

## Technical sheet #5

### Technology solution package

	Energy efficiency		Comfort, health and well-being
	Smart grid readiness		Informed users

### Building typology

	 Residential		 Office
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### Short description

Solution package focused on energy efficiency, in order to reduce the building energy consumption and the related carbon footprint, by optimizing control of heating/DHW/cooling generation and the corresponding emission and distribution systems.

### Solution package specific services

Domain		Standard configuration		Proposed configuration
	Heating	Central thermostat. Multi-stage speed pump and constant temperature control.		Individual room controllers and BACS communication. Variable speed pump and temperature control.
	Lighting	Manual on/off switch for indoor lighting.		Occupancy detection and control for indoor lighting.
SRI Score <sup>1</sup>				
	Energy efficiency	+20-30%		
	Comfort	+10-20%		

### Main impacts and co-benefits

This category “energy efficiency” refers to the energy savings impacts of the smart-ready technologies on building energy performances. Literature data<sup>2</sup>:

- Heating system: upgrading from a central thermostat to an individual room control with communication allows to reduce energy waste up to 25% of the yearly heating energy.
- DHW system: for an energy-efficient residential building up to 50% of the energy demand can be attributed to DHW, therefore relevant energy savings can be achieved by optimizing its control.
- Lighting system: occupancy-based control systems compared to manual control have an energy saving potential up to 30% of the annual electric lighting energy use.

The European standard EN 15232:2012 introduced a classification of the building control systems and functionalities, providing the methods for an estimation of the impact that these systems have on building energy performance and use.

Well-designed BACS for heating and cooling can contribute to a reduction of the energy consumption, while increasing thermal comfort for the building occupants. The same is true for visual comfort resulting from a correctly implemented automatic control of shading system and indoor lighting.

<sup>1</sup> Calculated using SRI assessment package v4.4.

[https://energy.ec.europa.eu/topics/energy-efficiency/energy-efficient-buildings/smart-readiness-indicator\\_en](https://energy.ec.europa.eu/topics/energy-efficiency/energy-efficient-buildings/smart-readiness-indicator_en)

<sup>2</sup> Van Thillo, L., Verbeke, S., & Audenaert, A. (2022). The potential of building automation and control systems to lower the energy demand in residential buildings: A review of their performance and influencing parameters. *Renewable and Sustainable Energy Reviews*, 158, 112099.