



Report about the recruitment of pilot clients

May 2017

Public report



Co-funded by European Union



Stefan Schulze-Sturm

ASEW
Eupener Strasse 74
D-50933 Köln
T: +32 2 74016-58
E: schulzesturm@asew.de

We gratefully acknowledge contributions from all EPC+ partners.

This document has been elaborated within the *Energy Performance Contracting Plus (EPC+)* project and is available on the project website.

www.epcplus.org

Deliverable: 5.1.



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 649666.

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1. Summary

The EPC+ project aims at developing and promoting new business models for the implementation of innovative energy efficiency services through cooperation of Small and Medium-sized Enterprises (SMEs). Such innovative energy efficiency services (EES) can be offered in the form of energy performance contracts (EPC).

Within the framework of the EPC+ project, each partner country established cooperations of SMEs, with the aim to offer joint EES to the market. These cooperations is called a *SPIN*. Such *SME Partnerships for Innovative Energy Services* are organized clusters of independent companies that jointly supply novel energy efficiency services to existing or new customers. As the concept of a SPIN – SME partnership for innovative energy services – is quite unique, the establishment process in the partner countries was crucial. Several reports describe the establishment of these SPINs and can be download on the EPC+ website <http://epcplus.org/sme-partnerships-spins/>.

One of the first tasks of these SPINs was the identification of potential pilot clients who are willing to implement technical tools (also developed within the frame of the EPC+ project and available on the project website: <http://epcplus.org/energy-service-packages/> within a frame of a pilot project.

The following report outlines the activities, barriers and results of the recruitment process carried out by the SPIN partners as part of the EPC+ project. The aim of the survey was to identify success stories as well as the barriers and needs for the implementation of pilot actions in each partner country in Energy Performance Contracting. The results from this survey will be used to determine the key factors for a practical way to find useful customers.

All the data collected has been treated in line with good ethical practice. The data collected will be kept strictly confidential and stored in-line with the data protection policy associated with the project, as submitted to the EU commission. No personal data of any involved company will be made public.

For the following report the data from 18 SPINs have been collected.

2. Survey Design

The survey document was designed by ASEW, with input and discussion from all other project partners except the Italian partner who will deliver all necessary information at a later stage.

In order to receive meaningful information the survey has been divided in two parts. In the first part the national SPINS had to answer several questions about their general recruitment activities during the last months. The second part of the survey included also more specific questions about the pilot clients itself which have been identified and the implementation process of projects.

During their search for pilot clients the SPINs haven't been really restricted. Only one condition has been agreed beforehand - that the pilot clients should be SMEs. Nevertheless, some partner countries mentioned already in advance that they might have problems to fulfill these expectations and deviations needs to be accepted. This compromise seems necessary due to the fact that some project partners experienced difficulties in their countries if the focus is strictly limited to SMEs. Therefore, it has been accepted that also public authorities or larger private companies can be clients, if no other pilot action can be realized otherwise. Nevertheless, the focus should be given to SMEs.

3. Survey Results

3.1. Minimum requirements per partner country for the implementation of a pilot project

Since the members of the national established SPINs are the real market experts, in a first step they have been asked about the existence of minimum criteria necessary for the selection of potential customers. All SPINs agreed that these criteria need to be defined beforehand and each SPIN set some of them for the implementation of an economically successful project. Only if several conditions and basic factors are realized in advance the implementation of a project makes sense. These factors concern mainly the minimum investment of a project, minimum energy consumption and a minimum amount which can be realized due to energy savings.

Concerning general criteria, valid in each partner country, the partners renounced to define common criteria to select pilot projects that would qualify as EPC+ services, so country specific criteria have been defined and utilized. The main reasons for this are that the economic and financial situation in the participant countries as well as the maturity of the EPC market, widely differ. For example, the project criteria for Germany which has easy access to sources of financing and a very mature EPC market are completely different to those of Greece and Bulgaria where sources of financing are very difficult to find and the EPC market is still at an infant stage.

The following table presents the minimum criteria SPINs of each country defined for themselves in order to implement an economically promising project in their respective country:

Country	Country-specific criteria for the selection of pilot projects
Austria (e7)	<p>e7 decided beforehand, that they want to offer an optimization package of the building operation system. The minimum requirements for this package should be:</p> <ul style="list-style-type: none"> • implemented in a new sector • together with an associate • on a performance based remuneration. <p>An optimization package of the building operation system shall include:</p> <ul style="list-style-type: none"> • analysis of the building energy consumption • installation of the monitoring hardware • analysis of monitoring data on a regular basis • different associates are going to design and suggest optimization measures for heating, cooling or efficient lighting • M&V remains with the SPIN coordinator <p>The SPIN coordinator decided further that:</p> <ul style="list-style-type: none"> • a project shall have no, or very little, investments (no-cost or low-cost measures) • quick payback period, up to three years maximum. • pilot measures shall be carried out in an innovative market (innovation with this respect means, that no (or only very little) EPC has been carried out in the relevant sector.
Austria (GEA)	<p>No requirements needed to be defined as criteria to select potential clients. The client directly contacted the SPIN coordinator out of the recommendation of an existing reference project.</p> <p>SPIN-partners already considered various applications and pilot projects and tested the rough concept in a previous project. For other pilot measures energy audits carried out by the SPIN coordinator showed already potential in waste heat recovery or lighting renewal.</p>
Belgium (Factor4)	<p>The selection of clients are based on existing contacts between one or more SPIN partners and the potential client and the following criteria:</p> <ul style="list-style-type: none"> • Annual energy baseline of > 100.000 € • Clear and short internal decision making process, e.g. family business • Recent implementation of major EE-improvement measures • No large changes in recent years (increase of production, renovations etc.)
Bulgaria (BSREC)	<p>No formally accepted criteria. SPIN partners agreed on:</p> <ul style="list-style-type: none"> • Minimum energy savings: 20.000 kWh/year • Minimum investment: N/A € • Minimum baseline energy consumption: 50.000 kWh/year
Czech Republic (SEVEN)	<p>As minimum requirements for the realization of a pilot project in the Czech Republic the SPIN members defined the following criteria about the client:</p> <ul style="list-style-type: none"> • Interest of management to decrease energy consumption • Energy saving potential and economic feasibility of the potential project • Client should be an SME or a public institution
Germany (ASEW)	<p>During the first common meetings all regional SPINs agreed on the fact that the first common projects they want to implement should focus on the modernization of lighting. Nevertheless, each SPIN defined different minimum requirements for their own pilot project:</p> <p>One SPIN agreed that a lighting project should have a:</p> <ul style="list-style-type: none"> • minimum investment of 15.000 € • minimum of 2.000 lighting hours/year

	<p>A second SPIN agreed about a:</p> <ul style="list-style-type: none"> • minimum investment of 30.000 € • minimum of 3.500 lighting hours/year
Greece (HELESCO)	<p>The main criteria are the high replicability of an energy solution and the innovation of this solution. The two main suggested technologies are the lighting renovation and heat recovery for the industrial sector using mechanical vapor compression. Further criteria are:</p> <ul style="list-style-type: none"> • Minimum energy savings: 15% • Minimum investment: 0 € • Payback period < 5 years
Ireland (TEA)	<p>After initial meetings with the SPINs it was established that projects should focus on the installation of a renewable energy system and an upgrade of a buildings heating system to air source heat pumps or an upgrade of a buildings lighting system. The minimum requirements for the initial projects are:</p> <ul style="list-style-type: none"> • Minimum investment: 5.000 € • Current building occupancy 2.500 hours or • Minimum electrical usage of 15.000 kWh/year or • Energy performance guarantee with minimum of 5% retention of project value retained until savings are guaranteed
Italy (ESCO ITALIA)	<p>The main criteria of the Italian SPIN in choosing EPC+ pilot projects are:</p> <ul style="list-style-type: none"> • the client target, which should be a private entity performing economic activities, preferably energy intensive SMEs, within the territory in which the SPIN member implementing the project is operating; • the measures, which should set the priority of energy efficiency and only after, where required as the best possible solution, integrate renewable in the project; • the willingness of the client to implement EE projects, eventually fostered by specific bank agreements and/or combined with the request of governmental funding or incentives and tax deduction.
Slovenia (JSI)	<p>Some general criteria for the selection of pilot projects presented below are used but each project is evaluated according to its specific techno-economic characteristics and SPIN requirements:</p> <ul style="list-style-type: none"> • Energy consumption: significantly higher than standard • Energy savings: ≥ 20% • Investment volume: ≥ 20.000 EUR • Duration of a contract: ≤ 7 years • Change of use: no plans for the next 10 years • Last refurbishment: ≥ 10 years • Operational and maintenance practice risks: low • Ownership: owned by the EPC+ client • Client business risk: low • Pooling (clients, buildings, technologies): possible • Subsidies: available <p>Simple payback time: preferably up to 3 years</p>
Spain (ESCAN)	<p>One SPIN agreed that clients should be SMEs or public installations with sufficient financial background. A second SPIN decided that a potential project should have a minimum investment of 10.000 €.</p>
Portugal (ISR)	<p>The criteria for the SPIN to carry out a pilot, was to address customers that already carried out some auditing work in their installations. One of the SPIN members is a specialized company in audits and also the SPIN Facilitator carried out already several audits in different activity sectors. Therefore, these already known customers are the target of the SPIN.</p> <p>The default criteria for EPC+ Projects targeting lighting and BMSs is the following:</p> <ul style="list-style-type: none"> • Minimum energy savings: 20.000 kWh/year (20%)

	<ul style="list-style-type: none"> • Minimum investment: 20.000 € • Baseline energy consumption: 100.000 kWh/year <p>Minimum requirements for targeting motor improvements are:</p> <ul style="list-style-type: none"> • Minimum energy savings: 10.000 kWh/year (10%) • Minimum investment: 20.000 € • Baseline energy consumption: 100.000 kWh/year <p>General requirements:</p> <ul style="list-style-type: none"> • simple payback time between 3 and 5 years is crucial • investment strategy for investments up to 20.000 € • Companies are willing to introduce changes if savings of at least 10% are possible
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Table 1 – Country-specific criteria for the selection of pilot projects

3.2. Client recruitment activities

After the SPIN members in each country set the minimum requirements for a pilot project they used different channels and networks to contact possible clients. Before contacting these customers the definition of the criteria helped also to carry out internal screening processes. Factor 4 e.g. used the defined criteria to make a longlist of all clients of the SPIN partners. These potential SPIN clients were awarded points for each criterion. This resulted in a ranking of the clients, allowing prioritizing. Also the German SPINs implemented an internal screening of their network and customers in order to get a first idea who could be a possible client. Therefore, the definition of criteria beforehand doesn't only help to set minimum technical conditions but also help to define the most qualified clients. Furthermore, the fast identification of qualified customers saves a lot of time during the recruitment process.

After identifying the first potential clients each SPIN started to contact them. The following overview shows that each partner and each SPIN used many different channels in order to reach potential customers. Nevertheless, nearly all SPINs used for its activities in a first step its own existing customer network. This seems absolutely logic since clients with an already existing working relationship are easier to address and to convince to implement a new service.

The clients itself have been mainly contacted directly via phone, followed by bilateral meetings. Other activities, organized occasionally by some partners and SPINs, were the organization of information evenings, seminars, trainings and conferences. Also websites, leaflets, mailings, best practice presentations and questionnaires have been used to force recruitment activities. On top, other market actors like financial institutions, ESCOs or the Alliances for Energy Efficiency in Bulgaria are used for the support to identify potential candidates.

With all activities carried out by the SPINs so far, more or less 150 possible clients have been directly contacted from 18 implemented SPINs. These clients have been identified as high potential candidates fitting the minimum requirements set by the SPIN partners in each country. This number does not include other interested clients who participated during the events, conferences, trainings etc. or have been reached via questionnaire, leaflets, mailings etc..

Country	Channels used for contacting clients	Numbers of potential clients contacted (not including the general interested customers)
Austria (e7)	<p>e7 used its <u>existing network</u>, especially in the field of hospital operators and contacted the potential client directly <u>by phone</u>. In case of interest by the client, the idea was discussed in detail <u>personally</u>.</p> <p>Furthermore, e7 is active in the <u>promotion of its projects</u> and know-how within the frame of <u>national conferences</u> as well as <u>training</u>.</p>	<p><u>Eight possible clients</u> have been contacted by the SPIN. Other potential clients have been meanwhile identified and will be contacted in the near future.</p>
Austria (GEA)	<p>In order to find potential clients one SPIN used <u>best practice presentations</u> of other projects of that type to demonstrate the effectiveness of the measures.</p> <p>Within a second SPIN contacts have been established through the <u>network of one of the SPIN partners</u>.</p> <p>Furthermore, GEA has been <u>directly contacted by two clients</u> for information about pilot actions.</p>	<p>Two SPINs had to contact only <u>one possible client each</u> in order to realize a pilot project.</p> <p>For other projects <u>clients contacted GEA directly themselves</u>.</p>
Belgium (Factor4)	<p>The clients were contacted initially by the SPIN partner that <u>already had a relationship</u> with them. In case of professional relationships, the SPIN partner can offer a much broader set of services and an integrated EPC project, rather than a project focused on one specific technique.</p> <p>After <u>initial phone contact</u>, a <u>meeting</u> is organized with the client, the SPIN principal (Factor4) and the partner is initially in contact with the client (if not Factor4).</p>	<p><u>More than 20 companies</u> have been contacted by one SPIN.</p>
Bulgaria (BSREC)	<p>Mainly direct communication with clients. Sometimes the <u>SPIN organized seminars</u> with interesting topics about energy efficiency, or an interesting innovation.</p> <p>In other cases, the SPIN establishes <u>direct contacts with clients</u>.</p> <p>Furthermore the SPIN principal is searching clients through the contacts of SPIN associates or through the Alliance for energy efficiency, where they are members.</p>	<p><u>Three concrete potential clients</u> have been contacted so far by one SPIN.</p>
Czech Republic (SEVEN)	<p>Clients have been contacted <u>via personal contacts followed by phone calls and face to face bilateral meetings</u>. Furthermore, events such as <u>seminars or</u></p>	<p>Three SPINs contacted so far <u>32 possible clients</u> – nine SMEs, 18 municipalities, two hospitals, one high school, a congress Centre as well as a</p>

Country	Channels used for contacting clients	Numbers of potential clients contacted (not including the general interested customers)
	<p><u>conferences</u> have been carried out to find clients.</p>	<p>retirement house.</p>
<p>Germany (ASEW)</p>	<p>The Spin coordinators of the regional SPINs (municipal utilities) used their <u>existing networks with SMEs and commercial customers</u> to contact potential clients directly <u>via phone</u>. Afterwards the ideas have been discussed in <u>bilateral meetings</u>.</p>	<p>Two SPINs had bilateral meetings with <u>four possible clients</u>. Further clients (e.g. sports facilities) have been identified and will be contacted in the near future. A third SPIN has been contacted by a <u>local facilitator who brought the client to the SPIN</u>. Also this SPIN will contact further client if the first pilot project is implemented successfully.</p>
<p>Greece (HELESCO)</p>	<p>SPIN members organized <u>bilateral meetings</u> with some clients they have been providing their services to in the past. Furthermore, the SPIN members developed an <u>online questionnaire</u> that was distributed to ESEE members (Hellenic Confederation of Commerce and Entrepreneurship (ESEE)), in order to create a significant number of potential projects. On top, <u>contacts</u> have been built with Piraeus Bank a <u>financial institution</u> that expressed interest to finance energy performance contracting projects, and ETVA VIPE an ESCO company of Piraeus bank.</p>	<p>One SPIN has been directly in contact with <u>four potential clients</u>. The questionnaire was distributed to circa <u>540 SME's</u>. CRES as client published a tender and received two offers in order to implement an action. During the negotiations <u>a second SPIN has been established</u>.</p>
<p>Ireland (TEA)</p>	<p>In order to find clients the Irish SPINs spread out an <u>EPC+ information leaflet</u>, organized <u>information evenings</u>, used contacts from the Tipperary Energy Agency and contacted clients <u>directly via phone</u>.</p>	<p>Two SPINs contacted directly <u>four potential clients</u>.</p>
<p>Italy (ESCO ITALIA)</p>	<p>Esco Italia is the leader of the SPIN and project promoter, the EPC+ offer is facilitated by Federesco's EE agreement with a big bank group and the contractual stage is assisted by the validation company VPE. This is illustrated, <u>using the banks channels</u>, in <u>several meetings with potential clients</u> and bank branch attendants. On the other hand, the direct transaction action is carried out by Esco Italia, even if the members also operate one by one within their territory, through its usual <u>market channels</u>, since offering EE interventions is its core business.</p>	<p>The <u>spin leader reports</u>, in the first 24 months of EPC+, <u>over 600 records of Italian contacts</u> (the number, documented by the company's CRM, is net of about: 100 proposals for the management of white certificates, 120 proposals to large companies and 250 proposals to public bodies). Of these 600 contacts to the SME sector, about 60 preliminary offers have been successful on about 80 listed offers. EE service successful offers towards SMEs are related to auditing, planning and other energy efficiency implementations, but the actual use of EPC is still very low.</p>

Country	Channels used for contacting clients	Numbers of potential clients contacted (not including the general interested customers)
Slovenia (JSI)	SPIN members organized <u>bilateral meetings</u> with some clients using their standard marketing approach. The SPIN Facilitator used its <u>existing network</u> of energy managers to inform potential customers on the possibility to develop an EPC project. Some energy managers were contacted directly <u>by phone</u> . In case of an interest by the client, the idea was <u>discussed in detail personally</u> .	One SPIN has been directly in contact with <u>three potential clients</u> . The information on EPC+ model was distributed to <u>circa 50 SMEs</u> .
Spain (ESCAN)	SPIN members carried out several marketing activities like the <u>creation and distribution of EPC+ leaflets in events and via mailings</u> to find the clients. On top, information has been given via the <u>EPC+ website</u> and during <u>face to face meetings</u> as well as <u>telephone conversations</u> .	Two SPINs contacted <u>several potential clients</u> : public institutions and SMEs mainly in Madrid, León, Barcelona, Sevilla and Bilbao. Also different universities have been contacted.
Portugal (ISR)	The SPIN Facilitator used its <u>customer network</u> to identify potential customers and <u>invited potential companies directly</u> . Potential clients from other SPIN members were <u>contacted by the SPIN facilitator, by email and or phone call</u> and a <u>bilateral meeting</u> was carried out.	All in all one SPIN has contacted <u>four clients</u> .

Table 2 – Communication methods and numbers of contacted high potential clients

3.3. First client reaction

Nearly all potential clients in every partner country appeared interested from the first initial conversation held with the SPIN. The first reaction has been nearly always positive, enthusiastic, full with expectations and the clients expressed interest in the proposed project, the EPC concept, its innovative approach (e.g. that an optimization package is offered in cooperation with several experts) and its value it might add to the company. Only some clients were interested highly in the EPC concept but not in the SPIN structure.

Potential customers, when facing the possibility of reducing energy consumption react in general very well. Many provided information about their status in terms of energy consumption, equipment and processes as well as discussed about the proposed energy solution with SPIN members and with financial institutions.

For some clients the idea of performance based remuneration is generally interesting to them, but it strongly depends on the volume of the project. Especially if energy audits have been already carried out, showing the saving potential of some measures, helps to get a positive reaction of the customers.

For some candidates it seems also interesting to participate in a European project and how it could assist with upgrading the profile of the company.

3.4. Barriers for implementing a project

Nevertheless, even if the first reaction is more or less in every way positive it is very difficult to find at the end a candidate who is really willing to implement a project. This is also an important feedback from the SPINs which all agreed about the fact that many potential customers need to be contacted in order to realize at least one pilot project.

The reasons for the difficulties to implement an action are lying in different barriers and obstacles. After the feedback from the SPINs about possible obstacles two major groups have been identified. On the one side there are country specific barriers like e.g. the lack of financing, the disinterest in EPC in general or the complexity of EPC. On the other side there are also project specific barriers which hinder an implementation and lead to withdrawals from the client. This occurs if e.g. the client belongs to a mother company where other people have to decide, if after an audit a project didn't turn out economically interesting enough or if the client chooses new partners for the project explanations.

The following sections will give an overview about the obstacles SPINs have to face while trying to find a qualified pilot client. Looking at the different countries every SPIN faces different barriers for finding interested customers. This explains also, why so many potential customers need to be contacted in order to find one client.

3.4.1. General barriers

Looking at the main identified barriers by the SPINs, especially two of them seem crucial: the lack of knowledge and interest about EPC and the lack of financing. Especially in the middle European partner countries the interest in EPC hinders the implementation of pilot projects while in southern and eastern European countries the lack of financing plays an essential role. The feedback from the SPINs show further that some countries tried already in the past to implement EPC services in the market and haven't been successful.

Austria

Basically there are no risks for the client with respect to the implementation of optimization packages of no cost measures on a performance-based remuneration. However, clients may see the billing procedure (including M&V) of an EPC+ contract as circumstantial and may prefer a standard contract instead. The efforts of a performance based contract are higher compared to a standard contract but the volume of the savings potential might be low. Especially in service buildings, clients see the risk that single users / tenants might complain about changed settings with the HVAC system. In order to satisfy these users all the settings will be withdrawn and set according to the pre-adjustment. Not telling the SPIN about this action can be seen as risk.

Belgium

The interest in and knowledge about EPC projects in Belgium are in general very low or even not existing. A lot of time is needed in the promotion and in explaining the concept. The possibility of third party investment initially raises the client's interest, but in the end, it appears that equity financing (followed by debt financing via the principal bank) is preferred.

A main aspect in EPC projects is providing a guarantee with regard to the technical risks. This often implies the necessity to interfere in the tasks and responsibilities of the client's personnel (maintenance crew, technical team, facility manager ...). Although the advantages of EPC (with or without third party financing) are clear and obvious to the CEO and/or CFO, convincing staff members at a lower management level is often much harder to achieve. If it is possible to 'enter' the organization at the right level, the selling process is much easier.

Another restraint by the client concerns the offered service itself. The SPIN tries to look for the best possible energy-saving measures for the client and ensures good execution of these measures, with a guaranteed end-result. This means that the offer is intentionally not too concrete, compared to an offer for the replacement of specific equipment. The offers are to some extent more complicated than traditional services. It requires more time before the client fully understands the benefits. It often becomes clear that energy cost and energy management in general is not the main focus or priority in the organization. Frequent reminders and calls are to be made to remind clients about the service offers and its advantages.

Bulgaria

One main barrier is the lack of trust in the EPC concept and EPC providers, due to limited knowledge of clients and poor past experience with EPC in public buildings (and consequently poor reputation of these EPC providers). The other crucial barrier which hinders the implementation of projects in Bulgaria concerns the financing of projects. There are several grant programs for SMEs currently existing and available or planned for energy efficiency. They come mainly from the EU Structural and Investment Funds or the National Trust Eco Fund. This prevents the development of the energy service market and all programs and funds that provide grants have rules that are incompatible with EPC+ concept. Furthermore, the limited understanding and experience of banks with EPC results in perception of these projects as too risky, so banks require high collateral. The national EE fund (EERSF) also requires high collateral and high interest rates.

Czech Republic

The main barriers in the Czech Republic are the complexity of EPC for all clients, the lack of trust in EPC and administrative barriers in the public sector.

Germany

The interest in Germany in EPC projects is in general quite low. Several market actors tried already in the past to offer and implement EPC without big success. One reason for this limited market adaptation lies in the fact that clients hesitate with an investment, because the amortization time seems for the clients often too long.

Greece

One major barrier that hinders the participation in EPC+ pilot projects is the missing financing provided either from the SPIN or from a financial institution. Piraeus Bank, a financial institution, expressed in the beginning their interest to finance energy performance contracting projects. They although participated during a number of meetings with SPIN members as well as a potential client. Unfortunately, they finally

decided that they cannot provide their support in an EPC+ project (a credibility crisis occurred in Greece during that period).

Ireland

Several barriers that can hinder potential EPC+ projects in the Irish market have been identified. EPC in the Irish market is only considered viable for large energy use that has only been implemented in large scaled industries such as the Pharmaceutical industry. SME's have previously tried to implement EPC projects in the past with limited success. Furthermore, clients are reluctant to being tied into a medium term contract (5 years +) with a third party as the client has own fund available and has applied for available government grant

Italy

Although the ESCO market in Italy is quite developed and the regulatory environment is increasingly adapting to the European and international ones, the growth of the ESCO activities and, in particular, of the EPCs is irregular and inconsistent, and the number and sizes of projects efficiency improvements in EPC are modest. This occurs, in addition to the hypothesis that the Energy Efficiency market may be distorted by the White Certificates and other incentives, since companies that have the technical and financial capabilities to supply and sustain an EPC contract are few, and most of the ESCO are SMEs if not even Micro Enterprises. On the side of the EPC demand from small businesses, we see that these have no way of approaching the issue either due to lack of internal resources, or even to lack of information and sensitivity towards the topic.

Slovenia

The major barrier that hinders the participation in EPC+ pilot projects is the missing financing provided either from the SPIN or from a financial institution. The second barrier is that the EPC+ standardized approach is the first of kind and therefore the complexity of EPC for all stakeholders still remains as a barrier.

Spain

In Spain the investments in energy saving projects for public buildings have been stopped with the economic crisis. The private sector sees EPC for small projects as not interesting enough and the main barriers are lack of own-financing. On top, the banks do not provide loans for "small investment projects" and EPC is not widely known.

Portugal

The interest in Portugal for EPCs is quite low, especially for small investments, both for ESCOs and for Clients. For ESCOs, willing to make large profits, small EPC projects are not being considered in their portfolio offer because the associated costs of M&V are seen a cumbersome. Moreover, the transaction costs of EPCs, even in the scope of EPC+, are considerable for ESCOs which do not exclude the involvement of their legal consultants to establish the contracts. The costs associated to the risks involved are the main concern. The client is still reluctant to long term investments. There is still lack of awareness among

potential customers and also the potential financiers. Most clients do not understand that, after implementing an EPC, the ESCO can be seen as an extension of their operations and maintenance team; client does not understand that the ESCO is not a mere supplier but an ally regarding the efficient operation of the measures.

Further, the present situation in Portugal is not very favorable for EPCs, at least within the timeframe of the EPC+ project, because there are a lot of refundable subsidies available in the scope of the partnership agreement signed by Portugal and the European Commission, that gathers the action of 5 European Structural and Investment Funds (P2020, under the thematic Goals to stimulate the growth and the creation of Employment.). Although these subsidies could be interesting for EPC+ projects, these programs, launched by the government, are quite bureaucratic and the call for applications takes long time. So, the client's expectation now is to apply for these funds, either energy efficiency related or not.

3.4.2. Project and client specific barriers

As mentioned before, next to country specific and more general obstacles also client and project related barriers have been identified. After the first direct meetings and conversations many SPINs managed to convince some clients to continue with the process of implementing a pilot action. Nevertheless, the experience shows that this process doesn't necessarily lead to a successful implementation of a project. Also the reasons for the withdrawals from the implementation process vary a lot and every SPIN in every country had to face more or less its own specific situation.

Austria

The SPIN members in Austria were in touch with several potential clients with respect to the implementation of energy efficiency measures. After invitation of offers, some clients preferred to work with existing contractors or technology suppliers, instead of working with the SPIN. The reasons are very different and cannot be generalized. However, some feedback was that the clients prefer a standard contract instead of a performance based one and that they prefer to work with existing providers instead of new providers.

Other reasons why pilot projects can't be implemented at potential clients were that no budget for energy efficiency measures have been foreseen in the company, the change of responsible staff at the side of the client and the fact that the minimum cost savings cannot be achieved, as power prices for big buyers are very low.

Belgium

Up to now 20 potential clients received an offer. Three have meanwhile approved a pre-study. The result of this pre-study is an investment and savings plan, to be approved before going to the next phase: implementation of the measures. Some clients decide to not continue the project after the pre-study. Main reasons so far were a shift in investment focus by higher management, re-location of the company or other more pressing issues related to the core business.

Bulgaria

There were several withdrawals due to missing grant availability and expectations. As mentioned before the limited understanding and experience of banks with EPC results in perception of these projects as too risky. SMEs and companies on the other hand must rely on the financing.

Czech Republic

There have been several withdrawals due to the complexity of EPC, lack of trust in the concept, technical problems with the measurement at one client and also the lack of energy saving potential to make EPC economically feasible.

Germany

Many clients are very open for the information about the concept itself and the concrete planning of the project from the SPIN members, but decide afterwards against the implementation of the action with these partners. Instead they prefer to invest themselves in a modernization. This behavior lies in the fact that money for the investment of an action is currently very cheap and therefore they don't need any additional financial support.

Another withdrawal appeared from the inactivity of the SPIN. One client asked during the planning for further instructions/offers/explanations from the SPIN members and they didn't react immediately or at least quite fast. At the end the client lost the overall interest in implementing an action.

Other problems which can occur are related to the organization structure of the client's company. If the potential customer is a public institution, in case of a technical modernization exceeding a certain invest, a public procurement process needs to be carried out. A similar problem turns up if the client is a subsidiary company which belongs originally to another organization. In case of a technical modernization this mother organization has to be consulted as well and has to agree also with the action.

Also during the technical analysis of a concrete possible project, an amortization time of at least 7 years for this project has been identified. A final decision hasn't been taken yet, but this might be a reason for the client to stop the project.

Focusing concretely on the modernization of lighting systems, the design of a new lighting system seems very relevant for office buildings and their employees. Therefore, individual preferences have to be taken into account and might lead to the point that projects won't be implemented at the end since there can't be found an agreement between decision makers.

Greece

Investments are currently very difficult in Greece, especially related to the economic crisis of the last years. Like in the most southern European countries companies must rely on the financial support of the banks they are not willing give.

Ireland

Ireland didn't face any withdrawals from potential projects. However some clients awaiting a government grant scheme which will enable them to produce 30% -50% of the funding required, which will then reduce the contract term between the SPIN and Client.

Another client expressed an interest only completing a single upgrade at a time as opposed to all the proposed upgrades.

The SPINs are proceeding with progressing with small scale projects or projects with limited risk. Some of the potential clients have varying levels of energy use and are in some cases unwilling to confirm a minimum required payback level. Also with funds readily available to the client and with payback periods more attractive with client only funds, this is proving the more popular choice for works.

Italy

The specific barriers of the pilot projects fully reflect the general ones: SMEs do not have the capability to implement EPC both from the demand and the supply sides in terms of resources. The need for tools (standards, technical documents, and financial, insurance and contractual instruments) to support EPC energy efficiency measures in a harmonized and integrative way is confirmed in quite all the projects implemented within the EPC+ initiative. The need is above all to manage the perception and the effective distribution of risks among the different actors.

Slovenia

Project and client specific barriers are directly connected to the general barriers: the clients are looking for the EPC+ projects financed by the SPIN and would like to implement simple and transparent EPC+ projects with a minimum involvement from their side.

Spain

Energy audits have been carried out at some potential clients. But the existing technologies were working properly and sufficient enough that only few luminaries needed to be replaced and no further actions needed to take place.

Portugal

One client has changed all the lighting system by LEDs, but not as an EPC with the SPIN partners. They paid in advance for another company to replace the existing lamps by LEDs, because they realize the potential for savings was so high that it was more cost effective to buy the lamps themselves, instead of paying for the lighting service. Interest rates are quite low at the moment, and, in addition, there are some interesting refundable subsidies for lighting.

4. Pilot projects

The paragraphs before demonstrated the difficulties and challenges SPIN partners have to face in the different countries as well as with the clients. It shows how difficult the EPC market is and how much persistent work from the SPIN members is required in order to find suitable candidates.

Therefore it doesn't come as a surprise that only a small amount of interested clients can be obtained to proceed with the final implementation procedure. Nevertheless, the following overview shows that several EPC projects have been already implemented successfully or are planned for the near future.

Country	Clients concrete offered to participate in a project*	Projects already implemented	Projects already planned
Austria (e7)	8	1	-
Austria (GEA)	4	2	2
Belgium (Factor4)	20	3	-
Bulgaria (BSREC)	3	-	2
Czech Republic (SEVEN)	32	2	-
Germany (ASEW)	5	-	2
Greece (HELESCO)	5	1	1
Ireland (TEA)	4	-	4
Italy (ESCOITALIA)	60	2	1
Slovenia (JSI)	5	-	2
Spain (ESCAN)	4	4	-
Portugal (ISR)	4	-	2
Total	154	15	16

Table 3 – Overview about implementation activities

*Several SPINs from different partner countries explained that they identified already new clients which will be contacted in the near future

This report focusses exclusively on the recruitment activities to gain potential candidates for the implementation of pilot actions. Therefore information about the implemented or planned activities are not part of this report but can be found in the annex.

5. Summary

The present report describes the recruitment activities of the SPINs in all countries in order to obtain clients for pilot actions and the barriers they have to face during these activities.

In a first step all SPINs defined country specific criteria as minimum requirements for a successful implementation process. Already due to these criteria many potential customers need to be filtered out.

Nevertheless, this process is very important in order to save time during the recruitment activities and to be able to make a fast decision about the profitability of a project.

Next to the filtering process also country specific barriers hinder the access to clients. Especially the lack of financing and the disinterest about EPC have been identified. Surprisingly is the fact, that in countries with a good economic situation where no external financial support is needed the clients are much less interested in the EPC concept and much more restrictive in implementing a new measure than in the other, southern European countries, where a high interest in EPC has been identified, but financial support is absolutely crucial for the customers to be able to invest in a pilot action.

Nevertheless, after identifying clients fulfilling the defined criteria they have been contacted via different channels. The survey shows that nearly all SPINs use their own network for the recruitment activities first. The experience indicates that clients are only willing to participate in a “new project” if there is already a working relationship with the SPIN partners and if trust between the partners already exists. To be able to convince completely new customers with new business approaches is very rare.

The feedback of the SPINs reveals further that nearly all directly contacted pilot clients have been interested and open in a first step. But also this reaction doesn't give a guarantee for a successful implementation of a project. Many other hurdles and obstacles exist which can hinder the process. Several ones have been described in detail.

As conclusion it needs to be noted that many - if currently still not too many - barriers exist during the recruitment process. Therefore many activities are required in order to identify finally a successful candidate who is willing to continue with the implementation process until the end.

6. Annex

The Annex includes information about the implemented and planned pilot actions which have been realized so far during the EPC+ project.

6.1. Implemented projects

No. Pilot Project	1
Project Partner	GEA
Country	Austria
Sector/object of the pilot project	Museum (owned by the municipality)
Project start	February 2016
Amount of SPIN partners involved	5
Implementation procedure	<p>The project in the children's museum was actually asked for by the client. In a first contact the SPIN coordinator a second SPIN member and the head of the children's museum discussed the needs of the clients. These were:</p> <ul style="list-style-type: none"> • modernization of the existing lighting concept in the exhibition area (LED), • service and maintenance of the cooling system, especially the chiller and heat exchange system • optimization of the operating parameters • Improvement of the indoor conditions and deduction of the energy costs with performance guarantee. <p>For the technical survey and the creation of the contract several meetings, emails and phone calls with the client were necessary. Different technical variants were discussed.</p>
Implemented technical measure	<p>The lighting of the exhibition area was changed into a more efficient LED system. All necessary requirements in lighting of works of art were kept. The cooling systems operated inefficient. There were no special technical measures required but optimizing the running parameters and service and maintenance (cleaning the heat exchanger).</p>
Problems during the implementation process	None
Problem solving	Not relevant
Support and Monitoring	<p>The saving proof was verified by the SPIN coordinator by a simplified method like metering before and after implementation of the measures. Therefore metering of the electrical power over a convenient period of about one week was realized. Additional the luminance intensity and indoor temperature was metered and all necessary quality standards have been reached and topped. After this one-time check and verification no further saving proof will be provided by the SPIN.</p> <p>Periodical service and maintenance are not part of the contract. The technical personal of the children's museum will organize the regular recurrent technical maintenance of the appliances through appropriate experts like the existing SPIN members.</p>

No. Pilot Project	2
Project Partner	GEA
Country	Austria
Sector/object of the pilot project	Park house (owned by the municipality)
Project start	August 2016
Amount of SPIN partners involved	3
Implementation procedure	<p>The project in the park house was a follow – up order of an energy audit that showed saving potential in lighting.</p> <p>The SPIN partners and the client first signed a Letter of Intent for the implementation of energy efficiency measures:</p> <ul style="list-style-type: none"> • modernization of the existing lighting concept in the park house • use of subsidies to reduce investment costs • optional implementation of an monitoring system to control energy consumption <p>For the technical survey and the creation of the contract several meetings, emails and phone calls with the client were necessary. Different technical variants were discussed.</p>
Implemented technical measure	GEA created two concepts for the renewal of the old existing lighting system by using LED technology. One included just the lights in the parking area, a second also the renewal of the lights in the floor and escape way lights. The parameters of the existing lighting control were optimized.
Problems during the implementation process	None
Problem solving	Not relevant
Support and Monitoring	<p>The saving proof was verified by the SPIN coordinator by a simplified method like metering before and after implementation of the measures. Therefore metering of the electrical power over a convenient period of about one week was realized. Additional the luminance intensity was metered. After this one-time check and verification no further saving proof will be provided by the SPIN.</p> <p>Another SPIN partner has not yet decided to implement the optional energy monitoring system. In case of installation of the system GEA will do an ongoing review of energy consumption.</p>

No. Pilot Project	3
Project Partner	e7
Country	Austria
Sector/object of the pilot project	Logistics for food and non-food products / storage house with cooling
Project start	March 2016
Amount of SPIN partners involved	2
Implementation procedure	Several phone calls, emails and personal meetings were already held. The official Kick-Off-Meeting on sight between SPIN partners as well as the clients was on 1 June 2016. The project tasks and time line were discussed.

	<p>Also a visit of the sight was carried out, important data obtained and pictures taken.</p> <p>Some smaller project progress meetings were held too. The latest findings from analyses were discussed and further steps decided.</p>
Implemented technical measure	<p>e7 is going to implement an optimization package of the building operation system. An optimization package of the building operation system includes:</p> <ul style="list-style-type: none"> • Analysis of the building energy consumption • Potential installation of monitoring hardware • Optimization measures for HVAC and lighting. • M&V <p>Innovative market: Logistics company for food and non-food products. No EPC with respect to optimization of the HVAC system has been implemented in this sector yet in Austria.</p>
Problems during the implementation process	<p>It turned out that the client needs more time to implement new settings for various optimization measures. As of 4 April 2017 it is clear which measures have been implemented by the client. This will be clarified in the end of April. However, following measures were suggested, for instance:</p> <ul style="list-style-type: none"> • Programming of bank holidays for ventilation and cooling devices • Shutdown of cooling devices during the night <p>Furthermore, it turned out that the cooling device needs in-depth re-commissioning. But the planning and implementation for this measure is not foreseen in the budget 2016/2017 of the client.</p>
Problem solving	<p>Reminding the client and scheduling personal meetings with tighter time line.</p> <p>The re-commissioning of the cooling device will be postponed towards the year 2018.</p>
Support and Monitoring	<p>After the implementation the SPIN coordinator e7 will be for all kind of problems the first contact person.</p> <p>e7 is the coordinator of the SPIN and face to the customer. With this respect, e7 pays attention especially to</p> <ul style="list-style-type: none"> • Schedule: estimate vs actual effort, analysis of variances • Costs: estimate vs actual costs, analysis of variances • Quality: how well are services / reports completed • Deliverables: could the SPIN deliver the right service in time • Benefits: definition of indicators to measure benefits. With this respect M&V is very important. Annual load profiles of respective sub-meters will be analyzed (prior measure, after measure). This approach was agreed with the client within the contract negotiation phase. <p>These elements are checked on a regular basis and communicated to the client within the frame of progress meetings or phone calls.</p>

No. Pilot Project	4
Project Partner	Factor 4
Country	Belgium
Sector/object of the pilot project	Construction / office building, workshop and storage building

Project start	April 2016
Amount of SPIN partners involved	5
Implementation procedure	The client was a customer of one of the SPIN partners. During a first bilateral meeting between the SPIN partner and the client, the concept of the SPIN offering was presented. The client agreed to receive a concrete offer for a Plus+ project (including the mandatory energy audit for large enterprises). Two months later, the contract for the pre-study and the mandatory energy audit was signed.
Implemented technical measure	The pre-study revealed following measures to be profitable within the boundary conditions set by the client: <ul style="list-style-type: none"> • Relighting of the workshop and storage area • Redesign of the heating system of the workshop • Optimization of the heating system in the offices. • Implementation of an energy monitoring system to identify standby power and other unwanted electricity use
Problems during the implementation process	No major problems. Energy cost and energy management in general are not the main priority in the organization. Frequent reminders and calls had to be made, our offer systematically disappeared into the background, behind more urgent and important core-business issues
Problem solving	Because the offer included also the mandatory energy audit for large enterprises (which had a clear and hard deadline, imposed by the authorities), it was eventually approved relatively easy.
Support and Monitoring	After the implementation the SPIN coordinator Factor4 will be the first contact person for all kind of problems and will delegate if necessary technical questions to the SPIN members. In addition, a regular communication exchanged is planned. A monitoring system will be implemented, of which the data is also accessible to Factor4. Factor4 will regularly follow the status and compare the energy use to the baseline. In case of problems, the client will be contacted.

No. Pilot Project	5
Project Partner	Factor 4
Country	Belgium
Sector/object of the pilot project	Education primary and secondary school / school building
Project start	November 2016
Amount of SPIN partners involved	4
Implementation procedure	The principal of the school was a personal acquaintance of one of the Factor4 coworkers. During a first bilateral meeting between Factor4 and the school, the concept of the SPIN offering was presented. The client agreed to receive a concrete offer for a Plus+ project. Three months later, the contract for the pre-study was signed.
Implemented technical measure	The pre-study revealed following measures to be profitable within the boundary conditions set by the client: <ul style="list-style-type: none"> • Relighting of the polyvalent area

	<ul style="list-style-type: none"> • Redesign of the regulation of the heating system • Implementation of an energy monitoring system to identify standby power and other unwanted electricity use
Problems during the implementation process	none
Problem solving	Not necessary
Support and Monitoring	<p>After the implementation the SPIN coordinator Factor4 will be the first contact person for all kind of problems and will delegate if necessary technical questions to the SPIN members. In addition, a regular communication exchanged is planned.</p> <p>A monitoring system will be implemented, of which the data is also accessible to Factor4. Factor4 will regularly follow the status and compare the energy use to the baseline. In case of problems, the client will be contacted.</p>

No. Pilot Project	6
Project Partner	Factor 4
Country	Belgium
Sector/object of the pilot project	Printing / storage and printing workshop, office building
Project start	September 2016
Amount of SPIN partners involved	4
Implementation procedure	<p>The client was a customer of one of the SPIN partners. During a first bilateral meeting between the SPIN partner and the client, the concept of the SPIN offering was presented. The client agreed to receive a concrete offer for a Plus+ project.</p> <p>Four months later, the contract for the Plus+ project was signed.</p>
Implemented technical measure	<p>The pre-study revealed following measures to be profitable within the boundary conditions set by the client:</p> <ul style="list-style-type: none"> • Relighting of the workshop and storage area • Redesign of the heating system of the workshop • Optimization of the heating system in the offices. • Leak detection, correction and prevention in compressed air circuit • Compressor redesign • Implementation of an energy monitoring system to identify standby power and other unwanted electricity use
Problems during the implementation process	No major problems
Problem solving	Not necessary
Support and Monitoring	<p>After the implementation the SPIN coordinator Factor4 will be the first contact person for all kind of problems and will delegate if necessary technical questions to the SPIN members. In addition, a regular communication exchanged is planned. The client operation is also CO2 neutral. This will be monitored by one of the SPIN partners in the coming years.</p> <p>A monitoring system will be implemented, of which the data is also</p>

	accessible to Factor4. Factor4 will regularly follow the status and compare the energy use to the baseline. In case of problems, the client will be contacted.
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No. Pilot Project	7
Project Partner	Seven
Country	Czech Republic
Sector/object of the pilot project	Municipality
Project start	September 2016
Amount of SPIN partners involved	2
Implementation procedure	<p>The client has been contacted via an open public tender. The SPIN principle fulfilled qualification requirements and submitted request to participate. Furthermore, the SPIN principle was invited to submit proposal on energy saving project in the beginning of April 2016. There was one meeting before the end of April 2016 where the SPIN principle visited the project premises, made photo documentation and obtained detailed technical data on the buildings. In May the principle submitted the tender. In June they presented and discussed the tender details within the negotiation process and the following email communication. Based on the obtained information, SPIN improved the offer and submitted the second version of the tender. After the submission, second round of negotiation process was opened and all the improvements of the project were presented to the client during the onsite meeting.</p> <p>In August results of public procurement were announced and proposal of the SPIN principle had been evaluated as the best for the client according to the criteria set at the beginning of the procurement process. After two weeks, negotiation about contract began and finally in September EPC contract was signed.</p>
Implemented technical measure	<ul style="list-style-type: none"> • Indoor lighting • Pumps • Managing and metering systems for buildings • Modernization / replacements of boilers (reconstruction of gas fired boiler house and installation of condensed boilers) • Biomass • CHP • Other: thermostatic valves, IRC
Problems during the implementation process	Payback of proposed energy saving measures was discussed and gradually adjusted during the negotiation process. It had to be decided whether decrease in size of energy savings and shorten payback below eight years as client required or extend the payback over ten years.
Problem solving	<p>According to the proposal of the client, several technical energy saving measures with payback over ten years were removed from the EPC project and will be subsidized from special programme Efekt (operated by Ministry of Industry). The client appreciated the final resolution.</p> <p>Payback of the subsidized measures becomes economically feasible. The overall energy savings of the pilot project will be considerably higher than</p>

	in the scenario without subsidies. The subsidies are provided only on the condition that energy savings by the selected measures are guaranteed.
Support and Monitoring	<p>The SPIN principle submits annual monitoring and verification report to the client. The report is discussed with the client until the client accepts it by signing it. The difference between the reported savings and the guaranteed savings is balanced by The SPIN principle (e.g. pays compensations in case of under achievement or receives bonus for saving excess).</p> <p>The pilot action will be monitored according to the Annex 6 of the contract by the SPIN principle. Monitoring and verification report will be submitted annually to the client.</p>

No. Pilot Project	8
Project Partner	Seven
Country	Czech Republic
Sector/object of the pilot project	Company is owned 100% by the City of Prestice and its role is provide maintenance of its buildings.
Project start	March 2017
Amount of SPIN partners involved	2
Implementation procedure	There were three meetings on which technical details were specified and the contract from tender dossier has been adjusted. Finally contract was signed on 20th March 2017.
Implemented technical measure	<ul style="list-style-type: none"> • Upgrade of the district heating system • Complete exchange of the house heat substations • Hot water interconnecting lines among island systems <p>This project is very innovative, as for the first time in the Czech Republic, all the heat delivered by the delivery system will be almost exclusively sourced from the biogas cogeneration units. The current heat network will be extended so more heat can be supplied from the cogeneration biogas plant, to save the non-renewable natural gas. Currently 60% of the heat comes from biogas, while after the project it will be 95%.</p>
Problems during the implementation process	Project documentation provided by the Client was not detailed enough and a few technical details had not been fully correct or completed.
Problem solving	SPIN members in communication with client developed additional technical specifications and completed technical solution were needed.
Support and Monitoring	<p>Almost entire volume of the heat delivered by the delivery system will be sourced from the biogas cogeneration units. If the state feed-in-tariff guarantee will be in place, it is expected that the project will run at least for 10 years. If, for any reason the biogas supply is not substantial, the missing volumes can be substituted from natural gas.</p> <p>To fulfill requirements of the subsidy programme, during the first 3 years after commissioning the installation, a yearly monitoring report will be provided to evaluate the achieved results.</p>

No. Pilot Project	9
Project partner	CRES
Country	Greece

Sector/object of the pilot project	Center for renewable energy sources
Project start	March 2017
Amount of SPIN partners involved	3
Implementation procedure	<p>According to a Public Tender, published on the 16th November 2016 with an estimated budget of € 30.000 (to be financed by CRES with own funds), 60% of the project budget is to deposited with the finalization of the installation, 10% at the end of the 1st year of operation of the equipment (following the verification of the guaranteed savings), a further 15% at the end of the 2nd year of operation of the equipment (following the verification of the guaranteed savings) and, finally, 15% at the end of the 3rd year of operation of the equipment (following the verification of the guaranteed savings). At a meeting held at CRES' headquarters on the 24th November, the Coordinator of the SPIN, KGS S.A., announced their intention to partner with two other associates for this Tender and to also consider the eventuality of also collaborating on a long-term basis. They therefore expressed a keen interest to participate in the EPC+ project regardless of the outcome of the Tender.</p>
Implemented technical measure	<ul style="list-style-type: none"> • For the evaluation of the project the "Lighting" tool will be implemented. • The Public Tender was decided by CRES, not only due to the economic benefits and the improvement of the quality of the indoor lighting that will result from the implementation of the project, but also as a pilot project for the public sector. As a matter of fact, this pilot project will be the first example of an implemented EPC project in the public sector (CRES is a public body that is however governed by private law), but also one of the very few examples of implemented EPC projects in buildings of the tertiary sector.
Problems during the implementation process	No problems
Problem solving	Not necessary
Support and Monitoring	<p>CRES, the client, undertook the energy audit of the existing installation and therefore established the baseline of the project with which the new installation will be compared. All participants in the Tender were invited to visit the CRES installations before submitting their offer and to also submit written requests for clarification. With the submission of the offer to the Tender, they accept all its terms.</p> <p>For the monitoring and verification, both Options A and B of the IPMVP will be adopted. More specifically, the SPIN should measure on an annual basis the absorbed power of the lighting fixtures with a sampling rate that will ensure less than $\pm 20\%$ uncertainty with an 80% confidence interval. The measured absorbed power should be within $\pm 5\%$ of the guaranteed reduction of absorbed power.</p> <p>Furthermore, they will measure the energy consumption throughout the three years of the monitoring and verification plan foreseen in the Tender with the installation of two power analyzers in the central branches of the two sub-circuits of the ground floor where the lighting fixtures have been replaced. The measured energy consumption should be within $\pm 5\%$ of the</p>

	guaranteed reduction of energy consumption.
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No. Pilot Project	10
Project Partner	Escan
Country	Spain
Sector/object of the pilot project	University / Building student hall
Project start	February 2016
Amount of SPIN partners involved	3
Implementation procedure	<p>Acclimatization is the main topic of this project and also Sanitary Hot Water (as in each room there is one shower). Therefore the EPC tools created in EPC+ about energy efficient ventilation/cooling.</p> <p>Escan explained and provided the EPC+ tool created about this topic to the client. An innovative chiller was chosen for this project.</p> <p>The client was interested in decreasing the energy consumption of electricity and gas. For the technical survey and the creation of the contract several meetings, emails and phone calls with the client were necessary. Different technical variants were discussed.</p>
Implemented technical measure	<p>The members of the SPIN analyzed the most energy consumption equipment's of the student hall. The identified measures were:</p> <ul style="list-style-type: none"> • Replacement of a chiller unit, • High efficiency gas boiler, • Energy equipment maintenance, • New water buffer tank, • Improvement of the thermal insulation in the building • Controlled starting of the circulation pumps.
Problems during the implementation process	<p>The chiller unit was broken and the client wanted a new one very quickly. SPIN members explained the client that there were different options in the market and the one that better suitable for this Student Hall was imported.</p>
Problem solving	<p>Searching several distributors for this technology that could send the chiller soon and the SPIN did the selection of a good distributor.</p>
Support and Monitoring	<p>The monitoring will be carried out by Escan. Several documentation and information will be used, example the invoices of the client.</p>

No. Pilot Project	11
Project partner	Escan
Country	Spain
Sector/object of the pilot project	Office Building
Project start	April 2016
Amount of SPIN partners involved	3
Implementation procedure	<p>The client contacted the SPIN because they required improvements of electricity in the building; several telephone conversations between Escan and the client; organization of a first meeting with the client explaining</p>

	that SPIN should perform an energy audit focusing on electricity consumptions and the benefits of the LEDs. Information about solar technology was also provided to the client.
Implemented technical measure	Innovative technology as the main focus is the replacement of old lamps through new LEDs in the Spanish market; also the replacement of an old stabilizer via a new efficient voltage stabilizer will achieve energy savings for the electricity bill of the building.
Problems during the implementation process	No relevant problems; the client decided not to implement solar panels because with the new normative it takes very long to achieve permission for solar auto-consumption.
Problem solving	Not relevant
Support and Monitoring	An energy audit has been performed before the new LEDs and stabilizer were placed. In the audit the electricity consumption is record with the electricity meter in May 2016. The metering of electricity is carried out again after the installation of the systems and the measures of electricity monitored.

No. Pilot Project	12
Project partner	Escan
Country	Spain
Sector/object of the pilot project	Residential Buildings and Shops
	March 2016
Amount of SPIN partners involved	3
Implementation procedure	Several telephone conversations explaining the benefits of the smart meter to the president of the Association of owners; organisation of a meeting with the president and the representatives of each apartment block.
Implemented technical measure	Innovative technology as the main focus is the replacement of old meters by new smart meters in the Spanish market; also the information that will be provided to consumers will be very useful to know the electricity consumption in the households.
Problems during the implementation process	none
Problem solving	Not relevant
Support and Monitoring	The electricity consumption is record with the electricity invoices of the households. The type of household and use is considered and a sample of 80 invoices will be collected, estimation utilized for the XXX households.

No. Pilot Project	13
Project partner	Escan
Country	Spain
Sector/object of the pilot project	Residential Buildings
Project start	December 2016

Amount of SPIN partners involved	3
Implementation procedure	Several telephone conversations explaining the benefits of the new insulation to the Neigh borough association, Comunidad de propietarios; organisation of several meetings with the representatives and president of these.
Implemented technical measure	The insulation material is placed in the facades and in the roof of the building
Problems during the implementation process	none
Problem solving	Not relevant
Support and Monitoring	The electricity consumption will be recorded with the electricity invoices of the households.

No. Pilot Project	14
Project Partner	Esco Italia
Country	Italy
Sector/object of the pilot project	Boiler's replacement and monitoring system installation in a building of 850 square meters and 2514 cubic meters under environmental architectural protective restrictions located in Florence owned by a real estate small (micro) enterprise: EPC and Validation.
Project start	March 2017
Amount of SPIN partners involved	2
Implementation procedure	Through meetings with the clients, it has been discussed the scope of the project and the type of contract (energy performance contract). Then, it has been carried out an energy analysis of the building and the best technical solutions to obtain the energy savings were identified. When the customer agreed on the best solution for energy saving, it was signed up an energy performance contract, with special attention to the calculation of the annual energy saving.
Implemented technical measure	<p>The actual boiler of the building was old with a poor efficiency. It has been proposed to change the boiler with a new condensing boiler with higher efficiency. The new boiler has a nominal efficiency of 98%, but the system was set to obtain optimum operating efficiency by maximize the recover of energy through condensation of vapor water. This was obtained by setting optimal flow rate and thus minimum returning temperature.</p> <p>Included in the proposal / other details:</p> <ul style="list-style-type: none"> - audit - boiler replacement - installation and use of the monitoring system - Measurement and Verification (IPMVP published by EVO - Efficiency Valuation Organization) - information and training plan - application for governmental incentives and tax deduction - Performance bond (assurance / guarantee) - financial needs (coming from the agreement with the bank group Intesa)
Problems during the implementation process	No problem arose during the implementation process. The main concerns were to organize the intervention with the customer

Problem solving	There were no problem to solve. However, in order to prevent any problem, we were in constantly in touch with the client.
Support and Monitoring procedure	After the implementation of the substitution of the boiler, we are in charge of the maintenance of the system, already defined in the epc. So, we give full support to the costumer and we monitor the system and the measurements.

No. Pilot Project	15
Project Partner	Esco Italia
Country	Italy
Sector/object of the pilot project	Heating system's optimisation of the building complex of Castello di Rivoli, included in the UNESCO heritage list, performing cultural events and exhibitions, education, food and shop activities
Project start	February 2016
Amount of SPIN partners involved	3
Implementation procedure	Through an energy analysis it has been selected the most promising solutions for energy efficiency. An Energy Performance Contract was discussed since the beginning with the Customer and the bank for the loan. Once the energy saving solutions were determined, an energy performance contract was signed.
Implemented technical measure,	The heating system will be controlled by a BMS (Building Management System) able to control e regulate the ambient temperature and working temperature of fancoils and heat generators.
Problems during the implementation process	No specific problem.
Problem solving	No specific problem.
Support and Monitoring procedure	The monitoring of the energy savings is carried out and report every month.

6.2. Planned projects

No. Pilot Project	1
Project partner	GEA
Country	Austria
Sector/object of the pilot project	Crematorium / Funeral palour (owned by the municipality)
Project start	open
Amount of SPIN partners involved	Currently only one partner involved – further partners have to be found
Implementation procedure	The SPIN coordinator GEA has been directly contacted by the client. GEA did an energy audit that showed saving potential mainly in using waste heat for cooling (absorption cooling).
Implemented technical measure	GEA created a technical concept to use waste heat of the crematorium for the cooling system by an absorption refrigerator.
Problems during the implementation process	There is generally a denial to use waste heat out of cadavers.

Problem solving	Not solved yet
Support and Monitoring	No concrete plans yet.

No. Pilot Project	2
Project partner	GEA
Country	Austria
Sector/object of the pilot project	Advertisement company
Project start	open
Amount of SPIN partners involved	Currently only one partner involved – further partners have to be found
Implementation procedure	The energy audit required by law and done by GEA showed a saving potential by using LED for lighting the advertisement boards with short payback period.
Implemented technical measure	Switching to LED-technology in the lighted advertisement boards in other projects generated a high saving potential in energy consumption.
Problems during the implementation process	The client has not yet decided to implement the measures.
Problem solving	Not relevant
Support and Monitoring	No concrete plans yet.

No. Pilot Project	3
Project partner	BSERC
Country	Bulgaria
Sector/object of the pilot project	Multi-family residential buildings
Project start	Earliest July 2017
Amount of SPIN partners involved	2
Background	The Council of Ministers adopted the National Program for Energy Efficiency of Multi-family Residential Buildings. It provides grants for the renovation of multifamily buildings through the implementation of energy efficiency measures. The program is managed at municipal level - municipalities manage the applications of building owners, their evaluation, selection of contractors, and monitoring of the implementation. First, municipalities undertake public procurement for the selection of the contractor who would carry out the energy audit and develop the building technical passport. Second, when the audit and the passport are completed, they undertake another public procurement to select the contractor for the implementation of the measures, prescribed in the audit.
Implementation procedure	The communication was limited only to the participation in the public procurement procedure for the energy audit and passport. The SPIN was selected and has the contract signed. The work is in progress. Still the public procurement for the implementation of measures has not started, but the SPIN expects that they would be selected there too.

Implemented technical measure	The technical measures will depend on the recommendations of the energy audit, which is still in progress. The innovative element is the target sector – multi-family residential buildings.
Problems during the implementation process	none
Problem solving	Not relevant
Support and Monitoring	To be discussed at a later stage

No. Pilot Project	4
Project partner	BSERC
Country	Bulgaria
Sector/object of the pilot project	Kindergarten (owned by municipality)
Project start	The energy audit (stage 1) is expected to start in May 2017; the implementation of the measures (stage 2) – not earlier than September 2017.
Amount of SPIN partners involved	2
Background	The municipality will receive 70% grant from the National Trust EcoFund (NTEF) to renovate a municipal kindergarten. The project is implemented at 3 consecutive stages, implemented by external contractors, based on public procurement: 1) energy audit; 2) implementation of the measures, prescribed in the audit; 3) “Control” energy audit, one year after the implementation of the measures, to confirm the achieved energy savings.
Implementation procedure	First communications with the municipality took place.
Implemented technical measure	Building envelope measures and replacement of the heating system (still no details are available). The innovative elements are the funding scheme, based on a partial grant + partial financing offered by the SPIN (normally projects in public authorities are based on 100% grant) and the innovative technology (advanced solar thermal collectors, not used in the country so far).
Problems during the implementation process	None so far
Problem solving	Not relevant
Support and Monitoring	A “Control” energy audit, one year after the implementation of the measures, will be implemented to confirm the achieved energy savings.

No. Pilot Project	5
Project partner	ASEW
Country	Germany
Sector/object of the pilot project	Food sector
Project start	open
Amount of SPIN partners involved	3

Implementation procedure	<p>The client has been contacted at first via phone from the SPIN coordinator and has been visited afterwards four times by the SPIN-partners. During the first bilateral meeting between the SPIN Coordinator and the client the focus has been put on general explanations about the EPC+ project and the first expectations of the client were discussed. During the second meeting one SPIN partner executed the technical analysis of the existing lighting system. During the third meeting, the technical facilitator visited the client and made a cost analysis for the installation of the new lighting system.</p> <p>During the fourth meeting on the in March 2017, the SPIN partners presented the overall planning and the EPC+ approach for the office building to the client and submitted a concrete offer. The decision from the client is still pending.</p>
Implemented technical measure	<ul style="list-style-type: none"> • old fluorescent tubes will be replaced via a new LED lighting system • a new standardized system for the regulation of the lighting system has been proposed to the client (but unfortunately this is not an option since the office workers prefer to keep their current individual opportunities for the lighting regulation)
Problems during the implementation process	<p>During the technical analyses onside, the partners realized that due to technical circumstances it would be very complicated and too expensive to install a new emergency lighting system. Therefore, the decision has been taken that the emergency lighting system will not be part of the new lighting system.</p> <p>In addition, the client didn't think beforehand about the fact what kind of new lighting system he wants to install. Therefore a comprehensive consultation was necessary and has been carried out in order to find a satisfying solution. Also the influence of the lighting design for the employees and their individual preferences had to be considered and led to time-consuming discussions.</p>
Problem solving	<p>One result after the whole consultation and planning process was that an initially preferred concept with individualized floor lamps hasn't been chosen by the client, because currently a lighting system with ceiling luminaires is installed. The technical costs of retrofitting and an installation of a floor lamp concept would be too expensive. Therefore, the decision makers agreed on the modernization of the current ceiling concept.</p>
Support and Monitoring	<p>After the implementation the SPIN coordinator will be for all kind of problems the first contact person and will delegate if necessary technical questions to other SPIN members. In addition, a regular communication exchanged is planned. For the regular technical maintenance a third SPIN member will be responsible.</p>

No. Pilot Project	6
Project partner	ASEW
Country	Germany
Sector/object of the pilot project	Public Sports Center
Project start	open

Amount of SPIN partners involved	3
Implementation procedure	The client has been contacted at first by one SPIN member, who mentioned the option of lighting renovation via contracting. Afterwards the client has been contacted twice via phone by the SPIN-partners. Another personal meeting has been carried out with the SPIN coordinator. Cooperation contracts and a marketing strategy for further clients is currently under development by the SPIN.
Implemented technical measure	<ul style="list-style-type: none"> • Old fluorescent tubes will be replaced via a new LED lighting system • a sports- secure LED will installed, which is an innovative technology • a lighting management system with daylight sensors will be offered to the client.
Problems during the implementation process	As the pilot project is a big public hall, the costs for the installation might be too high to reach effective amortization times. A new lighting design might also be too complicated to perform. But even a 1:1 change of the old lighting system to a new LED lighting system would save the client 50% of annual electricity costs. This installation would be rather easy and therefore be the best option. In further meetings, the SPIN will present different options to the client.
Problem solving	Another personal meeting and technical audit is planned to find the best solution for the client.
Support and Monitoring	Needs still to be discussed

No. Pilot Project	7
Project partner	Helesco
Country	Greece
Sector/object of the pilot project	Super Market
Project start	Mid 2017
Amount of SPIN partners involved	2
Implementation procedure	The client was contacted through, facilitator's personal contacts in the technical operations department. The communication process was initially through emails and telephone analyzing the project scope and the intended outcome of the investment in lighting. The initial communication was carried out during the last months of 2016 and the first meeting took place by the end of December 2016 in client's premises. During the meeting, it was discussed in more detail the solution to be implemented in the grocery store section of the super markets. Furthermore, it was agreed that the client will choose the super market store that the pilot project will be implemented. The second meeting was carried out (beginning of February 2017) in the super market store in order to evaluate the current situation, analyze the following steps required before the contract agreement and project implementation. The third meeting was carried out during the middle of February 2017 where the client provided a lighting fixture required for the customized replacement of some elements in

	order to install a LED light without changing the lighting fixture
Implemented technical measure	<ul style="list-style-type: none"> • For the evaluation of the project the “Lighting” tool will be implemented • The service provided in the lighting sector market can be assessed as an innovative approach since the SPIN strategy is to finance and implement a pilot project showing the benefits of energy savings as well as the increase in visual comfort, increase in sales volume and reduction of grocery wastage before the client decides for the full-scale implementation
Problems during the implementation process	<p>During the first meeting the client asked for more details regarding light level output and costing of the proposed solution, because during the past years the company has upgraded its lighting fixtures and they believe that further cost reduction will be marginal.</p> <p>They also are challenged to identify the benefit in terms of sales increase and reduction of wastage in the grocery store</p>
Problem solving	<p>During the first meeting the SPIN expert explained that the current lighting fixtures will be used with some minor changes in every fixture that will reduce the cost as well as increase the life cycle of the product. He also analyzed how the proper light and color output can increase the interest of the customer to focus on products as well as explained how the extreme light can increase the wastage in the grocery store.</p> <p>During the second meeting in the super market at the grocery store section the SPIN expert asked from the employees to switch on and off lights. With this he demonstrated the different color outputs of the same product in different light input. He also collected information about store light fixtures position and proper distances required from the grocery products in order to reduce the rate of wastage.</p>
Support and Monitoring	<p>The monitoring of the pilot action will have three different elements for outcome evaluation. The first is about energy savings where Option A or B of the IPMVP will be followed. The second is about product lifecycle (replacement of lights) that will be increased (currently every two years they replace the lights) up to 10 years. The third require to be further negotiated (requires sales and wastage data) will analyze the increase in sales volume and the reduction of the grocery wastage.</p>

No. Pilot Project	8
Project partner	TEA
Country	Ireland
Sector/object of the pilot project	Broadcasting Company / office building
Project start	open
Amount of SPIN partners involved	2
Implementation procedure	The client has been in contact with the SPIN via teleconference since early January 2017. These conversations mainly focused on the potential works and the savings that would be attributed from them. In February the client applied for government funding for the works, the client confirmed

	that should this funding be approved it was likely to proceed with SPIN project.
Implemented technical measure	PV design software was used to calculate the expected output from the PV system, this has given the client an accurate expectation with regards the installation. The SPIN has agreed that all existing fluorescent lights will be removed and replaced with new LED lighting. This will also include occupancy sensors for the upgraded lighting system.
Problems during the implementation process	The main issues between the SPIN and client were the duration of contract and contract value. As the client has potential government funding available for the proposed works they would prefer to utilize these funds. Final contract talks are to be held pending award of fund.
Problem solving	Contract negotiations are still ongoing with the client waiting to confirm their final budget pending government funding to be provided. Planning permission requirements have been assisted with by the Tipperary Energy Agency due to past experience in this area, this will help expedite future installation works.
Support and Monitoring	After the implementation of the project the SPIN coordinator are required to monitor the installation of the project for a period of 12 months to ensure the installation is as per the feasibility report provided. PV array operation can be monitored remotely from site and compared to software simulation results. As of yet there is no confirmed monitoring procedure present for the proposed lighting upgrade.

No. Pilot Project	9
Project partner	TEA
Country	Ireland
Sector / object of the pilot project	Retirement Village / 1 and 2 bedroom housing units
Project start	open
Amount of SPIN partners involved	2
Implementation procedure	The client has been in contact with the SPIN via teleconference since early August 2016. These conversations mainly focused on the potential works and the savings that would be attributed from them. In February the client applied for government funding for the works, the client confirmed that should this funding be approved it was likely to proceed with SPIN project.
Implemented technical measure	PV design software was used to calculate the expected output from the PV system, this has given the client an accurate expectation with regards the installation. The SPIN has agreed that all existing storage heating be removed and an air to water heat pump system be installed to provide occupants with heating and hot water.
Problems during the implementation process	The main issues between the SPIN and client were the duration of contract and contract value. As the client has potential government funding available for the proposed works they would prefer to utilize these funds. Final contract talks are to be held pending award of fund.
Problem solving	Contract negotiations are still ongoing with the client waiting to confirm their final budget pending government funding to be provided. Planning

	permission requirements have been assisted with by the Tipperary Energy Agency due to past experience in this area, this will help expedite future installation works.
Support and Monitoring	After the implementation of the project the SPIN coordinator are required to monitor the installation of the project for a period of 12 months to ensure the installation is as per the feasibility report provided. PV array operation can be monitored remotely from site and compared to software simulation results. Energy meter to be installed in heating upgrade to monitor system use and compare to previous installation using HDD method.

No. Pilot Project	10
Project partner	TEA
Country	Ireland
Sector / object of the pilot project	Agriculture Collage / school buildings and agriculture buildings
Project start	open
Amount of SPIN partners involved	2
Implementation procedure	The client has been in contact with the SPIN via teleconference since early January 2017. These conversations mainly focused on the potential works and the savings that would be attributed from them. In February the client applied for government funding for the works, the client confirmed that should this funding be approved it was likely to proceed with SPIN project.
Implemented technical measure	PV design software was used to calculate the expected output from the PV system, this has given the client an accurate expectation with regards the installation. The SPIN has agreed that all existing fluorescent lights will be removed and replaced with new LED lighting. This will also include occupancy sensors for the upgraded lighting system.
Problems during the implementation process	The main issues between the SPIN and client were the duration of contract and contract value. As the client has potential government funding available for the proposed works they would prefer to utilize these funds. Final contract talks are to be held pending award of fund.
Problem solving	Contract negotiations are still ongoing with the client waiting to confirm their final budget pending government funding to be provided. Planning permission requirements have been assisted with by the Tipperary Energy Agency due to past experience in this area, this will help expedite future installation works.
Support and Monitoring	After the implementation of the project the SPIN coordinator are required to monitor the installation of the project for a period of 12 months to ensure the installation is as per the feasibility report provided. PV array operation can be monitored remotely from site and compared to software simulation results. As of yet there is no confirmed monitoring procedure present for the proposed lighting upgrade.

No. Pilot Project	11
Project partner	TEA

Country	Ireland
Sector / object of the pilot project	Agriculture feed supplier / Factory and storage building
Project start	open
Amount of SPIN partners involved	2
Implementation procedure	The client has been in contact with the SPIN via teleconference since early January 2017. These conversations mainly focused on the potential works and the savings that would be attributed from them. In February the client applied for government funding for the works (result should be known late April 2017), the client confirmed that should this funding be approved it was likely to proceed with SPIN project
Implemented technical measure	PV design software was used to calculate the expected output from the PV system, this has given the client an accurate expectation with regards the installation. The SPIN has agreed that all existing fluorescent lights will be removed and replaced with new LED lighting. This will also include occupancy sensors for the upgraded lighting system.
Problems during the implementation process	The main issues between the SPIN and client were the duration of contract and contract value. As the client has potential government funding available for the proposed works they would prefer to utilize these funds. Final contract talks are to be held pending award of fund.
Problem solving	Contract negotiations are still ongoing with the client waiting to confirm their final budget pending government funding to be provided. Planning permission requirements have been assisted with by the Tipperary Energy Agency due to past experience in this area, this will help expedite future installation works.
Support and Monitoring	After the implementation of the project the SPIN coordinator are required to monitor the installation of the project for a period of 12 months to ensure the installation is as per the feasibility report provided. PV array operation can be monitored remotely from site and compared to software simulation results. As of yet there is no confirmed monitoring procedure present for the proposed lighting upgrade.

No. Pilot Project	12
Project partner	JSI
Country	Slovenia
Sector/object of the pilot project	Public sector / school and health centre
Project start	end of 2017
Amount of SPIN partners involved	2
Implementation procedure	This Client was identified by the SPIN members in the framework of the ELENA technical assistance for the Primorska region. All the procedures are already predefined and in place, so the related standard ELENA procedure is used.
Implemented technical measure	Buildings deep renovation: <ul style="list-style-type: none"> • Envelope, windows, doors • Indoor lighting • Heat pump

	<ul style="list-style-type: none"> • Reconstruction of heating station, air conditioning and ventilation • Other: thermostatic valves, water control systems
Problems during the implementation process	Buildings deep renovation is a client requirement so the long payback period is a problem-
Problem solving	Selection of measures was technically and economically optimized. Measures are going to be subsidized out of cohesion funding. The subsidies are provided only on the condition that energy savings by the selected measures are guaranteed.
Support and Monitoring	The SPIN principal submits annual measurement and verification report to the client. The report is discussed with the client until the client accepts it by signing it. The difference between the reported savings and the guaranteed savings is balanced by the SPIN principal.

No. Pilot Project	13
Project partner	JSI
Country	Slovenia
Sector/object of the pilot project	Public sector / schools, kindergarten, municipal hall
Project start	end of 2017
Amount of SPIN partners involved	2
Implementation procedure	This Client was identified by the SPIN members in the framework of the ELENA technical assistance for the Primorska region. All the procedures are already predefined and in place, so the related standard ELENA procedure is used.
Implemented technical measure	Buildings deep renovation: <ul style="list-style-type: none"> • Envelope, windows, doors • Indoor lighting • Heat pumps • Reconstruction of boiler houses, air conditioning and ventilation • Other: thermostatic valves
Problems during the implementation process	Buildings deep renovation is a client requirement so the long payback period is a problem-
Problem solving	Selection of measures was technically and economically optimized. Measures are going to be subsidized out of cohesion funding. The subsidies are provided only on the condition that energy savings by the selected measures are guaranteed.
Support and Monitoring	The SPIN principal submits annual measurement and verification report to the client. The report is discussed with the client until the client accepts it by signing it. The difference between the reported savings and the guaranteed savings is balanced by the SPIN principal.

No. Pilot Project	14
Project partner	ISR-UC
Country	Portugal
Sector/object of the pilot project	Tertiary sector / Hotel
Project start	mid 2017

Amount of SPIN partners involved	3
Implementation procedure	<p>This Client was identified by the SPIN leader, because this company was already involved with the design of the Energy Management System of this Hotel. However, the first contact for EPC+ pilot was made by the SPIN Coordinator, ISR-UC. ISR-UC is also in general responsible for the dissemination.</p> <p>In 2015 and 2016 three on-site meetings took place. After the last meeting, the SPIN leader has visited the client several times to carry out the necessary analysis and measurements. The overall planning of the works and the offer will be presented soon. The control strategy in the pilot room should be implemented before summer time.</p>
Implemented technical measure	<p>An energy management system will be installed to control the mini bar and HVAC of the room. The criteria to set up the control system will be based on the occupation rate of the hotel. The innovation is the control strategy for achieving savings without reducing the comfort level and using the data from the occupation rate software.</p>
Problems during the implementation process	<p>During the technical analyses, the partners realized that due high occupancy rates, the planning of the works is not trivial. The timing of the project is the main constraint. Moreover, this client is implementing several other improvements at the same time and they are applying also for subsidies. The procurement process takes time and the project has a tight schedule.</p> <p>Another concern is that one room alone will not bring many savings to justify an EPC. The replication in other rooms however will make the EPC feasible, but this will probably be implemented after the project ends.</p>
Problem solving	<p>The timing is still a concern.</p> <p>Regarding the demonstrator room, the solution was to include these costs into the application for the subsidy, to help with upfront costs and give economic feasibility to the pilot, but this is a lengthy process, and again timing concerns!</p>
Support and Monitoring	<p>After the implementation the SPIN leader will be for all kind of problems the first contact person. This company is already a regular supplier of this hotel, and therefore there are already business relations established. It is a common requirement from customers, to work with certain market companies of their trust.</p> <p>M&V will be carried out based on real data, supplied by the online platform available from the EMS that was recently installed in the Hotel.</p>

No. Pilot Project	15
Project partner	ISR-UC
Country	Portugal
Sector/object of the pilot project	Metal industry sector
Project start	Ongoing negotiations - implementation is expected for the near future.
Amount of SPIN partners involved	3

<p>Implementation procedure</p>	<p>The client has been contacted at first via email from the SPIN coordinator and has been visited afterwards four times between May and July 2016 by the SPIN-partners. During the first bilateral meeting between the SPIN Coordinator ISR-UC and the client the focus has been put on general explanations about the EPC+ project and the first expectations of the client were discussed. During the second meeting, after first discussions about the measures the SPIN was offering to install, a walkthrough audit was carried out, around the industrial plant. The 3rd meeting was carried out with the aim to install power analyzers during one week, to collect actual information about the pumps consumption and characterize the baseline. The idea was to define an accurate and updated baseline. The 4th meeting, was carried out when the power analyzers have been collected. The data was then treated by one SPIN Member. A short report was produced by the end of September 2016 consisting of the load diagrams and savings potential calculation.</p>
<p>Implemented technical measure</p>	<p>Regarding the motors pilot, this project was identified by one SPIN member, who is an energy auditor specialist. Following the obligation to carry out audits every six years (according to the regulation SGCIE, installations with yearly energy consumption above 1000 Toes have to carry out an energy audit every six years and reduce energy consumption yearly based on suggested saving measures), an audit was carried out in 2013 and several Energy Efficiency Improvement measures have been identified. Among these measures, there is a potential efficiency improvement in a group of induction motors.</p> <p>The company is very interested to implement some of the energy efficiency measures identified in the Rationalization Plan of the Energy Consumption, which is the result of mandatory audits being carried out in Energy Intensive Users, following Decree Law nº 71/2008, of 15 April, that transpose for the National Legislation article 8 of the Energy Efficiency Directive 2012/27/UE (Regulation of Management System for Energy Intensive Consumers-SGCIE).</p> <p>The SPIN leader has analyzed the audit report in order to check the feasibility of the application of variable Speed Drives in the group of pumps that are distributing the chilled water used in the manufacturing process of the metal rings to be incorporated in the combustion motors of vehicles. This is a highly precise process and therefore the requirements are very, very tight.</p> <p>The service will consist on the improvement of the chilled water distribution system for the machine tooling, by the application of VSDs and better motor system control. There are no EPCs established in motor systems in Portugal. Moreover, the improvement of the system control based on the feedback of the temperature of the water is quite innovative.</p>
<p>Problems during the implementation process</p>	<p>The definition of the baseline (taking the existing audit – already carried out one year ago - as a starting point), and the need to carry out additional measurements to update the available information</p>
<p>Problem solving</p>	<p>A monitoring campaign of one week, including the weekend, was carried out in these particular loads. The energy analyzers were installed on 20 of July and collected on 27th July 2016. Moreover, the control strategy to guarantee the tight requirements was analyzed. Main concerns are:</p> <ul style="list-style-type: none"> • Temperature of the water in the end use point;

	<ul style="list-style-type: none"> • Type of sensors for temperature and flux measurement; • Piping dimensioning; • Type of control to be implemented: should the reference temperature be the return temperature or the Delta temperature? • Energy management system installed; are there counters available to monitor these loads? M&V is very important for establishing an EPC • Alternative strategies to monitor these loads have been discussed, like using the VSD to communicate with a concentrator.
Support and Monitoring	After the implementation the SPIN leader will be for all kind of problems the first contact person. Through the EMS installed and through the yearly energy efficiency evaluation/control reports the monitoring will be guaranteed. After the implementation, one week audit will be carried out by ISR-UC.

No. Pilot Project	16
Project Partner	Esco Italia
Country	Italy
Sector/object of the pilot project	<p>Hospitality and education sector.</p> <p>EPC and TPF for the optimization of the heating system of historical buildings under heritage protection located in Florence.</p> <p>This Italian EPC+ case study involves the renovation of the heating system of edifices of unique historical and artistic value, housing XVIIIth century frescos and antiques, owned by Conservatorio Santa Maria degli Angeli, an entity that performs diverse activities including private education, hospitality and events organization</p>
Project start	20.06.2017
Amount of SPIN partners involved	3
Implementation procedure	<p>The bank, through the special EE agreement, helped contacting the client and the Esco had the opportunity to explain the benefits of implementing EE interventions through Escos, EPC and TPF instead of using spot technology providers: integrated approach, unique interlocutor for a unique harmonized project, inclusion of the incentives' request in maximizing the project's objectives, guaranteed savings, etc. Various meetings were held before the client opened to the technical survey of the place. Then the energy audit was made and after that a dialogue with the bank took place in order to discuss the investment and the payback plan. The bank and the ES provider cooperated with the client's manager in the proposal of the project within the Direction of the entity. After several debates and the revision of the EPC, the project started.</p>
Implemented technical measure, parts of the building	<p>The technical measures performed by the project consist of:</p> <ul style="list-style-type: none"> • heat pumps replacement, • monitoring system installation, • improvement of the entire heating distribution system (substitution of radiators and pipeline renovation, insulation and differentiation). <p>Included in the proposal / other details:</p>

	<ul style="list-style-type: none"> • energy audit • school facility lighting substitution with LED and dormitory lighting replacement with LED (measures pending, not included yet) • heat pumps replacement of boiler • monitoring system installation • construction works and technical management in order to modify the heat distribution system (radiators substitution, pipeline substitution insulation and differentiation) • information and training plan • Performance bond (assurance / guarantee) • governmental incentives Conto Termico obtaining (for about 40% of the boiler expenses) • financial needs and TPF supported by the agreement with the bank group Gruppo Intesa Sanpaolo
<p>Problems during the implementation process</p>	<p>The implementation process met different levels of criticalities:</p> <ol style="list-style-type: none"> 1. The execution period concurred with the presence of users on place and this could create diseases both to users and project team. 2. The building is under heritage protection and restrictions and the water distribution system's works were difficult to be made. 3. The settings of the heat pump were not compliant with the expectations and need. 4. The third responsible for the maintenance service contract was difficult to be found due to technical equipment's and general know how details. 5. The guarantee insurance was not available and the insurance entity was not equipped to offer this kind of contract.
<p>Problem solving</p>	<p>The solutions applied were the following:</p> <ol style="list-style-type: none"> 1. Buffer solutions as fractional or non-continuous procedures neither in terms of timing nor in the places of execution. 2. A fully integrated and accurate project planning with obvious effects on the timing but in parallel with point 5 anyway so that no further delay was registered. 3. The intervention of the technology provider was requested and this set the system as planned and needed. 4. The third responsible for the maintenance service contract was found by the ESCO in cooperation with the heat pump manufacturer who defined clear competences. 5. The insurance policy was reached in Germany.
<p>Support and Monitoring procedure</p>	<p>After the implementation of the technical measures, the test certificate is the basis for the definition of the most suitable monitoring system. A calorie meter will be installed as the heat pump is gas (methane gas energy vector). The measurement extends to the building object of the contract, even the hours of use of the plant are one meter. The measurements are made by the third responsible person mentioned above who is the figure appointed by the customer in the maintenance contract. The third party has a contractual obligation to make such measurements available to the exit.</p> <p>The expected monitoring year will start in May 2018 so it is still not possible to make an analysis between estimated savings and savings.</p>