



Unlocking the Flexibility of Buildings

Where Market Design meets the EPBD

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Unlocking the Flexibility of Buildings: where Market Design meets the EPBD

Consumers are at the heart of the energy transition in Europe. As we move from a centralised fossil-fuel based system to a variable, decentralised renewable-based one, consumers must be empowered to self-generate, modify their energy usage, and be rewarded for their flexibility. The transition needs open and competitive electricity markets, as well as a level playing field for innovative new aggregators and energy management companies.

The Commission's Clean Energy Package provides a much-needed regulatory framework for consumer flexibility and demand response in Europe, from access to dynamic pricing contracts and smart meters, to equal treatment for all energy market participants. Short-term markets, as close to real time as possible, will better integrate renewable energy and demand-side flexibility into the system.

Buildings have a key role to play in the energy transition, and specifically in demand response. So far European and national regulation have defined sustainable buildings exclusively on the basis of static measures taken within the building itself. As a result, Energy Performance Certificates have measured the passive fabric of a building. However, as we move towards a greener, smarter energy system, the building, and its ability to connect to its surroundings, must be viewed as an active and flexible part of the overall energy ecosystem.

Buildings, appliances, automated systems, storage potential, and electric vehicle infrastructure can offer great energy savings and flexibility, in response to the wider needs of the grid distribution system and wholesale price signals, and to balance renewable energy.

In the SEDC we want to see buildings fully utilised as tools for demand response, and see four key opportunities within the EPBD to do so:

- (1) The Smartness Indicator
- (2) Building automation and control
- (3) Electric vehicles
- (4) Long term planning and financing

(1) The Smartness indicator: what is it and why should a building have one?

A Smartness Indicator would give a measure of a building's ability to connect and cooperate with the surrounding energy ecosystem, as well as adapting to the needs of the occupant. It would give two high level measures. The first being how much of the building's load can be shifted at any one time¹, in terms of kW peak. Essentially how much of the building's overall demand for electricity can be flexible. The second being the capacity in terms of kWh of how much of this flexibility can then be delivered to the grid, including both offtake and injection.

¹The can include the internal ability of the building to manage its own demand by re-managing its own resources internally coordinating needs of grid and occupants, as measured in IEA EBC [Annex 67](#).

Contributing to these high level measures would be a range of factors which should include but not be limited to: smart meters, building automation and control systems, smart thermostats, smart recharging points for electric vehicles, energy storage, the interoperability (which could include industry standards for interfaces & communication protocols²) of the above appliances and systems. Once established, the Smartness Indicator could be used in the pre-qualification process for buildings to provide flexibility, notably to the balancing markets.

The Smartness Indicator must be simple, transparent, and easily understandable for consumers, with a clear format and design. It should complement but not be merged with the Energy Performance Certificate.

(2) Building automation and control: a crucial component of demand response

Building automation and control systems are key for allowing consumers – both small residential consumers and larger industrial or commercial ones – to participate easily in demand response. They are products, software and services for automatic controls, monitoring and optimization. As more flexibility is needed in the overall energy system to match the increase in renewable energy, it is simply unrealistic for consumers to be expected to manually adjust their appliances, thermostats or energy intensive systems in response to price signals³. Building automation and control systems are therefore crucial for participation in demand response and in active energy efficiency, as they provide the connection and reaction needed to link the building with the wider energy ecosystem. They also contribute greatly to the overall comfort and health of a building.

We therefore believe that building automation and control systems must be a mandatory part of new and renovated building requirements for both residential and non-residential buildings above a minimum threshold⁴, from 2023.

(3) Electric vehicles

The electrification of transport is vital to reduce CO₂ emissions and overall air pollution. It can also provide a key service in the overall energy optimization of a building and to the electricity grid, acting as both a storage device and flexibility tool.

For the SEDC the smart charging of electric vehicles is crucial for balanced systems. A vehicle's charging must be able to respond to price signals and system capacity by modulating the charging of the vehicle – not simply stopping and starting, but also speeding up and slowing. This would allow for electric vehicles to work in harmony with the grid, acting as a demand response, rather than simply additional demand. Looking to the future we must pave the way for bi-directional charging (also known as vehicle to grid charging). This is where the vehicle can feed back to the grid in times of need, allowing them to act as a service to the system. Owners would be rewarded and remunerated accordingly.

Infrastructure for recharging points is therefore important to include when looking at an overall technical building system. Consumer uptake of electric vehicles will be slower if the infrastructure is not in place. We see smart charging of an electric vehicle as a significant component of a smart home.

² Interoperability requirements must not lead to any future technology lock-in

³ Consumers should always have the power to over-ride automation and control systems

⁴ Total primary energy use of over 250 MWh/y for non-residential buildings and residential buildings with centralised technical building systems of a cumulated effective rated output of over 100 kW

The SEDC is a member of the Platform for Electro-mobility, through which we support joint provisions to facilitate the electrification of transport in Europe.

(4) Long term planning and financing

In order to unlock the potential of buildings as terms of energy efficiency and demand response providers, long term targets to decarbonize the building sector must be introduced. Such clear objectives for Member States will provide regulatory certainty and signal the long-term commitment of governments. Setting targets also pushes for coordinated action, further national support and encourages the development of innovative business models. Mandatory targets for renovations and retrofits can be incentivized through audits and minimum standards for resale or rental of properties.

Financial incentives provided by the EPBD must be linked to both the Smartness Indicator and the Energy Performance Certificate. Barriers must also be removed in order to allow for greater public investment in smart and energy efficient buildings. In Europe, according to the interpretation of accounting rules, when a municipality wishes to improve the efficiency of public buildings and make investments they must take 100% of all debt onto their own books. As their legal limit for debt is 3% of their budget this makes long-term efficiency investments near impossible. In the US, the partner ESCO, insurance company, technology provider or other investor can take debt of an energy efficiency investment. The US municipality does not have to take the full risk or acquire massing debt, but practically leases the service. European legislation must therefore be amended to remove such disincentives for public procurement of efficiency and retrofitting.

Any Member State's charges, taxes and levies, including VAT, must not disincentivise building owners, occupants and consumers to make their buildings smarter and to engage in demand response.