The impact of the new measures on Building Automation and Controls Systems in the revised Energy Performance of Buildings Directive

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Improving Energy Efficiency in Commercial Buildings and Smart Communities (IEECB&SC'20)
Tuesday 1 December, Session 1 Buildings, 9:00-11:00 CET

eu.bac european building automation controls association

- The European Building Automation and Controls Association represents the European manufacturers for Home and Building Automation
- Building automation and control solutions can range from thermostatic valves on radiators to advanced building management systems in large buildings

ENERGY PERFORMANCE OF BUILDINGS DIRECTIVE (Directive 2018/844)

- Entered into force on 9th July 2018
- Deadline for Member States to transpose the text into national legislations expired on 10th March 2020
- European Commission published their guidelines *(Commission Recommendation on building renovation ((EU) 2019/786)*

eu.bac documents:

- eu.bac guidelines on the EPBD transposition
- Waide study "The impact of the revision of the EPBD on energy savings from the use of building automation and controls"
- eu.bac EPBD BACS Compliance Verification Package

ART. 8 PAR. 1: THE KEY POINTS FOR AN EFFECTIVE AND AMBITIOUS TRANSPOSITION

WHEN?: in all new buildings + in existing buildings when heat generators are replaced

SCOPE: TRVs, room thermostat, fan coil unit regulating devices, individual device controls

ECONOMIC FEASIBILITY: parameter clearly identified, framed and justified (e.g.: payback time < 6 years?)

"Member States shall require new buildings, where technically and economically feasible, to be equipped with self-regulating devices for the separate regulation of the temperature in each room or, where justified, in a designated heated zone of the building unit. In existing buildings, the installation of such self-regulating devices shall be required when heat generators are replaced, where technically and economically feasible."

ART. 14/15 PAR.4: KEY POINTS FOR AN EFFECTIVE AND AMBITIOUS TRANSPOSITION

SCOPE: effective rated output>290kW

ECONOMIC FEASIBILITY: parameter clearly identified, framed and justified (e.g. France: payback time < 6 years?)

BACS CAPABILITIES: class B EN 15232

COMPLIANCE CHECK: eu.bac Compliance Verification Package

"Member States shall lay down requirements to ensure that, where technically and economically feasible, ***non-residential buildings*** *with an effective rated output for heating (Art.14)/air-conditioning (Art.15) systems or systems for combined space heating/air-conditioning and ventilation of* ***over 290kW*** *are equipped with building automation and control systems by 2025."*

"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."

ART. 14/15 PAR. 5-6: THE KEY POINTS FOR AN EFFECTIVE AND AMBITIOUS TRANSPOSITION

VOLUNTARY: Requirements for BACS capabilities in residential buildings are voluntary

REPLACEMENT FOR INSPECTIONS: Where available, they replace inspections

RELEVANT FUNCTIONALITIES: Individual room temperature control, dynamic balancing (EN 15316-2), weather compensation, scheduling, domestic hot water control

Paragraph 5:
"Member States may lay down requirements to ensure that residential buildings are equipped with:

- The functionality of continuous electronic monitoring that measures systems' efficiency and inform building owners or managers when it has fallen significantly and when system servicing is necessary.

- *Effective control functionalities to ensure optimum generation, distribution, storage and use of energy."*

Paragraph 6:
"Buildings that comply with paragraph 4 or 5 shall be exempt from the requirements laid down in paragraph 1"

FRANCE (example for EPBD transposition)

ART. 14/15 PAR.4

- Mandatory installation of BACS always feasible, unless there's proof that the payback time > 6 years
- Applicable immediately to new buildings (building permit 1 year after the Decree)
- All existing buildings must be equipped by 1 JAN 2025
- Maintenance: BACS are subjects to periodic checks
- Functionalities: no reference to EN 15232

Décret n° 2020-887 du 20 juillet 2020 relatif au système d'automatisation et de contrôle des bâtiments non résidentiels et à la régulation automatique de la chaleur

ART. 8 PAR. 1

- Mandatory installation of self-regulating devices always feasible in new buildings (building permit 1 year after the Decree)
- In existing buildings, mandatory installation when there's new installation or replacement of the heat generator unless there's proof that the payback time > 6 years
- No clarifications on when it is justified to have the separate regulation per designated heated zone instead that in each room

Décret n° 2020-887 du 20 juillet 2020 relatif au système d'automatisation et de contrôle des bâtiments non résidentiels et à la régulation automatique de la chaleur

Code de la construction et de l'habitation (L. 111-10-6)

IDENTIFIED POTENTIAL & BENEFITS

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)

Waide study "The impact of the revision of the EPBD on energy savings from the use of building automation and controls"

An incentivizing policy framework for BACS would between create 200,000 and 300,000 direct jobs and 3.7 million indirect jobs by 2030.

ECI study "Employment benefits from stimulation of demand for BACS in the EU"

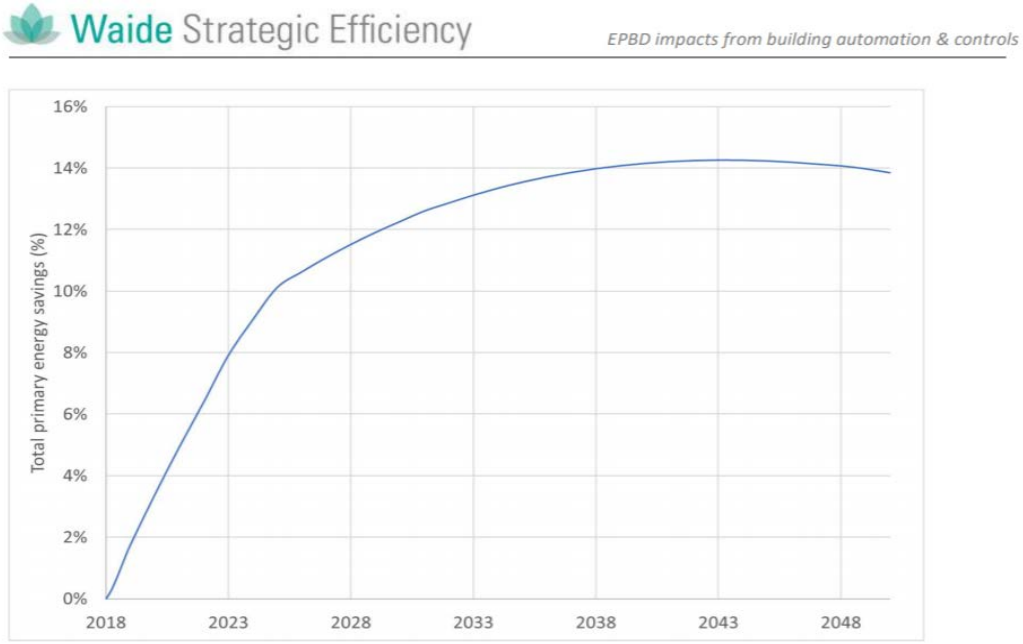
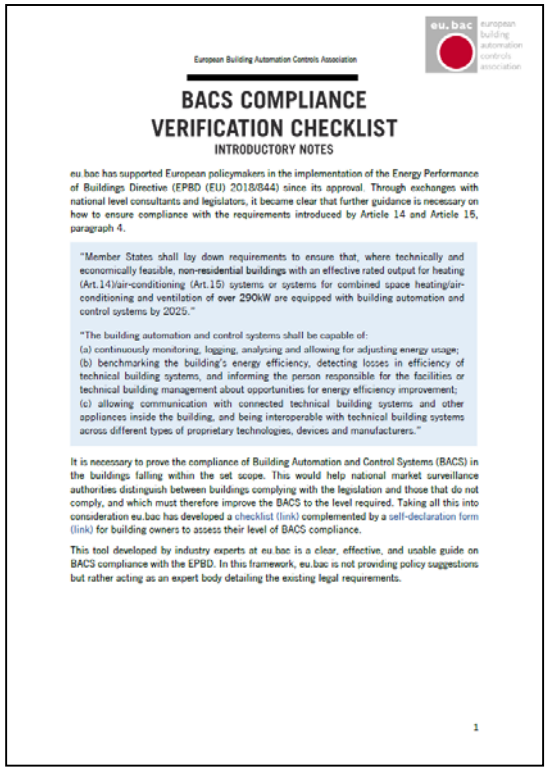


Figure ES1 – Total primary energy savings for all buildings for the *EPBD compliant* scenario compared to the *EPBD compliant without BACS* scenario

EU.BAC COMPLIANCE VERIFICATION PACKAGE



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BACS COMPLIANCE VERIFICATION CHECKLIST

INTRODUCTORY NOTES

eu.bac has supported European policymakers in the implementation of the Energy Performance of Buildings Directive (EPBD (EU) 2018/844) since its approval. Through exchanges with national level consultants and legislators, it became clear that further guidance is necessary on how to ensure compliance with the requirements introduced by Article 14 and Article 15, paragraph 4.

"Member States shall lay down requirements to ensure that, where technically and economically feasible, non-residential buildings with an effective rated output for heating (Art.14)/air-conditioning (Art.15) systems or systems for combined space heating/air-conditioning and ventilation of over 290kW are equipped with building automation and control systems by 2025."

"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."

It is necessary to prove the compliance of Building Automation and Control Systems (BACS) in the buildings falling within the set scope. This would help national market surveillance authorities distinguish between buildings complying with the legislation and those that do not comply, and which must therefore improve the BACS to the level required. Taking all this into consideration eu.bac has developed a checklist (link) complemented by a self-declaration form (link) for building owners to assess their level of BACS compliance.

This tool developed by industry experts at eu.bac is a clear, effective, and usable guide on BACS compliance with the EPBD. In this framework, eu.bac is not providing policy suggestions but rather acting as an expert body detailing the existing legal requirements.

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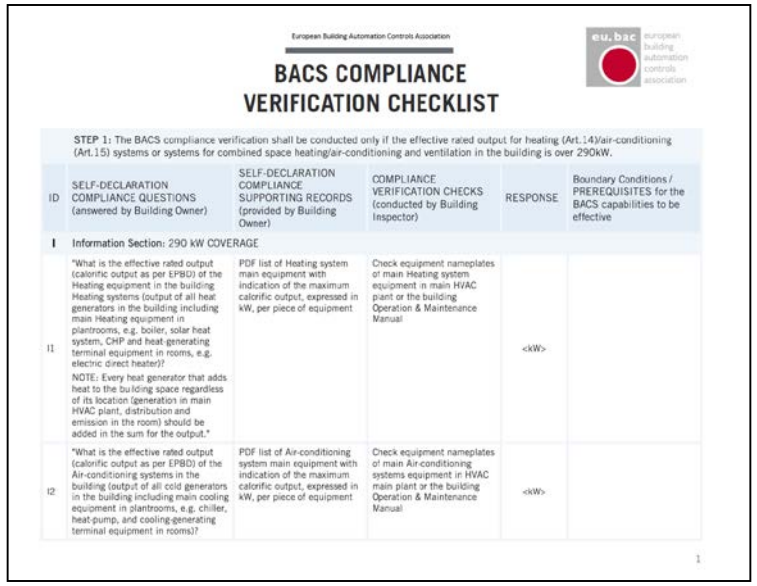

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BACS COMPLIANCE VERIFICATION CHECKLIST

STEP 1: The BACS compliance verification shall be conducted only if the effective rated output for heating (Art.14)/air-conditioning (Art.15) systems or systems for combined space heating/air-conditioning and ventilation in the building is over 290kW.

ID	SELF-DECLARATION COMPLIANCE QUESTIONS (answered by Building Owner)	SELF-DECLARATION COMPLIANCE SUPPORTING RECORDS (provided by Building Owner)	COMPLIANCE VERIFICATION CHECKS (conducted by Building Inspector)	RESPONSE	Boundary Conditions / PREREQUISITES for the BACS capabilities to be effective
I	Information Section: 290 kW COVERAGE				
I1	"What is the effective rated output (calorific output as per EPBD) of the Heating equipment in the building Heating systems (output of all heat generators in the building including main Heating equipment in plantrooms, e.g. boiler, solar heat system, CHP and heat-generating terminal equipment in rooms, e.g. electric direct heater)? NOTE: Every heat generator that adds heat to the building space regardless of its location (generation in main HVAC plant, distribution and emission in the room) should be added in the sum for the output."	PDF list of Heating system main equipment with indication of the maximum calorific output, expressed in kW, per piece of equipment	Check equipment nameplates of main Heating system equipment in main HVAC plant or the building Operation & Maintenance Manual	<kW>	
I2	"What is the effective rated output (calorific output as per EPBD) of the Air-conditioning systems in the building (output of all cold generators in the building including main cooling equipment in plantrooms, e.g. chiller, heat-pump, and cooling-generating terminal equipment in rooms)?	PDF list of Air-conditioning system main equipment with indication of the maximum calorific output, expressed in kW, per piece of equipment	Check equipment nameplates of main Air-conditioning systems equipment in HVAC main plant or the building Operation & Maintenance Manual	<kW>	

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BACS COMPLIANCE SELF-DECLARATION

BUILDING INFORMATION

BUILDING NAME	
BUILDING ADDRESS	
FLOOR AREA	
BUILDING OWNERS NAME	
OWNERS SIGNATURE AND DATE	
RESPONSIBLE EXPERT	
EXPERTS SIGNATURE AND DATE	

TARGET USERS:

BUILDING INSPECTORS – a simple mechanism to verify compliance

BUILDING OWNERS – an effective tool to inform about the requirements and prepare for the inspection

BUILDING DESIGNERS – a clear requirements specification for new and renovation projects

NATIONAL POLICYMAKERS a helpful practical tool for the legislator to clarify details about what the capabilities mean in practice

THANK YOU!