



SmartSPIN

Smart energy services to solve the **S**Plit **I**Ncentive problem in the commercial rented sector

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D6.1 – TOOLKIT ON BUSINESS MODEL & VALUE PROPOSITION

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			and texts according to Partners' comments
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TABLE OF CONTENTS

EXECUTIVE SUMMARY 6

1 INTRODUCTION 7

2 SmartSPIN business Model Segments Analysis 7

 2.1 INTRODUCTION TO SMARTSPIN'S BUSINESS MODEL 7

 2.2 KEY PARTNERS 11

 2.2.1 Energy Service Provider 11

 2.2.2 Contractors and Technical Support Network..... 11

 2.2.3 Project Financier..... 12

 2.2.4 Energy and Materials/Components Supplier 12

 2.3 KEY RESOURCES 13

 2.3.1 Human resources 13

 2.3.2 Material resources **Error! Bookmark not defined.**

 2.3.3 Intellectual and financial resources 13

 2.3.4 Technological resources 13

 2.4 KEY ACTIVITIES 14

 2.5 VALUE PROPOSITION 14

 2.6 CUSTOMER RELATIONSHIP 15

 2.7 CUSTOMER SEGMENT..... 15

 2.7.1 Building owners 15

 2.7.2 Facility Managers..... 15

 2.7.3 Building Management Companies 15

 2.7.4 Energy users 16

 2.7.5 Commercial building tenants..... 16

 2.8 CHANNELS 16

 2.8.1 Energy Service and Utility Companies 16

 2.8.2 Energy Service and Utility Companies 16

 2.8.3 Tenants 16

 2.8.4 Policy Instruments 17

 2.9 COST STRUCTURE..... 17

 2.9.1 RES and EMS Infrastructure..... 17

 2.9.2 Contractor Costs..... 17

 2.9.3 Prefeasibility Studies 17





2.9.4	Marketing costs.....	17
2.10	REVENUE STREAMS.....	17
3	OVERALL SmartSPIN Business Model.....	18
3.1	VISUALIZATION OF THE MODEL	18
3.2	INTERACTIVE WEB-APP	21
4	CONCLUSIONS	21

List of figures

Figure 1 SmartSPIN Business Model Canvas	8
Figure 2 SmartSPIN Business Model (Sinking Fund)	16
Figure 3 SmartSPIN Business Model (Bank or Lender).....	1Error! Bookmark not defined.
Figure 4 SmartSPIN tri-partite energy performance contractual agreement .	1Error! Bookmark not defined.





List of Abbreviations

ABBREVIATIONS	Description
SES	Smart Energy Services
ESCO	Energy Service Company
EaaS	Energy as a Service
HVAC	Heating Ventilation and Air Conditioning
RES	Renewable Energy Sources
EV	Electric Vehicle
B2B	Business to Business
B2C	Business to Customer
EMS	Energy Management System
ECM	Energy Conservation Measures
M&V	Measurement and Verification





EXECUTIVE SUMMARY

SmartSPIN is a project funded by the European Union's Horizon 2020 Research and Innovation programme under Grant Agreement n°101033744. The project aims at developing a new business model to improve the energy efficiency and foster flexibility in energy consumption in the commercial rented sector. The SmartSPIN consortium is designing, demonstrating, implementing, and testing smart energy solutions in three European pilot sites in Ireland, Spain and Greece.

The deliverable presents an in-depth analysis of the SmartSPIN project's innovative business model aimed at deploying a Smart Energy Service (SES) to the commercial rented sector to reduce energy consumption thereby mitigating climate change effects. Based on the Osterwald's business model canvas, the analysis performed explores bilateral and multilateral relationships between the key stakeholders, i.e., landlords, tenants, ESCOs, and energy suppliers. Each of the nine segments of the business model canvas is examined, encompassing key partners, resources, key activities, value proposition, customer relationships, segments, channels, cost structure, and revenue streams. The SmartSPIN model emphasizes tailored solutions, flexible contracts, and a novel concept of tri-partite energy performance contract, targeting a diverse customer base of energy consumers, building owners, facility managers, tenants. Through a combination of technological innovation, strategic partnerships, and a customer-centric approach, SmartSPIN is revolutionizing energy management in the commercial rented sector while creating sustainable value for all stakeholders involved.





INTRODUCTION

The scope of this Deliverable is to provide insights about the SmartSPIN business model for the deployment of the SmartSPIN Smart Energy Service (SES) to the commercial rented sectors in Ireland, Spain, and Greece, improving energy efficiency and unlocking flexibility in energy consumption through deployment of energy efficiency measures and a flexible dynamic energy tariff thus mitigating climate change. The business model was constructed using the Osterwald’s Business Model canvas, investigating multiple bilateral and multilateral options for a performance-based contractual agreement between landlord, tenants, and energy efficiency provider (ESCO). This deliverable includes a separate description for each of the nine segments that make up the Osterwald’s business model canvas.

1. SMARTSPIN BUSINESS MODEL CANVAS

1.1 INTRODUCTION TO SMARTSPIN’S BUSINESS MODEL

This comprehensive analysis of the SmartSPIN’s business model delves into the details of the nine key segments as these were identified through the examination of the proposed solution, based on Osterwald’s Business Model Canvas. These segments encompass crucial aspects such as key partners, resources, key activities, value proposition, customer relationships, customer segments, channels, cost structure, and revenue streams. By exploring these components, SmartSPIN aims to revolutionize energy management and create sustainable value for stakeholders across Europe, with a focus on optimizing energy usage, fostering partnerships, and delivering tailored solutions to diverse customer segments. SmartSPIN business model canvas is illustrated in Table 1 below.

Table 1: SmartSPIN Business Model Canvas



KEY PARTNERS	KEY ACTIVITIES	VALUE PROPOSITION	CUSTOMER RELATIONSHIP	CUSTOMER SEGMENT
<p>1. Main Materials/Components suppliers like Smart Devices, RES & Storage components and infrastructure, E-Mobility infrastructure, Smart Monitoring & Management Platform</p> <p>2. Contractors/Technical support network</p> <p>3. EaaS providers/ Market Facilitators</p> <p>4. Energy Service Companies (ESCOs)</p> <p>5. Project financiers</p> <p>6. Energy Performance Contracting facilitators</p> <p>7. Energy efficiency consultants</p>	<p>1. Awareness raising and customer engagement.</p> <p>2. Activities to define customer's needs and requirements for the integration of the solution/toolkit</p> <p>3. Selection of one or more packages of energy conservation measures (that form the solution)</p> <p>4. Definition of a staggered plan to implement energy conservation measures</p> <p>5. Set the price of the SmartSPIN energy efficiency service and determine a plan of payments (service fee paid by tenants)</p> <p>6. Implement agreed energy saving measures</p> <p>7. Energy management data collection & consulting for energy management optimization</p> <p>8. Run an Energy Performance Contract</p> <p>9. Measure & verify energy savings</p> <p>10. Training and behavioural change of users</p>	<p>1. The SmartSPIN Toolkit is an all-in-one solution for solving the split-incentive issue in the Commercial Rented sector offering along with significant energy optimization techniques, transparent methods for electricity billings in a more democratized way.</p> <p>2. The service fee paid by the tenants to the energy efficiency provider, which represents the monetary value of the SmartSPIN energy efficiency service.</p> <p>3. The monetary value of the energy efficient equipment and measures, which are installed in the building as part of the implementation of the SmartSPIN energy efficiency service, including: - Standard & flexible/adaptable solutions. - User Friendly Dashboard for energy monitoring - Smart energy management and control system - Electricity Prices Forecasting platform</p> <p>4. The maintenance service and its monetary value that is represented by the costs incurred by the energy efficiency provider to maintain the energy efficiency equipment installed and the energy efficiency</p>	<p>1. Face customer as partner. Seek dedicated solutions together.</p> <p>2. Co-Creation for tailor made solutions</p> <p>3. Quotation for the SmartSPIN energy efficiency service (provided by the energy efficiency provider to their clients) including cost of the service for renters and rewards for building's owner.</p> <p>4. Agreement between energy efficiency provider and clients about energy efficiency measures that will be installed to implement the service</p> <p>5. Flexible contracts</p> <p>6. Green Lease</p> <p>7. On bill financing</p> <p>8. Tri-partite Energy Performance Contracting</p> <p>9. Invoice for the SmartSPIN energy efficiency service (sent to renters)</p> <p>10. Receipt for the monthly or quarterly payment received by the building owner from the energy efficiency provider</p>	<p>1. Building owners (commercial or business buildings, Malls, industrial plants)</p> <p>2. Facility Managers & Companies - Landlord - Building Management Companies</p> <p>3. Energy users (businesses, industries)</p> <p>4. Renters of commercial buildings and facilities</p>





	<p><u>KEY RESOURCES</u></p> <p>1. HUMAN: 1.1 Entrepreneurs and Managers 1.2 Partners: Technicians, Engineers and Contractors 1.3 Energy Experts/consultants</p> <p>2. PROCUREMENT: 2.1 Supply chain (orders, procurement process, warehouse) 2.2 Contractual and tariff templates</p> <p>3. INTELLECTUAL: 3.1 Know-how about energy efficiency measures and service implementation</p> <p>4. CAPITAL: 4.1 Capital from National or EU funding schemes</p> <p>5. TECHNOLOGY: 5.1 Energy efficient equipment and measures 5.2 Building diagnostics tool 5.3 Technologies for smart controls in building 5.4 Gamification app 5.5 Interactive web-app 5.6 Early building performance diagnostics web-dashboard 5.7 Measurement and verification app</p>	<p>measures.</p> <p>5. Exploitation of flexibility in energy consumption under a dynamic tariff for electricity consumption</p> <p>6. Sharing the benefits of energy efficiency and the energy savings between the parties in a fair manner</p> <p>7. Maximize the investments in energy efficiency in the commercial rented sector.</p> <p>8. Improved thermal comfort of the building's occupiers</p> <p>9. Green image of the building with reduced carbon footprint and better competitive opportunity in the market</p>	<p><u>CHANNELS</u></p> <p>1. B2B & B2C contacts</p> <p>2. Partnerships (Contractors, Technicians)</p> <p>3. Energy Service and Utility Companies</p> <p>4. Digital Payment channels</p> <p>5.. Public tenders</p> <p>6. Website, Sales & Marketing</p> <p>7. Registers of Energy Performance Contracting facilitators</p> <p>8. Associations of ESCOs</p> <p>9. Social-media, conferences, workshops</p> <p>10. Local/National authorities</p> <p>11. Regulation/Ministry of Energy</p>	
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COST STRUCTURE

1. Equipment (RES infrastructure and components, smart devices, and EV Chargers) represent vast majority of the cost.
2. Software development costs
3. Contractor's related costs
4. O&M services
5. Costs associated with measurement and verification of energy savings
6. Fixed Costs (Licensing, Cloud services and data-storage)
7. Marketing/Dissemination activities (brochures, videos etc)
8. Cost of the energy efficiency service for commercial clients
9. Service provided may pay rent to the building owner

REVENUE STREAMS

1. Provision services (Consulting, Management)
2. Service fees - ECM implementation, M&V Service
3. Energy savings
4. Added value of energy efficiency upgrades



1.2 KEY PARTNERS

The success of the SmartSPIN business model hinges on the collaboration between several key stakeholders, each playing a critical role in its implementation and effectiveness. The four most crucial stakeholders in the SmartSPIN business model are the energy service providers, market facilitator finance providers, energy efficiency material/component providers and energy performance contracting facilitator (also referred to as project facilitator).

1.2.1 Energy Service Provider

The role of the energy service provider, based on the specific application scenario, could be attributed to an Energy Service Company (ESCO), an Energy as a Service (EaaS) provider, an Energy efficiency consultant.

Energy Service Companies (ESCOs), which specialize in implementing energy efficiency projects and delivering energy-saving solutions to their clients typically offer a wide range of services, including energy audits, project financing, equipment procurement, installation, and ongoing maintenance, all aimed at reducing energy consumption and costs for building owners and tenants.

The Energy as a Service (EaaS) providers offer comprehensive energy solutions on a subscription or pay-for-performance basis. These providers take responsibility for designing, implementing, and managing energy efficiency projects, allowing clients to benefit from immediate energy savings without the need for upfront capital investment. EaaS arrangements often include guarantees on energy savings, providing additional assurance to clients and aligning incentives between the provider and the customer.

Additionally, energy efficiency consultants play a crucial role in advising clients on the most suitable strategies and technologies to improve energy efficiency in their buildings. These consultants offer expertise in energy management, building systems optimization, and regulatory compliance, helping clients navigate complex energy markets and regulatory frameworks to achieve their sustainability goals.

Market facilitators, on the other hand, serve as intermediaries connecting customers, such as building owners and tenants, with energy service providers. They play a vital role in streamlining the procurement process, facilitating negotiations, and ensuring that clients have access to the most suitable energy solutions for their needs. By acting as trusted advisors and facilitators, market facilitators contribute to the scalability and widespread adoption of the SmartSPIN business model, ultimately driving greater energy efficiency and sustainability across the commercial real estate sector.

1.2.2 Contractors and Technical Support Network

The technical implementation of energy efficiency measures in buildings requires a skilled workforce and a robust technical support network to ensure successful execution. Contractors play a pivotal role in this process, as they are responsible for the physical installation of energy-efficient equipment and systems within the building infrastructure. These contractors may specialize in various works, including installation of HVAC (heating, ventilation, and air conditioning) systems, electrical, plumbing, insulation, and building automation systems. Their expertise ensures that energy-saving measures are implemented correctly and in compliance with relevant building codes and standards.





Additionally, a technical support network is essential to provide ongoing assistance and maintenance regarding installed energy efficiency measures. This network may consist of engineers, technicians, and other specialists who offer expertise in troubleshooting, system optimization, and performance monitoring. They work closely with building owners, tenants, and energy service providers to address any technical issues that may arise and to maximize the effectiveness of energy-saving initiatives.

Furthermore, the availability of internal or external technical support resources varies depending on the structure of the energy service provider organization. Some providers may have an in-house team of technical experts dedicated to supporting their projects, while others may rely on external contractors or third-party service providers for technical assistance. Regardless of the setup, availability of qualified personnel with the necessary skills and knowledge is crucial for the successful implementation and long-term operation of energy efficiency measures in buildings.

1.2.3 Project Financier

Another critical stakeholder in the SmartSPIN key partners segment is the project financier, that is responsible for providing the necessary funding to support energy efficiency interventions in commercial buildings. This role can be taken by either the energy efficiency service provider or the building owner.

In some cases, the energy efficiency service provider may act as the project financier, leveraging its own capital or accessing financing mechanisms to fund energy efficiency projects upfront. Alternatively, the building owner may take on the role of the project financier, using their own capital previously accumulated in a sinking fund or directly allocating funds from their operational funds for energy efficiency interventions. This approach allows building owners to invest in energy-saving measures and reap the benefits of reduced energy costs over time through the SmartSPIN business model.

Moreover, the energy efficiency provider or the building owner may also engage with external stakeholders such as banks or financial institutions specializing in energy efficiency financing to fund their energy efficiency project. These entities offer loans, lines of credit, or other financial products tailored to support energy efficiency projects, providing building owners and energy service providers with access to additional capital and liquidity.

By partnering with external financiers, the SmartSPIN business model allows to overcome the financial barriers and accelerate the adoption of energy-saving technologies in the commercial real estate sector, ultimately driving positive environmental and economic outcomes.

1.2.4 Energy and Materials/Components Supplier

The energy supplier is also another key partner playing a crucial role in the SmartSPIN business model by providing energy to the tenants of commercial buildings. In addition to supplying energy, the energy supplier may also (along with other market actors, such as flexibility providers and stakeholders) trade flexibility in the market. This refers to the ability to reward energy consumers that adjust energy consumption in response to market conditions (such as peak demand periods or fluctuating energy prices) or signals coming from the electricity grid. By trading flexibility, an energy supplier can optimize energy distribution and improve the balancing of supply and demand,





ultimately delivering benefits to both the energy provider and consumers by improving grid stability and reducing costs.

Finally, other partners are the main materials/components suppliers who are responsible for supplying the necessary equipment and components required for implementing energy efficiency measures in buildings. These suppliers are in direct contact with the energy service provider and provide a range of equipment including smart devices, renewable energy systems (RES), storage components, EV and e-mobility infrastructure, and smart monitoring and management software. By collaborating closely with materials and components suppliers, the energy service provider ensures access to high-quality products and technologies that meet the specific needs of each energy efficiency project. This partnership is essential for ensuring the successful implementation and performance of energy-saving measures, ultimately contributing to the overall success of the SmartSPIN business model in delivering sustainable and efficient solutions to the commercial rented sector.

Overall, the collaboration among the stakeholders is the foundation of the SmartSPIN business model, enabling the efficient deployment of smart energy services and driving tangible benefits for all involved parties.

1.3 KEY RESOURCES

The key resources for the SmartSPIN business model can be divided to four subcategories: human, materials, intellectual or financial and technological.

1.3.1 Human resources

With regards to the human subcategory, stakeholders and key partners involved in the business model value chain are crucial resources. These include energy service providers, project facilitators, market facilitators, contractors, technicians, and other personnel responsible for the planning, execution, and management of SmartSPIN projects.

1.3.2 Financial resources

Furthermore, financial resources, such as capital investment from National or EU funding schemes, are essential for financing SmartSPIN initiatives. These funding sources provide the necessary financial support for project development, implementation, and scaling.

1.3.3 Technological resources

Lastly, technological resources encompass a wide range of equipment, hardware and software resources that are vital for optimizing energy efficiency. This includes monitoring and control systems, diagnostic tools, and gamification applications aimed at enhancing user engagement and energy-saving behaviours. Smart energy devices ranging from smart meters to energy-efficient appliances and renewable energy systems, form the backbone of the SmartSPIN infrastructure. From procurement to installation, these resources enable the energy efficiency measures to be implemented in buildings.





Together, these key resources form the foundation of the SmartSPIN business model, enabling the delivery of innovative and sustainable smart energy services in the commercial rented sector.

1.4 KEY ACTIVITIES

The key activities outlined for the SmartSPIN business model primarily revolve around the responsibilities of the energy service provider.

As a first approach, awareness raising and customer engagement actions about the SmartSPIN solution should take place with customer's needs and requirements for the implementation of the SmartSPIN solution later being assessed. This involves educating stakeholders about the benefits of the service and understanding their specific needs and requirements.

Next actions include initial selection of one or more packages of energy conservation measures (that form the solution), based on detailed sizing of the energy components and design of the technical solution to satisfy customer requirements. Following this action, the energy service provider develops a staged plan for the implementation of the chosen energy conservation measures. This plan outlines the steps involved in deploying the solutions effectively while considering factors such as budget, agreed timeline, and resource allocation.

Additionally, the energy service provider facilitates the signing of energy performance contracts between relevant parties, formalizing the terms and agreements for the project. After the installation of the mutually agreed package of energy conservation measures on site, the energy performance contract will be started. During the contract, the measurement and verification of the energy savings will take place regularly, also ensuring the optimisation of the energy management practices. The M&V process ensures that the energy savings promised are achieved (if they are not achieved, the energy efficiency provider will have to compensate their clients for the shortage of energy savings), contributing to the optimization of energy management practices, and enhancing overall building's efficiency.

1.5 VALUE PROPOSITION

The value proposition of the SmartSPIN business model is pivotal, as it highlights the significant benefits it offers to various stakeholders and to the broader society, economy, and environment in general.

One of the key strengths of the SmartSPIN business model is that it can provide an adaptable/flexible and user-friendly solution, including energy optimization techniques and transparent methods for billing electricity consumption via smart energy management and control algorithms, incentivizing thus both tenants and landlords to improve the energy efficiency of commercial buildings, maximizing investments and job creation.

Moreover, special features such as price forecasting tools and/or flexible tariff contracts can be applied, to encourage customers to shift demand away from peak times thus reducing the energy cost of customers (demand response).

Beyond economic benefits, the SmartSPIN model contributes to environmental sustainability by reducing carbon footprints and improving indoor air quality and thermal comfort for occupants.





Overall, the model not only maximizes investments and job creation but also aligns with broader environmental goals, making it a comprehensive and impactful solution for the commercial rented sector.

1.6 CUSTOMER RELATIONSHIP

In the context of customer relationship, the SmartSPIN business model prioritizes on the customer through personalized solutions that match their needs and individual requirements in the best possible way by offering flexible contracts. In such way, the model ensures that customers receive the most suitable energy services while optimizing their overall experience.

A key aspect of this approach is the establishment of a tri-partite energy performance contract between the tenant, building owner, and the energy service provider. This approach is compatible with green leases and on-bill financing schemes which may help to further enhance customer engagement and facilitate the adoption of sustainable practices. This collaborative arrangement ensures that all parties are aligned in their objectives and responsibilities, fostering transparency and accountability throughout the whole process of implementation of the agreed energy efficiency measures.

Through all these practices, the SmartSPIN business model not only strengthens the relationships with customers, but also promotes long-term cooperation and mutual benefits for all directly involved stakeholders.

1.7 CUSTOMER SEGMENT

In terms of customer segment, the SmartSPIN business model targets a diverse range and profile of customers within the commercial rented sector, recognizing the different stakeholders that are involved in energy management and efficiency improvement solutions. The customers segments that have been identified through this study are listed in the following subsections.

1.7.1 Building owners

Building owners, including those of commercial buildings, malls and industrial plants represent a primary customer segment as they hold the major decision-making authority over energy related investments and upgrades.

1.7.2 Facility Managers

Facility Managers and Companies responsible for the day-to-day operations and maintenance are also key customers in this customer relationship scheme, considering their role in the implementation of energy efficiency measures, while ensuring optimal building performance. Although facility management companies do not contract directly with the energy efficiency provider, they play an important advisory role to liaising with the energy efficiency service provider (and project facilitators if any) to determine the contractual agreements that are most suitable for the building owner.

1.7.3 Building Management Companies





Additionally, building management companies attain a pivotal role as well in overseeing multiple properties and thus, are essential partners for scaling up the adoption of the SmartSPIN solution across multiple buildings, fostering a bespoke approach.

1.7.4 Energy users

Furthermore, SmartSPIN's business model caters also for energy users across various industries and businesses, acknowledging their combined interest in reducing operational costs and enhanced sustainability. Many of these energy users are tenants of commercial buildings whose engagement plays a fundamental role in the deployment of the SmartSPIN business model to overcome the split incentive issue.

1.7.5 Commercial building tenants

Finally, tenants of commercial buildings and facilities are an important customer segment, as they directly interact with the SmartSPIN energy service as well as with the rest of customer segments. Through the SmartSPIN energy efficiency service, tenants obtain benefits from improved in-door comfort, reduced operational costs, and enhanced environmental performance.

The proposed business model aims to address the multifaceted needs of the stakeholders of the commercial rented sector and can effectively drive the adoption of smart energy solutions and services.

1.8 CHANNELS

The SmartSPIN business model aims to establish concrete communication channels in the commercial sector both at a Business to Business (B2B) and a Business to Customer (B2C) levels of interaction, facilitating effective engagement with key stakeholders involved in the widespread deployment of the SmartSPIN smart energy service.

1.8.1 Energy Service and Utility Companies

More specifically, communication channels are established with the energy efficiency service provider and with the utility companies, as well as with contractors and technicians, who have a key role in the implementation, operation and maintenance of energy efficiency measures.

1.8.2 Energy Performance Contracting Facilitators

In addition, connections are created with energy performance contracting facilitators, who can provide valuable expertise and support for the optimization of buildings' energy performance.

1.8.3 Tenants

Moreover, tenants will be able to engage through dedicated websites or interactive platforms, social media pages, as well as targeted marketing campaigns with a view to raise awareness and familiarization with energy efficiency interventions and promote the adoption of the SmartSPIN solution. In parallel, the planning of workshops and webinars enables to provide educational resources and practical guidance to the tenants for the implementation of the SmartSPIN service.





1.8.4 Policy Instruments

A strong channel with policy instruments will be established to facilitate the overcoming of legislative and market barriers regarding the implementation of the “energy as a service” business models. The engagement with local/national authorities, ministries of energy as well as associations of ESCOs and/or Energy Service providers is a key activity to overcome such legislative and market barriers.

By leveraging these channels, the SmartSPIN business model aims to foster collaboration, build trust, and navigate regulatory landscapes effectively to drive the widespread adoption of smart energy solutions in the commercial rented sector.

1.9 COST STRUCTURE

The cost structure of the SmartSPIN smart energy service consists of various components, which are crucial for the successful implementation and seamless integration and operation of its smart energy solutions.

1.9.1 RES and EMS Infrastructure

A significant portion of the cost can be attributed to the provision and installation of the necessary equipment, including RES and storage system components, smart metering devices, EV chargers, along with associated infrastructure. In addition, substantial investments must be made for the development or acquisition of commercially available energy management systems (EMS), essential for the management and monitoring of all installed and operated energy related assets, as well as for the validation of energy savings achieved through the implemented measures. It should be also noted that the cost of acquiring and operating such energy management software solutions can also include licensing fees. Moreover, expenses related to cloud-data storage must be also considered.

1.9.2 Contractor Costs

Contractor related expenses, covering professional services and labour to ensure the effective deployment, installation, and maintenance of energy efficiency upgrades, constitute another significant cost component associated with the deployment of the SmartSPIN service.

1.9.3 Prefeasibility Studies

Moreover, costs associated with conducting prefeasibility studies, including energy auditing in buildings, to assess the implementation of energy efficiency interventions, are also factored into the cost structure included in the SmartSPIN Business Model.

1.9.4 Marketing costs

Furthermore, costs related to marketing campaigns for the SmartSPIN smart energy service are considered essential for raising awareness among the stakeholders and promoting a widespread adoption of the SmartSPIN solution. Comprehensively, understanding the cost structure of the SmartSPIN Business Model enables the effective budgeting and resource allocation to support the successful implementation and sustainability of the solution.

1.10 REVENUE STREAMS





The revenue streams anticipated from the SmartSPIN Business Model are multifaceted and encompass various sources derived from the delivery of smart energy solutions and related services. The main revenue stream envisioned through the implementation of the SmartSPIN solution are determined by the generation of the energy cost savings associated with the implementation of Energy Conservation Measures (ECM). In turn, these savings are translated into tangible financial benefits for the involved stakeholders.

In practice, a revenue stream for the energy efficiency provider is obtained from service fees paid by the tenants, which depend on the energy savings obtained by the implementation of ECMs. The service fee along with the investment in energy efficiency measures also covers the costs of equipment maintenance as well as those of the measurement and verification of energy savings (M&V) service. The costs associated with the design and installation of the efficiency measures is covered by the initial investment performed by the energy efficiency provider or by the building owner.

Further on, the provision of a flexibility service to the electricity grid, which is an implicit demand response service based on the shifting of energy consumption from peak hours (characterised by high energy prices) to non-peak hours (characterised by low energy prices), offers an additional revenue stream by enabling customers to optimize their energy consumption and improve the energy management of the electricity grid.

Besides these primary revenue streams, further indirect sources of income may exist, such as those from consulting and management services related to energy efficiency initiatives. Moreover, the added value resulting from energy efficiency upgrades, such as enhanced building performance and occupant comfort, may also contribute to increased revenue over the long term, contributing to attract and retain renters.

Taking all above diversified revenue streams into consideration, and by capitalizing on the value generated by the implementation of smart energy solutions, the SmartSPIN business model aims to establish a sustainable financial framework useful for its long-term viability and growth.

2. OVERALL SMARTSPIN BUSINESS TOOL KIT

With a view to provide all stakeholders in the commercial rented sector with a hands-on experience of the SmartSPIN solution and its implementation, an online and interactive web-application has been developed, which can be accessed through the project's website (<https://www.smartspin.eu/toolkit/>).

2.1 BUSINESS MODEL

The overall concept of the SmartSPIN business model can be illustrated as Figure 1: SmartSPIN Business Model (Sinking Fund). Figure 1 below. A tri-partite energy performance contractual agreement between tenant, building owner and the energy service company (energy efficiency provider) has been established. In this specific set-up, the building owner is responsible for the financing of the energy efficiency upgrades via own funding (sinking fund).



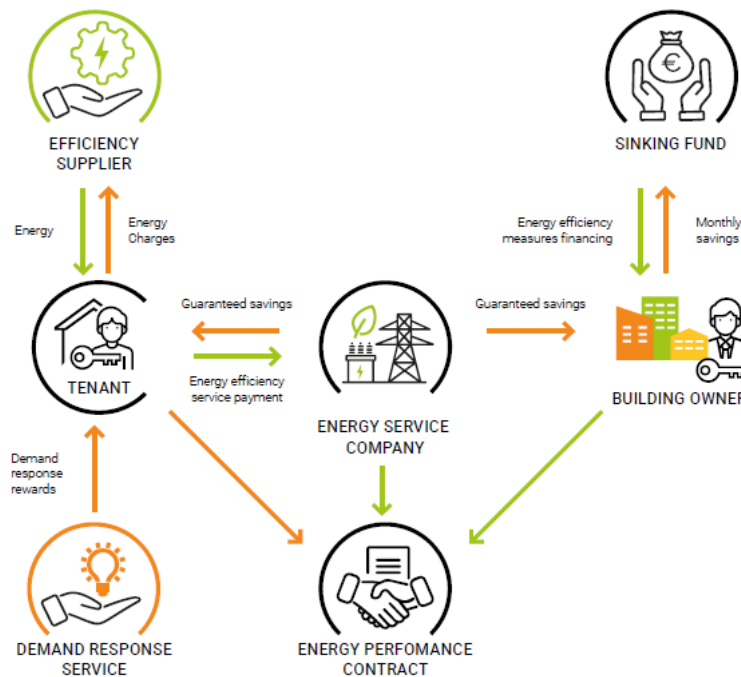


Figure 1: SmartSPIN Business Model (Sinking Fund).

The building owner then attributes back to their own fund or sinking fund the remuneration from the monthly guaranteed energy savings to payback the investment. The energy service company receives a monthly remuneration from the tenants, paid by the energy cost savings achieved by them. Indeed, the tenants also pay the energy supplier company based on their actual energy consumption. Their monthly energy bill will be reduced because of the implementation of the energy efficiency upgrades.

Moreover, the energy supplier could potentially provide a flexible tariff contract incentivizing the shift of energy consumption of energy consumers toward non-peak hours, which will in turn allow the trading of customers' flexibility to the market. In this way, the available flexibility in energy consumption by tenants may be unlocked, thus leading to a further reduction of the operational energy costs for the tenants.

At the end of the contract, either the tenant or the building owner can choose to purchase the equipment paying its residual value to the ESCO, extend the contract, or (less commonly) return the equipment. As depicted in Figure 2, the funding source can be a different entity like a bank or lender. In this case, the energy efficiency upgrade measures are funded by the building owner through a bank loan, and consequently the building owner is responsible for the loan repayment. In other set-ups of the model, the ESCO could act as the project financier via a bank loan and share the energy savings with the building owner according to an agreed percentage (without guaranteeing a minimum amount of energy savings).

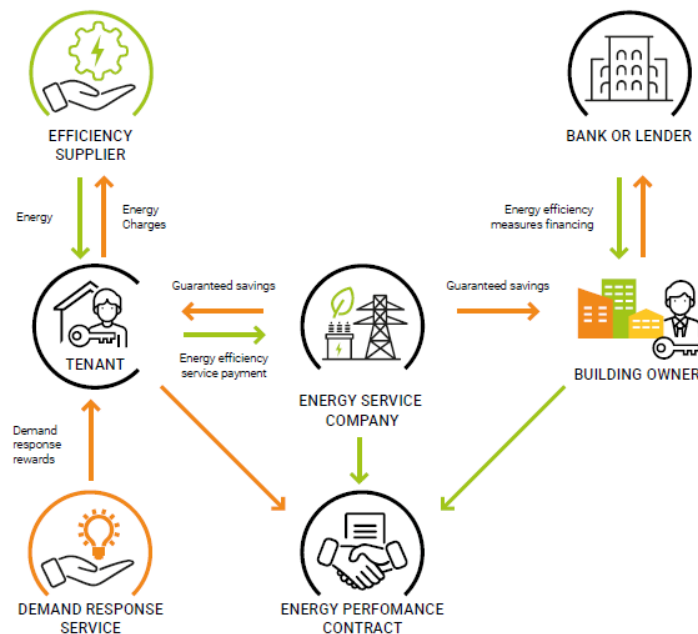


Figure 2: SmartSPIN Business Model (Building owner liaising with Bank or Lender)

By using the toolkit, stakeholders, including building owners, tenants, and energy efficiency providers, can familiarize themselves with the tri-partite energy performance contractual agreement between tenant, building owner, and the energy service company, and with the business model that enables to reward the landlord with energy savings that would be otherwise reaped only by the tenants, thereby overcoming the split incentive issue (Figure 3). Moreover, through consideration of the different funding mechanisms, such as sinking funds or bank loans, they can also understand the different options available for financing energy efficiency upgrades.

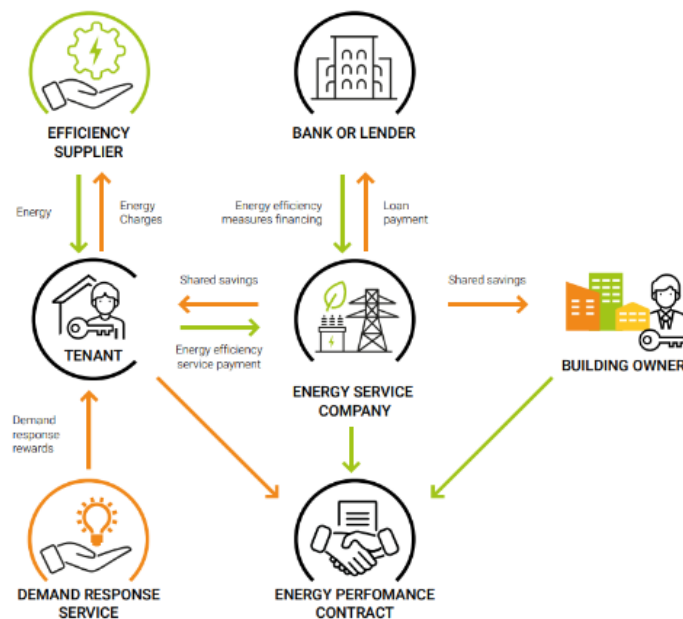


Figure 3: SmartSPIN Business Model (Energy Service Company liaising with Bank or Lender)





Finally, the toolkit provides insights into the role of energy suppliers in offering flexible tariff contracts and demand response schemes, contributing to further reductions in energy costs for tenants.

2.2 CONTRACTUAL AND TARIFF TEMPLATES

SmartSPIN has defined a contractual model to optimise the building energy services between ESCO, landlord and tenant. This contract addresses the needs and obligations of all parties involved in the commercial rented sector and can be freely used as a basis for drafting a contract involving more than two parties. The contract template would preferably be a tri-partite model including Landlord/Tenant/ESCO. The template was designed so that it accommodates this possibility. The performance guarantee of savings by the ESCO is an essential keystone and marketing tool for the overall process as it ensures that the client gets a financial return from the project. Flexible tariff template links the system marginal price, (SMP) i.e., electricity market hourly clearing price to the electricity price paid by the customer. The flexible tariff template attempts to compare 15-minute consumption data for clients with the SMP for every hour of every day using data provided by the authorised DSO. [D3.5 Contractual and Tariff Templates](#) describes SmartSPIN contractual tariff template and flexible tariff template developed by the project.

2.3 INTERACTIVE WEB-APP

Users can explore the potential for energy management that can be exploited for an EPC in a commercial rented building aspect using [SmartSPIN Interactive Webapp](#). The App presents the most suitable “target” market across Europe for the SmartSPIN split-incentives business model based on Energy Performance Contracts (EPC). The web-app focuses on different typologies of commercial buildings and facilities, summarizing their potential for EPC under different boundary conditions such as climate, demand response market maturity, and dynamic electricity tariffs.

2.4 EARLY BUILDING PERFORMANCE DIAGNOSTICS WEB-DASHBOARD

The [early building performance diagnostics web-dashboard](#) is a data-driven energy diagnostics algorithm to identify the most significant energy & cost streams in buildings using a minimal dataset of information. It considers general information about the building such as location (i.e., climate), characteristics (i.e., size), usage (opening hours, schedules, etc.), and general HVAC characteristics, as well as overall facility energy consumption. In line with the overall SmartSPIN concept, the diagnostic will comprise not only overall energy use, but also deliver granular data for its integration with energy tariffs in real practice (i.e., this implies that energy use is divided by energy carrier, and that electricity use is divided by billing schedules). The early building diagnostic results in the calculation of key performance metrics that allow automatic identifying energy saving measures when cross-referenced against current building performance databases.

2.5 MEASUREMENT AND VERIFICATION TOOL

The measurement and verification (M&V) tool of SmartSPIN is built upon the recommendations and best practices defined by existing M&V protocols such as the International Performance Measurement and Verification Protocol (IPMVP), ASHRAE Guideline 14, Uniform Methods Project (UMP). The M&V tool enables: 1. to train data-driven energy baselining models and calibrate them against pre-intervention data; and 2. to facilitate the use of sub-metering data and information on





technical systems in the M&V process. The data-driven models incorporated into the M&V tool enable to assess demand-response and control optimisation measures. The M&V tool enables to perform a seamless update of baseline-models and assessment of the impact of energy saving measures, along with supporting the identification of non-routine adjustments to models. The tool works in synergy with the algorithms for early building diagnostics and prognostics for operation and control and facilitates their verification and fine-tuning.

CONCLUSIONS

The SmartSPIN project presents an innovative business model designed to revolutionize the deployment of a Smart Energy Service (SES) designed for the commercial rented sector that enhances energy efficiency and (if applicable to the considered building) flexibility in energy consumption, ultimately aiming to reduce carbon emissions and combat climate change. Through meticulous analysis and strategic identification of its key components such as partners, resources, activities, value proposition, customer relationships, segments, channels, cost structure, and revenue streams, the SmartSPIN business model provides a comprehensive and robust framework allowing an effective service implementation to the commercial rented sectors in Ireland, Spain, and Greece. By fostering partnerships with energy service providers, market facilitators, financiers, and material suppliers, SmartSPIN ensures a holistic approach to addressing the diverse needs of stakeholders. Moreover, the emphasis on customer-centric solutions, flexible contracts, and tailored energy performance agreements underscores the project's commitment to maximizing value for building owners, tenants, and energy service companies alike. The delineation of revenue streams, determined by energy cost savings, service fees, and indirect revenue sources stemming from both energy and non-energy benefits, further highlights the effectiveness and the potential for a significant market up-take of the SmartSPIN business model. Overall, the SmartSPIN project presents a compelling vision for the future of energy efficiency in the commercial rented sector in Ireland, Spain, and Greece, poised to drive significant environmental, economic, and social impact.

