

CLIMA 2019

Built environment facing climate change



**UT
CB**
Universitatea Tehnică
de Construcții București

REHVA
3E
Federation of
European Heating,
Ventilation and
Air Conditioning
Associations



REHVA 13th HVAC World Congress
26 - 29 May, Bucharest, Romania



BACS supported performance, technical monitoring and certified commissioning of HVAC systems

28 May 2019

Bonnie Brook (*Chair eu.bac System Group*)

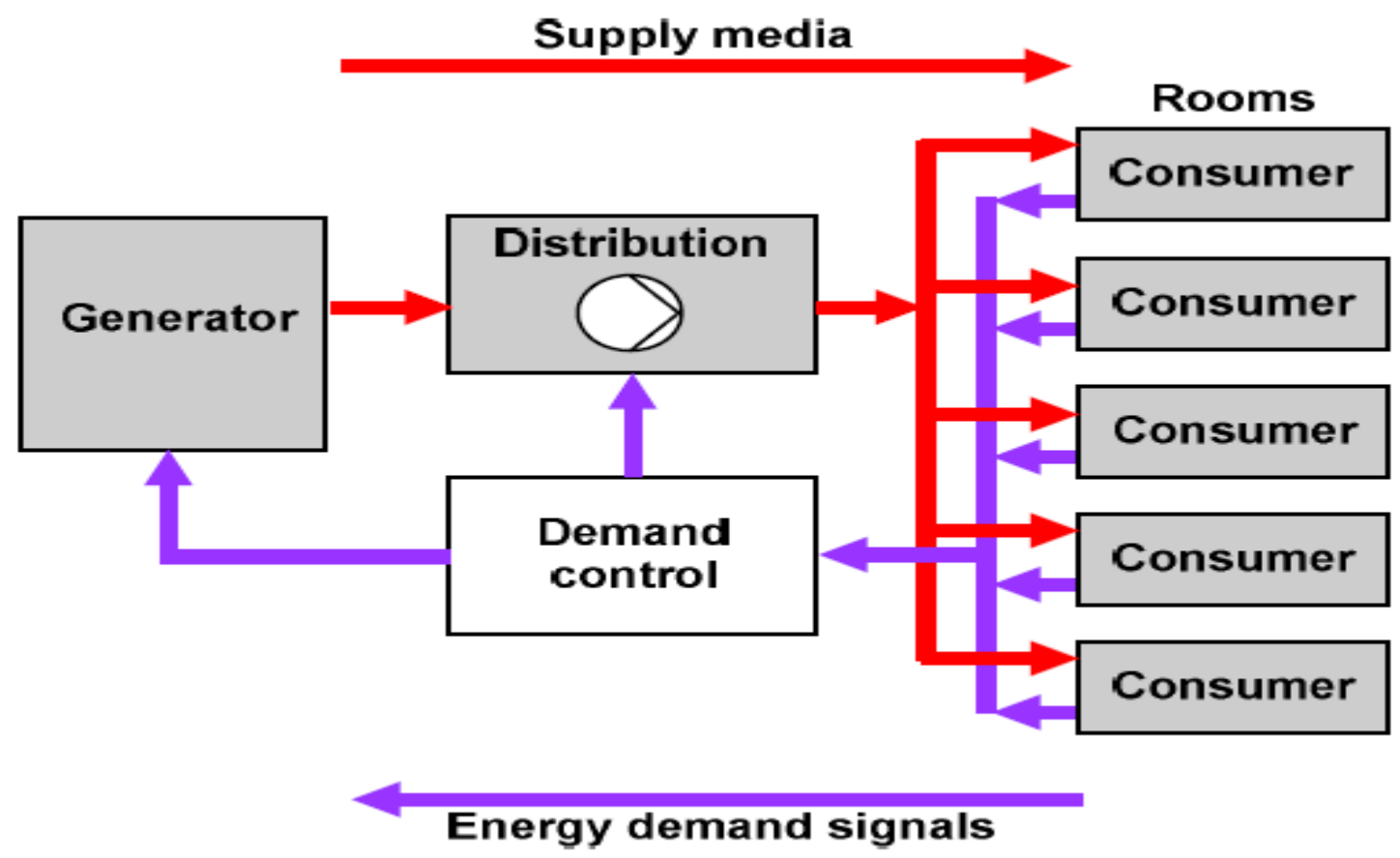


EPBD-compliant BACS capabilities

- A continuously **monitoring**, logging, **analysing** and allowing for **adjusting** energy usage;
- B **benchmarking** the building's energy efficiency, **detecting** losses in efficiency of technical building systems, and **informing** the person responsible for the facilities or technical building management about opportunities for energy efficiency improvement; and
- C **allowing communication** with connected technical building systems and other appliances inside the building, and **being interoperable** with technical building systems across different types of proprietary technologies, devices and manufacturers.

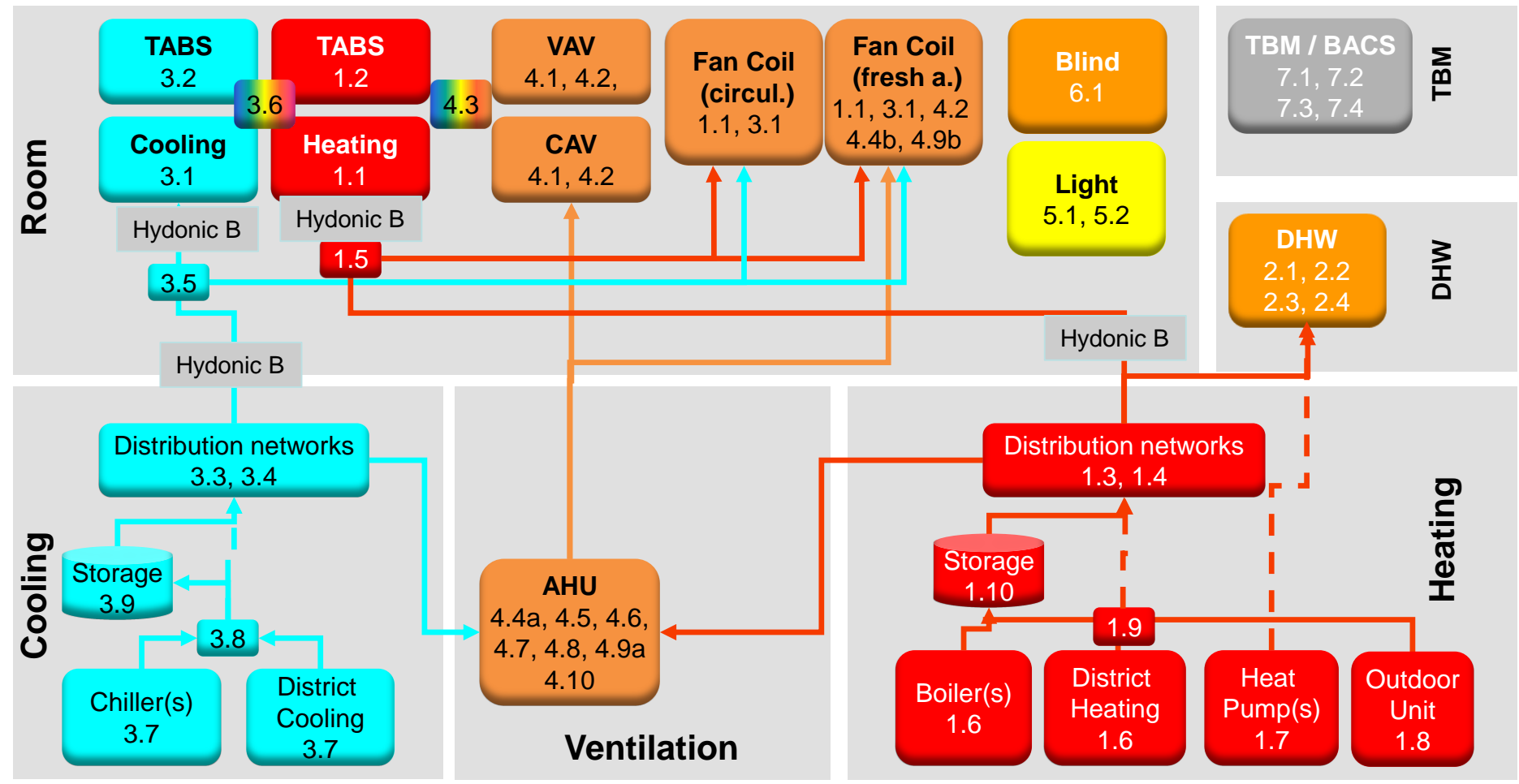


EN15232 - Energy demand and supply model





EN15232 - functional groups in energy flow





A. EPBD-compliant BACS capabilities

A

continuously monitoring, logging, analysing and allowing for adjusting energy usage;

- Continuous monitoring of actual values for energy consumption, system operation and indoor environment is available.
- System event and diagnostic data are logged.
- Actual data and trend information is used for early detection of changed patterns.
- Setpoints and runtimes can be adjusted individually from a central location including preconditioning phases.
- Individual room control with communication is available in rooms that are usually occupied during operating hours. .



B. EPBD-compliant BACS capabilities

B

benchmarking the building's energy efficiency, detecting losses in efficiency of technical building systems, and informing the person responsible for the facilities or technical building management about opportunities for energy efficiency improvement; and

- Benchmarking of actual efficiency against design efficiency, previous period efficiency or values from other buildings is possible.
- System events and alarms are indicated at a central location
- Triggers are set to alert a user if values are drifting.
- Support in the diagnosis of these deviations is provided.



C. EPBD-compliant BACS capabilities

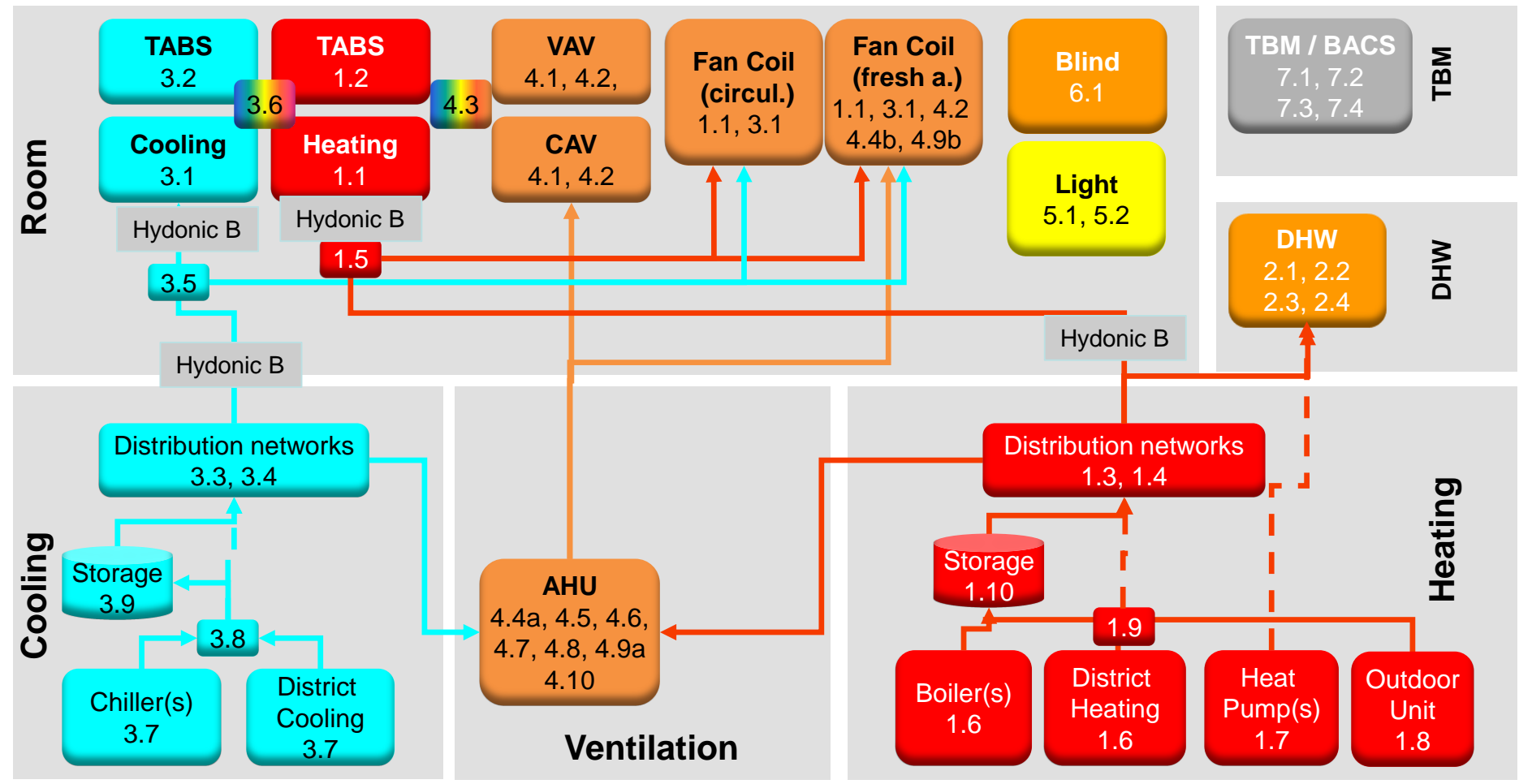
C

allowing communication with connected technical building systems and other appliances inside the building, and being interoperable with technical building systems across different types of proprietary technologies, devices and manufacturers.

- Information is exchanged between technical building systems in order to maintain level B functionality for combined functions.
- Room automation is networked to allow for demand-based control.
- Interoperability through industry communication standards is possible.

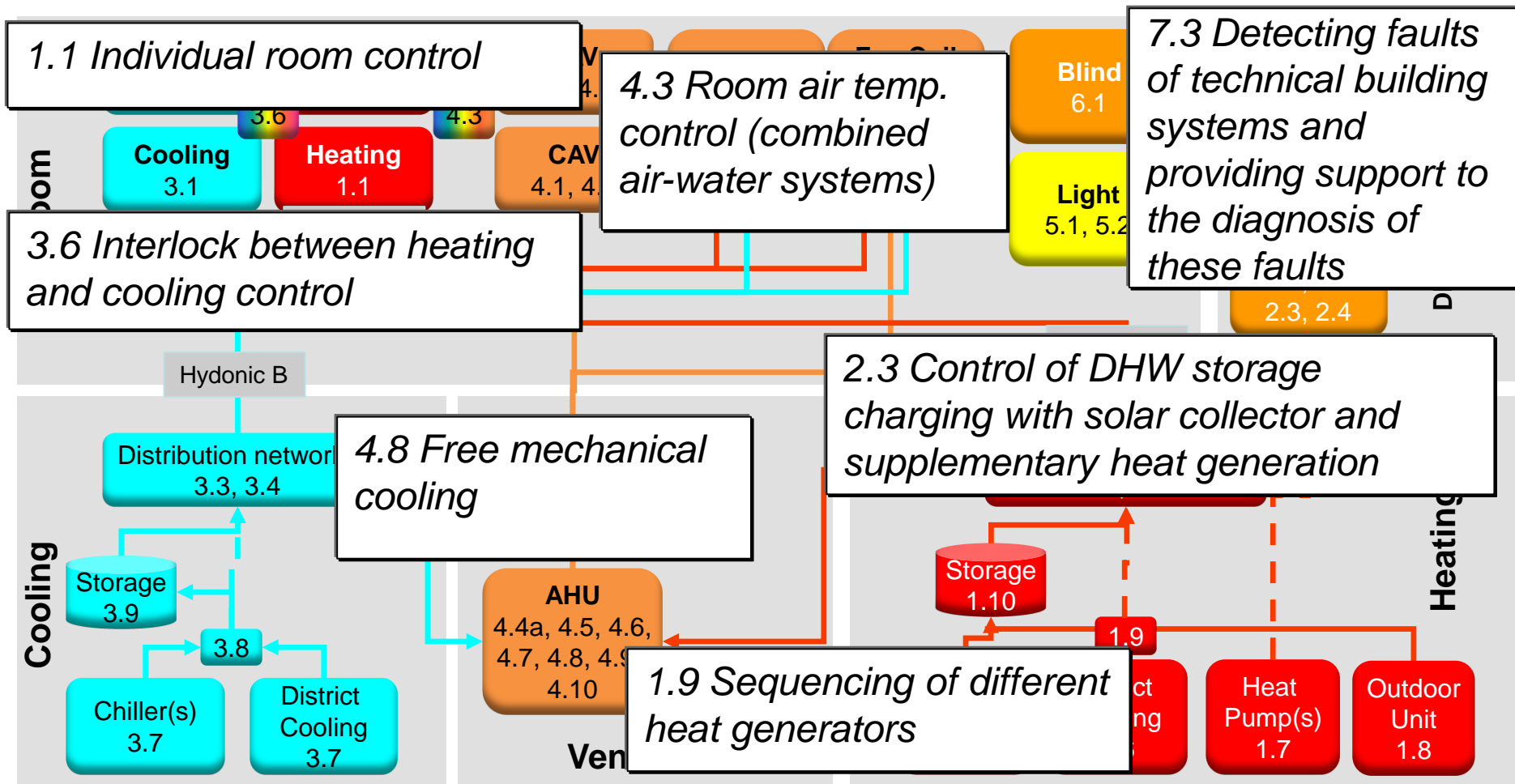


BACS controls and coordinates energy flows in a building



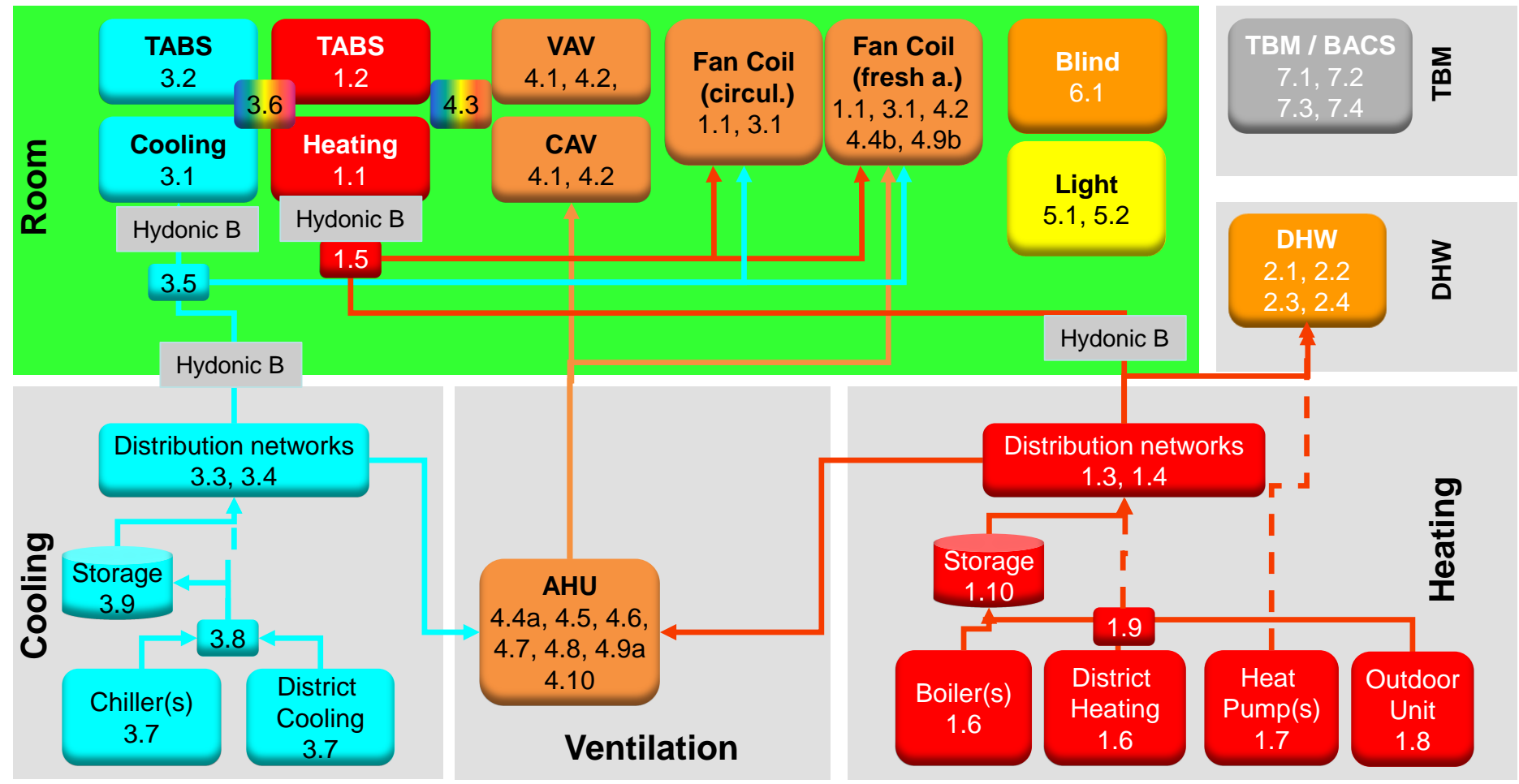


BACS controls and coordinates energy flows in a building





Energy efficiency and operational performance





Multiple benefits from EPBD BACS capabilities

**Smart, efficient
and healthy
building**



Operational efficiency

Energy performance and
indoor environmental quality

Continuous optimization of
building performance

Individual control



User benefits

Building Operator

„I know the performance of my technical systems and stay in control of their operation.“

Building Occupant

„I feel comfortable and can concentrate on my work.“

Building Owner

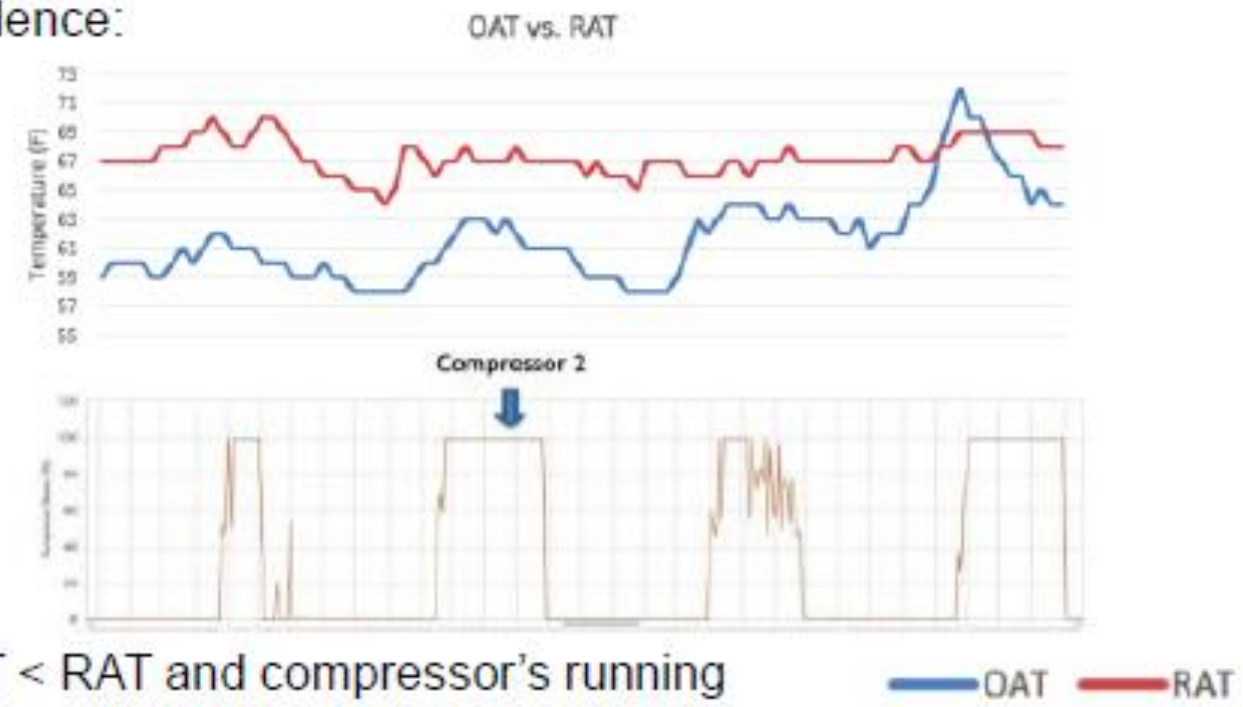
„I maintain the value of my building and am ready for the future.“





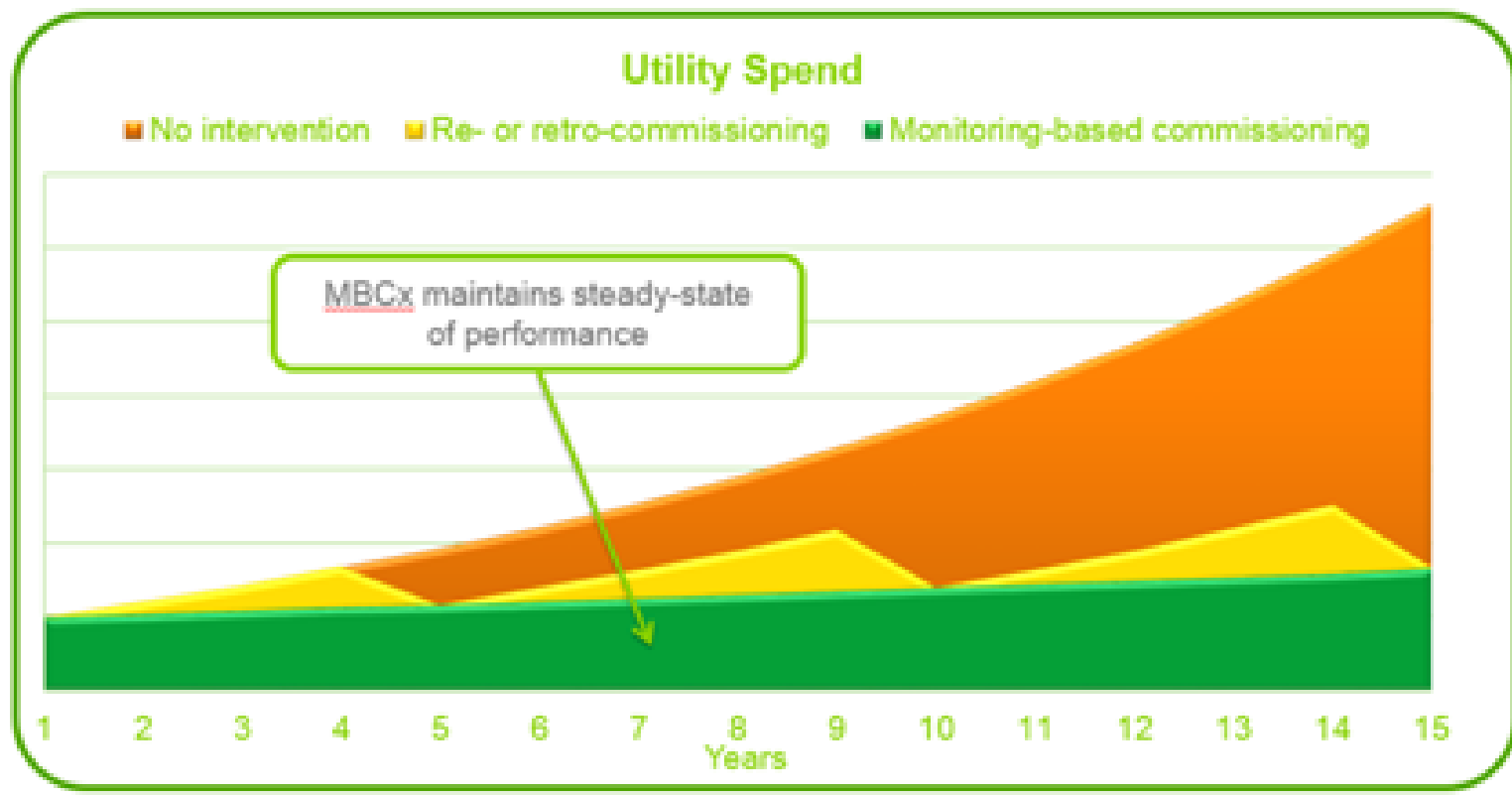
How to distinguish the BACS that can deliver these capabilities?

Evidence:





Ongoing Cx: Fine -Tuning your Building Saves Energy





How do BACS meet the aims of the Art.14/15 HVAC inspections?

Physical inspection of HVAC equipment

vs

Inspection using mandatory BACS

Isolated system approach

Holistic system approach

Subjective estimate of typical or average operating conditions

Actual performance under real-life use conditions

Assessment of equipment efficiency at a point in time under a certain load condition

Ongoing supervision of system performance

Once at a time considerations for improvement

Continuous fine-tuning to the building needs



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IMPACT: Annual energy savings up to 20.3% of all EU service sector building energy consumption (49.7 Mtoe)



Conclusion

Physical inspections were **yesterday**.



Today BACS is used to continuously monitor, detect, analyse and inform on TBS performance...



...in order to enable **tomorrow** when predictive maintenance, self-learning systems, digital twin, and the building as a prosumer will be facts.

Thank you

