SUPER HEERO
Human Energy Efficiency Retrofitting Optimisation

D.4.6 – Roadmap for Super-Heero to contribute to achieving the EU's objectives

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Terms, definitions and abbreviated terms

Table of abbreviation and acronyms			
Acronym	**Definition**	**Acronym**	**Definition**
EC	European Commission	MITECO	Ministry for Ecological Transition and the Demographic Challenge
EE	Energy Efficiency	NDC	National Determined Contributions
EED	Energy Efficiency Directive	NECP	National Plan for Energy and Climate
EFSA	European Food Safety Authority	NEEAPs	National energy efficiency action plans
EPBD	Energy Performance of Buildings Directive	PERTE ERHA	Strategic Project for the Recovery and Economic Transformation of Renewable Energies, Renewable Hydrogen and Storage
EU	European Union	PNIEC	Plan Nacional Integrado de Energía y Clima
GAP	Green Action Plan	PNRR	Piano Nazionale Ripresa e Resilienza
GHG	Greenhouse gas	PREPAC	Programma
GSE	Gestore Servizi Elettrici	RES	Renewable energy source
IEA	International Energy Agency	SDGs	Sustainable Development Goals
M	Month	SH	Super-Heero
		WP	Work package

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1 Executive Summary

According to EU, improving resource efficiency in SMEs offers enormous potential for the reduction of production costs and productivity gains. A better use of resources is calculated to give an overall savings potential of 630 billion EUR per year for European industry. [1] In the SME world, the retail sector in general and supermarkets, in particular, are large consumers of energy, especially electricity. It is therefore clear the interest that revolves around the involvement of supermarkets in a constant and incisive process of adoption of energy efficiency measures and retrofits to achieve the ambitious objectives of the UN 2030 Agenda objectives and the European Green Deal.

The COVID-19 has brought supermarkets back to a centrality that seemed to be fading little by little compared to the disruptive force of online sales. On the contrary, supermarkets have been able to take advantage of the pandemic moment, both to engage the traction of the online market and to reposition themselves in a pre-eminent position with customers. This central and strategic role of supermarkets goes hand in hand with a growing awareness on the part of consumers of sustainability issues. Furthermore, there's a clear scientific consensus that reducing emission targets are difficult to reach if we focus our attention and effort only on technological and policy measures, without addressing social changes too.

SMEs, supermarkets first, can play an active role in the process of social innovation necessary to initiate and stabilize structural changes. In this sense, supermarkets can become ***"supermarket 2.0"*** agents of change and transformation, through the adoption of innovative mechanisms to implement energy efficiency in their buildings. Customers are an integral part of this new process, because, called to action, they can actively participate in the initiatives put in place by supermarkets.

The challenge of the Super-Heero project lies precisely here: to create fertile conditions for technology to be financed through innovative systems, at the basis of which are supermarkets and customers, in a win-win combination able to activate virtuous and effective paths to sustainability and the achievement of ambitious EU objectives. The Super-Heero roadmap, therefore, passes through the launch of tools capable of playing with all these players and elements ready to become the best witnesses of a best practice that can make many followers in other energy intensive sectors.

[1] https://ec.europa.eu/environment/ecoap/about-eco-innovation/policies-matters/eu-green-action-plan-boosts-sme-resource-efficiency_en

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1 Introduction

1.1 Background and motivation

The EU has always paid particular attention to energy policies both on the supply and demand side.

The reason is clear: for decades energy policies have been the prerogative of nation states. A greater European integration inevitably also passed through a more rational consumption and less dependent on production from non-EU countries, especially for some states where the dependence on external energy sources exceeds 70%.[2]

Over time, the environmental issue has become more and more prominent in the European debate: with the adoption of the EU Green Deal, the EU has set itself the goal of transforming the European continent into a modern, resource-efficient and competitive economy.

The COVID-19 pandemic has further accelerated this process: One third of the 1.8 trillion euro investments from the Next Generation EU Recovery Plan, and the EU's seven-year budget will finance the European Green Deal.[3]

With the adoption of the European Green Deal, the EU is increasing its climate ambition and aims at becoming the first climate-neutral continent by 2050. Furthermore, the Commission will review the Energy Efficiency Directive (EED) (issued in 2012), to meet the emissions reduction target of at least net 55% by 2030 – and becoming climate neutral by 2050 - as a part of the Fit for 55 package under which name there are all the revisions and initiatives linked to the European Green Deal climate actions and in particular the climate target plan's 55 % net reduction target.[4] Once approved, the Directive will guide how national contributions are established and almost double the annual energy saving obligation for Member States.

Hence, the role of energy savings in fighting climate change is fundamental and widely acknowledged in the political debate. This is also supported by different scenarios which require a significant reduction of energy demand in order to achieve relevant emission reductions while exploring ways to reach climate neutrality. However, there is a divergence between the recognition the idea of energy efficiency receives by policy makers and the commitment needed to make it happen on the ground.

[2] European Commission: Eurostat pocketbooks. Energy, transport and environment indicators. Publications Office of the European Union: Luxembourg, 2020

[3] https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en
[4] https://ec.europa.eu/info/news/commission-proposes-new-energy-efficiency-directive-2021-jul-14_en

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Although, energy efficiency measures have contributed to reduce energy use trends over the years, energy consumption still increased from 2014 to 2017, while in 2018, the change was marginal compared to the previous year.

In 2019, both primary and final energy consumption decreased, but current progress is slow and not sufficient to tap into the full potential of energy savings.[5]

In this context Super-Heero can play a very important role not only for the combination of EE measures and innovative financial packages, but also for the strategic element represented by supermarkets (and its workers) and local communities involvement as a key factor to implement energy efficiency in an effective and lasting way.

The involvement of people is fundamental in the face of a mature technology: the package of innovative financial measures put in place can provide the necessary plus to start a positive movement that can transform traditional supermarkets into "***supermarkets 2.0"***, i.e. real agents of transformation, catalysts for change, going beyond their traditional classic retail role to become active participants in the process towards the ambitious European targets on energy efficiency.

1.2 Purpose of the document

This document intends to investigate new approaches that can help the project to achieve the energy efficiency targets set by the European Union.

The paper first reviews the European policies on energy efficiency, with an in-depth look at the directives, regulations and all other legislative initiatives put in place by the European Commission to achieve the European 2030 and 2050 targets. Further on, we will outline the key factors for effectively and sustainably implementing energy efficiency measures that can unlock the immense potential for economic development and energy savings at the same time. One of the key factors is identified precisely in the role that can be played by SMEs, to which supermarkets belong.

The other key element is to consider supermarkets as "agents of change", i.e. active subjects capable of catalysing both economic resources and innovative approaches to involve local communities and their customers, in a movement of transformation of the supermarket from a

[5] https://www.eea.europa.eu/publications/trends-and-projections-in-europe-2020

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simple supplier of goods to an active actor able to generate services for their own and the community's benefit.

The last part of the document outlines a roadmap that takes into account the social innovation approach, previously outlined, as a key element to effectively implement energy efficiency projects. It starts from a value proposition able to flourish a capacity building and a real implementation that transform energy efficiency measures from simple elements of technology to a more profound renewal not only of buildings but also of the perception of the technology itself for energy efficiency, so as to make it an essential and easy to use subject in a multi-year and European perspective.

1.3 Organization of the document

The present Deliverable is articulated into the following sections:

- Chapter 1 provides the introduction;
- Chapter 2 presents an overview on EU policy framework, including directives and other EU legislative initiatives;
- Chapter 3 illustrates what are considered the key factors to achieve EE targets;
- Chapter 4 drafts the roadmap to obtain effective results through innovative approaches;

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2 EU Energy Efficiency objectives

2.1 The Energy Efficiency Directive

In 2012 the EC established a set of mandatory measures to help the European Union reach its 20% energy efficiency target by 2020: the Directive2012/27/EU.

Under the directive, all EU countries were required to use energy more efficiently at all stages of the energy chain, including energy generation, transmission, distribution and end-use consumption.

In this context, several actions have been adopted throughout the EU to improve energy efficiency in Europe such as:

- Policy measures to achieve energy savings equivalent to an annual reduction of 1.5% in national energy sales;
- EU countries making energy efficient renovations to at least 3% per year of public buildings;
- National long-term renovation strategies for the building stock in each EU country;
- Mandatory energy efficiency certificates to sell and rent buildings;
- The preparation of national energy efficiency action plans (NEEAPs) every three years;
- The massive adoption of energy label and ecodesign for a variety of products (ie boilers, household appliances, lighting and televisions/monitor to state minimum energy efficiency standards);
- The planned rollout of around 200 million smart meters for electricity and 45 million for gas by 2020;
- Energy companies are obliged to achieve 1.5% yearly energy savings of annual sales to final consumers;
- Mandatory energy audits for large companies at least every four years;
- Protecting the rights of consumers to receive easy and free access to data on real-time and historical energy consumption.[6]

The directive itself was amended in 2018, as a part of a larger package of directives and regulations that goes by the name of **Clean Energy for All European Package**: **a complex of four directives** – to be adopted by member states - and **four regulations** – directly applicable in member states.

[6] https://www.iea.org/policies/1118-the-eu-energy-efficiency-directive-201227eu

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The **Clean Energy for All European Package** presents for the first time the concept of ***Energy Communities*** in its legislation, notably as citizen energy communities and the concept of ***Renewable Energy Communities.***

More specifically, the **Directive on Common rules for the internal electricity market (2019/944/EU)** introduces new rules that enable the active participation of consumers, both individually and through citizen energy communities, in all markets, through two distinct lines: the first by generating, consuming, sharing and selling electricity. The second by providing flexibility services through demand remodelling and storage. The goal of the directive is to increase the deployment of energy communities, while making citizens active participants within the electricity market, increasing its efficient integration.

Regarding ***Renewable Energy Communities,*** the revised **Renewable Energy Directive (2018/2001/EU)** aims to strengthen the role of both renewables self-consumers and renewable energy communities.

Table 2.1 Clean Energy for all European Package (Directives)

Directives	Description
Energy Efficiency Directive (EU) 2018/2002	The Directive sets a target of 32.5% for energy efficiency for 2030, compared to a baseline scenario established in 2007, with a possible upward revision in 2023. It also includes provisions extending energy savings obligation and heat meters remote reading.
Energy Performance in Buildings Directive (EU) 2018/844	The Directive sets specific provisions for better and more energy–efficient buildings. It updates and amends many provisions from the Directive 2010/31/EU
Renewable Energy Directive (EU) 2018/2001	The Directive sets a binding target of 32% for renewable energy sources (RES) in the EU's energy mix by 2030, with a possible review for an increase in 2023. It also includes provisions for mainstreaming RES in the transport and heating & cooling sectors.
Electricity Directive (EU) 2019/944	The Directive sets rules for the generation, transmission, distribution, supply and storage of electricity. It also includes consumer empowerment and protection aspects. In addition, the market design Directive sets provisions for distribution system operators' flexibility procurement.

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Table 2.2 Clean Energy for all European Package (Regulations)

Regulations	Description
Governance of the Energy Union *Regulation (EU) 2018/1999*	The Regulation sets a new governance system for the Energy Union. Each Member State is to establish an integrated 10-year National Energy and Climate Plan (NECP) for 2021 to 2030, with a longer-term view towards 2050. The plan is to outline how the Member State will achieve its respective targets.
Electricity *Regulation (EU) 2019/943*	The Regulation sets principles for the internal EU electricity market. It focuses mainly on the wholesale market as well as network operation. In that regard, the Regulation includes provisions that affect certain articles in the electricity network codes and guidelines.
Risk Preparedness *Regulation (EU) 2019/941*	The Regulation requires the Member States to prepare plans on how to deal with potential future electricity crises. They are to use common methods and identify the possible electricity crisis scenarios, at both national and regional levels.
ACER *Regulation (EU) 2019/942*	The Regulation updates the role and functioning of the European Union Agency for the Cooperation of Energy Regulators (ACER).

2.2 EU Directives and Super-Heero project

As it can see, the Clean Energy for all European Package amended the Directive on Energy Efficiency (2018/2002), in order to update the policy framework to 2030 and go beyond. The new ambitious energy efficiency target for 2030 is to reach at least 32.5%. The target, to be achieved collectively across the EU, is set relative to the 2007 modelling projections for 2030.

In absolute terms, this means that EU energy consumption should be no more than 1128 Mtoe (million tonnes of oil equivalent) of primary energy and/or no more than 846 Mtoe of final energy (following the withdrawal of the UK).

The amending directive, entered into force in December 2018, also includes an extension to the energy savings obligation in end use, introduced in the 2012 directive: EU countries will have to achieve new energy savings of 0.8% each year of final energy consumption for the 2021-2030 period, except Cyprus and Malta that will have to achieve 0.24% each year instead.[7]

[7] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018L2002&from=EN

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There are other directives besides the EE directive itself that affect the Super-Heero project such as:

1. **Energy Performance in Buildings (EPBD) Directive (EU) 2018/844**[8] *(see Table 2.1)*

   The **EPBD directive** amends provisions from the Directive 2010/31 /EU.

   Its main elements relevant to Super-Heero are:

   - Low and zero emissions building stock in the EU by 2050
   - Use of smart technologies
   - Long term building renovation strategies
   - Mobilise public and private financing and investment.

2. **Renewable Energy Directive (EU) 2018/2001** [9]*(see Table 2.1)*

   In the **Renewable Energy Directive,** the EU wants to support RES mainly for the following reasons: first of all EU wants a more environmentally sustainable energy system, as RES can contribute to the reduction of GHG emissions and local pollutants and, as a consequence, to climate change mitigation and improvement of air quality.

   Secondly, the penetration of RES in the energy mix can also help with other traditional goals of the EU energy policy, such as the competitiveness of energy prices and reducing dependence on carbon-fossil resources.

   Third, the promotion of renewable energy can boost opportunities for employment, helping as well EU leadership in green technologies and contributing to overall economic growth.

   The Directive specifies national renewable energy targets for each country, taking into account its starting point and overall potential for renewables. These targets range from a low of 10% in Malta to a high of 49% in Sweden.

[8] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018L0844&from=EN
[9] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018L2001&from=EN

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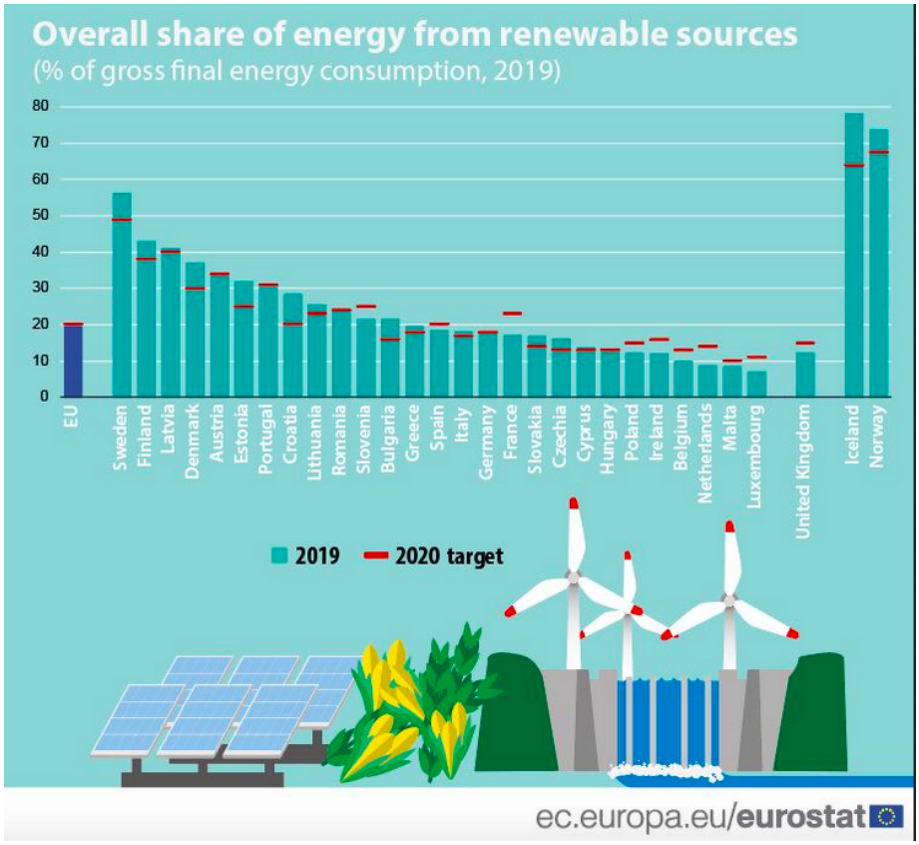
Figure 2.1: Overall share of energy from RES (eurostat)



The interesting element of this directive, for Super-Heero project, concerns the annual increase of energy from renewable sources in **heating and cooling** expected to rise up to 1.3 percentage points indicatively, or 1.1 percentage points if waste heat is not taken into account. In fact, heating and cooling sectors represent a relatively larger part of the final energy consumption, being about 30% and 40% respectively.[10]

As a result, they cannot be ignored if one aims to achieve significant decarbonisation in Europe. Even so, efforts to increase the use of RES in these sectors have obtained limited results so far. This is why it becomes strategic to adopt more approaches and activate more avenues to implement energy efficiency measures and to involve more actors and categories.

SMEs are one of these categories on which to focus efforts.

[10] https://ec.europa.eu/eurostat/en/web/products-eurostat-news/-/ddn-20201229-1

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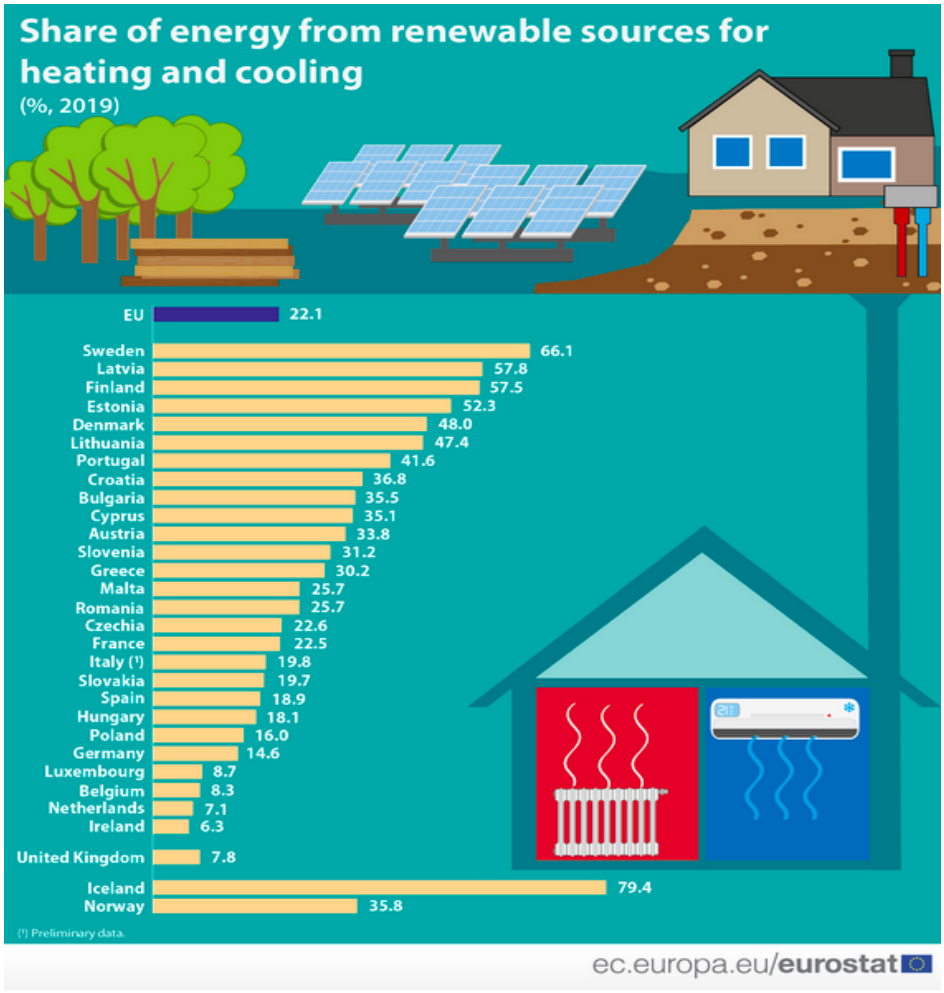
Figure 2.2: Overall share of energy from RES (Eurostat)



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2.3 EU Green Deal, Fit for 55 and new ambitious targets

> *"MAKING EUROPE THE FIRST CLIMATE NEUTRAL CONTINENT IN THE WORLD IS OUR GOAL"*
> *Delivering the European Green Deal*

With the adoption of the **European Green Deal**, the EU is increasing its climate ambition and aims at becoming the first climate-neutral continent by 2050.

The first two initiatives that have been published to implement the European Green Deal are the **legally binding European Climate Law (March 2020),** which transposes the 2050 carbon neutrality objective into EU law, and the **European Climate Pact** (March, 2020), which aims at engaging citizens and society in climate action.

This requires current greenhouse gas emission levels to drop substantially in the next decades. As an intermediate step towards climate neutrality, the EU has raised its 2030 climate ambition, committing to cutting emissions by **at least 55% by 2030** (compared to 1990).

To implement the increased ambition, on 14 July 2021 the Commission presented the first series of adopted files under the **'Fit for 55'** package. The package contains legislative proposals to revise the entire EU 2030 climate and energy framework, including the legislation on effort sharing, land use and forestry, renewable energy, energy efficiency, emission standards for new cars and vans, and the Energy Taxation Directive.

The Fit for 55 package consists of a set of **inter-connected proposals,** which all drive towards the same goal of ensuring a fair, competitive and green transition by 2030 and beyond. When possible existing legislation is made more ambitious and where needed new proposals are put on the table.

Overall, the package strengthens eight existing pieces of legislation and presents five new initiatives, matching a range of policy areas and economics, with a careful balance between **pricing, targets, standards and support measures**. The sectors involved are: climate, energy and fuels, transport, buildings, land use and forestry.

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Table 2.3: Fit for 55 package

Targets	Pricing	Rules
Updated Effort Sharing Regulation Updated Land Use Land Use Change and Forestry Regulation Updated Renewable Energy Directive Updated Energy Efficiency Directive	Stronger Emissions Trading System including in aviation Extending Emissions Trading to maritime, road transport, and buildings Updated Energy taxation Directive New Carbon Border Adjustment Mechanism	Stricter CO_2 performance for cars & vans New infrastructure for alternative fuels ReFuelEU: More sustainable aviation fuels FuelEU: Cleaner maritime fuels

Support measures
Using revenues and regulations to promote innovation, build solidarity and mitigate impacts for the vulnerable, notably through the new **Social Climate Fund and boosted Modernisation and Innovation Funds.**

The EU effort is to align current laws with the 2030 and 2050 ambitions. Once again, the Commission highlights the importance of the Energy Efficiency Directive, together with other EU energy and climate rules, as the key core in order to ensure that the new 2030 target of reducing greenhouse gas emission by at least 55% (compared to 1990) can be met. To meet the new EU 2030 climate target Energy Efficiency needs to be prioritised. To strengthen and intensify its efforts, the European Commission put forward, in July 2021, a proposal for a new directive on energy as part of the package **"Delivering on the European Green Deal".**

"Energy Efficiency First" becomes the cardinal principle on which the energy policy is based and marks its importance and relevance combining policy applications through practical implementations and investment decisions.

More in detail, it seeks to introduce a higher target for reducing primary (39%) and final (36%) energy consumption by 2030 now binding at EU level, in line with the Climate Target Plan, up from the current target of 32.5% (for both primary and final consumption).

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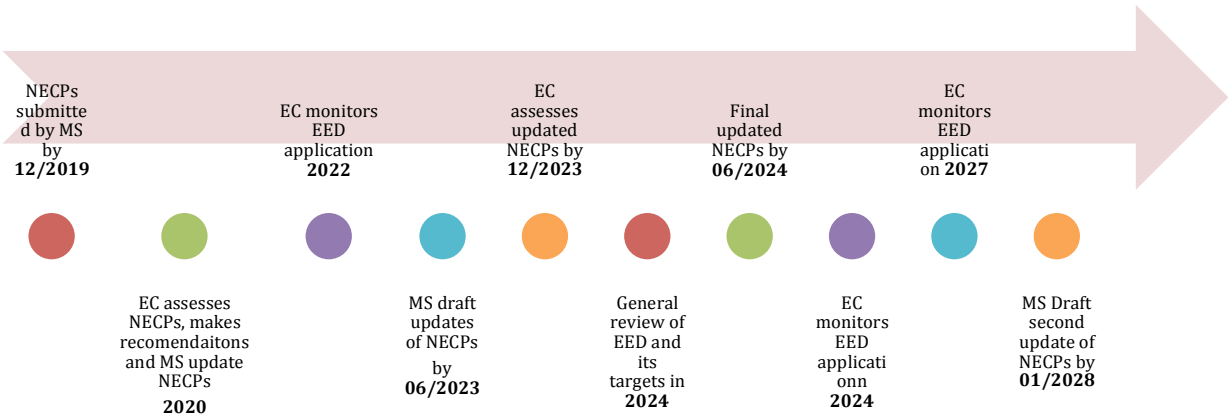
It introduces a benchmarking system for Member States to set their national indicative contributions to the binding EU target.[11] The new directive also proposes to nearly double Member State annual energy savings obligations in end use. In stimulating this acceleration, the proposal focuses on sectors with high energy-savings potential such as **heating, cooling, industry** and highlights the importance of the public sector as an important actor to push the transition.

Given the enormous potential for renovation to act as a springboard for economic recovery following the Covid-19 pandemic and the emphasis given to the building sector in **the EU's Recovery and Resilience Facility**[12] – the proposal also outlines a range of changes that should increase the uptake of energy efficiency investments.

A number of further elements linked to building renovation and decarbonising the building sector will be covered by a proposal for revision of the **Energy Performance of Buildings Directive (EPBD)**, due for publication before the end of 2021.

The European Green Deal is also the most powerful tool to get out of the economic slowdown as a direct effect of the COVID-19 pandemic : it will be financed by **one third of the 1.8 trillion euro** investments from the Next Generation EU Recovery Plan and the EU's seven-year budget.

Figure 2.3: Timeline: Energy Efficiency Directive and its 2030 objectives



[11] https://ec.europa.eu/info/sites/default/files/amendment-energy-efficiency-directive-ambition-2030-climate-target-with-annexes

[12] https://ec.europa.eu/info/business-economy-euro/recovery-coronavirus/recovery-and-resilience-facility_en

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2.4 National Contribution to 2030 Energy Efficiency measures in pilot countries in the post COVID-19 Recovery: Italy and Spain.

2.4.1 Italy

Covid-19 represents a watershed point between the policies implemented before the pandemic and what is happening and will happen in the coming years. In fact, the pandemic has brought to the forefront the fundamental question of a development that can only be **sustainable** in its entirety and political-social-economic and technological declination.

The strong economic contraction occurred in all European Union countries can be the detonator element for a new push, a renewal that goes beyond the simple application of European directives but that is a deep stimulus for the medium and long term for all economic sectors and beyond.

The starting point is the **official Italian NECP** (National Plan for Energy and Climate) plan (2019) built on two pillars both very interesting for Super-Heero project: renewables and energy efficiency complemented by the phasing out of coal by 2025.

The first pillar of the Plan is based on renewables which, by 2030 and with 33 million tons of oil equivalent (Mtoe), will provide 30% of the gross final energy consumption. The greatest contribution to the growth of renewables will come from the electricity sector: according to the Italian NECP, a generation of 187 terawatt-hours (TWh) must be achieved by 2030, whicht will provide 55% of the total consumption of 340 TWh.

However, according to other studies, this plan would prove to be obsolete and in order to meet the objectives of the European Union, it would be necessary to reach a production of 241 TWh, 54 TWh more than the National Plan indicates at the moment, reaching a coverage of 70% of electricity production from RES.[13]

The second pillar of the Plan is energy efficiency, where Italy aims for a reduction of 43% for primary and 39.7% for final energy consumption. This was considered sufficiently ambitious in the Commission's assessment and amounts to a consumption of 125 Mtoe and 103 Mtoe respectively for primary and final energy consumption by 2030.

The largest results of energy efficiency measures would derive from tax incentive schemes to foster renovation of the building stocks. Over 60% of residential buildings are more than 45 years old[14] and were built before the first energy saving law (373/1976).

[13] https://www.qualenergia.it/articoli/eolico-fotovoltaico-politiche-mancheremmo-30-50-gw-target-2030/
[14] https://euobserver.com/environment/149759

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This inefficient building stock represents a huge opportunity for energy saving. To grasp this opportunity legislations such as tax deduction schemes, white certificates, grants and a thermal energy account were enacted. Although on paper it seems easier to implement energy efficiency measures to meet EU targets, Italy has a tangle of energy efficiency measures that, together with the difficulty of obtaining adequate funding, make implementation more difficult.

In 2020, Italy launched the **Ecobonus** scheme (Law 77/2020), reinforced and extended in measures by **Superbonus 110%** in late 2021[15], which allows recovery, through a preferential fiscal treatment, of 110% of the cost for improving energy efficiency of buildings. As the Ecobonus and Superbonus were introduced in 2020/20021, after the submission of the NECP, its impact has probably not yet been totally factored into the energy savings for buildings, in particular the Superbonus that must certify the improvement of 2 energy classes. Both Laws will be in force up to 2024 (Ecobonus) and 2025 (Superbonus).

The support schemes for buildings are well conceived but, in order to achieve the stated objective of reducing greenhouse gas emissions from 87 to 52 million tons of CO_2 equivalent (Mt CO2eq) in 2030, it must be ensured that the procedures to benefit from the various schemes are not too cumbersome.

It should be noted that the Italian NECP was drafted before the COVID-19 crisis, as it was presented in 2019. As a consequence, the opportunities provided by the huge funding of the Recovery Plan have not been taken into account by the NECP.

When disbursing the funding of the Next Generation EU and the Multiannual Financial Framework, Member States should follow the European Council Decision and allocate 30% of the budget to climate related projects. The unprecedented scale of funding of the Recovery Plan, could be a catalyst to speed-up the clean energy transition in Italy as well as in other EU countries.

On 30 April 2021, Italy's **PNRR**[16] (National Recovery and Resilience Plan) was forwarded by the Government to the European Commission, receiving a positive assessment on 22 June 2021. **Mission 2 "Green Revolution and Green Transition"** of the PNRR aims to improve the sustainability and resilience of the economic system and ensure a fair and inclusive environmental transition. The Green Transition pillar stems directly from the **European Green Deal** and the EU's twin goals of achieving climate neutrality by 2050 and reducing greenhouse gas emissions by 55 per cent compared to the 1990 scenario by 2030.

[15] https://www.governo.it/superbonus
[16] https://www.governo.it/sites/governo.it/files/PNRR_0.pdf

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Within Mission 2, the item **'Energy efficiency and upgrading of buildings'**, with its €15.36 billion of planned investments, is particularly important. Substantial tax incentives are foreseen to increase the energy efficiency of private and public buildings.

In addition to the objective of saving energy and preventing seismic risks, the measures included contribute to giving a strong boost to the country's economy and employment, and to promoting social resilience by improving the population's housing conditions and alleviating the problem of energy poverty. In particular, the component consists of **three lines**:

1. Implementation of a programme to improve the efficiency and safety of the public building stock, with interventions concerning in particular schools and judicial citadels;
2. Introduction of a temporary incentive for the energy requalification and anti-seismic adaptation of the private building stock and for social housing, through tax deductions for the costs incurred for interventions;
3. Development of efficient district heating systems.

The second line of activity (Energy and seismic efficiency of private and public residential buildings) includes the 110% Superbonus measure with its extension in time and also by category, including social housing, in addition to private housing.

In addition to these economic measures, other measures are planned to overcome non-economic barriers through **four lines of action**:

I. Making the National Portal for Energy Efficiency in Buildings operational;
II. Strengthening the activities of the Information and Training Plan for the civil sector;
III. Updating and strengthening the National Fund for Energy Efficiency;
IV. Accelerating the implementation phase of projects financed by the PREPAC programme (Programma di Riqualificazione Energetica per la Pubblica Amministrazione Centrale)

The impact of the Recovery Fund/PNRR should therefore be factored into the upcoming revisions of the NECPs and should be instrumental in achieving the new 55% objective of reducing greenhouse gas emissions by 2030.

An additional consequence of the COVID-19 crisis to be assessed when revising NECPs are the behavioural changes induced by the pandemic. These changes, still in process, will result in structural modifications of energy demand and energy mix. An example is offered by remote working: a widespread use of teleworking and teleconferencing will decrease demand for

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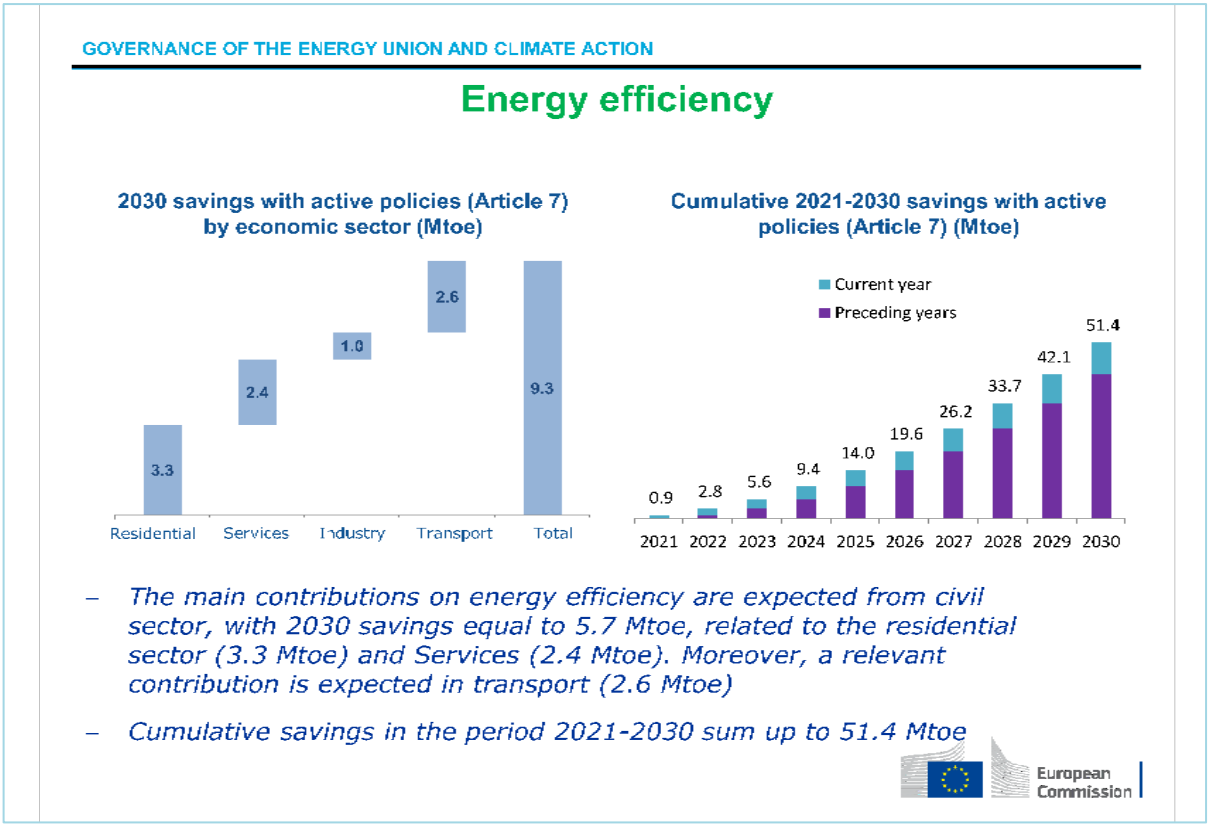
transport and increase demand for electricity. (more remote working meetings, less office, in presence meetings).

So, once again, a mix of the two pillars described above, hopefully strengthened, seems unavoidable. The Plan includes other initiatives such as an inventory of energy subsidies to be phased out, the creation of an observatory to address energy poverty and increase of public funding for research & innovation in clean energy from 222 to 444 million euros annually.

Table n. 2.4: Energy Efficiency potential [17]



[17] https://www.mite.gov.it/sites/default/files/archivio_immagini/Sergio_costa/Comunicati/draft_necp_presentation_by_italy_v10.pdf

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Table n. 2.5: Ecobonus[18] & Superbonus[19]

Interventions		
Ecobonus - 50-65% (single house) 75% (condos)	**Superbonus 110% (single house/condos)**	
Law 77/2020 Law 178/2020 until 31/12/2024	**Law 34/2020 Law 234/2021 until 31/12/2025 (110% up to 2023 gradually reduction up to 65% in 2025)**	
Installation of class A condensing boilers	Interventions on the common parts of buildings for replacement of existing air conditioning systems with centralized systems, such as heat pumps and condensation	**Superbonus Leading Interventions**
Installation of condensing hot air generators		
replacement of winter air conditioning systems with high-efficiency heat pumps and geothermal systems	Thermal insulation of opaque vertical, horizontal and inclined surfaces on more than 25% of the gross surface of the building	
interventions of insulation of the opaque envelope	Interventions on single-family buildings or independent units within multi-family buildings, to replace existing air conditioning systems with alternative systems	
purchase and installation of windows including frames		
replacement of winter air conditioning systems with systems equipped with condensing boilers at least in class A (provided for by EU Regulation no. 811/2013) or with systems equipped with heat generators powered by biomass fuels	Demolition and reconstruction of a building, provided that the work ensures an improvement in energy performance	**Superbonus Towed Interventions**
replacement of traditional water heaters with heat pump water heaters dedicated to the production of domestic hot water	Replacement of window frames and installation of solar screens	
interventions of replacement of winter air conditioning systems with systems equipped with hybrid appliances, consisting of heat pump integrated with condensing boiler	Installation of micro-generators for energy supply	
solar collectors for hot water production	Installation of electric vehicle charging equipment	
purchase and installation of solar screens		

[18] https://detrazionifiscali.enea.it/ecobonus.asp

[19] https://www.mise.gov.it/index.php/it/incentivi/energia/superbonus-110

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2.4.2 Spain

The impact of the Covid-19 pandemic on Spanish society was at the beginning as sudden and overwhelming as in Italy. Both countries have followed similar trajectories in terms of health and economic measures. The reduction in emissions and other impacts related to the economic shutdown caused by the pandemic throughout 2020 has proved to be an illusion with the first data on environmental impacts related to the economic recovery in 2021.

Nevertheless, solid steps have been taken during this period, mainly aimed at reducing the carbon footprint and in line with the EU's environmental objectives. The most notorious effort, from which many smaller initiatives draw, is the **PNIEC** (Plan Nacional Integrado de Energía y Clima), whose final version was approved in March 2021, and which will cover the period from 2021 to 2030 in terms of climate action. The main targets set, which can be found below, may even exceed those set by the EU government:

- A 23% reduction in greenhouse gas (GHG) emissions compared to 1990.
- Increase to 42% of renewables in the final use of energy.
- Improvement of energy efficiency by 39.5%.
- Increase up to 74% of renewable energy in electricity generation.

If we look at the expected trend for the PNIEC, using 2005 as the reference year for the estimates, a reduction of up to 39% in emissions from "diffuse sectors", i.e. those that are not subject to the emission rights market, is foreseen. In contrast, a 61% reduction in GHG emissions is estimated for the sectors that apply to the emission rights markets.

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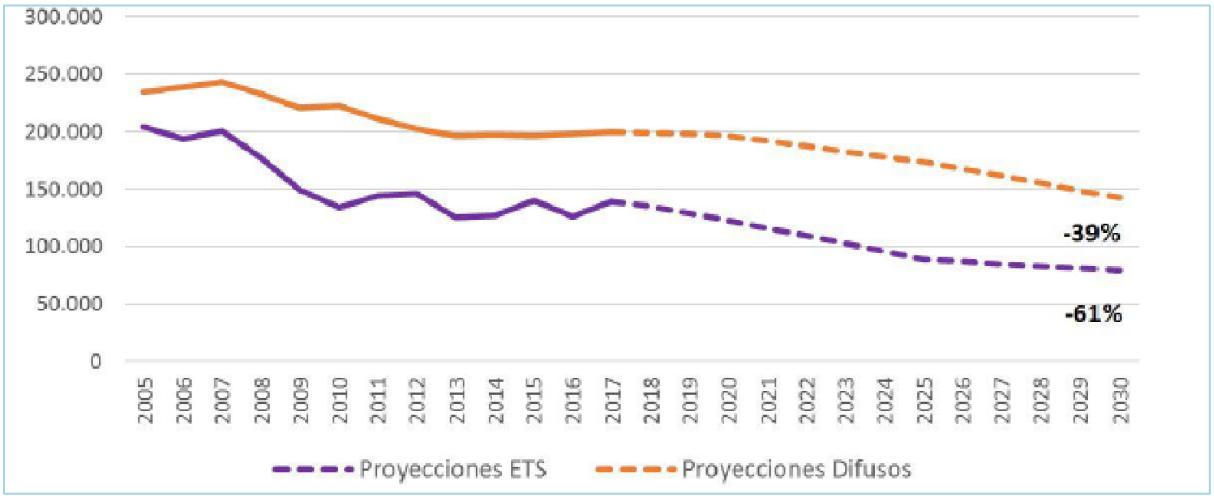
The data are shown in the graph below:

Figure2.6: Trend of GHG emissions in Spain by sector[20]



Flowing from this plan, more specific programmes are being launched in order to achieve a higher level of energy efficiency in specific sectors.

In the case of **sustainable mobility**, there are the **MOVES** programmes. These programmes will finance the purchase of electric and plug-in hybrid vehicles such as cars, vans or motorbikes, as well as the purchase and installation of public and private access, charging infrastructures. The MOVES, which together consist of 4 different programmes targeting different sustainable mobility objectives, are financed with up to **850 million euros**.

In the **building energy renovation sector**, which due to its overall volume of energy consumption has a significant impact on the average energy efficiency level in Spain, the PREE programmes have recently started. These aids are arranged along two lines, one more generic and the other aimed at directing funding to areas considered to be of "demographic challenge", that is, highly depopulated areas with no industry or strong economic activities. Altogether, they have 350 million euros in funding.

[20] https://www.miteco.gob.es/es/ministerio/recuperacion-transformacion-resiliencia/ayudas-inversiones/default.aspx

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The Ministry for Ecological Transition and the Demographic Challenge (MITECO) has opened two calls for pilot projects for **energy communities**, with a budget of **40 million euros**, which will promote social innovation and citizen participation in renewables, energy efficiency and electric mobility.

These are two of the first calls for proposals under the Strategic Project for the Recovery and Economic Transformation of Renewable Energies, Renewable Hydrogen and Storage (PERTE ERHA) and are expected to enable the implementation of around **40 renewable energy, electric mobility and demand-side management projects**.[21]

The current Spanish government's approach is to combine environmentally sustainable energy initiatives with the fight against rural depopulation and other demographic challenges. In this way, several programmes have been developed to promote environmentally sustainable investments in areas considered to be of "demographic challenge". These efforts are reflected, for example, in the requirement to carry out social, economic, and industrial impact studies, at local and regional level, for the renewable energy installations that are currently in the design phase.

This is the case of the **DUS 5000** programme with a fund of **75 million euros**, which can be increased. This aid may cover up to 85% of the necessary investment in projects promoted by town councils and other public bodies in municipalities with less than 5,000 inhabitants. Subsidies will be granted for projects aimed to improving **energy efficiency** in public buildings and infrastructures, promoting green investments (in particular **self-consumption**) or **charging infrastructures for EVs**, among others.

[21] https://www.miteco.gob.es/images/es/pnieccompleto_tcm30-508410.pdf

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3. Key factors for achieving EU objectives

3.1 SME: a fundamental key to Europe's decarbonization effort

According to the International Energy Agency (IEA), **SMEs account for at least 13% of global final energy consumption annually** and energy efficiency improvements are to provide 40% of the reduction in energy-related greenhouse gas (GHG) emissions over the next 20 years. However, investment in energy efficiency is expected to fall, - probably related to pandemic effects - making effective energy efficiency policies all the more pressing.[22]

The economic backbone of the European Union is made up of SMEs that represent 99% of the entire business[23]: that's why the European Commission adopted on July 2014 the "Green Action Plan for SMEs: turning environmental challenges into business opportunities"[24].

The **Green Action Plan (GAP)** proposes a set of actions for SMEs at European level allowing SMEs to turn environmental constraints into business opportunities, and can be presented in five sections:

1. **Greening SMEs for more competitiveness and sustainability**
   Improving resource efficiency in SMEs offers enormous potential for the reduction of production costs and for productivity gains. A better use of resources is calculated to represent an overall savings potential of 630 billion EUR per year for European industry.
2. **Green entrepreneurship for the companies of the future**
   Preventing environmental damage and moving towards a low carbon economy is a societal challenge which also offers new business opportunities for enterprises that bring green products and services to the market. SMEs need a favourable business environment in which green ideas can be easily developed, financed and brought to the market.
3. **Opportunities for SMEs in a greener value chain**
   SMEs and entrepreneurs need a supportive environment to move towards a circular economy: re-manufacturing, repair, maintenance, recycling and eco-design have a great potential to become drivers of economic growth and job creation while, at the same time, making a significant contribution to addressing environmental challenges.

[22] www.iea.org/reports/energy-efficiency-2020
[23] https://ec.europa.eu/growth/smes_en
[24] https://ec.europa.eu/growth/smes_en

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4. **Access to the markets for green SMEs**
   87% of European SMEs sell their green technologies, products or services only in national markets: a more supportive framework and more international cooperation are required in order to help SMEs successfully integrate into global value chains.
5. **Governance**
   The Green Action Plan for SMEs has been widely supported by EU Member States administrations and SME stakeholders in consultations on the future of SME policy and in meetings with the Network of SME Envoys and business organisations. It must be sustained over time.

The aspect that most interests the Super-Heero project concerns the efficient use of resources**: "Greening SMEs for more competitiveness and sustainability".** According to EU, improving resource efficiency in SMEs offers enormous potential for the reduction of production costs and for productivity gains. A better use of resources is calculated to give an overall savings potential of 630 billion EUR per year for European industry. Furthermore, European manufacturing firms spend, on average, 40% of their costs on raw materials, with energy and water pushing this to 50% of total manufacturing costs, to be compared to a share of only 20% for labour costs. [25] Thus, energy efficiency becomes a strategic piece of both decarbonizing and staying competitive.

The Green Action Plan also aims to support the Green Jobs Initiative, which proposes a roadmap to support the creation of green jobs across the EU.[26]

"In a Europe with 26 million unemployed Europeans it is not enough to create growth. We must also expand in areas that can generate jobs. The green sector offers enormous potential for job creation and we have to make sure Europe can harvest its benefits in full."

Connie Hedegaard, Former European Commissioner for Climate Action

The European Green Deal funds made available by EU are the passport for a whole series of post-COVID-19 pandemic initiatives directed towards an economy that pays great attention to

[25] "Guide to resource efficiency in manufacturing", Europe INNOVA, EcoInnovation, REMake.

[26] https://www.iisd.org/sustainable-recovery/green-recovery-plans-can-unlock-millions-more-jobs-than-return-to-normal-stimulus/

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the revitalization of SMEs in order to hold together a strategic combination: new jobs and innovation through the adoption of EE measures for SMEs as a catalyst for their economic growth on the one hand and a strong reduction of emissions on the other.

3.2 Energy Efficiency for the retail world: a great potential ready to boost

SMEs in retail and wholesale represent a key contributor to the EU economy, an important pool of jobs, a source of innovation and are deeply rooted in the local economy. They account for 5.4 million businesses in the EU. Two-thirds of these operate in retail (3.6 million) and one-third in wholesale (1.8 million). The great part of them are very small: over 90 % of retail and wholesale businesses are micro-businesses, employing less than 10 people, generating 55 % of the combined turnover in the sector.

The retail and wholesale sector currently employs 29 million Europeans, almost two-thirds of which work in SMEs, including 5 million self-employed. [27]

SMEs are a key element for implementing innovation. Being close to their customers, they can easily adapt to their changing needs and tailor their services and value propositions accordingly. The way to innovate for retailers and wholesalers is different compared to other sectors: much more agile and flexible as they have informal and adaptable processes. This flexibility and short and direct line of management mean that process innovations can be introduced and adopted quickly with the necessary resources.

Retail and wholesale is a highly competitive sector. Joining integrated networks such as franchises, networks of independent retailers and cooperatives is a way to benefit from scale provided by the network, while remaining independent. These forms of cooperation have proven to be useful and effective to support and transfer know-how and innovation.

The rapid expansion of the digital economy, boosted in particular during the COVID-19 pandemic, has affected the entire retail and wholesale sector, supermarkets included.

However, the expansion of digital is not to be seen in a completely negative light: the industry has had to reorganize quickly and has taken the opportunity to innovate by rapidly adopting e-commerce models.

[27] *Eurostat source*

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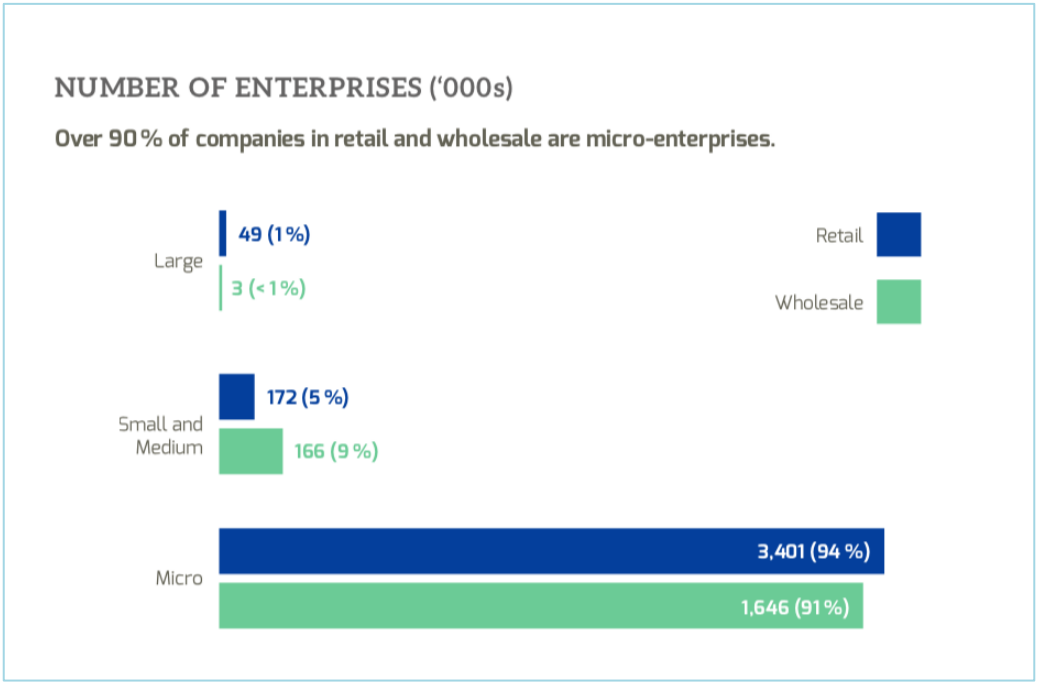
Table 3.1: Eurocommerce data: Retail and wholesale companies



In November 2017, Eurocommerce - the principal European organisation representing the retail and wholesale sector - asked EU decision makers to establish a horizontal SME policy, suggesting to:

- Facilitates **access to finance**, including easier access to EU SME fundings. Such funding can help SMEs invest in becoming more competitive. It could be channelled through local consortia or cooperatives which are best placed to provide collective guarantees and direct finance to micro-enterprises and SMEs;
- Supports SMEs to **meet circular economy goals** and to benefit from circular economy business opportunities.

SMEs are often not aware of what circular economy means in practice and how they can apply the concept to their daily work. As can be seen, it is the same trade associations that are calling for faster access to funding and new ways to be part of the circular economy model. The retail world knows that, in order to innovate, it is necessary to rapidly intercept trends and financing, and that with the funds of the EU Green Deal /Next Gen there could be a new fruitful path of development capable of making the sector a true catalyst for change, perfectly inserted in the sustainable circular economy.

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Supermarkets in particular with the pandemic have rediscovered a new central role in the life of the local community. This rediscovered centrality in the life of the local community combined with more agile ways of financing can make supermarkets as **"agents of transformation"**, real catalysts and active players in implementing the measures necessary to achieve the ambitious energy targets that the EU has set.

Table 3.2: Eurocommerce source: SME in numbers

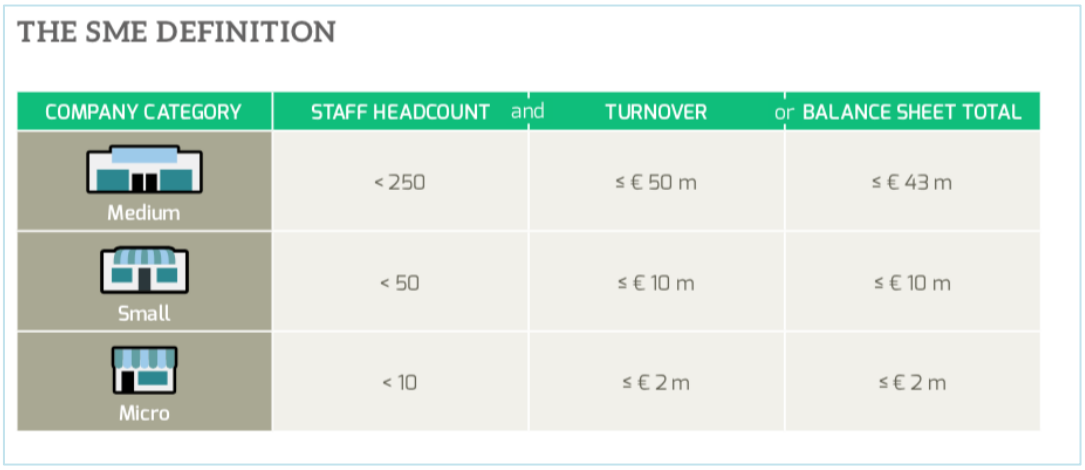
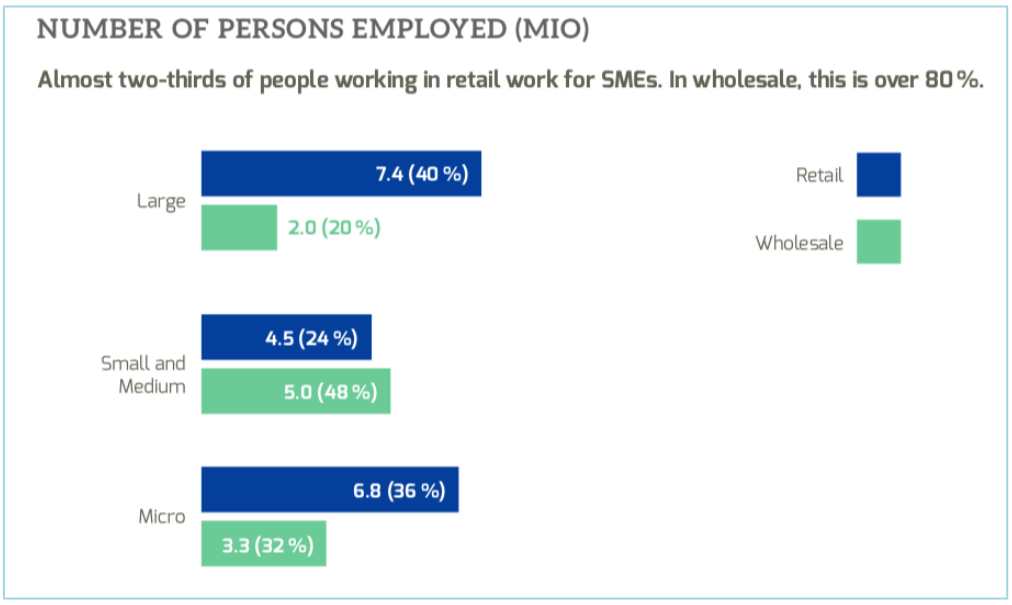


Table 3.3: Eurocommerce source: SME in numbers



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3.3 Social Innovation: the cornerstone for increasing Energy Efficiency

There's a clear scientific consensus that reducing emission targets are difficult to reach if we focus our attention and effort only on technological and policy measures, without addressing social changes too. The transition towards a carbon neutral economy in Europe requires deep changes in its intitutions, economy, politics and social aspects, including daily people's behaviour.
Social innovation initiatives for decarbonization can play an active role and impact to change EU citizens behaviour. Hence this becomes an interesting fruitful scenarios for the low-carbon transition and complementary to technology-driven approaches, as two sides of the "decarbonization coin".
Social innovation activates specifically local social communities for decarbonisation. Through its bottom-up character and the fact that it is rooted in the specific local context, it complements 'top-down' public policies addressing decarbonisation.

As pointed out by Van den Have and Rubalcaba, **Social Innovation**, in general, contains two "core conceptual elements":

A. *a change in social relationships, -systems or –structures*
B. *such changes serve a shared human need/goal or solve a socially relevant problem.*' [28]

A clear example of how social innovation can act to the benefit of the community by holding together policy and technology is represented by the liberalisation of energy market.

In fact the liberalisation has created new roles for EU citizens (as consumers but also as prosumers) that involve them directly in the energy transition becoming important change agent.

Figure 3.1 : Community Value

[28] *Van den Have and Rubalcaba,"Social Innovation Research: an emerging area of innovation studies?" 2016*

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European Commission wants to empower consumers in the energy market: the goal is to create a context in which consumers can switch supplier easily, can receive a clear, easy to understand bill, becoming more active in the energy system as a *prosumer* who is able to generate, self-consume and store or sell electricity according to the needs.

This is a growing trend in Europe which clearly contributes to the decentralisation of the energy system. In 2015, there were 4.8 million EU household prosumers and 620 000 collectives, and it can be expected that around half of EU households will be prosumers (either individually or collectively) by 2050. [29]

Acting like responsible consumer and prosumer, individuals should be able to use energy in a more conscious manner, changing their behaviour towards efficiency and flexibility. Hence these active citizens can reduce greenhouse gas emissions through social innovations that can be declined in many ways but always has a clear root linked to local social context and local community needs.

Under this paradigm, crowdfunding assumes a new and wider meaning compared to its original role linked to campaigns mainly for the not-for-profit world.

The increase in consumer awareness can direct consumers towards individual and collective investments that differ from business as usual banking-financial investments. Here the role of local retail intervenes.

The supermarket and any type of retail store experienced epiphany with the pandemic: the local store, during the lockdown, represented a safe and important place for the lives of citizens.

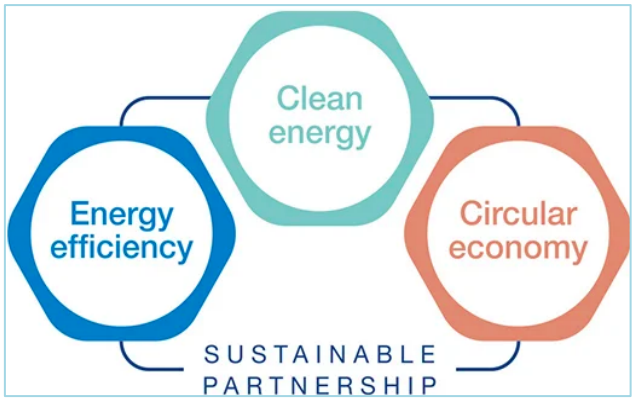

Figure 3.2 : Sustainable Partnership

Activating crowdfunding mechanisms to finance energy efficiency interventions in local supermarkets, therefore, could become just the missing cornerstone for the energy efficiency sector.

[29] *PROSEU, H2020 (H2020-LCE-2017) GA N°764056*

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The social innovation mechanism through crowdfunding is able to transform unaware consumers into conscious actors of the value of energy savings and how private investment can make a difference. At the same time, technology benefits because the number of energy efficiency interventions could be high and widespread.

Finally, supermarkets and any retail store that decides to use crowdfunding to finance its EE interventions, become **"supermarkets 2.0",** real agents of change both in favor of a strong decarbonization and to increase its link with the local community.

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3.4 Sustainable Development Goals (SDGs): much more than a graphic tool

Figure 3.3: United Nations SGDs

The 2030 Agenda for Sustainable Development adopted by all United Nations Member States in 2015, provides a shared blueprint to boost peace and prosperity for people and the planet.
The core is represented by 17 Sustainable Development Goals (SDGs), which are an urgent call for action by all countries - developed and developing - in a global partnership.

They recognize that ending poverty and other deprivations must go hand-in-hand with strategies that improve health and education, reduce inequality, and spur economic growth – all while tackling climate change and working to preserve our oceans and forests.

SDGs can be considered as an interesting matrix, an opportunity to be seized by several economic sectors, including the retail/supermarkets sector.

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In fact, the SDGs can inspire new corporate sustainability goals - starting from the drafting of an annual Sustainability Report but above all a dedicated action plan, with the possibility to anticipate future trends and scenarios.
The SDGs era recognizes that companies have a key and decisive role in sustainable development. All companies, whatever their size, sector or geographical location, are required to take a proactive approach to sustainable development over the next 15 years, through the development of new responsible business models, investment, innovation, technological enhancement and partnership action.

According to Lise Kingo, Executive Director, UN Global Compact, there are three key elements for an effective implementation of the SDGs.

1. The first is leadership: innovating business models by integrating sustainability into core activities requires a strong commitment from top management.
2. Second, collaboration with stakeholders plays a central role: companies must co-invest in innovative projects, so that joint efforts pool resources, share risks and strive for scalable solutions.
3. The third key element is transparency, which is crucial in building trust and strengthening stakeholder relationships.

Figure 3.4: Circular economy

If we take a look at the SDGs we see that the retail/supermarket world could work effectively on more than one point such as **SDGs 7-8-9-11** .

Supermarkets, by embracing the SDGs and implementing an action plan, can take energy efficiency measures on their buildings not only to reduce costs, but to achieve, with real and concrete actions, the **SDG n. 7 (Affordable and Clean Energy)**, with the involvement of stakeholders and local communities (**SDG n. 9 - Industry innovation and Infrastructure - and n. 11 - Sustainable cities and communities**) and at the same time increasing the comfort for their workers (**SDG n. 8: Decent work and economic growth**).

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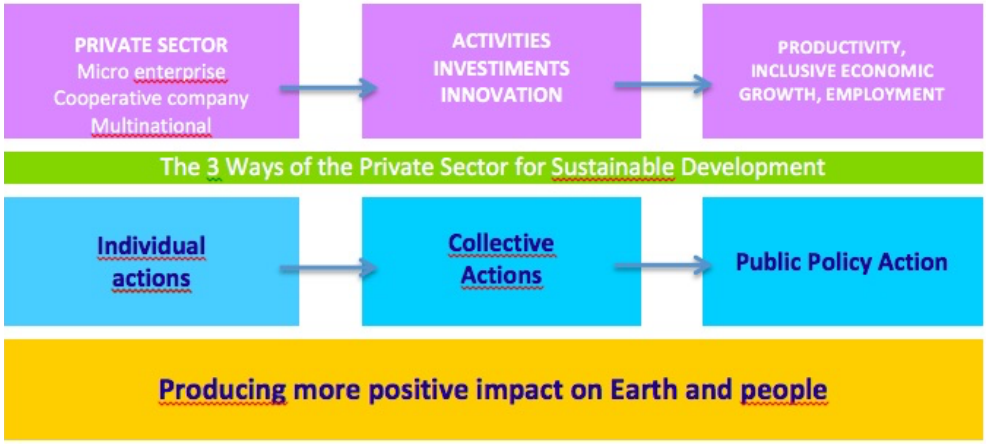
In particular **SDG n. 9** is related to **innovation**: in this case through a bottom-up process the supermarket activating actions of involvement of customers and local communities through - for example - crowdfunding actions to finance its energy efficiency measures, can achieve multiple results: involvement of local communities, stakeholders and employees themselves, energy savings, recognized active role in the fight against climate change, innovation of both process (crowdfunding) and technology in implementing efficient and effective energy saving measures.

Table 3.4: Private Sector towards Sustainable Development[30]



Bearing in mind that citizen participation is absolutely essential to increase acceptance towards the development of renewable energy projects[31], SDGs can represent the framework within which supermarkets activate virtuous processes of involvement of local communities and stakeholders showing a first-person commitment through concrete and meaningful actions such as making supermarkets more efficient, with greater comfort, communicating the results and the process that led to them, calling customers to action.

[30] Global Compact Network "Business and SDGs" (www.globalcompactnetwork.org)
[31] CrowdFundRes, H2020, GA n. 646435

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4. Super-Heero roadmap to achieve EU's objectives

4.1 Super-Heero Elevator Pitch: the winning arrow for capacity building and implementation

We know that energy efficiency technology is now mature in Europe. We also know that in order to implement energy efficiency measures to cut CO_2, save money, and increase the comfort of supermarkets for employees and customers, supermarkets need investments and that these can be easily made available by large chains, much less so for small supermarket chains and franchise owners.

In general, as pointed out by Deliverable D1.1,[32] there is a difficulty in communicating energy efficiency plans as well as possible: on the one hand, large chains leave all responsibility for energy saving plans to the technical management department. On the other hand, small chains, overburdened by daily operations, when they manage to finance an energy savings/retrofit plan, end up outsourcing it to professional firms or energy providers, losing the centrality they could have in actions of this type.

However, a change in this regard is being noticed: everything that revolves around sustainability and all the actions to implement it (energy saving etc.) are beginning to be central topics to be communicated and implemented by supermarkets and others.

This was confirmed by the organisation of the Italian workshop/webinar to introduce Super-Heero to supermarkets (held in July 2021 - remote workshops/webinars to comply with anti COVID-19 regulations): the participants were mostly from the departments dealing with supermarket credit and marketing and only to a small extent from technical and facility departments.

In fact, it was primarily the marketing departments that saw crowdfunding applied to energy saving as an interesting and powerful tool to increase customer loyalty.

[32] Super-Heero, Deliverable D1.1, p.56.

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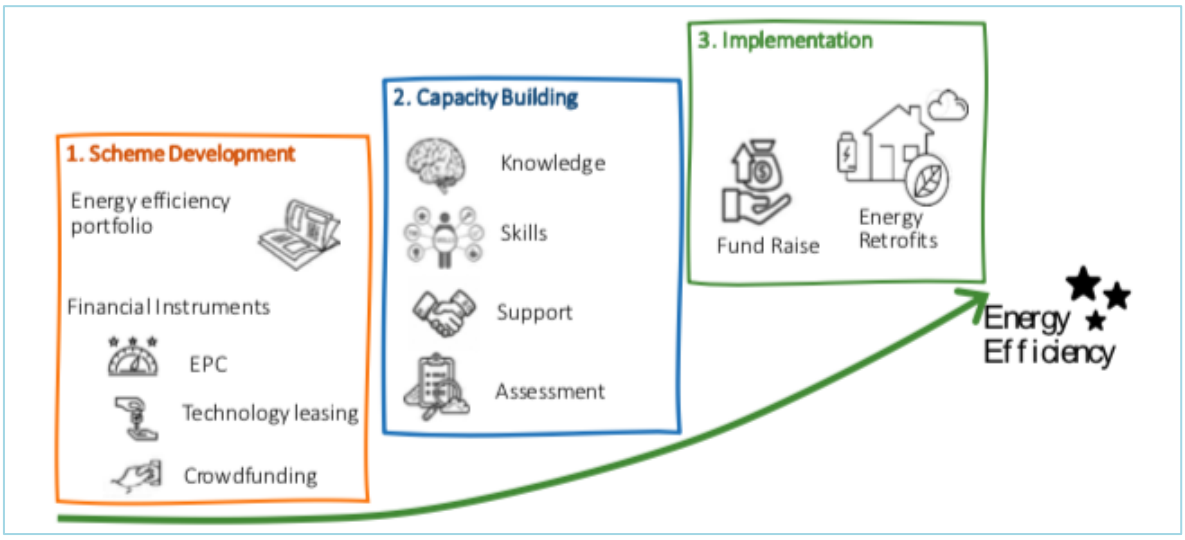
Figure 4.1: Super-Heero overall approach



The retail world is particularly varied depending on the market strategy that the supermarket chain adopts. In the case of the workshops organized by Super-Heero, the supermarkets involved are those that, although large in size, do not have centralized policies and are very tied to the territory, even allowing for a certain margin of independence to the individual supermarket, even though they may be part of the same chain, regardless of whether they are franchised or directly managed stores.

In contrast, retail chains with centralised policies have multiannual plans for energy efficiency measures managed by technical and facility departments. Everything is financed by the supermarket itself: both retrofit measures and energy upgrades on new buildings.

“Ad-hoc" communication plan, related to energy saving and sustainability, is communicated promptly: for example, the installation of a photovoltaic system that will cut electricity costs and CO_2, or the construction of a new supermarket that will be done in a way that achieves the best possible energy certification. For this type of supermarket, customer brand loyalty is achieved through a series of *"call for action"* actions concerning packaging, food waste, recycling, and collection points for spent batteries. While, with regard to energy, brand loyalty translates into communicating energy saving actions/measures and renewable energy installations in a unidirectional way to the customer.

Instead, with Super-Heero, the role of supermarkets is a dynamic one of a transformation agent: calling their customers to action, offering them the possibility to participate in change, in active

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sustainability measures, investing on the crowdfunding platform to finance energy retrofits and renewable energy installations.

The audits that took place in the supermarkets that made themselves available, confirmed what had emerged during the workshops: the technical/facility department is well aware of the energy saving technologies on the market. However, it does not see a link with customer loyalty, which is very clear to the marketing department eager for tools and ideas to engage customers and increase brand loyalty.

This led to the need to identify an elevator pitch that could stimulate and enhance the capacity building/implementation phase as well as show the holistic approach of Super-Heero, a project with the potential to:

- to combine different innovative financial instruments
- to easily and quickly activate EE/retrofit financing, bypassing traditional credit channels and their timeframes not compatible with fast-paced supermarket contexts
- to draw up in-depth feasibility studies
- and above all, to use all this as a driver for targeted marketing campaigns, engaging supermarket customers and local communities, who are called upon to play an active role, as part of the dynamic role played by supermarkets becoming new players, agents of change.

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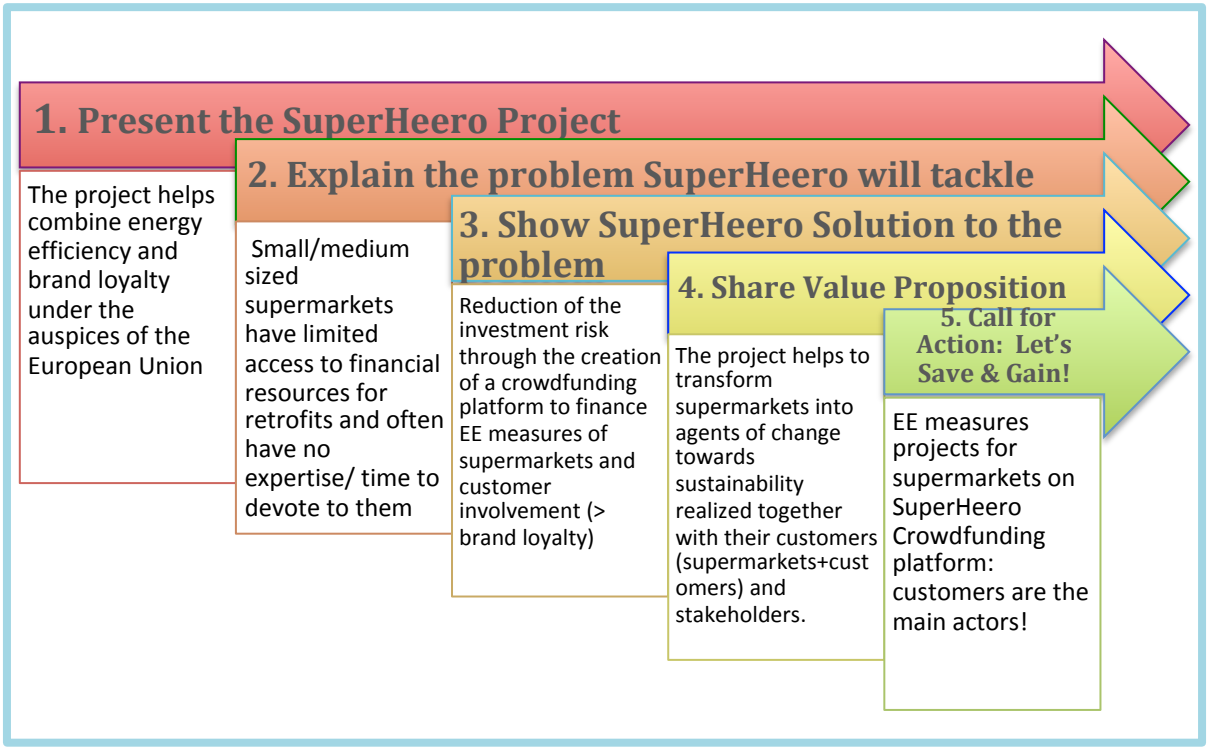
Figure 4.2: Super-Heero Elevator Pitch



The webinars/workshops have proved crucial to engage with supermarket chains and explain the Super-Heero project in detail. The communication activity (social media, newsletter etc) is an important corollary activity to keep alive the attention on the project and the activities "in progress". ***(1. Present the Super-Heero Project)***

The workshop - held remotely - focused on presenting the project and its purpose: how to overcome the problem of having limited access to credit to finance EE measures in supermarkets. The Super-Heero project aims to provide a replicable financial scheme for supermarkets based on three main tools, namely: energy performance contracts (EPCs); product-service models for technology supplier engagement; and community-based crowdfunding/cooperative initiatives that allow for reduced upfront costs, engagement of additional investment sources, and diversification of the risk associated with the model. ***(2. Explain the problem Super-Heero will tackle)***

A further added value perceived by supermarkets lies in the fact that this is an EU project, therefore ***superpartes***, which acts as a passepartout between the supermarkets: without commercial pressure to choose one technology over another, the Super-Heero project is free to explore and follow new paths to achieve the ambitious EU 2030 energy efficiency targets.

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The holistic approach of the Super-Heero project is based on 3 pillars:

1. through energy audits carried out with dedicated visits to the supermarkets: on these occasions the project partners do not prefer one technology over another but try to understand which retrofit interventions have an interesting ROI, are easy to implement and have characteristics capable of attracting the customers of the supermarket in question and any local stakeholders.
2. through a work done in concert with the supermarket chain to understand the peculiarities, the type of client and the context in which they are rooted. In this direction, a tailor-made solution is the best. The supermarket chain that manages the stores directly has different needs and targets from the chain that operates totally in franchising.
   (3. Show Super-Heero solution to the problem; 4. Share Value Proposition)
3. At this point the project partners together with the supermarkets, decide which EE measures to take and implement on pilots. The project, after undergoing technical, financial and legal analysis, is proposed on a crowdfunding platform by Super-Heero.

According to one of the risks indicated by the project (GA, 1.3.5 WT5 "Critical implementation risks and mitigation actions"), EE interventions could be too onerous and difficult to implement for supermarkets (directly managed or franchised). This risk can be overcome precisely by presenting projects to be financed through a diversification of investment funds and investors so as to reduce risk and also initial costs. Another risk manifested by some supermarkets (the fear that the retrofit project financed on a crowdfunding platform will not be understood as an opportunity the supermarket wants to share with customers) is also zeroed by overturning the static vision of the supermarket.

On the contrary, the latter, particularly with the long-lasting Covid-19 pandemic, can be transformed into a dynamic entity capable to offer its customers a place for two-way exchange. The supermarket is able to transform itself into an **agent of change/transformation**, capable of concretely conveying actions and information linked to sustainability, confirming that it is a fundamental key to Europe's decarbonization effort.

Table4.1: Super-Heero Retention & Acquisition tool

	OPPORTUNITY	EFFECTS
CUSTOMER RETENTION	Chance to invest in a ESG/SDG project offered by my trusted supermarket	▪ Clients and employees involved ▪ Increase participation and sense of membership
CUSTOMER ACQUISITION	Involvement in a ESG/SDG project offered by a supermarket new to me	▪ The supermarket gets new clients & Local community engaged

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4.2 Supermarkets 2.0 and energy communities

This role of change agent/transformation for the supermarket seems to fit perfectly with the concept of renewable energy communities, which have been present for several years now in some Northern European countries such as Denmark and Germany.

As we saw in chapter 2, the Clean Energy for All European Package first introduced the concept of **"renewable energy communities"** which then took shape in the Directive on Common rules for the internal electricity market (2019/944/EU) and the Renewable Energy Directive (2018/2001/EU) which created the framework where member states then intervened with specific laws.

In **Italy**, for example, energy communities were born with the **Decreto Milleproroghe 162/2019**. The term "energy community" refers to an association of citizens, businesses, local authorities, companies and chain shops that decide to equip themselves with a shared plant, with a total power of less than 200 kW, for the self-production of energy for immediate consumption or to store it in storage systems (and use it when necessary).

The new law also gives legal dignity to energy communities, defining the rights of individual participants, who will continue to be free to choose their electricity supplier and will be able to appoint a delegate, even from an external company, to manage flows with the Gestore dei Servizi Energetici (GSE). For energy communities, there is a tariff benefit for 20 years managed by the GSE with a unit fee and a premium tariff, the latter amounting to 110 euros/MWh.

Spain has also done so: with **Royal Decree-Law 23/2020**, which approves measures in the field of energy and other sectors for economic growth, the concept of Renewable Energy Communities is introduced as "legal entities" based on open and voluntary participation, autonomous and effectively controlled by partners or members located in the vicinity of renewable energy installations owned and developed by these legal entities, whose partners or members are natural persons, SMEs or local authorities, including municipalities, and whose primary purpose is to provide environmental, economic or social benefits to their partners or members or to the local areas in which they operate, rather than financial gain. These communities can rely on installations of any energy carrier, as long as it is from a renewable source.[33]

Energy communities therefore have many positive impacts on the people, entities and communities involved:

[33] https://www.idae.es/ayudas-y-financiacion/comunidades-energeticas

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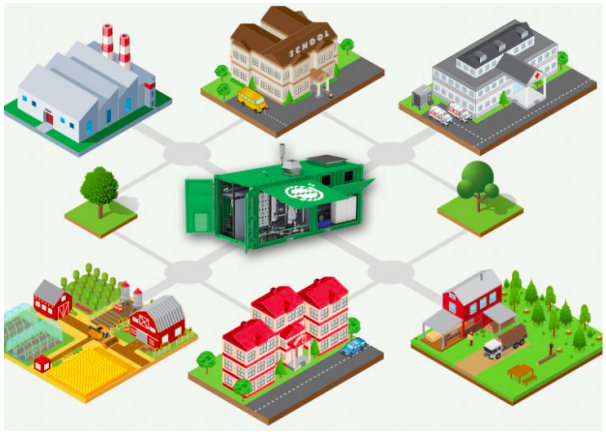
- They provide users with fair and easy access to energy from renewable sources produced locally;
- Users will be able to control their energy needs and have greater responsibility for self-generation;
- Communities are offered the opportunity to create an income that is generated and remains in the community, increasing the propensity for local renewable energy development;
- They produce environmental benefits, by avoiding on the one hand producing energy from fossil fuels, and on the other hand dissipating energy in grid losses;
- They produce social benefits, thanks to the sharing of economic advantages and financial profits with the energy community and environmental benefits - with the reduction of pollutants and climate-changing agents - for the whole area in which it is located.
- Investment opportunities are created for local citizens and businesses.

Figure 4.3: Energy Community



The supermarket that decides, for example, to install a photovoltaic system on its roof and to share unused energy on weekends or evenings with nearby buildings, through the creation of an energy community, truly becomes an agent of change, a **"supermarket 2.0"** around which a group of conscious consumers is formed.

The successful and virtuous circular model that is created allows the supermarket to be at the centre and "call to action" its customers through, for example, a crowdfunding project to install the photovoltaic system.

Around this fulcrum, new users, private houses, condominiums, other SMEs that decide to participate in the process of creating their own energy - from a renewable source - can grow, share it, obtain economic and environmental benefits and at the same time produce a cultural change, through greater awareness of the environmental and energy targets set by the European Union. In this sense, the Super-Heero project, involving supermarkets in its pilot cases, potentially has what it takes to be a great promoter of development through the adoption and implementation of energy communities which, according to estimates by the Politecnico di Milano, may experience exponential development in the coming years.[34]

[34] https://www.enelx.com/it/it/storie/2020/05/comunita-energetiche-cosa-sono

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4.3 Implementation: Let's Save and Gain!

Figure 4.4: Super-Heero Crowdfunding mechanism

As we can see from the diagram above, the project in its implementation phase of innovative financial instruments starts with the development, on a crowdfunding platform by Super-Heero , of 4 pilot projects (two in Spain and two in Italy).

The projects are tailored to the specific characteristics of each supermarket, after carrying out energy audits. This means for each pilot project:

a) EE/retrofit measures undergo technical-financial analysis to assess the payback time of the investment which, during 2022, could be significantly reduced in the face of generalized increases in electricity (+55%) and gas (+41%), in Italy[35], and in Spain as well, with similar percentages.

b) To reduce financial risk, the project can be financed in different percentages and by multiple parties. For example, in the case of a franchised chain of supermarkets, the parent company can finance the energy efficiency measures at 40% by asking the franchise owner to take on 30% and the remaining 30% is financed through crowdfunding. The percentage varies in the case of supermarkets managed directly

[35] www.arera.it/it/com_stampa/21/211230cs.htm#

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by the owner. In this case it can be as high as 70% financed directly by the supermarket and the remaining 30% raised through crowdfunding.

c) The retrofit/energy efficiency projects, depending on the best combination that emerges from the technical and financial evaluations, are then placed on the Super-Heero crowdfunding platform ready for the start of financial collection: they can then be implemented by ESCOs or through technology leasing or pay-per-use.

d) An important phase is the evaluation of the target audience of supermarkets: the latter will be able to decide whether to offer their customers a higher interest rate (linked to the loyalty card) or discount vouchers to use for shopping.

Marketing and communication campaign are crucial: they will accompany the launch of the pilots on the crowdfunding platform for the entire duration of the funding phase (60-90 days) and also during the implementation phase of the retrofit measures. The project partners will work to support the crowdfunding campaign with all available tools (social networks, press releases etc.), working in concert with the marketing/communication departments of the supermarkets and constantly monitoring the platform.

Once the financial round has been completed, we will move on to the implementation of the EE measures, which will also be supported by information/marketing campaigns, accompanying the progress of the work and its completion.

The fulcrum of the communication and marketing campaigns is the claim ***"Let's Save and Gain!"*** which indicates the new active role as an **agent of change** that the supermarket can take on within its local community.

In addition, the pilots, through the savings obtained and the CO_2 cut, can be part of a broader plan that also includes the assumption of the SDGs (in particular SDGs n. 7-8-9-11-13) as a guiding star for supermarkets, which will have essential material to draw up their annual Sustainability Reports: these are real strategic milestones for the retail world that wants to take an active and responsive role towards Sustainability at this point consistently communicated and applied in the real world.

Figure 4.5: SDGs& Sustainability Reporting

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The monitoring of EE measures' implementation should be considered another strategic and essential step both for the success of crowdfunding itself (through the payment of interest to customers who have subscribed to the offer to finance the pilots) and as a launch and continuation towards other supermarkets and other sectors interested in using new and innovative financial instruments as well as involving customers and stakeholders.

4.4 What's next? A concrete future scenario

Figure 4.6: Super-Heero and its replicability timeline

The success of retrofit and energy efficiency interventions on pilots can pave the way for replicability on supermarkets of the same chain or of other chains, including those that have centralized EE interventions, as described above: in fact, we believe that ***"Let's Save and Gain"***, which indicates the role of supermarkets as agents of change, is a very attractive concept for the retail world always looking for new marketing ideas that can support and increase customers and profitability margins.

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Moreover, during 2022 wholesale energy prices are set to rise dangerously, making any energy efficiency/retrofit plan supermarkets have on their agenda, particularly attractive and no longer postponable.[36]

Replicability on the supermarkets of the same chain is the way that can be immediately practicable also to optimize the upfront cost and to increase teamwork and customer engagement, thanks to the good practices that we expect to derive from crowdfunded pilots.
In this regard we give some data of the supermarkets participating with their pilots:

- Despar in Italy has about 1300 stores
- NaturaSì in Italy has about 300 stores
- Dia in Spain has about 3900 stores
- Coviran in Spain has about 2430 stores.

Figure 4.7: The Supermarkets brands in Italy and Spain

The supermarkets described above have different characteristics: they go from discount supermarket to organic supermarket.
As you can see, **scalability and replicability** are within the reach of the Super-Heero project.

The results dissemination phase is crucial and just as important as implementation:

- On the one hand, we want to involve retail trade associations that can see in the success of crowdfunding a way to revitalize supermarkets *per se*, and local supermarkets in areas where economic revitalization is needed. The same associations, for example, organize in Italy the International **agri-food fair CIBUS** in Parma, headquarters of the European Food Safety Authority (EFSA).

[36] https://think.ing.com/articles/three-scenarios-for-european-power-prices

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- On the other hand, workshops will be organized to disseminate the results of Super-Heero to which all the retail world will be invited to participate, as well as other energy-consuming sectors that have a strong membership characterizing them: shopping centers, gyms, swimming pools, sports centers, and all sectors receptive to social innovation and sustainability engagement.

Figure 4.8: Replicability to other high-energy consuming sectors

In addition, the Super-Heero project can also be used as a best practice by technology providers, ESCOs and other operators in the retrofit sector, as an example of an alternative financial instrument to be offered to their customers, compared to the traditional banking channel. Again, participation in trade fairs and conferences will be supported with Super-Heero materials.

The dissemination of the results of the pilots will be focusing on a dual qualitative and quantitative track:

a) **Qualitative** on the type of target reached with the involvement of supermarket customers;
b) **Quantitative** in terms of kWh saved and CO_2 cut, for the achievement of the targets of the EU Energy Efficiency Directive.

The Super-Heero project has all the credentials to become a Best Practice not only for the retail sector but also for other energy intensive sectors.

Dissemination of the results obtained, such as:

- CO2 and kWh saved

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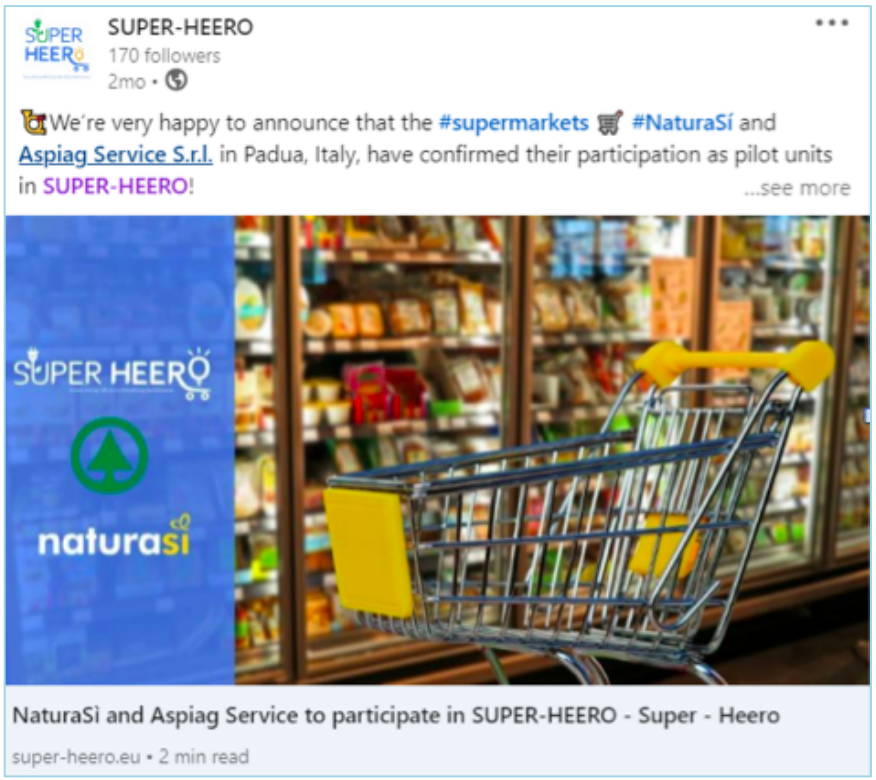
- Engineering of the crowdfunding/pilots package
- Marketing/communication campaign
- Adoption of the SDGs as a structural corollary of the new sustainable supermarket line
- Sustainability report
- Risks and issues emerged and successfully resolved

will be the best guarantee to activate the multiplier lever able to replicate the Super-Heero project and spread, at the same time, the concept of **social innovation** where supermarkets, as SMEs, represent one of the cornerstones to achieve the European 2030 and 2050 targets.

Figure 4.9: Super-Heero communication of results: Twitter use



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Conclusions

Super-Heero is in front of a great opportunity: taking advantage of a more mature and well known EE technology, the project can accelerate the adoption of innovative financial tools through a leading role assumed by supermarkets as **agents of transformations**.
Client engagement, a "call for action", has the potential to boost the plans to do EE actions/measures on supermarkets making them more comfortable places, much less energy intensive, and active laboratories for sustainability.
This process that mixes technology, financial elements and social innovation can also be replicated in other energy-intensive sectors where there is a strong group of membership features.

Any energy efficiency target at the European level cannot disregard a bottom-up approach: technology alone is not enough to solve the major challenges that sustainable development presents us with. The proof lies in the fact that new opportunities are rising everywhere and outside the traditional channels, such as crowdfunding platforms compared to traditional banking financial channels.

It is up to innovative projects such as Super-Heero to show new versatile approaches, proposing tailor-made solutions each time, remembering that the Sustainability compass passes through the union of economic and social aspects, without which any initiative runs the risk of running aground.

SUPER-HEERO...
LET'S SAVE & GAIN !

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