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**“Making buildings smart and healthy through building automation and controls: the role of EU legislation”**

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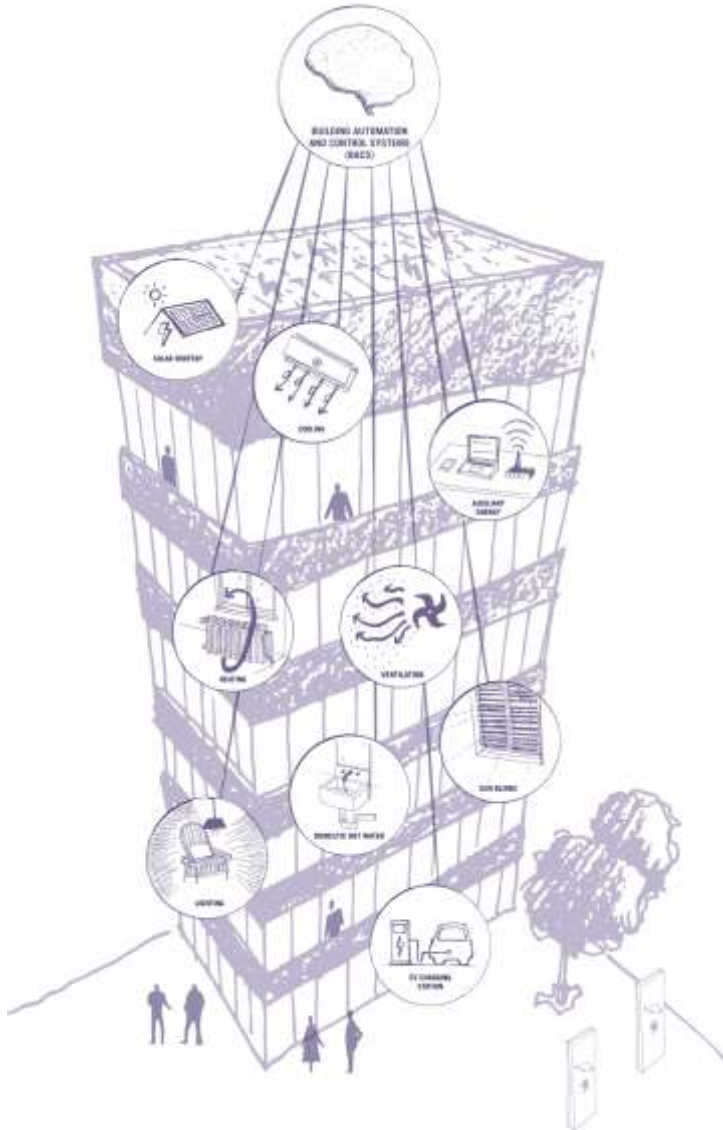
eu.bac is the European Building Automation and Controls Association and represents the European manufacturers for Home and Building Automation and Energy Service Companies.

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## BACS – the “brain” and “intelligent nodes” of the building



- BACS (Building automation and control systems) refers to the products that **monitor** and **automatically adjust the energy using technologies** in our homes and buildings to deliver a comfortable environment while optimising the energy use
- Building automation and control solutions can range from **thermostatic valves on our radiators** to **advanced building management systems in large buildings**.
- All the technical building systems are needed, but only the “**brain**” – BACS – is able to ensure **integration** and **optimal functioning** of them, avoiding malfunctions and TBS working against each other.
- BACS represent also the “**intelligent nodes**” of the smart integrated energy system developed around the building. **Demand response, consumption prediction, energy storage, management of distributed generation of renewables** (e.g. solar roof-top PV) are all “smart functions” strongly connected to an optimal functioning of the building.
- Building managers have therefore **real-time access to cloud-based analytics, reporting and services**, allowing for informed decision making.



## Indoor Environmental Quality: a key element for health, well-being and productivity

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- The World Health Organisation estimates that we spend approximately 90% of our time indoor, in residential and non-residential buildings.
- The level of CO<sub>2</sub>, humidity and fine dust have a considerable impact on the health, well-being and productivity of the occupants.
- **BACS optimize thermal comfort, air quality and lighting levels and operational efficiency while preventing, legionella and other infections.**
- A Harvard Research showed an 8% increase in productivity for those who benefitted from a better Indoor Environmental Quality over participants who didn't benefit from the improved conditions. This then was quantified as a \$6,500 increase in productivity per employee.



## BACS in the revised Energy Performance of Buildings Directive (2018/844/EU)

- Art. 8, par. 3:

**WHAT:** Mandatory installation of **self-regulating devices for the separate regulation of the temperature in each room**

**WHERE:** **All buildings**, non-residential and residential, existing and new

**WHEN:** In the existing buildings when heat generators are replaced, in new buildings since their construction.

**CONDITIONALITY:** Where technically and economically feasible

**EXAMPLE OF SELF-REGULATING DEVICE:** **Thermostatic Radiator Valves** are the most basic form of self-regulating devices.

*“Expected saving in heating energy use across EU homes would be 18% where manual radiator valves are converted to TRVs”*



## BACS in the revised Energy Performance of Buildings Directive (2018/844/EU)

- Art. 14, par.4/5:

**WHAT:** Mandatory deployment of Building Automation and Control Systems (BACS) functionalities

**WHERE:** Large non-residential buildings (with effective rated output of over 290 kWh), **existing** and **new**

**WHEN:** By **2025** all buildings in scope must be equipped

**CONDITIONALITY:** Where technically and economically feasible

**WHICH BACS:** Only the ones that are able to provide the following functionalities (Level A or B EN15232)

The building automation and control systems shall be capable of:

**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;

**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.

## Policies that make buildings smart and healthy: fully implement the revised EPBD

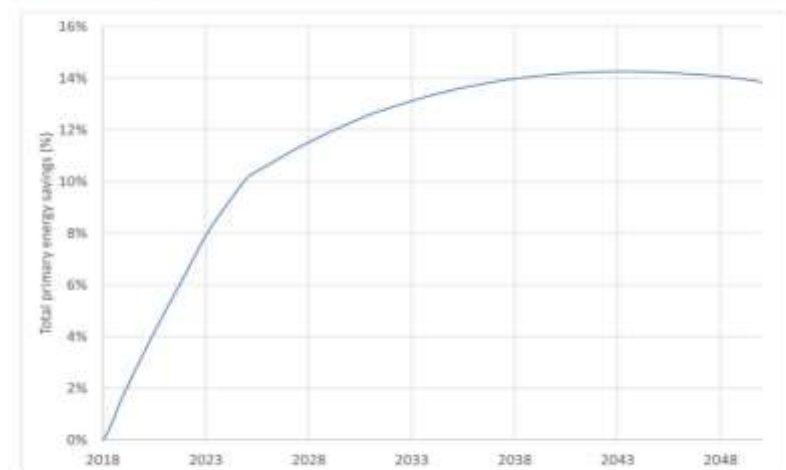


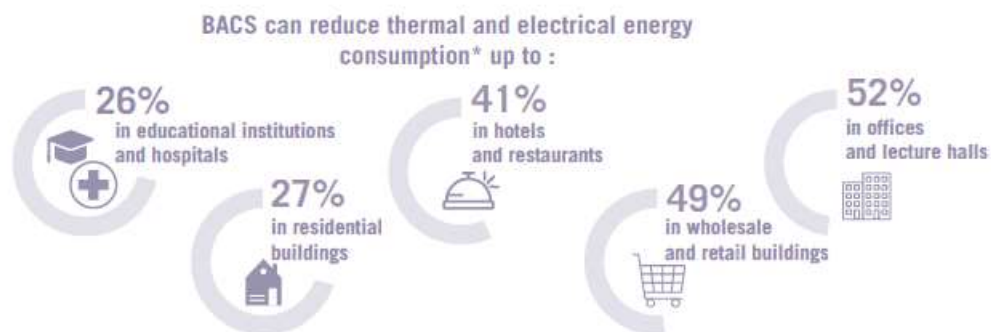
Figure ES1 – Total primary energy savings for all buildings for the EPBD compliant scenario compared to the EPBD compliant without BACS scenario

– According to the [Waide study “The impact of the revision of the EPBD on energy savings from the use of building automation and controls”](#), an ambitious transposition of the BACS measures included in the revised EPBD could lead to:

- 64 Mt CO2 annual savings (peak in 2030)
- 450 TWh annual final energy savings (peak in 2035)
- Savings corresponding to 14% of total building primary energy consumption (by 2038)
- €36 billion energy bill savings triggered (peak in 2035)
- Value of energy savings exceeds the value of investments by a factor of 9 (comprised of a factor of 8.1 for residential buildings and 10.4 for non-residential buildings)



## Policies that make buildings smart and healthy: enlarge the scope of BACS requirements



- In order to achieve the **higher EU climate goals** as set by the European Green Deal, **more policy measures need to be put in place.**
- The mandatory requirements for BACS functionalities set in the revised EPBD cover only a very small part of the building stock (only large non-residential buildings).
- The European Commission should therefore extend the existing requirements, to include **medium-size non-residential buildings** and **larger residential buildings**
- A first step in this direction should be set by the Renovation Wave, ensuring that these additional categories of buildings are equipped with **BACS functionalities**, at least when they undergo renovation. This would result in a dramatic improvement of the energy consumption of the buildings , taking them towards net-zero carbon and making them ultra-efficient, smart and healthy.
- **Dedicate funds for the deployment of smart technologies** should support implementation



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**THANK YOU!**