

# THE ROLE OF SHOPPING CENTERS IN A SUSTAINABLE FUTURE SOCIETY

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## COMMONENERGY POLICY RECOMMENDATIONS

*CommONEnergy developed a policy paper building on demo cases and giving concrete examples of the benefits generated by the renovation of shopping centers. Its recommendations can serve as an important basis for revising the Energy Performance of Buildings Directive (EPBD) (part of the Clean Energy for All Europeans policy package the European Commission released at the end of 2016) and for shaping EU legislation for European buildings. Following the project's policy recommendations would mean seizing the opportunity for a more ambitious revision of the EPBD and better recognizing the significant role shopping centers can play in achieving EU energy efficiency targets. The recommendations are based on expertise and research from over 23 organizations and three demonstration cases and grouped under four main themes: engaging stakeholders, communicating the benefits of renovation, promoting energy efficient technology packages, and supporting the energy transition. They are available at [commonenergyproject.eu](http://commonenergyproject.eu).*

Initially considered the “icons of consumerist society,” shopping centers are now becoming lighthouses of energy-efficient systems and sustainable architecture. In the last four years, the EU-funded project CommONEnergy has supported this transition by developing solution sets for deep, systemic retrofitting, as well as support tools and methods for energy-efficiency evaluation, lean management, continuous commissioning, environmental and socio-cultural impact assessment, and health and comfort analyses.



*To optimize natural lighting, innovative light domes were deployed, which pass on sunlight through solar tubes.*



Non-residential buildings make up a significant portion of the EU's building stock (30%) and GDP (11%). This means that investing in their retrofitting would result in huge energy savings and CO2 reductions and thus is a great support in attaining the EU's long-term energy and environmental climate objectives.

The renovation rate of shopping centers is high (4.4%) compared to the rate of the entire EU building stock (1%), mainly because shopping centers are subject to constant changes and evolutions. They are also regularly refurbished and redesigned for marketing reasons: They must remain highly attractive for clients, who are more and more attracted by “green” solutions and sustainable architecture. Because of their peculiarities, however, such as different owners in short timeframes; continuous re-styling; a need for standard, pre-manufactured parts; large spaces and





## FOCUS ON INNOVATIVE SOLUTIONS

*Solutions to improve the utilization of natural sources for shopping centers' envelopes were studied, while introducing new functions for reducing the energy demand of the whole building. Some are listed below:*

**1. Greenery integration in the building envelope:** Direct use of vegetation to improve the building's thermal performance. Vegetation placed on the façade can reduce the absorption of solar irradiation on the wall surface. It may also influence the convection of heat transferred to/from the wall.

**2. Multifunctional smart coating materials:** Several commercial nanoparticles were examined to check their reflectance properties, thermal behavior, and anti-molding/antibacterial activity: the four most effective formulations were chosen for integration into the base paint to enrich it with added properties. The final user can pick from a list of properties those suitable for the area's climate conditions and just add the formulation to the desired commercial coating product.

**3. To optimize natural lighting,** innovative light domes were deployed that pass sunlight through solar tubes.



*Mercado del Val in Valladolid (Spain) after the retrofit.*



energy storage systems. The iBEMS allows the inter-communication of different systems using open protocols for building management.

## HELPFUL TOOLS

Several tools were also developed based on the shopping centers' deep retrofitting drivers and detailed simulations of reference buildings. The Integrated Design Process (IDP) library is a user-friendly online repository tool conceived to provide designers, owners, and managers with relevant information to start a shopping center retrofitting process. It collects information about malls' archetypes and specific technology features, as well as climate, social, and urban contexts. The Economic Assessment Tool, meanwhile, is an instrument for estimating the energy-saving potential and economic benefits of retrofitting shopping malls. The tool targets shopping center managers and owners and allows them to enter relevant information about their centers. It provides quick information on energy consumption and options to reduce energy demand, CO<sub>2</sub> emissions, and environmental impact, and provides an economic assessment of the investments.

The steps in CommONEnergy's systemic retrofitting approach are: develop a retrofitting concept, develop a technology solution set, design,

procurement, implementation, and validation/assessment. The innovative technologies and solutions it generated were implemented in three demo cases in Italy, Spain, and Norway, where several technology solutions were chosen, designed, installed, and commissioned with the local design teams, building owners (the "clients"), and the general contractors.

2017 is the closing year of CommONEnergy, which can now boast with solutions and methodologies available on the market, in addition to many lessons learned. Indeed, the project has shown that there is a great deal of replication potential and exploitable co-benefits in shopping centers' energy retrofitting and that this is also valid for similar buildings, like airports and train stations. Keeping in mind that clients expect more and more from their experience in shopping centers, it is important that such buildings are constantly upgraded, not only aesthetically, but also in terms of sustainability, becoming great business opportunities for shopping center stakeholders. Such buildings are extremely complex and peculiar, however, and therefore require a higher and more specific regard in EU legislation (e.g. directives EPBD, EED) and relevant national legislative frameworks.

Projects like CommONEnergy play an important role in raising awareness around energy and environmental issues and in facilitating the transition of shopping centers from "icons of consumerist society" to lighthouses of energy efficient systems and sustainable architecture. In the future, by drastically reducing energy needs, shopping centers have the potential to become energy hubs at the heart of local smart grids, integrated with demand/response mechanisms and renewable energy sources. The project CommONEnergy, led by 23 partners from across Europe from research centers, the retail sector, and the industry, implemented and/or tested over 25 solutions and tools it developed in three demo cases and eight reference buildings, leading to up to a 75% reduction in energy demand and costs, with the initial investment paid back within at most seven years. Find out more on [www.commonenergyproject.eu](http://www.commonenergyproject.eu).

