"/>	More savings SAVE
Telecommunication	LIST	24	24	Smaller temp change	<input type="range"/>	More savings SAVE
Vestibule	LIST	14	24	Smaller temp change	<input type="range"/>	More savings SAVE

Smaller temp change More savings [ADD](#)

Energy

Indoor Climate



Intelligent Control

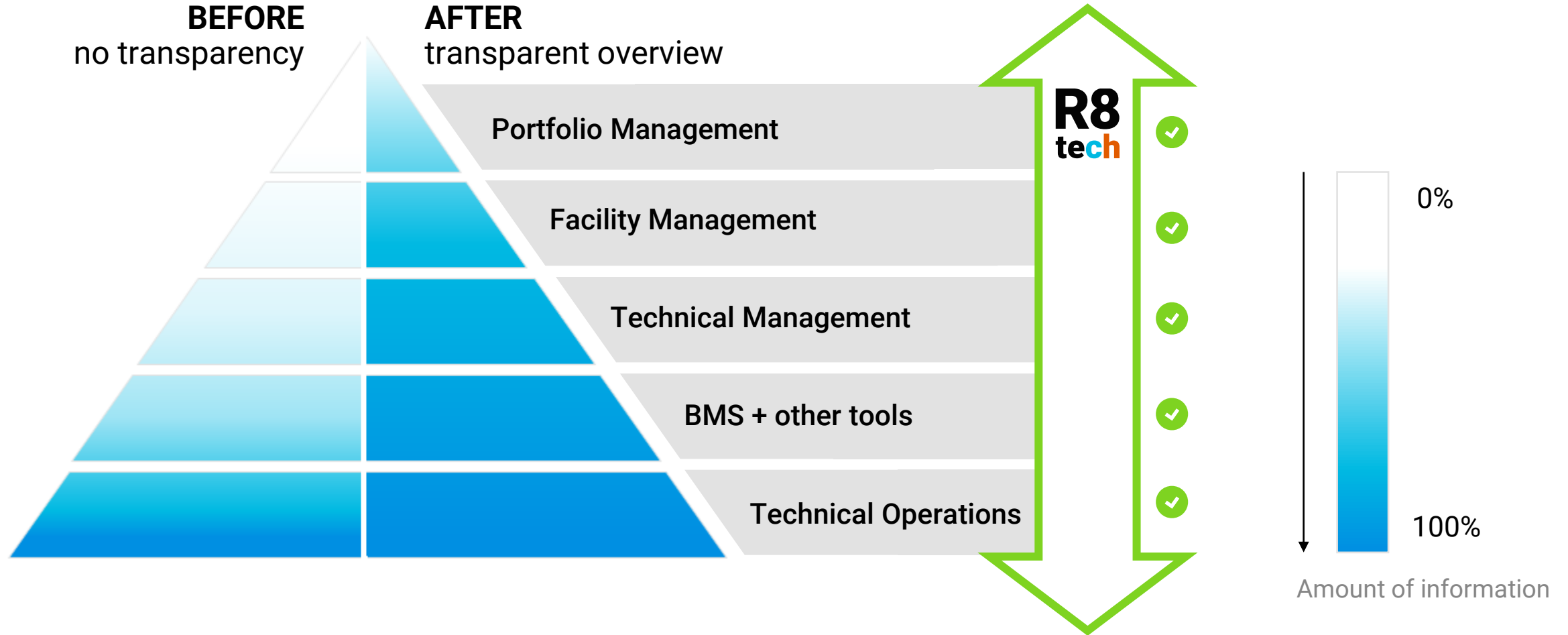
R8 Technologies

R8 Technologies take building technical management to the next generation. We add R8 Digital Operator, an autonomous and unified artificial intelligence on top of building's existing automation system to increase HVAC system efficiency and indoor comfort. At the same time R8 Digital Operator provides facility managers a transparent overview of HVAC system faults and anomalies to decrease energy waste and CO2 emissions.

[Website](#)



Digitalization increases operation efficiency



Thank you!

We take Your
buildings' technical management
to the next generation!

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