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Project Title:

# Bankability Assessment of the New EPC

## NOVICE

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| Description of the related task and the deliverable in the DoA | This deliverable provides a bankability (financial viability) analysis of the new EPC. This study focuses on project assessments and impact analysis based on actual investor requirements. EPC bankability is examined considering the different risk assessment criteria of financial funds. Based on interviews with 10 investors representing specialized financial funds for energy efficiency and renewable generation technologies, this deliverable concludes that thus far, each financial fund is held to its own internal criteria. While there are general commonalities between fund criteria, each fund is nonetheless bound to its own specificities and there is often little crossover. The resounding conclusion from all funds is that the bankability of a NOVICE EPC is largely reviewed on a per-project basis and depends on a specific investor's criteria. Moreover, despite the original hypothesis of the NOVICE consortium that adding demand response measures to an energy efficiency project would increase the overall attractiveness of the project to investors (due to higher IRR, lowered payback time and dual revenue stream), the reality is that demand response remains an unknown program type to most investors and thus far adds an element of uncertainty. However, if the savings are substantial and the demand response aspect can be justified as bringing overall greater value to the entire project (as well as the financial model fitting the fund's general expectations), the project can be considered as bankable. For a more robust understanding pre-investment of the bankability of a given project – NOVICE or otherwise (in order to model the project accordingly), a standardized risk-assessment and due diligence procedure for investors needs to be built out in Europe, which does not yet exist, given the relative immaturity of the market. | | | | |
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### Disclaimer

# 1 CONTENTS

# 2 ABBREVIATIONS

| | |
|---|---|
| BOOT | Build-Own-Operate-Transfer |
| IEC | Integrated energy contract |
| EE | Energy Efficiency |
| EPC | Energy Performance Contract |
| ESC | Energy supply contract |
| ESCO | Energy Service Company |
| FM | Facility Manager |
| DR | Demand Response |
| DSO | Distribution System Operator |
| TSO | Transmission System Operators |
| IRR | Internal rate of return |
| NPV | Net present value |

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# 5 EXECUTIVE SUMMARY

This report provides an analysis and evaluation of the bankability of the NOVICE dual revenue stream energy performance contract (EPC) model by investors. The dual revenue stream model analysed offers revenue from both energy efficiency and demand response. The definition of bankability is that the project is robust enough from a revenue and risk perspective to attract finance under the terms of an EPC contract. This deliverable is therefore focused on assessing the NOVICE model from the point of view of a financial institution. The theory behind an energy performance contract (EPC) is also explained along with a detailed description of the financing model behind it, the different ways that exist of financing through the NOVICE model and the differences between them. Key applications and stakeholder relationship graphs are clearly presented along with both pros and cons for each stakeholder for each model presented in the tables.

For this deliverable Joule created a questionnaire in order to gain further insight into investor requirements for EPC. Joule reached out to twenty-three investors of which ten agreed to participate in an interview. The ten who participated are representatives of financial institutions within Europe, representing private equity funds, and public-private partnerships. All investors interviewed offer financing solutions for EPC. The role of these (and banks) when it comes to financing in EPC are reviewed and assessed based on whether the current characteristics in their market behaviour is beneficial for the EPC and NOVICE model.

The contracting parties are defined along with definitions of different projects in order to give a clear understanding of involved stakeholders' roles and respective interests. Along with these, the risk categories and the characteristics of these risks are presented and cover the most common risks for all parties involved.

Financing of projects is defined in terms of self-financing, bank loans, equity financing, and special purpose vehicles (SPV). The deliverable explains what the financing landscape looks like in today's market. The two EPC models "guaranteed savings model" and "shared savings model" are clearly portrayed in performance and stakeholder graphs to give a visual representation alongside a thorough written review of how each model works and who benefits. The bankability possibilities are examined and concluded, as well as the suggested market changes that could inspire an upswing an increased movement in this sector.

The research results in this report concludes that the majority of financial institutions that finance projects organized under EPC contracts yet will not rely on the future savings as receivables. Rather, they rely on physical assets and the credit rating of the parties to secure the investment. If a project is secured in the true' EPC fashion (secured against the value of future energy savings) this is usually within an equity investment in an SPV structure.

Thus far, each financial fund is held to its own internal criteria. While there are general commonalities between fund criteria, each fund is nonetheless bound to its own specificities and there is often little crossover here. The resounding conclusion from all funds is that the bankability of a NOVICE EPC is largely reviewed on a per-project basis; however, if the savings are substantial and the demand response aspect can be justified as bringing overall greater value to the entire project (as well as the financial model fitting the fund's general expectations), the project would be considered as bankable.

# 6 Objective of the report

The objective of this deliverable is to assess the bankability of a dual revenue stream Energy Performance Contract (EPC) model by investors. This contracting model, developed by NOVICE, combines both energy efficiency and demand response measures into one performance-based agreement.

The report reviews the key participants in an EPC contract, in particular the types of financing institutions available and then looks at key investment criteria for EPC and the bankability of the demand response measures. In order to gather information concerning the bankability of EPCs from the investor's point of view, Joule Assets used its working categories of risk areas, which it already applies through in-house project analysis using its eQuad platform. Developed within the SEAF H2020 Project (2016-2018), Joule's eQuad platform facilitates project financing by providing financial analysis, due diligence, access to project certification and performance insurance, and introductions to pre-qualified capital sources.

The team then created an investor questionnaire based on market-tested risk factors; the questionnaire formed the basis for a series of interviews with leading financial funds. The aggregated results are reported in Chapter 8.2.

The key conclusions outline requirements for bankability, and how demand response measures impact the bankability of EPC contracts.

# 7 Project and participant definitions

**Energy efficiency projects**: Energy efficiency projects are projects that reduce consumption behind the electricity meter - compared with an agreed baseline. A wide range of technologies can be installed to achieve overall reductions – everything from wall insulation, new windows, and improved machinery. Renewable energy generation, battery storage and CHP installations may also be included in this category – while the latter are not energy efficiency measures strictly speaking, they are included here because they (a) reduce energy costs for the site, (b) are cleaner sources of energy, (c) are commonly included in EPCs. Unlike Demand Response energy efficiency measures do not react to signals or controls from outside the property but are internal only. Energy efficiency improvements can also be affected through changes in customer behaviour. However, measures to foster behavioural change are not included in this report. They are by definition not bankable – there is no way for a fund to foresee improved behaviour patterns, nor finance them.

**Demand response:** Demand response entails customer load (energy consumption patterns) responding to outside signals – usually pricing signals. This makes consumption patterns flexible and means the customer uses more energy when electricity is cheap or clean, and less when it is expensive or dirty. Further definitions of the types of demand response are below.

It[1] is now widely acknowledged that an active demand-side participation in the energy market is essential for effective competition, system efficiency and consumer empowerment. Two types of Demand-Side Flexibility can be distinguished in this respect:

[1] Mapping Demand Response in Europe Today 2015, SEDC

- **Explicit Demand-Side Flexibility** is committed, dispatchable flexibility that can be traded (similar to generation flexibility) on the different energy markets (wholesale, balancing, system support and reserves markets). This is usually facilitated and managed by an aggregator that can be an independent service provider or a supplier. This form of Demand-Side Flexibility is often referred to as "incentive driven" Demand-Side Flexibility.
- **Implicit Demand-Side Flexibility** is the consumer's reaction to price signals. Where consumers have the possibility to choose hourly or shorter-term market pricing, reflecting variability on the market and the network, they can adapt their behavior (through automation or personal choices) to save on energy expenses. This type of Demand-Side Flexibility is often referred to as "price-based" Demand-Side Flexibility.

Both types of Demand-Side Flexibility are complementary and should coexist to allow for consumer choices and enable efficient energy system usage. It is important to note that enabling both types are necessary to accommodate different consumer preferences and to exploit the full spectrum of consumer- and system benefits from Demand-Side Flexibility.

**ESCO**: An Energy Service Company (ESCO) provides energy services to customers, these include a broad range of energy solutions such as the design and implementation of energy savings projects, retrofitting, energy conservation, energy infrastructure outsourcing, power generation and energy supply, and risk management. Other common terms used to describe this role are "project developer" or "contractor"; however these terms have slightly different nuances and do not necessarily imply a service-focused business model.

ESCOs may vary widely in size and focus, with some companies focusing almost exclusively on project development and management and others behaving as energy brokers. In reality, therefore, the definition and labelling of ESCOs and ESCO services differs both between Member States and between companies themselves.

According to the definition of ESCO by Joint Research Centre of the European Commission (http://iet.jrc.ec.europa.eu/energyefficiency/esco), the three main characteristics of an ESCO are:

- ESCOs guarantee energy savings and/or provision of the same level of energy service at lower cost. A performance guarantee can take several forms. It can revolve around the actual flow of energy savings from a project, can stipulate that the energy savings will be sufficient to repay monthly debt service costs, or that the same level of energy service is provided for less money.
- The remuneration of ESCOs is directly tied to the energy savings achieved.
- ESCOs can finance or assist in arranging financing for the operation of an energy system by providing a savings guarantee.

This means that the ESCOs accept some degree of risk, since their incomes depend on the effective energy efficiency the project has effectively delivered to the customer. Energy Performance Contracting is therefore required for a traditional ESCO service. These contracts sit between the ESCO and the end client but must also protect the securitisation requirements of funds. (For more information on EPC contracting, see Chapter 9).

**Aggregator**: Aggregation has an important role to play in energy efficiency, energy brokerage and demand response projects. Each is in fact a different activity and plays a role in the bankability of EPC contracts.

- **Aggregation of clients or resources:** The aggregation of resources or clients allows for economies of scale. It improves the negotiation position of energy consumers so that they are able to purchase, energy, goods or services at reduced prices. This in turn will improve the return on investment within and EPC contract.
- **Energy brokers** often act as aggregators to be able to obtain better prices or services for their customers and at the same time, providing administrative and other benefits to energy producers. Aggregation is normally done in the interest of the customer rather than the producer.
- **Aggregation of energy efficiency projects:** aggregating several EE projects allows for these projects to be financed as a single unit- increasing access to financing and potentially lowering the cost of capital. In order to achieve aggregation – the EPC contracts signed by the range of clients must be standardized, risk mitigation must be performed in a similar manner and many times funds want all the projects in the aggregated pool to use the same technology. ESCOs, project developers, specialised consultancies or single large clients can all aggregate energy efficiency projects. It is therefore not a specialised market role.
- **The role of the aggregator within Demand Response:** A demand response aggregator is a specialised market role, taking on legal and financial responsibilities within the electricity markets.

An aggregator is a service provider who operates[2] – directly or indirectly – a set of demand facilities in order to sell pools of electric loads or production units (e.g. back-up generators) as single units in electricity markets. The aggregator – a service provider who may or may not also be a supplier of electricity or other participants in the electricity market – represents a new role within European electricity markets. Most consumers do not have the means to trade directly into the energy markets because, for example, they are too small to manage the complexity. They require the services of an aggregator to help them participate. Aggregators pool many different loads of varying characteristics and provide backup for individual loads as part of the pooling activity, increasing the overall reliability and reducing risk for individual participants.

Aggregators “aggregate” consumers’ flexibility, to “build” reliable Demand Response services: they negotiate agreements with industrial, commercial and residential electricity consumers to aggregate their capability to reduce energy and/or shift loads on short notice. They create one “pool” of aggregated controllable load, made up of many smaller consumer loads, and sell this as a single resource. These loads can include fans, electric heating and cooling, water boilers, grinders, smelters, water pumps, freezers, etc. It is important to recognise that the activity of aggregating consumers’ loads requires a number of very specific competencies unique to this role. For example, the aggregator needs significant industry knowledge and experience to identify the flexibilities in various industries, technical assets and processes, and the limitations of those flexibilities, in order to match these to the requirements in a specific market.

Consumers often do not know about their own potential for flexibility, so they need expert support. In addition, aggregators have the technical capability to physically connect the customers and integrate their load into their aggregated pool. These activities require a sophisticated communication

[2] Definition of the Demand Response Aggregator is taken from Mapping Demand Response in Europe Today 2015, SEDC

infrastructure (hardware and software) and a central IT system capable of dealing with a wide variety of loads with different properties.

In the case of the NOVICE model EPC contract - both the ESCO and the Demand Response aggregator must cooperate under a single agreement. The roles and responsibilities of the parties must be clearly defined. The revenue streams and their related risk factors must be defined and the impact quantified, in order for the financier to have insight into the relative risks of any given project.

**Balance sheet:** A balance sheet lists a company's assets, liabilities and owner's equity. Assets are what the company owns (or controls). More formally, assets are resources controlled by the company as a result of past events and from which future economic benefits are expected to flow to the entity. Liabilities are what the company owes. More formally, liabilities represent obligations of a company arising from past events, the settlement of which is expected to result in an outflow of economic benefits from the entity. Equity represents the owners' residual interest in the company's assets after deducting its liabilities. Commonly known as shareholders' equity or owners' equity, equity is determined by subtracting the liabilities from the assets of a company. The information contained in a company's balance sheet is a good way for stakeholders, particularly potential investors, to measure a company's liquidity and its ability to handle unexpected expenses or undertake expansion projects.

**End Client:** The end client is a signee on any EPC contract. This party may be a public, commercial, or industrial client of the ESCO (and by extension the demand response aggregator). From an investor's perspective the most important indicator for a client is their credit viability. They want to ensure that the client will have the ability to pay for the project for the duration of the investment. Many EPC clients finance their own projects and do not require outside financing. Assuming outside financing is wanted, the client must also accept the security measures required by a fund – these can include step-in rights: the investor's right to remove technology if not paid, and any other asset that they require, as a security measure. The earlier in the sales process that these terms are presented and negotiated with the client, the more likely they are to be accepted.

**eQuad:** Software platform developed within the SEAF H2020 project (The Sustainable Energy Asset Framework), which ran from 2016-2018. eQuad was built by a consortium of partners with expertise in sustainable energy assets, electrical and environmental engineering, risk assessment, energy efficiency insurance, and software development.

Joule Europe operates and is the Data Controller of eQuad, a web-based software-as-a-service platform that connects project developers and investors in relation to energy efficiency and renewable energy projects.

The Platform has two main categories of users - project developers/contractors, who submit a project idea or proposal to the Platform, and potential investors or financing entities. The Platform works with, and provides data to, third parties such as an energy performance insurance provider and a provider of quality assurance and due diligence services. After Contractor provides Information about its Projects to the Platform, eQuad uses that Information, where appropriate, to (i) evaluate a Project and generate a Project report; (ii) calculate Project metrics; (iii) make introductions to Investors; and (iv) send Project Information to Investor(s), Performance Insurance Provider, Quality Assurance Provider, and to other contractors engaged by the Platform.

ESCOs, engineering firms, and construction companies can access appropriate investment for their energy efficiency projects.

eQuad significantly lowers upfront due diligence costs for investors by standardizing prequalification processes. Funds or investors can grow their investment pipeline from a larger pool of already vetted, insured, and certified opportunities that meet their investment criteria.

Quad helps easily manage every aspect of the project finance lifecycle with end-to-end project finance support in the form of:

- Financial analysis
- Due diligence
- Project certification
- Performance insurance
- Investor support
- Investment support
- Pipeline growth (for investors)

**Facility Management (FM) company**: Facility Management companies integrate the principles of the administrative, management, architectural, engineering and human science factors around the building administration. Facility managers can, in theory, increase their returns from building management by lowering the running costs of the facility as this increases the margin between the fee they charge to the client and the cost of delivering the service. This includes cost reductions or revenues gained through energy efficiency and demand response. The functions of an FM company are to plan and steer the overall activities of their client relating to correct and efficient global building management, leading the effective integration of services, developing corporative strategies that consider the building resources, space optimization policy, coordination of building and retrofitting projects, contracting all the services and products related with the correct working of the facility, maintenance and conservation equipment. That said, today the returns on investment and payment structures for facility managers are steady and comfortable. They are therefore not particularly motivated to engage in energy efficiency or demand response programs.

**Internal rate of return (IRR):** Internal Rate of Return (IRR) is a metric broadly used to estimate the profitability of potential investments. Internal rate of return is a discount rate that makes the net present value (NPV) of all future cash flows from a particular project equal to zero.

Generally speaking, the higher a project's internal rate of return, the more desirable it is to undertake. IRR is uniform for investments of varying types and, as such, IRR can be used to rank multiple prospective projects a firm is considering on a relatively even basis. Assuming the costs of investment are equal among the various projects, the project with the highest IRR would probably be considered the best and undertaken first.

**Investor:** Within this deliverable, the term 'investor' is understood as a financial fund specialized in energy efficiency and/or a wider variety of sustainable energy assets including renewables – the fund itself is a given amount of capital that is meant to be invested within a specific timeframe and for a specific purpose. In all cases, every fund has its own set of 'investors', or shareholders, with their own individual interests, aims and objectives, who provide the actual capital. In most cases, those providing the capital have little to no expertise in energy efficiency or demand response per se, and the business models upon which projects are based – rather, they are looking to glean steady returns on their investment and are keen to invest capital into the "green" economy.

The definition of 'investor', therefore, while in the broadest sense, signifies a specific fund, it is important to understand that, while many commonalities exist across funds, the fund itself is the face and representation of a group of self-interested individuals who are looking to deploy their own capital in order to make a profit. Given the diversity of the actual sources of capital, each fund is ultimately unique – 'standardizing' funds/investors, and therefore their definition of 'bankability' is possible only in general terms.

**Net Present Value (NPV):** Net Present Value is the difference between the present value of cash inflows and the present value of cash outflows over a period of time. NPV is used to analyze the profitability of e.g. a project investment.

**Return on Investment (ROI):** Return on Investment is a metric used to evaluate the performance of an investment or to compare the performance of a number of different investments. ROI measures the amount of return (the benefit/profit) on an investment relative to the investment's cost. To calculate ROI, the benefit (or return) of an investment is divided by the cost of the investment, and the result is expressed as a percentage or a ratio. The ratio's simplicity is both its strength and its weakness, as it ignores the value of money (compared e.g. to a metric such as IRR).

# 8 STANDARD PROJECT RISK CATEGORIES

An Energy Performance Contract (EPC) is a contractual arrangement between the beneficiary (client/project owner) and the provider of an energy efficiency improvement measure, verified and monitored during the whole term of the contract, where investments (work, supply or service) in that measure are paid for in relation to a contractually agreed level of energy efficiency improvement or other agreed energy performance criterion, such as financial savings (Directive 2012/27/EU). EPC generally falls under two contractual frameworks – the Shared Savings model, or the Guaranteed Savings model, described in full in sections 9.3 and 9.4.

As with contracts, investors have been developing and testing a broad range of risk assessment and risk mitigation tools in recent years with little standardisation of transparent communication between parties. For the main types of risk involved, the status quo in their evaluation and mitigation can be summarised in three categories: General/Traditional risk, Performance Risk, and Enforceability of the EPC contract.

## 8.1 GENERAL/DEBT RISK:

- **Credit risk (ESCOs and End Clients and any third party): This is a primary risk in project finance.** A variety of well-established credit risk assessment methodologies already exist, including international credit rating agencies and companies offering credit checks on a national level. These are represented in a range of national credit rating agencies.
- **Market risk:** This can be seen as either political risk or a regional cultural risk (often interrelated). The investor must be confident the country will stay stable and follow the rule of law for the duration of the investment. This is a question today, even within the Euro-zone.
- **Cultural norms:** The investor must be comfortable with their grasp of local business norms in the area (e.g. could the ESCO simply walk away with the money?). This risk is usually handled by a simple decision to enter the geographical area or not, or by increasing/decreasing the cost of money.
- **Currency risk:** On a global scale, currency risk still represents a significant factor in investments. If needed, currency hedging options are a common practise for mitigating the effects of unfavourable exchange rate movements.
- **Management risk:** Managing energy efficiency projects is a specialist activity and a relatively new sector, less homogeneous than the onshore wind or solar sectors for example. Inexperienced ESCOs that are ill-equipped to deal with complexities and variability in the sector can easily fail.

- **Pipeline risk:** When investors are about to invest in small projects, they do so on the understanding more projects will be brought to them of the same type (the closest the industry comes to bundling projects today). Investors analyse risks to the pipeline to be confident that more contracts will be signed and that they will be able to provide finance to the rest of the End Client base.
- **Regulatory risk:** Any investment whose returns are dependent upon any form of government support are considered to have regulatory risk. This can be a feed-in tariff or a tax break; investors either accept this risk or they do not. If they do not, then a project must demonstrate it is viable without the regulatory measure remaining in place. This process can be simplified through demonstrating this clearly in the modelling of the project itself, as is possible today within platforms such as eQuad.

## 8.2 Performance Risk:

- **Repayment risk:** Projects which are going to re-pay finance through savings made on the energy saved or on energy generated, are 'performance based' and are reliant on correct calculations by the ESCO and on the technology performing as expected. Under-performance can therefore be a significant risk to the success of the project, and more broadly, can impact the reputation of the parties. Standardised performance protocols, as proposed by ICP and specific energy efficiency performance insurance policies, can significantly increase the level of investors' trust in the project's performance and provide assurances in case of failure.
- **Technology risk:** Technology risk is generally easily mitigated by the ESCO by including equipment warranties covering (ideally) at least the whole investment period. However, this does not hold true when technologies are new and untested, the company producing the technology goes bankrupt or the ESCO lacks sufficient experience in their use – all of these risks must also be accounted for.
- **Operations & Maintenance (O&M) risks:** Risks relating to the operation and maintenance of the building and/or installed technology must be mitigated in performance-based contracts. Detailed specifications in the EPC contract on roles and responsibilities as well as transparency in the Measurement and Verification processes throughout the project duration are of utmost importance.
- **Interface risk:** As with O&M risks, the roles and responsibilities between the ESCO and the End Client need to be contractually defined, in order to avoid any unauthorised maintenance work or alterations taking place on the installations.
- **Energy price risk:** Two main forms of ESCO-End Client contracts, namely EPCs, are often based on savings/earnings in terms of kWh and the value of that kWh. Mitigation for energy price fluctuations (assuming they are relevant) could include: fixing longer-term energy prices with suppliers; hedging the price risk away on the commodity market; or simply understanding what the risk actually is and deciding if it is a threat to the project. The answer may be no, depending on the margins and the payback time.

## 8.3 Enforceability of EPC contract:

- **Enforceability of EPC contract(s):** as the security package with EPC contracts is different than with energy generation projects, it is necessary to pay attention to the enforceability of contracts. It is particularly important to consider what happens in the case of bankruptcy of the ESCO itself and/or its End Clients (this is also dealt with in contract standardization).

This is a short summary of the main project risk categories considered by most investors. However, today each of these categories are tracked with different levels of detail. Investors tend to learn from their own mistakes, more than they learn from each other, which can be a painful process. Joule Assets has had discussions with funds that have stated that 80% of their first investments failed because they neglected entire risk categories or didn't fully understand the risks, and potential consequences, that they had identified and analysed. Funds had also refused investments in projects that they perceived as being too risky and missed massive opportunities. In fact, most **first** funds – newly raised funds which are on their first round of investment and have never invested in these types of projects previously - tend to lose money or just break even due to poor investment decisions based on improper risk analysis.

**A more significant problem** (beyond the increase in project failure rates) is that the lack of standardisation and categorisation of risk, prevents two critical market developments:

1) **Projects cannot be bundled between funds** It is not possible to know which risk criteria were applied to a given set of projects and with what rigour. Therefore, different projects, assessed by different funds do not necessarily have the same risk profiles.
2) **The categorisation/benchmarking of projects** is not possible because the risk criteria are not transparent or known outside the financial institution carrying out the risk assessment itself. This therefore blocks the ability to benchmark projects – there is no common tools for analysis and grading.

The risk factors outlined here were reflected in the NOVICE 4.5 questionnaire and also Joule's analysis of EPC contracts as described below.

# 9 ENERGY PERFORMANCE CONTRACTS (EPC)

In principle, EPC requires a reliable source of finance to work. In an EPC, the end client (energy user) enters into a long-term agreement with the ESCO, which is based upon guaranteed performance of installed equipment to achieve energy savings – the initial investment and its financing cost must be paid back through the savings made on the client's energy bill. In this model, the ESCO performs the energy audit, project development, technical design, construction, commission, and provides the savings guarantee through Operation and Maintenance (O&M) of the equipment installed. The guarantee is the critical element here, as the energy savings are considered the means of repaying the project investment.

While numerous innovative financing options exist, the most typical ways of financing EPC projects are either through straight debt (also known as ESCO "self-finance"), or equity and Special Purpose Vehicle (SPV).

## 9.1 SELF-FINANCING AND BANK LOANS

**Self-finance:** A typical practice for energy efficiency projects is "self-finance" – where the project is financed either directly by the project owner or the ESCO itself. This is usually done using the ESCO or client's equity (provided they have enough equity).

**Finance EPC as a bank loan:** Most commonly an ESCO or client 'self-finances' a project, through standard interest-based loans (debt) issued by their own bank. In this case, the loan rates and payments amount are not based on the performance of the project. And this performance is often never measured or verified. In the case of debt, debt is always recorded directly on the borrower's books, an interest rate is always charged at a fixed rate, and a payment schedule is always outlined in the contract.

If the ESCO finances the project through a bank loan, they take on debt in order to be able to sell their services and projects to end clients. This often limits their ability to grow, as most SME ESCOs will be unable to take more debt on their books.

The main benefit of debt for most ESCOs is that interest rates are generally quite low (approximately 2-3%). However, while low interest rates may be attractive and the process of applying for a bank loan familiar, the reality is that this model means that an ESCO takes on debt every time it has an opportunity to provide its valuable services. This debt is counted as a direct liability on the ESCO's balance sheet and increases its debt-to-equity ratio. Less equity directly limits the opportunities the ESCO can take on, such as hiring new staff to sell and deploy energy efficiency projects – ultimately limiting its growth. ESCOs that rely on loans therefore struggle to scale up the volume of projects they take on per year and find themselves constantly looking to balance their books, as opposed to growing their equity value. Furthermore, debt does not offer flexibility in terms of payment schedules, or for future financing – it is always a one-off, project-by-project arrangement.

It should also be noted that debt may **undermine** an EPC in that it complicates the sales process. The finance is a key element of the entire offering and should be highlighted in the first communication with the (potential) client. The nature of taking on debt on a per-project basis means that there is no real guarantee that an institution will provide debt a second or third time. The lack of certainty to access the capital therefore complicates the messaging which should be used to sell an EPC and represents a significant Achilles' heel in the ESCO's sales process.

Bank loans also impact the sales messages surrounding EPC as a managed energy efficiency service for which the ESCO is paid according to performance. Because loans must be paid at the same rate whether the project performs or not, the ESCO then takes on the full risk for the performance of the project, meaning that if they project does not generate the savings for the client, they must pay the fund in any case – even if they are not receiving these amounts from the client.

A bank loan which involves fixed payments and strict debt covenants, forbidding conversion or selling before maturity, should only be treated as a last-resort, one-off option, particularly in the case where a "proof of concept" is required to establish credibility during a business model transition. It is important to analyse the long-term costs/benefits of debt, as it may weaken an SME ESCO's already fragile financial health. Debt usually does not result in a long-term financial partnership that protects the ESCO's financial health, nor does it take into consideration the ESCO's future ability to roll out more projects.

## 9.2 Equity financing and Special Purpose Vehicles (SPV)

Equity may be considered money that is spent on a project that is not paid back through pre-defined fixed payments; rather, the ESCO, project owner, and investor all own part of the project and stand to benefit or lose depending on its performance. Both capital and expertise are contributed to a project; the contributing lenders and experts then own the assets. As a result of the cash flows generated, the equity owner then receives an economic benefit – whether dividend, disbursement or other.

One of the most desirable types of third-party finance offered for energy efficiency and renewable energy projects is through *equity financing*. Equity financing involves raising capital through the sale of shares in an enterprise. In the case of energy efficiency or renewables, the project, or grouping of projects, becomes part of the "enterprise", held within what is known as a Special Purpose Vehicle (SPV).

In this context, an SPV is the means to providing equity finance to a project. It consists of a joint "company" with shareholders, created on an ad hoc basis that carries the financial risk of a project and holds the assets. The "company" may consist of the investor(s), the ESCO, and project owner, or any combination of these parties. As an SPV is a custom-made structure, there is a high degree of flexibility as to the shareholder structure, and this may vary from project to project.

In place of the financial partner or ESCO, the SPV itself assumes the transaction risk and owns the assets and transfers the technical risk to the ESCO. All economic consequences generated by the initiative are attributed to the SPV that is designated to secure cash receipts and payments (lenders finance a venture, not an operating firm). The assets of the SPV are the only collateral available to lenders together with the cash flow from the initiative. Approval of the financing is a function of the project's ability to generate cash flow, to repay the invested capital, and pay dividends on the capital invested at a rate consistent with the degree of risk inherent to the venture concerned.

A key benefit of financing through SPV, is that it is off-balance sheet, meaning that is has its own balance sheet to document its assets, liabilities and equity, and appear on the parent company's balance sheet as an investment asset and not as debt. Stakeholders involved typically prefer this arrangement due to improved management of assets and liabilities, lower risks, higher credit ratings, lower funding costs, and greater financial flexibility and lower capital requirements. For ESCOs, entering into an SPV safeguards their balance sheets and may therefore open the possibility of multiple transactions and projects with investors.

Despite the benefits, however, an SPV is not suitable in all circumstances, particularly for small, standalone projects. Heavy administrative requirements and legal costs mean that an SPV is time consuming and requires a good deal of upfront capital for legal and accounting support (for example, it is necessary to file a tax return on the SPV). The project must therefore be large enough (in general above €2 million) with strong projected cash flows. The partners also must have the resources to withstand the extra administrative costs.

Due to the fact that the majority of energy efficiency projects are smaller investments (under €1 million, and usually under €500,000), an innovative solution that many investors look to structure is bundling several projects into one SPV. Therefore, this may be a viable option for ESCOs with a strong pipeline that would enable them to receive finance for several projects at once and enter into a financial transaction that frees up their balance sheets, allowing for more growth. As was already mentioned in the risk section, it is crucial to have standardized procedures in order to cluster projects and to reduce upfront costs.

Otherwise EPC contracts work well within an SPV structure. The roles and responsibilities of the parties are made clear within the contract form. An equity stake in a company or project is always impacted by performance and deciding who takes which risk within an equity arrangement is part of the negotiation process in either case.

## 9.3 Analysis of Guaranteed Savings EPC Model

In a Guaranteed-Savings EPC, the Contractor takes over the entire performance and design risk by guaranteeing a certain level of savings to the End Client. This guarantee means that the ESCO is contractually obliged to fill any performance gaps, but on the other hand will benefit from overperformance of the installed technology. With this level of performance risk, the Contractor is unlikely to be willing to further assume the credit risk of the End Client. Thus, the End Client is financed directly by an investor, e.g. through a loan.

### 9.3.1 Key Applications

The credit worthiness of the end client is one of the first risks an investor will investigate prior to active engagement. Although an investor usually does not engage directly with the ESCO's client, an investor may approve (or disapprove) an investment upon certain adjustments in the ESCO's contract with its end-client.

*Table 1: Key Applications - Guaranteed savings model*

| KEY APPLICATIONS | KEY RISK IMPLICATIONS | | | |
|---|---|---|---|---|
| **End Client:** The End Client has to have the financial health to sustain the liabilities towards the investor<br>**Technologies**: Include EE and RES, usually well-established technologies, often in a comprehensive agreement, that addresses the full scope of a facility's needs<br>**Project size:** Usually longer-term (3-10 years) projects<br>**Markets:** Market requires well-established banking structure, high degree of familiarity with EPCs and technical expertise | **RISK TYPE** | **INVESTOR** | **ESCO** | **END CLIENT** |
| | Credit risk (Client) | **X** | | |
| | Credit risk (Contractor) | | | |
| | Repayment risk | | | **X** |
| | Performance risk | | **X** | |
| | Energy price risk | | | **X** |
| | Technology risk | | **X** | |
| | Regulatory risk | | | **X** |

| + / – FOR INVESTORS | + / – FOR ESCOS | + / – FOR END CLIENTS |
|---|---|---|
| + Investor deals directly with the End Client | + No Client credit risk<br>+ Off-balance sheet: more projects possible | + |
| – | – Smaller uptake from project returns<br>– Complex and time-consuming to set up (particularly for new ESCOs), thus making it a harder sale to the End Client | – Liability is on balance sheet<br>– Energy price risk in on the End Client, as the Contractor only guarantees kWh savings |

### 9.3.2 How it works

In a typical guaranteed savings contract the customer takes out a loan from a financier to finance the investments in energy savings. The customer contracts with the EPC provider to implement the energy savings works. The provider assumes performance risk by guaranteeing energy savings. The customer pays the provider on acceptance of the installation, possibly withholding a portion until savings have been verified.

The customer may also pay the provider an ongoing fee to verify savings annually or maintain the equipment. If savings are insufficient, the EPC provider pays the difference between what was achieved and what was guaranteed. The savings are valued based on fixed energy price agreed at the outset. Here the provider takes the performance risk, the customer takes the energy price risk and the financier takes the credit risk.

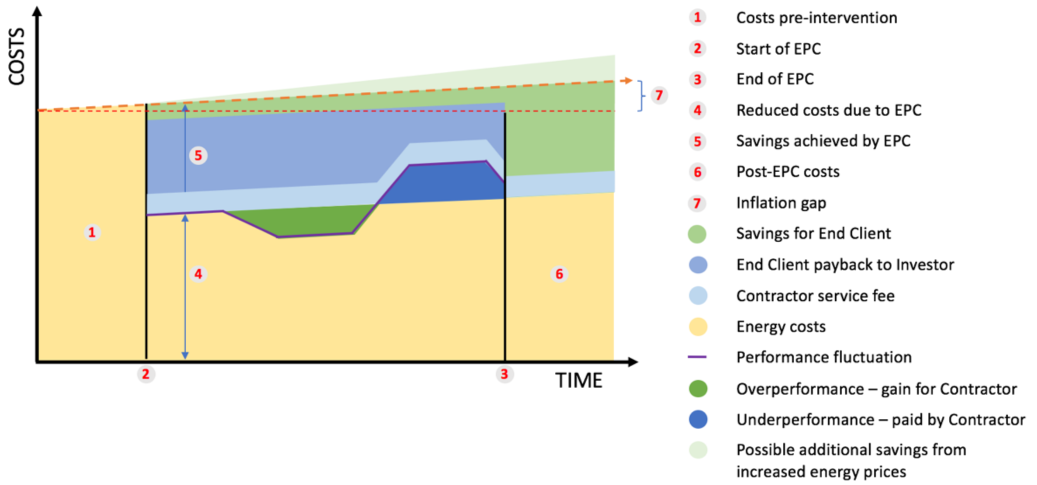


*Figure 1: Guaranteed savings model*

### 9.3.3 EPC Guaranteed Savings model - Stakeholders

The EPC provider designs and implements the project and guarantees the energy savings. If the savings are less than expected, the EPC provider covers the shortfall. Usually a third party provides the financing directly to the customer; the EPC provider may facilitate the financing arrangements.

In a typical guaranteed savings contract the customer takes out a loan from a financier to finance the investments in energy savings. The customer contracts with the EPC provider to implement the energy savings works. The provider assumes performance risk by guaranteeing energy savings. The customer pays the provider on acceptance of the installation, possibly withholding a portion until savings have been verified.

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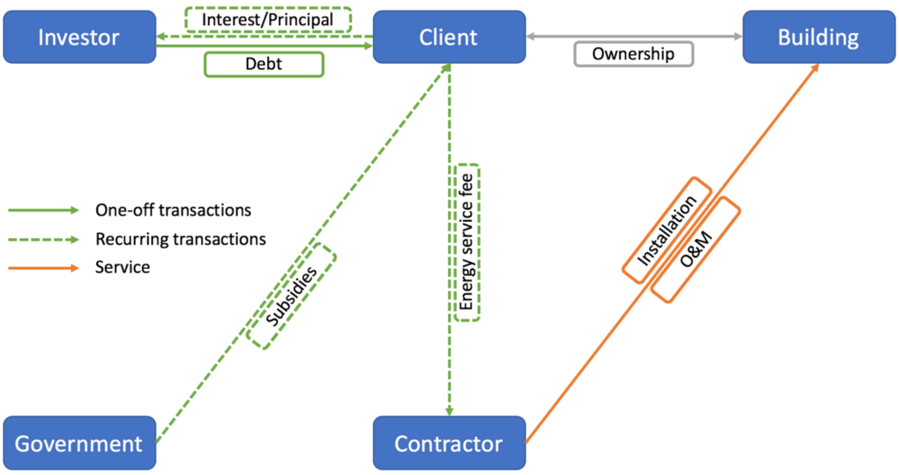


*Figure 2: Guaranteed savings model-stakeholders*

### 9.3.4 Key risk implications

There are generally three main categories of risk that touch this type of contract structure. The first is the performance risk, which falls on the shoulders of the ESCO. A further risk is the market risk. This risk is that the energy costs may rise or fall, potentially reducing the value of the EPC to the organization. These risks are now typically borne by the end client. Finally, there is a debt risk, i.e. an obligation to make a series of future payments which is usually borne by the customer but may be taken on by the ESCO in a shared-savings scheme. If there is a third-party finance company providing the cash (and there usually is since few ESCOs are large enough to fund projects from their own reserves), then the finance company bears a credit risk.

It is often the case that there one party takes on more risk than others. In the guaranteed savings model that is the ESCO since the ESCO assumes the performance risk by guaranteeing kWh savings and the energy price risk, and this liability is on their balance sheet. The ESCO has the benefit of no client credit risk since that falls on the investor in this model and it is also off balance-sheet finance which is highly beneficial for the ESCO. The biggest downfall for investors is of course that they take on the client credit risk however that also means that they are dealing directly with the end client which eases things for the investor from a procedural point of view.

The guaranteed savings model is a rather complex and time-consuming arrangement to set up, and this, combined with the risks to the client, makes it harder to sell.

## 9.4 Shared Savings EPC Model

In a **Shared-Savings EPC**, the ESCO designs, finances (or facilitates finance), and implements the project, verifies energy savings and **takes an agreed share of the actual savings** over a fixed period **with the End Client**. The Contractor itself may choose to receive financing from an external investor. In case external finance is provided (e.g. through a loan), the share of savings retained by the Contractor must exceed the debt service payments to the investor.

- **Option 1:** A so-called **"first-out" clause** would command that the End Client only starts to benefit once the Contractor has been repaid in full.
- **Option 2:** A "**single energy price**" can be stipulated with the value of the service being agreed upfront (resembles Guaranteed-Savings approach, see below)

### 9.4.1 How it works

The EPC provider designs, finances, and implements the project, verifies energy savings and shares an agreed share of the actual energy savings over a fixed period with the customer. The EPC provider may receive financing directly from a third party.

*Table 2: Key Applications and risk implications - Shared savings model*

<table>
<tr><th>KEY APPLICATIONS</th><th colspan="4">KEY RISK IMPLICATIONS</th></tr>
<tr><td rowspan="8">End Client: The ideal End Client is cash poor, but financially healthy (e.g. municipalities)<br>Technologies: Include EE and RES, usually well-established technologies, often in a comprehensive agreement, that addresses the full scope of a facility’s needs<br>Project size: Usually longer-term (beyond 5 years, often beyond 10) projects<br>Markets:</td><td>RISK TYPE</td><td>INVESTOR</td><td>ESCO</td><td>END CLIENT</td></tr>
<tr><td>Credit risk (Client)</td><td>X</td><td></td><td></td></tr>
<tr><td>Credit risk (Contractor)</td><td>X</td><td></td><td></td></tr>
<tr><td>Repayment risk</td><td></td><td>X</td><td>X</td></tr>
<tr><td>Performance risk</td><td></td><td>X</td><td>X</td></tr>
<tr><td>Energy price risk</td><td></td><td>X</td><td>X</td></tr>
<tr><td>Technology risk</td><td></td><td>X</td><td></td></tr>
<tr><td>Regulatory risk</td><td></td><td>X</td><td></td></tr>
<tr><th>+ / – FOR INVESTORS</th><th>+ / – FOR ESCOS</th><th colspan="3">+ / – FOR END CLIENTS</th></tr>
<tr><td>+</td><td>+ Sharing savings incentivizes the End Client to minimize energy use and thus reduce the energy performance risk<br>+ Revenue from installation, O&M and possibly project equity</td><td colspan="3">+ No capital requirement<br>+ Off-balance sheet improvement of the building<br>+ Single payment to Contractor for design, operations and financing</td></tr>
<tr><td>− The long duration of EPCs could represent a higher risk to the investor, as there is no guarantee that End Client and Contractor companies will remain sufficiently unchanged for the project lifetime</td><td>− Complex and time-consuming to set up (particularly for new ESCOs), thus making it a harder sale to the End Client<br>− Contractor must have a strong track record and strong balance sheet</td><td colspan="3">−</td></tr>
</table>

In a typical shared savings contract the ESCO offers the capital (perhaps out of its own funds or out of a loan from a third-party financier to cover the cost of the investments in energy savings).

Typically, the term of the contract and the loan will match, and the provider share of the savings will exceed the loan repayment costs. Importantly, the financier is taking the risk that the provider may be unable to repay the loan; if the provider is a small or medium enterprise, the cost of credit may be quite high – from 7-9%. In some cases, the energy savings may be valued based on prevailing energy prices, which means the provider also takes the energy price risk. These conditions generally mean the provider is a large enterprise with strong balance sheet and access to capital markets.

Although this contractual arrangement can specify that the EPC provider will guarantee, rather than share, the savings, the provider is likely to prefer to share. Sharing savings incentivizes the customer to minimize energy use and reduces the energy performance risk.

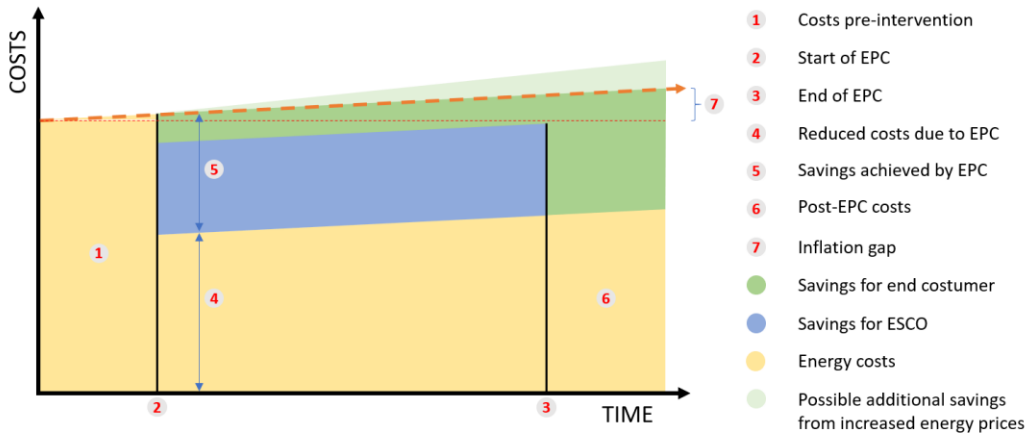


*Figure 3: Shared savings model*

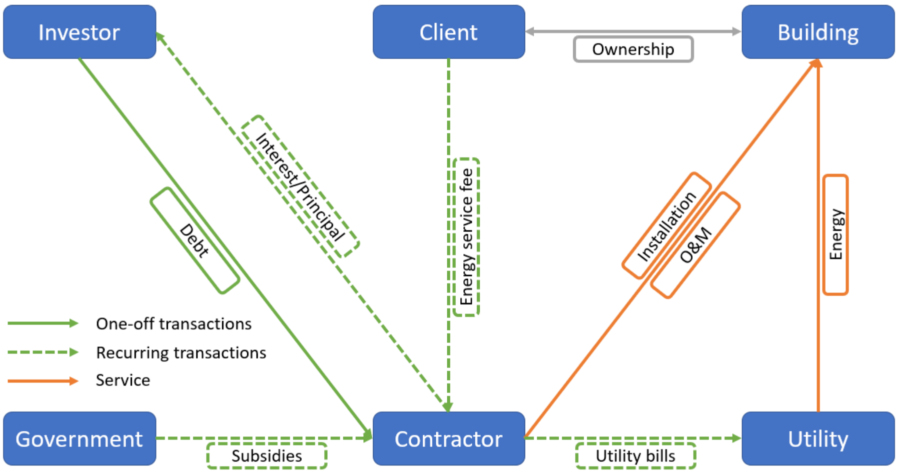


*Figure 4: Shared savings model-stakeholders*

# 10 EPC Bankability Assessment

This chapter analyses the bankability – the attractiveness and ability of Financial Institutions (FIs) to invest in projects under this contractual framework – of EPC, and specifically the NOVICE dual energy services EPC, for investors. The most commonly approaches used by ESCOs to finance energy efficiency projects are debt or the Special Purpose Vehicle. It is important to keep in mind that EPC is not a financing mechanism in itself but a contract which implies that financing comes from a source other than the end-client's pockets.

## 10.1 Methodology

The below assessment was made through in-house desk research, an internal review of EPC project negotiation with banks, private funds and infrastructure funds and supplemented by interviews with ten representatives of financial institutions within Europe, representing private equity funds, and public-private partnerships (PPPs). All investors interviewed offer financing solutions for EPC, though in reality these financing options take the form of standard bank loans.

### 10.1.1 Questionnaire introduction

For this study Joule created the below questionnaire in order to gain further insight into investors' views of and requirements for EPC. We reached out to 23 investors for interviews and 10 agreed to answer the questionnaire. The interviews were performed in online calls (in December 2019).

### 10.1.2 Questionnaire

The following questions were put to respondents:

- In the case that you can finance EPC contracts, do you have a preference between the shared savings model and the guaranteed savings model?
- What are the main risk elements associated with
    - Shared savings
    - Guaranteed savings
- Are you able to combine demand response with energy efficiency within an EPC (or other finance structure)?
- If yes
    - How would this be different from a standard energy efficiency EPC? What would the critical contractual requirements be?
- If no
    - why not? What are the barriers to investing in a project combining these technologies?

- Key Contractual elements that influence an EPC's "bankability" according to Client type:
    - Private end-client
    - Public end-client
    - Public-private partnership
- Key contractual elements that influence an EPC's "bankability" according to Building typology:
    - Industrial building (factory)
    - Commercial site
    - Other?

- Key EPC contractual elements that influence an EPC's "bankability" according to building ownership structure:
    - Sole Proprietorship
    - Partnership
    - Corporation (for-profit)
    - Not for profit
- Negotiation process for private end-client
    - Typical negotiation process
    - Main risk factors that need to be assessed and deal with in EPC structure
- Negotiation process for public end-client

  - Typical negotiation process
  - Main risk factors that need to be assessed and dealt with in EPC structure
- Any other overarching collateral and guarantees required in an EPC that eliminate risk?

## 10.2 Financial Institution Typologies

The respondents fell into three main categories: Private funds, and public-private partnership funds consisted of the majority, with one respondent coming from a large, socially-oriented bank.

### 10.2.1 Banks

A bank core financing product is providing loans against assets. Today most banks require a (at least) 100% guarantee against any loan they provide. This means that they will expect the loan to be backed by assets of the same (or higher) value. It also means that a bank will predominantly focus on the credit risk of the end client. Is the client financially strong enough to pay back the loan? If they fail, can the bank take their physical assets (equipment, buildings, …) to pay back this loan? This sets up a core conflict when dealing with EPC contracts which are not necessarily backed by the value of any physical assets, but rather are based on the promise of future energy savings. In other words, the security of the loan is based upon a contractual arrangement.

Today this means that most banks do not finance EPC contracts, or if they do, they ensure that they secure these loans through assets, and not through the promise of future savings based on a contractual agreement. This leaves the ESCO and the end client in the situation of having to have a sufficiently high credit rating, to attract a loan (just as they would if they did not work under and EPC agreement) and it shuts most of the market.

Another challenge is project size. Most energy efficiency projects only require €500,000 or less. Banks are actually interested in projects of €50 million and above (this is the reality, not what is publicly stated). A €10 million project is small but perhaps manageable. This is due to the fact that their internal due diligence processes are slow and expensive to run. They usually require at least 6 months to perform full project due diligence but often significantly longer. The cost of paying the personnel to be engaged at all, for that amount of time, means that they will lose money on small projects - no matter the performance. Also, unlike a fund, which can charge between 8%-15% in interest, a bank will usually be charging below 5%. This gives them very little margin for either risk or upfront expense.

However, no matter the reasons, either the bank is uninterested in specialised loans and sees them as a niche product to make regulators happy, or there are almost no projects of a large enough size to engage them. What they remain able to do, is provide bank loans to financially strong project developers or end clients who are willing and able to take on more debt to their balance sheets. For this, the loan form is the same as would be used to buy a car, a new piece of equipment, or any other asset.

### 10.2.2 Private Funds

Specialized, private investment firms with energy efficiency funds, generally offer a range of financing structures to ESCOs, (including debt, equity, forfeiting and leasing), based on the mandate of the fund itself and the specificities of a given project. A key task for each fund is raising capital from shareholders; depending on the shareholders, investment criteria may vary greatly from one fund to another, including risk profile, minimum investment ticket, project size, type of projects and geographical location.

The funds usually have some in-house technical expertise on energy efficiency/renewable energy projects, which means they possess a greater understanding of the technical aspect of projects than more traditional financial institutions such as commercial banks. They also have more leeway and freedom in their investing strategy since it is private funds being invested.

#### 10.2.3 Public-Private Partnership Funds

Numerous large public-private funds dedicated to energy efficiency exist in Europe. These types of funds are based on a partnership between three or more public and private bodies including commercial or investment banks, as well as national or European authorities. The funds generally pool investments from a wide range of shareholders: institutional and private investors, donor agencies, governments, and international financial institutions.

Receiving funding from public-private partnership funds represents two key benefits to ESCOs (assuming it is accessible to them at all). Firstly, in the case that a project fits the investment criteria, these funds may be flexible in terms of contract structure. Debt, equity, EPC, and leasing are all viable options for most funds. Secondly, the geographical scope of these funds is often wide; public private partnership funds exist at both national and European level, which mean that finance is available in most European member states for larger projects. These are more restricted since they are institutional and have a responsibility towards their customers, therefore they can't take the same risks as a private fund. ESCOs turning to banks as a finance solution need to be prepared to present a very strong, low-risk business model or accept debt.

### 10.3 Bankability Traits Common to Shared and Guaranteed Savings EPCs

The results shown below reflect the conclusions drawn from the internal research, desk research and interview results for NOVICE Deliverable 4.5. As mentioned, many financial institutions will finance projects organized under EPC contracts yet do not rely on the future savings as receivables, rather they rely on physical assets and the credit rating of the parties to secure the investment. If a project is secured in the 'true' EPC fashion (secured against the value of future energy savings) this is usually within an equity investment in an SPV structure.

In that regard, it is questionable whether one can really conclude EPCs are bankable today in Europe, with or without demand response projects included. Though a few selected funds will accept future savings as a form of security in reality most financing sources disregard future savings and focus instead on credit risk and physical assets. That said, EPC agreements will still be financed in this case but as a normal loan or equity investment.

Below is a review of how standard risks are analysed during the financing process:

#### 10.3.1 Stage one: Pre-due diligence:

Prior to performing due diligence, the investor must assess whether the project is interesting to engage with at all. They require little information to perform this exercise. The following key information points usually suffice:

- **Location:** This question covers market and regulatory risks. The investor will learn from this, if the project is taking place in a Member State they cover. They will also assess if they are already over exposed to risk from this market. For example, at time of writing, funds are careful not to be over exposed to UK market risk, due to Brexit. Therefore, even if a fund may cover a Member State in theory, they can reject a given project, if they judge they are already exposed to that risk.

- **Size of project:** Is the project large enough to be worth engaging with? Most funds require a project or secure portfolio of projects to be over €5million. However, a few specialised funds will engage with projects of €1-2 million or accept portfolios of small projects that add up to €1-2 million. These are still the exception.

- **Duration of contract:** Funds will have specific criteria here, depending on who their investors are. For example, a pension fund will look for contracts of 15 years and above. A private fund may only accept contracts of 5-10 years.

- **Payback time:** The fund will want to know how quickly they will be paid back and when they begin to earn. Again, this will be decided by what they have promised their own investors, balanced by the perceived risk of the project. Most funds that engage with eQuad, have an average expected payback time of 5 to 7 years. (The range is in general 3-8 years, with a median of 5 years.) Longer payback times are generally avoided. The longer the payback time, the more the financial health of the end client is of critical importance. The client must demonstrate its solvency, as well as a long-term growth strategy.

- **Internal rate of return:** To attract the attention of investors, especially for small energy efficiency projects (with or without demand response) a strong internal rate of return (IRR) of at least 10%-12%, is necessary. IRR is a metric used to measure the profitability of potential investments. The IRR is the interest rate percentage that produces a net present value of zero when calculated for the expected stream of future cash flows. For a financial institution, an expected project IRR that is greater than its minimum required return on investment suggests that the project could be undertaken.

  The IRR is calculated for a given time span, and for a project with up-front costs and a steady stream of positive cash flows continuing for several years. Therefore, the higher a project's internal rate of return, the more desirable it is for an investor to undertake the project. Faced with projects with equal IRRs, the project with a higher NPV would be chosen by an investor. The underlying assumption with IRR is, that all returns are reinvested at the same rate (which might not always be granted!).

- **Technology:** Is it a new technology they cover? Is the risk they calculate is brought by the technology balanced by other factors such as the project size? If a technology is complicated or new, the project size may need to increase significantly in order to be acceptable.

As mentioned, each financial institution in the eQuad Investor Community has specific targets in terms of technology, geographical location, project size, and beneficiary type (i.e. commercial, industrial, public etc). While diversity in investors' specific criteria and due diligence practices is to be expected, the eQuad team has identified key, repeatable criteria that ESCOs must be aware of. These key criteria can be answered by the questions above.

**Demand response** is an unknown program type for many investors with unsteady (and unpredictable) revenue streams. That said, as it is also only used to increase the revenue of a project rather than the core business model, this can be overcome by simply basing the financing model on the energy savings rather than any eventual demand response revenues.

Private Equity Funds may find a NOVICE EPC bankable under the conditions that:

- Their fund criteria allow them to invest in DR technology. Some investors have much more open technology criteria than others. For example, a fund that is legally bound by its investors to invest in specifically LED projects cannot invest in a dual energy services project.

- Public Private Partnerships often have mandates that look not only on technology but on the overall $CO_2$ savings that the project will present. In this case the project will only be deemed bankable if the DR can be justified directly through $CO_2$ savings. The ESCO would therefore need to demonstrate that the addition of DR measures allow for greater renewable capacity on the grid, therefore indirectly creating $CO_2$ savings by reducing the carbon intensity of grid electricity. At the moment, there is no commonly accepted methodology for such a proof.

### 10.3.2 Stage 2: Due Diligence

Assuming the fund decides to engage, the due diligence phase can begin.

- **Credit risk (ESCOs and End Clients and any third party):** This is a primary risk in project finance. Beyond the elements named above, the credit worthiness of the end client is one of the core risks an investor will calculate. While it is necessary to demonstrate that the project is well designed and has attractive returns, of equal importance to securing finance is to prove the debtor's ability to pay throughout the duration of the payback period. High levels of debt on a building owner's books should be duly considered by the ESCO before project design has begun (assuming this information can be made available); financiers will not be willing to engage a project if there is doubt as to the end client's ability to pay its future energy bills. Indeed, during the SEAF H2020 project, over 50% of ESCO stakeholders reported that negotiations for investment in a project stalled due to the balance sheet of the client.[3] The ESCO must therefore consider the end client's financial health and demonstrate this to the investor.

  Although an investor usually does not engage directly with the ESCO's client, an investor may approve (or disapprove) an investment upon certain adjustments in the ESCO's contract with its end-client. This can usually be performed relatively quickly through national credit rating agencies or through looking at the Clients financials – assuming these are available and in good order (if not- the project will usually not go forward in any case).

- **Performance risk:** As stated above, projects which are going to re-pay finance through savings made on the energy or on energy generated, are 'performance based' and are reliant on correct calculations by the ESCO and on the technology performing as expected. Investors do not accept performance risk in an EPC structure; this must be taken by the ESCO, client, manufacturer or other third party. Performance risk is connected to a project's failure to perform as intended or meet business requirements, which in turn can extend the duration of the project and increase technological costs. In the case where performance risk is accepted, much higher returns from the project are generally expected (for example within an equity arrangement in an SPV).

[3] The Sustainable Energy Asset Framework: Bridging the gap in energy efficiency finance, connecting opportunity to capital: A Review of capital sources available for energy efficiency projects, key enablers and barriers for ESCO and investor success, 2018, Joule Assets Europe.

- **Enforceability of EPC contract(s) and Interface risk:** as the security package with EPC contracts is different than with energy generation projects, it is necessary to pay attention to the enforceability of contracts. This is problematic for small projects in particular. If a client refuses to pay or the project does not perform it can cost more to instigate legal proceedings than the value of the project itself. However, the return rate on the investor's portfolio will be reduced causing them both financial and reputational harm. It is an expensive risk. Joule knows of three such on-going cases where the client or the ESCO has the ability to pay investors, but it is simply not viable due to the fact that they know legal proceedings are costlier than the value of projects.

- **Operations & Maintenance (O&M) risks:** Risks related to the operation and maintenance of the building and/or installed technology must be mitigated in performance-based contracts. Most investors handle this risk by ensuring that part of the ESCO's payment is reserved for O&M services, incentivising them to stay engaged for the long term.

- **Price risk:** ESCO-end client EPCs are often based on savings/earnings in terms of kWh and the value of that kWh. That said, in reality this risk is usually not a particular issue. What can be more problematic is understanding the revenue streams of projects with multiple sources of income (for example those that also use demand response).

  Each revenue stream will require its own due diligence review. If there are tax breaks involved – have they been calculated correctly in relation to their value for a specific client? If there are subsidies, how long do they last, and will the project be built in time to take advantage of them? If there are demand response revenues, how stable is the market, and the market's regulatory framework? This process can usually be performed successfully but requires time; for example, an investor may ask the ESCO to completely re-model their contract according to next year's regulations etc. Projects which include demand response will always go through this process.

- **Management risk:** Managing energy efficiency projects is a specialist activity and a relatively new sector, less homogeneous than the onshore wind or solar sectors for example. In the case of projects which include both demand response and energy efficiency measures, there will be two management teams which come under review; the ESCO team and the demand response aggregator. This will effectively double the amount of work required to persuade an investment team of the management's capabilities.

- **Pipeline risk:** When investors are about to invest in small projects, they do so on the understanding that multiple similar projects will be carried out within a given amount of time. This process is unaffected by including or excluding demand response. Points analysed here are: how far along is the ESCO in their negotiations with future clients, how clear and motivating is the deal being offered to these clients, how many parties are involved (many small possible clients or a few larger opportunities)? Pipeline risk is a key risk, if projects or project portfolios are small or on the edge of the lower limit for a fund.

## 10.4 Key provisions missing from EPC contract

The contract between the ESCO and end client should be developed in partnership with the investor prior to the end client's signing; in some cases, standard EPC contracts drafted by ESCOs miss key provisions that are essential for the investor prior to structuring a deal with the ESCO. Missing or incomplete provisions can represent a "deal breaker" with an investor, or can dramatically slow the negotiation process, especially if the contract is signed by the end client prior to the investor's review. The following are common examples cited by financiers:

- A robust Maintenance and Operation plan should be explicit. A contract should not have an "install and walk away" policy, as investors expect EPC contracts to have a clearly defined Maintenance and Operation strategy in place, especially when the project duration is not short term and given that repayment is based on energy performance.
- The project owner should be specified. In an EPC it is of great importance for investors that the ESCO verify that the client is the actual owner of the project site. It is important to keep in mind that the investor will have to do a much deeper level of due diligence than the ESCO and will require the deed for the building. The contract should therefore clearly outline that the client is the site owner.
- Step-in rights should be defined. Most eQuad investors require clearly defined terms under which they can select a different ESCO to take over the EPC. This is often missing from standard EPC contracts.

# 11 Conclusions

One of the principal hypotheses of the NOVICE project was that the combination of Energy Efficiency (EE) and Demand Response (DR) measures would reduce project risk by increasing revenues, reducing payback time, and increasing IRR, thus making projects more attractive for clients and more investible to investors. However, the findings of this deliverable indicate that, while in theory this model works, the reality is that for investors, a dual-revenue stream EPC, while not impossible, is more, rather than less, complicated. This is largely because DR does not explicitly fit with most investors' criteria for projects and would need further justification, and the fact that the revenue streams coming from DR themselves cannot be guaranteed in the same way that pure energy efficiency measures can be. Below are the key conclusions of the report:

1. **Demand response is an unknown programme type with unsteady und unpredictable revenue streams and is a 'grey technology area' for many investors:**

Ultimately, a project's overall ability to fit a given investor's mandate/criteria are among investors' top considerations when assessing a project. For investors interviewed for this deliverable, the project should be financially viable with EE alone; additional revenues from DR would be considered more of a 'bonus' that would need to be justified to fit their specific fund criteria. This is especially considering that volatility of electricity markets and prices add an element of uncertainty to long-term revenue streams; typical measures to alleviate risk associated with standard energy conservation measures, such as warranties or performance insurance, are not possible for DR.

As yet, demand response is not a commonly recognized measure by most investors. For many, demand response remains an unknown programme type with unsteady and unpredictable revenue streams. At best, an investor may have more 'open' technology criteria or fund mandates, which would allow any 'green' energy measure to be eligible.

That said, if DR is used to increase the revenue of a project rather than the core business model, these issues can be overcome simply by basing the financing model on the energy savings rather than any eventual demand response revenues. Private Equity Funds may for example find a NOVICE EPC bankable under the conditions that their fund criteria allow them to invest in DR technology, keeping in mind that some investors have much more open technology criteria than others. Public Private

Partnerships often have mandates that look not only at the technology but on the overall $CO_2$ savings that the project will present. In this case, one should aim to justify the demand response directly through $CO_2$ savings, in which case bankability can be achieved.

2. **The current state of the art is that financing EPC using pure energy efficiency measures remains a challenge for investors:**

Beyond the question of the NOVICE dual-revenue stream model, this deliverable demonstrates that the current state of the art is that financing of EPC itself using pure energy efficiency measures remains challenging for investors. **Many investors will finance projects organized under EPC contracts yet do not rely on the future savings as receivables.** Rather, they rely on physical assets and the credit rating of the parties to secure the investment. If a project is secured in the 'true' EPC fashion (secured against the value of future energy savings), this is usually within an equity investment in an SPV structure.

According to funds within Joule Assets' network, the success rate to invest in regular energy efficiency projects is very low; about 80% of energy efficiency investments from Joule's sample group have failed to reach deal closure because the contractor neglected entire risk categories or did not fully understand and mitigate the risks associated with a given project**.** In fact, most early stage funds tend to lose money or only break even due to poor investment decisions based on improper risk analysis.

Judging from the overwhelming percentage of funds failing at first attempts, it would be wise to use the information gathered from experienced investors to categorize these risks and standardise a way of evaluating them in order to stop them from hindering the development of the EPC market.

As mentioned in Chapter 6, this goes beyond just an increase in project failure rates. It also leads to the inability to:

- Bundle projects between funds
- Categorise/benchmark projects

Both these flaws have a direct impact on the financing of real projects. When financing EPC it has been established (see chapter 9.1) that bank loans are not optimal. Bank loans create on balance sheet debt, hinder the ESCO's development and undermine EPCs. This has an impact on the sales message behind EPCs. For larger projects (in general above €2 million), an alternative to debt is to create an SPV (Special Purpose Vehicle) with a private investor. An SPV is by nature off-balance sheet, meaning that is has its own balance sheet to document its assets, liabilities and equity, and appear on the parent company's balance sheet as an investment asset and not as debt. Stakeholders involved typically prefer this arrangement due to improved management of assets and liabilities, lower risks, higher credit ratings, lower funding costs, and greater financial flexibility and lower capital requirements. For ESCOs, entering into an SPV safeguards their balance sheets and may therefore open the possibility of multiple transactions and projects with investors.

Despite the benefits, however, an SPV is not suitable in all circumstances, particularly for small, standalone projects. Heavy administrative requirements and legal costs mean that an SPV is time consuming and requires a good deal of upfront capital for legal and accounting support. The project must therefore be large enough with strong projected cash flows. The partners also must have the resources to withstand the extra administrative costs.

3. **There is no set definition of 'bankability' among investors; the concept of 'bankability' itself is largely investor-specific:**

When discussing whether or not a give project is 'bankable' – with or without demand response, it is worth repeating that 'bankability' depends largely on a given fund's appetite for risk. As things currently stand, **there is no standardized method of analysing risk and performing due diligence from the perspective of the private investor – for energy efficiency and less so for demand response**. Should this be developed, bundling would become a viable option and financing SPVs would therefore be possible to a greater extent than today. Pursuing a standardized risk analysis process for investors could therefore lead to a ripple-effect of positive developments in EPC financing.

However, despite a lack of a standard definition of 'bankability', traits common to all investors' individual assessments of bankability include:

**Project size:** When projects are in fact viable and of high interest for investors, **the size of a project can be of high importance**; some funds will not deal with projects/portfolios less than €5 million, however there are specialised funds who deal in the €1-2 million range. There would, however, be more potential here if project bundling was possible. **Project duration** is also an important factor and varies depending on the fund – however, generally accepted project duration ranges from between 5 to 15 years. This of course also correlates to payback times and when the fund actually starts earning money from their investment. This usually ranges between 3-8 years, with a median of 5, and the longer the payback time, the more important the end client's financial health is a key factor impacting the investor's decision on whether to invest.

**Project IRR:** Whether the project includes demand response or not, the project IRR (internal rate of return) is always a decisive factor. A strong IRR is, at lowest, around 10-12%, and in cases of equal IRRs, in deciding between two projects, the Net Present Value (NPV) will be the decisive factor. For a financial institution, an expected project IRR that is greater than its minimum required return on investment suggests that the project could be undertaken. Some financial institutions also have specific technologies which they are interested in and often avoid new unproven technology because of perceived additional risk. If the technology is new, the return may have to be considerably larger in order to be accepted.

**Credit worthiness of the end client:** Credit worthiness of the end client is one of the core risks an investor will calculate. While it is necessary to demonstrate that the project is well designed and has attractive returns, of equal importance to securing finance is to prove the end client's ability to pay their bills throughout the duration of the payback period.

Given the above, it is questionable whether one can conclude EPCs are 'bankable' today in Europe, with or without demand response projects included. Though there are indeed funds who will accept future savings as a form of security, most financing sources disregard future savings and focus on credit risk and physical assets.

Thus far, each financial fund is held to its own internal criteria. While there are general commonalities between fund criteria, each fund is nonetheless bound to its own specificities and there is often little crossover here. The resounding conclusion from all funds is that the bankability of a NOVICE EPC is largely reviewed on a per-project basis; however, if the savings are substantial and the demand response aspect can be justified as bringing overall greater value to the entire project (as well as the financial model fitting the fund's general expectations), the project might be considered as bankable.

# 12 REFERENCES

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