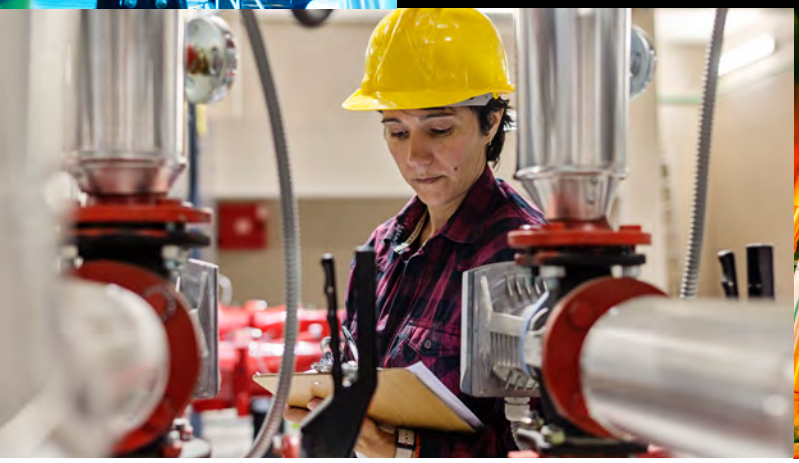
PROJECT 6-25

Realising energy efficiency projects through ESCO partnerships



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Authors:
Victor Donselaar (ADVEN)
Ruben Boere (GETEC)
Yorick Cramer (Rabobank)
Stijn Santen (CO2-Net)

Contributed to this white paper:

ADVEN Advantage in energy

GETEC

Rabobank

CO2-Net

Table of contents

1. Executive summary

In order to meet the UN's Sustainable Development Goals and the Paris Agreement goal of limiting the global temperature rise to well below 2 degrees Celsius, we need to lower emissions substantially. In the Netherlands and Europe, the target is to roughly halve greenhouse gas emissions by 2030 (compared to 1990 levels), whilst the economy is (generally) growing. This involves massive challenges for society. This white paper addresses the challenges for the Dutch energy intensive industry (top 300 emitters and energy users) from the viewpoint of industrial energy efficiency measures and the roles that financial service providers can play in partnerships to meet these challenges. The top 300 emitters are responsible for 95% of the total industry scope 1 emissions, with just 13 companies responsible for 75% of the industrial emissions.

The challenge for Dutch industry (excluding the closely linked power sector) is to deliver a reduction of 14.3 million tonnes of CO_2/year before 2030, requiring a large portfolio of measures. A rough estimate of the required investment in order to reach this goal is approximately 10 billion Euros, an estimated 1 billion Euro of which is for energy efficiency.

Besides the climate goal of CO_2 reduction, energy intensive industries in the Netherlands often need to compete globally. Reducing OPEX by improving energy efficiency is often one of the best ways of improving operational excellence and competitiveness. The 2018 IEA's publication on investments in energy efficiency shows that, since 2017, investments in Europe are lagging behind investments in other regions in the world, especially China.

The traditional CAPEX budgets for each industrial plant to realise these emission-reducing projects will not be sufficient. Therefore, additional financing is required, either from the parent company (internal), or from external financiers. Large industrial companies might have a strategy to focus their own capital on business expansion rather than on operational energy and energy efficiency solutions. (New) accounting regulations, like IFRS 16 and US GAAP, make traditional external financing methods, such as leasing and loans, less attractive in view of the financial criteria and KPIs (minimum solvability and maximum ratio of debt/EBITDA) agreed between industry and their financial partners such as shareholders, bondholders and banks. As a result, traditional on-balance-sheet financing beyond these ratios is often not allowed by individual production sites.

In addition, the required staffing or the availability of expertise for these energy projects might be unavailable, or this could put a lot of pressure on the current organisation. The ESCO can take full responsibility for the capital investment, expertise and operations of energy solutions for an industrial company, and delivers this as a service model. Investments through ESCOs for energy efficiency and energy production is a rapidly growing market in the world, but still relatively unheard of in the Netherlands.

The purpose of this white paper is to explain the significant challenges faced by industry and to explain the potential financial solutions, including the ESCO concept. It shows that ESCO is not only a financier, but also takes operational responsibility and carries risk, thereby decreasing the pressure on operational staff in industry whilst lowering the risk profile. The latter becomes even more valuable when novel technologies or solutions are being implemented.

This white paper is intended for financial and operational decision-makers of energy intensive industrial companies. It builds upon the insights and experience of ADVEN and GETEC that have a long experience in delivering energy services through an ESCO partnership internationally, RABO bank as a financial institution and CO2-Net as a consultant.

2. Introduction

This white paper introduces the concept of an ESCO (Energy Services Company) as a method to accelerate and realise energy efficiency projects within the industry, the ultimate goal being to reduce greenhouse gas emissions. An ESCO partnership can help the industry by taking full responsibility for the design, build, investment, operations and maintenance of energy efficiency projects. Investments in industry through the ESCO model are experiencing rapid global growth. However, ESCO models are still relatively unknown within Dutch industry and this white paper aims to resolve this. It provides an insight into why an ESCO partnership can help achieve the climate goals that we, as a society, government and industry, have set.

As a result of the Paris Agreement in 2015, the EU and its member states have defined CO_2 reduction goals. For the Netherlands, this amounts to 49% CO_2 reduction from 1990 until 2030, and this goal might even become stricter in the future. For Dutch industry, this amounts to a reduction of 14.3 million tonnes of CO_2 per year. Energy efficiency can deliver a very cost-effective contribution to this goal, of 3 million tonnes of CO_2 per year, as underpinned by the Project 6-25 publication of summer 2020.

Besides the climate goal of CO_2 reduction, energy intensive industries in the Netherlands often need to compete globally. Reducing OPEX by improving energy efficiency is often one of the best ways of improving operational excellence and competitiveness. The IEA's publications on investments in energy efficiency show that, since 2017, investments in Europe are lagging behind investments in other regions in the world, especially China.

This white paper is intended for financial and operational decision-makers of energy intensive industrial companies. Industrial energy efficiency projects often require significant capital investments and a dedicated team of experts to develop, construct, finance, and operate these solutions. This paper provides an overview of potential models and the steps to take to finance and realise these projects through ESCO partnerships.

This first chapter provides a brief overview of Project 6-25 which aims to assist Dutch industry to reduce CO_2 emissions significantly by 2025 through energy efficiency.

In the second chapter, we focus in detail on the challenges for industrial companies that are typically encountered when realising energy efficiency projects from a financial, but also organisational, viewpoint. The third chapter defines and describes various ESCO models, structures, and contractual principles that are a potential partnership model to help overcome the challenges described in chapter 2. The fourth chapter describes the benefits of ESCO models. The final chapter describes the role of traditional financial service providers, such as banks, and the instruments that can help realise energy efficiency projects directly to the industry or through the ESCO. Together with other experts, financial models are developed to accelerate large-scale deployment of energy efficiency solutions in industry as part of Project 6-25.

2.1. Project 6-25: Assisting Dutch industry to implement energy efficiency measures

Dutch industry is facing huge challenges; there is a need to stay competitive globally whilst also meeting climate-related CO_2 reduction targets. Therefore, companies need to make choices from a large portfolio of measures, where each measure also involves different technologies. This involves large-scale transitions, such as the rise of the hydrogen economy, the dawn of electrification and the roll-out of carbon capture and storage. But the most fundamental form of sustainability, which can be executed promptly, is to use less energy through the increase of energy and process efficiency. At the same time, technology suppliers have developed mature energy efficiency solutions for industry which could be deployed in the market at a much faster pace.

Project 6-25 identified that industry (the top 300 energy consumers) could achieve an energy reduction equivalent to 3 million tonnes of CO_2 per year within the payback period requirement of less than 5 years.

Project 6-25 aims to roll out large-scale deployment of novel, but also mature, technologies in energy intensive industries to improve energy efficiency. This requires a novel eco-system of industry, technology suppliers, engineering contractors and financiers. By reducing industry's carbon footprint and facilitating large-scale implementation of innovative technologies, Project 6-25 can make a lasting contribution to a more sustainable society. At the same time Project 6-25 can contribute towards a more competitive industry delivering innovative products and generating more jobs in industry and technology suppliers. The role of financing is crucial as very large investments are needed to achieve the desired CO_2 reduction targets.

This white paper has been produced by ESCO and financial partners that are members of Project 6-25 and builds on the experience of these companies in assisting industrial companies to finance and realise sustainable energy-related projects for more than 40 years. More information about these members can be found here.

For more information about Project 6-25, please visit www.6-25.nl

3. Challenges in financing and realising energy efficiency projects

Compared to other decarbonisation measures, energy efficiency has significant advantages as it has a relatively short implementation time and the payback time is usually within the mandatory 5-year period. The successful implementation of energy efficiency measures is, however, not straightforward and the challenges for implementation need to be addressed.

3.1. Challenges in implementing energy efficiency projects

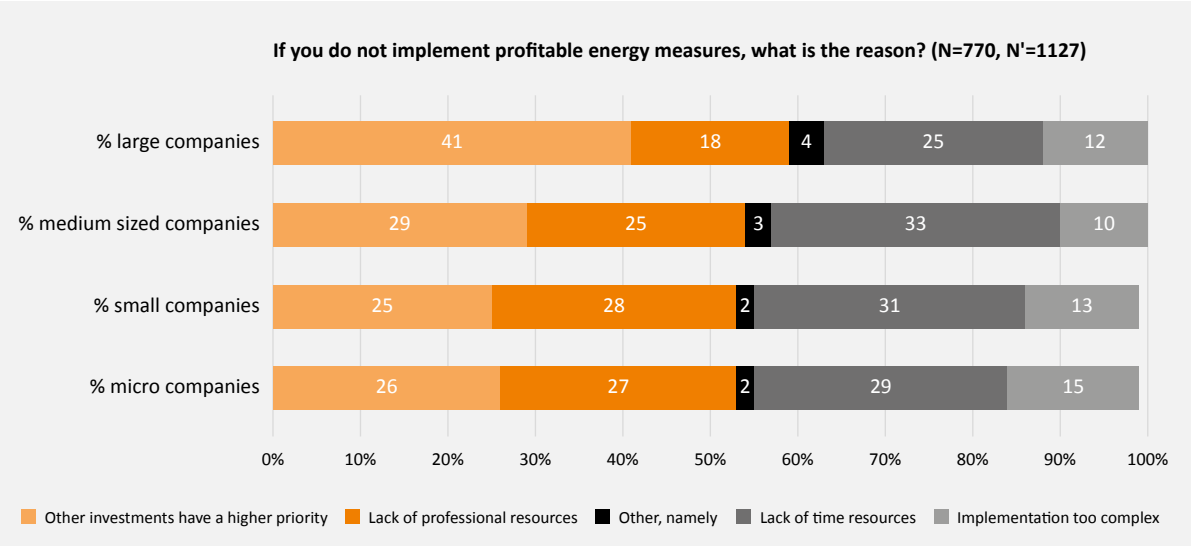
There are a number of barriers that industrial companies face when realising energy efficiency projects. Experience in cooperation with industrial customers has shown that there are significant barriers across sectors that need to be overcome:

- The continuity of production (safety, maintenance, uptime, production volume) has a higher priority than energy-related issues, energy efficiency therefore has a comparatively low level of management attention,
- Knowledge and resources for energy efficiency are limited within energy intensive industrial companies, as a result of globalisation and centralisation of resources.
- There is often little trust in the economic success of possible efficiency measures and their underlying technologies.
- The available CAPEX budget for individual plants is often limited and only available for high-priority projects that usually do not take energy efficiency measures into account.
- The financial KPIs for the energy efficiency projects might not be in line with the industrial company's internal minimum requirements, for example, the payback time might be longer than what has been approved, the IRR or NPV values might not be within the limits of company approval etc.
- On-balance-sheet investments might negatively influence financial indicators of the industrial company that are agreed with shareholders, bondholders or banks.

This experience is confirmed by a survey conducted by the University of Stuttgart during the first half of 2019, on the questions posed to German companies of various sizes:

> ***"If you do not implement profitable energy measures, what is the reason?"***

The result is shown below[1]:



According to this, the main challenges can be summarised in three areas:

- Financial issues
- The lack of confidence in the added value of efficiency measures
- The availability of resources and expertise to design and operate the energy efficiency solutions

3.2. Financial issues

Availability of CAPEX budget

The CAPEX budgets for operational investments in a plant of a multinational company are, to a large extent, decided by the head office of the corporation. At plant level, top priorities for investments are (in decreasing order) safety, compliance, production growth/novel products, uptime, maintenance and energy/process efficiency. This is why the resulting available budget for energy efficiency investments is often rather small. Investments in energy-related measures are often sizeable because there are many energy efficiency opportunities.

Payback time and other financial KPIs

The sizeable investments in long-lasting assets and the payback periods that can be achieved are often relatively long compared to internal criteria. For this reason, these investments are "shunned" and the available, usually limited financial resources are mainly used for projects with short payback periods or in production areas in order to expand the core business.

Due to the limited CAPEX budget and competing priorities, energy efficiency measures in the past were only implemented if the payback period was very short (less than 2.5 years). The Dutch government, through RVO, states that all industrial energy efficiency investments with a payback time of less than 5 years should be implemented. In order to implement all these measures, a significantly higher CAPEX budget is required. Due to the high investment costs and limited financial resources available for energy-related measures, financing with own funds is usually not possible. An alternative is debt financing. However, the disadvantage of this form of financing is that companies enter into long-term obligations and therefore burden their own balance sheet. In addition, industrial companies typically have minimum requirements set for project size and KPIs, such as IRR levels that might hinder investment in energy efficiency projects.

[1] Obstacles to energy efficiency measures (Source: Universität Stuttgart: EEP-Energieeffizienz-Index 1. Halbjahr 2019)

Off-balance IFRS16 / ASC 842 (US GAAP) versus on-balance-sheet financing

If the company is unable to provide the higher CAPEX budget by internal financing to all its production sites for energy efficiency measures, external financing is an option. There are different forms of external on-balance-sheet financing, such as debt financing and leasing. Many corporations have agreements with their shareholders, bondholders and banks on the minimum solvability and maximum ratio of debt/EBITDA. As a result, traditional on-balance-sheet financing beyond these ratios is often not allowed by individual production sites.

In the past, energy efficiency measures were more commonly implemented as operating leases and, therefore, did not affect the balance sheet on the customer side. This represented a considerable advantage compared to self-financing if the internal cost of capital is high, or if CAPEX availability is limited due to the reasons mentioned above.

Since 2019, Energy Efficiency Contracts have had to comply with the stringent requirements of accountancy rules IFRS 16 (or US GAAP ASC 842). For the vast majority of contracts, this means that the resulting long-term obligations must be reported in the balance sheet of the contracting client.

External off-balance-sheet financing according to the new accounting rules is still possible with the use of ESCOs, but requires experience in structuring and formulating such relationships under the accounting principles. As a result of the stricter accounting rules and the higher demand for CAPEX, the use of ESCOs has become more widespread around the world.

3.3. Lack of confidence in the economic feasibility

In industrial companies, energy efficiency measures are often identified independently ‘bottom up’ and proposed to the management for implementation. In some cases, measures from third parties, such as energy utilities or technology suppliers, are brought to the attention of the responsible persons in the companies and implementation is recommended. Regardless of whether it is a matter of implementing one's own ideas or measures proposed by external partners, the underlying problem is often a lack of confidence in the economic feasibility of the measures. Management is asked to approve a budget without having the certainty that the measures will be successfully implemented and that the efficiency gains presented can be realised. This is particularly the case when the proposed technical solutions and projects are new to the company, although the supplier may have a track record in other companies.

3.4. Availability of resources and expertise

Many large energy intensive companies are “lean and mean” with many centralised processes and expertise. Since energy efficiency is often not a top priority within the industry, local staff availability for identification, design, development and implementation of energy efficiency projects is limited due to many other competing priorities. This is even more of an issue when novel technology is proposed. This could be a limitation in operational staff, technical staff, or purchasing, but also in regulation and subsidies. The same holds true for the management priority, which also influences the available budget and the decision-making process. As a result, the company generally does not have the necessary resources or available skills for energy project development, implementation and operational management, which is sometimes necessary due to the complexity of the project.

4. ESCO partnerships as a model to realise energy efficiency projects

This chapter provides a definition of an ESCO and the characteristics of industrial projects that can be realised through an ESCO partnership. A short description of how ESCOs are used internationally is also provided. Furthermore, an overview of the various models and contracting principles is given. ESCOs deliver a positive business case with cost reductions, predictability and, in some particular contracting models, performance and profitability of the measures can be guaranteed. ESCOs also reduce the risk of the solution, as they are responsible for design, implementation of the project, investment and operations.

4.1. Definition of an ESCO

ESCO is the acronym for Energy Services Company. There does not seem to be a universal definition of the term ESCO, as it is used to describe various types of companies that are involved in energy production, energy efficiency or other energy-related areas and could be involved in various stages of the design, implementation and financing of these projects. IEA[2] defines an ESCO as "a company that delivers energy efficiency projects that are financed based on energy savings". The European Commission[3] has a broader definition and defines an ESCO as "all natural or legal entities that deliver energy services or other energy efficiency improvement measures at a final customer's facility or premises, and accepts some degree of financial risk".

The definitions of an ESCO vary in a number of areas:

[2] International Energy Agency, Energy Service Companies (ESCOs), 2018
[3] European Commission, Energy Service Companies in the EU, JRC Science for Policy Report, 2017

Area	Description of variance
Type of energy service	From all energy-related areas including energy production, to energy-efficiency only projects
Responsibility	Most definitions specify that the ESCO is responsible for the design, implementation and operation of the energy solution.
Financing	From financing of the project as an option, to a definition where financing is an integral component of an ESCO or where this is defined as "accepting a certain degree of financial risk"
Compensation/business model	From compensation mainly from energy cost reduction to compensation based on performance or energy flow
Ownership	From independent private companies to joint ventures, to state-owned and non-profit organisations

In the context of Project 6-25, the ESCO in our definition covers the following characteristics:

- Deliver energy and/or energy efficiency projects at the customer location through a service model
- The ESCO is responsible for design, implementation and operation
- The ESCO can finance the projects from its own capital, or can arrange external financing. This may include financing of the end customer that is transferred to a legal entity created for the project; a so-called SPV (Special Purpose Vehicle). If the end customer provides financing of the solution, the ESCO is more of a project manager that guarantees performance rather than a full ESCO according to our definition. The key is that the ESCO accepts a certain degree of financial risk in providing the service.
- An ESCO can have various legal structures dependent on the services that are included and the form of financing

This definition in Project 6-25 is therefore the broader definition as per the European Commission: "all natural or legal entities that deliver energy services or other energy efficiency improvement measures at a final customer's facility or premises, and accepts some degree of financial risk".

4.2. Characteristics of energy efficiency projects that would benefit from ESCO partnerships

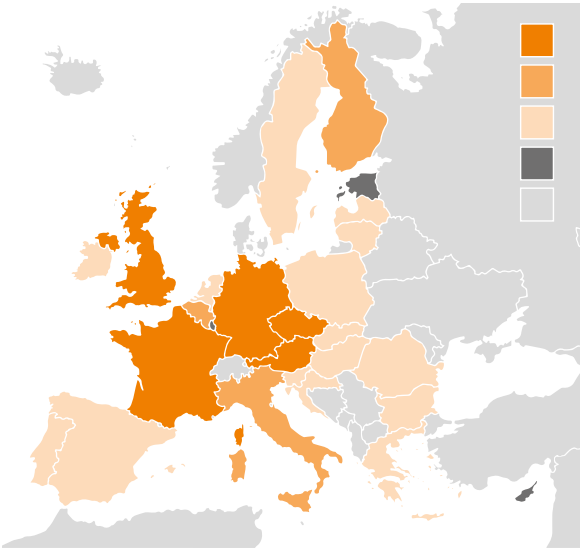
ESCO models are suited to deliver a wide variety of energy supply and energy efficiency projects. However, there are a number of characteristics of industrial energy related projects (and their respective industrial companies) that make them more suitable to be delivered through a Service Contract in an ESCO model.

- Capital intensive energy investments: investments that are million(s) or tens of millions of euros for companies that wish to implement the projects, but prefer not to spend their own capital.
- Off-balance-sheet: projects that do not negatively affect the company's balance sheet and financial indicators (solvability and debt/EBITDA).
- Projects with long payback times that do not meet internal standards (less than 5 years).
- Complex projects requiring multiple technologies that require significant additional expertise and availability of resources.
- Limited own resource availability.
- Lack or limited availability of the right skills.
- Projects that are classified as a non-core business activity. Some companies have received a mandate from management to "outsource" as much as possible and focus on core activities
- A company looking to reduce risk: outsourcing project, operational, and maintenance risk and having a lifetime warranty on equipment through an ESCO model, rather than getting a limited warranty directly from suppliers.

4.3. ESCO models and international experience

The birth of the first ESCO can be attributed to the energy crisis of the late 1970s[4], especially in the US. The attractiveness of ESCO models increased and decreased in subsequent years and was linked to the energy price: when energy prices were high, ESCO models would be more interesting and vice versa. This was also fuelled by the increase in new energy-reducing technologies and the deregulation of the energy market throughout the 1990s[5].

The ESCO market in the European Union has been growing steadily in the last decades[6]. However, a different level of ESCO models are being used in the individual members states, as can be seen from the image below (2014) where the darker orange colours represent a larger ESCO market size and the light-orange colour represents a smaller ESCO market size, to which the Netherlands belongs[7].



Countries in the European Union, such as France, the Nordics and Germany, have a much larger ESCO market than, for example, the Netherlands.

Beyond Europe, IEA indicates that by far the largest ESCO markets are in China and the USA, which are more than 50 times the size of that of the next country on the list[8]. They mention that these differences may be the result of a difference in definition between the countries of an ESCO model, the policies that are used in those countries and technical capability. It is also important to mention that these figures also include ESCO partnerships for non-industry, such as buildings.

In the Netherlands, recent market research specifically concerning energy efficiency ESCO projects, indicates that the current Dutch ESCO market is relatively small, especially compared to (for example) the Italian market[9]. This report concludes that, for energy efficiency projects in the Netherlands:

- Limited CAPEX is available for energy efficiency projects in the industry
- Investments in these projects face a number of hurdles that stop them from being implemented
- Projects with payback times longer than 2.5 years are seldomly implemented
- There is even a very significant energy efficiency potential for projects with a payback period of up to 7 years

When compared to the more mature Italian ESCO market, the Netherlands Enterprise Agency report indicates that the Italian government was an early mover when it came to implementing policies, subsidies (through so-called white certificates), and monitoring to stimulate energy efficiency projects. As a result, Italy is positioned in the EY top member states for implementing the European Energy Directive (EED) on Energy Efficiency.

In conclusion, the Dutch ESCO market is relatively small compared to other European countries. Both ADVEN and GETEC have their roots in countries where the ESCO model and markets are larger and more mature than in the Netherlands. The ESCO market has been growing steadily throughout the world, and this growth is expected to continue. With the recent urgency, policies and policy enforcement, there is an expected increase in demand for implementation of energy efficiency projects. This will also increase the need for external financing.

[4] Bullock, Cary, and George Caraghaiur. Guide to Energy Services Companies. The Fairmont P, Inc., 2001. 10 Mar. 2008
[5] GreenBiz, ESCOs and utilities, shaping the future of the energy efficiency business, https://www.greenbiz.com/article/escos-and-utilities-shaping-future-energy-efficiency-business
[6] European Commission, Energy Service Companies in the EU, JRC Science for Policy Report, 2017
[7] Bertoldi, Boza-Kiss, Panev, & Labanca, European ESCO market report, 2014
[8] International Energy Agency, Energy Service Companies (ESCOs), 2018
[9] Netherlands Enterprise Agency, A model approach to finance industrial energy efficiency projects, 2018

4.4. ESCO models

As described in the ESCO definition, we define an ESCO as an entity that delivers energy and/or energy efficiency services to an end customer location, where the ESCO carries a certain degree of financial risk. Within this definition, a wide variety of possible ESCO models can be applied.

The differences between ESCO models can be identified in terms of:

- Risk taken by the ESCO
- Contract type (Energy Performance Contracting, Energy Supply Contracting, "Build Own Operate" type of contracts)
- Organisational structure
- Financing (on-balance-sheet and off-balance-sheet)

4.4.1. Contract type

There are different contract types that vary between ESCO models. The most common types are:

- Build, Own, Operate, Transfer (BOOT, with possible variations)
- Energy Supply Contracts (ESC)
- Energy Performance Contracts (EPC)

4.4.1.1. Build Own Operate Transfer (BOOT)

Under a "Build Own Operate Transfer" model, the ESCO is responsible for all stages of the projects: design, construction, operation and maintenance of the solution. The ESCO owns the equipment and, at the end of the period, this can be transferred to the customer (usually at residual value). These contracts are charged according to the service delivered and usually include capital and operating components. As described earlier, these contracts can also include elements of other models, such as a performance-based energy-efficiency target. There are a wide number of variations of the model where, for example, the equipment is not owned by the ESCO, or where the asset is not transferred to the customer at the end of the contract period. The contract duration of this model is usually lengthy, with large capital investments and a high degree of complexity.

4.4.1.2. Energy Supply Contract

Under an Energy Supply Contract, the ESCO supplies energy at the customer location and is responsible for the implementation and operation of the plant. The main focus of the ESCO Contract is to reduce energy supply cost for the customer, which can include the optimisation of the equipment. These projects typically involve, for example, heat generation through boilers, CHP plants and other forms of centrally located energy systems. The ESCO is paid on the volume of energy supplied. The customers typically own the equipment, but the ESCO is responsible for maintenance and upgrade costs.

4.4.1.3. Energy Performance Contract

In an Energy Performance Contract, the ESCO implements an energy efficiency project at the customer's premises, and uses the income from the cost savings to repay the cost of the project (and margin). The approach is based on the transfer of technical risks from the customer to the ESCO, based on performance guarantees given by the ESCO. The contract contains guarantees for cost savings and takes over financial and technical risk for the development, implementation and operation for the project during the contract period. Once the contract has ended, the cost benefits brought about by the energy savings from the project remain with the customer[10].
In EPC Contracts, it is important to establish a baseline energy cost and performance profile, as well as extensive measuring and monitoring based on which the savings are continuously calculated.

The two most common types of EPC Contracts are:

- Guaranteed savings
- Shared savings

Under a Guaranteed Savings Contract, the ESCO implements the project and guarantees the energy savings. This means that the customer does not have a performance risk. If the savings are less than expected, the ESCO is responsible for making up the difference. If there is an excess of savings, this is usually split between the parties in a pre-determined manner. In a project of this type, the customer typically finances the project.

[10] Bertoldi, Rezessy, Vine, Energy service companies in European countries: Current status and strategy to foster their development, 2006

Under a Shared Savings Contract, the energy cost savings are divided between the customer and the ESCO at a pre-determined percentage. The percentage depends heavily on the technical, project and operational risks that the customer and ESCO are willing to assume and the contract length. Under this type of contract, the ESCO typically finances the project.

4.4.2. Risk taken by ESCO

The various ESCO models and types of contract have different risks that are taken by the ESCO. There are different types of risk that effect an ESCO:

- Technical risk
- Operational risk
- Financial/performance risk
- Credit risk

The technical risks in ESCO models are related to whether the contracted solution and technology are able to deliver the envisaged energy efficiency. In all models, the ESCO is responsible for the technical risk. The operational risk for an ESCO relates to the ongoing functioning of the solution and includes the maintenance risk. The operational risks that the ESCO is responsible for depend on the type of contracting model. However, in almost all ESCO contracting types and practical implementations, the ESCO assumes responsibility for the operations and maintenance. The ESCO and customer may agree that the operations and maintenance are carried out by the customer or third-party, but the ESCO typically remains responsible.

The financial and performance risk that the ESCO takes depends on the contracting type. EPC models assume a higher direct financial and performance risk compared to a BOOT model, as the payments are based on the energy savings and performance. A BOOT model compensation is not directly based on the energy savings (it is indirectly based on energy savings as often the fees are lower than the costs of the previous solution). Note that in, for example, a BOOT model, some performance risk can be shared/allocated between the customer and ESCO by adding individual clauses to the contract (e.g. a certain energy efficiency target that, if met, is split or taken in full by a single party). Also, for example, if a BOOT model is performed under a closed or open-book principle, which also affects the financial/performance risk level that the ESCO takes.

The credit risk that an ESCO takes depends on the type of contract and on how the solution is financed and, naturally, the company's credit rating. If the ESCO provides, or is responsible for, the financing (through the company's own or third-party financing), the ESCO carries the credit risk. If a third party finances the solution directly to the customer, the credit risk is not carried by the ESCO but by the financing party. The latter is, however, no longer off-balance-sheet financing. A credit risk can be mitigated through a bank guarantee or insurances, or if the customer is part of a larger international conglomerate, a parent guarantee can also be used to mitigate risk.

4.4.3. Organisational structure and relationships

There are a number of organisational structures and relationships that can be implemented based on the type of contract and the involved parties. There are simple relationships, where the ESCO is responsible for the financing and service delivery to the customer and no other parties are involved. There are also more complex structures where, for example, third-party financing is used by the customer and there is therefore a relationship with both the financing party and the ESCO delivering the service.

4.4.4. Financing

If the customer is financing the project, the ESCO role is more that of a manager with a performance guarantee, but not of a financer. The customer can use its own capital or arrange a third-party financing solution. On the other hand, an ESCO can also be responsible for financing the solution, either through direct own capital or through third-party capital.

Whether a solution is financed off or on-balance-sheet is often a critical decision factor for customers. Recent accounting principles enforce stricter regulations (e.g. US GAAP or IFRS) on whether a particular solution can be considered off or on-balance-sheet, based on whether it can be considered to be an operational lease or a Service Contract. If a solution is considered to be off-balance-sheet, the customer does not have to enter this in its balance sheet and this therefore does not affect some of its key financial indicators.

Government subsidies can often also be seen as an indirect form of financing, as they cover a certain percentage of capital or operational expenditure.

4.4.5. Summary and conclusion of ESCO models

As described in the sections above, there are a number of ESCO models that differ based on type of contract, assumed risk, organisational structure and financing. The choice of a model that best fits a particular project depends on the type of project, its size, duration, risk and other factors. Also note that elements from one model could be added to a type of contract for another model, for example, a performance-based compensation structure can be added to a Build Own Operate Transfer model.

Below a summary of the different ESCO models:

Area	Build Own Operate Transfer	Energy Supply Contract	Energy Performance Contract (EPC)	
			Guaranteed savings	Shared savings
Main goal	Predictable cost with a positive business case	Reduce energy supply cost	Energy cost saving	Energy cost saving
Investment size (1-40mEUR+)	Medium-large	Medium-large	Small-medium	Small-medium
Duration (2-20 years)	Medium-large	Medium-large	Small-medium	Small-medium
Ownership assets	ESCO until end contract	Customer	Customer	ESCO until end contract
Complexity of solution	Medium-high	Small-medium	Small-medium	Small-medium
Off-balance possibility	Yes	No	Yes	Yes
Financing responsibility	ESCO	Customer	ESCO	ESCO
Compensation base	Capital + operational fixed fee + volume or performance targets	Energy volume	Fixed guaranteed saving + potential excess saving split	Fixed energy saving %
Technical risk	ESCO	ESCO	ESCO	ESCO
Operational	ESCO	ESCO	ESCO	ESCO
Financial/ performance risk	Indirect ESCO (performance risks for specific items could be in contract)	Indirect ESCO	Direct ESCO	Direct ESCO
Credit risk	ESCO	Customer	Customer	ESCO

4.5. Phases in an ESCO partnership model

There are a number of ways in which ESCOs work with their customers. The exact methodology and phases depend on the type of ESCO model chosen, but in general there are three phases in the partnership.

In the design phase, the ESCO typically takes responsibility for finding and designing solutions to address the particular energy challenges of that customer. This phase can include concept design, pre-engineering, and detailed engineering. The right technologies and solutions are put together and a business case is often developed in cooperation with the customer. For EPC models especially, establishing a baseline energy profile is important, as this is used to compare the savings and performance once the solution is operational. This phase might also include environmental impact assessments or permits carried out by the ESCO.

Once the customer and the ESCO reach an agreement, the next phase Build and Invest starts. The ESCO is often responsible for the capital investment that is required. This may include purchasing new equipment, civil works, etc. The investment can be on or off-balance-sheet for the customer, depending on the account principles and other factors. The ESCO is ultimately responsible for the project management.

Once the solution has been delivered, it is put to operational use. Depending on the agreement with the customer, the ESCO's own personnel might operate the solution, or instruct the customer's personnel. The ESCO is typically fully responsible for the operations of the solution, as well as the maintenance. This reduces risk significantly for the customer as it is then not responsible for the equipment.

5. The benefits of ESCO partnerships to realise energy efficiency projects

This white paper describes different ESCO models as a solution to increase energy efficiency realisation. Through the ESCO model, there is a significant reduction in energy usage and costs. The customer is fully "unburdened", as the ESCO takes responsibility for the design, investment, project management, and operations and maintenance using the experience and expertise of the ESCO. Though financing is, of course, an important advantage of ESCOs, there are many other benefits from realising energy efficiency measures with an ESCO as partner. The benefits are summarised as:

1) **Reduction in energy costs**
2) **Reduction in CO_2 emissions**
3) **Implementing projects that would otherwise not be implemented**
4) **Outsourcing operations, thereby reducing operational risks**
5) **Energy savings without the company having to invest**

The partnership approach to achieve these benefits is explained in the following subchapters.

Project development with an experienced partner
The core business case of ESCOs is the development, realisation and operation of energy-related projects. In effect, ESCOs have in-depth experience in all aspects relating to certain energy efficiency projects over their entire lifecycle.

- This starts with knowledge about the relevant regulations that need to be taken into account, such as the impact of ETS and CO_2 pricing.
- Furthermore, knowledge regarding subsidies that are available is key in determining which possible projects should be focused on.
- The changes in power production, especially through renewable power, have led to highly volatile energy prices. This development creates a risk about the potential outcome of an energy-saving project. But flexible energy production also presents opportunities, for example, existing energy resources can be optimally utilised.
- Many developed projects often turn out to be more expensive than expected and deliver less savings, leading to uncertainty for business decisions for energy efficiency. With ESCOs, depending on the model, there are direct and indirect guarantees in terms of capital costs and savings, so this risk is minimised.
- As ESCOs are often responsible for a project's full lifecycle, a focus on optimal total cost of ownership is standard.

Project realisation within the responsibility of the ESCO
With the following services, ESCOs can support the implementation of energy efficiency measures. The ESCO is responsible for the whole project and manages all works and suppliers. As the client has one single point of contact in the project, the organisational impact and resource demand is reduced significantly.

- The whole tendering process is managed by the ESCO. The ESCO makes sure that all of its suppliers work in accordance with local standards for safety, health, quality, etc.
- The ESCO is responsible for project management, engineering, construction management and commissioning. Bundling these activities to form one company that, at a later stage , is also responsible for the operation of the installation, ensures a smooth realisation.

Operational excellence
One key aspect of most ESCO models is that the ESCO is also responsible for the operation. Outsourcing these activities has the following benefits:

- Operational costs are included in the ESCO's fixed fee. Costs for repairs are also included in these fees, leading to budget certainty for the customer over the contract period.
- The availability of the installation is guaranteed contractually, reducing the risk of downtime of the relevant installation, improving savings, or even operation of the production since this might depend on this installation.
- ESCOs can also give guarantees on the energy-related OPEX costs of an installation, for example the efficiency of the installation. If a customer realises a project itself, assets can be bought with efficiency guarantee, but these are usually only short term (1-2 years warranty) and only relevant for one asset, but not the entire system, which is standard for the ESCO.
- An ESCO has many energy production/saving installations in operation and a structure to do this optimally, with remote 24/7 monitoring and advanced automation systems, as well as operational onsite and offsite staff.

Financing and off-balance solutions
Finally, of course, the possibility of financing is an important aspect of a partnership with an ESCO for energy efficiency projects.

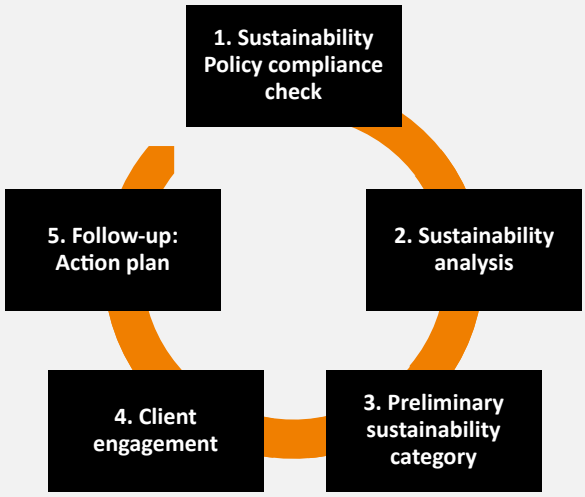
- The availability of external CAPEX allows the customer to focus the CAPEX that is available on its own production
- Also, projects that do not achieve the required customer-specific KPIs, such as IRR or simple payback time, can be realised with an ESCO, potentially allowing more savings to be made within the company.
- Depending on the ESCO model that is chosen, the project can be off-balance-sheet according to IFRS and US GAAP. This allows energy savings projects to be realised without impacting the balance sheet.
- Energy savings projects will reduce your OPEX costs. Since no CAPEX is required and the investments are accounted for in capital costs, which will also impact the OPEX costs, OPEX savings can be realised without using any CAPEX.

6. The role of traditional financial service providers in realising energy efficiency projects

This section describes the role of financial service providers that can play a role in financing energy projects directly to the industry, or indirectly by financial and risk instruments through ESCOs.

In the Netherlands and Europe, the target is to roughly halve greenhouse gas emissions by 2030 (compared to 1990 levels), whilst the economy is (generally) growing. This involves massive challenges for society, including financial service providers. Therefore, sustainability and tackling climate change are increasingly fully integrated into the corporate strategy of financial service providers. Many of the financial service providers strive to make their portfolio more sustainable (in addition to them becoming more sustainable – e.g. lowering energy usage). Financial institutions therefore play a crucial role in helping their client become more sustainable. They can do this by providing financial solutions with climate-related products and services – and also through networking and by sharing knowledge.

In order to help clients become more sustainable, financial service providers first have to know how sustainable they already are. Therefore, many of them have integrated sustainability into their credit approval process. With each loan application or revision, they asses the sustainability performance of potential and current business clients, which results in a rating. Thereafter, they engage with clients on relevant climate change actions – such as investing in energy efficiency measures - and support them with knowledge, a network and by providing financial solutions. Some financial service providers have gone so far that they link the conditions of the financial instrument to the client's sustainability performance.



Main developments

- **Active client engagement** aimed at improving their sustainability performance and to engage with clients on relevent climate change actions and support them with knowledge, a network and (financial) services
- Assesment of sustainability performance of potential and current business clients **integrated in credit approval** and monitoring processes

With regard to energy efficiency projects, financial instruments can be given to clients directly if the client intends to invest in the efficiency measures itself. It is, of course, also possible for financial instruments to be given to the ESCO by the financial service provider.

6.1. Financing the industrial company end-user directly

In terms of giving financial instruments of energy efficiency projects directly to clients, the following financial instruments might be of interest:

- Green bonds
- (Green) loans
- Financial or Operational lease.

The term 'green' is now defined in the EU's Sustainable Finance taxonomy.
https://ec.europa.eu/info/sites/info/files/business_economy_euro/banking_and_finance/documents/200309-sustainable-finance-teg-final-report-taxonomy_en.pdf

6.1.1. Green bonds

Green bonds are debt securities; the proceeds are used exclusively to promote climate and environmental sustainability purposes. For a bond to qualify as 'green', its proceeds should be used for projects with clear environmental benefits that can be described and quantified or assessed, such as renewable energy or waste management, but also energy efficiency. Therefore - as energy efficiency measures help companies to be more sustainable - green bonds may be a way of raising funding for the investment.

At first green bonds were mainly issued by banks and governments, but over the past few years, their popularity increased when corporations also started to issue them. The market for green bonds now represents more than EUR 700 billion in assets, with a record number issued in 2019, to the tune of EUR 255 billion. It is expected that 2020 will again be a record year.

In 2014, the Green Bond Principles (GBP) were established, the aim being to promote integrity in the green bond market through guidelines that recommend transparency, disclosure and reporting. More specifically, issuers should establish impact objectives and engage environmental reviews of the projects. Reporting on the use of proceeds along with the qualitative or quantitative indicators of the environmental impact should be done at least annually.

There are several potential benefits for issuers when issuing green bonds:

1) investor diversification and engagement: because there's a trend towards investing in sustainable projects, corporates can attract new investors by issuing green bonds
2) improved corporate reputation and awareness: because you have to report about the sustainability of the project, companies can make those around them aware of their sustainability performance
3) possible financial benefits (e.g. lower interest rates): because of the significant demand for green bonds, interest rates are typically lower than "ordinary" bonds or financial loans

However, green bonds also have some disadvantages. Most of the time, a financial institution is needed to help with issuing the bonds. Therefore, green bonds are only of interest for larger projects. There is also an administrative burden; the proceeds should be moved to a sub-portfolio which is ringfenced, and an auditor should be appointed to track the flow of funds. In addition, corporates have to report on the use of the proceeds annually. Because of this, at this moment, green bonds are only of interest for larger corporates. However, this financial instrument will potentially eventually be accessible for smaller companies too, as the green bonds seem to be such a successful instrument for financing sustainable projects.

6.1.2. (Green) loans

If a company requires funding for investments in energy efficiency measures because it does not have enough resources to finance the investment itself, or if it plans to allocate its resources to other projects, companies can take out a loan with a financial institution, such as a bank. Because of the nature of the investment, in some countries like the Netherlands, it might be possible to have a so-called "green loan". A green loan is a business loan for sustainable projects or innovations. This green loan has a favourable interest rate because of the "green discount". In order to be considered for a green loan with discount, a company has to apply for a "green certificate". A green certificate is issued by Rijksdienst voor Ondernemend Nederland (RVO), which will assesses whether you are eligible. If the project or investment meets the conditions of the Regeling Groenprojecten, RVO will issue a green certificate. The certificate is valid for 10 years maximum.

https://www.rvo.nl/subsidie-en-financieringswijzer/regeling-groenprojecten/veelgestelde-vragen

With regard to energy efficiency measures, a green certificate can also be obtained for an investment in specific categories, such as hot cold storage, LED lighting, cooling and heat use, the use of residual heat and cold distribution.

Taking out a loan also has disadvantages, of course. The bank performs a creditworthiness check, which can be a lengthy process. Also, as is the case with any other financial instrument, a loan is another obligation that increases a company's risk profile.

6.1.3. Financial lease / Operational lease

If an investment in a specific energy efficiency measure consists of an independently identifiable machine or device, a company could also apply for a lease. A lease is a contractual arrangement asking the lessee (user) to pay the lessor (owner) for use of an asset. There are two types of lease: Financial lease and Operational lease.

The difference between a financial lease and operational lease is mainly the ownership. With a financial lease, the company is the owner of the business asset that you lease from day one. Operational leases are similar but in this case the business asset remains the property of the lease company and you pay monthly for use.

The benefit of a financial lease is that this gives control. The company purchases the machine and immediately becomes the owner. At the end of the term - possibly after payment of a final instalment - the business asset has been fully repaid. The company is then free to do what it wishes with the asset: continue to use it, or sell it. The disadvantage is that the asset may depreciate faster than you had previously estimated. As you are the owner of a financial lease, you are responsible the associated risk. With a financial lease, you are responsible for maintenance, repairs and any damage. That is a disadvantage for companies wishing to be completely 'unburdened', but an advantage for companies that wish to maintain control. The company does not depend on the choices made by the lease company for maintenance and repair, but arranges these as it wishes.

Operational lease is a form of rental, so you are not the owner of the asset during the term. This can have advantages. For example, the leasing company (as opposed to you) bears the risk of unexpected depreciation of the machine. With an operational lease, you must relinquish the business asset at the end of the Lease Contract, even though you have paid towards this for years.
An operational lease with service offers security and convenience. Maintenance, repairs and insurance are arranged for you and you will not be faced with unexpected costs. This is reflected in the monthly costs of this type of lease, which are usually higher. You pay for services you may not need. And you are governed by the choices made by the lease company.

The main advantage of leasing (both operational and financial) is that it is often a very quick process. The lease company assesses the asset and, if the asset has sufficient market value, the lease company provides the lease. The main disadvantage is that the machine has to be independently identifiable and it must be possible to remove the machine in order to sell it, in the event that the lessee defaults.

6.2. Funding the ESCO

One of the main advantages from a customer's point of view in terms of the ESCO arrangement, is that a customer doesn't need to invest its own capital, the ESCO does that for them. Of course, in that case, the ESCO has to make the investment.

If the ESCO does not have sufficient resources for the investment, it can also approach the market for funding. However, because of the nature of the ESCO, not all financial instruments are suitable. For example, asset-based financing, such as lease, is probably not possible because the asset itself is not within reach and supervision of the ESCO, as it's located at the end-user's site. Therefore, the asset cannot serve as collateral for the lease company This is also a problem for an 'ordinary' loan, because banks often ask for assets as collateral and, if the ESCO only has assets at the end-user's site, a bank cannot use them as collateral.

One alternative might be equity funding. Existing ESCOs, such as ADVEN and GETEC, have infrastructure investors or private equity companies behind them funding the investments. In addition, an ESCO could create a diversified portfolio and hence have a diversified risk profile, so that banks feel comfortable enough lending money based on the underlying Payment Contracts, instead of assets as collateral.

Another option to explore is that of government guarantees. The ESCO arrangement could play such an important role in achieving the Sustainable Development Goals (SDGs), that it would be beneficial for governments to explore whether they can guarantee loans provided by banks, so that banks are more willing to issue loans. There are already instruments, such as the "Bedrijfsborgstellingskredieten" (BMKB) and "Garantie Ondernemingsfinancieringen" (GO-faciliteit) in the Netherlands, which could be used in such a way. However, those instruments are currently not always available to ESCOs. With ESCOs gaining momentum and contributing towards achieving the SDGs, attention should be paid to extending the functioning of instruments, such as BMKB, to ESCOs.

6.3. ESCO construction: Lowering the risk profile of end-users

As already mentioned, one of the advantages of the ESCO arrangement is that the end-users do not have to make the investments themselves. This means that they don't require debt for a specific project and this keeps the balance sheet clear of additional debt. The ESCO arrangement therefore 'de-risks' the company, which can be profitable for the end-user. If the energy efficiency is also guaranteed, which is the case in some ESCO arrangements, this means that cost reduction is also guaranteed. This leads to an even lower risk profile. With a lower risk profile, it can take on debt for other investments, possibly under better conditions, or because a lower risk profile is more attractive to suppliers and a supplier is therefore more inclined to increase the payment term.

Project 6-25

Supporting industry to be greener, more efficient and competitive in 2025

Project 6-25 underlines the crucial role technology will play in successfully addressing the climate & energy challenges faced by society. By reducing industry's carbon footprint and facilitating large-scale implementation of innovative technologies, it can make a lasting contribution to a more sustainable society. At the same time it can contribute towards a more competitive industry delivering innovative products and generating green jobs.

Dutch industry is facing large-scale transitions such as the rise of the hydrogen economy, the dawn of electrification and the roll out of carbon capture and storage. But the most fundamental form of sustainability is to use less energy. The Project 6-25 ambition is to support industry in achieving substantial reduction of their carbon footprint through the increase of energy- and process efficiency. Technology companies have a wide range of proven innovations ready for large-scale rollout. Independent validation proved that these innovations can help Dutch industry to achieve at least a 3 million tonne reduction in carbon emissions by the end of 2025 with a window to a 6 million tonne reduction in carbon emissions by 2030.

The Project 6-25 provides industry with a new and integrated approach for plant owners that is based on close cooperation and partnerships between parties throughout the whole Value Chain. It delivers a portfolio of innovative, yet proven, technologies together with support in feasibility studies, business case development, implementation and (off-balance) financing propositions. This is the key to overcome the often-named barriers such as the lack of capacity, capex, expertise and evidence and help industry to reach their challenging carbon reduction targets in time.

For further information please refer to: www.6-25.nl

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Kenniscentrum en belangenbehartiger van zakelijke energie- en watergebruikers

Project 6-25
Zilverstraat 69
P.O. Box 190
2700 AD Zoetermeer
The Netherlands

+31 (0)6 27 34 63 35
Project625@fme.nl
www.6-25.nl