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# Opportunities and challenges of energy performance contracting in the Italian market for energy efficiency services.

Silvano Mazzantini<sup>1</sup>, Annamaria Di Legge<sup>2</sup>, Marco Mastracci<sup>3</sup>, Patrick Maurelli<sup>4</sup>, Flavio Rosa<sup>5</sup>

<sup>1,2,3</sup> MPMLEGAL s.t.a.p.a., Law Firm, Via Monte Santo 10/A, Rome, Italy

<sup>4</sup> FEDERESCO, Italian ESCO Association, Via Mario Pagano 41, 20145 Milano, Italy

<sup>5</sup> CITERA, Sapienza University of Rome, Via A. Gramsci 53, 00196, Rome, Italy

Flavio Rosa: [flavio.rosa@uniroma1.it](mailto:flavio.rosa@uniroma1.it)

**Abstract.** The improvement of energy efficiency entails important benefits both for the individual user, owner of the infrastructure, and for the community in general. In fact, Energy Efficiency is a strategic priority of the European Union. However, the great potential deriving from energy efficiency is currently untapped. The reason for this gap is essentially due to the reluctance of customers to commit financial resources for these projects. The EPC scheme allows to overcome this reluctance, offering the customer a wide range of services that exempt him from most of the risks and responsibilities associated with the implementation of the energy efficiency project. Nevertheless, a series of financial barriers hinder the application of EPCs, effectively limiting the use of a sophisticated contractual instrument, which could contribute to the development of the energy efficiency services market. This report examines the opportunity to encourage greater use of EPCs in Italy, using refinancing instruments.

## 1. Introduction.

Energy efficiency (EE) is broadly defined as the ratio of the amount of energy output to a given energy input [1] In this perspective, a higher level of EE allows to provide -at least- the same output services, while consuming less energy [2] It follows that one of the immediate consequences of an improvement in energy performance is cost savings on energy bills [3–5].

The opportunities related to energy efficiency are not limited to the mere - albeit relevant - economic side. The achievement of a substantial improvement of energy efficiency levels across Europe [6,7] is considered as a strategic priority by European Institutions, as it would allow Member States to reduce energy imports [8] and, at the same time, contribute to improving the well-being of people, the competitiveness of industries and the general functioning of society [9]. In this regard, it is worth highlighting that EE is often considered not only as a criterion for measuring energy savings, but as a resource [10]. It is therefore not surprising that over the past three decades, the EU has adopted various policies aimed at raising awareness of energy efficiency, as well as multiple measures in order to incentivize an improvement in energy performance in the various areas of interest, and this with particular reference to the buildings sector [11], to which a significant portion of energy consumption is considered to be attributable [12].

Despite the considerable advantages mentioned above, and the level of priority gained by Energy Efficiency in the political and strategic agenda of the Union [13], it is noted that throughout the European territory the great potential deriving from energy efficiency is currently untapped. This gap between the state of the art of energy efficiency and its potentials (steadily expanding due to technological innovation) can arise from numerous factors, including lack of trust in savings forecast, high cost for project preparation and procurement, split incentives, lacking awareness for non-core activities such as energy efficiency, perceived low energy prices [14] as well as confusion with renewables potential [15].

According to a recent survey [QUALITEE, 2019] [16], the most significant obstacles to the EPC business include: *complexity of the concept / lack of information* (identified by 55% of the respondents), followed by *lack of trust in the ESCO industry* and *administrative barriers in public sector* (both identified by 42% of the respondents) [17]. In some countries, the *administrative barriers*



are perceived to be more significant by a higher share of respondents (Greece – 80%, Portugal – 71%, Czech Republic – 67%) [14,18]. The results indicate a potential improvement in perceived ESCO industry trust over time as respondents citing *lack of trust* as a main barrier has reduced from over 50% in 2015 & 2017 to 42% in 2019 [19,20].

These barriers, declined from the point of view of the customer - i.e., the beneficiary of the energy efficiency measure - can be overcome through the application of Energy Performance Contracts (EPC), i.e., contractual schemes by means of which the companies that offer Energy Efficiency Services (frequently called ESCO) offer the client a package of services including pre-financing the investment, while also ensuring the achievement of a predetermined result in terms of savings [21–24]. Through the EPC model, the energy efficiency service provider designs, pre-finances and implements energy performance improvement solutions [25,26], undertaking the technical risk of actually achieving energy savings [27]. The characteristic feature of this contractual scheme is, in fact, that the remuneration of the ESCO consists of an annual fee, the amount of which depends on the level of savings achieved [28].

The Energy Performance Contract could thus represent an instrument capable of giving new momentum to the energy efficiency services market, significantly accelerating the process towards achieving the targets set at national and European level [29].

However, the idea of a large-scale implementation of this mechanism [30] encounters, in practice, a series of financing barriers as well as issues in selecting ancillary technologies such as storage [31].

As mentioned, ESCOs normally pre-finance energy efficiency projects, which will be repaid over time by the customer. This pre-financing, which normally takes place through the involvement of a financial institution, not only appears in the company's balance sheets, but could limit the possibility for the ESCO to rely on financial resources for any subsequent energy efficiency projects.

In order for the EPC to represent the key tool for the expansion of the energy efficiency services market [32], it is necessary to develop refinancing schemes, i.e., tools capable of injecting new liquidity to ESCOs, making them able to implement a wide range of projects [23,33,34] up to refurbishment [35].

This report, based on the preliminary results of the REFINE project, intends to investigate the financial barriers to the implementation of the EPC model in Italy in order to formulate solutions aimed at promoting greater development of the energy efficiency services market.

## **2. Energy Performance Contracts as a flexible tool for maximizing energy efficiency.**

An Energy Performance Contract is an agreement under which an energy efficiency service provider (normally an ESCO) undertakes to carry out - with its own financial means or with the financial means of third parties - a series of measures (e.g. construction works, provision of equipment) designed to improve energy efficiency through reducing the energy consumption of existing infrastructure owned by another subject, the customer, who will correspond a remuneration the amount of which is contractually defined and correlated to the amount of energy savings.

An EPC involves a capital investment in assets which may be in removable assets (e.g. boilers) and / or non-movable assets (e.g. insulation), which reduce energy consumption. In addition, an EPC may also include capital investments in ancillary equipment and goods that facilitate the provision of services provided under the EPC and / or assets that produce energy.

The value of EPCs in unlocking energy savings is highlighted in the Energy Efficiency Directive (2012/27/EU), which defines such contractual scheme as *a contractual arrangement between the beneficiary and the provider of an energy efficiency improvement measure, verified and monitored during the whole term of the contract, where investments (work, supply or service) in that measure are paid for in relation to a contractually agreed level of energy efficiency improvement or other agreed energy performance criterion, such as financial savings* [36].

Performance is therefore the key concept around which the EPC scheme revolves, representing both the purpose of the contract and the amount of its economic consideration. On this point, it seems appropriate to mention that, in order to precisely calculate the actual savings achieved in terms of energy consumption, performance and energy savings are usually evaluated in the light of standard models, such as the IPMVP protocol and ISO 50015 [37–39].

The contents of the provisions that form the EPC are largely left to the free will of the parties. However, in the Italian legal system, certain minimum requirements are set by Legislative Decree 102/2014 (at Annex n.8). By virtue of this rule, an Energy Performance Contract governed by Italian law must necessarily include: (i) a clear and transparent list of the efficiency measures to be applied or

the results to be achieved in terms of efficiency; (ii) the guaranteed savings to be achieved by applying the measures provided for in the contract; (iii) the duration and the fundamental aspects of the contract, the terms and conditions envisaged; (iv) a clear and transparent list of the obligations incumbent on each contractual party; (v) the reference date or dates for determining the savings made; (vi) a clear and transparent list of the stages of implementation of a measure or package of measures and, where relevant, the related costs; (vii) the obligation to fully implement the measures provided for in the contract and the documentation of all changes made during the project; (viii) provisions governing the inclusion of equivalent requirements in any concessions under contract to third parties; (ix) a clear and transparent indication of the financial implications of the project and the shareholding of the two parties in the pecuniary savings made (for example, remuneration of service providers); (x) clear and transparent provisions for quantifying and verifying the guaranteed savings achieved, quality controls and guarantees; (xi) provisions that clarify the procedure for managing changes to the framework conditions that affect the content and results of the contract (by way of example: changes in energy prices, intensity of use of an infrastructure); and (xii) detailed information on the obligations of each of the Contracting Parties and on the penalties for non-compliance.

The parties to the EPC contract are essentially the Energy Efficiency Service Provider (ESCO) and the customer / beneficiary; however, it is possible that these two parties may also need to be joined by a financial institution participating in the transaction if the contractual scheme provides for it.

Not being strictly regulated by the laws, which - as mentioned above - outlines only the essential aspects of the discipline, the energy performance contract is presented as a flexible scheme, capable of regulating various cases.

In fact, EPCs can be classified into four main categories: (a) *"first out"*: the implementation of the project is financed by the ESCO, whose remuneration is paid by the customer / beneficiary using the entire savings achieved; (b) *"first in"*: in this case, the ESCO guarantees the customer the achievement of a certain savings target (which is calculated on the historical energy expenditure sustained in the years prior to the implementation of the EE measures), and withholds any further economic savings by way of remuneration; (c) *"shared savings"*: the ESCO finances the measures in part or in full, and shares the savings obtained as a result of the efficiency gains with the customer; and (d) *"guaranteed saving"*: the implementation of the project is financed by the customer, while the ESCO intervenes in the implementation and management phase of the project, guaranteeing a minimum of energy savings and assuming responsibility for the lack of savings.

Through EPCs, ESCOs are able to offer a set of services that, overall, relieve the customer from a series of risks and responsibilities, including the management of the infrastructures and the search for financing, as well as from a series of related technical risks to the actual achievement of the result.

In this sense, the EPC qualifies as a decisive tool for maximizing energy efficiency as a real starting point for later renewable integration [40] together with its dedicated modelling [41] for each specific application [42].

On this point, it is worth noting that most forms of EPC (ie, all the categories mentioned above excluding the "guaranteed savings" formula) do not involve any initial capital investment by the customer. This aspect is of fundamental importance for the purposes of this report, indicating, on the one hand, that the EPC scheme is revealed as responding to the customer's needs, and, on the other, that the ESCOs often play an active role in identifying the financial institution (FI) that will be involved in case of third-party financing, with all the consequences that will be better examined in the next paragraph.

### **3. Refinancing schemes as tools to foster the expansion of the EES market.**

#### *3.1. Overview*

From the point of view of the structure of the legal transaction in the EPC, one must identify, in addition to the strictly technical ones, purely legal contents, other economic and technical ones. It is evident from what has been mentioned that, within this composite structure of the EPC, the financial component is extremely relevant.

Therefore, if, on the one hand, this type of contract, in order to provide ample protection for the customer of the EE measure, succeeds in giving space in the legal reality to the structure of demand side management, it generates, on the other hand, an increasing need for financial exposure of the ESCO. This brings out several critical issues in the structure, not only financial, of EPC-based operations. Although the focus of this report is on the financial aspects and to these, therefore, the

analysis is limited, a specification on the structural relationship involved in the various components of an EPC is necessary. The structure of the EPC, in fact, generates critical issues both of a financial nature (e.g. because the EPC represents a more onerous form of financing than others and because it financially exposes the ESCO) and of a legal-administrative nature (e.g. access to the various incentive schemes and management of the various authorization processes). This lack of homogeneity of conditioning factors has the effect of creating a close interdependence between the strictly legal-administrative and the purely economic-financial components. This interdependence leads elements that must be ascribed to the legal-administrative components to take on the role of causes of the economic-financial components, generating a cross-border relationship between these components.

In this perspective, for example, it is sufficient to think of the impact on the economic-financial equilibrium that the withdrawal of incentives (which several times has been ordered without any legal substratum) can have, generating an evident 'system uncertainty', on the economic-financial structure of the operation and on its subsequent refinancing possibilities. Therefore, refinancing instruments must take adequate account of this evidence, otherwise they will be unable to generate effective financial resilience of these instruments and operations.

In order to incentivize the customer's interest in the implementation of the energy efficiency measure, it is not uncommon for the ESCOs to take care of the aspects related to the financing of the project (so-called third-party financing) so that the client can take advantage of the multiple benefits of an EE investment without burdening their own accessibility and / or credit limits.

In this case, the ESCO pre-finances the investment, and the beneficiary / customer will repay the ESCO over time, with periodic payments of a predetermined amount taking into account the energy savings produced. It is clear that the provision of these services relating to the financing of the measure are outside the core business of the EES providers.

Such strategic choice, which not infrequently proves necessary to be able to operate effectively in the market, however, exposes the ESCOs to a series of risks and limitations, which are particularly relevant if we consider that most of the European ESCOs reflect the dimensional parameters of the SMEs. First of all, there is a limitation directly linked to the financial capacity of the company: in order to offer the third-party financing service, in fact, the ESCOs must obtain the financing, and consequently, respect their credit limits. It follows that the financial capacity of the company is a determining factor in identifying the quantity, quality and size of the projects that the ESCO is able to finance without overloading its credit limits. Another important limitation is that EES providers are not well prepared to bear the risk of their customers' default, which could significantly increase the risk associated with the initial investment.

The REFINE project aims to analyze, through interdisciplinary working groups and the analysis of pilot projects, the barriers that have the effect of limiting the implementation of EE projects in Italy, in order to identify solutions capable of boosting the market for Energy Efficiency Services (EES).

### 3.2. *Methods*

The REFINE project carries out an assessment of the Energy Efficiency Services market with a focus on the use of refinancing schemes throughout Europe and in particular in Italy. After having investigated the level of diffusion of the refinancing schemes of energy efficiency projects and analyzed the reasons that support such a level of diffusion, the project experts assess a number of case studies on the existing refinancing schemes, which have been applied in Italy - both in the public and private sectors - with different approaches.

Net of the analysis conducted on the refinancability of EES projects, and different approaches to refinancing, the REFINE project isolates the main distinguishing features of refinancing schemes, and then proceeds to examine them individually. In particular, the specific aspects linked to both the credit risk and performance risk are also examined for each refinancing option.

Having examined the elements mentioned above, the REFINE project proceeds to identify the "logical combinations" of these characteristics, obtaining "generic" refinancing schemes, capable of being particularly successful in a specific field of application.

### 3.3. *Results*

From the assessments carried out during the project, it emerges preliminarily that it is not possible to theorize a universal approach, which claims to be equally suitable for all types of clients, intervention, and circumstance; rather, there is a range of refinancing schemes with specific characteristics that reflect the needs of the application fields. With this in mind, it is possible to evaluate, through a series

of indices, the refinancing of a project, to know the levels of risk connected to it and to identify the most suitable measures to facilitate its implementation, with a view to contributing to the full development of the energy efficiency services.

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