Smart and Smart-er: architecture and building performance

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eu.bac european building automation controls association

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BACS – why are they so essential? 1/2

Buildings serve a purpose for living or businesses. Some of the benefits delivered by BACS:

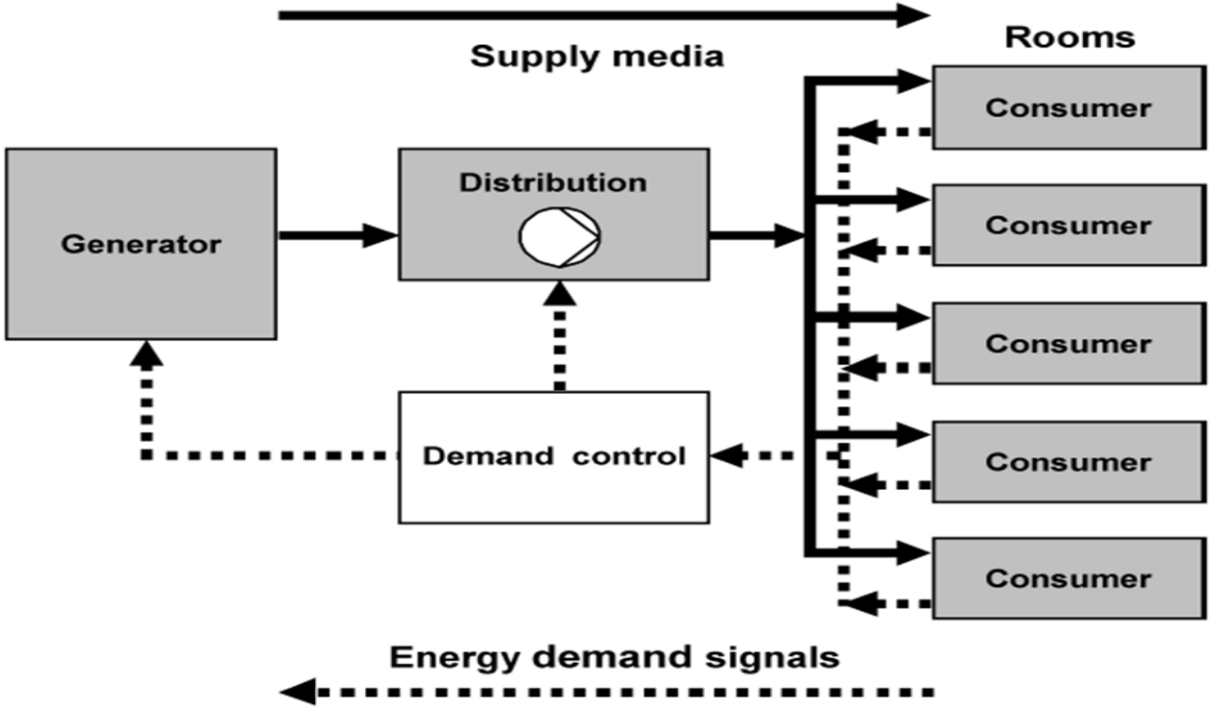
- Together with other installed TBS (e.g. heating, cooling, ventilation, light, shading and others) - ***healthy, productive and comfortable*** conditions in building spaces
- Schedule and run systems when services are needed
- Modulate operation towards demand (e.g. people presence, schedule of occupation, temperature, humidity, air quality, light level, differentiate geographical and clima zone needs)
- ***Monitor, inform and report on performance, malfunctions and delivers maintenance information***
- Inform occupants/operators about conditions and they trigger actions to support operational organization (e.g. remote operation, web access)
- Allow occupants and operators to reset system parameters to efficient values (e.g. manually adjusted setpoints) after occupancy

BACS – why are they so essential? 2/2

Buildings serve a purpose for living or businesses. Some of the benefits delivered by BACS:

- Avoid systems working against each other (e.g. heating and cooling emissions at the same time in the same room)
- Ensure that equipment (e.g. air handlers and boilers) are started, operated and shut down in the proper sequence, protecting equipment and reducing maintenance

Demand Driven Energy Supply (from EN 15232)



BACS – potential for smarter and healthier future

- Buildings are connected to the grid and energy use: the generation will be tuned according to a selected strategy including local storages (e.g. energy cost, GHG footprint, used energy) and EV charging (and potentially discharging) → leads to “prosumers”, digital buildings
- Productive and comfortable environments shall not be touched within given boundaries (e.g. temperature, air quality)
- Appliances and other equipments can be integrated and automated – if desired and influencial enough compared to the other technical equipment (e.g. like elevators, humidifiers)
- Include new EPBD-required functions that serve investors, users and operational people informing about smart capabilities of their installed system (Smart Readiness Indicator)

BACS – potential for smarter and healthier future 2/2

- Under Optimal Scenario, implementation of BACS at European level leads to yearly savings of around 632 TWh / 54 Mtoe, 111 million tons CO2 emissions (=gross inland energy consumption of Belgium in 2014)

- Under Optimal Scenario, BACS incentivizing framework can create 200,000 and 300,000 direct jobs and 3.7 million indirect jobs by 2030

What can architecture do to support successful implementation?

- Enable data exchange with “digital twin” as engineering source for BACS (e.g. Room / zone naming concept)
- Review automation functions as defined by the selected supplier (so called “submittal”) with the investor / operational responsible
- How is the building supposed to be used and where are the positions to inform/influence operation?
- What part of the building is used at what time and what services should be delivered for how many persons / which industrial processes?
- Control zones (geographical space section) shall include the same boundaries for all services of that zone (e.g. heating, cooling, ventilation, light, blinds)
- How shall “on site” renewables being included?
- Success in construction depends on capabilities to see “automation” in a holistic way. Integrations of different disciplines during the construction and commissioning is crucial and needs either insourced capabilities or outsourced ones

What can architecture do to support successful implementation?

- Require quality time for commissioning – depending on the complexity / seasons of operation
- Include actual “in use” scenarios in “building commissioning” – allow project execution time
- Recommend operational staff to be included commissioning procedures before building gets in use
- Respect physical boundary conditions need in the energy distribution design (e.g. separation of heating supply between north and south oriented space)

Thank you

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