Smart energy services to solve the **SP**lit **IN**centive problem in the commercial rented sector

Call topic: H2020-LC-SC3-2018-2019-2020
Start date of the project: 01/09/2021
Duration: 40 months

D6.3– REPORT ON BEST PRACTICE FOR LANDLORDS & TENANTS

Due date	**31/07/2024**	**Delivery date**	**03/01/2025**
Work package	Work Package 6: Business Model Definition and Development of SmartSPIN Toolkit		
Responsible Author(s)	Daniel Ring – Lawler Sustainability		
Contributor(s)	Dylan Aylward – Lawler Sustainability, Nicola Ring – Lawler Sustainability		
Dissemination level	Public		

Version and amendments history

Version	Date (MM/DD/YYYY)	Created/Amended by	Changes
V0.1	25/07/2024	Dylan Aylward	First Draft - Internal
V0.2	25/09/2024	Daniel Ring	Second Draft – Team Circulation
V0.3	16/12/2024	Sotiris Papadelis	Quality review
V1.0	03/01/2025	Luciano De Tommasi	Final version & submission

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101033744.

TABLE OF CONTENTS

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101033744.

List of figures

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101033744.

List of Abbreviations

Abbreviation	Meaning
BEP	Building Energy Performance
BMS	Building management system
CSR	Corporate social responsibility
EEaS	Energy Efficiency as a Service
EPC	Energy Performance Contract
ESCO	Energy Service Companies
ESG	Environmental, Social, and Governance
EU	European Union
FM	Facilities Manager
IPMVP	International Performance Measurement & Verification Protocol
LS	Lawler Sustainability
M&V	Measurement and Verification
SaaS	Smart Energy as a Service
SES	Smart Energy Services
SMEs	Small and Medium Enterprises

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101033744.

EXECUTIVE SUMMARY

The private commercial property sector represents a large untapped market where retrofit, decarbonisation and integration of renewables and demand response technology are going to be inevitably a growing requirement. It is also a sector where due to the split incentive there is risk of delayed or stagnated progress unless the split incentive can be successfully solved.

SmartSPIN developed a toolkit for key stakeholders that presented the key features of its business model in a way that is easy to understand and easy to access (D6.1 Toolkit on business model & value proposition). However, Ireland does not currently apply 'time of use 'tariffs which would be needed to provide greater transparency for all stakeholders in building this new EPC business model toolkit. The toolkit aims to provide a step-by-step guide for all stakeholders from planning to contracting to ongoing performance monitoring.

LS have captured best practices and learnings from previous EPC projects which they have applied during the implementation of their Irish Pilot site.

The application of the gamification app and a visualisation dashboard will define the new measurement metrics for this toolkit. The presentation and integrity of this data will provide an extra degree of trust needed to make this model a reality for Landlords and tenants.

Some of the key learnings for a successful EPC are

1. Ensure a holistic stakeholder communication plan between Landlord/tenant/FM
2. Conduct an initial energy audit & assessment
3. Establish an agreed Energy baseline (P7)
4. Measurement and verification of any proposed energy efficiencies in line with IPMVP
5. Identify risks that could affect proposed energy savings

It is important that this new scheme does not add any extra risk to either tenant or landlord contractual arrangement.

Ideally a 'Green lease' arrangement between both parties outlining, defined responsibilities, feedback channels, funding supports, payback times will be drawn up as part of this toolkit.

A survey questionnaire will form the basis of this analysis.

It is envisaged that the issue of 'on bill financing' will become clearer as Daniel Ring of LS is planning to have bilateral discussions with both Tenants and landlords on the Irish site of Herbert Road, Dublin

In the projects work through WP 2, & 4 much has been developed by way of business model options, developing a service definition and associated contractual templates and then using energy data to help with M&V automation. All of this work has been a great support to developing the SmartSPIN concept into a workable market business model.

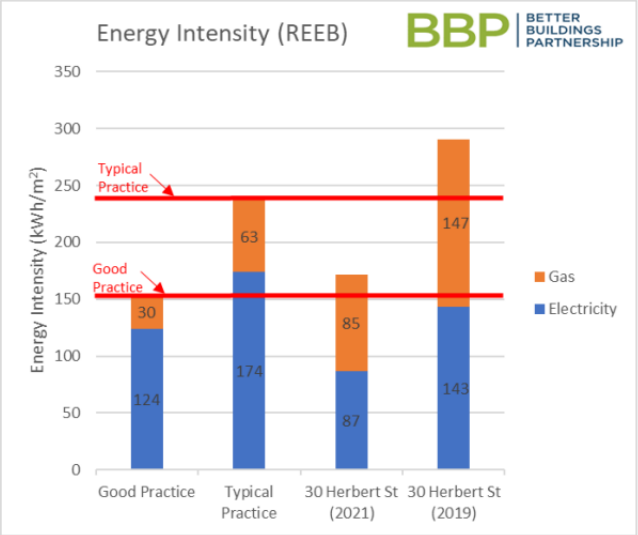
It is however WP5 where practical challenges and learnings are presented that some of the less obvious but nonetheless 'real world' challenges were encountered.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101033744.

Having reviewed the successes and challenges this task then presents a guide for Landlord & Tenant to help them firstly assess the suitability of the SmartSPIN approach and then presenting specific guidance once the SmartSPIN Model is entered into contractually with an ESCO.

LAWLER SUSTAINABILITY

Building Energy Baseline



The Building is using approx. 100% more energy than Good Practice Benchmark. Energy systems are controlled separately by landlord and tenant with evidence that they are counteracting each other. Much of this excess relates to heating which is carbon intensive gas. This suggests good reduction opportunity.
There was an approx. 40% reduction in energy and carbon footprint during covid showing the effect of closed offices still carries cost.

Figure 1 Building Energy Baseline

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101033744.

1 INTRODUCTION

The challenge for policy makers attempting to procure smart energy services in the commercial rented sector is how can it be achieved in a sustainable and equitable manner?

The split incentive dilemma can will be tackled using the SmartsSPIN model across 3 different sites in Europe (Ireland, Greece,Spain). The aim is to provide feedback from the demonstration activities on those sites. In particular what best practices can be established?

However, based on the feedback we need to identify the barriers preventing SES being deployed fully within these markets.

The learnings from these sites should provide policy makers at all levels an insight into why there is a delay to decarbonize the electricity market.

Having distilled into research and learnings to date from Work packages 2,3 & 4 and also the practical experiences of Work package 5 and its associated pilot site learnings into simple practical guidance will hopefully encourage key stakeholders to embrace the SmartSPIN model.

The SmartSPIN Model is created on the output-based model with delivered energy savings at the heart of the proposition. The project concept suggests an ESCO or energy efficiency provider as a delivery partner, initial assessments would point strongly towards the ESCO as being a key actor in the market.

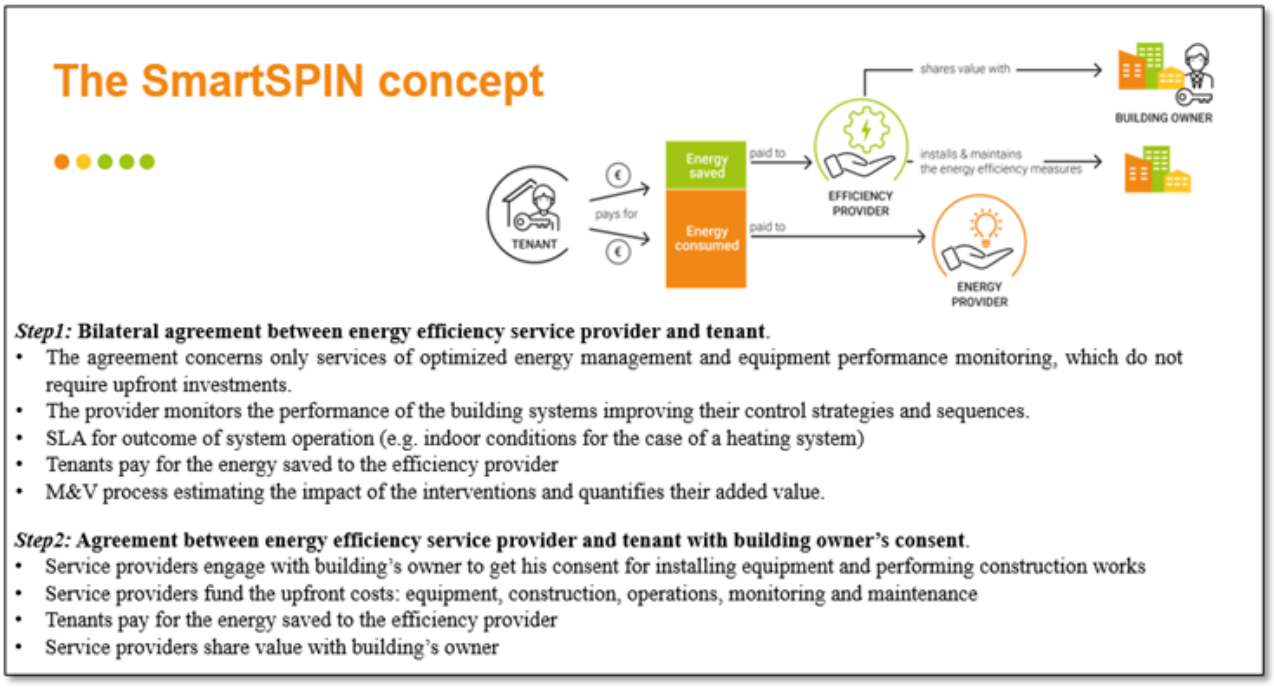


Figure 2 The SmartSPIN Concept

To address the split-incentive issue, the following is recommended:

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101033744.

- Introduce mechanisms for collaboration between landlord and tenant in the tenancy agreements.
    - Move towards agreements that facilitate building upgrade works.
    - Introduce collaborative environmental targets.
- Prioritize low-cost actions e.g., energy audit to identify cost-effective upgrades, focus on the range of fast payback measures.
- Develop transparent business models which facilitate deep renovation beyond lease contractual timelines, enticing tenants proportionate to their tenancy duration.
- Develop a matrix of business models for varying building designs & landlord/tenant scenarios building off the SmartSPIN concept to look at scenarios which may differ.
- Cost recovery clause on a green lease for sharing the cost of capital expenses.
- Optimize the integrated building design for construction.
- Offset up-front costs of capital-intensive projects through utility incentives, then spread the balance through options like on-bill financing or EPCs.

2 REVIEWING SUCCESSES AND CHALLENGES

2.1 WORK PACKAGE 3 – CONTRACTUAL SERVICE DEFINITION

There is an emerging demand and ambition in the landlord/tenant landscape to improve building sustainability credentials and operational performance.

Buildings with 1) high commercial opportunity, 2) sustainability ambition, 3) good financial covenants could progress through an ESCO route.

This insight is found to be a necessary requirement to implement the Smart SPIN business model.

A successful approach to overcoming misaligned incentives between tenants and owners should consider splitting costs and benefits in a balanced way. A share of energy cost savings should be allowed to be used for investment repayments. This means that tenants could be subject to a repayment fee on their utility bills, landlords should also take part of the investment cost given the property's value increase because of the energy efficiency upgrade.

This task identified that the EPC/Performance based approach is least developed in Greece. Maintenance contracts are mainly operated on an annual basis whereas Spain enters longer-term contracts, which could be an inhibitor as shorter-term contracts are likely more favourable.

2.2 WORK PACKAGE 4 – DATA ANALYTICS FOR ENERGY MANAGEMENT

The objective is to use data from buildings to offer better services for tenants/landlords to support SES. These services include:

- Automate Measurement & Verification (M&V) for the SmartSPIN business model, to better estimate savings achieved by energy efficiency interventions. Thanks to better M&V approaches, the benefits can be better split between landlord/tenants and the process will

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101033744.

be more trusted by them. This service has been properly developed and would be deemed a success.

- Platform-agnostic algorithms for:
  - *Building performance diagnosis* – this has been developed, and a web-tool is available. It is a success because the tools allow for an energy diagnostic of the building, identifying which energy and cost streams have the most interest for the SmartSPIN business model. This is where focus should be for improving the building as it will be more cost-effective.
  - *Automating baseline establishment* – like the explanation for the M&V. Well established baselines allow for clearer business models.
  - *Predicting short- and longer-term energy-efficiency and flexibility opportunities* – forecasting models were developed that predict energy consumption with 24h ahead. This is considered a success as the model will allow to better plan the energy consumption. Optimizing energy cost from the grid, use of renewable energy etc.

Although the services exist and have been implemented into a platform, it is a challenge to integrate the processes mentioned into smart contracts. The algorithms and models developed could not be fully understood by stakeholders, e.g. energy forecasting is a useful tool, but facility managers based the control of the building on their know-how. Changes of paradigm are complicated, implementing cutting-edge technologies or even well-known technologies fully proved is a slow process.

2.3 WORK PACKAGE 5 – DEMONSTRATION AND VALIDATION OF THE PROPOSED SERVICE

Within WP5 it was the intent to validate the SmartSPIN concept. There were some practical challenges that were encountered in achieving expected progress .LS needed permission from JLL (FM) to share a list of ECMs mentioned in BER certificate improvement path with consortium members in order to add them to project deliverables. Moreover, a bilateral meeting with tenants and landlords was required for service validation. A questionnaire was created to facilitate collection of data justifying the EPC model as an agreed retrofit application for commercially rented sector. The questionnaire also covered the gamification app and the visualisation dashboard.

2.3.1 Irish Pilot Site

In terms of successes this site successfully mobilised both landlord and tenants to engage with each other and allow the installation of a 'Whole Building' control system which allowed harmonisation of landlord heat producing equipment with tenants heating and cooling systems through a new BEMS system that integrates with the tenancies viewing their heating and cooling system and adjusting the landlords in unison and also providing air quality monitoring to allow adjustment of landlord fresh air supply plant. This prevents energy wastage as landlord equipment does not fight against tenants heating / cooling equipment. The project also has a performance- based contract signed to ensure monitoring and optimisation of this new system reaches the proposed energy reduction threshold.

Sub metering has already been installed by LS and the data from it is ready to share with Landlord and tenant. Both Landlord and tenant are keen for a minimum level of disruption, if the project is to proceed to the next stage.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101033744.

> **LS need permission from JLL (FM) to share a list of ECMs mentioned in BER certificate improvement path with consortium members in order to add them to project deliverables.**

LS had a bilateral meeting with landlords & tenants followed up by a separate meeting with the FM for 30 Herbert Road. A questionnaire from this meeting provided data to justify the EPC model as an agreed retrofit application for the commercially rented sector. Enclosed below are images of M&V system used at 30 Herbert Street.

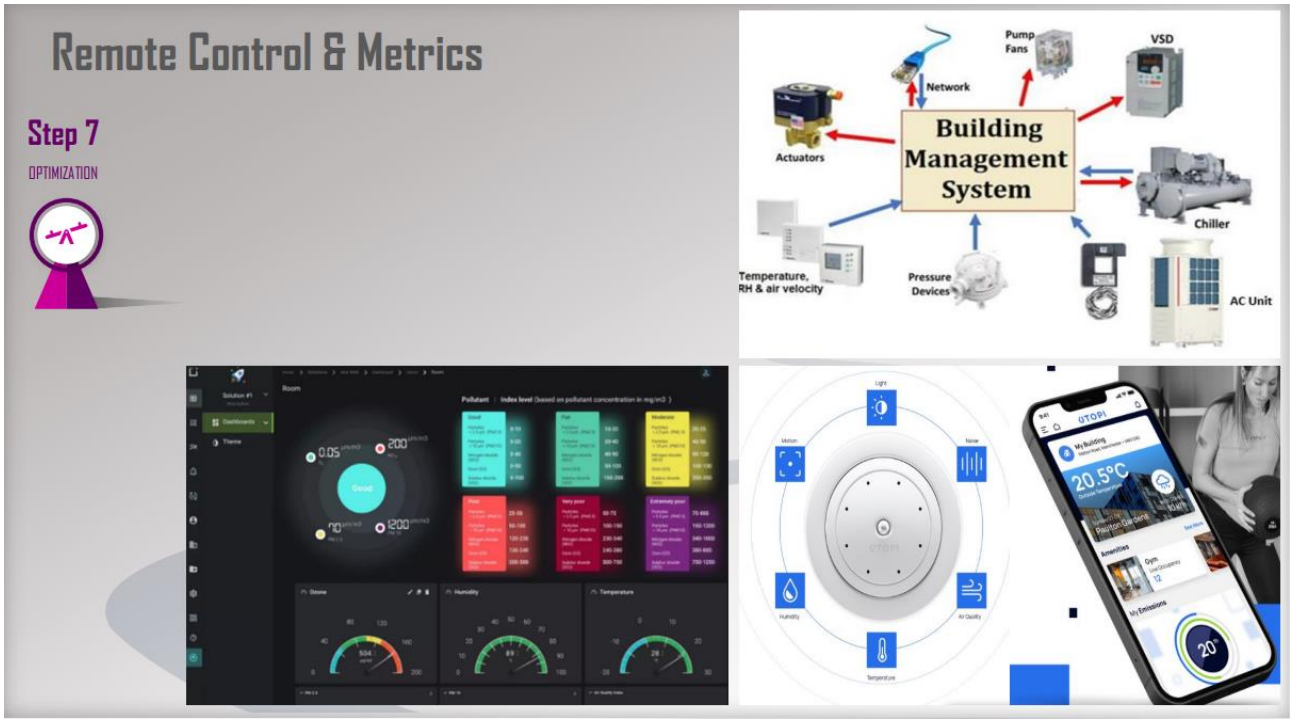


Figure 3 Remote Control and Metrics

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101033744.

Figure 4 Lawler Sustainability – Vision System

In terms of challenges on this site the following were noteworthy:

- Lease agreements similar to many are 'all in' with landlord heat to tenancies included and therefore no incentive to reduce consumption.
- The concept of Energy Performance Contracting and awareness of it as a model is very low. The relationships of letting agents representing both building owner and tenants and the conservative nature and established norms all took considerable time to explain and give reassurance.
- The market turbulence currently in the commercial office sector post COVID with work from home and downsizing by technology companies meant that making progress was very slow in promoting the concept.
- The lack of precedence and successful reference sites to give confidence also resulted in slow decision making.
- The immaturity of the Energy Performance Market and complexity of landlord / tenant mix is likely to mean that there will be a reluctance by ESCO's and their financing partners to advance.
- During our time working on the site on this project the Building Owner progressed LED Upgrades and AHU Upgrades as part of their own capital investment programme so the SmartSPIN model would need to move much quicker to avoid overlapping programmes between general maintenance and engineering retrofit.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101033744.

2.3.2 Spanish Pilot Sites

The ownership and management team effectively facilitated the implementation of a smart metering infrastructure in collaboration with tenants. This system enabled real-time tracking of both electric and thermal energy consumption through the Smarkia Energy Management Platform.

This initiative allowed Klepierre, As the Shopping Center Owner and Manager, to lay the groundwork for a Future energy billing model. Under this model, tenants will be charged based on their actual energy consumption rather than the size of their leased space. this approach encourages tenants to participate in gamified energy-saving initiatives, fostering engagement and promoting Energy-use Reduction. Both Sites Ensured Systematic Monitoring and Optimization of Energy Efficiency Measures, Which Validated the Project's Capability to Achieve the Targeted Energy Reduction Thresholds.

Landlord / Tenant issues

- Technology Integration: Synchronizing the new smart meters with existing systems posed technical challenges, requiring tailored solutions to address compatibility issues.
- Energy Performance Contracting Awareness: As in other pilot sites, the concept of Energy Performance Contracting was unfamiliar to many stakeholders, necessitating extensive education and trust-building efforts.
- Alignment of Stakeholders: Coordinating the efforts of landlords, tenants, and external service providers involved complex negotiations and collaboration, often causing delays in decision-making.

2.3.3 Greek Pilot Site

In general, the **SmartSPIN** initiative allowed both building managers and tenants:

- To better understand for the first time their energy consumption requirements and routine
- To think of how energy savings and electricity costs reduction could be achieved
- To adopt and consider in the future a more transparent and fair energy billing model, as well as a way of sharing the costs for energy-related improvements. In this way, tenants could be charged based on their actual energy consumption and not only on the office space they occupy.
- To adopt some further "green practices" such as e-mobility and more efficient energy consumption behavior.

Challenges Landlords & Tenants

Following the successful completion of the Greek pilot, one can also consider a few challenges that could be addressed for this project, or even future ones in the realm of the Split-Incentive-Issue, as seen throughout the demonstration of the Greek pilot case.

- **Technical issues**: The Building's Wi-Fi network and local electricity network often caused the disconnection of the smart devices and in some cases therefore, it was difficult to gather the data as manual ways of data collection had to be implemented.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101033744.

Countermeasure: The integration of batteries for storage and additional back-up power for the metering devices will certainly address effectively such issues.

- **Organizational limitations**: For some tenants, due to their internal organizational processes and approvals, the collection of the data and the use of smart devices was somehow difficult at the beginning of the project.

  Countermeasure: Such issues can be certainly solved with respective NDA agreements, where this is needed, prior to the installation of smart metering and monitoring devices.

- **Changes in tenancy**: This was also the greatest challenge the Greek Pilot faced, as during the project implementation some of the original tenants left the building. Several of the new tenants, due to internal policy procedures, could not connect their smart meters and plugs to their local Wi-Fi network causing also the interruption of their live connection to SMARKIA's platform. This also caused a misconnection between the initial energy consumption data which had been collected and the new ones, as the new tenants showed increased energy consumption patterns, implying the need for setting a new baseline consumption figure.

  Countermeasure: Communication on a more frequent basis with the building owner or operation and management team for updates on the status of the buildings' occupancy can certainly address efficiently such issues, allowing for extra available time in case certain actions are needed in relation to the operation of the smart metering and monitoring devices.

3 SMARTSPIN FEASIBILITY ASSESSMENT

3.1 ASSESSING THE EXISTING MARKET

An important area to focus on for an ESCO when deciding on the feasibility of the SmartSPIN model are the following:

- *Is there a market?* – Quantitatively assessing the size of the possible market will allow for an insight into the opportunity available.
- *Umbrella Organisation* – Identifying the large players in the market will provide clarification on the potential ease to market for an ESCO.
- *Competitor analysis* – Identifying the strengths and weaknesses of competitors in the market can allow an ESCO to possibly identify where they will flourish in the market i.e. is there a specific sector that an ESCO is best suited for based on their own strengths.

A key learning point identified for an ESCO within WP3 identified that tenants with strong sustainability/ESG building agendas should increase the likelihood of a contract being awarded for the SmartSPIN business model.

It was found that there is appetite to progress building and engineering system upgrades, the technical solutions are well developed however the pathway to executions has some challenges. From an ESCO perspective, this market it has only now started to develop across the EU which can lead to a slow uptake of the SmartSPIN model and significant time requirement to educate clients before a project commences. This could result in the stagnation of the SmartSPIN model adoption.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101033744.

The complexity of the recommended landlord/tenant relationship may encourage more single building ownership dynamic than landlord/tenant dynamic. [OBJ]

ESCO also faces project finance difficulties, the complexity of risk around vacant tenancies, potential disruption to revenue streams, contracts and risk between additional parties all lead to unfavorability.

3.2 SERVICE/PRODUCT VIABILITY

Other key components to consider for an ESCO when implementing the SmartSPIN toolkit:

- *Design, construct, maintain & operate* – to deliver SaaS the ESCO should consider these components, and the relevant competencies required within their organisation to achieve these components. A template of scenarios and cost sharing could be developed to help with early discussions
- *Provide gap analysis* – An ESCO needs to understand what services they need to offer within their organisation to have competencies for the SaaS for the SmartSPIN business model to be delivered. Assessing the internal management of the organisation is important here, this will allow the ESCO to decide what they must do to have competent people for project delivery.
- *Maintenance responsibilities* – Clearly outline the responsibilities of both landlords and tenants regarding property maintenance, repairs, and improvements.

A key learning point from WP4 found that data-driven algorithms and models are a useful tool to increase trust between ESCO & landlord/tenant as the ESCO has the opportunity to prove their worth to the clients with accurate M&V approaches. With accurate processes the ESCO can reduce the uncertainty of the contract and offer better deals e.g., an ESCO thinks they can reduce the bill by 'X' % but the M&V processes are not accurate, therefore they offer a reduced savings percentage on the contract (X-Y) %, with improved M&V processes the difference between 'X' and 'Y' can be reduced and thus can improve the benefits of the acknowledged savings from the M&V process.

Data-driven algorithms can also lead to exploitation of flexibility services of buildings, through participation in demand response programs or shifting consumption away from peak times using dynamic pricing, creating additional revenues that can further reduce payback time.

3.3 FINANCIAL VIABILITY

A key final area of focus before endeavouring on implementation of the SmartSPIN toolkit is assessing the financial viability of a project:

- *Internal financial requirements* – What liquidity is required within the ESCO to ensure the successful delivery of SaaS, ESCO should be prepared for anomalies within the timeframe of the contract where savings may not be as high as modelled, in this scenario an ESCO may be left with less of a payout than expected in certain months of the year.
- *External financial requirements* – Important consideration for an ESCO when financing projects, ESCO should choose a lender that is understanding of the SaaS model and willing to offer enticing interest rates.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101033744.

- *Clear lease terms* – Ensure that lease agreements have well-defined terms, including rental amounts, lease duration, and any renewal options.
- *Exit clauses* – Clearly define conditions for lease termination, including notice periods, penalties, and any circumstances allowing early termination.
- *Compliance with Laws and Regulations* – Ensure that the lease adheres to all relevant local, state, and federal laws and regulations governing landlord-tenant relationships.
- *Confidentiality* – Include provisions to protect sensitive information shared between the parties during the course of the lease agreement.
- *Subleasing and assignment* – Specify conditions under which subleasing or assigning the lease is allowed and the process involved.

It was found that tenancy agreements never originally considered energy efficiency and landlord/tenant collaboration to reduce overall BEP. This leads to an additional amount of consideration within agreements. Where the SmartSPIN concept is to be considered, ESCO would need to ensure protection from the risk of payment defaults, and the tenancy agreement would have to consider this.

Traditional forms of leases do not set the ground for energy efficiency investments. In the commercial sector, green leases can bridge these differences by splitting costs and benefits between the parties in such a way that both parties can benefit from an energy retrofit. Despite their potential, green leases are not currently widely used in Europe. Sharing green lease guidelines can increase awareness among key interest groups.

4 ENTRY TO MARKET & PROJECT SELECTION

Some key considerations when selecting projects to implement the SmartSPIN business model.

- Securing projects: existing customers, public procurement, private sector
- Customer attributes
- Building attributes
- Finance landscape

4.1 CUSTOMER ATTRIBUTES

Certain criteria to look out for when selecting potential customers:

- *What is their budget?* – This will allow an ESCO to clarify if a customer is capable of self-financing the project, from this an EPC could be introduced.
- *Energy Monitoring experience* – The level of understanding from a customer in the field of energy monitoring will be an important criterion to consider informing the simplicity of implementing the SmartSPIN model.
- *Interrelationship* – Here is also an important criterion to consider for an ESCO as the willingness of a customer to work alongside the ESCO will be necessary when implementing a project with a new business model. The relationship between the customer and ESCO is important here but also the relationship between the customer and tenant, as mutual agreement will be paramount when implementing new services in a project.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101033744.

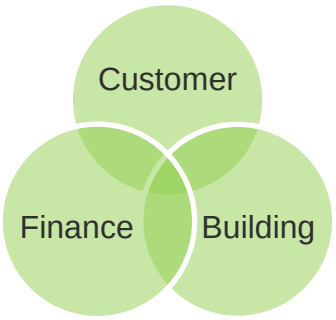


Figure 5 Customer, Finance, Building

Characteristics to look out for in customers during project selection may include the following as identified in previous Work Packages as key learning points for an ESCO:

- Tenant with a strong sustainability/ESG building agenda.
- Tenant where operating costs are significant.
- Tenant who values lower operational costs
- Tenant lenient towards operational disruption

Tenants with these types of characteristics should enhance the likelihood of a contract being secured, and these types of tenants should be targeted as priority.

Both landlord & tenants need to be motivated to mobilise, each must see value. An overall decarbonisation strategy needs to be developed so that investment in upgrades has context within an overall strategy.

4.2 BUILDING ATTRIBUTES

Important aspects of the building to consider when implementing the SmartSPIN model:

- *Does the building have a large energy footprint?* – if this is the case, SES becomes a more viable solution to introduce as a cheap retrofit for a project. Where good savings opportunities can be demonstrated.
- *Support from tenants* – Are the tenants supportive of energy & ESG building improvements is an important consideration for the project, the less frictions in agreement can greatly enhance project delivery.
- *Is the building owner financially strong?* – This can allow for potential overhead costs that may arise during project delivery.

A learning point form previous work packages found that Landlord's & their agents likely to have to take the lead and possibly have the most to lose through asset value risk, for the initial SmartSPIN concept being successful.

4.3 FINANCE ATTRIBUTES

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101033744.

- *Payment structures* – Establish a transparent rent payment structure, detailing due dates, acceptable payment methods, and consequences for late payments.

When financing such a project an ESCO such consider lenders who will understand & support the landlord/tenant landscape. The lender should provide below market interest rates. Finance likely to be a curtailing factor and innovative solutions needed for this.

An alternative interaction proposed a more practical approach including project execution structure and project financing. This includes a sinking fund for ongoing maintenance, which provides a financial reserve to ensure building maintenance & periodic capital investment is put in place. This alternative has been noted as potentially a better mechanism to facilitate building investments.

5 LANDLORD, TENANT AND ESCO CONSIDERATIONS

- *Dispute resolution* – Include a mechanism for resolving disputes, such as mediation or arbitration, to streamline conflict resolution processes.
- *Insurance requirements* – Specify insurance obligations for both parties, covering property damage, liability, and any other relevant aspects.
- *Accessibility and use restrictions* – Clearly permissible uses of the property and any restrictions, especially if there are common areas or shared facilities.
- *Renovation and alteration guidelines* – Establish guidelines for property alterations or renovations, outlining procedures, approvals, and who bears associated costs.
- *Environmental responsibilities* – Address environmental considerations, such as waste disposal and environmental compliance, to ensure sustainable practices.
- *Default and remedies* – Clearly outline actions and penalties in case of default by either party, including procedures for resolving breaches and potential consequences.
- *Security deposits* – Clearly state the amount of any security deposit required, conditions for its return, and permissible deductions.
- *Notices* – Establish protocols for providing official notices, including the acceptable methods and required timeframe.

5.1 ESCO GUIDANCE FOR LANDLORDS & TENANTS OF SMARTSPIN MODEL ADOPTION

It is likely that ESCO's entering this market may already be active in the single owner/occupier scenario. Therefore, some of the guidance will already be best practice for works that they undertake with an owner occupier.

It is also worth noting that as we see greater encouragement for energy performance contracting within EU directives and member state legislation, we are likely to see new entrants emerge in this market. There is a recognition that this is an important part of the capacity building that needs to take place in order to create a supply chain of sufficient scale to decarbonize at the rate required to meet our climate change ambition.

In that context it is worthwhile taking some time to look at the type of companies existing now that hopefully in the future will consider providing Eco services. So, where shallow retrofit (substantially

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101033744.

re-engineering of building) takes place, it is likely that existing building services consultants, mechanical and electrical contractors and facility management Contractors will be best positioned, to adjust and participate in the Eco market.

Where deep retrofit is undertaken then it is likely this will be led by a building contractor who will bring in engineering expertise.

So, considering entering this market from the perspective of engineering retrofits there are three key phases involving design, implementation and maintenance/ system optimization. These tend not to exist within a single organization currently and therefore partnering or internal capacity building will be needed.

Another important consideration for Landlords & tenants where projects are to be funded, is the financial model that the ESCO will use. This should not be underestimated and should be considered at an early stage to avoid abortive work and resourcing.

The ability for the landlord/tenant axis to draw funds from a 'Sinking fund' that is already in place to support ongoing investment in energy efficiency measures is important to identify.

The potential for a green lease to promote a new contractual arrangement for delivering energy efficiency measures is a positive avenue to explore and unlock further funding.

In breaking down this guidance into distinct stages we are going to utilize the project stages relevant to the model.

Step 1 – Project viability assessment

Step 2– Project Proposal Stage

Step 3 – Project design and implementation.

Step 4 – Project optimisation and monitoring.

5.2 STEP 1 - PROJECT VIABILITY ASSESSMENT

In terms of the specific landlord/tenant landscape and the potential to use the SmartSPIN model the following key guidance should be considered:

Customer profile and Landlord Tenant Interaction

1. Who is championing the ESCO model and is there precedent for its use?
2. How good is the landlord/tenant relationship and do any collaborative forums exist currently between both parties.
3. Is there currently a sinking fond model being used for maintenance and upgrades and is this font in Credit currently?
4. Is there currently a sinking fond model being used for maintenance and upgrades and is this fund in credit currently?

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101033744.

5. Currently how strong are ESG agendas amongst Landlord and Tenants?
6. Will tenants consent to sharing energy data?
7. What level of operational disruption will a tenant accept?
8. Are there property agents or management companies that represent the building owner or our tenants? This can add complexity and prolongation.

Site Selection & Profiling

1. What type of building is considered? Ideally the SmartSPIN model will require high energy use and long run hours.
2. What level of interdependency is there between landlord and tenant power and heat systems?
3. Smart spin model is premised on initial targeting of low-cost/no cost initiatives – do these exist on site?
4. Is there sub-metering on site to allow measurement of energy efficiency?
5. Carry out high-level sense check that energy performance contract model will fit the site. Heat pump projects struggle to support an EPC approach and are likely to require subvention to ensure viability.
6. Are there multiple FM contractors across the Landlord / Tenant areas. The ESCO will likely displace these and therefore understanding the current arrangements is important.
7. Are there any site contracts in place covering energy related plant such as CHP, Generators, Heat supply contracts that need to be considered in the structuring of a potential EPC?

Financial

1. What is the financial strength of a building owner as this will be an important factor in overall project financing?
2. Will the building owner consider incurring debt or entering into a building upgrade financing loan?
3. What is the financial strength of a building owner as this will be an important factor in overall project financing?
4. Will the owner indemnify the tenant's financial risk?
5. Will the building owner consider incurring debt or entering into a building upgrade financing loan?
6. Will tenants consider contributing as a minimum avoided cost of energy and carbon?

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101033744.

7. Are tenants' business profile deemed to be secure or could tenant erosion put project viability at risk.
8. Will the ESCo finance partner consider landlord only or both landlord tenant?
9. What will be the likely cost of preparing a bid?

It is suggested that the above considerations be taken from an ESCO internal project viability assessment so that at an early stage a decision to advance to the proposal stage can be made.

It should be recognized that the cost of putting together a proposal can be significant and therefore technical, organizational and economic environmental considerations should be fully assessed to protect this investment.

5.3 STEP 2 - PROJECT PROPOSAL

Project proposals are often facilitated by a specialist appointed by the building owner. Some key considerations at this stage of the project would be the following:

1. At the proposal stage there is usually a release of information in the form of technical files which help greatly in the formulation of proposals. At the proposal stage there is usually a release of information in the form of technical files which help greatly in the formulation of proposals. The quality of this information needs to be assessed at an early stage and where there are material gaps this needs to be noted. So, record drawings of existing systems and their associated specification, maintenance reports and an asset register. In addition to 12 months energy consumption figures would be regarded as base information.
2. A detailed site assessment then needs to be embarked upon drawing on contracting and technology experts to fully assess site opportunities.
3. Another important element of site assessment is to capture legacy problems within the existing systems which may ultimately affect predicted system performances post retrofit. So, for example there could typically be leaks on hydraulic systems, valves that are passing, motorized controls that are not operating and Air systems with significant leakage. It is important at this proposal stage to capture and note as many of these issues as possible. This exercise is important for ESCO to avoid additional costs or delays during implementation phase or energy or systems underperformance during operational phase.
4. At this stage also it is important to determine Site restrictions associated with upgrade works and whether building is to be vacated or whether you are working in an occupied building.
5. Having carried out energy use analysis and assessed technology upgrades. It is then possible to obtain market costs for works and formulate a commercial proposal. As with all such proposals it is very important to outline your assumptions and in particular note all Site legacy issues that you have become aware of.

.

5.4 STEP 3 - PROJECT DESIGN & IMPLEMENTATION

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101033744.

The development of the proposal outline design into a details design and its implementation in terms of re-engineering of existing building services and the integration of renewable technology and demand response functionality for the building is a very important project stage.

1. Firstly, before advancing to detail design and scope definition it is important that there is a user requirement/contract scope document agreed with building owner or agents and where relevant with tenants. This should confirm all new works and their scope and also address any legacy problem remediation or additional scope introduced by client or tenant. At this stage it is also important that Site conditions are clearly agreed in terms of access and vacant possession or working in alive environment.
2. It is important that design completion and procurement is undertaken and completed soon after the scope has been agreed.
3. Once project Implementation commences it is important that clear procedures for communication with building owner, their tenants and any appointed agents are in place.
4. Once installation is completed, then the importance within performance-based contracts of rigorous commissioning with particular care to share and central systems taking place. Also, careful validation of avoided energy, renewable power and demand side revenues and clarity across Landlord and tenancies if proportional apportionment through metering is intended. This should be helped by access for all stakeholders to reporting dashboard.

5.5 STEP 4 - PROJECT OPTIMISATION & MONITORING

Once the project reaches commission stage, then it enters into the service phase. This involves ongoing monitoring and measurement, optimisation of systems, review and introduction of additional relevant initiatives and generating monitoring and verification reports to allow invoicing of revenue from site initiatives.

So, some important points to guidance for this phase:

1. The M & V process becomes very important and having internal competency to generate accurate report structures and allow easy auditing by third-party facilitator or building owners and tenants directly.
2. Carry out early technical and metering checks to ensure that calculated savings and revenue are being delivered on the ground. Audit each initiative and where there are deviances quickly troubleshoot these areas.
3. Seek to establish landlord and tenant and reporting forums where there is clear understanding of individual and collective benefits and also an understanding of how behavioural impacts can significantly affect the contract success
4. This part of the contract encompasses ongoing maintenance and repair. Consideration needs to be given here to the role of the ESCO. So, the ESCO could work with incumbent FM contractors and carry out optimisation and MV with the incumbents reporting and managed by the ESCO. Alternatively, the ESCO could take on the FM companies' role also and displayed them in the building. Particular relationships within tenancies, landlord areas, there management agents all need to be carefully navigated in reaching an improved regime that will fit with the SmartSPIN concept.
5. It should be noted that use of energy performance contracting has in most cases brought significant cost savings to the facility management expenditure however the introduction of this changed regime can present ‘people’ challenges.

This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 101033744.

5.6 LANDLORD & TENANT BEST PRACTICE GUIDANCE FOR THE ADOPTION AND IMPLEMENTATION OF SMARTSPIN MODEL

In terms of landlord and tenant guidance the early assessment stage will echo many of the assessment questions already posed for the Eco in relation to the suitability of the site for a SmartSPIN concept approach.

The SmartSPIN concept is promoting initially no cost/low-cost interventions which might be done with either tenant or landlord individually or with both.

So, the type of building, the relationship that exists between landlord and tenant and the external environment in terms of economic stability and finance will all be key influencers in deciding whether the SmartSPIN concept will succeed. Also, the support of landlord and tenant individually in striving to create a more sustainable building is also key. So, building owners who have mobilised and made ESG commitments measuring and reporting into corporate sustainability programs or frameworks. Tenants with this motivation will be more likely to work together to embrace joint progress in sustainability and embrace the smart spin concept.

6 CONCLUSIONS

Successes of implementing the SmartSPIN Service in WP4

The objective of this WP is to use the data from buildings to offer better services for tenants/landlords to support SES.
These services include:

- Automated Measurement & Verification (M&V) for the SmartSPIN business model, to better estimate savings achieved by energy efficiency interventions. Thanks to better M&V approaches, the benefits can be better split between landlord/tenants and the process will be more trusted by them. This service has been properly developed in WP4, therefore it would be a success.
- Platform-agnostic algorithms for:
    - (i) building performance diagnosis à it has been developed, and a web-tool is available. It is a success because the tools allow to perform an energy diagnostic of the building, identifying which energy and cost streams have the most interest for the smartspin business model (this is, where you should focus to improve your building as it will be more cost-effective).
    - (ii) automating baseline establishment à similar to the explanation for the M&V. Well-established baselines allow for clearer business models.
    - (iii) predicting short- and long-term energy-efficiency and flexibility opportunities à Also a success, we have been able to develop forecasting models that predict energy consumption with 24h ahead. These models will allow us to better plan our energy consumption, optimizing energy cost from the grid, use of renewables, etc.

Challenges of implementing the SmartSPIN Service in WP4

Although the services exist and have been implemented into a platform, it is a challenge to integrate the above-mentioned processes into smart contracts. The algorithms and models developed could not be fully understood by stakeholders.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101033744.

For example, energy forecasting is a useful tool, but facility managers based the control of the building on their know-how. Change of paradigm is complicated (we have experienced this already in many projects additional to SmartSPIN). Implementing cutting-edge technologies or even well-known technologies fully proved is a slow process.

Key learning points

Data-driven algorithms and models are a useful tool to increases trust between ESCO, landlord and tenant as the ESCO has the opportunity to prove their worth to the clients with accurate M&V approaches. With accurate processes the ESCO can also reduce the uncertainty of the contract and offer better deals. For example, an ESCO thinks they can reduce 10% of the bill but the M&V process is not accurate, so the ESCO could not prove to the user that the savings are achieved at 10%, so it would offer on the contract 5% savings. With better M&V approaches, it could go to 7 or 8% by contract.

Also, if we have precise M&V methods that can accurately calculate the savings thanks to the intervention, we can better split incentive/revenues/benefits between landlord and tenant (for example, we reduce the bill by 20%, but this reduction is due to

- 10% warmer winter on the given period
- 10% directly linked to the intervention;
  The tenant and landlord can know that 10% is thanks to the intervention so they can share the benefits)

Data-driven algorithms can also lead to exploit flexibility services of buildings through participation in demand response programs or shifting consumption away from peak times using dynamic pricing, creating additional revenues that can further reduce payback time.

When operating as an Energy Service Company (ESCO) in the rented commercial sector where split incentives exist (meaning landlords pay for energy improvements but tenants benefit from reduced energy bills), **some key guidance points** are:

1. Engage All Stakeholders: Facilitate open communication and collaboration between landlords, tenants, and any other relevant parties (property managers, facility managers, etc.). Ensure everyone understands the benefits of energy efficiency improvements.

2. Identify Shared Savings Opportunities: Explore options for sharing the costs and benefits of energy upgrades. This might involve negotiating lease terms that reflect shared savings or implementing shared savings agreements where feasible.

3. Offer Performance Contracts: Propose performance-based contracts where the ESCO guarantees a certain level of energy savings. This shifts the risk away from the landlord and provides assurance to tenants regarding the effectiveness of the improvements.

4. Focus on Quick Payback Projects Prioritize energy efficiency measures with short payback periods to appeal to landlords who may be hesitant due to lease turnover or short-term ownership plans.

5. Educate Tenants on Benefits: Communicate directly with tenants about the advantages of energy-efficient upgrades, such as improved comfort, lower operating costs, and potentially enhanced lease terms.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101033744.

6. Leverage Financing Options: Assist landlords in accessing financing mechanisms specifically tailored for energy efficiency projects. This could include loans, grants, utility incentives, or other financial tools.

7. Utilize Submetering and Data Analytics: Implement submetering to accurately measure energy use by tenants. Use data analytics to identify opportunities for efficiency improvements and to demonstrate the impact of upgrades.

8. Adapt Solutions to Lease Structures: Tailor energy efficiency solutions to fit different lease structures (e.g., gross leases, triple net leases) and ensure they align with the financial responsibilities of both landlords and tenants.

9. Provide Long-term Monitoring and Support: Offer ongoing monitoring and support to ensure continued energy savings. This can include maintenance services, periodic energy audits, and performance reviews.

10. Stay Informed on Regulations: Keep abreast of local regulations and incentives related to energy efficiency. This knowledge can help identify additional financial incentives or compliance requirements that could benefit both landlords and tenants.

By following these guidelines, ESCOs can navigate the complexities of split incentives in the rented commercial sector more effectively, fostering partnerships that lead to mutually beneficial energy efficiency improvements.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101033744.