SECOND EDITION

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GUIDE TO FINANCING FOR SUSTAINABLE ENERGY PROJECTS

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SPANISH SUSTAINABLE ENERGY FINANCING PLATFORM

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Collaborators: *Ignacio Contreras (Sevilla University)* • *Daniel Cerveró Marina (SI Capital Private Equity S.A, S.G.E.I.C.* • *Enrique Barrasa (KIPLAI)* • *Antonio Sáez Pérez (Enair Energy S.L.)* • *Xavier Arola (Associate consultant at Tracis)* • *Jordi Pascual (AIGUASOL)* • *Eldu Corporate*

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anese

The need to promote a more sustainable energy model is compelling increasingly more people, companies and public authority organisations to consider the validity of sustainable energy projects. Meanwhile, this growing market is beginning to promote the use of several traditional financing alternatives and instruments for energy efficiency or renewable energy production projects, as well as the development of new financial instruments that are adapted to the needs of such projects.

One initiative of the ENERINVEST project, is asking developers and investors about the limitations of sustainable energy projects, and one of the most common responses we receive is that the two sectors "do not speak the same language". It would appear, therefore, that the energy sector needs to be able to understand the different types of financing available, as well as what they involve, while the financial sector needs to understand those technical characteristics involved in sustainable energy projects.

ENERINVEST aims to become the national reference platform in Spain with respect to the financing of sustainable energy projects, a platform for meeting and dialogue between the sector's main stakeholders, one that provides technical, legal and financial solutions to projects promoted both from the public and the private sectors. As such, this guide seeks to provide an overview of those aspects that need to be taken into account when funding sustainable energy projects, from the standpoint of promoters (whether public or private) and investors alike.

The regulation in this area is continuously changing, the same way as new alternatives and financing instruments for sustainable energy projects are emerging. For this reason, this guide has to be read keeping in mind its date of publication, a period of time when new tools are rapidly growing and the applicable regulations are evolving.

1 Basic Steps in the Implementation of Sustainable Energy Projects

1. Carry out an energy study beforehand

The opportunities for implementing a sustainable energy project can be identified on the basis of an energy-based diagnosis of a facility.

This phase ensures that an analysis is undertaken of the technical, economic and regulatory viability of the project.

2. Define the proposal for the action

The proposal must contain both a section dedicated to technical development (scope of action, the technology to be used, envisaged energy savings, etc.) and a financial study (investment volume, interest rate, period of return on investment, etc.).

This phase must take into account the acquirement of permits, licences and those relevant administrative authorisations.

3. Determine financing origin

This may be:

a. **Internal.** The project is totally self-financed with funds from the project-developer.

b. **External.** In this case, a decision needs to be made with respect to the types of financing available on the financial market, or those public grants available.

c. **Mixed.** A combination of self-funding and external funds is possible.

4. Decide on the type of contract

When financing is available for the sustainable energy project, one essential step is that of analysing and selecting the best type of contract with the Energy Service Company (ESCO) or the engineering company that best suits the project requirements.

In the case of public sector projects, specifications for the relevant technical and administrative conditions need to be prepared. This step will be dependent on the project type and the final funding model.

5. Select the best developer

Study which type of company best suits each individual sustainable energy project being promoted: ESCO, engineering company, installation company, etc.

This process involved is more complex in the public sector, as all projects must be put out to tender and this involves a public adjudication process.

6. Project launch

This phase involves the following processes:

- The implementation of improvements (final design)
- Construction (civil engineering) or the final installation, ready for testing
- The certification of plant completion or of its modification
- The commissioning and start-up of the installation

7. Operation and maintenance

This phase includes the tasks of continual improvement needed to ensure that the installation is totally guaranteed during the project duration.

8. Controlling measurements and verifying energy savings in sustainable energy projects

In addition to the monitoring of the correct undertaking of the conditions established in the contract, this stage should also consider the measurement and verification (M&V) of energy savings (in accordance with the EVO procedure: ***Efficiency Valuation Organization;*** one of the most frequently used protocols), through which consumption is monitored and those energy savings achieved are evaluated.

2 Seeking funding for a sustainable energy project

How to finance your project

This is one of the main questions project developer asks when evaluating the possibility of opting for energy efficiency improvements or the implementation of renewable production in their facilities, either by individuals or companies that want to optimize the energy consumed and be more competitive, or by public authorities.

Sustainable energy projects provide multiple benefits at both collective and individual levels (energy savings, environmental protection, reduced inefficiency, the possibility of creating a new and sustainable business, among others), however the initial investment required may sometimes prevent a project from becoming a reality. There is little information currently on hand regarding those forms of funding available that enable assessment to be made on how best to finance a project.

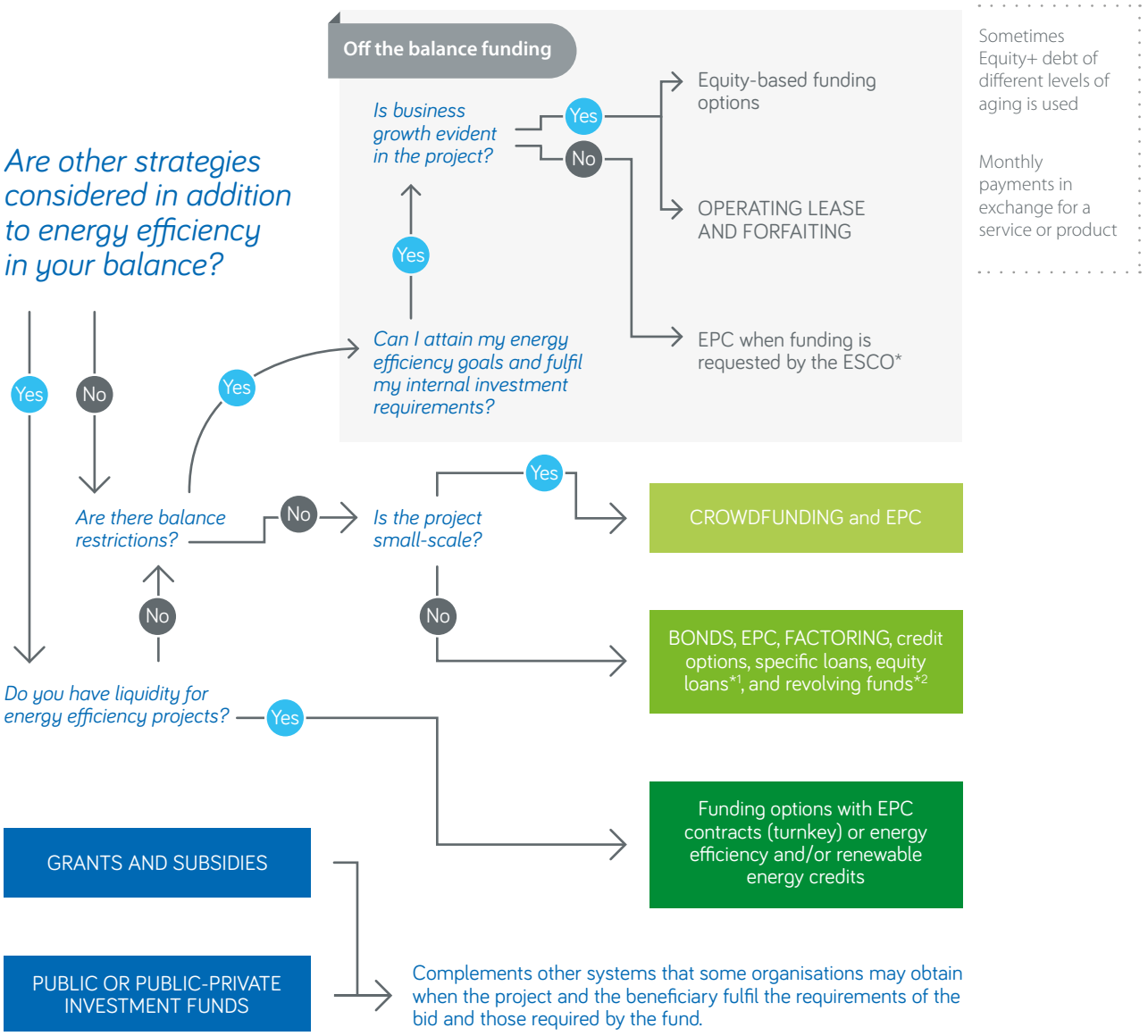
In order to provide an overall view of existing possibilities and to assist in decision-making with respect to financing sustainable energy projects, the main external financing options that may be used for sustainable energy projects have been detailed below.

2.1. Defining the most appropriate Funding Source for the Project:

The flow diagram below seeks to help project developers take decisions with respect to their project financing options. Four main parameters have been taken into consideration:

- The liquid assets available to the developer or the beneficiaries of the final project
- Developer or client size (in terms of economy and balance)
- Beneficiary leveraging capacity
- Project size
- Business growth in terms of the project

Selection Process for Financial Options



Sometimes Equity+ debt of different levels of aging is used

Monthly payments in exchange for a service or product

(*) 'EPC' – is used in general terms.

'EPC when funding is requested by the client' and the financial risk is the responsibility of the beneficiary – Shared Savings Model.

'EPC when funding is requested by the ESCO' and the financial risk is the responsibility of the ESCO – Guaranteed Savings Model.

(*1) Funds that offer loans to energy projects and are continually replaced when the beneficiaries of the loans return the amount lent. Normally promoted by public authorities.

(*2) The beneficiaries of these funds are local governments, public or private entities that act as public service suppliers, social housing associations, energy service companies, etc.

2.2. Available Financial Alternatives:

2.2.1. Financing: through banks or financial intermediaries:

One of the most well-known forms of financing for projects of all types is that of credits or loans. As a general rule, financial bodies require a certain level of credit history and a minimum level of solvency.

a. **Credit:** this option is generally established for a one-year period, but may be renewable and extendable. In this form of credit provision the bank places an account at the disposition of the client, from which the latter may obtain funds up to a certain limit. The client pays interests on the quantity of money that has actually been used. This type of arrangement is normally used to finance working capital, i.e., it is usually appropriate for companies seeking to finance deadline problems with respect to the receipt of charges and payments or to deal with temporary periods when liquid assets are scarce. Credit could, for example be used in the energy efficiency sector in order to finance a series of renovations on the company installations.

b. **Specific loans:** some banks offer specific loans for the construction of sustainable housing or for renovation projects that focus on energy efficiency. The most relevant type of loan in this context is the energy efficiency loan and/or loans for the use of renewable energy sources. In these loans the interest rate may be lower than that of a conventional loan and, in general, the repayment period is approximately equal to the return period calculated on the basis of the expected energy savings. These energy savings must be verified throughout the contract.

   However, conventional loans can also be used to finance the purchase of a specific asset, such as a photovoltaic unit or a biomass boiler.

c. **Renting and leasing:** renting and leasing are two types of long-term rental. They are similar, but involve certain differences that have been outlined below. There are companies that offer renting and leasing associated with an electricity generation system or with efficiency measures, such as a change to LED lighting systems.

Renting

- Rental contract for goods and/or associated services.
- There is no need to purchase the asset. Initially no purchase option is considered.
- Available for both natural and legal entities.
- The company that rents the asset usually purchases it and places it at the disposal of the client on a hire basis. The renting company therefore retains property rights.
- No specific regulations apply. Everything must be established by contract.
- Does not enter into the balance sheet.
- The lessee does not declare/register the leased asset as tax being deductible.
- The lessor retains the asset and declares the income from the fees obtained from its rental.

Leasing

- Contract to finance the purchase of an asset. Only includes the asset. There are no additional services.
- From the outset, the leasing company grants user rights to the client.
- Available only for legal entities.
- The leasing company usually purchases the asset. The debt belongs to the client (and the leasing company).
- Regulated.
- Enters into the balance sheet.

When is this system applied?

a. In contracts in which the term of the lease coincides or covers most of the asset's economic life.

b. When the special characteristics of the assets subject to leasing mean that they may only be used by the lessee.

c. The lessee can cancel the leasing contract and the losses suffered by the lessor due to cancellations are assumed by the lessee.

d. Those results that arise from fluctuations in the reasonable value of the residual amount are assigned to the lessee.

d. **Forfaiting and factoring:** forfaiting refers to the sale of promissory notes or other legal documents that involve payment obligation to a financial institution. The developer or the ESCO discharge their financial debt to the financial institution, obtain liquidity, and transfer the risk of default to the financial institution. The latter is the main differential factor when this system is compared with factoring, which is a very similar system, but one in which the responsibility to demand payment for charges falls to the developer or the ESCO. Furthermore, this latter system is based on the transmission of invoices issued, as proof that the asset or service has been provided.

   Factoring and forfaiting are alternatives that may be used to support the growth of the energy services market, as they discharge developers or ESCOs from any previously acquired debt, so enabling them to continue operating.

2.2.2. Equity ownership:

If the promoter is a shareholder company, long-term financing may be obtained from an investor by means of increasing capital, i.e. the issuance of new shares, or by increasing the nominal value of existing shares. Investor types are as follows:

a. **Business Angels:** these are private investors (also known as 'angel investors') who, in addition to providing capital may make contributions with respect to their experience in a specific sector, their specialized technical knowledge, access to a network of personal contacts, etc. These shareholders normally invest in the initial phases of a project or company and invest in initiatives that incorporate some type of innovation. Some business angel networks compile information on projects and present it on forums aimed at potential investors. Some of these investors are specialists in certain areas of economic activity, such as technological start-ups. The main business angel networks currently active in Spain can be found at this link: *http://www.business-angel.es/directorio.html.*

b. **Specialised venture capital funds:** specialized equity funds exist in the energy sector. Unlike individual investors, venture capital companies are businesses that invest their resources in the financing of other companies. These types of investors are usually of a temporary nature, this means that in order to invest venture capital funds in a company, they must have confidence in the business plan, in the people who are carrying it forward and also be clear about their own 'exit strategy' (when they plan to sell their shares, ideally, at a significant profit, as they have taken on a risk). In general, venture capital funds often provide larger amounts than business angels, however they also tend to become involved in more advanced and consolidated phases of company growth, i.e. when a business has already demonstrated a certain level of market viability.

c. **Specialised investment funds:** due to the specific characteristics of energy efficiency and renewable energy projects, private, public and public-private investment funds are appearing at a European and Spanish level. These funds specialize in offering products that are adapted to projects of this type. These funds provide developers with investment vehicles for energy efficiency operations.

2.2.3. Participatory Loans:

This system is an intermediary formula between a share in company capital and a long-term loan. The lending company charges both a fixed interest rate and a variable rate, depending on how the company develops, using criteria such as net profit, turnover or any other factor that the parties agree on. These loans usually offer repayment terms and longer repayment waiting periods than those normally associated with conventional loans.

Participative loans (or subordinated equity loans) bolster the company's own funds, as commercial legislation classifies them as the company's own funds and a subordinated debt is taken into account, i.e., in case of liquidation they are located after common creditors, but ahead of the shareholders.

2.2.4. Green Bonds:

Investment bonds are debt alternatives that are backed by a set of assets or a guarantee provided by another entity, in which investors are accorded preferential status if they wish to recover their investments. The issuance of these guaranteed bonds enables lenders to obtain lower financing costs. Green bonds have emerged in

recent years, and provide specific financing access for sustainable energy projects and ensure that sustainability standards are fulfilled.

2.2.5. Crowdfunding:

This is a financing practice that involves collecting money from a large number of private investors, without resorting to the services of a bank as an intermediary, or to any another financial institution. Financing through crowdfunding is usually processed through internet platforms that offer this type of financial service (fintech). However a project may also be collectively financed using a share purchase model or through cooperatives (as described in the next section). There are several funding alternatives available in the crowdfunding system, the most common being the following:

a. **Donation and reward:** in this case, the project developer does not return the money, which is officially considered to be a donation, nor does the developer offer shares in company capital. The objective here is social or environmental, i.e. the donation is made "for a cause". However, the project promoter may provide a non-monetary reward, a prize or a gift, in recognition of the support given. This formula is often used for community projects that have a direct impact on their beneficiaries.

b. **Crowdequity:** with this system, a company in its initial (start up) phase obtains funding through several small investors (micro-investors), who purchase capital, these investors generally contribute small amounts and become company stockowners or shareholders, depending on the amount they have contributed.

c. **Crowdlending:** this method of funding is generally undertaken by companies that already have a cash-generating capacity. It consists of loans made by numerous investors for relatively small amounts. Crowdlending platforms manage the process of analysis, formalization and the charging of fees. Investors receive interest on the amount invested, which is currently higher than the interest offered by bank deposits, although the risk is also usually higher.

d. **Invoice trading:** this is factoring through an internet platform; companies cede the right to charge for invoices in exchange for money to a group of investors, after a platform analyses the veracity of the invoice, the payment capacity of the client who the invoice is issued to, and the company that receives the order and provides the credit.

e. **Generation:** is a special type of reward that involves supplying energy free of charge, or with a discount on electricity fees for donors, when the financed project is a renewable energy generation project and the investor is a client of the supplier company that is selling the energy produced.

2.2.6. Investment through Energy Cooperatives:

Some cooperatives sell clean energy and invest in renewable energy projects through a fund sourced from the savings of cooperative members who wish to become investors. Some of these cooperatives offer their cooperative members the chance to invest in renewable energy projects with a fixed or variable interest rate, or where profits are made through discounts on energy purchases from the cooperative itself. A European federation of renewable energy cooperatives is seeking to promote this type of model (REScoop.eu, more information is available at: *https://rescoop.eu/*). It is envisaged that this federation could also develop financial tools, such as an equity fund that could acquire a stake in the ownership of projects, thus facilitating the collection of capital from the general public.

2.3. Financial Instruments

Financial instruments incorporate one or more financial alternatives and mechanisms, either they are in or off balance.

2.3.1. SPV - Special Purpose Vehicle:

When a developer wants to promote a project and finances it using their own funds or those of third parties, there comes a point when, after having undertaken several projects at the same time their financial solvency is compromised. Nor may a developer be able to allocate their economic resources for investment in sustainable energy projects. In these cases the solution may be to finance the project directly through a special financial vehicle,

which is commonly known as an SPV or Special Purpose Vehicle. In this case a financial institution, for example an investment fund, finances the SPV that has been created specifically for a determined project. The fund provides the initial capital for the operation. This system ensures that neither the developer nor the client has to finance the project with their own funds.

The profits are shared between the promoter and the fund. If the project is undertaken by an ESCO, benefits are directly linked to the energy savings attained. The main difference, when compared with the traditional ESCO model is that neither the ESCO's nor the client's balance reflect the debt incurred by the initial investment of the project. It is the SPV that takes on the debt that arises from the project, releasing the ESCO or the developer from this debt, which allows the developer/ESCO and the final client, greater liquidity.

2.3.2. Specialised Revolving Funds:

In some countries revolving funds are available that specialize in energy efficiency and renewable energy sources. These funds offer loans for energy projects. The funds from which these loans are provided are replenished on a continual basis, when the beneficiaries of the loans return a part or all of the initial amount lent. These funds are usually promoted by public authorities in order to foster energy projects in a specific area.

2.4. Subsidies for Sustainable Energy Projects

Non-recoverable grants or subsidies from public authorities are commonly-used systems for providing economic support to energy projects. They are used to promote technology at an early stage of societal implementation or in order to implement measures that have been approved as part of strategies, programmes or development plans in different regional areas.

In most cases, public authorities provide subsidies for a percentage of the total investment for a series of projects, as defined in a public bid, which is established on a competitive basis. Both the tender bases and the bidding process for subsidies, as well as any subsequent modifications, are made public through the official reference bulletins pertinent to each authoritative body.

The financing of this aid is usually shared between the funds of the regional communities, provincial or local funds and funds from other governmental bodies, or the European Union. One of the most commonly-used financial resources is the European Regional Development Fund (ERDF), whose main goal is a transition to a low-carbon economy in all sectors. The ERDF Fund is a financial instrument of the European Commission that provides funding for non-refundable grants. These are directly managed by different programmes (or plans) by central, regional and local public authorities. The ERDF Fund finances the following actions:

- Direct aid to investments made in companies (especially SMEs) in order to create sustainable employment.
- Infrastructures linked to research and innovation, telecommunications, the environment, energy and transport.
- Financial instruments (venture capital funds, local development funds, etc.) to support regional and local development and to promote cooperation between cities and regions.
- Technical assistance measures for projects and actions in line with those previously implemented.

The European Agricultural Fund for Rural Development (EAFRD) is another community fund that provides co-financing in order to launch sustainable energy projects in rural areas.

In the case of grants for energy projects, other Community funds, such as the European Social Fund, the Cohesion Fund, or the European Maritime and Fisheries Fund, are applied for on a more specific basis.

a. Beneficiaries of subsidies:

Subsidy application procedures normally distinguish between public organisations, associations or non-profit organisations and natural or legal persons. Municipal councils, local corporations or homeowners' communities are some of the groups at whom many subsidies are aimed with respect to energy efficiency or the incorporation of renewable energy sources.

Companies, especially SMEs and commercial companies or other bodies in the industrial and tertiary sector often have specific subsidies available to them.

b. The publication of subsidy information:

As of 2016 all calls for subsidies and all related awards approved by Spanish public authorities must be published in the National System for the Advertising of Subsidies of the Ministry of Finance and Public Services (El Sistema Nacional de Publicidad de Subvenciones, del Ministerio de Hacienda y Función Pública) which can be consulted at: *http://www.infosubvenciones.es*

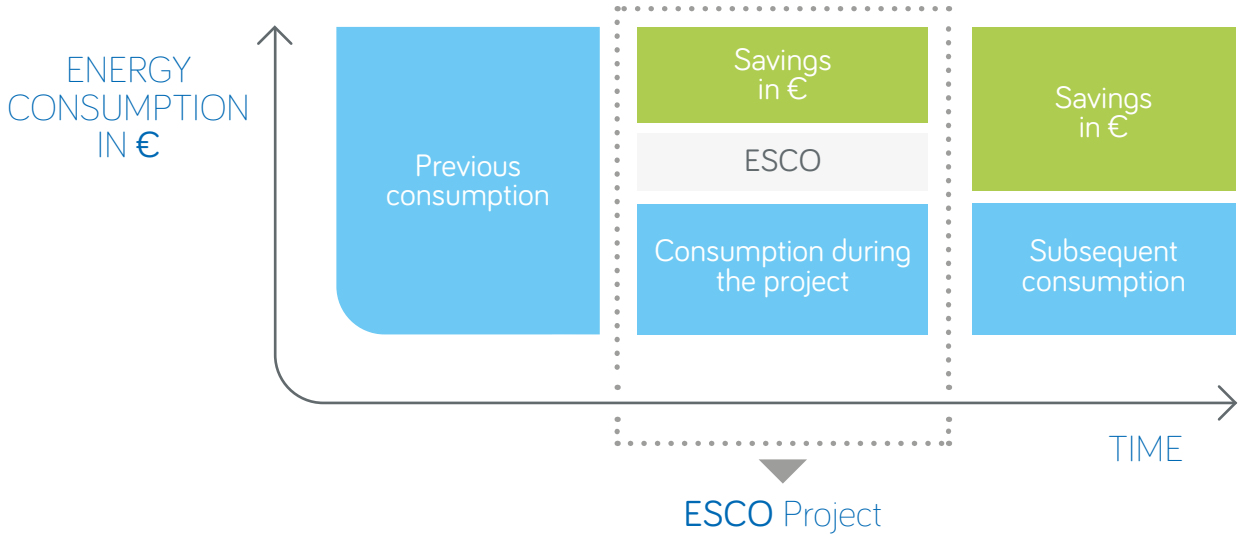
2.5. Energy Service Companies (ESCOs)

The term 'energy service company' or ESCO, stands for Energy Service Company. In order to find a complete and official definition of an ESCO, one needs to go back to 2006. ECA Directive 2006/32 provides the following definition:

> *"Energy Services Company: a natural or legal person who provides energy services or improves energy efficiency in a user's facilities or premises and who accepts a certain degree of economic risk in doing so. The payment for services rendered shall be based (in whole or in part) on obtaining improvements in energy efficiency and in compliance with other agreed performance requirements".*

Energy service companies are entities that offer energy savings and economic savings through the implementation of an energy efficiency project. This enables their clients to reduce their energy consumption without having to deal with an initial investment that is beyond their means.

There is a public register of energy service providers according to Royal Decree 56/2016. This register is centralized by the IDAE but the companies that want to be part must be registered in the Autonomous Community where they have their headquarters. *http://www.idae.es/informacion-y-publicaciones/bases-de-datosherramientas/provee-dores-de-servicios-energeticos*



The ESCO model changes subtly with respect to the type of contract applied. In order to analyse this market it is essential to know which contract types are those most frequently used by ESCOs in Spain when projects are undertaken.

CONTRACT TYPES

Energy Performance Contract (EPC) Guaranteed Savings Type	A contract through which the ESCO implements energy efficiency improvement measures and in which investment is recovered from those savings guaranteed by the contract. In this type of contract, savings clauses are signed in terms of kWh. The payment for the services provided is based either partially or totally on obtaining energy efficiency improvements. With this EPC mode: • The client contracts a loan in order to undertake the project or use their own funds. The client takes on the financial risk. • The ESCO guarantees that the loan will be repaid by the guaranteed savings achieved with the implementation of the project. • The ESCO pays the difference if the previously agreed-upon savings have not been attained. • The main advantage for the ESCO: it can undertake more projects.
Energy Performance Contract (EPC) Shared Savings Type	With this EPC mode: • The client does not have to take out a contract on a loan. • The ESCO finances the project and assumes the financial risk. • Any losses are shared. • The main advantage is that the client does not have to borrow money.
Energy Supply Contract (ESC)	The ESCO supplies transformed energy to the client (steam, hot, cold water, etc.) from an installation set up by the ESCO itself, which may or may not be independent from the client's own facilities. The ESCO charges a per-unit fee for transformed energy sold to the client. The ESCO usually retains ownership of the equipment and accepts the risk of the energy price and the performance of the installation. Savings clauses are signed in this type of contract in terms of € per kWh.
Comprehensive Energy Contract or 5Ps	This model is a combination of the ESC and the EPC models. In Spain, this model is better known as the 5Ps, due to the five performance criteria it covers. It is widely-used by public authorities, and dates back to 2007, when the concept was presented by the Spanish Institute for Energy Savings and Diversification (IDAE). Its five performance aspects are: 1. Energy management 2. Maintenance 3. Total guarantee of equipment 4. Improvement measures 5. Energy efficiency improvements The IDAE and has developed models for technical and administrative specifications for the provision of energy services in public lighting installations. The public-private sector cooperation model and the mixed contract model for services and supplies may be found by clicking on the link below: *http://www.idae.es/index.php/id.644/relmenu.429/mod.pags/mem.detalle*
Turnkey Contract	The ESCO, or the engineering company, designs, constructs and launches the installation of the pertinent equipment. The ESCO transfers the ownership of the installation to the client after the installation has been proven to work. The client pays a basic price for investment costs.

Public ESCO

Although a rare model in Spain, some European countries, such as Belgium or France have implemented public or public-private ESCO models. An ESCO is considered to be a public entity when it is the public administration itself that takes on the technical and/or financial risk of an energy efficiency project.

This type of model is usually used to make energy efficiency funding accessible to sectors with limited financial resources or to generate demand in sectors where energy services have not yet reached those developmental levels initially envisaged, such as the residential sector.

A public or semi-public ESCO is responsible for project design, implementation and monitoring, energy-saving guarantees, and the provision of third-party financing where necessary, and even for subcontracting services to a privately-owned ESCO. In some cases, it adapts payback periods to the needs of the owners or residents' communities, which makes funding available to people with limited resources.

2.6. Other Strategies for Project Funding

Some important barriers in terms of financing energy efficiency or renewable energy projects are a lack of standardization and the high transaction costs in the different project phases. On the other hand, the lack of cross-sector knowledge at technical and financial levels hinders communication and collaboration between developers and funders. As a result of these difficulties, standardization, project grouping and technical support systems have emerged in order to improve confidence and relevant knowledge in the two highly different sectors of energy and finance. Some of these strategies are detailed below:

2.6.1. Investment Bundling:

Many potentially attractive investments are small in size or are distributed among different municipalities. This makes it difficult to evaluate them and also increases evaluation and transaction expenses. In some areas the relevant public authorities have grouped together several small or medium-size investments in order to achieve economies of scale and reduce transaction costs for their projects. Actions are, for example organised together in public or private buildings that require energy rehabilitation, so as to attain sufficient demand volume, in order to ensure better economic criteria for the project. The GREENER-EX and the MLEI_ACCELERATE projects undertaken in Extremadura and the Province of Huelva, respectively, are examples of such investment groupings.

2.6.2. The Integration of Knowledge, Procedures and Areas of Action:

Another strategy being promoted by some public authorities is to act as a facilitator between those different areas of action necessary for the development of sustainable energy projects: engineering, financing, business models, etc. Another similar line of work consists of integrating procedures in order to facilitate project management, such as the grouping of bids, the definition of standardized criteria for the implementation of projects in a specific region, the compiling and testing of energy efficiency measure packages, or the creation of a central purchasing office. One example of this strategy is that of the BEENERGY programme, which is coordinated and managed by the Provincial Government of Girona.

2.6.3. Instruments for creating Investor Confidence:

In recent years systems have appeared that have been designed to improve the confidence of potential investors in energy projects, by the establishment of methodologies and specific standards, or simply by improving the transparency of information on projects of this type.

2.6.4. Technical and/or Financial Support Services:

Some public authorities have opted to establish a specific support service with technical or financial support, so that developers or investors can carry out their projects, even though they do not possess the specific know-how required in one of these areas. For example, some public authorities support local businesses, schools and

communities in order to implement renewable energy facilities. Others rely on public-private partnerships to provide technical assistance and/or market financing.

2.6.5. Tax-exempt Financing:

Another financial mechanism to take into account when promoting a sustainable energy project are the tax incentives that may be associated with it. For example, in some regions, tax deductions are available for the purchase of electric vehicles or for the energy rehabilitation of buildings with property tax rebates (the Spanish IBI tax).

2.6.6. On-Bill Financing:

This is a type of innovative contract that is not been widely implemented in Spain to date, although it is well-established in the United States, while in the United Kingdom it was launched with limited success through the Green Deal programme. With this model, energy suppliers help their clients to invest in energy efficiency measures, such as a high efficiency heating systems or with investments in domestic heat insulation. Investment cost funding may be structured in different ways: as a loan contract, as an energy fee, as an energy services contract or as a lease. The energy supply company will include additional charges in its energy bill, until all debts have been repaid. There are two types of systems, one that allows funding to be transferred to successive tenants or homeowners, and another for which this latter option is not possible, as the contract is only undertaken with the tenant or current owner of the home.

2.6.7. Power Purchase Agreement (PPA)

A Power Purchase Agreement (PPA) in the renewable energy sector is a contract between: (1) a consumer and an energy producer (of any kind); (2) a producer and a trader or (3) traders among themselves to buy electricity at a pre-determined price, under agreed conditions, and for a previously established period of time. Basically, there are two aspects to take into account: the stakeholders and the types of contract.[1]

I > Benefits for the involved actors

In any of the three cases consumer-producer; producer-trader and trader-trader; there is a part that buys energy and another that sells it. In this transaction both parties establish specific agreements taking into account, for example, the type of technology and installation to be developed (or already developed).

The buyer: the bilateral contracting through a PPA contract allows the purchasing party to ensure the access to an amount of energy previously agreed upon with guarantees of continuity, both for the supplier and for the buyer, at established levels and quantities for a period of time and at an agreed price. This results in a more exhaustive control over the energy costs in those periods. By agreeing on the quantities and prices of energy, the PPA covers the established needs avoiding the existing fluctuations in the regular market.

The seller: for the selling stakeholder, the benefits consist of ensuring the sale of the energy produced under the agreed conditions, which allows the stakeholder to access financial markets more safely than in the fluctuating market. The return on the investment in the installation is more predictable, and much of the risk associated with the initial investment is eliminated. In addition, it allows the stakeholder to plan the production more rigorously according to demand.

In this sense, PPAs can be seen as a financing instrument for new generation projects, since they allow the developer to eliminate risks linked to future energy prices. The stakeholder clearly knows the investment periods return, and can access third-party financing more easily.

In addition to the mentioned stakeholders, there are other actors that benefit from the PPAs, such as creditors, guarantors, or collective financing platforms, reducing the financial risk of operations.

1 UNEF (2018): Los acuerdos de compra venta de energia (PPA). UNEF

II > Contracts

Generally speaking, PPAs are private contracts that are negotiated according to the needs of the two involved parties which seek to meet their interests with the agreement. The contractual terms of sale of electricity of the PPAs are the same terms that we find in other contracts: duration of the contract, point of supply, days and hours of supply, volume, price and product, guarantees of penalties or management of deviations. The electricity sold can come either from an existing energy supply or from a new project.

Types of PPA contracts

There are two types of contracts: **(1)** the physical PPAs and **(2)** the financial PPAs.

(1) Physical PPAs are those in which there is a direct or indirect physical delivery of electricity. They can be ***on-site*** and ***off-site,*** depending on whether generation and consumption are directly connected, or if they are connected to the distribution network without direct connection.

(2) Financial PPAs are contracts that offer long-term energy price coverage. They are contracts with indexed price. There is also an agreement between seller and buyer in parallel. They are more flexible and there is no physical delivery of electricity.

How the price is fixed:

It is mainly set as a fixed price or a discount depending on the market prices.

(1) Fixed price: in this case, the energy price that is going to be paid during the contract lifetime is initially agreed. This can be the same throughout the contract lifetime, or the parties can stablish variations linked, for example, to inflation or other parameters. It can be established that the prices of the first period of the PPA are higher, to facilitate the amortization of the debt to the producer.

(2) Market price discount: in this case, the parties establish a fixed discount percentage to the wholesale market price, setting a "minimum price" clause per MWh that ensures a minimum income to the producer, and a "maximum price" clause that establishes a maximum cost to the buyer.

2.7. When is energy project finance considered public debt on balance sheet?

The Maastricht Treaty and EUROSTAT[2] define public debt as the consolidated gross debt of the general government in terms of nominal value (cash), those liabilities payable by the general government within the following accounts: currencies and deposits, debt securities and credits. All Spanish local public authorities must comply with the principles of budgetary stability[3] (structural surplus or balance situation in terms of financing capacity), the principle of financial sustainability (capacity to assume the debt of present and future commitments of expenditure within the limits of shortfall, public debt and late payment in commercial debt) and the principle of the expenditure rule (changes in government spending cannot exceed a reference rate, namely the Spanish economy medium-term nominal GDP growth rate).[4] To date, public investments in sustainable energy in Spain involve indebtedness in the following cases *(see table below):*

2 *https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Government_gross_debt*

3 Article 135 of the Spanish Constitution.

4 Chapter II: General Principles of the Organic Law No 2/2012 of 27 April 2012 on budgetary stability and financial sustainability.

Situation of the public authority	Contract mode	Energy Service Company	Consideration for debt calculation
Without limitations for undertaking operations involving public debt (such as investments in energy efficiency)	**Energy Supply Contract (ESC)** - financial lease. Amortisation fees and purchase options are applied.	The ESCO assumes all the risk of the investment (and its funding).	Public debt increases. The asset falls under government ownership. The operation is included in the expenditure budget.
	Mixed contract with a financial entity linked to a subcontract (direct bidding with the ESCO).	The ESCO does not take on any financial risk (the investment is paid at once, with the liquidity obtained).	Public debt increases.
With limitations in terms of undertaking operations involving public debt (such as investments in energy efficiency)	**Energy Performance Contracts (EPC)** – operational lease. The contractor shall be considered economic owner of the installation and the EPC assets for all purposes.[5]	The ESCO bears all the risks and most of the rewards associated with the investment as economic owner, including its funding.	In terms of balance sheet, the operation is included on the expenditure budget, without being recorded as net public debt "off balance" to the legal owner (the public body).

According to EUROSTAT *("Manual on Government Deficit and Debt – Implementation of ESA 2010-2016 edition")*[6] the concession of public works and public-private consortia are not considered as public debt (if the latter are> 5 years, if the private partner assumes > risk, if > 50% of the value of the asset is spent, if there are phases of exploitation and construction/rehabilitation, etc.).

Eurostat Guide for the Statistical Treatment of Energy Performance Contracts:

The guide issued by Eurostat in May 2018 *"EPC: A Guide for the Statistical Treatment of Energy Performance Contracts",*[7] describes the conditions in which the Energy Performance Contracts (EPC) can be considered off-balance-sheet by the Public Sector. This Guide is expected to ease the replication of the energy efficiency projects which have been implemented through EPC in Public Sector.

So far, there were some aspects which could raise doubts about how this type of arrangements ought to be included in the accounts of a public entity, so Eurostat's guidelines are an improvement on the standardisation of the market.

A key aspect of Eurostat's Guide is the definition of the term "economic ownership" of the energy efficiency measures implemented through the arrangement. In this regard, a distinction is made between "economic ownership" and "legal ownership" on the basis of which of both parties take the risk. In this Guide, the economic owner is identified as the party that bears most of the risks and has the right to most of the rewards associated with the EPC assets (these assets are the implemented measures entailing capital expenditure implemented under the EPC). If the Energy Service Company (ESCO) takes on this role, then the EPC can be recorded off balance sheet for government. If, however, the assessment of risks and rewards indicate that the government is the economic owner, then the EPC must be recorded on balance sheet for government.

It must be taken into consideration that EUROSTAT's analysis does not deal with aspects such as "bankability" or "value for money" of the services provided in the contract.

5 For further requirements, cf. Chapter 3 of *A Guide to the Statistical Treatment of Energy Performance Contracts:* *https://ec.europa.eu/eurostat/documents/1015035/8885635/guide_to_statistical_treatment_of_epcs_en.pdf/f74b474b-8778-41a9-9978-8f4fe8548ab1*

6 *https://ec.europa.eu/eurostat/web/products-manuals-and-guidelines/-/KS-GQ-16-001*

7 *http://www.eib.org/en/infocentre/publications/all/guide-to-statistical-treatment-of-epc.htm*

It should be noted that the procurement process and the legal form the contract takes (contract for services, concession, mixed, etc.) are not relevant to the statistical treatment. The Guide is aimed at prevailing the intrinsically linked requirements and features of the EPC above the terminology used for naming the arrangement.

The Guide defines a typical EPC arrangement as the following diagram illustrates:

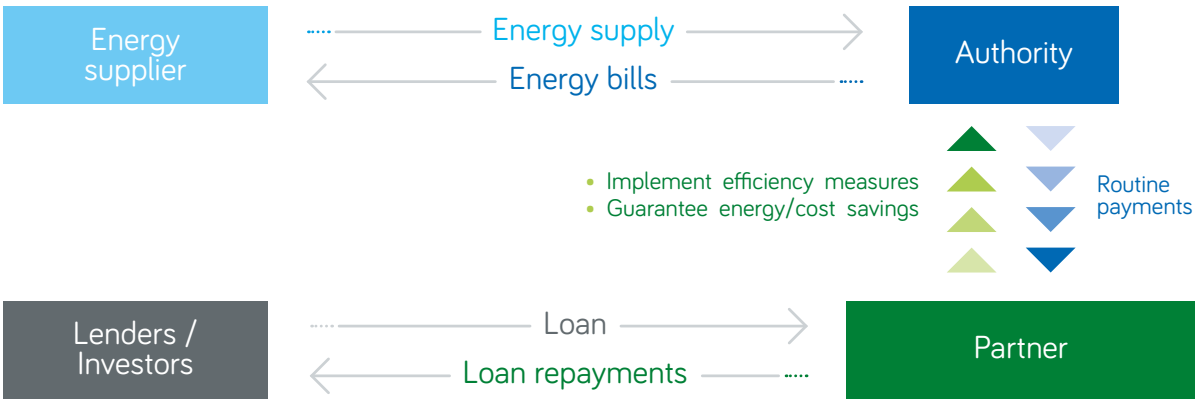


Figure 1. EPC diagram. Source: Eurostat / European Investment Bank.[8]

Some of the Eurostat's features for an energy efficiency project to be recorded off balance sheet for government are:

a. Guaranteed savings must exceed contributions and grants associated to the implemented measures.

b. Principle of proportionality: contributions received by ESCO must be proportional to the guaranteed savings that have been achieved.

c. The arrangement must transfer the risk to the ESCO, but also the reward. In the case of achieving a saving higher than expected, the share of the surplus for government cannot be higher than 1/3 from the total share.

d. If the public entity participates in the financing of an EPC (for example in the form of grants, guarantees or loans), this will influence its balance depending on the percentage of ownership.

e. If the project benefits from European funding (grants or financial instruments), this will not have any impact on balance.

f. If any additional energy saving measure were to be implemented during the duration of the arrangement, its involvement shall be examined, since an arrangement not being recorded as debt may need to be recorded as debt for government afterwards (e.g. an energy saving measure reducing the percentage of saving excess going to the ESCOs).

In short, this Guide reviews item by item the different circumstances and provisions which can occur in the context of an EPC and recommends the best solutions for the public administration, especially to avoid investments being recorded as debt.

Depending on how a particular contractual provision is written, this Guide describes which typical provisions of the relevant EPC influence the statistical treatment, so that they are decisive or not at statistic level, and, therefore,

8 *http://www.eib.org/en/infocentre/publications/all/guide-to-statistical-treatment-of-epc.htm*

make EPC as a whole being recorded or not on balance sheet for the public body. The level of influence can be measured using the following scale (from least to most influence):

Does the provision influence the statistical treatment?

A) If, according to the analysis offered by this Guide, the provision does not have any influence, then no further, more exhaustive analysis is required.

B) If, according to this Guide, the provision influences the statistical treatment, then it is necessary to determine whether the influence level is MODERATE, HIGH, VERY HIGH, OR ON BALANCE SHEET (automatically shall be recorded on balance sheet for the public body) according to the provisions contained in this Guide.

Therefore, this Guide identifies all the provisions or parameters of the relevant EPC that influence or not the statistical treatment, and the level of influence according to the particular approach. The methodology for the assessment of whether the EPC shall be included or not on balance sheet for government is the following:

STEP I • Identify and list all the provisions that influence the statistical treatment according to their category of importance (i.e. MODERATE, HIGH, VERY HIGH, and ON BALANCE SHEET). If this step identifies one ON BALANCE provision, the EPC should be recorded directly on balance sheet and steps 2 and 3 do not apply.

STEP II •• Analyse the degree. The second step is to analyse the degree of each of the influential provisions identified at step 1. The aim is to check whether an adjustment to the categorisation of importance should be made. Eurostat will not re-categorise the following adjustments:

- VERY HIGH → HIGH or MODERATE
- HIGH or MODERATE → VERY HIGH
- Adjust a provision that is based on proportions or percentages
- In some particular cases, Eurostat may re-categorise a HIGH importance provision as ON BALANCE SHEET
- VERY HIGH → ON BALANCE SHEET

STEP III ••• Conclude the assessment. Once the adjustment has been made, according to Eurostat, there would be a strong presumption that the EPC is OFF balance sheet for government as long as some of these combinations is met:

VERY HIGH	HIGH	MODERATE
≤1 clause identified in this category	No clauses identified in this category	≤2 clauses identified in this category
No clauses identified in this category	≤2 clauses identified in this category	≤1 clause identified in this category
No clauses identified in this category	≤1 clause identified in this category	≤4 clauses identified in this category
No clauses identified in this category	No clauses identified in this category	≤7 clauses identified in this category

If and EPC has a combination of provisions that does not fall within one of the thresholds listed above, there is a strong likelihood that Eurostat will conclude that it is on balance sheet for the public administration.

In conclusion, if the EPC are elaborated following the guidelines of this Guide, the public sector can promote sustainable energy projects without doubts of interpretation about how recording investments on their balance sheet.

An example of innovative public contracting for energy efficiency services:

• • The Catalan government's Energy Performance Contract Model with Guaranteed Savings.

On 14 February 2017, the Catalan government approved a governmental agreement to facilitate the renewal and energy modernisation of buildings and public utility facilities. The agreement facilitates the extension of service contract terms in the energy efficiency sector for up to 12 years. This allows companies to provide those economic resources necessary for actions of improvement and recover the cost involved in providing the contracted efficiency service.

The Energy Performance Contract Model with Guaranteed Savings is based on the fact that a specialised company, through building maintenance services, may also provide an energy efficiency service that guarantees determined savings and efficiency objectives. These types of contracts are classified as service contracts. The equipment and parts required are provided by the contractor in order to fulfil the energy efficiency service, without, being the property of the authorities, and are therefore not calculated as debt. In the classification of the table above, these contracts will be considered as a variation of 'operational lease' contracts, although in this case, they will not be associated with amortisation quotas, nor residual value tables, and will solely consider payment for the contracted service. The payment received by the contractor for the energy efficiency services derives solely from the energy savings obtained under contract. Therefore, in order for these specialised companies to obtain a minimum level of profitability, contract periods need to be of a sufficient duration.

Contracts of this type would cover two services

C. Energy efficiency services
   - The implementation of energy conservation actions
   - The technical management and the measurement and verification of savings

D. Maintenance service

The Energy Performance Contract Model with Guaranteed Savings:

1. Ensures that contracts **do not involve a debt** for the government, by establishing that the installations provided by the private companies do not fall under the ownership of the public authorities at any time, and remain the property of the companies that provide services.
2. Guarantee that the actions undertaken **do not involve a budget increase for the public authorities,** by allowing service contracts to remain in force for up to 12 years, which ensures that the contractor is paid by means of the savings generated.
3. **Eliminate risks for the public authorities,** by establishing that the payments made to those companies that provide energy efficiency services are less than the economic value of the savings actually obtained, such that the economic risk is taken on by the ESCO.

2.8. Reference Documents

The following documents may be consulted for more information on that detailed above:

The Existing Financing Framework in Spain for Sustainable Energy Projects:

This document details the current frameworks of the financial models used in Spain, information has been compiled using the opinion of experts in the sector and real project examples.

https://www.enerinvest.es/en/resources/documents

Manual of Good Practices:

This manual is a selection of representative and successful projects. In addition to detailing the technical results of the actions, both their strong and weak points are described, while the profitability of these projects when based on energy efficiency is also detailed, in addition to the use of renewable energy and energy savings.

https://www.enerinvest.es/en/resources/documents

Investment Groupings in Energy Efficiency:

This guide describes the group contracting procedure for the efficient management of public lighting in nine municipal areas in the Huelva region. This project has increased energy efficiency investments in municipalities in the Province of Huelva that are members of the Covenant of Mayors.

http://laccc.diphuelva.es/galerias/docs/303.pdf

Map of Experiences:

The ENERINVEST web page also provides a compilation of innovative projects with respect to funding strategies:

https://www.enerinvest.es/en/resources/map-of-experiences

3 Investing in a Sustainable Energy Project

For investors who are not accustomed to evaluating and investing in energy efficiency projects, this subject area appear to be complex. As it is not yet a sector accustomed to the activities of investors, it is highly important to bear in mind the types of projects on offer, which parameters may be used for their evaluation, the financial profitability they might provide and the specific risks involved. Profits may be highly attractive. The most important aspects have been detailed below, in order to outline the specific traits of this sector with greater precision.

3.1. Parameters for Evaluation:

The decision as to whether or not to undertake a determined sustainable energy project is often based on a series of previously-made feasibility studies, and which become more complex and more detailed the greater the investments involved. The main decision-making criteria may be resumed in three distinct areas:

3.1.1. Technical Parameters

The technological options and products available in the energy sector are highly varied, which means that technical criteria will differ with respect to the technology implemented.

In order to initiate any energy project, the following, among other aspects, should be analysed:

- The technology to be used and its availability on the market
- The level of technological development
- Guarantees with respect to equipment and the availability of replacements
- A base line (a starting point in energy terms and an estimate of electrical production or generation).

The technical analysis must also include an analysis from an environmental standpoint of the alternative proposed, which guarantees the sustainability of the alternative. The aim of this environmental analysis process is:

a. To define and evaluate the project from an environmental point of view.

b. To foresee the nature and the magnitude of the effects caused by the construction and launch of the project.

c. To establish adequate measures, i.e. those that are technically and economically viable, and which allow the minimisation of foreseeable negative environmental impacts and the determination of residual impacts after the application of the measures.

3.1.2. Legal Parameters

From a legal standpoint, any feasibility study of an energy project must ensure that the project is legally valid and that all permits, licences and authorisations are held, both in terms of beginning construction and for operating under those conditions established. Analysis must also be made of the complexity involved in processing authorisations and the legalisation of the installations to be made (e.g. permits for power lines).

The fulfilment of all applicable legislation must be guaranteed from a technical, environmental, construction, operational and maintenance perspective.

3.1.3. Economic-financial Parameters

The economic-financial analysis must detail:

a. Project profitability

b. The capital requirements for both initial investment and operation, and the financial capacity to provide those economic resources necessary during the investment period.

c. An estimate of the income produced by energy sales (for renewable energy projects), taking into account development during operation (e.g. lower production levels during stoppages.

d. Operating costs and taxes imposed.

e. Those funds that will be produced during operation.

f. The main profitability and liquidity rates, as well as their sensitivity to changes in certain variables, such as energy prices.

One fundamental requirement for the funding of an investment or a development project is the establishment of guarantees (collateral), of which there are many varieties. The subject of guarantees is dealt with in Section 4 of this guide.

3.1.4. Intangible Parameters

The intangible impacts of energy projects are also a factor in the taking of investment-based decisions. A large number of these frameworks currently include environmental and social impact analyses, these are developed using multi-criteria assessment as well as involving eco-systemic focuses, among other aspects.

The economic profits of a sustainable energy project must be high enough to be attractive to investors. However, such projects may also be attractive due to their impact and social visibility, which could add an additional positive influence on the decision-making framework itself.

One example is the new European legislation commonly known as the "Winter Package" (Directive 2009/28 / EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources). This provides a new perspective on the energy sector. The targets for renewable energy and energy efficiency have increased to 27% and 30%, respectively for 2030, however this legislation also takes the eradication of energy poverty into account, due to the latter's impact on health, well-being and the social inclusion of people. The eradication of energy poverty therefore seeks to promote the rehabilitation of buildings as a way to improve energy efficiency, enhance comfort and decrease domestic energy bills in those homes affected.

Global meetings, such as the Conference of the Parties at the United Nations Framework Convention on Climate Change (COP 21), which was held in Paris and COP 22, in Marrakesh, have demonstrated worldwide concern about climate change. This concern has led to a greater interest in clean energy use and the idea of reducing (energy) dependence on other countries.

Meanwhile, electric vehicles are becoming increasingly popular. Air pollution in cities is receiving increasing attention due to its effect on health and its relationship with respiratory and heart-related disorders. In a large number of European cities, car sharing initiatives have been implemented; these provide the public with the opportunity to use electric vehicles. Public transport is also being modified to use less polluting vehicles, such as natural gas or electric buses and hybrid taxis.

In accordance with this idea of cleaner cities, not only does transport have to improve, but also heating, ventilation and air conditioning in buildings. To this end, the promotion of renewable energy usage with photovoltaic installations is necessary in order to generate electricity, and to power air conditioning units or solar thermal devices to raise the temperature of heating water, so reducing the need for domestic boilers that require the use of fossil fuels.

The implementation of different types of projects, as promoted by ENERINVEST therefore not only ensures economic profits, but also seemingly intangible benefits for society as a whole.

3.2. Investment Repayment Periods

The investment return periods for different projects types are shown below, according to technical classification made by ENERINVEST. The information is based primarily on data from 80 actual cases that have been compiled within the project, as well as on the literature available.

Returns on investment may be highly variable, and depend on factors such as technology, the initial and final situation, the investment undertaken, and the evolution of energy prices, among other aspects. Generalization is therefore difficult and the data provided must be analysed with care and attention.

Project Type	Investment Return (years)	Comments
Energy Efficiency Rehabilitation in Buildings	20 – 30	The return periods are usually very long and may exceed 30 years. Although this period is much shorter than the useful life of the rehabilitated building.
HVAC Systems – boilers	2 – 10	District heating projects usually involve longer return periods (20 - 25 years), due to the high investment required in distribution systems.
HVAC Systems – heat pumps, refrigeration, industrial cooling units	2 – 6	-
HVAC Systems – solar energy (thermal)	5 – 15	-
HVAC Systems – improvements to distribution systems	Highly variable	The diversity of projects covered in this type of system prevents us from obtaining a fixed set of normal values for their return periods. However, we can affirm that the insulation of generators and hot or cool air distribution systems usually results in considerable savings with minimum investment costs, especially in the industrial sector, meaning that return periods are occasionally less than one year.
HVAC Systems – industrial heating units	Highly variable	As in the case above, we cannot provide information on normal values for return periods. In general, return periods are shorter than for similar projects in the domestic sector.
Lighting	2 – 10	-
Electrical Equipment and Installation Projects	1 – 10	Once again, given the wide variety of projects of this kind, return periods may be very different, depending on each project: • The replacement of more efficient domestic appliances: 5 – 8 years • The replacement of motors for more efficient models: 5 – 10 years • The incorporation of frequency inverters under specific conditions: 1 year • Transformer replacement: 10 years
Sustainable Electricity Generation Facilities	5 – 15	Photovoltaic installations may involve investment return periods of 8 – 15 years. Mini-eolic, between 8 and 14 years for mini-wind generation units, and between 8 and 12 years for mini-hydraulic systems, and cogeneration between 5 and 10 years.
Energy Monitoring and Management	< 1	-
Sustainable Mobility – vehicles	6 – 10	These projects may have very different periods, although they are generally quite long. In this case the period indicated corresponds to a case involving the replacement of a fleet of conventional vehicles for electric ones.

3.3. Environmental aspects and public procurement

Public procurement is key in the development of the so-called "Europe 2020 Strategy", since it is becomes an instrument for the internal market to be used to achieve smart, sustainable and inclusive growth, guaranteeing at the same time a more rational economic use of public funds.

Given this scenario, the Law 9/2017 on Public Sector Contracts transposes the Directives 2014/23/EU and 2014/24/EU into the Spanish legal system. This law entered into force on March 9th 2018.

The objectives that inspire the regulation contained in the new law of public sector contracts are, firstly, to achieve greater transparency in public procurement, and secondly to achieve a better value for money, including the obligation of the contracting bodies to ensure a design of award criteria that allows obtaining high quality works, supplies and services by including environmental, social and innovative aspects linked to the contract itself. It also aims to impose less bureaucracy for bidders and better access for SMEs.

Throughout its articles, Law 9/2017 specifies the importance that environmental aspects must have in the requirements and types of award criteria and in the special conditions of execution of the contract, as well as the obligations in environmental matters that Contractors must meet.

The articles where environmental aspects are specifically mentioned are:

- Article 1 establishes as a purpose that ***"In all public procurement, social and environmental criteria shall be included in a transversal and mandatory manner, provided that it is related to the object of the contract".***
- In article 145, where the requirements and types of awarding criteria are detailed, the new law establishes that the award will be made using a plurality of criteria, economic and qualitative, based on the best value for money. Likewise, the qualitative criteria established by the contracting body may include, among others, environmental aspects linked to the object of the contract, such as: reducing the level of greenhouse gas emissions; the use of energy efficiency measures and the use of energy from renewable sources during the execution of the contract; as well as the maintenance or improvement of natural resources that may be affected by the execution of the contract.

  In addition, this article indicates that more than one award criterion should be applied in contracts whose execution could have a significant impact on the environment. In this case, for its adjudication, measurable environmental conditions should be assessed, such as the lower environmental impact, savings and efficient use of water and energy and materials, the environmental cost of the life cycle, the procedures and methods of ecological production, the generation and management of waste or the use of recycled or reused materials or ecological materials.

  On the other hand, the contracting authorities must take the necessary measures to ensure that in the execution of the contracts the contractors comply with the applicable environmental obligations set out in European Union law, national law, collective agreements or by provisions of international environmental law that bind the State.
- In its article 202, the law regulates the special conditions of execution of the contract of a social, ethical, environmental or other nature. These conditions may relate to economic considerations, innovation, environmental or social aspects. In this sense, it will be possible to establish environmental considerations that pursue: the reduction of greenhouse gas emissions, thus contributing to comply with the objective established in Article 88 of Law 2/2011, of March 4, on Sustainable economy; the maintenance or improvement of environmental values that may be affected by the execution of the contract; more sustainable water management; the promotion of the use of renewable energies; the promotion of product recycling and the use of reusable packaging; or the impulse of the delivery of bulk products and organic production.
- Article 148 establishes that the calculation of the life cycle cost of the product, work or service shall include, as the case may be, all or part of the following costs incurred during the life cycle of a product, a service or a work:
  - The costs of use, such as the consumption of energy and other resources.
  - The costs imputed to environmental externalities linked to the product, service or work. These costs may include the cost of greenhouse gas emissions and other polluting emissions, as well as other costs of mitigating climate change.

This new law therefore implies a change of orientation with respect to the previous legislative framework in this area, since it prioritizes the quality-price ratio in comparison to the only criterion of the most economically advantageous offer, which was the previous procedure. With the inclusion of environmental criteria, the law allows prioritizing the contracting of companies that are committed to energy efficiency and renewable energies if this is established in the bidding requirements. In this way, public procurement can become an instrument to implement public policies to promote a more sustainable energy model.

The new law is constantly taking practical concretions, for example, in relation to the duration of mixed contracts which contain supplies and services with investment in which the service of supply is the main (investment). It is the case in many energy service contracts, where the State Advisory Board on Public Procurement[9] allows a longer duration than the established five years as a general rule for the supply contracts, when required by the payback time.[10]

Examples of environmental criteria associated with energy efficiency

• • • Obejo Municipality

In May 2018, the Obejo City Council, a Spanish municipality of 2,000 inhabitants in Cordova, publishes the social and environmental clauses in the new Public Sector Contracts Law and its application in this municipality.

With regard to aspects related to energy efficiency and renewable energies, we find that in contracts that involve the use of vehicles, the council will assess potential improvements on emissions and pollution.

The text indicates that: *"Those who use quality certificates, those who do not pollute and use motors with filters and who comply with European regulations, will be better scored. The use of electric vehicles by the bidder will be positively valued".*

On the other hand, in the contracts of supplies and / or IT services: *"The environmental quality of the equipment will be valued if the offered processors have operating modes that allow the saving of energy, the best heat dissipation characteristics and if they do not exceed the emission of levels of harmful substances according to the procedure defined in the Blue Angel Ecolabel".*

https://www.obejo.es/sites/default/files/clausulas_sociales_y_medioambientales_en_la_contratacion_administrativa.pdf

• • • Sevilla Municipality

In 2016, the City Council of Seville approved its guidelines on responsible public procurement in the Government Board.

According to the City Council, depending on the object of the contract that the city council tenders, the most suitable award criteria must be included to improve and promote the qualities and environmental characteristics of the services tendered. In relation to criteria associated with energy efficiency and the use of renewable energies, the following applies:

- *"The emission reduction of gases will give x points in addition to those established in the specifications.*
- *The use of eco-labels and other environmental quality labels, as well as energy efficiency measures, will provide x points.*
- *A total of x points will be given in case of electricity supply contract or similar, that said energy is of renewable origin (green), with its corresponding certificate. "*

https://www.sevilla.org/ayuntamiento/competencias-areas/area-de-hacienda-y-administracion-publica/servicio-de-contratacion /archivos/clausulas-sociales.pdf/

9 Expedient 55/18. Duration of energy service contracts: *http://www.hacienda.gob.es/Documentacion/Publico/D.G.%20PATRIMONIO/Junta%20Consultiva/informes/Informes2018/55-18.%20Duraci%C3%B3n%20cto%20servicios%20energ%C3%A9ticos.pdf*

10 Article 29.4 of the Law 9/2017 of 8 November, on Public Sector Contracts.

Madrid Municipality

On the other hand, the City Council of Madrid incorporated, in the list of administrative clauses of the ***"Framework Agreement for the supply of renewable electric power for municipal buildings and equipment of the City of Madrid and its Autonomous Bodies",*** and as a criterion of technical solvency; the certification issued by the National Commission of Markets and Competition. This is in accordance with the IET/931/2015 order, of May 20 that modifies the ITC 1522/2007, of which the commercialized energy is of 100% renewable origin.

https://contrataciondelestado.es/wps/wcm/connect/66c4e599-4914-4b64-94f0-3fcc412073cf/DOC_CD2018-080906.pdf?MOD=AJPERES

Barcelona Municipality

The City Council of Barcelona, through different technical instructions, has defined criteria for sustainability in order to minimize the environmental impacts derived from municipal activity.

For example, the environmental criteria that should be included in the bidding documents for electricity supply are power adjustment, reactive energy correction, green electricity and give priority to renewable sources.

As an environmental criterion for the acquisition of computer equipment, the specifications are required to include the equipment's energy efficiency criteria. As such, the contracting body must establish that the equipment meets the requirements on typical electricity consumption (or TEC, Typical Energy Consumption) established in the latest version of the Energy Star or equivalent.

"The technical instruction for the application of sustainability criteria in the office furniture" indicates that in the acquisition of complements that consume energy, the contracting body will incorporate energy efficiency criteria, such as the use of efficient technologies (LED, compact lights of low consumption or high performance halogen bulbs) or the higher energy efficiency categories (A to C), if any.

The efficiency criteria are also applicable in works tendered by the Barcelona City Council. In the contract, documents for the drafting of urbanization, redevelopment or infrastructure projects to achieve maximum energy self-sufficiency, the following efficiency criteria must be included:

- Minimize energy consumption, applying energy efficiency criteria for lighting systems and other energy consumption.
- Maximize energy self-production, based on the study of the use of local energy sources, including renewable or residual energy (heat and cold) to meet existing energy demands or new energy demands, the viability of seasonal or electrical thermal storage and the design of support structures for renewable energy production facilities.
- Calculate the total cost of ownership (TCO), taking into account at least the investment costs in equipment and materials, maintenance costs and annual operating costs.

Likewise, in the promotions of new buildings of municipal ownership, joint alternatives should be proposed that favor maximum energy self-sufficiency and economic, management and energy efficiency in the use/exploitation phase, in order to achieve the objective of nZEB buildings. In addition, a minimum energy rating must be required in the specifications.

In the case of renovation or rehabilitation of municipal buildings, the energy saving measures, that must be additionally established in the contract documents, shall also be established and provide solutions to each of the energy problems, in accordance with the priorities defined in the Energy Improvement Plan in the municipal buildings of the Barcelona City Council.

With respect to the contracting of vehicles, the council gives priority first to the contracting of electric vehicles and secondly to hybrid plug-in vehicles. The maximum power (in kW), the power consumption (in kWh/100km), the standardized autonomy (km) and the useful life of batteries are criteria to be considered in the contracting procedure.

http://ajuntament.barcelona.cat/contractaciopublica/es/contractacio-sostenible/contratacion-publica-ambiental

4 Guarantees

Guarantees allow certain risks inherent in a project to be transferred to interested parties who do not wish to be directly involved in the operation of the project. Guarantees maintain the off-balance sheet operation as a direct liability, rather than providing or lending capital, thereby allowing the project to remain viable. The guarantee constitutes a bank commitment to a third party, on behalf of the client, so ensuring compliance with a contractual obligation.

With respect to the taking of the final decision on project development, it may be important to undertake a due diligence (legal audit) procedure. The aim of this audit is to provide trust and transparency to the relationship between the parties involved in the project, and as such it is usually commissioned to an independent third party. A due diligence process focuses on the impacts that different circumstances may have on the investment and involves a study of the risk factors, the technical decisions, the legal and fiscal aspects involved, in addition to intellectual or industrial property rights and the processes followed to ensure that the technical infrastructure of the project supports the business objectives, thus allowing the investor to identify, where appropriate, any possible additional risks to business development itself.

4.1. Financial Guarantees

When external funds from financial institutions are used for an energy efficiency project, the lender generally requires a series of technical and economic guarantees (collateral), and sometimes an insurance policy of some kind. These guarantees are intended to ensure compliance with the agreed obligations, generally the capacity to return the investment made. If the developer is the agent directly requesting funding, the characteristics of the guarantees solicited will depend on the criteria of each individual banking organisation, but in general terms, details on the company's solvency, credit history, sales and profit trajectory, the technical solvency of the project, maturity of the technologies used are required. This, together with other fluctuating conjunctural factors, makes evaluating collateral value a complex process, and a periodical review of this aspect is recommended.

Guarantees may be classified according to whether they are personal, or collateral (property-based guarantees. In the first case, all obligations must be met by natural or legal persons, who must respond with their assets, or by several persons in the compulsory modality that has been agreed (jointly or severally), these are obligations transferable by inheritance. However, with respect to collateral obligations, compliance with the obligation is linked to personal property, either in the present or the future, which belongs to a third party who has provided their authorisation. Specific guarantees are also available for project financing.

PERSONAL GUARANTEES	
Of the Holder	In this case it is the debtor themselves who responds with their present and future property/assets in the event of a breach of the contracted obligations.
Conventional Bond	In order to establish this guarantee, a third party (guarantor or co-guarantor) is involved in the relationship, who undertakes to respond, in whole or in part, with their own assets in the event of a breach or default by the main debtor. This strategy is normally used when the sponsored developer has a limited payment capacity and a default risk exists. The guarantor or guarantors bind themselves unilaterally with the creditor and, if the bond is used (when a default has been demonstrated by the main debtor, who does not possess enough assets with which to respond) they act on the latter's behalf, as if they were the secured debtor. Subsequently, this third party may carry out return and subrogation actions against the insolvent debtor (and repayment actions with other insolvent co-signers).
Others	Commercial bonds, exchange guarantees (for bills of payment, promissory notes or cheques) and first demand guarantees (atypical and not related to the obligation).
Collateral Policy	Represents the evidence of a contract that provides the indemnities of an insurance company with respect to a third party in the event of certain acts or omissions having been made by the insured party.

COLLATERAL	
Mortgage Guarantee	The assets that guarantee the operation of the secured debtor are property – real estate, often being the same as that which has given rise to the provision. The guarantee is therefore imposed on the property itself and in the event of non-payment, the guarantee is executed by means of an embargo on the offices, premises, land or property that is subject to the guarantee. Mortgage guarantees are often associated with large loans with long repayment terms and lower interest rates in comparison to others, and offer greater security and lower risks for creditors.
Collateral Security	Unlike the option described above, the assets in this case are properties that do not possess the characteristics of real estate, and must meet certain requirements in order to be accepted as a pledge. They must be free of charges and encumbrances and as such, totally available. Such assets may be property items, such as: products, inventories, receipts of trusts or storage, etc. But they may also be rights such as: current account balances, accounts receivable, loans with co-signers, term deposits, concession rights, life insurance policies, etc.
Financial Guarantees	These are fiduciary and special guarantees that are used for operations involving major financial assets (pecuniary, present and future financial obligations) for financial instruments or cash on account in which a creditor financial institution always intervenes, which is protected from bankruptcy, and as such meeting the credit laws of the financial market. These guarantees may be constituted by pledge or by the transfer of ownership, their scope must appear clearly in the agreements established between the parties. In addition to ensuring a reliable and efficient coverage for financial institutions, this type of guarantee facilitates debtors with access to good credit conditions.
Antichresis	This is a guarantee by which the creditor acquires the right to the profits from a tangible property that belongs to the secured debtor as payment for the interest and capital of the amount provided for financing purposes. The debtor, who will always retain ownership of their tangible asset, will not regain the right to use the profits for their own purposes until the debt has been paid.
Guarantees of Institutional Programmes	This is a summarised version of some of the conditions applied by Spanish institutional programmes that need to be taken into account: • **Bank guarantee:** the developer is blocked from using a sum of money, so that the client may have access to it if the project does not attain those savings anticipated, or if the project is not undertaken. • **Surety bond/insurance contract:** the insurer is obliged to indemnify the insured party for any unfulfilled obligations. • **Cash deposit for the IDAE:** this deposit is made to the General Deposit of a Government Ministry (La Caja General de Depósitos del Ministerio de Economía y Competitividad) for 20% of the loan amount.
Others	Guarantee of securities, merchandise, livestock and machinery, works certifications, savings account balances, fixed term deposits, bills of exchange, investment funds, savings plans, etc. There is also a mixed modality, which combines both personal guarantees and collateral within the contractual autonomy that exists between debtor and creditor.

GUARANTEES FOR PROJECT FINANCING	
Project Finance	This is a financing alternative that allows a project developer to undertake a project, by obtaining the financing for investment, despite not possessing the necessary financial capacity. Unlike those credit alternatives that are normally used, Project funding is mainly based on the ability of a public or private project to generate resources. These must be sufficient to pay the returns on the capital, the operator's profits and return the invested capital. Only projects with a very low risk level are usually subject to this funding model.
Deficiency Guarantee	These are limited-amount guarantees. They may be used when a shortfall in funds is anticipated, and which must be covered by the guarantor. By definition, this type of guarantee is present in a joint venture, risks of excess investment costs need to be covered. The members of the joint venture provide those funds required to make up for the deficit. A joint venture is the result of a commitment between two or more companies, who carry out complementary operations in a specific business operation.
Take or pay	This is an indirect and unconditional guarantee from an income stream. It involves an agreement between a buyer and a seller in which the former periodically pays specific sums to the latter in exchange for products or services. The buyer must make payments, even if the supply of the goods or services contracted is not made for reasons attributable to the buyer. This type of contract ensures the financial viability of a project.

When contracts are undertaken with the public authorities, the tenderer who presents the most advantageous offer, besides proving their technical and financial solvency, must provide a guarantee to the administrative body in question. The amount of this guarantee is a percentage of the amount of the contract award, in accordance with the provisions of Article 95.1 of the Consolidated Text of the Public Sector Contracts Act. There are two types of guarantees for tenderers in the field of public contract procedures: provisional guarantees, which must be justified by the contracting authority, and definitive guarantees, public contracts of any type. This latter type is always used, and consists of the constitution of a guarantee that is available to the contracting authority, accordance with the amount of the award (5% excluding VAT, which may be supplemented by up to 5% for special contracts). The manners in which this guarantee is established may be formalized in the following three manners: in cash or in public debt securities and security bonds.

For practical purposes, the eligibility criteria of the financial mechanisms, in addition to the guarantee criteria applied, largely depend on the type of project to be undertaken (i.e. the technology to be used) and on the economic status of the client.

There are even programmes in which the need for a guarantee is not previously stipulated, but rather it is the financial organisation that determines the guarantees to be applied, in accordance with the economic solvency of the developer or project feasibility.

4.2. Operational Guarantees

The previous section outlined those currently-existing financial guarantees that are necessary for access to external financing alternatives. However it is increasingly common for financial institutions and developers or clients of sustainable energy projects to request operational guarantees in order to ensure project feasibility, and above all, the subsequent operability of any project. In those ventures where guaranteed energy savings exist, it is important to ensure the useful life of the project by undertaking rigorous control and maintenance.

a. Manufacturer's warranty insurance policies

This section covers performance warranty insurance policies; the useful life warranties that apply to certain products. Technology is a key element in sustainable energy projects, and as such ESCOs and engineering companies use technological products that offer these guarantees, this strategy ensures that the designs prepared and the calculations made are fulfilled.

The following is an example of the warranty policy, with the terms and conditions of a standard warranty for professional outdoor lighting installations.

Warranty terms and conditions:

LED lighting warranties	LED I	LED II
GOLD warranty	10 years	5 years
SILVER warranty	5 years	3 years
BRONZE warranty	3 years	1 years

b. ESCO Energy Service Company Certificates (ESE and ESE Plus)

There is currently an ESCO certification that validates as to whether or not a company fulfils those requirements necessary to undertake an energy services contract and guarantee energy savings by contract, i.e. if it meets ESCO model standards or not.

This classification was launched in 2015 and there are already numerous companies certified in Spain. TÜV Rheinland is the certification body that validates a company's capacity to fulfil the requirements to act as an ESCO or ESCO Plus, furthermore, a company that obtains certification has two of these possibilities.

Some of the requirements for an ESCO to attain classification as an ESE plus (translation note ESCO= ESE) include the regulation that an ESCO must demonstrate that clauses exist guaranteeing investment amortisation based on energy savings or that penalties are applied if savings levels are not met.

Due to this type of company certification, which is open to any company that wishes to become a certified ESCO, potential clients and financial organisations are provided means with which to confide in projects undertaken by these companies, as a separate body accredits that the work undertaken by the ESCOs fulfils the rigorous standards applied in line with the established criteria. This certification should not be confused with the register of energy service providers of the IDAE. This seal provides a more exhaustive certification than the registration of the IDAE, precisely to provide an additional trust to the financial sector and the final customers.

For more information, go to *www.anese.es*

c. Sustainable Energy Project Certificates (ICP Europe)

In Europe, certificates exist in order to verify that projects comply with the definitions of "Investor Ready Energy Efficiency TM projects", which are ventures that are ready to be financed. This accreditation is obtained through a third party organisation and it is currently being introduced into Spain. ICP Europe is a European project that is working to implement this type of certification in Europe.

The certification accredits individual projects in order to facilitate the development of the global energy efficiency market through the reduction of transaction and design costs, while increasing the reliability and rigorousness of energy savings estimates. In the long term, this initiative seeks to encompass energy efficiency projects in a single type of asset, one that is attractive to those capital markets interested in investing in this sector.

A certified project, in itself, does not guarantee savings, however it does help to create greater client and investor confidence, so accelerating the financing process. This type of certification therefore creates guarantees for both clients and financial entities.

5 Risks

Risk evaluation is an important part of project evaluation when investing in or promoting an energy efficiency or renewable energy project, in addition to the implementation of those measures to mitigate such risks. Many of these risks can be reduced by establishing appropriate preventive measures. This means that risk assessment should be used to improve guidance with respect to project actions, rather than to block them.

Several risks worthy of consideration have been detailed below:

RISKS ASSOCIATED WITH SUSTAINABLE ENERGY PROJECTS	
Market Risks	Payback periods and returns on investment in sustainable energy projects are calculated on the basis of estimated future energy prices. Forecasts may be affected by variations in market prices that are caused by some unforeseen conjunctural event or because the project has high investment levels that require a lengthy return period (meaning therefore that future price projection is more difficult). For example, lower-than-expected prices after an investment period of 5 years would generate lower revenues for a renewables project or would affect savings calculations with respect to an energy efficiency project.
Financial Risks	The developer must be in a position to cope with any unforeseen issues or delays in the installation or work, as well as provide power generation forecasts in projects of this type. In the case of a renewable energy facility, for example, a developer must have enough "financial muscle" to be able to fulfil their obligations to suppliers and industrial manufacturers during the installation phase and maintain production at the facility until the break-even point.
Technical Risks	These risks involve the studies and technical characteristics of each project and each specific technological area. In projects that involve the production of renewable energy, for example, solar radiation levels or wind speed may be initially overestimated at the site in question. This will impact revenue flows (or result in higher costs, in the case of energy efficiency investments). Another technical risk involves possible technical failures to equipment, or an overestimation of the equipment's useful life or its maintenance requirements.
Corporate Risks	When an ESCO or an engineering company calculates the savings that a series of measures could produce for a company, these calculations are based on the criteria of time when they are made. Corporate policies however may well change, and if after several years the company in question decides to replace one production line for another, savings and investment return periods may vary greatly from those initially estimated.
Political-regulatory Risks	Changes of government may be accompanied by policy changes and changes to the sector's regulatory framework. These changes may affect issues such as feed-in tariffs subsidies or government aid for improving energy efficiency in buildings, the tax applied to investments in renewable energy sources or in energy efficiency, etc.

Conclusions

Although funding is currently seen to be a major constraint on the implementation of sustainable energy projects, an increasing number of alternatives are now emerging in order to facilitate this crucial step in project development. On the one hand, there is an increasing diversity of promoters who have opted to improve efficiency or install renewable production facilities in their premises; these promoters range from individuals at a domestic level to companies of all sizes, not to mention public authorities. Investor profiles are also changing, while small and medium-sized projects that previously had difficulty finding funding by means of traditional financing systems can now access alternative instruments. Initiatives have also emerged that allow the incorporation of small investors and even investment at an individual level.

All factors therefore point to a scenario in which the funding of sustainable energy projects in the coming years will become more diverse and flexible. The funding options detailed in this guide are sure to become well-established, standard market practices, which will allow the number of sustainable energy projects to increase.

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