Position paper on Ecodesign Work Plan 2015-2017

The need for building automation and control systems

Brussels, February 2015

eu.bac european building automation controls association

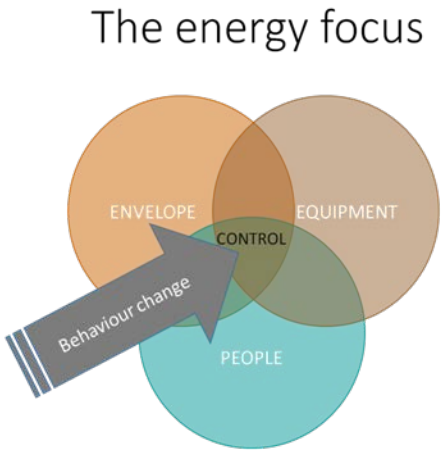
Buildings are key to an Energy Efficient Europe

Buildings account for approximately 40% of the EU`s overall energy consumption and for 36% of the EU`s overall emissions of greenhouse gas. 70% of the buildings that we will occupy in 2050 are already built. Around 20% of the energy consumed by Europe's buildings is thrown away, mainly due to inefficient operation/maintenance, a lack of basic energy efficiency measures and poor energy efficiency behaviour by end-users. This loss represents a cost of approximately €270 billion every year, a figure that is set to increase by 53% by 2030 if no action is taken to curb it.

About building automation and control systems

Buildings are built for people, therefore people are using energy, not the buildings themselves. The best way to address this is to give the people the means to control their energy ensuring their needs are met. Good level of control of building services ensures that energy savings are realised independently of whether the building is in use or not and that high indoor environment quality is delivered where and when required and at exact levels (i.e. thermal comfort, indoor air quality, lighting and acoustic environment).

This becomes especially important now that the energy market is undergoing a paradigm change. With the supply of energy now originating from different sources (fossil, nuclear, renewable), dependence on distributed generation increases. Building automation and controls have a key role to play in helping the economy adapt to this change of paradigm as they assure the integration and optimization of several energy sources for users in their environment. The increased volatility in energy supply caused by greater dependence on weather based energy (on-site renewable), needs to be mitigated by using control to balance between local production, grid and storage. As a result nearly zero/positive energy buildings are delivered.



The potential reductions with the introduction of building automation and controls are substantial in all sectors, for instance:

- In non-residential buildings reductions of up to 40% in thermal energy and 14% in electrical energy[1];
- In residential buildings reductions of up to 19% in thermal energy and 8% in electrical energy[1].

[1] EN 15232 "Energy performance of buildings – Impact of Building Automation, Controls and Building Management"

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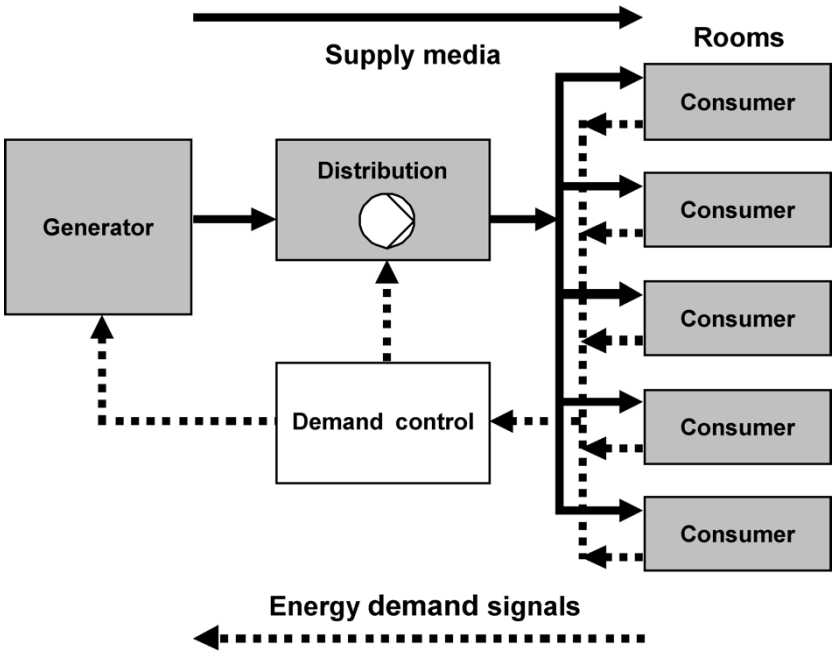
Building automation and control systems (BACS) are relatively low cost and have a high return on investment. Usually, the payback period is between 2 and 6 years, depending on the complexity of the system. After the payback period passes, the resulted reduced energy bills create greater disposable income, thus stimulating the economy.

The missed opportunity

Today, regulations do not achieve the most cost effective energy reductions, as they tend to promote equipment replacement and investments in building envelope. This leads not only to missing significant energy efficiency gains, but also to some degree of market distortion and lack of integration between different technologies.

A suitable regulatory framework needs to be in place to fully realise the opportunities for building automation and control systems, and to ensure that energy savings are made. Ecodesign regulations represent remarkable tools for reducing energy consumption of products which is foreseen to provide a 9% energy saving for the EU as a whole by 2020[2]. However, building automation and controls are vertically applied within other Lots (i.e. Lot 1 Boilers, Lot 2 Water heaters, Lot 10 Room air conditioning appliances, Lot 20 Local room heating products, Lot 21 Central heating products using hot air to distribute heat (other than CHP), ENTR Lot 6 Air conditioning and ventilation system, plus new preparatory studies ENTR Lot 33 Smart appliances and ENTR Lot 37 Lighting systems) which prevents the exploitation of their full potential. Therefore, eu.bac believes that Ecodesign regulations are not complete and as industry we support to have a separate Lot for BACS. Otherwise, unpredicted situations might occur such as regulations development at regional level, having detrimental consequences on the industry, and overall preventing the full potential of energy demand reduction, and decreasing the integration of distributed energy sources.



The "divide et impera" methodology applied to building services by creating groups of energy using products within buildings eases the management of the environmental assessment for each individual product e.g. boiler with integrated control. However, building services, especially in commercial buildings -

[2] Van Holsteijn en Kemna B.V. (VHK), Ecodesign Impact Accounting, Part 1 – Status Nov.2013, contract No. ENER/C3/412-2010/FV575-2012/12/SI2.657835

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operate together and influence each other (see graphic on the right hand side from EN 15232[1] presenting the major controls components of a building service).

In an ideal system, all components work only if there is a demand from the consumer. In case of no demand, all components are shut off or they operate in a protection mode avoiding damage to the building e.g. technical building systems, building structure.

As a result of this methodology, the integrated approach is sacrificed, which leads to poorer performance of products at system level. On top of this, when constructing a building the expenses have to stay within the limits of a defined budget. Considering the market`s competitiveness this means that economic savings will be made in those parts of the system which are not covered by regulations – e.g. parts of the building services.

On the other hand, viewing buildings as products would be well aligned with having all building services operating together at product and system levels for assuring the needs of the occupants (e.g. thermal comfort, indoor air quality, use of appliances) with optimum values of energy consumption and energy price.

Smart appliances share the same product approach which doesn`t grasp the full savings at system level. Even in the case in which smart meters communicate with smart appliances the scope is to assure demand flexibility thus not fully adopting the energy efficiency “mindset”. It is clear that the smart appliances and smart meters approach focuses on demand response readiness and interoperability. Nonetheless, it lacks the capability of overarching the operation of systems at building level and of demand side management. This might lead in the end to the control of the network`s stability (smart grid) by voltage and frequency i.e. switching off from grid activity instant loads within customers as opposed to demand response with dynamic pricing with longer term reaction (e.g. 24 h) for guiding the demand towards the low cost times.

In the end, it is important to underline that to ensure optimisation and prevent market distortion, the adoption of an Ecodesign regulation for Building Automation and Control Systems (BACS) is essential and would result in the effective integration and improved performance of products and systems and would provide truly “Smart Buildings”.

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