

## The Italian “Superbonus 110%” economic recovery program - a golden opportunity for energy-efficient technology!

*Buildings are the biggest energy consumers of all and account for >40% of global energy consumption (compared with approx. 30% for industry and 30% for transport). New Italian legislation aims to boost the economy by providing financial incentives promoting sustainability and improving energy efficiency, especially in older residential properties. The COVID-19 economic recovery program will strongly support a shift towards energy-efficient solutions by allowing for the tax deduction of up to 110% of the costs incurred over several years.*

The Governmental *Relaunch Decree* (“*Decreto Rilancio*” n.34/2020 dated 19<sup>th</sup> May 2020 and valid until 31<sup>st</sup> December 2021) aims to strengthen the Italian economy by implementing a broad range of fiscal measures. Italy is one of the European nations hardest hit by the COVID-19 crisis, with an economy already in a state of recession when the spread of the viral infection sent the nation into the most rigid lockdown situation in Europe.

In order to save the economy from further decline, measures have been implemented which primarily aim to safeguard employment. One of the key areas which must be protected from further decline is civil engineering. At the same time, the European Green Deal devised (and heavily funded) by the European Commission aims to make Europe the first climate-neutral, resource-efficient continent by 2050. This is expected to bring significant opportunities for economic growth together with technological advancement in many key areas. One of them is real estate.

Italy is rich in historic cities with relatively old buildings. Of Italy’s 12.2 million buildings and more than 31 million dwellings, 15% were built before 1918 and a further 65% were built before the first energy-saving laws were passed in 1976. Meaning that there is great potential for saving energy through modernization, especially in Southern Italy where mild weather means that many buildings are devoid of double glazing or efficient insulation.

In Italy, central heating for apartment buildings is the exception rather than the rule. Most dwellings have their own boiler-based heating and hot-water supply, mainly gas-fired. In Southern Italy, stand-alone gas-fired water heaters (usually in the bathroom) are frequently the only source of heating, supplying hot water to simple radiators.

The *D.P.R. Law n.412* dated 26<sup>th</sup> August 1993 subdivides Italy into 6 climate zones. For each climate zone, dates are defined for the start and finish of the “heating season”, together with the number of heating hours allowed per day. For example, *Rome is in Zone D where heating is permitted from 1<sup>st</sup> November to 15<sup>th</sup> April for up to 12 hours/day (at a maximum of 22°C)*. These heating hours can be split into two or three blocks throughout the day, from 05:00 to 23:00. In the case of harsh weather conditions, local authorities may authorize temporary exceptions. Breach of these regulations, applicable to central heating and individual boiler-based systems alike, is punishable by law. All in all, a complex and highly regulated subject.

Let’s now examine the Smart Home/building-automation-relevant legislation in more detail.

Italian *Law n.208/2015* already included an “Ecobonus” and makes provisions for the fiscal deduction (**65% over several years**) of expenses incurred when **systems remotely monitoring/controlling heating, air conditioning and hot water supply** - using mobile devices - are installed within a property.

These expenses cover the purchase of devices installed within the property (e.g. thermostats, sensors) but not the cost of procuring mobile devices such as smartphones/tablets/computers. The cost of installation works (e.g. masonry, redecoration) and professional services (technicians, documentation) is covered. The new “**Relaunch Decree**” legislation is effective as of July 2020 and valid until the end of 2021 (although the Italian Government is now considering extending its validity until the end of 2024). It adds attractiveness and extends fiscal deduction to **110%** when building automation systems are installed in conjunction with other, more extensive works aiming to reduce energy consumption within the same building.

These extensive works are defined as “towing works” and the minor (e.g. building automation installation) works are labeled “towed works”. Such “towing works” may include:

- replacement of windows, installation of modernized thermal insulation, new roofing, etc.
- installation of heat-pump systems, condensing boilers, solar energy systems with power grid connection
- installation of E-mobility charging points
- measures to improve the building’s resistance to seismic activity

The “towed works” are to feature:

- **remote control of heating/airconditioning** and hot water systems
- **remote monitoring of ambient conditions**, e.g. temperature/humidity
- **remote monitoring of energy consumption** with the supervision of consumption data by ENEA, the public body governing energy supply

**All in all, the work carried out must lead to an improvement of at least 2 energy categories. Basically, any measures which contribute towards reducing energy consumption can be interpreted as falling under the general scope of the “Relaunch Decree”. In principle, private individuals, as well as any entity entitled to claim tax credits, are eligible for fiscal benefits.**

The implementation of the benefits foreseen by the “110% Superbonus” initiative must be approved case by case by ENEA. Interested parties must file the appropriate request and supply full documentation - including a detailed technical evaluation of the property’s thermal efficiency rating before and after the work is carried out - in order to gain entitlement to preferential tax treatment.

As an extra incentive, the new regulations allow for flexible payment of the installation costs. The homeowner may opt to offset the costs against personal income tax in yearly installments. Or choose to get a 100% discount on the invoiced cost, for which the invoicing company can claim 110% against their own tax burden over several years. Various fiscal options are available to encourage spending in enhancing energy efficiency.

Basically, modernizing a building's outer shell, its airconditioning and heating system, the hot water supply system or its roof and glazing to improve their thermic efficiency is a comparatively slow, expensive undertaking with long return-on-investment times. It should also be borne in mind that such work is intrinsically energy-intensive. Retrofitting building automation systems, on the other hand, is an often-overlooked low-cost way to improve comfort and save money at the same time - from "Day 1". A reduction of up to 40% in the energy consumption of older buildings can be attained with relatively low investment costs, fast return-on-investment and without disruption - there is no need to vacate the premises whilst installation takes place, or to redecorate them afterward.

The older Italian "Ecobonus 65%" and the new "Superbonus 110%" legislation take an important step forwards towards energy efficiency of the smarter kind. A few examples of what can be done today to reduce energy consumption (whilst adding comfort and convenience at the same time):

- Shading can be automatically controlled by solar sensors to compensate for ambient warming caused by sunlight, reducing the need for air conditioning;
- The opening and closing of doors and windows can be monitored through magnetic contacts/smart handles, governing the heating or airconditioning accordingly and saving energy;
- Occupancy sensors can detect empty rooms and turn off lights, heating and airconditioning accordingly (as well as performing alarm functions);
- Temperature/humidity and solar sensors, smart thermostats and intelligent radiator valves optimize climate comfort whilst greatly reducing energy consumption.

In more detail: an excellent example of high technology that can be retrofitted in minutes and makes a big difference to energy consumption is the **energy-harvesting wireless thermostat valve** that powers itself (by exploiting temperature differences between heating appliance and ambient air) and communicates wirelessly with solar sensors and smart thermostats in order to fine-tune heating to changing conditions, room by room. The zero-maintenance smart thermostat can communicate with a smartphone app via a room controller/gateway, enabling the remote management of individual environments. An additional benefit: frost protection for seldom-used spaces is easily implemented, avoiding the risk of costly repairs due to burst water pipes in freezing weather. Installation can take place quickly, without laying cables and damaging walls or having to vacate the premises whilst repair/redecorating takes place. Smart!

All this, and much more, is made possible by modern sensor technology - in a residential context but also in schools, clinics, care homes, offices and other spaces that are subject to heavy power consumption and fluctuating occupancy. Simple systems can be installed step-by-step, starting with basic applications which can be later developed into more complex, sophisticated solutions. Some examples:

- To counter the COVID-19 pandemic, CO2 sensors (complemented by VOC detectors to sense other environmental pollutants) can control access and trigger automatic ventilation of contaminated spaces, improving air quality and safeguarding health - especially in schools, universities and healthcare facilities.
- Sensors can "learn" occupancy patterns and monitor living spaces in assisted living situations.
- Even the local weather conditions and forecasts can be taken into account, e.g. to deploy or retract sunblinds taking current and forecasted wind conditions into account.

When these sensors are wireless, self-powered and maintenance-free, they can be retrofitted easily and economically, in a matter of minutes and without the need to lay cables (i.e. no noise, no dirt, no redecoration, no disruption and no downtime). There is no need to monitor, stock and replace batteries with the ensuing disposal issues. Nothing is environmentally friendlier and makes better financial sense than self-powered devices that require no maintenance whatsoever - over decades.

Interoperable EnOcean wireless technology enables the quick and simple, “peel and sticks” installation of state-of-the-art sensors, switches and other devices that are powered by light, movement or temperature differences. The open EnOcean wireless standard guarantees interoperability between all kinds of devices from many different suppliers.

The EnOcean Alliance is a non-profit organization founded in 2008 with the aim of establishing and maintaining an open industry standard (ISO/IEC 14543-3-10/11). It enables and promotes wireless energy-harvesting ultra-low-power sensor technology worldwide and today acts as a network and marketing platform for some 400 companies which participate as Members active in 37 nations. These suppliers currently offer 5.000+ products that freely communicate amongst themselves (even using existing Wi-Fi networks) and with all major building automation systems and gateways (e.g. BACnet, KNX) including internet/Cloud-based solutions.

Over the past 18 years, 20 million EnOcean-based products have been installed in more than 1 million buildings. These range from individual residential properties to high-rise condominiums, from office buildings to warehouses, from industrial facilities to historical buildings, from shopping malls to hotels, from shops to nursing homes, from hospitals to airports, from museums to exhibition centers, from public buildings to sports venues - virtually any space can benefit from intelligent management of its energy consumers.

If you want to carry out the works described above and to qualify for the eco-bonus, please look for the appropriate sensor solution or manufacturers listed on our website: <https://www.enocean-alliance.org/products/>

#### **Sources:**

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