DELIVERABLE: D5.2 Effective Contractual Arrangements for Innovative and Integrated Energy Services

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Building Up Next-Generation Smart Energy Services Offer and Market Up-take Valorising Energy Efficiency and Flexibility at Demand-Side.

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Executive summary

Background and Objectives

European clean-energy policies and targets (from the *Clean Energy Package* to *Fit-for-55*) are fundamentally reshaping the energy services market. They push beyond one-off efficiency retrofits toward **continuous, performance-cantered services** that deliver verified energy savings and demand flexibility. In this context, BungEES innovative business model has emerged. However, this model face **non-technical barriers** despite its technical viability. The presented deliverable addresses this gap by proposing effective contractual arrangements to support **"bundled" smart energy services** (combining energy efficiency, distributed generation, and demand-side flexibility, as well as non-energy services) across the EU. The goal is to facilitate one-stop-shop delivery of integrated energy solutions, thereby reducing market fragmentation and complexity for consumers and providers alike. This executive summary distils the report's main findings and conclusions, with a focus on practical insights for industry stakeholders – including Energy Service Companies (ESPCs[21]), demand response aggregators, technology providers, and implementation partners.

Key Findings and Conclusions

1. One-Stop Shop Model is Key – It is impractical to expect consumers (households, businesses, public agencies) to separately navigate auditors, installers, financiers, and regulators for advanced energy upgrades. **One-Stop Shops (OSS)** have therefore emerged as a pivotal model to consolidate these steps into a **single, accountable customer journey**, cutting through complexity. An OSS approach reduces transaction costs and uncertainty – two persistent barriers to energy efficiency projects – and simplifies multi-stakeholder coordination. In essence, integrated service delivery under one roof accelerates adoption of energy efficiency, distributed generation, and demand response solutions.

2. Two-Part Contractual Framework – To enable the OSS model, the document outlines a **replicable and scalable contractual framework** comprising **two complementary contracts**. First is the **Bundled Energy Service Master Agreement** (Head of Terms I) – an overarching framework agreement that governs collaboration among multiple service providers (e.g. an ESPC, a demand response aggregator, technology installers, etc.) in delivering a bundled offering. This "master" contract defines the partners' roles, responsibilities, revenue-sharing, data governance, and risk allocation while accommodating various partnership structures. Second is the **OSS Retail Customer Contract** (Head of Terms II) – a unified agreement between the one-stop shop (or **Bundled Smart Energy Provider, BESP**) and the end-user that covers all service components in one simple contract. This retail contract is designed for simplicity and transparency, translating the complex package of services into clear terms for the customer. Together, these two contracts enable a seamless bundled service: the master agreement **ensures operational continuity and risk mitigation** among providers, and the retail contract **focuses on the customer relationship** and experience. By using standardized templates with a stable core of terms and adaptable annexes, the framework can be **tailored to each EU Member State's regulations and market specifics**. This balance – standardization plus flexibility – makes it easier to launch integrated services with minimal friction and to scale them across different countries, while remaining compliant with national rules.

3. Compliance with EU Market Principles – The proposed framework is fully aligned with EU directives that govern retail energy markets. Notably, it respects the Clean Energy Package principle that **demand response services must be offered independently of energy supply**. In practice, this means an aggregator can provide flexibility services within the OSS model without infringing on electricity suppliers' roles. The master agreement explicitly allows such independent aggregators to operate while coordinating with suppliers or other partners. The unified contracts also embed EU consumer

protections – for example, they include a **14-day withdrawal/cooling-off period** for new service contracts, reflecting consumer rights law, and accommodate **electronic signatures** for convenient remote sign-up. Ensuring legal compliance in areas like data privacy (GDPR), e-payments, and consumer rights is essential to build trust and avoid contractual invalidity across jurisdictions.

4. Common Barriers Across Europe: The research confirms that *non-technical barriers* – rather than technology or economics – are the chief hurdles to scaling innovative energy service contracts. These barriers fall into two broad categories:

- **Behavioural and Consumer-Related Barriers** – Widespread **lack of awareness** and understanding of new service models, **low trust** in providers, risk aversion, and inertia slow customer uptake. Even when solutions are cost-effective, consumers may be hesitant to participate in an energy efficiency contract or a demand response program due to fear of the unknown or perceived complexity. For instance, many potential clients worry that promised savings won't materialize or that giving an aggregator some control (over, say, thermostat settings) might compromise comfort. Moreover, customers often prefer the status quo – e.g. sticking to flat-rate tariffs and familiar routines – over seemingly complex "smart" schemes. Building trust through transparent performance guarantees, **clear communication**, and even trial periods (a "try before you buy" approach) is critical to overcome these human factors.
- **Institutional, Legal, and Financial Barriers** – Regulatory and administrative hurdles remain significant. **Fragmented rules** and market designs across Member States, cumbersome permitting or procurement procedures, and unclear legal frameworks for new models create uncertainty for providers. For example, until recently each country had its own rules (or none) for demand response aggregation and energy communities, making cross-border scaling difficult and leaving some markets underdeveloped. Similarly, public accounting rules can deter energy performance contracting (e.g. if EnPC obligations are counted as public debt, municipalities shy away). **Financing constraints** also persist: many efficiency projects rely on grants that are not integrated with performance contracts, reducing opportunities for ESPCs to offer pay-for-performance deals. High transaction costs for small projects and lengthy project development cycles further impede commercial viability. Overall, these institutional barriers raise the risk profile for market actors.

Importantly, these barriers are **interrelated** and present in every country to some degree. In advanced markets like Germany or France, sophisticated actors still struggle with issues like split incentives (e.g. landlord vs tenant benefits) and complex administrative requirements. In less mature markets (e.g. Slovakia or Portugal), basic regulatory frameworks and awareness have developed only recently, though generous EU renovation subsidies may buoy activity (e.g. in Slovakia). Despite such differences, the *underlying types of barriers are comparable EU-wide*, meaning successful solutions and best practices can often be transferred or adapted across borders. The overarching conclusion is that **policy and market interventions must tackle these non-technical barriers head-on** – technical potential alone will not unlock the market.

5. Enabling Factors and Success Strategies: The study identifies several levers to overcome barriers and enable effective energy service contracting at scale. A combination of measures is needed:

- **Supportive Policy & Regulatory Reform** – Clear and harmonized rules lower market entry costs. Full implementation of EU directives (on aggregator access, energy communities, dynamic pricing, etc.) and removal of artificial obstacles are foundational. Regulators should clarify accounting rules for performance contracts and ensure **data access frameworks** (smart metering data, IoT device data via the Data Act) so that providers can verify savings and automate services. Consistent regulation across Member States – or at least mutual recognition – will reduce the current market fragmentation that complicates multi-country operations.

- **Innovative Financing Models** – Performance-based services need financing solutions that accommodate shared savings and longer paybacks. Mechanisms like on-bill financing, energy-as-a-service models, or guarantee funds can help. Ensuring that performance contracts can be off-balance sheet for clients (addressing "Maastricht neutrality" concerns in public sector) encourages uptake. Standardized contracts with well-defined risk allocation make projects more **bankable**, attracting private investment by clarifying how returns are generated and how risks (e.g. performance shortfalls) are mitigated.
- **Consumer Engagement & Trust-Building** – To address awareness and trust gaps, **education and marketing** tailored to different customer segments are vital. Simplified offers (clear value proposition, straightforward pricing) resonate better with consumers, especially those with low energy literacy. The contracts themselves contribute to trust by **ensuring transparency** – for example, itemizing the services and benefits in plain language and providing clarity on how savings or rewards are calculated. Furthermore, incorporating consumer-friendly terms like **short initial commitment periods (e.g. 1-year contracts with easy renewal)** and **graceful exit options** improves willingness to sign up. The synthesis recommends offering trial periods for novel services so customers can "test drive" the solution before fully committing. Building certification schemes or reference cases (pilots demonstrating success) can also provide social proof to sceptical customers.
- **Digital Infrastructure & Data Quality** – Since smart services rely on data, effective arrangements for **data sharing and integration** are enabling factors. The framework assumes that providers can access reliable consumption and metering data and connect to customer devices (with consent) to execute demand response. Interviews highlighted that *data reliability and API integration* are critical – fragmented home devices and variable market signals make it challenging for aggregators to forecast and monetize flexibility. The contracts therefore stipulate **data quality assurance measures** (e.g. regular technical performance reports, integration testing) to ensure that all parties have the needed information to perform. Continued rollout of smart meters and common data standards across Europe will significantly lower the cost and risk of implementing such services.
- **Coordination and Capacity-Building** – Finally, creating facilitation mechanisms such as local one-stop shop **advisory hubs** and training programs for new skills (e.g. demand response aggregation, energy management system integration) will strengthen the ecosystem. Many Member States are already encouraged to set up OSS "facilitators" to guide consumers through projects. Scaling integrated services requires that **implementation partners** (installers, energy auditors, etc.) are available and competent. The document notes that a **shortage of skilled personnel** in emerging fields (like residential flexibility management) can be a bottleneck. Contractual provisions allowing **subcontracting** under quality conditions help address this by letting lead providers bring in qualified subcontractors when needed. The BungEES OSS contract ensures any subcontractor adheres to the same standards and that customers are informed, maintaining service quality and trust even when multiple actors are involved.

Implications for Industry Stakeholders

The findings carry specific implications for various industry actors involved in delivering smart energy services:

- **Energy Service Companies (ESPCs)** – Traditional ESCO models focused on energy efficiency retrofits must evolve toward continuous services and deeper partnerships. The report's framework enables ESPCs to **bundle efficiency with flexibility services**, expanding their value proposition. By partnering with aggregators or tech providers under a master agreement, an ESPC

can offer clients additional benefits (like demand response revenues or PV/storage integration) without developing all capabilities in-house. Crucially, clear contracts help **build client trust** – for example, by guaranteeing performance and defining transparent measurement & verification (M&V) procedures. Standardized OSS contracts can also simplify ESPCs'' negotiations with customers, reducing legal friction in closing deals. However, ESPCs should be mindful of financing and policy nuances: in markets flush with grants, they should seek to integrate subsidy programs with performance contracting to remain competitive. Public-sector ESCO projects should leverage the contract templates to address off-balance sheet and procurement concerns, using the risk allocation clauses to satisfy auditors while achieving energy savings commitments.

- **Demand Response Aggregators** – Aggregators stand to benefit from the BungEES OSS model by tapping into new customer segments (e.g. small consumers) via partnerships. The master agreement offers a flexible structure for aggregators to team up with energy retailers, device installers, or ESPCs depending on the market approach. For instance, under a **"service provider model,"** an aggregator can provide turn-key demand response services to a utility or retailer's customers, whereas a **"partnership model"** allows revenue-sharing with a retailer co-marketing the service. The contracts include features to protect aggregators' business case: **limited initial pilot territories and short contract terms** allow testing viability in new markets without over-committing. Performance thresholds tied to contract renewal or termination ensure aggregators are not locked into unprofitable engagements if external conditions (prices, regulations) turn unfavourable. Another key implication is the emphasis on **data management** – aggregators should invest in robust IT integration, as the agreements call for regular data reporting and quality checks to maintain reliable service delivery. Finally, aggregators must prioritize customer relations: the BungEES OSS customer contract gives end-users flexibility to opt out of DR events without penalty and demands that comfort or operations are not unduly affected. Aggregators who ensure customers stay comfortable and informed ("why and when they are participating… and what their rewards are") will have higher retention and program success.

- **Technology Providers (Equipment and Software Suppliers)** – For providers of smart thermostats, building automation systems, EV chargers, etc., the integrated approach means their products are bundled into larger service offerings rather than sold standalone. This opens opportunities for **wider deployment** via BungEES OSS partnerships but also requires meeting interoperability and data-sharing expectations. Tech providers should be prepared to support **standard APIs and data formats**, as the contractual framework highlights API integration to reduce costs and ensure seamless operation across devices. Moreover, technology firms might participate as subcontractors or lead generators in these models. The contract provisions on **quality assurance and performance reporting** imply that technology solutions will be continuously monitored – providers need to maintain reliable performance to uphold the OSS's guarantees. Importantly, **data privacy and cybersecurity** are paramount: the BungEES OSS contract enforces privacy-by-design and demands that any third-party technology handling customer data adheres to strict obligations and allows customer control. Technology vendors that build trust (e.g. through cybersecurity certifications, transparent data policies) will be preferred partners in the OSS ecosystem. In sum, technology providers should align their products with the integrated service model, ensuring easy integration and compliance, to become key enablers of bundled services across Europe.

- **Implementation Partners (Installers and Service Delivery Partners)** – Installers, contractors, and local energy agencies involved in project execution will find the one-stop shop approach both challenging and rewarding. On one hand, BungEES OSS model shifts away many **administrative burdens** from small installers – instead of each installer contracting directly with the customer, the lead OSS provider coordinates and the unified contract cover all services. This can streamline

workflows and provide a steady pipeline of projects. On the other hand, partners must **adhere to higher standards and coordination requirements** set out in the master agreement. Clear schedules, performance metrics, and communication protocols will govern their work. For example, an HVAC installer might be contractually obliged to follow a set installation timeline and meet certain efficiency performance criteria, with monitoring reports submitted to the OSS lead. Implementation partners should note the framework's flexibility in assignment: if one provider exits (or is replaced), the contracts ensure continuity of service for the customer, meaning partners need contingency plans to transfer responsibilities smoothly. Additionally, the emphasis on **branding and customer experience** in partnership models means local partners might operate under a unified brand or co-brand – they should be ready to **deliver a consistent customer experience**. The upside is that a familiar local presence combined with a strong brand can enhance customer trust in new services. In summary, implementation partners are critical to making innovative contracts work on the ground, and those who invest in training, quality management, and customer service will thrive in the BungEES OSS paradigm.

Practical Insights into Contract Design for Energy Services

This BungEES deliverable offers **practical guidance on structuring contracts** that underpin successful integrated energy services. Key design insights include:

- **Clarity and Simplicity for the Customer** – A successful OSS contract must be written in accessible, **non-technical language**, clearly outlining the service scope, customer obligations, and benefits. Interviews confirmed that customers – especially residential ones – respond far better to simple, easy-to-understand offers. The contract template addresses this by detailing all included products and services in an annex (so it can be customized per offering) and stating in plain terms *what the customer is paying for and what results to expect*. This transparency is essential to build a "reasonable level of trust" and encourage engagement. Avoiding jargon and providing concrete examples of savings or rewards can make the difference in converting an interested prospect into a signed customer.

- **Balanced Risk Allocation** – Effective contracts allocate risks to the parties best able to manage them, which increases the overall bankability of the service. This deliverable draws lessons from performance contracting and service-level agreements, suggesting that partners' remuneration be tied to **key performance indicators (KPIs)** wherever feasible. For instance, a lead generator's commission might depend on the number of customers connected and activated, and an aggregator's fee might include a performance-based component for delivered flexibility. This ensures each party has skin in the game and is rewarded for outcomes, not just activities. At the same time, contracts incorporate **safeguards for underperformance** – minimum performance thresholds and pilot phases after which contracts can be terminated or reviewed if results are below expectations. Such clauses protect providers from prolonged losses in volatile or nascent market segments (e.g. residential demand response) and allow course corrections. For customers, the risk allocation is designed to be fair: e.g. if an energy-saving guarantee isn't met, the contract may stipulate compensation or adjustments, so the client isn't left disadvantaged. In sum, aligning payment with performance and defining clear recourse in case of shortfalls creates a more resilient contract structure.

- **Flexibility and Adaptability** – Given the dynamic nature of energy markets and policy, contracts need to allow **adaptive management** over multi-year service periods. The BungEES OSS master agreement includes provisions for **regular performance reviews and updates** – for example, quarterly joint evaluations between partners in a partnership model, or annual reviews in a lead-generation model. This ensures the partnership can adjust to changing circumstances (like new regulations, subsidy changes, or technology updates) without terminating the relationship.

Additionally, terms regarding **contract duration and renewal** are crafted to provide flexibility – the recommended approach is an initial one-year term with automatic annual renewal, which enables renegotiation or exit if external conditions shift significantly. For customers, flexibility is seen in features like the ability to opt out of demand response events and a straightforward exit procedure if they choose to leave the service. By embedding flexibility, the contracts remain **"living documents"** that can evolve with the market – a critical factor in a sector where energy prices, policies, and technologies may change rapidly.

- **Consumer Protection and Trust Mechanisms** – A strong thread throughout the contractual design is safeguarding the consumer's interest, which in turn builds trust in the service. The BungEES OSS customer contract incorporates robust **data protection** and privacy clauses, ensuring compliance with GDPR and giving customers control over their data (e.g. they can withdraw consent to data processing and have clear redress mechanisms for any misuse). It also avoids punitive measures that would alienate customers – for example, **no harsh penalties for early termination** or failure to deliver a certain amount of flexibility. Instead, if a customer chooses to cancel or not participate, the model favours giving them easy exit options rather than enforcement via fees. This reflects a "customer-first" approach that de-risks participation from the user's perspective. Additionally, the contract clearly defines communication channels and obligations – customers are to be informed of any demand response events, changes in conditions, or pricing updates in a timely and transparent manner. Proactive communication (e.g. mobile alerts about an upcoming demand response event and the reward earned) can greatly enhance customer satisfaction and willingness to stay enrolled. By designing contracts that treat the customer as a true partner – with clarity, fair options, and data respect – OSS providers can overcome the trust barrier that has hindered many energy service programs in the past.
- **Standardization with Room for Localization** – The deliverable emphasizes that while a **benchmark template** is invaluable, one size will not fit all in Europe's diverse landscape. The solution is a contract architecture with a **stable core** (common general terms that embed best practices and legal essentials) and **modular annexes** to adjust for local specifics. The core covers universal elements like baseline legal language, consumer rights, liability, and fundamental duties of each party. The annexes can then specify variable elements – e.g. the technical scope (which may differ if, say, solar PV is viable in one country but not another), pricing and tariff details (to align with local energy price structures), measurement and verification protocols (maybe using country-specific standards or subsidy program requirements), and so on. This approach allows industry players to replicate successful contract models across regions while still complying with national laws and reflecting local market conditions. For commercial actors, this means faster deployment (no need to draft bespoke contracts from scratch for each project) and easier negotiation, since many terms will be recognized and trusted as part of a standard. At the same time, necessary **customization is preserved**, ensuring relevance in each context. The report's annexes provide template Heads of Terms that companies can use as starting points, which can significantly streamline the legal process for new OSS initiatives.

Design Recommendations for Effective Contractual Arrangements

Drawing on the research findings and stakeholder insights, the report concludes with **practical recommendations** for designing and implementing effective contractual arrangements in innovative energy services:

- **Use a Two-Tier Contract Structure** – Separate the **B2B partnership agreement** (among service providers) from the **B2C customer contract**. This allows multiple companies to collaborate behind the scenes while presenting a **single unified offer to the customer**. Ensure the master agreement clearly defines each partner's contributions, revenue entitlement, and exit options, whereas the

customer contract aggregates all services into one understandable package (with one point of contact for support and billing). This structure has proven to reduce friction and confusion, enabling bundled solutions to launch and scale more easily.

- **Embed Flexibility to Adapt to Change** – Design contracts with the expectation that things will change – be it energy prices, technology, or regulations. Include clauses for **periodic review** and allow amendments by mutual consent to adjust to new conditions (while safeguarding the customer's core terms). For instance, set an initial contract term (e.g. 12 months) after which terms can be revised or the contract ended without heavy penalties. This way, all parties can pilot the service and only commit long-term if it proves viable. Clearly define any **performance thresholds** or business conditions that trigger renegotiation or termination (e.g. a minimum number of installations or a regulatory change that makes the service illegal). This foresight prevents disputes and losses down the line.
- **Prioritise Clarity, Transparency, and Fairness** – Contracts should be drafted in plain language with **minimal technical jargon**, especially on the customer side. All charges, fees, and performance calculations must be transparent. Avoid one-sided terms; instead, include **balanced provisions** (for example, if the provider can terminate for cause, the customer should have similar rights). Implement standard consumer protection measures like a cooling-off period, refund policies for non-performance, and easy communication channels for support or complaints. A fair contract not only satisfies legal requirements but is also a selling point – customers and partners are more willing to sign when they perceive the terms as reasonable and mutually beneficial.
- **Incorporate Data and Privacy Agreements** – Given the digital nature of smart services, ensure the contract addresses data handling in detail. Define what data will be collected (energy usage, equipment performance, etc.), how it will be used, and who it can be shared with. Obtain explicit **consent from customers for data usage** and allow them to withdraw that consent if desired. Include obligations for partners regarding cybersecurity and data confidentiality. For example, if an IoT device supplier is part of the master agreement, they should commit to secure data transmission and compliance with privacy laws. Clarity here builds trust and avoids legal complications, as data misuse or breaches could otherwise derail an entire OSS venture's reputation.
- **Align Incentives Through Performance-Based Elements** – Wherever practical, integrate performance-based payment terms so that all parties profit when the project succeeds. This could mean an ESCO only receives full payment if guaranteed savings are achieved, or an aggregator shares a portion of market revenues with the site owner. These mechanisms align interests and encourage proactive performance. However, balance is key – combine fixed fees for baseline cost recovery with bonuses or shared savings to motivate excellence. The contract templates illustrate this by linking part of partner compensation to delivered outcomes (e.g. number of active sites, amount of flexibility delivered). Such alignment also makes it easier to attract financing, as lenders see that the contract self-corrects for underperformance (reducing their risk).
- **Plan for Continuity and Succession** – Given that integrated services involve multiple players, the contract should spell out what happens if one party can no longer fulfil its role (due to business failure, takeover, etc.). **Assignment and step-in clauses** are crucial. For instance, if an OSS's technology partner goes out of business, the master agreement might allow the lead provider to bring in an alternative supplier, and the customer contract would permit this substitution under defined conditions. Similarly, avoid clauses that *lock-in* customers irreversibly; instead, allow that if the main provider exits, customers can either continue with a new provider or amicably terminate. The interviews underscored the "cascade effect" risk – one contract failure can upset the whole chain – so legal arrangements must provide **safety nets to maintain service continuity**.

This not only protects consumers but also gives confidence to each partner that their efforts won't be wasted if another partner falters.

In conclusion, **effective contractual arrangements are the backbone of next-generation energy services**. The BungEES findings demonstrate that by thoughtfully designing contracts to be comprehensive yet user-friendly, flexible yet secure, and by aligning them with both market realities and consumer expectations, industry players can unlock new business models in energy efficiency and demand flexibility. For commercial stakeholders – from ESPCs and aggregators to tech suppliers and installers – adopting these best practices in contracts will support strategic decision-making, reduce project risks, and ultimately accelerate the commercial uptake of integrated energy services across the European Union. The pathway to Europe's climate and energy goals does not lie in technology alone, but in **getting the rules of engagement right** – and that is exactly what effective contracts can achieve.

CONTENTS

Notations, abbreviations, and acronyms

API	Application Program Interface
BESP	Bundled Energy Service Provider
CEE	Council Of European Energy
DR	Demand Response
DSR	Demand Side Response
EED	Energy Efficiency Directive
EES	Energy Efficiency Service
eIDAS	Single Euro Payments Area
EPBD	Energy Performance Directive
EV	Electric Vehicle
ESCO	Energy Service Company
HoT	Head Of Terms
KPI	Key Performance Indicator
M&V	Measurement And Verification
OSS	One-Stop Shop
PV	Photovoltaic Energy
SEPA	Single Euro Payments Area
SLA	Service Level Agreement

1. Regulatory Context for Smart Energy Efficiency Services Market Uptake

The policy engine: climate neutrality, the Clean Energy Package and Fit-for-55

The European Climate Law establishes a legally binding objective for the EU to achieve climate neutrality by 2050 and codifies the intermediate trajectory for reducing greenhouse-gas (GHG) emissions[1]. To operationalise this goal for the 2030 horizon, the European Commission and co-legislators adopted the "Fit-for-55" legislative package, which revises energy, climate, transport and taxation rules so that net GHG emissions fall by at least 55% by 2030 relative to 1990 levels[2]. These reforms update, among others, the EU Emissions Trading System, effort-sharing rules, renewables and energy efficiency targets, and standards for buildings and vehicles.

The earlier Clean Energy for All Europeans package overhauled electricity market design and consumer rules, giving legal effect to "active customers," aggregators and citizen energy communities while reinforcing smart metering, billing transparency and data access[3] [4]. In particular, the Electricity Directive (EU) 2019/944 mandates that Member States enable dynamic electricity price contracts, protect switching rights, and remove barriers to third-party aggregation[4]. These provisions create the commercial and legal gateway for Smart Energy Efficiency Service (Smart EES) providers to monetise value from flexibility, demand response, and time-of-use optimisation at retail level.

Together, these packages set the expectation that **retail markets should reward flexible consumption**, that customers should access their data and act upon it, and that digital technologies will complement efficiency retrofits by ensuring systems operate as designed. As a result, the policy engine now steadily pushes energy services away from static, capex-only interventions and toward continuous, performance-centred services that deliver verifiable and market-aligned outcomes.

Translating ambition into demand: the revised EED and EPBD

The recast Energy Efficiency Directive (EU) 2023/1791 strengthens the "energy efficiency first" principle and raises the Union's energy-efficiency ambition for 2030[5]. It requires Member States to deliver additional end-use savings and to embed efficiency considerations across planning and investment decisions. The recast framework sets a collective target corresponding to an additional 11.7% reduction in energy consumption by 2030 relative to 2020 projections, supported by annual savings obligations on energy suppliers or distributors[10]. This architecture translates directly into demand for services that can uncover, deliver and verify end-use savings at scale – particularly those that combine analytics, building automation and control (BAC), behavioural engagement, and pay-for-performance mechanisms.

The recast Energy Performance of Buildings Directive (EU) 2024/1275 focuses the buildings sector on a trajectory toward zero-emission buildings by 2050 and requires all new buildings to be zero-emission from 2030[6]. It strengthens minimum energy performance requirements for new and renovated

[1] Regulation (EU) 2021/1119 — European Climate Law. Official Journal of the European Union. https://eur-lex.europa.eu/eli/reg/2021/1119/oj/eng
[2] 2030 climate targets and 'Fit for 55' overview. European Commission – Climate Action. https://climate.ec.europa.eu/eu-action/climate-strategies-targets/2030-climate-targets_en
[3] Clean energy for all Europeans package. European Commission – Energy. https://energy.ec.europa.eu/topics/energy-strategy/clean-energy-all-europeans-package_en
[4] Directive (EU) 2019/944 on common rules for the internal market for electricity. EUR-Lex. https://eur-lex.europa.eu/eli/dir/2019/944/oj/eng
[5] Directive (EU) 2023/1791 on energy efficiency (recast). EUR-Lex. https://eur-lex.europa.eu/eli/dir/2023/1791/oj/eng
[6] Directive (EU) 2024/1275 on the energy performance of buildings (recast). EUR-Lex. https://eur-lex.europa.eu/eli/dir/2024/1275/oj/eng

buildings, supports renovation passports and building logbooks, and expands the deployment of technical building systems (TBS), building automation and control, and e-mobility infrastructure. Such provisions create a **persistent market for services** that design, commission, monitor and optimise systems – air-conditioning and **heat pumps**, ventilation, lighting, **on-site generation, storage and EV charging** – so that buildings achieve verified performance in real operation.

By pivoting regulation from theoretical performance on paper to measured outcomes in use, the EED and EPBD jointly accelerate the shift from one-off installation projects to long-term, digital and results-oriented service contracts. This creates a **natural role for Smart EES providers that can integrate metering, controls, analytics and procurement of flexibility into coherent, bankable offers**.

Digitalisation and data access: the substrate for service innovation

In parallel to sector-specific rules, the EU has adopted a horizontal framework to unlock data-driven innovation. The Data Act (EU) 2023/2854 establishes harmonised rules for fair access to and use of data generated by connected products and related services[8]. For energy, this can materially improve access to data from smart thermostats, building automation, electric vehicle chargers and other IoT devices—subject to privacy, security and trade-secret safeguards—thereby enabling new services for optimisation, M&V and aggregation.

The Commission's Action Plan on Digitalising the Energy System (COM(2022) 552) sets out a programme of 24 actions to enhance interoperability, cybersecurity, and the creation of a common European energy data space[7] [12]. The plan seeks to ensure that smart metering, distributed resources and demand-side resources can be integrated efficiently, that energy data can be safely shared with authorised parties, and that new retail products (including dynamic tariffs) can function at scale[12].

These digital enablers are essential for SEES. Providers depend on timely, granular data to diagnose inefficiencies, train control strategies, bid flexibility into markets and attribute savings accurately to their interventions. As more Member States roll out advanced metering and meter-data access frameworks under the Electricity Directive[4], and as data sharing arrangements mature under the Data Act[8], the **transaction costs of starting and scaling services decline markedly**.

Demand-side flexibility and market signals

Smart EES do not only reduce consumption; they also shift when consumption occurs, responding to price and system conditions. European regulators increasingly recognise **demand-side flexibility (DSF) as a necessary resource for integrating high shares of variable renewables** and for lowering overall system costs. The Agency for the Cooperation of Energy Regulators (ACER) has called for "no-regret" actions to remove barriers to demand response, including stronger price signals through dynamic pricing and simplified market entry for aggregators[10]. In their market monitoring work, ACER and the Council of European Energy Regulators (CEER) likewise underline that active consumer participation depends on smart meters, accessible data, and retail offers that expose consumers to time-varying prices in a fair and comprehensible way[11].

The regulatory right to offer and to contract for aggregation services is now embedded in EU electricity market legislation[4], opening the door for SEES providers to monetise flexibility at multiple levels: retail bill optimisation, wholesale arbitrage through aggregators, balancing and capacity services (where allowed), and local flexibility procurement by distribution system operators. As these opportunities expand, **service propositions increasingly blend efficiency with flexibility ("flex-efficiency")**, delivering both avoided consumption and avoided system costs.

[7] Communication COM(2022) 552 — Action Plan on Digitalising the Energy System. EUR-Lex. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52022DC0552
[8] Regulation (EU) 2023/2854 — Data Act. EUR-Lex. https://eur-lex.europa.eu/eli/reg/2023/2854/oj/eng

Market size, customer segments and drivers of adoption

Buildings remain the dominant arena for Smart EES growth. The sector accounts for a substantial share of final energy use and associated emissions across the EU and therefore offers a large and relatively low-cost abatement opportunity[6] [9]. Within buildings, three waves of demand are notable:

- Non-residential portfolios (offices, retail, logistics, healthcare, education) face immediate pressure to manage energy costs, comply with corporate carbon targets, and meet strengthening minimum performance standards. They value integrated services that combine analytics, remote operations, fault detection and diagnostics (FDD), and continuous commissioning to ensure compliance and to preserve asset value throughout the life cycle;
- Municipal and public-sector buildings are subject to the EED's public-sector exemplarity provisions and often procure long-term performance contracts. Here, Smart EES can be layered on top of energy performance contracts (EPCs) to provide transparent M&V and adaptive optimisation of lighting, HVAC and district energy connections[5];
- **Residential and mixed-use sites**, propelled by the EPBD's requirements for zero-emission buildings and e-mobility readiness[6], **increasingly adopt smart thermostats, heat pumps, PV-battery systems and EV charging**. They are to become mandatory for new public buildings from 1 January 2028 and for private buildings from 1 January 2030. Renovation of existing buildings shall lead to zero emission building standard from 1 January 2030. By then, this should lead to nearly zero-energy buildings, which necessarily require the use of local renewable energy sources, which are enhanced by their integration with demand response, energy storage, and electric vehicle charging. Aggregators and suppliers can bundle these assets into simple, consumer-friendly offerings—dynamic tariffs plus automation—to share the benefits of flexibility while safeguarding consumer protection and data rights under sectoral and horizontal rules[4] [8].

Across all segments, Smart EES adoption is catalysed by four reinforcing mechanisms: (i) binding EU and national targets that translate into budgets and mandates, (ii) high energy-price volatility that rewards flexibility, (iii) digital infrastructure (smart meters, IoT, data spaces) that reduces transaction costs, and (iv) credible M&V that increases investor and customer confidence.

Business and revenue models

As policy and technology converge, business models for Smart EES have diversified:

- Software-as-a-Service (SaaS) analytics and M&V: recurring subscriptions for portfolio-level analytics, energy benchmarking, anomaly detection and automated reporting. Revenue derives from license fees, with optional success fees tied to verified savings.
- Managed optimisation ("operations-as-a-service"): providers run building management systems (BMS) and distributed energy resources (DERs) remotely, implementing control strategies to minimise costs, emissions and discomfort incidents. Contracts typically blend fixed fees with performance-based components measured against normalised baselines.
- Flexibility-as-a-service / aggregation: Smart EES aggregate controllable loads (HVAC, EV charging, thermal storage) into virtual power plants. Revenues combine retail bill savings, explicit demand response payments, and, where permitted, wholesale or balancing market revenues via licensed market participants[4] [10] [11].

[9] Greenhouse gas emissions from energy use in buildings in Europe. European Environment Agency. https://www.eea.europa.eu/en/analysis/indicators/greenhouse-gas-emissions-from-energy

[10] Unlocking flexibility: ACER's 12 no-regret actions to remove barriers to demand response. ACER – Agency for the Cooperation of Energy Regulators. https://www.acer.europa.eu/news/unlocking-flexibility-acers-12-no-regret-actions-remove-barriers-demand-response

[11] ACER-CEER Market Monitoring Report — Energy Retail and Consumer Protection (latest edition). ACER / CEER. https://www.acer.europa.eu/sites/default/files/documents/Publications/ACER-CEER_2024_MMR_Retail.pdf

- Energy-as-a-Service (EaaS) for electrification and retrofits: providers finance, install and operate heat pumps, on-site PV and storage, and digital controls while guaranteeing outcomes (comfort, uptime, carbon). Repayments are structured as service fees or pay-per-use tariffs, de-risked by robust data and M&V records[5 6 8].
- Public-sector performance contracts: EPCs and energy performance partnerships that embed digital monitoring and verification can qualify savings toward national EED obligations while unlocking capital at municipal level[5].

These models all depend on trusted access to metering and device data[7 8 12], credible baselining and measurement, and the legal ability to transact flexibility and share value fairly among participants[4 10 11].

Barriers and risk factors

Despite strong tailwinds, several barriers can slow the uptake of Smart EES:

- **Transposition of the EU rules**: EU legislation is applied unevenly and inconsistently across Member States. Its implementation is fragmented, and some fundamental elements of the new electricity market design are often delayed, for example due to resistance from incumbents. Many barriers are artificial and have no basis in the reasons given. In this case, the details of the rules matter more than usual. Most of these newly created barriers are in clear breach of EU law;
- **Data access and interoperability**: inconsistent metering architectures, vendor lock-in within building automation, and fragmented data-sharing arrangements increase integration costs. The Data Act[8] and the Action Plan on Digitalising the Energy System[7 12] aim to mitigate these barriers by standardising fair-access rules and promoting interoperable interfaces;
- **Consumer protection and trust**: dynamic pricing and automated control strategies must be transparent, controllable by users, and accompanied by clear safeguards for vulnerable consumers[4 11]. Poor practice by any provider can undermine wider adoption;
- **Measurement and verification quality**: weak baselines or poorly controlled pilots diminish the credibility of savings claims. Widely accepted M&V methods and continuous monitoring are necessary to support financeable, pay-for-performance contracts under the EED[5];
- **Skills and procurement**: public and corporate buyers need the skills to specify outcomes (not just equipment) and to evaluate digital service proposals. Framework contracts that integrate performance metrics, cybersecurity requirements and data-sharing clauses can streamline adoption.

Outlook to 2030: from pilots to mainstream

By 2030, national transposition of the EED[5] and EPBD[6] should be fully in force, dynamic pricing and aggregator access will be more widely available under the Electricity Directive[4], and the first wave of Data Act obligations will have normalised device-level data access[8]. Against this backdrop, the building stock's digital layer is expected to thicken – smart meters and sub-metering, cloud-connected controls, EV charging, distributed generation and storage – creating the conditions for continuous optimisation and for the monetisation of flexibility at scale.

Public authorities and large portfolio owners are likely to act as anchor customers, procuring outcome-based services that blend energy savings, emissions reduction and flexibility revenues. Municipal programmes can bundle Smart EES with social objectives (healthy indoor environments, energy-poverty alleviation) consistent with the EED and EPBD, while corporate buyers pursue cost, comfort and decarbonisation outcomes. As the European Environment Agency continues to track

[12] Key actions for digitalising energy — implementation tracker. European Commission – Energy. https://energy.ec.europa.eu/topics/eus-energy-system/digitalisation-energy-system/key-actions-digitalising-energy_en

building-related emissions[9], credible Smart EES will serve as one of the most scalable, cost-effective and verifiable contributors to Europe's climate objectives.

In sum, the EU's policy architecture now aligns ambition (European Climate Law[1]) with delivery mechanisms (Clean Energy Package and Fit-for-55[2] [3]), practical end-use obligations (EED[5]) and sector-specific standards (EPBD[6]), underpinned by digital enablers (Action Plan and Data Act[7] [8] [12]). This alignment is **turning smart energy efficiency services from a niche solution into a mainstream instrument for delivering measurable, financeable and system-friendly decarbonisation**.

2. BungEES One-Stop-Shop Business and Revenue Model

2.1 Why One-Stop-Shop approach?

As highlighted by the BungEES project, **buildings** are to become an **important energy infrastructure**. This is happening against the backdrop of a rapidly evolving energy landscape. Under the EU energy acquis, buildings are expected to produce electricity from renewable sources, store electricity from these sources and from the grid, feed it back into the grid, support electric mobility (EV charging), and provide flexibility for energy systems. BungEES One-Stop-Shop (BOSS) Business and Revenue Model (BM) describes a systemic shift driven by distributed energy resources (DER) proliferation (PV, heat pumps, batteries, EV charging) and **IoT enabled control**, which transform buildings into flexible resources. Smart metering, forecasting and optimisation (e.g., DERMS) are prerequisites, **with data protection and cybersecurity** highlighted as critical adoption risks.

The transition **from passive consumption to coordinated demand** brings another level of complexity for new and renovated buildings, which should meet the zero-emission building (ZEB) standard from 1 January 2028 (new public buildings) or 1 January 2030 (new private and renovated existing buildings). Such changes on the demand side require systemic changes on the supply side. **Fragmentation among suppliers** and a lack of cooperation on the supply side can prevent the full deployment of smart energy systems. This would harm consumers and **undermine the credibility of the political goals** of the clean energy transition. Although the drive to deploy distributed renewable energy sources is strong, companies are constantly grappling with inefficiency and low yields, for example from PV systems, which alone cannot effectively exploit the potential of renewable energy sources and deliver the expected return on investment.

It is unfeasible to force households, small businesses, and public agencies to navigate a maze of auditors, installers, financiers, and regulators. OSS bundles these steps into a single, accountable customer journey. This integration reduces transaction costs and uncertainty—two of the most persistent barriers to energy upgrades—and turns complex, multi stakeholder projects into manageable decisions[13] [14]. Therefore, one **stop shops (OSS) have emerged as a pivotal model** for accelerating the adoption of energy efficiency and distributed energy solutions.

At its core, the proposed **OSS** performs four functions that conventional, fragmented markets struggle to deliver consistently. First, OSS **coordinates technical scope**: from initial energy audits and building diagnostics to the design and installation of measures such as high efficiency HVAC, heat pumps, lighting, building controls, rooftop solar, and battery storage. Second, OSS **integrates financing**: packaging energy as service offerings, or incentives, rebates, on bill financing, so that customers can adopt capital intensive improvements with predictable cash flows. Third, OSS **manages risk** by offering performance assurances – ranging from workmanship warranties to energy performance guarantees backed by measurement and verification. Fourth, OSS **navigates compliance**: permitting, interconnection for distributed generation, safety codes, and program eligibility, which is particularly valuable where incentives are dynamic and rules are intricate[13] [15] [16].

This model is especially powerful **for residential customers and small and medium sized enterprises** (SMEs). These segments face high search and coordination costs, thin internal expertise, and acute sensitivity to hassle. The OSS reduces decision fatigue by providing a single proposal with a coherent

[13] European Commission Joint Research Centre (JRC). *One-stop shops for residential building energy renovation in the EU* (Science for Policy Report, 2021)
[14] European Commission. *Energy Efficiency Directive (revised): consumer empowerment, one-stop shops, and energy-poverty focus*
[15] U.S. Environmental Protection Agency. *Inclusive Utility Investments (Tariffed On-Bill Programs): Overview and resources*
[16] Efficiency Valuation Organization (EVO). *International Performance Measurement and Verification Protocol (IPMVP)*

bundle of measures optimized for the site rather than piecemeal upgrades that can conflict or underperform. For example, sizing a heat pump correctly depends on envelope improvements; scheduling both within one project avoids oversizing and lowers lifecycle costs. In practice, the OSS becomes a trusted advisor that translates incentives and engineering into plain language value: comfort, lower bills, resilience, and healthier indoor air.

In under resourced segments such as affordable multifamily housing, a "single point of contact" is often the make-or-break feature. Equity minded OSS models centralize outreach, eligibility screening, scope development, contractor management, and consumer protections—raising participation and savings where energy burdens are highest[17] [18].

For **commercial portfolios and municipalities**, the OSS adds value through **standardization and scale**. By developing repeatable project templates – specifications, procurement packages, and financing structures – the OSS can roll out upgrades across dozens or hundreds of facilities with consistent quality. Aggregation also improves economics: bulk procurement lowers equipment costs; portfolio level performance guarantees spread risk; and centralized measurement and verification simplifies reporting for lenders and public funders. Where public policy aims to deploy large volumes of capital quickly (for example, through building retrofit programs), the OSS functions as delivery channels that convert budget into outcomes with transparent metrics. Applying recognized protocols (e.g., IPMVP) and M&V guidance for performance contracts aligns delivery with capital market expectations and public sector procurement, enabling dozens or hundreds of similar projects to proceed with predictable quality[16].

Digitalization amplifies these roles. Modern OSS platforms increasingly use remote audits, interval meter data, and building information models to pre-qualify sites, generate scenarios, and shorten sales cycles. Automated incentive lookups and document workflows compress weeks of paperwork into minutes. Post installation connected devices and building management systems provide continuous commissioning and demand flexibility services. This creates a pathway from static energy savings to dynamic grid value: the OSS can enrol fleets of buildings in demand response or virtual power plants, stacking revenues that make deeper retrofits financially viable.

Despite clear benefits, **the OSS model faces challenges**. Vendor neutrality must be preserved so that technology choices are tailored to the customer rather than to manufacturer relationships. Data interoperability and open standards are essential to avoid lock in and to enable third party verification. Consumer protection – transparent pricing, clear guarantee terms, and privacy safeguards – builds the trust that OSS offerings depend on. Finally, equitable access requires deliberate design: multilingual outreach, low friction financing for credit constrained customers, and community partnerships to serve renters and low-income households who often bear the highest energy burdens yet have the least agency[14] [18].

Looking ahead, the OSS is likely to evolve from project developers into **long term service partners**. Energy performance will be monitored and optimized continuously, upgrades will be sequenced over multiyear "roadmaps," and financing will resemble subscriptions more than loans. As distributed energy resources proliferate and grids decarbonize, **the OSS becomes a market maker** – aligning customer comfort, building value, and system level needs. In short, by collapsing complexity and aligning incentives, one stop shops transform the energy service sector from a collection of

[17] ACEEE. *Closing the Gap in Energy Efficiency Programs for Affordable Multifamily Housing* (Research Report U1903, 2019)
[18] Energy Efficiency for All (EEFA). *One-Stop Shop Fact Sheet for the Multifamily Sector*

transactions into a coherent service experience, accelerating the scale and depth of the transition to efficient, low carbon buildings[19] [20].

2.2 BungEES OSS Business Model: From Smart Energy Efficiency to Market Ready, Customer Centric Services

The European energy system is under simultaneous pressures to decarbonize, digitalize, and decentralize. Customers are installing distributed energy resources (DERs) – from heat pumps and rooftop PV to EV chargers – while grid operators need flexible demand to integrate more renewables, shave peaks, and avoid costly reinforcements. BungEES responds with a practical, market ready business model that transforms these disjointed trends into coherent services households can adopt today. Its model weaves together **Smart Energy Efficiency Services** (EES), flexibility, and **non-energy benefits** (NEBs), and then monetizes them through a portfolio of revenue streams and country specific pathways. The result is a service platform where value accrues to end users (lower bills, comfort, convenience), to the system (flexibility, stability), and to providers (recurring revenue, data driven growth).

BungEES project sets out an integrated model for Smart EES, advancing earlier BungEES work by turning a prototype into a detailed, market ready service architecture. It clarifies scope and objectives, maps how project outputs connect, and stresses that the service package must address user preferences, value propositions, enabling infrastructure, actors and interactions across the energy system.

Key elements of the model

BungEES structures its go to market using the **Business Model Canvas** (BMC) and a companion **Service Model Canvas**. These are not just templates; they are living scaffolds that map customer segments, value propositions, channels, relationships, key activities, key resources, partners, costs, and revenues – the nine "boxes" required to align a cross-border energy service with heterogeneous national rules and habits. The Service Model Canvas extends this thinking with pragmatic dimensions such as usage, ROI, KPIs, and operational challenges – things that must work on day one for households. Within this structure, BungEES prioritizes **bundled offerings** and **servitisation**: customers can start small (e.g., control of an existing heat pump) and grow into richer packages (PV + battery + EV + optimization). Meanwhile, the **aggregator role** – a central actor in the model – translates customer side flexibility into tradable value for DSOs/TSOs and wholesale markets.

Value proposition: Customer value, clearly stated

The BungEES value proposition sits at the intersection of **savings**, **comfort & convenience**, **sustainability**, and **participation in energy markets**:

- **Savings**: efficiency and automation reduce baseline consumption; tariffs and demand response cut costs further by shifting loads.
- **Comfort & convenience**: smart thermostats, occupancy-aware control, and integrated apps coordinate HVAC, PV, and EV scheduling without micro-management.
- **Sustainability**: lower CO_2 via reduced demand and better self-consumption of local generation.
- **Market participation**: households provide flexibility – brief, imperceptible load reductions or shifts – paid through aggregators and capacity mechanisms.

[19] Lawrence Berkeley National Laboratory. *The Status and Promise of Advanced M&V: An Overview of "M&V 2.0"*
[20] International Renewable Energy Agency (IRENA). *Energy-as-a-Service: Innovation Landscape Brief* (2020).

These benefits are not theoretical. Already early pilots (Spain, Czechia, Portugal) have demonstrated that **short, automated curtailments (≈10 – 15 minutes)** could deliver flexibility **with negligible comfort loss**. Preliminary Spanish pilot data have indicated **~15% energy savings** across participating.

The offer: Modular packages that scale with the home

Packages are **simple to understand**, **modular**, and **stackable**, aligning with real-world retrofit paths:

- **Basic Heat Pump / Basic Solar / Basic e-Mobility**: install-and-control or control-only variants; maintenance and energy supply can be included.
- **Control Package**: orchestration for existing devices (heat pump, PV, EV charger) to optimize schedules and respond to grid signals.
- **Premium**: full-stack bundle – Installation and control of heat pump, PV, and EV charging, plus maintenance and energy.

This packaging strategy supports **progressive engagement**: a household can start with a single controlled device and later add solar, battery, and EV charging. Or they begin with PV and later add a heat pump. The model keeps friction low by allowing **control-only** for customers who already own "smart-ready" devices, while offering **install-and-operate** for those who prefer turnkey solutions.

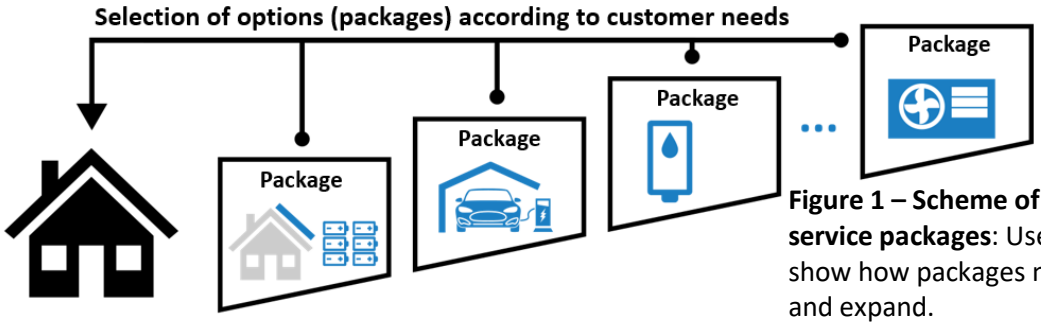
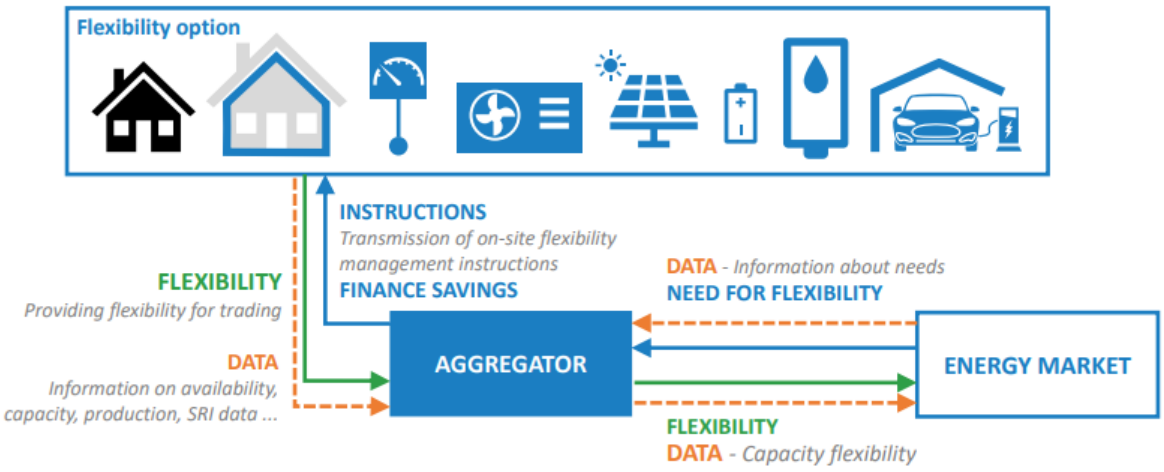


Figure 1 – Scheme of EES service packages: Use to show how packages nest and expand.

How it works: The aggregator as market translator

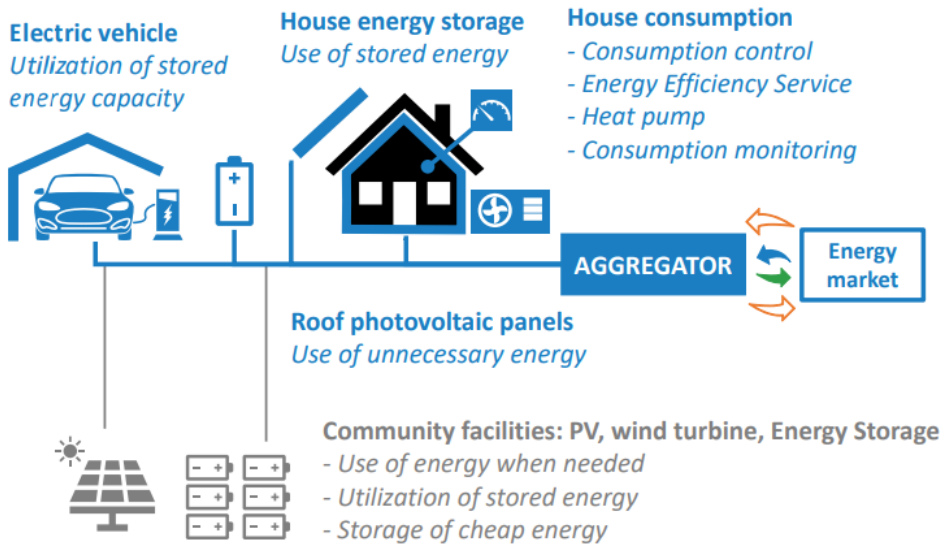
At the heart of the BungEES model is a **software-enabled aggregator** that communicates with end-users, DSOs/TSOs, and markets. The aggregator ingests **real-time device telemetry**, **household preferences**, **market price signals**, and **grid requests**, then dispatches micro-actions: defer a heat pump cycle, slightly pre-heat water, or shift EV charging by 30 minutes. That orchestration is where small actions across many homes add up to **valuable flexibility**.

Figure 2 – Diagram of Communication in Smart EES Model Prototype



BungEES also embraces **platformisation**—a maturing European trend where utilities and service providers run cloud platforms for energy optimization, VPPs, and trading. The model is consistent with this evolution while keeping the household experience single-pane and simple.

Figure 3 – Diagram of Smart EES Model Prototype



Key activities and resources: what must be true operationally

Key Activities include customer acquisition, audits, installation, device integration, data collection, analytics, dispatch, M&V of savings/flexibility, and customer support. **Key Resources** range from vetted device kits (gateways, smart switches, meters, sensors) to IoT connectivity (often cellular to avoid home Wi-Fi dependencies), a secure data platform, and certified technicians. Two recurring technical lessons from pilots:

1. **Electrical topology matters.** Devices targeted for control/measurement (e.g., a heat pump) should sit on **a dedicated breaker**; where two appliances share a breaker, readings get polluted and control becomes unreliable.
2. **Accessibility matters.** In some dwellings, indoor units are embedded (roofs/walls) or switchboards are full; small civil works or panel expansions may be required. These constraints must be reflected in cost and scheduling.

Costs and risks: making the unit economics work

Fixed costs: organization (people, offices, certification), software (development/licensing), toolkits for field teams. **Variable costs**: site surveys, installation time/materials, cellular data, maintenance truck rolls, and customer support. By bundling services and growing the installed base, the model drives down **customer acquisition cost** (CAC), increases **lifetime value** (LTV), and tilts the economics toward recurring margins (SaaS + O&M + market revenues). Risks that must be actively managed include **component price volatility** (e.g., semiconductors, metals), **interoperability**, **cybersecurity & privacy**, and **regulatory timing** (e.g., aggregator recognition, dynamic tariff rollout). The deliverable maps these risks and proposes mitigations such as standard protocols, clear consent journeys, and diversified supplier pools.

Revenue logic: multiple streams, tuned by country

BungEES deliberately avoids reliance on a single income source. Instead, it layers **complementary revenue streams**:

- **Direct service fees** (install, control-only, or turnkey) and **hardware margins**;
- **Ongoing O&M/monitoring fees**; **Software-as-a-Service** subscriptions for analytics/optimization dashboards;
- **Performance models**: Guaranteed Savings and Shared Savings (EPC-style) where customers repay from proven savings;
- **Flexibility monetization**: demand response/ancillary services, capacity payments, congestion management, and **peak optimization** to cut contracted capacity charges;
- **Public incentives** reduce customer capex and accelerate uptake (grants, tax credits), but BungEES treats them as accelerants – not the core business.

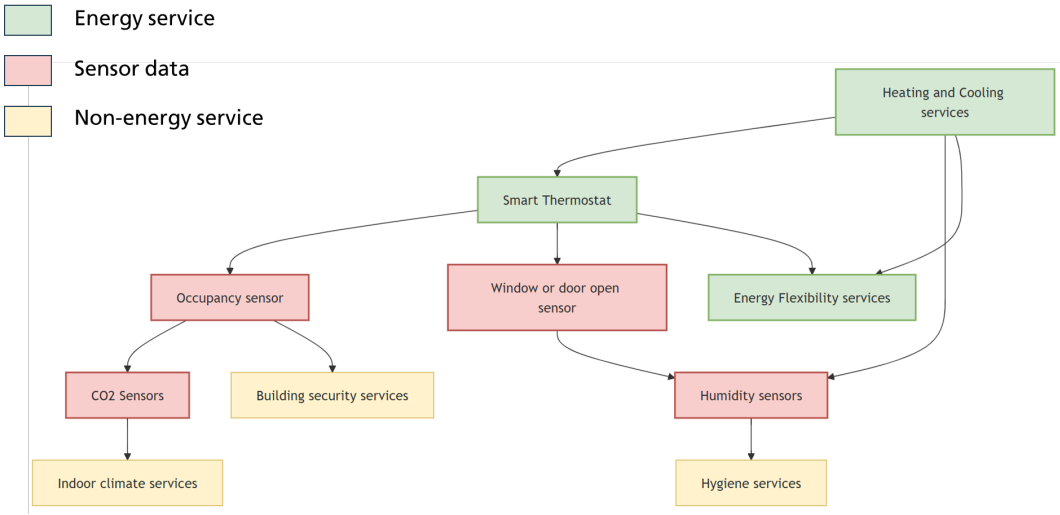
The deliverable details **national specifics** that shape monetization:

- **Czechia**: *Lex OZE/RES III* enables aggregation, storage, and dynamic tariffs; energy sharing is unfolding via the Energy Data Centre. Strong tradition of EPC supports performance contracting;
- **Slovakia**: programs like *Green for Households* and *Green Solidarity* subsidize heat pumps/PV; energy sharing via the OKTE Energy Data Centre exists but faces tariff and procedural complexities; communities need clearer tariff relief and meter roll-outs;
- **Germany**: dynamic tariffs and ancillary markets create robust flexibility revenue; smart-meter rollout underpins real-time pricing; EV/V2G and SaaS energy management are rising complements to traditional ESCO models;
- **France**: mature DR frameworks (e.g., NEBEF), strong heat-pump market, and capacity mechanisms; independent aggregation is established. EV infrastructure and storage pilots support deeper flexibility portfolios;
- **Spain**: aggregator regulation is expected to firm up; energy communities are recognized; PV growth is surging, creating fertile ground for **PV + storage + control** bundles that prepare homes for flexibility revenues as rules mature;
- **Portugal**: dozens of registered aggregators; collective self-consumption and energy communities have a defined (and evolving) tariff framework; low feed-in value nudges customers toward **maximize self-consumption** via batteries and smart scheduling – ideal for BungEES control services.

Non-energy benefits (NEBs): from "nice to have" to monetizable services

BungEES elevates NEBs from footnotes to **line-items**: indoor air quality and comfort, predictive maintenance, reduced downtime, safety (smoke/CO_2 detectors), and well-being. Some can be monetized directly (e.g., **appliance maintenance plans**), others bolster conversion and retention (customers are willing to pay a bit more for better comfort and fewer hassles). For certain segments, **payment protection** micro-policies can increase adoption by reducing perceived financial risk. Methodologically, the model recognizes ways to value NEBs – **willingness-to-pay**, **time value**, **maintenance cost avoidance**, and, where feasible, **health-related savings** – and uses them to enrich business cases without over-promising.

Figure 4 – Energy and non-energy service configuration: It neatly shows how NEBs pair with energy services (e.g., humidity monitoring + HVAC flexibility).



Evidence from the field: pilots and market insights

Spain (Plenitude – Voltalis – CONAIF): 24 prospects across Cantabria and Catalonia yielded **15 residential installs**. Installations followed a standard flow (site check, panel prep, gateway + smart switch + meter commissioning, IR device setup where needed). **Keys given to users** via the Voltalis platform; early operations showed **short curtailments (~10–15 minutes)** are feasible with minimal comfort impact; one case reported discomfort in December 2024 and was promptly reverted – illustrating a **customer-first failsafe**.

Portugal: strong presence of **air-to-air** heat pumps in cities and legacy appliances in rural areas; **Sensibo-type smart thermostats** allowed legacy units to be orchestrated, and pilots combined PV, batteries, and EV charging to maximize self-consumption. **Aggregator lists exist**, though actual market activity varies – reinforcing the need for clear role communication to end-users.

Czechia & Slovakia: homes often have modern "smart" heat pumps (as opposed to older units that are easiest to retrofit), and **switchboard space** can be constrained in older buildings. Pilot sites included **family homes, apartment buildings, and a hotel**; technical prerequisites included **>1 kW loads**, **three-wire installations**, and in some cases **new distribution boards**.

These lessons feed directly into the business model: **pre-installation checks** (breaker exclusivity, access), **country-specific device mixes**, and **clear customer expectations** about comfort safeguards.

Market size and momentum: heat pumps, PV, and smart-home penetration

BungEES leans into strong adoption curves for **heat pumps** (for example across FR, DE, ES) and **PV** (notably Spain's record growth). These trends enlarge the controllable asset base and make the case for orchestration compelling. Where PV feed-in values are low (e.g., Portugal), **self-consumption + storage + smart control** wins economically – providing a natural entry point for BungEES services. The following figures illustrate the market trends in these countries.

BungEES supports two complementary contracting modes:

- **As-a-Service** (monthly fee): easiest for customers; ideal for control-only or turnkey packages; opens room for **embedded financing** of devices.

- **Sale + optional service**: one-off device purchase with optional monitoring/maintenance; good for DIY-prone or subsidy-driven buyers.

Where appropriate, **EPC-style guarantees** or **shared-savings** can be offered, especially in multi-apartment or public buildings, leveraging a European track record of EPC projects (e.g., Czechia). Contract design always preserves **customer comfort overrides** and **explicit consent** for automated controls.

The model presumes **10-minute (or finer)** data granularity for optimization, safeguarded with encrypted transport/storage, strong authentication, and transparent user controls. BungEES recommends **data-minimization by purpose**, role-based access, and clear **value explanations** (e.g., "sharing this data enables X% savings or €Y flexibility earnings"), converting privacy from a barrier to a dialogue about value.

BungEES OSS Business Model offers a **pragmatic blueprint for scaling Smart EES**: a modular product system anchored in an aggregator-centric data architecture, validated by pilots and strengthened by NEB monetisation and servitised business models. If providers pair these design choices with straightforward customer outreach and proactive regulatory/infrastructure alignment, the sector can unlock household-level savings and resilience benefits while assembling the distributed flexibility Europe's power system now requires.

In the described market context, **Smart EES emerge as the connective tissue** between buildings-sector decarbonisation and system-level flexibility. The **2050 climate-neutrality goal** sets the direction; the **CEP and Fit-for-55** establish roles, rights and economic signals; and the **revised EED and EPBD** convert ambition into **building-level obligations and smart-system requirements**. National implementations – from Czech energy sharing and aggregation rules to Slovakia's EDC data hub and Germany's dynamic tariffs – are turning these frameworks into workable markets. Where reforms are coherent and digital foundations are strong, **Smart EES uptake accelerates** through servitised, bundled, and platform-enabled services; where fragmentation or execution gaps persist, **uptake slows** despite favourable policy intent. The path to scale is therefore less about inventing new technologies than about **finishing the policy-to-practice bridge** – standardised data access, fair local fee structures, consumer protection, and a capable workforce – so that Smart EES can deliver the **savings, comfort, and flexibility** Europe now requires.

3. Non-Technical Barriers to Energy Service Contracts in Europe

Energy service contracts – such as Energy Performance Contracts (EnPCs), demand response agreements via aggregators, and prosumer arrangements (e.g. on-site renewable generation through energy communities or cooperatives) – are key instruments in Europe's clean energy transition. These contractual models promise improved energy efficiency, flexibility, and citizen participation. However, their uptake has been hampered by numerous **non-technical barriers**. This review provides a high-level overview of these barriers, focusing on the European Union (EU) context (with examples from Czechia, France, Germany, Italy, Portugal, Spain, and Slovakia) and categorizing the barriers using relevant theoretical frameworks. It draws on both peer-reviewed studies and grey literature to discuss how behavioural, legal, accounting, and procedural factors impede the effective provision of energy services. Despite recent policy developments in the EU, many of these barriers persist and must be understood to design better support frameworks.

3.1 Overview of Energy Service Contractual Arrangements

Energy Performance Contracting (EnPC) – also known as Energy Service Performance Contracts – involves an Energy Service Company (ESCO[21]) implementing efficiency improvements for a client (often a public authority or building owner) with performance guarantees. The ESCO's remuneration is tied to the achieved energy savings[22]. EnPCs have been promoted across Europe (e.g. via the Energy Efficiency Directive) to retrofit public buildings and infrastructure. **Demand Response (DR) Aggregation** is a flexibility service whereby an aggregator contracts with multiple consumers (or small generators) to adjust their load in response to grid needs or price signals. The aggregator bundles these resources to participate in energy markets or balancing services on behalf of the consumers. **Prosumer and Energy Community Contracts** refer to arrangements enabling consumers to produce, store, or share energy (for example, a cooperative owning solar panels and battery storage, or a "citizen energy community" as defined in EU legislation). These collective schemes allow multiple participants to invest in and benefit from local renewable energy or demand-side projects. Each of these models has demonstrated technical viability, yet in practice they face significant non-technical hurdles.

Before delving into categories of barriers, it is important to note the heterogeneity of national contexts. Some EU Member States have mature markets for energy services (Germany, France, Italy), while others are in earlier stages (e.g. Slovakia, Czechia, Portugal)[22]. Nonetheless, research and surveys indicate a common set of **recurring barriers** across countries[22] [23]. Broadly, these barriers can be grouped into **behavioural (consumer-related)** barriers and **institutional (legal, financial, and procedural)** barriers, in line with frameworks from behavioural science, economics, accounting, and

[21] European Commission defines more than one kind energy service companies (https://e3p.jrc.ec.europa.eu/node/190). ***An ESCO*** is a company that offers energy services which may include implementing energy-efficiency projects using energy performance contracting (EnPC) and in many cases on a turn-key basis. Another category of companies that offer energy services to final energy users, including the supply and installation of energy-efficient equipment, the supply of energy, and/or building refurbishment, maintenance and operation, facility management, and the supply of energy (including heat), are ***Energy Service Provider Companies (ESPCs)***. They may be consultants specialised in efficiency improvements, equipment manufacturers or utilities. As **BungEES goes beyond this narrowly defined type of service** companies, we use throughout the project the term **ESPCs** and the term ESCO is only used if we refer specifically to a service company using EnPC in the meaning of the above-mentioned definition of the European Commission.

[22] Moles-Grueso, S., Bertoldi, P., Boza-Kiss, B. Energy Performance Contracting in the Public Sector of the EU – 2020, EUR 30614 EN, Publications Office of the European Union, Luxembourg, 2021, ISBN 978-92-76-30877-5, doi:10.2760/171970, JRC123985.

[23] Council of European Energy Regulators (CEER), Consumers and Retail Markets Working Group & Distribution Systems Working Group, Report on Regulatory and Consumer Considerations for Decentralised Energy Opportunities, 25 March 2025

law. Below, we review each category and illustrate how it constrains EnPCs, demand response, and prosumer/community initiatives.

3.2 Behavioural and Consumer-Related Barriers

One major class of non-technical obstacles is rooted in human factors – the decisions and behaviours of consumers (or other stakeholders) that diverge from purely rational economic models. Behavioural science frameworks help explain why even cost-effective or technically available energy services may be underutilized. Key **behavioural barriers** include lack of awareness or information, low trust, risk aversion, and decision-making biases on the part of consumers or clients.

Lack of Awareness and Understanding

Many potential beneficiaries simply are not aware of innovative energy service models or do not fully understand their benefits. For example, public authorities or building managers may have **"conceptual confusion"** about EnPCs, not realizing how guaranteed savings and third-party financing can advantageously meet energy targets[22]. Similarly, surveys show that public awareness of energy communities is low; a 2025 study across six EU countries found that most citizens were unfamiliar with the concept of Clean Energy Communities (CECs)[24]. This knowledge gap means consumers don't seek out or agree to these contracts, stalling market growth.

Trust and Perceived Risk

Engaging in a long-term performance contract or a demand response program often requires trust in the service provider and confidence in the outcomes. A **"mistrust and lack of understanding"** of the ESCO model has been identified as a common factor explaining the slow or halted development of EnPC markets in some countries[22]. Clients may worry that promised savings will not materialize or that ESCOs will not deliver quality work, reflecting a credibility gap. In the residential demand response context, **trust in the aggregator** is crucial – consumers are hesitant to cede control of appliances or share consumption data unless they trust that the service is secure and beneficial[25]. Indeed, regulators report that **lack of consumer trust** is a top barrier to new models like energy sharing and community self-consumption[23]. Building trust through quality assurance and transparent communication is thus essential. For instance, the European Commission's Joint Research Centre recommends efforts in **measurement and verification (M&V), best-practice demonstrations, and one-stop advisory shops** to normalize performance-based contracts and address information barriers at the Member State level[22].

Behavioural Inertia and Preferences

Even when aware of an opportunity, consumers may exhibit **status quo bias or inertia**, preferring not to change their routines or take on new complexities. A recent Dutch report on demand response found that many residential users "simply won't take any decision" regarding participation **even when the benefits are obvious**, due to inertia or hassle factors[25]. Households and small businesses often stick to familiar flat-rate energy tariffs and appliances rather than enrol in dynamic demand response schemes that might save money but add complexity. Furthermore, consumer **values and preferences** play a role: some people attach high value to comfort, autonomy, or privacy and thus resist interventions that might, for example, remotely adjust their heating or reveal detailed usage data[25]. If an automated demand response program is perceived as infringing on comfort or control, many will

[24] Kamin, T.; Golob, U.; Kogovšek, T. Barriers to the Diffusion of Clean Energy Communities: Comparing Early Adopters and the General Public. Energies 2025, 18, 2248. https://doi.org/10.3390/en18092248
[25] Bo de Wildt, Ross Quirke, Jos Sijm, TNO 2022 P10368: Barriers to demand response, 12 May 2022

opt out despite potential economic gains. Likewise, in energy communities or cooperative projects, only certain "early adopters" with strong environmental or community values may join initially, while others remain sceptical or uninterested. This creates a gap between enthusiasts and the broader public. Research indeed shows that **early adopters cite institutional complexities, whereas later adopters emphasize personal barriers like knowledge and finances**[24]. Tailored engagement strategies are needed to motivate the less-involved majority.

Information Presentation and Complexity

The way options are presented, and the complexity of participation can significantly affect consumer uptake (a finding aligned with behavioural economics insights on framing and choice architecture). For demand response programs, the format of information and user interface is critical. If dynamic price signals or control instructions are confusing, many users will disengage. As one analysis notes, poor design of the user interface or communication can itself **"be a barrier to DR"**, especially for behavioural (non-automated) response programs[25]. Simpler, user-friendly tools can mitigate this. Similarly, in the context of prosumer contracts, the administrative complexity of joining an energy community or arranging collective investments can overwhelm individuals. Consumers are more likely to participate when processes are simple and support is available to guide them, reducing the cognitive load of what might otherwise be a daunting decision.

In summary, the behavioural barriers centre on the human element: limited information, trust deficits, ingrained habits, and subjective valuations. These factors are well documented across Europe. For instance, a Council of European Energy Regulators (CEER) survey in 2023 confirmed that **lack of awareness, limited energy literacy, and low trust are the top-ranked barriers** hindering energy community development in EU countries[23]. Overcoming these obstacles requires strategies from behavioural science – e.g. using social proof via pilot projects (early adopters as role models), clear messaging on benefits, trust-building through certifications or guarantees, and reducing complexity in consumer engagement.

3.3 Legal and Regulatory Barriers

Another critical category of non-technical impediments arises from the **legal, regulatory, and institutional frameworks** governing energy services. These barriers can be understood through the lenses of law and institutional economics – they often involve misaligned regulations, bureaucratic hurdles, or the absence of enabling rules. In Europe's multi-level governance system, both EU-wide directives and national laws shape the feasibility of innovative energy contracts.

Fragmented or Unclear Legal Frameworks

A fundamental barrier is when the law simply does not clearly accommodate new business models. Until recently, many EU countries lacked a defined legal status for independent aggregators or for energy communities, creating uncertainty. *"There is no coordinated approach across Europe for the inclusion of independent aggregators into [electricity] markets"*, noted one working paper, highlighting that each Member State had its own rules (or none) for demand-side aggregation[26]. This patchwork made it hard for aggregator companies to scale services across borders and left consumers in some countries without access to demand response programs. The EU's 2019 Clean Energy Package sought to address this by requiring Member States to enable independent aggregators and to legally recognize **Citizen Energy Communities** and **Renewable Energy Communities**, but implementation has varied. Regulators report that **lack of a clear or uniform legal definition** for energy communities remains a top barrier in practice[23]. For example, countries like Czechia and Slovakia have only recently

[26] Rachel Bray and Bridget Woodman, Barriers to Independent Aggregators in Europe, EPG Working Paper: EPG1901, 9 January 2019

formulated explicit rules for energy communities in response to the EU directives, and this slow start delayed projects. Even where frameworks exist, secondary regulations (grid codes, licensing, consumer protection rules) may not yet be adapted to these novel entities[23]. The absence of a well-defined framework leads to legal uncertainty, deterring investment and participation.

Public Procurement and Contracting Rules

In the public sector (e.g. municipalities or state bodies trying to use EnPCs), standard procurement procedures can clash with the innovative, long-term nature of energy performance contracts. Public procurement law in the EU traditionally emphasizes open competition, clear evaluation criteria (often favouring lowest upfront price), and relatively short contract terms – whereas EnPCs involve performance-based payments over 5–15+ years and a focus on life-cycle cost savings. Several countries have encountered **"procurement incompatibilities"** when trying to tender EnPC projects[22]. For instance, if a city issues a tender for building retrofits with an energy performance guarantee, it may struggle to compare bids on more than just initial cost, or to justify a higher-cost bid that yields greater savings over time. Rigid rules can thus favour the status quo (simple works contracts) over performance contracts. Moreover, the administrative burden of these tenders is high. Small municipalities in Italy, for example, noted that even with technical assistance grants (like ELENA from the European Investment Bank), the **added complexity and paperwork of EnPCs** can be prohibitive[22]. This suggests a need for adapted procurement guidelines that allow innovative contracting (e.g. using quality-based or negotiated procedures, standard EnPC contract templates, etc.). Until procurement rules are made more flexible, public authorities in countries such as Portugal or Spain might shy away from energy performance contracts, opting instead for conventional procurement of equipment with no performance guarantee[22].

Market Design and Regulatory Restrictions

In energy markets, the existing design can impose barriers for new entrants and services. A prominent example is the issue of **supplier-aggregator relations** in demand response. Traditionally, only licensed electricity suppliers could trade in retail and wholesale markets. Independent aggregators who curtail a consumer's load create imbalances for the consumer's supplier (since the supplier had contracted energy that is now not consumed). Incumbent suppliers, understandably, lobbied for compensation for this lost volume. For years, EU countries had divergent approaches: some required aggregators to get the supplier's consent or to pay compensation, effectively giving incumbents a veto or extra revenue, whereas others (like France) developed administered compensation mechanisms[26]. This lack of a standard rule was identified as *"the key barrier to be overcome in setting a common framework for independent aggregators in Europe"*, as it created prolonged regulatory uncertainty[26]. The EU electricity market legislation now pushes for aggregators' access without prior consent of suppliers and leaves compensation methods to regulators, but many Member States (as of 2023) were still finalizing these rules. In practice, where onerous compensation or licensing requirements exist, aggregators face higher costs or legal tussles, slowing the rollout of DR services. Another market design barrier is the lack of **dynamic price signals** at the retail level in some countries. If regulated tariffs or retail price caps keep electricity prices flat or artificially low (as has been the case historically in parts of Central Europe, including Slovakia or Czechia), the economic value of demand response is muted. Consumers in such markets have little incentive to shift loads, and aggregators find limited opportunity for arbitrage or flexibility services. Regulatory moves to introduce time-of-use tariffs and capacity-based network fees are gradually addressing this, but progress is uneven.

Licensing, Standards, and Administrative Compliance

New energy service models may also bump up against various legal requirements originally designed for traditional market actors. For instance, an energy community that wants to supply electricity to its

members might have to obtain a supplier license, comply with consumer protection rules, and meet grid connection standards like a utility – a daunting task for a community cooperative. CEER notes that many energy community activities (supply, network operation, market participation) *"need specific licensing and pre-requisites that require energy system expertise,"* making it **far from simple for new community groups to comply**[23]. Administrative requirements (e.g. establishing a legal entity, filing regulatory reports) can weigh heavily on volunteer-led cooperatives. In some countries, regulatory constraints like geographic limits on energy sharing or caps on project size also limit community energy growth – although such limits can be viewed as grid safeguards, they are perceived as barriers by community advocates[23]. In summary, without regulatory sandboxing or exemptions, many citizen-led or small-scale initiatives struggle to navigate the full complexity of energy laws. Harmonizing and simplifying these requirements (while maintaining necessary protections) is an ongoing challenge.

In all, the legal and regulatory landscape can either enable or stifle energy service contracts. Recent **EU directives and national reforms** have begun to remove some barriers – for example, updated public accounting guidelines (Eurostat's 2017 guidance) clarified conditions under which EnPC investments can stay off public balance sheets, addressing a major concern about public debt limits[22]. Likewise, the Clean Energy Package established rights for aggregators and energy communities. However, concrete implementation in each Member State determines the real effect. As of the latest surveys, regulators and stakeholders still cite **missing or confusing regulations, cumbersome procedures, and restrictive market rules as significant non-technical barriers** across Europe[23]. Aligning legal frameworks with the innovative nature of these services – through clearer definitions, streamlined procurement and licensing processes, and supportive market design – is essential to unlock their potential.

3.4 Financial and Accounting Barriers

Even when regulations permit a given energy service model, economic and accounting factors can pose non-technical barriers. Here we employ the perspective of finance and accounting, noting how investment conditions, cost structures, and budget rules affect the viability of energy service contracts. Unlike purely technical cost issues, these barriers relate to how costs, savings, and risks are perceived or allocated among stakeholders.

Access to Capital and Financing Costs

Many energy service projects require upfront investment – for example, retrofitting a building under an EnPC, installing smart control systems for demand response, or purchasing solar panels for a community project. If clients or ESPCs cannot secure affordable financing, projects will not proceed. A persistent barrier is that **ESPCs (incl. ESCOs) and aggregators may face higher financing costs or credit hurdles than traditional investors or public entities**. The JRC found that **"insufficient access to competitive financing for ESPCs (especially EnPC providers – ESCOs)"** is a key barrier, particularly in countries where public-sector borrowers can obtain loans at lower interest rates[22]. For instance, in Germany, Austria, Czechia, and Slovakia, municipal or state bodies can often borrow cheaply with sovereign backing, undercutting ESCOs' ability to offer attractive financing[22]. This makes the ESCO model less appealing in those contexts, as public authorities might prefer to borrow and fund efficiency projects themselves (even if they then lack the know-how to implement them as effectively). Similarly, for energy communities and prosumer cooperatives, **access to finance is a known hurdle** – these are typically grassroots organizations without credit history or collateral, making it hard to get bank loans. A comparative study noted that *"one of the most serious impediments for energy communities and cooperatives is the lack of capital,"* especially at early stages[27]. While some EU funds

[27] Sokołowski, M. M., Taylor, M., & Buller, I. (2025). Seven pillars of energy cooperation: an energy justice-driven

and national grants exist to support community energy (e.g. grants in France or Italy, or revolving funds in Czechia), they are often insufficient or complicated to obtain. Uncertainty about long-term revenue streams (due to changing energy prices or subsidy schemes) also makes banks cautious. Therefore, many potential projects stall for financial reasons even if they are economically rational in the long run.

Split Incentives and Risk Allocation

A classic economic barrier in energy services is the **principal–agent problem**, often manifesting as split incentives. This occurs, for example, when one party is responsible for investment and another reaps the energy cost savings (e.g. a landlord vs. tenant situation). Split incentives are prevalent in the building sector and can stymie EnPCs and other efficiency services. If a building owner doesn't pay the energy bills, they have less motivation to sign an EnPC to retrofit the property, since the tenant would benefit from savings. Conversely, tenants usually can't sign long-term contracts for a building they don't own. In a broader sense, allocation of performance risk also matters: EnPCs shift performance risk to the ESCO (since they guarantee results), but there is still perceived risk for clients – what if the ESCO goes bankrupt, or what if savings are hard to measure and dispute arises? Such concerns can deter clients from entering contracts. In demand response, a split-incentive type issue can arise between building owners and occupants regarding who can enrol in an aggregator's program (e.g. commercial real estate scenarios). Solutions like contractually passing through benefits to tenants or having tripartite agreements are possible but add complexity.

Accounting Rules and Budgetary Treatment

For public-sector projects, the accounting treatment of energy service contracts can be a deciding factor. Under EU public accounting (ESA) rules and national budget laws, if an energy performance contract is counted as public debt or capital expenditure, it can conflict with deficit limits or debt caps (the Maastricht criteria for Eurozone members). This was long seen as a **major barrier** to public-sector ESCO projects[22]. Public authorities feared that entering an EnPC – even one that pays for itself through energy savings – could end up on their balance sheet, worsening their fiscal indicators. In 2017, Eurostat (EU's statistical agency) issued guidance clarifying when EnPCs could be recorded off-balance-sheet (i.e. as a service contract rather than a debt)[22]. This guidance, developed with the European Investment Bank, provided criteria (such as the ESCO carrying sufficient risk) to allow performance contracts to remain "Maastricht-neutral." While this helped alleviate the barrier, **uncertainties remain**. As of 2020, many countries were still interpreting and applying the rules cautiously, especially when blending EnPCs with grants or other public funding[22]. For example, combining EU structural funds or national renovation grants with an EnPC can complicate the accounting: if a grant is involved, part of the project might be viewed as public expenditure after all. Several Member States (e.g. Germany, France) expressed uncertainty about how to ensure **"Maastricht neutrality"** in such cases[22]. The need to forfeit certain financing or to use complex forfaiting arrangements to keep debt off books has undoubtedly slowed down public-sector EnPC uptake in countries like France and Portugal. On the private-sector side, accounting issues are less about public debt and more about how to reflect performance payments and energy savings on company balance sheets, which can affect corporate decisions to engage in these contracts.

Perceived Profitability and Incentive Structures

Even if financing is available, the perceived business case for an energy service can be weak if prices or incentives are not aligned. For instance, where energy prices are low due to subsidies or price regulation (historically the case in some of the reviewed countries, such as regulated tariffs in Spain

framework for energy communities and energy cooperatives. *Journal of Energy & Natural Resources Law*, *43*(3), 287–309. https://doi.org/10.1080/02646811.2025.2455853

or generous fossil fuel tax breaks in parts of Europe), the **economic savings from efficiency or DR are smaller**, discouraging investment[22]. Without sufficient energy cost savings, the payback period for ESCO projects lengthens, making them less attractive. In the demand response arena, if wholesale market prices rarely spike or if capacity payments for flexibility are minimal, aggregators will struggle to generate revenue to share with participants. An ACER market monitoring report (2023) emphasized that removing retail price distortions and introducing time-variable network tariffs are important to **make demand-side flexibility profitable** – in other words, **market signals** need to reflect real value of flexibility, or else the business case remains weak[23]. Additionally, competing incentive programs can unintentionally hinder energy services. For example, if generous government grants are available for building renovations, a municipality might prefer "free" grant money over an EnPC arrangement, effectively **competing with the ESCO model**[22]. Many Member States have poured grants or subsidies into efficiency (a positive thing overall), but without integrating these with performance contracting, it can leave ESCOs with fewer opportunities (this dynamic has been observed in, for instance, Slovakia and Italy, where EU-funded grant programs for public buildings took precedence over ESCO solutions in some cases). Aligning financial incentives so that performance-based solutions are rewarded – or at least not put at a disadvantage – remains an important policy task.

In summary, financial and accounting barriers highlight that an energy service can be technically sound yet economically unfeasible for the actors involved under current conditions. The literature consistently flags **financing difficulties, split incentives, and accounting constraints** as barriers requiring attention[22] [24]. Recent developments, such as new EU financial instruments (e.g. ELENA, Horizon Europe grants for aggregators, or the Social Climate Fund for energy communities) and updated accounting rules, are steps in the right direction. Still, from Germany to Portugal, stakeholders call for more accessible finance (perhaps via public guarantees or green banks) and clearer accounting guidance to ensure energy service contracts can flourish without fiscal or financial impediments.

3.5 Organizational and Procedural Barriers

Beyond broad regulatory and financial issues, there are more granular **operational barriers** – the practical challenges of organizing, procuring, and administering these contracts. These often manifest as high transaction costs and administrative burdens, which can be analysed through the lens of transaction cost economics and public administration.

Complexity and Transaction Costs

Non-technical does not mean non-complicated – in fact, a recurring theme is that energy service arrangements tend to be more complex to set up and manage than business-as-usual solutions. This complexity incurs transaction costs (time, effort, consultancy expenses) that can deter participants. Even when a public authority has the capacity to engage in an EnPC, they often realize that the contract involves lengthy audits, baseline calculations, monitoring plans, and legal negotiations that a straightforward equipment purchase would not. Small municipalities or companies may lack the in-house expertise to navigate this, and hiring external consultants adds cost. For example, Italy's experience shows that when small local authorities tried to bundle projects and use ELENA technical assistance, they still faced **notable administrative burdens to aggregate projects and conduct procurement**, implying only larger entities or those with strong support can manage those transaction costs[22]. In demand response, complexity arises in arranging contracts between multiple parties (consumer, aggregator, supplier, possibly the DSO or TSO), and in verifying performance (baselining consumption and measuring load reductions). If the process to enrol and participate in a DR program is too cumbersome (multiple forms, lengthy contracts, need for specialized metering), many consumers simply won't bother – which is a barrier of procedural nature. The goal, then, is to **standardize and simplify** contracts and procedures. The development of standardized EnPC contract

templates, shared measurement & verification protocols, and aggregator frameworks are attempts to reduce these transaction costs. The more "plug-and-play" these services become, the lower the barrier of complexity.

Administrative and Organizational Capacity

Implementing energy service models often requires capabilities that the involved organizations may not have. A city administration, for instance, might lack a dedicated energy manager or legal advisor to champion an EnPC project, leading to inertia. The result is that potential users are left without guidance or support. On the flip side, in countries where a **national ESCO facilitator or programme** exists, for example, Germany's energy agency **dena** (German Energy Agency) providing model contracts, the uptake has improved, suggesting that boosting organizational support helps. In the case of energy communities, forming and running a cooperative or community project is itself a managerial challenge. A new energy cooperative must navigate group decision-making, regulatory compliance, technical planning, and financing – tasks that require a mix of skills. CEER notes an *"inherent barrier"* for new energy communities: without an existing organization, **the administrative burdens weigh heavily on newly established groups**[23]. Early enthusiasts can be overwhelmed by paperwork and governance issues before the project even delivers energy. This points to the need for intermediary support structures (like community energy hubs or federations that provide legal templates, regulatory advice, etc.). In demand response, aggregators themselves need certain organizational maturity – handling data, interfacing with grid operators, managing customer relations – which means startup aggregators face a steep learning curve and initial costs. If there are only a few pioneering firms in a country, market growth may wait until those organizations scale up or new entrants are attracted, which can be slow if barriers remain high.

Coordination and Principal-Agent Issues

Split incentives are mentioned earlier as a financial principal-agent problem, but there is also a broader coordination barrier. Energy service arrangements often involve multiple stakeholders (e.g., landlord and tenant, multiple co-owners in a building, or members of a community group) who must all agree and cooperate. Achieving consensus and aligning different interests can be difficult and time-consuming – a barrier of a social-organizational nature. For example, a condominium in France may technically be a great candidate for an EnPC to retrofit the whole building, but if dozens of apartment owners must agree on the contract, the decision process can derail the project. Likewise, establishing an energy community requires gathering a critical mass of participants who share a vision and trust each other, which may be easier in some locales (e.g. villages in Germany with a cooperative tradition) and harder in others (perhaps in urban areas with less community cohesion). These **collective action challenges** are well-documented in sociological studies of community energy, which emphasize the importance of local champions and social capital. From a theoretical view, such barriers relate to transaction costs of group decision-making and the need to overcome free-rider concerns – for instance, some individuals might wait for others to initiate projects rather than doing it themselves.

Procedural Rigidities

Finally, certain procedural rules and norms can unintentionally create obstacles. For example, if a government budgeting procedure does not allow multi-year contracting easily, then signing a 10–15-year EnPC is procedurally complicated. Some municipalities in Central Europe (like Czechia or Slovakia) encountered this, needing special approvals for long-term obligations. Similarly, utility procedures for connecting distributed generation or demand response resources can be lengthy. If getting a feed-in tariff contract or a demand response contract involves months of processing, interest will wane. In the aggregator domain, procedures for measurement and verification and for communication with system operators need to be streamlined to lower the entry barrier for new flexibility services[23]. The EU's

ongoing efforts to create **digital platforms and standardized data exchange (e.g. for smart meter data)** are aimed at easing such procedural frictions, enabling automated demand response and peer-to-peer energy sharing with less administrative delay[23].

Taken together, these organizational and procedural issues emphasize that even if policy and economics align, the *devil is in the details* of execution. High transaction costs, lack of supporting infrastructure (institutional or informational), and cumbersome procedures can dilute the impact of otherwise well-designed programs. Addressing these barriers may involve capacity-building (training energy managers, funding community energy advisors) and **process innovation** (e.g. one-stop-shop platforms for public building renovations, or aggregator "prequalification" processes that are faster and transparent). Indeed, the European Commission has encouraged Member States to establish facilitation mechanisms – **one example is creating "one-stop shops" for energy efficiency projects**, which can guide consumers and authorities through the complex process[22]. Simplification and support at the procedural level can make a decisive difference in translating technical potential into actual projects on the ground.

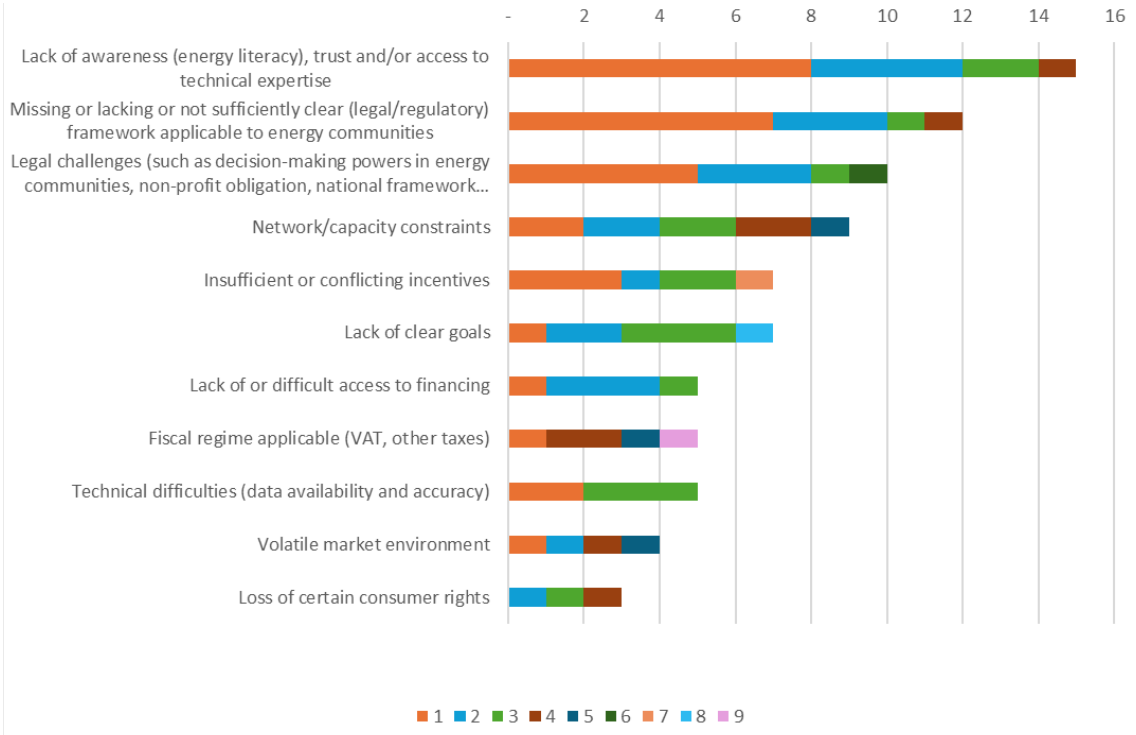


Figure 5 – Top barriers for energy communities in Europe, as identified by national regulators. *Lack of consumer awareness/trust and unclear legal frameworks are the highest-ranked hurdles, followed by legal/organizational challenges and insufficient incentives or financing. Addressing these barriers requires both regulatory action and targeted support for community initiatives*[23]

3.6 Systematic approach needed

In conclusion, current energy service contractual arrangements in Europe – Energy Performance Contracts, demand response aggregation, and prosumer/community energy models – face a multifaceted array of non-technical barriers. This review has categorized those barriers using concepts from behavioural science (to illuminate consumer-related challenges like limited awareness, trust, and decision biases) and from legal, economic, and institutional theory (to elucidate regulatory, accounting, and procedural impediments). We find that **behavioural and informational barriers** (lack of awareness, low trust, inertia) often limit consumer engagement in energy services across the EU[23] [24]. At the same time, **regulatory and procedural barriers** – including inadequate legal frameworks,

restrictive procurement and market rules, high transaction costs, and financing/accounting constraints – pose significant hurdles for providers and authorities attempting to implement these services[22].

Notably, these barriers are interrelated. For example, a lack of legal clarity (institutional barrier) can undermine consumer trust (behavioural barrier), and insufficient access to financing (financial barrier) can reinforce inertia or risk aversion. They also vary by country: in some Member States like Germany or France, relatively advanced markets still struggle with issues like split incentives and complex administration, whereas in others like Slovakia or Czechia, the primary challenges may be rudimentary frameworks and low awareness, and the market is buoyed by generous EU subsidies available for building renovations and other energy efficiency projects[22] [23]. Despite these differences, the underlying categories of barriers are comparable across the EU, suggesting that lessons and policy solutions can be shared.

Crucially, the recent literature and EU surveys underscore that addressing non-technical barriers is **essential to scaling up energy service contracts**. Technical potential and economic rationale alone are not enough – success requires overcoming human, institutional, and procedural challenges. To that end, a combination of strategies is needed: **policy and regulatory reform** (to remove legal obstacles and create enabling rules), **financial and accounting solutions** (to provide affordable capital and clarify treatment of performance contracts), and **behavioural interventions** (education, trust-building, simplification of choices)[23] [24]. The EU's current initiatives – from the Clean Energy Package directives to funding programs for capacity-building – have begun to acknowledge these factors. Still, as this review highlights, a systematic categorization of barriers is important to navigate Europe's highly heterogeneous context. By explicitly recognizing categories like behavioural vs. procedural barriers, stakeholders can apply the appropriate theoretical frameworks and tools to tackle each. Ultimately, surmounting these non-technical barriers will be pivotal for Europe's energy transition, enabling innovative contractual arrangements to deliver the promised energy savings, flexibility, and citizen empowerment across all member states.

4. Contractual Arrangement for One-Stop Shop

As highlighted by BungEES, the transition **from passive consumption to coordinated demand** introduces an additional layer of complexity for new and renovated buildings, which must adhere to the **zero-emission building (ZEB)** standard by 1 January 2028 for new public buildings and by 1 January 2030 for new private buildings and renovated existing buildings. These changes in demand require systemic changes in supply. A **lack of cooperation and fragmentation** among suppliers can prevent the full deployment of smart energy systems. This would harm consumers and undermine the credibility of the political goals of the clean energy transition.

It is impractical to expect households, small businesses and public agencies to navigate a complex network of auditors, installers, financiers and regulators. OSS consolidates these steps into a single, accountable customer journey. This integration reduces transaction costs and uncertainty — two of the most persistent barriers to energy upgrades — and simplifies complex, multi-stakeholder projects. Therefore, **one-stop shops (OSS) have emerged as a pivotal model** for accelerating the adoption of energy efficiency and distributed energy solutions.

The purpose of this part is to propose a contractual framework for integrated energy delivered within the one-stop shop model that is fully compliant with the Clean Energy Package. This package mandates demand response to be provided independently from energy supply and the proposed package respect this principle. The integrated offer is expected to encompass demand response, renewable generation, electric vehicle charging and heat pump flexibility.

We propose a contractual framework for these services based on two complementary components: The bundled Energy Service Master Framework (Head of Term I) is designed to cover services delivered by multiple parties. The Retail Contract (Head of Term II) is designed to ensure simplicity, transparency, and adaptability of the offer to the customer.

BungEES is designed to provide flexible packages tailored to various customers' needs, rather than a one-size-fits-all solution. In this way, several options are available to customers: they can choose a one service package like flexibility for heat pumps for example or combine it with the installation of PV panels, a battery storage system, or an EV charging station coupled with an assistance service. For any combination of services selected and any type of package (Basic, Control, Premium), a single contract should cover the services.

The scope of this deliverable is dedicated to the architecture of the contractual framework: operation and collaboration conditions, pricing, billing and payment mechanisms, and risk allocation. Nevertheless, these proposals are intended to serve as conceptual framework that can be easily customized to suit the service elements.

Thus, this deliverable started with a literature review (1) to understand the basic concepts and assertions to consider when designing contracts. We describe the central elements (enabled commercial operations and risks) in the BUNDLED ENERGY SERVICE MASTER FRAMEWORK Head of Term I (3) and the OSS- CUSTOMER CONTRACT Head of Term II (4) and discuss STAKEHOLDER INSIGHTS AND LESSONS LEARNED (5). The full templates Head of Term I and Head of Term II are provided in the annexes chapter of this deliverable.

4.1 Methodology

Head of Term I and Head of Term II were drafted according to pilot results and in-house experience of the BungEES project team, in particular Voltalis and Plenitude who both have hands-on market experience bundling customer engagement, demand side response, distributed assets, and energy advice.

To better understand the nuance of potential contract users and feed-in to the drafted agreements the following steps were taken: desk research, interviews, and document analysis. It starts with desk research to learn about the legal framework, practices, and pillars of bundled services and one-stop shops, which inspired the overall architecture of our contract proposals.

We conducted semi-structured interviews with various stakeholders representing different parts of the integrated smart energy services value chain: consumer association, DR aggregators, energy communities, ESCOs, and an energy agency. Insights from these stakeholders helped us to have an overview on the market, legal and operational realities affecting contracts and business models. Afterwards the project team analysed the commercial actions that the bundled energy service agreement and OSS-customer contract are seeking to implement, as well as the risks inherent in these actions.

For the interviews, we clustered the findings according to barriers, levers, and best practices. The recurring themes were then matched to the features and key elements of Head of Term I and Head of Term II. In this way, the proposed contractual framework reflects levels of expectations expressed and the level of trust required by stakeholders.

4.2 Literature review

There is no universal definition of what is a "master agreement" across all industries. A "master agreement" can be defined as an overarching agreement *governing all the legal commitments between the parties* through a contract setting general terms and modular annexes addressing activity details [28] . In other literature, multi-party relationships and collaboration is governed by *a framework (alliance) agreement*[29]. This framework defines common rules for buildings work within the context of common governance.

These definitions have inspired the BungeEES team to define the Bundled Energy Service Contract as: a framework agreement for one-stop shop delivery. It enables an energy service provider to collaborate with one or multiple parties to deliver a comprehensive package of bundled energy services (demand-response heat pumps, solar PV panels, EV charging, O&M, etc. under one single customer contract. Bundled energy services improve the synergies between fragmented energy service and enhance their value. Therefore, bundling supports the supplier, here referred as Bundled Smart Energy Provider "BESP," in securing a better market position.

In the back office, service providers should have an understanding and distinction of their roles, rights, and obligations, as well as detailed provisions concerning their schedule, performance evaluation, and monitoring. Experiences and practices related to bundled services in different sectors have inspired Head of Term I. The latter is designed as a main body with general provisions and annexes to address that can be adapted to the details of each partner's activity: scope and exclusions, pricing/billing, Measurement, and verification (M&V) & settlement, reporting, data & privacy, and territory and exclusivity.

In areas where service delivery is handled by multiple providers, each responsible for a specific part of the service, IFRS 15 treats bundled services as separate performance obligations. The resulting revenue is recognized only when the performance is satisfied either overtime or at point of time[30]. Similarly, other demand-side models that are based on subscription, output or data driven (EaaS, XaaS)

[28] Contract Nerds, " Best Practices for Drafting a Statement of Work Template," *Contract Nerds*, accessed October 20, 2025, https://contractnerds.com/best-practices-for-drafting-a-statement-of-work-template/
[29]Crown Commercial Service, "Modular Building Solutions: Framework Agreement - RM6014 Customer Guidance & Ordering Procedure v.9"April 2023. https://assets.crowncommercial.gov.uk/wp-content/uploads/RM6014-Customer-Guidance-and-Ordering-v9.pdf
[30] KPMG 2025 IFRS 15 Handbook

have proven success with linking Key Performance Indicators (KPIs) to remuneration[31] .In this way, partners in Head of Term I are paid based on results; for instance, in Head of Term I lead generator's remuneration is defined according to the number of installations and customers commissioned (Installation, activation, commission, or operation) or according to monthly activity report.

The revenue aspect is only one of the key parameters in developing bundled energy service offer that are resilient and replicable. Data governance, settlement mechanism and partners orchestration are fundamental to the success of this type of service[32]. Quality criteria, M&V work, and the digital spine backing the service must also be fundamental for services combining, renewable generation demand side response and storage [33].

Energy Performance Contract practice informed by incomplete contract theory, allocate risk according project stage. Thus, in the design and installation phase only the service provider is exposed to technical and performance risks. However, in the operation and M&V phase the operational and use risk is only endured by the client. Both parties share the M&V responsibility[34]. In the IT sector, "Service Level Agreement, SLA" is documented in addition to the principal agreement. The SLA implements commitments and obligations cited in the main contract and measures them. It describes the performance to be achieved, how and when it can be evaluated, and what will happen if it is not achieved[35]. This layer can therefore strengthen bundled services in our context. SLAs ensure service continuity and guarantee a certain level of convenience when the service provider changes since the BESP will not need to write a new contract from scratch.

At the front desk, the BESP represents and manages part or the full customer value chain. This relationship is pictured in head of term II (Head of Term II). One stop shops and bundled services should bring value to customers when they facilitate access to complex and cumbersome products and services[36]. These of initiatives are recognised and supported by the EU in the Energy Efficiency Directive (EED)[37] and Energy Performance of building Directive (EPBD)[38].

Both Customer Right Directive[39] and Empowering Customer Directive[40], address key aspects and consideration to be respected in retail commercial operations. Bundled offers were not addressed in these directives. In our proposal for Head of Term II, we apply this horizontal law baseline similarly to bundled services and products. Therefore, the proposed bundled offer should guarantee the same

[31]Sing et al., 2024 "Re-Imagining Energy Services: Empirical Analysis Of Demand-Side As-A-Service Business Models And Use Cases In Energy Sector" Microsoft Word - SSC2024_full-paper.docx
[32] Iria et al., 2023 - Energy-as-a-Service for prosumer aggregators (Applied Energy): An energy-as-a-service business model for aggregators of prosumers - Astrophysics Data System
[33] Ruan et al., 2024- Data-driven energy management of VPPs: Data-driven energy management of virtual power plants: A review
[34] Shiyu Wan et al., 2024, Risk allocation for energy performance contract from the perspective of incomplete contract: a study of commercial Energy performance contract buildings in China: EM-IJCC220030 1..22
[35] What is an SLA? Best practices for service-level agreements | CIO
[36] JRC (Joint Research Centre), *One-Stop Shops for Residential Building Energy Renovation in the EU* (2021): https://publications.jrc.ec.europa.eu/repository/handle/JRC125380
[37] EU, Directive (EU) 2023/1791 (EED recast), OJ L 231, 1
[38] EU, Directive (EU) 2024/1275 (EPBD recast), EUR-Lex
[39] EU, Directive 2011/83/EU (Customer Rights), OJ L 304, 64–88
[40] EU, Directive (EU) 2024/825 (Empowering Customers), EUR-Lex

level protection (data[41], pricing, fairness etc.), predictability (billing settlement[42],etc.) and convenience (e-signature[43], notification, cooling-off period[44],etc.) as single products offers to customers. Transparency is an overarching principle when it comes to agreements with customers. Transparency should not be solely tied with prices, it should be considered when defining parties' liabilities, obligations, and the overall contract conditions[45].

The Council of European Energy Regulators (CEER) sets design principles for bundled products: First, the CEER believes that customers should have a single point of contact for bundled offers. Clarity and consistency of provisions are essential to ensure that customers have reasonable assurance about the product, billing, prices, and the responsibilities of the parties involved. At the same time, customers must be well informed about the terms and conditions for modifications to the package they receive[46]. These principles guided our proposal for the retail contract Head of Term II; The specific conditions figure on the contract front sheet to inform on fundamental aspects related to (billing method, price, duration...). Details and specific information (billing and settlement calendar, exclusions, reporting, etc.) will be part of annexes to keep agreement transparent and portable.

Regarding energy services, offers promoted with green claims and environmental statements should be supported by justifications otherwise it would be considered misleading or selling broad green promises[47]. In the context of Head of Term II, periodical reports, and communication achievements according to the marketed benefits will allow customer to pair the bundled offer with green outcomes.

4.3 Bundled Energy Service Master Agreement

4.3.1 Commercial actions the enabled by the Head of Terms I

4.3.1.1 One offer and multiple market channels

A bundled service brings together different suppliers, services, and products provided by a single contracting party.
In this proposed contractual framework, several routes for customer acquisition and service provision by the bundled energy services provider (BESP) are suggested, while making sure that provision of demand response services is independent from the supply of electricity as required by the Clean Energy Package[48]. This will allow the contractual framework to be adapted to different levels of market maturity and different service provider capacities. In this way, BungEES propose three modes under which a bundled energy service, including demand side response, can be provided: lead generation, partnership, and service provider model. Opening these possibilities will allow the BESP not only to minimize risk but also to create maximum value that can benefit different customer's segments.

[41] The lawfulness of data control and processing, contract information and transparency should follow the regulation (EU) 2016/679 on General Data Protection and the *Guidelines 07/2020 on the concepts of controller and processor in the GDPR*
[42] Settlement should take place according to the eIDAS regulation (Regulation (EU) No 910/2014) : https://digital-strategy.ec.europa.eu/en/policies/eidas-regulation
[43] Conditions on electronic signatures ans their legal effect are the subject of Art.25 of the regulation *EU) No 910/2014 (eIDAS) on electronic identification and trust services*
[44] The 14 day right of withdrals is stipulted in Art.9 of *Directive 2011/83/EU on Customer Rights*
[45] Eurelectric, 2018, CEER public consultation on bundled products: https://www.eurelectric.org/wp-content/uploads/2024/06/ceer_public_consultation_on_bundled_products-2018-030-0706-01-e.pdf
[46] CEER (Council of European Energy Regulators), Guide on Bundled Products (November 2019): 1 ZUSAMMENFASSUNG
[47] EU, Directive (EU) 2024/825 (Empowering Customers)
[48] Directive (EU) 2019/944 on common rules for the internal market for electricity and amending Directive 2012/27/EU, art. 13

In the first mode, a lead generator is only involved in collecting prospects for the bundled energy service. They are paid only when converted into customers, based on a commission.

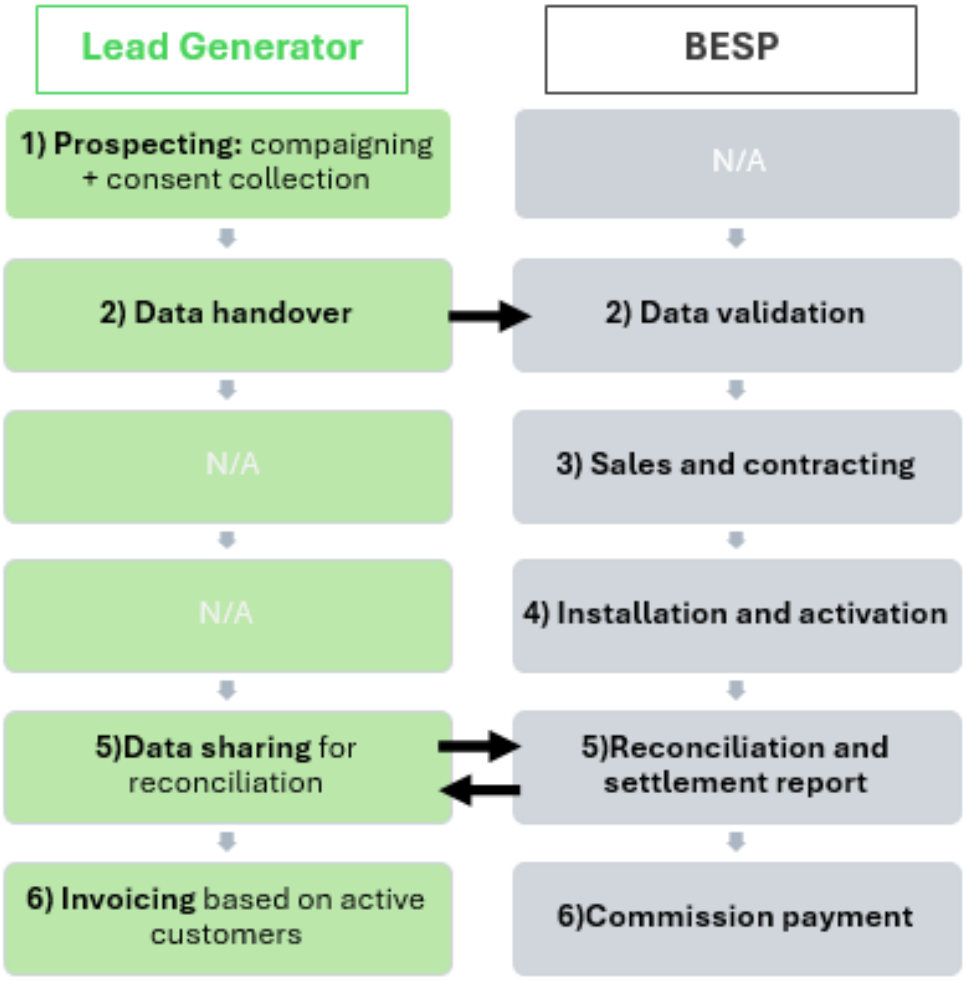


Figure 6 Lead Generation model process

In the second mode Partnership model, the BESP collaborates with an existing brand of a Commercial Partner under a partnership agreement. The Commercial partner receives a revenue stream on marketed services and an additional commission on documented energy savings.

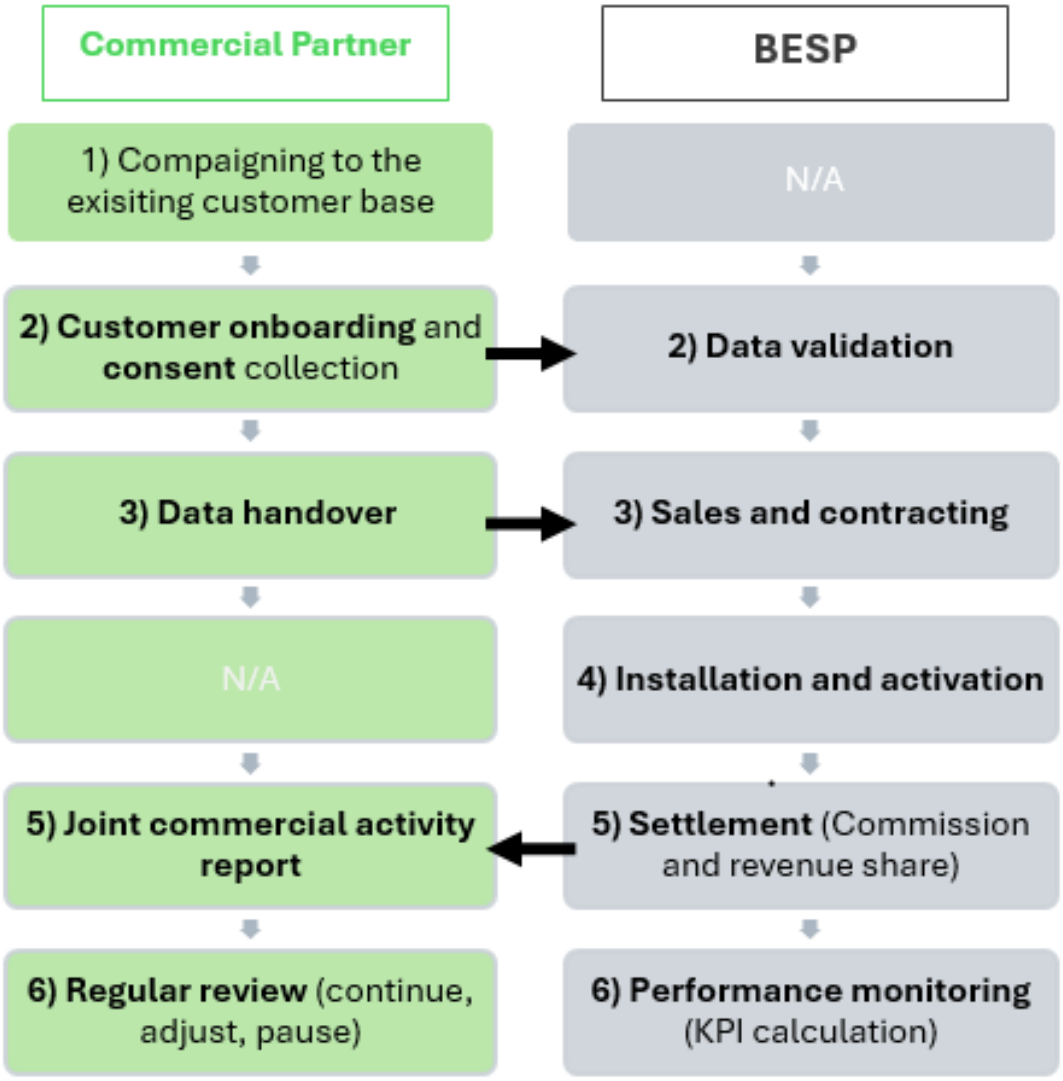


Figure 7 Partnership model process

In the Service Provider model, a field expert or an installer collaborates with the BESP on onsite operations. The service provider is paid by a fixed rate per intervention.

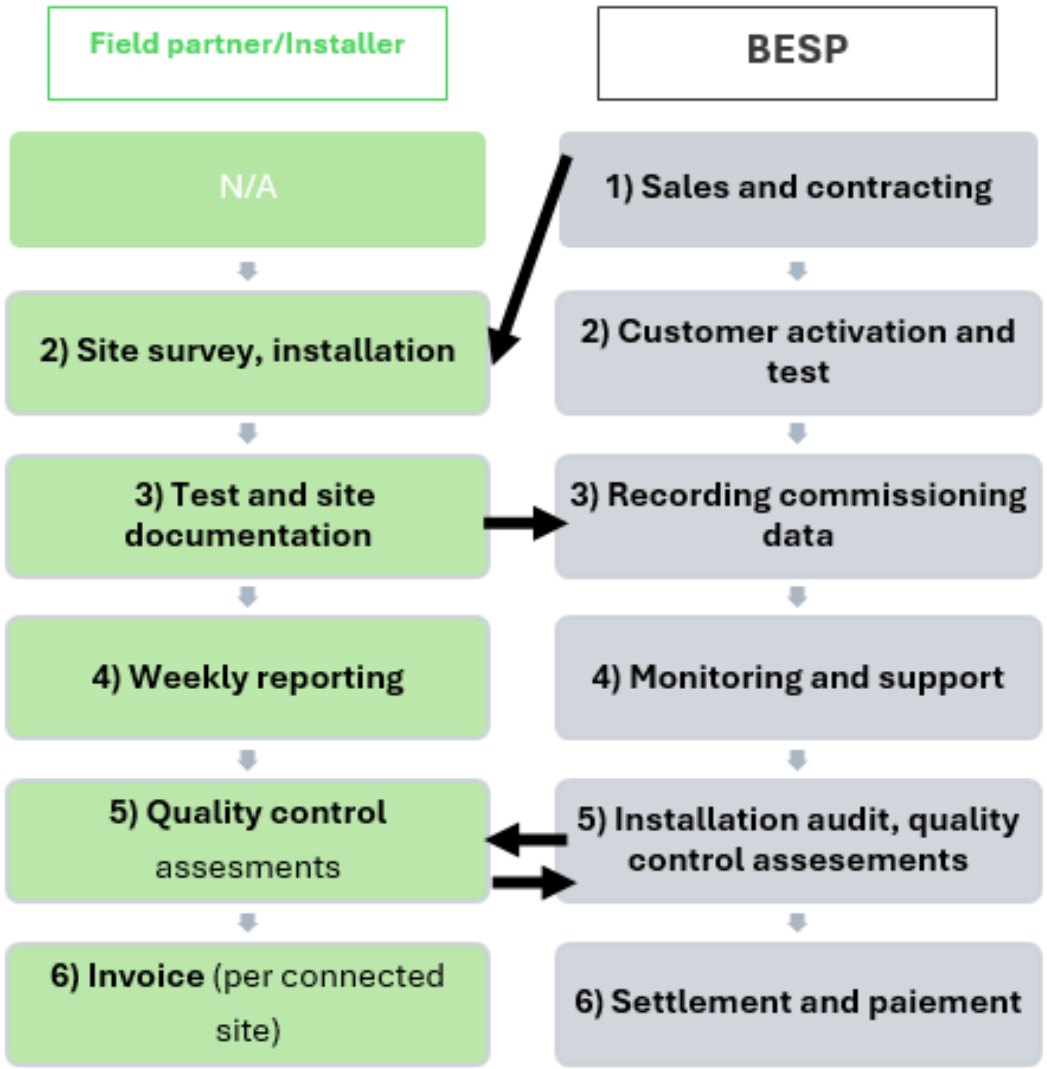


Figure 8 Service Provider model process

4.3.1.2 Value creation

The main objective of the proposed Head of Term I is to make bundled, flexibility centred energy services in one stop shops a business that is to be replicated and deployed with low friction.

Firstly, Head of Term I seek to protect service providers' margins: this contract proposal seeks to align cash flow with actual value creation (customer activation, KPIs, energy savings, etc.) to create performance -based incentives for partners and a financial buffer.

Added to that, Head of Term I enables a go-to-market approach by offering different modes of collaboration with partners (lead generation, partnership, and service provider) with a certain

flexibility. The ability to expand or reduce activity in each territory, to subcontract or disengage from a partner, and other aspects to avoid lock-in.

Furthermore, this flexibility has been defined by taking into consideration a central element, which is the protection and trust of the end customer. The contract not only allows the customer to choose their level of engagement (opt-in/opt-out) but also provides safeguards to ensure the continuity of the customer-aggregator relationship regardless of events that may affect the relationship between service providers.

Across all this, quality measuring is a fundamental principle that is respected in all Head of Term I provisions: all the decisions to be made by the contracting parties should be based on metrics and KPIs.

4.3.1.3 Scale and continuity

Head of Term I enables BESP to adopt different strategies to grow its customer base: whether it is expanding into new markets (geographic expansion) or local expansion via a subcontractor. The contract proposal offers a limited risk approach. In the first case, the pilot program is launched for a defined period, and the continuity of the exclusive partnership is governed by performance indicators that must be met. Similarly, in the second case, BESP can subcontract without affecting its agreement with its initial partner provided that the KPIs are met. The contract with the customer is not affected either.

4.3.2 Identified risks

4.3.2.1 Legal and compliance risk

A legal risk is present whenever a provision in an agreement with a partner (lead generator, partner, service provider) is very vague, does not comply with certain codes or formalities, making the provision unenforceable by law or easy to challenge. For example, this may be the result of unclear descriptions of territorial limits, piloting conditions, or the liability limits of the parties. The legal risk can be triggered when it comes to defining parties' exposure and exclusion of risks and how to resolve their conflicts: jurisdiction, mediation, and arbitration.

4.3.2.2 Compliance risk

A commercial risk is best understood as adherence to applied regulations. For example, at Head of Term I, procedures and actions related to the brand, commercial data, and non-disclosure agreements are subject to confidentiality risks. Compliance risk is also significant when it comes to personal data protection, control and access to this data, and compliance with the GDPR. In addition, Heads of Terms I is in total compliance with the Clean Energy Package: it keeps demand response independent from energy provision, while allowing operational to aggregators and contractual freedom to customers.

A commercial risk arises when the business practices negatively impact the profitability, process efficiency, or growth of the activity. For instance, a weak partner's performance (in terms of quality assurance, lead conversion, number of installations, etc.) in Head of Term I can have a cascading effect the performance of other partners. A territorial expansion can also increase a partner's commercial risk if they cannot meet the increase in demand because of their limited capacity or regulatory friction in the new market.

The continuity of the customer relationship is another aspect of commercial risk. Therefore, if the agreement between the partners does not specify in advance who will take over the customer, and all the procedures for transferring this data if their agreement is terminated, the relationship with the customer will be stalled or damaged.

4.3.2.3 Financial and settlement risk

The financial risk reflects a situation where BESP incurs costs that lead to economic losses rather than generating income. This could be the case of operations where revenue is uncertain, such as ineligible leads, or paying for interventions that are outside the scope of the contract.

Financial risk also arises when cash flows cannot be accurately predicted by BESP: This may be due to the way the billing and settlement procedures are defined or to conflicts between partners on audit and reporting transparency.

4.3.2.3 Operational delivery and quality risk

An operational delivery risk is marked by the failure of the day-to-day process of the business or technical process (in context of smart energy services). For instance, this risk can be associated with the performance of APIs, accidents that may occur, and their impact on business operations in terms of predictions accuracy, data quality, and performance.

The quality risk arises in on-site operations such as installations at customer premises. An installation that is not safe, requires multiple revisits, or is inaccessible are events that will impact BESP's reputation and revenue.

4.4 OSS-End customer Contract

4.4.1 Commercial actions the enabled by the Head of Terms II enables

4.4.1.1 Offer design and contracting

In Head of Term II, a provider can sell bundled energy services under one single contract. Whether it is demanding response participation, renewable energy, maintenance, or energy efficiency advice, etc. Head of Term II enables providers to combine and mix different services without juggling many contract packages. In practice, the proposal dedicates the annexes to the activity-specific provisions (scope, prices, billing, etc.). Therefore, the annexes can be customized according to the mix of services and packages.

As for customer-related conditions and settings, these will appear on a separate front page ("Specific Conditions") while the "General Conditions" stays regardless of the service mix. This approach makes Head of Term II adaptable and replicable for a diversity of customers. It also guarantees speed and efficient customer onboarding. Moreover, Head of Term II allows the contract to be concluded remotely thanks to the eIDAS (electronic Identification and Trust services) signature. In such cases, the contract offers the customer a 14-day trial period where customer can withdraw from the offer with simple instructions.

These elements make bundled energy services easier to deploy and replicate across residential customers, commercial customers or energy communities with less sales friction and customer trust.

4.4.1.2 Billing

Head of Term II follows a simple subscription model. Billing is based on the period and fixed amounts defined in the contract. Additional fees must be approved separately otherwise they cannot be subject of bill. To ensure payment discipline, the contract also allows the service provider to charge interest in the event of late payment. Similarly, if a charge is contested by a customer the contract entitles the BESP to collect the undisputed amounts on time while the dispute is reviewed.

4.4.1.3 Channels and scale

Head of Term II is non- exclusive. Customers may subscribe to services from external providers if these services are not covered by Head of Term II. Similarly, BESP is not required to serve the customer exclusively: BESP may operate in different markets and different value chains without restriction. In addition, BESP can scale through subcontracting and assignment to qualified partners, provided that the terms of delivery to the customer are maintained.

4.4.1.4 Service delivery duties

Head of Term II defines the scope of BESP's services, so the customer fully understands what to expect from the services and what is not covered. At the same time, the BESP must comply with its obligations in terms of security, staff qualifications, customer notification channels, and methods to ensure consistent and timely communication.

Furthermore, the contract specifies the areas in which the service provider does not intervene, such as misuse and aesthetic work and the channels. In return, it also sets out the customer's obligations to ensure the success of the service, such as granting access, sharing information, and making timely payments.

4.4.1.5 Contract duration and exit

Head of Term II is a one-year contract that is automatically renewed. The procedures for terminating the contract, as well as its conditions and triggers, are clearly defined. Head of Term II also allows the service provider to charge the customer early termination fees if the later does not comply with the terms of the contract.

4.4.2 Identified risks

4.4.2.1 Legal and compliance risk

Legal and compliance risks refer to the losses that the service provider may incur because of failing to comply with an obligation, whether legal or contractual. In the context of Head of Term II, customer protection measures related to sales and personal data are areas that evolve the legal and compliance risk. For instance, when provisions related to duration, price, rates, and termination clauses are drafted in unclear manners, this raises several interpretations. Remote contract conclusion may also be contested if the electronic signature does not comply with legal requirements. Similarly, communication with customers must be conducted through legally valid channels.

Furthermore, possession, control, and access to customers' personal data are sensitive areas where it is important to clearly define the roles of those involved and justify the purposes and duration of use of such data. Similarly, marketing operations may present a compliance risk if they are not subject to customer’s consent.

When the demand-side response is included in the service package, attention should be paid to leave the customer free to choose to provide DR (or not) and not request exclusive rights to demand response amongst an energy supplier's customers. Moreover, the bundled nature of the energy service and synergies promoted within its components might lead to overpromising savings or greenwashing claims if the savings are not actually guaranteed.

All these elements may therefore be subject to contestation, litigation, or fines if they are not properly defined and handled.

4.4.2.2 Commercial and market risk

Both the design and execution of the bundled energy services depend on external factors related to the market in which they are provided, creating commercial and market risks. When the BESP accepts operations outside the scope of the contract, margins are enshrined. Differences in the interpretation of exclusivity provisions may contribute to blocking customers who wish to subscribe to additional services from external parties and therefore trigger conflicts. Commercial also occur when fragile dependencies affect the continuity and portability of the service: this could be the case of a poor transition procedure to a new subcontractor or new equipment. Finally, customer turnover following early termination of the contract impacts on the profitability of the BESP and the compensation of onboarding costs. This is why commercial risk has a major impact when deciding on a horizontal (new services) or vertical (supply chain) integration strategy...

4.4.2.3 Financial and settlement risk

Billing errors, hidden costs, unexpected charges, or price increases can trigger a dispute with customers and delay or even block cash-flow streams. Financial risk also arises from customers' default and persistently unpaid bills. When contracting and customer onboarding are conducted remotely, the customer's credit risk may increase if due diligence related to customer evaluation is poorly applied and if the invoice contains variable costs.

4.4.2.4 Operational delivery and quality

A delivery risk covers the quality of services and operations provided in terms of safety, effectiveness, and customer satisfaction. This also covers on-site accidents, delays, incomplete works, and revisions to be made due to a customer failure when it comes to providing accurate information, site access, or permit delivery.

This risk can be also reflected in glitches in customer portals, the delays in device response: for instance, when a heat pump cannot be reliably controlled, this can impact the associated solar PV panels or the performance of demand flexibility. This cascade effect can also happen when an API update breaks device control and leads to poor data quality. As a result, the service provided by BESP does not live up to the promises made in the contract.

4.5 Stakeholder insights and lessons learned

4.5.1 Interviews description

A total of 14 organizations participated in the semi-structured interviews to gain insights into the drivers, challenges, and best practices in their sector. Interview participants can be grouped into 5 categories:

- Category 1: Energy community, energy cooperative, energy community facilitator
- Category 2: Energy agency
- Category 3: Demand response aggregators, energy management solutions provider
- Category 4: Pan-European Customer Association

These activities cover several countries, such as Ireland, Portugal, Romania, Greece, Spain, Estonia, France, Sweden, Norway, Germany, the Netherlands, and the EU.
The questions were based on subjects of common interest for all interviewees: the organization, its activities and clients, regulatory and economic market context, stakeholder roles and responsibilities within the business, and the organization's pricing and billing practices. Questions were also adopted according to the respondent's specific sector (see Annex 7 Stakeholder Interview Questions).

Examples of questions addressed to ESCOs and providers of demand response flexibility included elements related to customer contracts, such as negotiation, risk sharing, conflict management, termination, extension of deadlines, etc. Topics related to the execution of the activity were discussed, such as telemetry, M&V, APIs, etc. For the energy cooperatives and energy communities, governance and member rights were also discussed, as well as project management and financing. As for the customer association, exchanges focused on the need to ensure that innovative energy services ensure customer protection and on how these services can be made more attractive. Finally, questions with the energy agency focused on strengthening prosumers and supporting demand side response in local policy and legal frameworks.

All respondents consented to their responses being used for the purposes of this analysis. Interview notes were classified according to respondent categories. For each activity, we identified areas of difficulty, levers and opportunities and best practices.

The following table presents key themes raised by respondent in each interview category:

	Energy Communities	ESCO and DR Aggregators	Customer Association	Energy agency
Market	Grid access, metering, tariff, local market participation	Personnel, metering,	N/A	N/A
Legal/ regulatory	Status, incentives, procedure,	Market access, liability, data management, customer compliance, standardization	N/A	N/A
Economic	Funding, CAPEX, OPEX, risk sharing	Revenue models	N/A	N/A
Member/ Customer governance	Voting, benefits, onboarding, exit, communication	opt in / opt out, consent, communication	N/A	N/A
Data protection	N/A	N/A	Consent, retention, transparency, privacy, data control	N/A
Customer uptake of smart energy services	N/A	N/A	Flexible participation, tailored incentives, trust	N/A
Self-consumption	N/A	N/A	Barriers (metering, grid access, billing), subsidies, on-bill financing, OSS	N/A

	Energy Communities	ESCO and DR Aggregators	Customer Association	Energy agency
Prosumer policy integration	N/A	N/A	N/A	Streamlining procedure, incentives, energy communities
Enabling DSR	N/A	N/A	N/A	Aggregator's market access

Table 1 Key themes addressed by interviewees

These recurring themes were taken into consideration as lessons, guardrails, and good practices to reflect in our proposal for Head of Term I and Head of Term II: the addressed barriers helped to highlight some potential risk while the levers and good practice have inspired the clauses.

4.5.2 Interview Lessons for One-Stop Shop Contracts

This section describes interview learnings and matches them with contract elements in Head of Term I and Head of Term II.

4.5.2.1 Bundled Energy Service Master Agreement

Head of Term element	Interview observation	Head of term proposition
Piloting, limited territory with later roll-out	In interviews, it was clear that regulatory and policy instability in the clean energy sector, as well as differences in market structure and maturity among member states, were common risk factors for ESCOs, DR aggregators, and energy communities. "*Dealing with directions that change frequently*" and market fragmentation "*complicate these players' long-term predictions.*" So, when it comes to executing these projects, scoping geographical focus and expansion strategy are critical decisions to avoid investing commercial efforts in the wrong territory.	• **Service Provider model:** These risks are particularly relevant to be addressed in the Service Provider model. In the Head of Term I language, the choice was to define "*territory to be as limited as possible, especially in the first instance*"[49]and to commit to limited duration, *"one year"*[50] first. Piloting in small, well-defined territories should take place to test if the offer technically and commercially viable. This helps to better manage uncertainties and even reduce expansion costs by starting in a regional level and developing standardized contracts, protocols, and tools that can then be replicated nationally. Another important step is to define the conditions under which a pilot phase can be terminated. This can be a minimum revenue threshold, pipelines...etc., which represents an important safety measure when seeking to implement in unstable regulatory and market environments. This also allows the BESP to

[49]Annex 2 Head of Term I §1.5
[50] Annex 2 Head of Term I §1.6

Head of Term element	Interview observation	Head of term proposition
		offset the opportunity cost and back up their future national or European development decisions with solid KPIs. • **Partnership model:** The partnership model links a Commercial Partner (a retailer or any business that already has an established customer network) with the BESP. When one of the entities already has sales channels, setting geographical limits may conflict with the retailer's commercial strategies. Therefore, the risk of instability and fragmentation in the partnership model are monitored through *"quarterly performance targets evaluation"* [51] and a *"regular report"*[52]. Moreover, it is worth noting that a significant portion of the risk associated with customer acquisition, performance, and in some cases even installation is absorbed by the retailer, making questions related to operational arrangements much more significant than the territory of activity. • **Lead generation model:** In this case, piloting and territory do not increase any risks for the lead generator's work, as the operational and technical work is handled by the Service provider.
Termination tied to thresholds	The interviews revealed that in certain areas such as DSR aggregation, activity in the residential sector is subject to greater uncertainty than other sectors: *"volatile market prices, regulatory changes, high investment costs, and low, unpredictable returns,* personnel *costs,"* etc. This is why underperformance in these segments should be mitigated in advance to avoid it extending over long periods,	• **Service Provider model:** Contract termination is triggered by thresholds tied with sales volume, commissions, or connected sites…etc. This ensures that the Service provider has a clear exit solution *"if sales thresholds are not met (especially if there is some exclusivity)"*[53] • **Partnership model:** In this model, if performance thresholds are not met, the contract is not renewed.[54] Nevertheless, this should not affect the relationship of the retailer with his clients: he may keep them to protect his brand.

[51] Annex 2 Head of Term I § 4.4.7
[52] Annex 2 Head of Term I § 4.4.5
[53] Annex 2 Head of Term I §1.6
[54] Annex 2 Head of Term I §4.7.1

Head of Term element	Interview observation	Head of term proposition
	especially if the partners in question operate on an exclusive basis.	Thus, the risk of underperformance is controlled primarily through the contract renewal mechanism. • **Lead generation model:** The integration of performance thresholds is not relevant here since lead generators' reward is based on the conversion of leads into pipelines.
Customer relationship	Interviews with DSR aggregators and the customer association reveal that residential customers tend to be more interested in DR programs when they can control their own participation and opt out without penalty, and when their comfort level isn't affected during DR activation.	• **Service Provider model:** In this context the DSR aggregator provides the main service to the customer. The termination of the contract between the aggregator and the field partner does not affect the aggregator/ customer agreement. • **Partnership model:** In This model, both partners can deal directly with customers. The information gathered during interviews about customer preferences are considered to safeguard the relationship between customers and the DSR aggregator, including if the partnership agreement is terminated. This is to avoid any conflict with customers and to protect the levels of trust and comfort already established with them. Consequently, Head of Term I explicitly authorise the aggregator *"seek consents from end users if needed and the client may have the option to continue with DSR aggregator when/ if they terminate their contract with Commercial Partner."*[55] • **Lead generation model:** N/a (lead generators do not deal with customers)
Data reliability and API integration	Customer consumption data and metering are one of the sensitive issues for DSR aggregators operating in the residential sector. The challenges lie not only in data precision, but also in data processing due to the fragmentation of household	• **Service Provider model:** Head of Term I provision include "*weekly reports on technical interventions*"[56] and "*integration quality assurance tests*"[57] *to* better manage customer data quality. • **Partnership model:**

[55] Annex 2 Head of Term I §2.3
[56] Annex 2 Head of Term I §4.4.9
[57] Annex 2 Head of Term I §4.4.12

Head of Term element	Interview observation	Head of term proposition
	appliances. On top of this is the DR market is subject to variable pricing, and sometimes changing and disabling regulatory requirements, and data integration cost, making data accuracy a key factor in ensuring reliable cash flow forecasting for aggregators. API connection was cited as efficient way to reduce integration cost.	In this model, "*quarterly evaluations of performance targets*"[58] and "regular report on joint *commercial activity*"[59] are produced to ensure that commercial and technical results are in line. • **Lead generation model:** N/A
Paiement and commissioning	In the residential sector, *costs are spread across a smaller number of customers, making DR economically more challenging*. Similarly, training and customer onboarding costs are higher than in the commercial sector.	• **Service Provider model:** Given that the residential sector has tighter margins, Head of Term I provision must ensure that the service provider does not bear costs for leads that will not generate revenue. Therefore, early payments should be avoided. Payments will be made to the aggregator according to "*connected installations as one-off or ongoing*."[60] • **Partnership model:** Commissioning and payments per installation do not apply in this model since partners share revenue resulting of the service provided to the customer[61]. • **Lead generation model:** Similarly, the service provider should not pay for prospects before they become "*connected installations*"[62] to align future revenues and cash outflows.
Branding options	According to the interview with the customer association, simplicity, clarity, and familiarity with the service are very important factors for residential customers when it comes to smart energy services. The transparency and clearness of billing also impact the level of trust in these services.	• **Service Provider model:** N/A (the brand is owned by the service provider) • **Partnership model:** In the partnership model, the business partner (retailer) already has a customer base that it introduces to another partner. Head of Term I allows co-branding and labelling services by the commercial partner. Which not only introduces the new service to its

[58] Annex 2 Head of Term I §4.4.7
[59] Annex 2 Head of Term I §4.4.5
[60] Annex 2 Head of Term I §1.3
[61] Annex 2 Head of Term I §4.3.3
[62] Annex 2 Head of Term I §3.2

Head of Term element	Interview observation	Head of term proposition
		customers but also "*manages their opt in and opt out.*"[63] This provides customers with a degree of comfort with the brand, which is an important variable for households with low literacy levels. In addition, customers continue to benefit from a billing process, brand identity, and communication style that are familiar to them. • **Lead generation model:** N/a (lead generators do not deal with customers)
Revision, mediation, and arbitration	According to the interviews, regulatory instability, changes in subsidy and accounting policies have important impacts on the profitability of ESCOs, aggregators, and energy communities. These activities are sometimes multi-party chains, where a single problem can have repercussions on all related contracts.	When context, roles or stakeholders change agreement between parties, should stay workable. Head of Term I approach these challenges in a way that allows for provision adjustments, conflict resolution, and service continuation. In the **lead generation model**, the contract is subject to annual reviews[64]. In the **partnership model**, quarterly evaluations of performance objectives allow for corrective measures to be planned[65]. For the **service provider model,** dispute resolution measures were defined, involving mediation or arbitration[66].

Table 2 Interview lessons informing the bundled energy service master agreement

4.5.2.2 OSS- Customer Contract

Head of Term element	Interview observation	Head of term proposition
1. Object	Feedback from customer associations has revealed that customers with lower levels of literacy or limited knowledge of the market are more receptive to clear and simple solutions. This means that a clear understanding of the service and clarity of the value proposition increases the chances of sign-ups.	In the proposal for Head of Term II, the service provided is described in detail to the customer. These details of the "*products and services*"[67] will be included in an *Annex* attached to the contract to ensure that Head of Term II can be customized according to the provider's activity. Clarity is important to establish a reasonable level of trust and expectations regarding what is being paid for, the limits of the offer, and to ensure a certain willingness to consent, engage, and collaborate.

[63] Annex 2 Head of Term I §4.4.6
[64] Annex 2 Head of Term I §4.7.1
[65] Annex 2 Head of Term I §4.4.7
[66] Annex 2 Head of Term I §4.9
[67] Annex 3 Head of Term II §1

Head of Term element	Interview observation	Head of term proposition
2. Contract duration and renewal	When it comes to new energy services, adoption by households is closely linked to the financial incentives they receive, such as government subsidies. In terms of payment and ownership models, they prefer offers that are easy to understand and simple, allowing them to know exactly how much they will have to pay on a regular basis. As an example, direct ownership tends to be more appealing than other models such as performance-based payments. In addition, it has been recommended that trial periods be offered for innovative products to allow customers to test the systems and assess their suitability before committing.	Customer arrangements must be flexible to consider changes in energy tariffs, regulations, and government subsidies. And while the services offered are sensitive to the political context, this should not affect their perceptions experience. To this end, Head of Term II limits the commitment "*to one year, and will be tacitly extended for annual periods*"[68] to recalibrate provisions when necessary. In addition, Head of Term II considers convenience and speed, and allows remote subscription via e-signature. To prevent customer lock-in, the contract also allows a 14-day period to cancel the effects of the contract "*by sending the Provider the specific withdrawal document*" [69]. This is to give customers an easy way to leave the service if it does not work for them, as a sort of "try before you buy" option.
3. Billing and payments	Some energy services, such as demand response aggregation, are more complex and less profitable in the residential sector, particularly because lower margins are spread over a larger base. As mentioned earlier, clarity and transparency in billing are very important to customers so that they understand the costs before committing to a new product or service. One-time cost of ownership is also far better perceived. When it comes to contracts, service providers should avoid	In Head of Term II, the monthly payment configuration (*SEPA mandate*) is the option that meets customer preferences for certainty, predictability, and transparency. The proposed provisions foresee interest payments to avoid default or late payment[70].

[68] Annex 3 Head of Term II §4
[69] Annex 3 Head of Term II §11
[70] Annex 3 Head of Term II §5.2

Head of Term element	Interview observation	Head of term proposition
	imposing penalties on customers, as this increases conflict and high costs are unlikely to be accepted by customers. In addition, provisions should be made for the definition of dispute resolution and arbitration mechanisms.	
4. Termination and penalties	Customers receiving services from different providers may be affected when one provider defaults, which can have negative repercussions on other providers. In addition, long-term energy service agreements may be disrupted if one party changes during the term of the agreement (building owner, building manager).	Agreements with customers must include provisions for events that could lead to termination and disruption of the contract. These provisions must also safeguard against disputes when the contract is terminated. In Head of Term II, provisions were defined to ensure that termination could take place swiftly and smoothly in 5 events: mutual agreement of the parties, expiration of the term[71], request of the customer[72], breach by one party[73], or blocking of delivery by the supplier caused by events[74].
5. Assignment and subcontracting	The interviews highlighted that the services provided by several parties are fragile due to the cascade effect. Personnel and training costs are significant in the residential sector. One reason for this is the shortage of skills in new areas such as DSR aggregation. In addition, device integration was also cited as complex depending on the energy management solutions.	When the original provider exists, Head of Term II ensures that the service continues. Customers cannot be transferred to another service provider unless the initial providers ensures that the assignment maintains the initial conditions to safeguard comfort and trust[75]. In addition, subcontracting is permitted under the provisions[76] to give the service provider room to streamline processes and achieve economies of scale in terms of technical investments and personnel. In this case, the service provider is required to have customer's authorization.

[71] Annex 3 Head of Term II §8.1
[72] Annex 3 Head of Term II§8.3
[73] Annex 3 Head of Term II§8.2
[74] Annex 3 Head of Term II§8.3
[75] Annex 3 Head of Term II§10
[76] Annex 3 Head of Term II§12

Head of Term element	Interview observation	Head of term proposition
6. Data protection and control	Customer privacy was one of the most important areas that the customer association had to ensure was considered in contracts. The provisions must guarantee that customers can withdraw their consent and have access to redress mechanisms at any time to be protected against misuse and data collection on the one hand.	Head of Term II implements the principle of privacy by design and ensures that customers have control over their data and understand their rights and redress options. To do this, it describes third parties and their obligations in a clear way[77]. This means customers know who to talk to (DPOs and data controllers)[78] if they have any privacy-related questions or complaints. Head of Term II also provides different consent protocols with the option to withdraw consent for different processes and business purposes[79].
7. Communication	For complex or innovative energy services, discussions with energy communities and DSR aggregators reveal that service providers must ensure that communication channels are clear, stable, and allow for proactivity and customer feedback. For DSR activities in particular, customers need to be able to decide when to opt in and opt out. Aggregators should ensure that their customers are informed and understand why and when they are participating in the program and what their rewards are.	In Head of Term II, the official communication channels are defined [80], as well as the terms and conditions and the notification process for customers to ensure that they are informed of events and important changes, obligations, and applicable rates. Personal information required from customers and update deadlines are defined to ensure the traceability of communications[81].

Table 3 Interview lessons informing the OSS- customer contract

[77] Annex 3 Head of Term II§13.4
[78] Annex 3 Head of Term II§13.1
[79] Annex 3 Head of Term II§13.5
[80] Annex 3 Head of Term II§14.1
[81] Annex 3 Head of Term II§14.2

4.6 Conclusions on OSS Contractual Arrangements

This report outlines a replicable and scalable contractual framework for flexibility-cantered integrated energy services. Relationships between service providers can take several forms: partnership, service provision, and lead generation. The bundled energy service agreement (Head of Term II) accommodates these relationships while ensuring operational continuity and minimizing risks. The retail contract (Head of Term II) focuses on the customer's relationship with the one-stop shop.

Together, these two proposals facilitate one-stop shop delivery: Having a benchmark or a standardized template for OSS agreements not only enables bundled solutions to be launched with less friction but also makes it easier to scale and to finance. The proposal within this deliverable remains, however, a general framework designed to be tailored to each member state' regulations and service packages. For this reason, the agreements come as a stable core, remaining intact for most clauses (legal backbone, consumer safeguards) and adaptable annexes (for elements such as energy mix, prices, M&V, etc.).
Finally, it is essential to point out that this contract proposal assumes that suppliers receive reliable information on customer metering, can communicate with their devices, can aggregate the flexibility of small assets, and participate in the electricity and flexibility market. It's recognized, however, that electricity markets in EU member states have different levels of openness, development, and maturity, as well as and that regulations are similarly fragmented.

4.7 Bibliography on OSS Contractual Arrangements

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5. Annexes

5.1 Annex 1 Interview questions

Questions for Consumer Associations on Prosumer Activity

The purpose of this Survey is to obtain information concerning your vision and evaluation of certain aspects associated self-consumption, energy poverty, and consumers protection in your member state.

Prosumers activity

1. Do you find that current policies and current market structure encourage sufficiently households to become prosumers?
2. What recommendations does your association have to make self-consumption more attractive?
3. Do you believe people are fully informed about the benefits smart energy services and of becoming prosumers (their rights, their obligations, the available incentives…)
4. In your opinion, who is the first responsible on raising awareness about these opportunities?
5. How can permitting and administrative processes to become prosumers be improved and/or facilitated?
6. What recommendations do you have to set up a local energy marketplace for end-consumers (customers, SMES, communities…)?
7. What do you consider to be the most significant barrier(s) for becoming a prosumer?

Consumers protection

8. Are high energy prices an issue in your country? how is your association advocating for consumer protection in this regard?
9. What is your association's view on addressing energy poverty? Are there sufficient programs to support low-income households and ensure their access to affordable energy/ become prosumers?
10. Are there any support programmes targeting low-income households that address energy poverty by transforming them into prosumers?
11. What is your view on sharing consumer's data for new and innovative energy services?

Questions on Demand Response contracts

The purpose of this Survey is to obtain information concerning your vision and evaluation of certain aspects associated with Demand Response (DR) contracts.

General Information

1. How long has your company been involved in operation of demand response programmes?
2. What types of clients participates in your programmes?
3. Are the roles and responsibilities for all parties involved in contracting and activating DR (utilities, consumers, aggregators…), clearly defined in your country? is there particular overlaps or gaps?

4. Does the fragmentation and complexity of residential market impact significantly the costs of developing and implementing standardized DR protocols, and services model?
5. Have you experienced difficulties in making a clear business case for consumers to participate in flexibility services? If yes, what are the key challenges in making the financial incentives attractive to consumers?
6. How do you address the uncertainty in revenue generation due to the variability in energy market prices and customer behaviour in your contracts?
7. Have you encountered challenges related to data access and responsibilities in DR contracts? (e.g., who has the right to get access, who obtains customer permissions, who is responsible for data protection) Do these challenges impact the contractual arrangements with consumers?
8. Do customers show preference to manual or **automatic** demand response activation? Why?

Negotiation

1. Is there difficulty in complying with data security, or other legal obligations? Do they impact contract negotiation or service costs?
2. Have you had any difficulties or issues defining the terms of use of the facilities installed~~?~~
3. Have you encountered challenges in negotiating or defining the content and scope of risk-sharing and conflict resolution clauses in your contracts~~?~~
4. Do you have to set significant sale process? Did you face challenges in training your personnel to effectively sell the business model and in building trust with clients?
5. Does consumer limitation of control over energy systems impacts significantly the provisions and negotiations of contracts?

Execution

1. What measures have you planned to improve user trust in terms of loss of control over consumption?
2. What are the main barriers to effective tendering for DR contracts?
3. Have introduced penalties for non-compliance with consumption commitment or bonus for exceeding consumption target to encourage households to adjust their consumption behaviour? What was the impact of these measures?

Questions on Prosumers – Energy efficiency Service Contracts

The purpose of this Interview is to obtain information concerning your vision and evaluation of certain aspects associated with renewable energy service contracts.

General Information

1 What types of clients do you typically serve?

2 Does your company offer flexibility programs? How important is it to have clear roles and responsibilities defined for all parties involved in contracting and energy management (utilities, consumers, aggregators, regulators…), is this a particular issue in your country?

3 Does the fragmentation and complexity of residential market impact significantly the costs of developing and implementing standardized protocols, and services model?

4 What are the specific obstacles or challenges for smart energy service in the residential market?
5 Have you experienced difficulties in making a clear business case for consumers to participate in your services? If yes, what are the key challenges in making the financial incentives attractive to consumers?
6 Do you face uncertainty in revenue generation? How does your company address that?
7 Have you encountered challenges related to (energy, customer...) data access and responsibilities? (e.g., who has the right to get access, who obtains customer permissions, who is responsible for data protection) Do these challenges impact the contractual arrangements with consumers?

Negotiation

1. Is there difficulty in complying with data security regulations, health, safety, or insurance obligations or for the installed equipment? Do they impact contract negotiation, costs, or implementation? (if yes please explain the obligations and difficulties related to them)
2. Have you encountered challenges in negotiating or defining the content and scope of risk-sharing, liability for economic loss and conflict resolution clauses in your contracts?
3. Have you had any difficulties or issues defining the terms of use of the facilities installed? Do consumers show preferences for financing options for the installed equipment or fee structures?

Execution

1. What specific elements of contracts would benefit most from standardization?
    - Maintenance and support services
    - Equipment guarantees
    - Revenue and cost calculation
    - Demand side response service
2. Have you experienced any difficulties associated with specific building types? (condominium, single-family house, apartment building?)
3. In the event of a failure, do you face challenges in defining customer's rights and actions in your contracts? (e.g., direct intervention, recourse to a third-party supplier)
4. Have you introduced penalties for non-compliance with consumption commitments or bonuses for exceeding targets to encourage customers to control their consumption? Did these schemes work? How was the impact of these measures?
5. Do you have to set significant sale process? Did you face challenges in training your personnel to effectively sell the business model and in building trust with clients?

End of Contract

1. Are there challenges related to changes in control or ownership after the contracting period? Please describe the challenges.
2. What are the difficulties you face when defining the continuation of service at the end of the contract period? (e.g., whether the service will continue, equipment will be replaced, or the customer must seek another supplier)

Questions on Energy Community/ Cooperative

The purpose of this Interview is to obtain information concerning your vision and evaluation of certain aspects associated with Energy Community (EC) Contracts.

General Information

1. How long have you been involved in energy community?
2. Is your energy community compliant with EU Directives, specifically the *Renewable Energy Directive*[82] and the *Electricity Market Design Directive*[83]? These directives legally define Citizens Energy Communities (CECs) and Renewable Energy Communities (RECs)?
3. Is your energy community registered as a legal entity (cooperative or other forms?)? If so, does it have a designated legal representative authorized to manage contracts?

Governance, Decision Making and Citizen Rights

1. Do you have to set significant sale process? Did you face challenges in convincing a group to contract?
2. Are there parties (except the community association) or resources that would improve the creation and operation of energy communities in your experience?
3. Do any legal documents, such as statutes or terms of reference, define the operational structure and decision-making processes of your energy community? If so, please specify which documents apply?
4. How can energy communities improve stakeholder collaboration to prevent misinterpretation or misunderstandings of roles and responsibilities? Do you recommend any strategies?
5. In your opinion what are the elements that should be included in in contractual provisions to insure democratic governance and smooth decision-making process in the energy community? (majority? anonymity?)
6. Do you face challenges in defining benefits (revenue distribution, profit) and costs (maintenance, upgrades) shared between participants in the energy community? Which areas require more efforts to be accepted by participants?
7. Are there modalities and the limitations on profit distribution (e.g. dividends) clearly defined in your energy community's contracts? Additionally, are these limitations mandated by law or set internally by the community?
8. How does your contract asses financial risk? Are participants satisfied with this contract solution?
9. Have you faced difficulties defining clauses or negotiating conditions to leave the energy community? what conditions on contracts can be considered as excessive from citizen point of view?

Financing

1. In your view, how effective is contract standardization in reducing the time and costs associated to finance an energy community project?
   Additionally, are there specific challenges related to project risk assessment, sustainability goals, or other documentation that could be addressed through standardization to facilitate easier access to funding?

[82] Recast of the Renewable Energy Directive II (2018/2001)
[83] Recast of the Electricity Market Design Directive (2019/944)

Technical, technology and services

2. In your assessment, is it important to include risk mitigation tools, such as insurance or performance guarantees / savings guarantees? Do you use other tools? Please explain
3. How do you make sure that cost and pricing structure from ESCOs or technology or service providers align with you community revenues?
4. Are there specific contractual challenges or regulatory barriers associated with the installation and maintenance of the equipment? (e.g. definition of liability)

Questions on Energy performance contracts

The purpose of this Interview is to obtain information concerning your vision and evaluation of certain aspects associated with Energy Performance Contracts (EPCs).

General Information

9. Why ESCO Projects are limited in social housing or building blocks (assuming building ownership and decision-making are in the hand of one entity)
   (not profitable)

Negotiation

10. How important is the duration of an EPC in allowing your company to amortize investments?
11. What challenges do you face regarding the long-term duration of EPCs?
12. Have you faced difficulties when drafting or financing contracts with off-balance component?
13. What are the main barriers to effective tendering for EPCs?
14. What specific elements of EPC contracts would benefit most from standardization? Why?
15. Do consumers show a preference for certain fee structures? (fixed payments, variable payments... etc?) and which ones are preferred

16. What are the contract clauses or section where you mostly face difficulties when drafting them: termination clause, buyout...?
17. Do you have to set significant sale process? Did you face challenges in training your personnel to effectively sell the business model and in building trust with clients?
18. Have you encountered challenges in negotiating or defining the content and scope of risk-sharing and conflict resolution clauses in your contracts?

Execution

19. What improvements would you suggest for the M&V process to enhance reduce bias and increase consumer trust?
20. How do you currently handle the costs associated with performance monitoring and verification?
21. Would the involvement of an EPC facilitator help in engaging final customers, increasing his trust, and securing project management?

End of Contract

22. Are there challenges related to changes in control or ownership after the contracting period?

Question for Energy Authorities on Prosumer and DSR[84] Activities

The purpose of this Interview is to obtain information concerning your vision and evaluation of certain aspects associated self-consumption, energy communities, and demand side response in your member state.

Integration into energy policy and regulatory framework

1. How are prosumers and energy communities positioned in the national energy transition goals? Are there long-term policies to empower prosumers or energy communities (such as attractive feed-in tariffs, tax benefits, subsidies?)

2. Does the national legislation transpose EU Directives? Are there guidelines for existing energy communities who were active before transposition (cooperatives, associations). What is the current timeline for transposition?
   Are there any gaps or challenges for energy communities to transition from the old framework to the new one:
   - metering
   - retaining/ losing benefits
   - rights, limitations on doing commercial activities like selling energy to members and non-members?
   - tax benefits

   If the transposition did not take place, what steps will be taken to align with CEC and REC definitions?
3. What efforts are being made to reduce administrative complexity and accelerate the creation of energy communities?
4. Are there plans to adapt accounting and reporting burdens to smaller energy communities who are run by members and usually lack experts and personnel?

5. How does your institution ensure that prosumers (or households) are fully informed about their rights, responsibilities, and available incentives?

Permitting and infrastructure issues

1. Are there special procedures to simplify the permitting process for households to become prosumers (or energy communities)?
2. High connection costs and delays are often cited as barriers for prosumers. Is this the case in your country? Are there any plans to reduce grid connection fees or make them more transparent for small prosumers (and energy communities)?
3. Are there any measures being taken or planned to upgrade and expand the grid to accommodate more prosumers?
4. Are there any policy support or incentives for households to install energy storage systems (e.g. batteries, to avoid pressure on the grid or to reduce the electricity bill)?
6. Are there penalties for feeding electricity back to the grid or any grid access limitations for prosumers?

Demand side response and market participation

[84] Demand Side Response

1. What are the current regulatory barriers for aggregators in your country? Do they have any limitation on access to electricity market?
   Are there plans to create a more enabling environment for them to enter the market (or to operate more effectively if they already exist)?
2. Aggregators rely on access to accurate and timely energy data. Does the exiting legislation define clearly data-sharing process and the relationship and rights between DSOs and aggregators

5.2 Annex 2 Head of Term I

Bundled Energy Service Master Framework

I. Introduction

As part of the BungEES project, this document presents the heads of terms for three types of potential contracts: lead generation contract, partnership contract, and service provider contract. It is important to note that the Clean Energy Package does not clearly define the nature of the relationship between electricity suppliers and aggregators. Therefore, within the framework of the BungEES project, we propose to study all types of contracts to be considered.

II. Partnership types and parties

There are 3 types of partnerships detailed in this document: lead generation, partnership, and service provider contracts. For each section below, the specific characteristics and requirements of these three contractual relationships are described in detail, allowing for a clear understanding of their respective terms and conditions.

III. Head of Term

1 MODEL 1: Service provider

1.1 PURPOSE OF AGREEMENT

Commercial Partner offers DSR Aggregator to end users as part of a one stop shop offer.

1.2 SERVICES

Connection to DSR Aggregator technology giving end users the opportunity to reduce/monitor energy consumption.

1.3 FINANCIALS

Commercial Partner pays DSR aggregator for service. This may be one off or ongoing. Payments could be per connected installations as one off or ongoing.
Fees per connection could be reduced as volumes increase.

1.4 END CLIENTS

DSR aggregator services would be offered to existing and new clients. Parties would collaborate on marketing materials.
contracts would be:

a) DSR aggregator and Commercial Partner as per these heads of terms
b) between Commercial Partner and end user

Contractual relationships under 2 would end when contract 1 ends

1.5 TERRITORY

Spain (or a region of Spain) with the opportunity for roll out to other EU countries.
Territory to be as limited as possible, especially in the first instance

1.6 START DATE/DURATION/TERMINATION

Initial pilot phase of one year, then automatically renewed yearly.

Standard termination provisions
Termination by DSR aggregator:
if sales thresholds are not met (especially if there is some exclusivity)

2 MODEL 2: Partnership

2.1 PURPOSE OF AGREEMENT

Introduction of Commercial Partner's clients to DSR aggregator Services.
End client has the opportunity to opt out/opt in of different services

2.2 FINANCIALS

Each party will meet their costs in fulfilling the contract other than as below.
DSR aggregator services will be provided to the end client for no cost. Such cost may be split between DSR aggregator and Commercial Partner.
The consideration will be the opportunity for DSR aggregator to use the end client consumption data. If costs of installation have been split, then exploitation of data will be split. The split need not be 50/50.
Consideration for Commercial Partner will be an opportunity to offer a service to its customers.

2.3 END CLIENTS

DSR aggregator services will be offered existing and to all new clients
Contract will provide mechanisms so that DSR aggregator may seek consents from end users if needed and the client may have the option to continue with DSR aggregator when/ if they terminate their contract with Commercial Partner.

2.4 TERRITORY

Spain and any subsequent EU roll out.

3 MODEL 3: LEAD GENERATION

3.3 PURPOSE OF AGREEMENT

Commercial Partner introduces end clients to DSR aggregator for a fee
DSR aggregator provides its Services to end client
DSR aggregator may use and trade aggregated data

3.2 FINANCIALS

The contract will provide a consideration paid to Commercial Partner for introducing clients to DSR aggregator services. The consideration may be structured with targets or with thresholds to be met. Thresholds could be in relation to number of connected installations. Payments could be per connected installations as one off or ongoing.
To mitigate costs, DSR aggregator may charge end users for DSR aggregator services.

3.3 VOLTALIS SERVICES

Connection to DSR aggregator technology giving end users the opportunity to reduce/monitor energy consumption. However, services may grow and evolve.

3.4 END CLIENTS

End clients will be clients of DSR aggregator company.
The contractual relationship between DSR aggregator and end user may survive termination of contractual relationship between DSR aggregator and Commercial Partner

DSR aggregator services will be offered existing and new clients of Commercial Partner, using marketing materials produced jointly.

3.5 TERRITORY
Spain and subsequent roll out to other EU countries

IV. Appendices: Example for each type of contract

4.1 DEFINTION

Lead generation
4.1.1 Qualified Lead: Qualified lead refers to an existing or a potential new customer taking on the DSR solution (including hardware, or API or other communication protocol)
4.1.2 DSR Technology: Any hardware, software, metering devices, and systems provided or developed by the DSR technology provider, including but not limited to the VPP, hardware, and associated infrastructure.
4.1.3 VPP (Virtual Power Plant): The Software platform developed and owned by DSR Aggregator to aggregate and manage energy resources across multiple sites.
4.1.4 Demand Side Response (DSR): The process by which customers' energy consumption is adjusted or reduced to provide DSR volumes on power markets.
4.1.5 Installed Site: A site (household or commercial) shall be considered "Installed" when:
a/ the DSR has been successfully installed, activated, and commissioned at the premises, enabling its participation on the Virtual Power Plant (VPP) and Demand Side Response (DSR) services.
b/ An API has been successfully implemented between the appliance's manufacturer and the DSR aggregator, enabling the sites' appliances participation on the Virtual Power Plant (VPP) and Demand Side Response (DSR) services.
4.1.6 DSR CRM System: The proprietary Customer Relationship Management (CRM) platform operated by the DSR aggregator to track, manage, and maintain interactions with leads, customers, and partner companies. The CRM System ensures accurate recording of leads generated, monitoring of lead status, validation of installed households, and compliance with data privacy regulations.
4.1.7 Customer relationship: The DSR technology provider and aggregator maintain and keep the customer relationship.

Partnership
4.1.8 Branding: This refers to all DSR aggregator services that are marketed; under the Commercial Partner's brand when white labelling or under both Partners' brand when co-branding. This approach allows the Commercial Partner to offer the DSR solutions while maintaining their brand identity with their customers.
4.1.9 DSR Technology: This definition refers to all the technical elements mentioned previously, with an important feature: the ability to adapt and customize DSR solutions according to the Partner's specific needs.
4.1.10 Contractual Territory: This term designates the precise geographical area where the Partnership is active and operational. This clear delimitation prevents any overlap of activities and ensures optimal market coverage.
4.1.11 Customer relationship: Both Partners maintain and maintain the customer relationship.

Service Provider:
4.1.12 Technical Services: These services refer to all essential technical services: initial installation of DSR equipment, regular maintenance, and continuous technical support to ensure proper operation.
4.1.13 Service Levels: These commitments precisely define the Service Provider's quality standards and response times. They constitute a service guarantee to ensure the satisfaction of partners and end users.

4.2 SCOPE OF SERVICES
Lead generation
The parties are Lead Generator and DSR Provider.
4.2.1. Lead Generation Responsibilities: The Lead Generator shall be responsible for identifying and generating Qualified Leads for DSR technology installations, the Lead Generator acknowledges that they shall specifically target sectors agreed upon by both Parties.
4.2.2. Lead Submission and Verification: All leads must be submitted to DSR Provider for qualification. A lead shall only be considered a Qualified Lead if it meets the defined eligibility criteria and results in the successful installation and activation of the DSR Technology.
4.2.3. Compliance with Customer Agreement: The Lead Generator acknowledges that all customers generated under the agreement between the parties shall be subject to DSR Provider's Customer Agreement. The Lead Generator shall ensure that all potential leads are aware of and willing to enter into the Customer Agreement before submission.
4.2.4 Exclusive Rights: Lead Generator [will / will not] serve as the exclusive provider of lead generation services within the defined territory and market segment.

Partnership
The parties (together, refers to as Partners) are the Commercial Partner and the DSR Aggregator.
4.2.5. Partner Responsibilities: The Commercial Partner will oversee service commercialization and provide first-level customer support. These activities include promoting solutions and managing initial customer inquiries.
4.2.6. DSR Aggregator Responsibilities: The DSR Aggregator handles the technical aspect by providing specialized support and ensuring continuous maintenance of applications, thus guaranteeing the proper functioning of the entire system.

Service Provider
The parties are: Commercial Client and Service Provider
4.2.7. Installation: Installation services include equipment supply, on-site deployment, and complete system commissioning. This phase is crucial to ensure the initial proper functioning of the solutions
4.2.8. Maintenance: Preventive and corrective interventions

4.3 RENUMERATON AND TERMS PAYMENT
Lead generation
4.3.1. Payment Structure:
B2B2C Leads: The Lead Generator shall receive payment upon successful installations.
B2B Leads: The Lead Generator shall receive payment upon successful installations and/or commissioned onto the DSR Provider VPP platform.
4.3.2. Payment Conditions:
Payments shall be made only upon confirmation by DSR Provider VPP that the lead has resulted in fully operational installation.

Payments shall be made on a regular basis

Partnership

4.3.3 Revenue sharing on marketed services

A revenue sharing system will be established for marketed services, allowing for an equitable distribution of benefits generated through the sale and use of DSR Aggregator services.

4.3.4 Commission on energy savings achieved

A commission will be paid based on achieved KPIs, creating a direct incentive to optimize the energy efficiency of installations.

Service Provider

4.3.5 Fixed-rate pricing per intervention

A fixed rate will be applied for each technical intervention, providing transparency and predictability of costs for services rendered.

4.3.6 Quality target bonuses

Bonuses will be awarded when quality targets are met, encouraging the maintenance of high service and performance levels.

4.3.7 Invoicing

Regular invoicing with agreed payment terms, establishing a clear framework for financial management.

4.4 REPORTING AND VERIFICATION

Lead generation

4.4.1 Regular Reporting Obligations:

The Lead Generator shall, at the conclusion of each quarter, provide the DSR Provider with a report detailing the total number of Qualified Leads, along with supporting documentation to substantiate Qualified Leads.

4.4.2 DSR Provider will review and certify the report to ensure accuracy before payments are made to the Lead Generator based on the agreed payment structure

4.4.3 Audit and Verification:

DSR Provider shall reserve the right to audit the Lead Generator's records pertinent to Qualified Leads to authenticate the accuracy of reported installed capacities and corresponding remuneration calculations. Such audits shall be conducted at DSR Provider discretion as deemed necessary.

4.4.4 API Integration Reporting:

For API-enabled installations, the Lead Generator shall provide detailed reporting on successful API implementations between appliance manufacturers and the DSR aggregator, including the number of connected devices and their operational status.

Partnership

4.4.5 Regular report on joint commercial activity

These reports will track all commercial activities conducted jointly by DSR Provider and the Partner. It provides a clear view of the collaboration and results achieved.

4.4.6 Monitoring of revenue generated by joint services

Tracking of revenue generated by white co-branded or labelling services, which are marketed under the partner's brand while using DSR technology.

4.4.7 Quarterly performance targets evaluation

A regular evaluation of performance targets that measures the achievement of set objectives.

4.4.8 API Performance Monitoring:

Regular monitoring and reporting of API integration performance, including uptime, response times, and successful communication rates between connected devices and the DSR platform

Service provider

4.4.9 Weekly report on technical interventions
A regular report detailing all technical interventions performed, ensuring precise monitoring of maintenance and installation operations.
4.4.10 Monitoring of interventions and incidents
Continuous monitoring of interventions and incidents and reporting to the Partner to ensure service quality and quickly identify potential problems.
4.4.11 Quality control of installations by DSR Provider
Quality control of completed installations, ensuring that all installations meet the required technical standards.
4.4.12 API Integration Quality Assurance:
Regular verification of API integration quality, including testing of communication protocols, data accuracy, and system compatibility between manufacturer devices and the DSR platform

4.5 DATA PRIVACY AND COMPLIANCE

Lead generation

4.5.1 GDPR Compliance: All parties shall handle all personal data in compliance with GDPR and applicable privacy laws.
4.5.2 Data Ownership: All lead data collected under this Agreement shall be the exclusive property of DSR Provider. The Lead Generator shall not use, sell, or disclose such data without DSR Provider's prior written consent.

Partnership

4.5.3 GDPR Compliance: Both companies shall handle all personal data in compliance with GDPR and applicable privacy laws.
4.5.4 Joint responsibility for data processing:
Both companies jointly assume responsibility for data processing, involving close coordination in the management, protection, and use of customer information. This shared responsibility requires a clear definition of each party's roles and obligations.
4.5.5 Joint data protection procedures:
Common data protection procedures have been established to ensure a consistent and secure approach. These procedures cover the entire data lifecycle, from collection to deletion.

Service provider

4.5.6 Limited access to technical data for Partner:
Access to technical data for Partner is strictly limited to information necessary for the execution of agreed services. This restriction ensures the protection of sensitive information while enabling effective collaboration.

4.6 CONFIDENTIALITY

Note: The following terms and conditions apply identically to all three types of contracts (Lead Generation, Partnership, and Service Provider) – Except 5.6.1 see the note below

A: Lead generation

4.6.1. Non-Disclosure: Both Parties agree to keep all confidential information exchanged under their agreement strictly confidential and not disclose it to third parties without prior written consent.

Note: Lead Generation contracts specifically, information about load shedding events will not be communicated to the Partner.
4.6.2. Publicity: The DSR Provider and Commercial Partner shall not use the other's name, branding, or marketing materials without prior written approval.
4.6.3 Confidential Information: Each party undertakes to keep confidential all proprietary, non-public information exchanged under their agreement which includes but is not limited to customer lists, pricing data, and technical specifications and load shedding data.

4.7 TERM AND TERMINATION
Note: The following terms and conditions apply identically to all three types of contracts (Lead Generation, Partnership, and Service Provider)
4.7.1 Term of Agreement: The agreement shall become effective as of the date of signing a binding contract and continue for an agreed period unless terminated earlier. However, the parties will agree that their agreement will be subject to a review at specific anniversary dates. Agreement may be reviewed in response to market conditions, performance metrics, or changes in strategic objectives.
4.7.2 Termination for Convenience: Either party may terminate their agreement by giving an agreed written notice.
4.7.3 Post-Termination Obligations: Upon termination, outstanding fees owed prior to the termination date will be paid. Certain conditions relating to confidentiality and data will continue.
4.7.4 Customer relationship: Upon termination, the customer relationship is handed over (or not) according to contract terms.

4.8 LIMITATION OF LIABILITY
Note: The following terms and conditions apply identically to all three types of contracts (Lead Generation, Partnership, and Service Provider)
Limitation of Damages: DSR Provider's liability will be limited to direct damages resulting from its obligations under the chosen agreement. Under no circumstances shall DSR Provider be liable for indirect, special, or consequential damages.

4.9 DISPUTE RESOLUTION
Note: The following terms and conditions apply identically to all three types of contracts (Lead Generation, Partnership, and Service Provider)
Resolution of Disputes: In the event of any disagreement arising from their agreement, both parties will agree to pursue amicable resolution through negotiation, failing which disputes may proceed to mediation or arbitration. Both parties shall bear costs equally, except as otherwise determined.

4.10 INTELLECTUAL PROPERTY RIGHTS
Note: The following terms and conditions apply identically to all three types of contracts (Lead Generation, Partnership, and Service Provider)
Ownership of Intellectual Property: IP can be shared or not, depending on type of partnership and contractual clauses. However, each party shall maintain ownership of its IP throughout the agreement.

4.11 GOVERNING LAW
Note: The following terms and conditions apply identically to all three types of contracts (Lead Generation, Partnership, and Service Provider)

Jurisdiction: The agreement shall be governed by and construed in accordance with the laws of a European country where one of the parties is based.

5.3 Annex 3 Head of Term II

Service Provision Contract for Integrated Energy Service Package (OSS-Customer Contract)

In one of of 20

Gathered

On one side, (_____), domiciled in (_____) and NIF (_____), registered in the Mercantile Registry of (_____), represented by (_____), of legal age, with DNI (_____), in their capacity as (_____), with the powers conferred on her by the deed of power of attorney by the Notary of (_____) D./Mrs. (_____), on date (_____) (hereinafter, "The Provider").

On the other hand, [client Name] , domiciled at and NIF (hereinafter, the "End Customer").

Hereinafter, the Provider and the End Customer will be jointly referred to as the "Parties" and individually as a "Party".

Exposed

I. The Provider is a company that professionally helps, maintenance and, in general, value-added services (hereinafter, the "Products and Services") and is duly authorised to carry out the activities.
II. The End Customer is a natural person/self-employed entrepreneur/company that is interested in receiving the provision of the Products and Services of the Provider, being legally qualified to sign this Contract without any legal contradiction that allows it in accordance with the applicable regulations[85].
III. In view of the above, the Parties, mutually recognizing, in the respective capacities in which they act, sufficient legal capacity to contract and bind each other, formalize this contract, which is made up of General Conditions and Specific Conditions (hereinafter, the "Contract") based on the following:

CLAUSES

1. OBJECT

[85] In this clause “applicable regulation” should be adapted in accordance with local legislation.

1.1. The purpose of this Contract is to regulate the terms and conditions under which the Provider undertakes to provide the End Customer with the Products and Services detailed in the Annex (_____)[86], in accordance with the provisions of said Annex and the conditions of this Contract.

In general, the Products and Services will consist of:

- Technical assistance in the CLIENT's energy installations.
- Preventive and/or corrective maintenance of electrical, thermal, or other equipment detailed in the Annex attached to the contract.
- Value-added services, such as consumption monitoring, energy efficiency, savings proposals, etc.

The Products and Services to be developed by the Provider will be at the following address:

[(_____)[87]

2. NON-EXCLUSIVITY

2.1 The Provider may provide the Products and Services to other End Customers, so it is not exclusively linked to the End Customer signing this Contract.

2.2 Similarly, the End Customer may contract with another Provider other products like those set forth herein in everything that the Provider is not helping in accordance with the provisions of the Annex attached to the contract.

3. INDEPENDENCE OF THE PARTIES[88]

Both companies are independent of each other without any corporate relationship between them, nor do they share shareholders or management teams or administrators, nor is the generation of a corporate relationship between the Parties, nor of association, agency, branch, or representation.

In addition, the End Customer manages its own resources and has full capacity when it comes to hiring workers or deciding on its selection strategies. In no case does the End Client use the material means of the principal, nor is it subject to the supervision of the principal.

Therefore, no relationship or employment relationship arises between the Parties, nor between the End Client and the personnel assigned by the End Client to provide the services described in the object of the Contract.

To this end, the Parties expressly state that the personnel assigned to the provision of the services by the End Client act under the instructions and directives of the End Client, without the Provider being involved in the management of the personnel.

4. DURATION OF THE CONTRACT AND ACCEPTANCE

[86] Annexes should be developed by the service provider according to the service and product.
[87] The signatory must fill in the address where the services are to be provided.
[88] This clause should only be added if the end customer is not a natural person.

Unless a different duration is provided in the Annexes, this Contract will have a duration of one year, and will be tacitly extended for annual periods, unless denounced by either party at least one month prior to the date on which it is to be terminated, without prejudice to the provisions of Clause 5 below.

Prior to the entry into force of this Contract, the Provider may consult files with information on financial solvency and credit, as well as the End Customer insolvency situation. The Provider reserves the right to obtain solvency data of objective criteria, being fully eligible by the Provider whether to proceed with the acceptance of the Contract or not.

In contracts concluded at a distance, the End Customer may sign this Contract by means of a recognized electronic signature. By signing this Contract, the Client consents to the use of the recognized electronic signature in all its contractual relations with the Provider. In any case, the signature must comply with the provisions of REGULATION (EU) No 910/2014 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL, of 23 July 2014, on electronic signature, as well as the provisions of the local legislation.

This Contract will enter into force on the date of its signature.

5. REMUNERATION

5.1. Service price

The price of the Service will be detailed in the Annex (_____) attached to the contract.

The fees mentioned do not include VAT[89], nor the expenses incurred for the provision of the Service by The Provider that are excluded or exceed what is agreed between the Parties in Annex (_____) attached to the contract, such as travel, accommodation, meals, excess budget in parts or other similar expenses.

The extra costs must be assumed by the Provider in accordance with this Contract will only be paid by the End Customer when they meet the following requirements:

- They have been previously authorized by the End Customer according to a separate budget, which will form an integral part of this Contract.

5.2. Accrual

The Provider will be billed to the End Customer monthly and will be charged by direct debit 14 days from the date of issue of the invoice.

For the authorisation by the End Customer of the Direct Debit, the End Customer will sign the corresponding SEPA mandate, which will form an integral part of this Contract.

If the agreed period elapsed without the payment having been made, the Provider will have the right, without the need for prior notice, to increase the overdue debt with a default interest resulting from applying the legal interest rate of money plus a defined[90] percentage points.

[89] The signatories must take into consideration others applicable taxes in accordance with local legislation.
[90] The amount should be defined and stated in the contract

If the End Customer, in a justified manner and in good faith, considers that the invoice issued by the Provider is not correct, it must notify it including the reasons and amount of the discrepancy and will proceed to the payment, within the terms determined in the invoice, of the amount not disputed.

If there are credit and debit balances at the same time between the Parties, it is expressly recognized that such credits and debts may be offset against each other.

6. OBLIGATIONS OF THE PROVIDER

The Provider, in accordance with the provisions of this Contract and the Annexes that comprise it, undertakes to:

- Execute the services in accordance with the deadlines and specifications stipulated in the Annex attached to the contract.
- Execute the services in accordance with current technical and safety regulations.
- Have qualified and sufficient personnel for the provision of the services.
- Inform the End Customer of relevant incidents or recommended improvements in the place of provision of the Products and Services.

The following will not be the object of this Contract[91]:

- Inspections, assistance, or repairs carried out by personnel other than the Provider in relation to the Equipment.
- The repair of breakdowns in those elements that are owned by companies other than the Provider or those that are owned by the Client and that are not included in the Annex attached to the contact, as well as the incorrect operation of elements owned by companies outside the Provider.
- The correction of defects or breakdowns arising from the electrical installations owned by the Client unless they are included in the provision of the Products and Services in accordance with the Annex attached to the contract.
- The repair of damage or breakdowns derived from the location of the Equipment, its improper, negligent, or improper handling or use by the End Customer or by a third party that has not been designated by the Provider.
- Aesthetic improvements requested by the Client with respect to the installation that are not linked to its correct operation. Any aesthetic improvement will be considered any embellishing structures of the components, hiding wiring of the installation, installation of the components in preferential places, request for specific brands or materials, request for preferential interventions, request for specific lifting material, etc.

7. OBLIGATIONS OF THE END CUSTOMER

[91] The activities excluded from the scope of the contract are provided for illustrative purposes only. They must be reviewed and adjusted according to the products ultimately developed by the business.

The End Customer, in accordance with the provisions of this Contract and the Annexes that compose it, undertakes to:

- Allow access to the facilities indicated in Clause 1 to provide the Products and Services that are the subject of this Contract.
- Provide the necessary information and documentation required by the Provider for an adequate service.
- Pay the agreed amounts within the established deadlines.

8. TERMINATION OF THE CONTRACT

8.1. This Contract will be terminated at any time, by mutual Contract of the Parties, and upon expiration of the term provided for its validity.

8.2. In addition to the causes provided for by law, any breach of the obligations assumed by the Parties in this Contract will be cause for termination. In such a case, neither Party will be subject to the payment of any penalty.

8.3. Likewise, either Party may terminate the Contract with at least one (1) months' notice. If the End Customer terminates the Contract early without justified cause in accordance with this provision, it will be subject to the payment of the penalty set out in Clause 9.

8.3. Specifically, by way of example and not limitation, The Provider may immediately terminate the Contract by:

- Impossibility of access to the Facility subject to the provision of the Products and Services for reasons attributable to the End Customer.
- Refusal by the End Customer to provide the information or documentation required by the Provider.
- Failure to pay the agreed amounts in the amount of 2 (two) monthly instalments[92].

9. PENALTIES[93]

In the event of unilateral termination by the End Customer not justified by the breach of contract by the Provider, the End Customer must pay the outstanding fees until the end of the current contractual period, corresponding to the Products and Services contracted in accordance with the Annex attached to the contract.

10. ASSIGNMENT

10.1. The relationships and rights derived from this Contract are of a very personal nature, so the End Customer may not assign, or transfer, under any legal title the rights and obligations derived from this Contract, nor be replaced by a third party in them, without the express, prior and written authorization of The Provider.

[92] The indicated period should be defined and valued by business
[93] The penalties should be defined and valued by business

10.2. Any total or partial assignment without consent will cause the automatic termination of the Contract and the provisions of Clause 9 will apply.

10.3. The Provider may, however, assign its contractual position to another entity that provides the Products and Services under the same conditions as the Provider.

11. RIGHT OF WITHDRAWAL

Within fourteen calendar days from the signing of this Contract, the Client may cancel the effects of this Contract, by sending the Provider the specific withdrawal document for this purpose.

12. SUBCONTRACTING

The Provider may subcontract, in whole or in part, with third parties, who have all the required authorisations, the execution of the corresponding Products and Services without the need for any authorisation from the End Client.

13. DATA PROTECTION

13.1. This Privacy Policy informs about the processing of personal data collected by the data controller (as defined below), as required by law, including the provisions of the European Union's General Data Protection Regulation ('GDPR'). Personal data will be controlled and processed by the data controller in accordance with the terms of this Privacy Policy.

1. Responsible for the processing of personal data:

DATA CONTROLLER: (_____) (hereinafter referred to as the Provider)

CIF: (_____)

CONTACT ADDRESS: (_____)

DATA PROTECTION OFFICER: (_____)

2. Purposes and legitimacy of the processing of personal data:

The personal data provided by the End Customer at the time of contracting and pre-contracting, as well as the personal data that subsequently derived from contractual relations, will be incorporated into the "Customers" processing activity.

A. Management of the Provider's products and services, End Customer's personal data is used for the management of the products and services contracted, which includes attention to queries, informative communications, invoicing, advice on contracting processes.

The legitimacy for the processing of personal data is the execution of the contract.

B. Management of pre-contractual relationships: The Provider processes the personal data of POTENTIAL CUSTOMERS for the purpose of providing, managing, controlling, and maintaining the pre-contractual relationships requested by the latter. In certain contracts with the Provider.

The legitimacy for the processing of data is the application of pre-contractual measures.

C. Management of queries or suggestions that users may make through web forms.

The legitimacy for the processing of personal data is consent.

D. Call recording: The Provider makes recordings of calls with the End Customer in order to provide, manage, control and maintain pre-contractual and contractual relationships, in the event that it is necessary, the Provider may use these recordings to deal with possible actions or claims that may be undertaken.

The legitimacy for the processing of data is the execution of the contract and for the satisfaction of the legitimate interest in maintaining the quality of the service and keeping a record of these to verify the integrity of these calls.

E. Consultation of information files on financial solvency and credit: The Provider processes the End Customer's data for the purpose of carrying out financial risk analysis of the End Customer and comparing their economic solvency data, in full compliance with the applicable regulations.

In the same way, and subject to current regulations, the customer is informed that failure to comply with the obligations to pay for the energy supply assumed under the contract may lead to the inclusion of their personal data in a solvency and credit file as established in clause 4.

Legitimacy for the satisfaction of the Provider's legitimate interest to the extent that it is necessary to know the economic capacity of an End Customer. In this sense, data protection regulations do provide for the inclusion and consultation of companies to this type of file.

F. Compliance with legal obligations imposed.

The Provider processes the End Customer's data to comply with the accounting, legal, tax and administrative obligations associated with contractual relations.

Legitimacy for data processing in compliance with a legal obligation.

Lawfulness of the Processing: Legitimacy for the execution of the contract and for compliance with a legal obligation.

G. Commercial and Marketing Purposes

Provided that the customer has given their consent for the following purposes in addition to the activity of the data controller:

-Market research, economic analysis, statistics and where appropriate, profiling to develop automated individual decisions.

-Marketing of the services of the data controller and/or a third party, sending advertising/information/promotional material and participating in initiatives and offers aimed at rewarding the data controller's customers.

-Surveys of the degree of customer satisfaction with the quality of the services provided.

These activities may relate to the Provider's products and services as well as those of its business partners and may also be carried out through an automated call service, without the intervention of an operator, including email.

Consent to this data processing and communication to these indicated subjects is optional and can be revoked at any time by contacting customer service, or at the email address (_____).

3. Periods or Criteria for the retention of personal data.

The personal data to which access is obtained will be processed for the duration of the contractual relationship. In this sense, the Provider will keep the personal data once the contractual relationship has ended, duly blocked, during the limitation period of the actions that may arise from the relationship maintained with the interested party.

Finally, and only if you have consented to their processing, the Provider will process your personal data once the contractual relationship has ended to re-offer you products, services, or promotions in the energy solutions sector, for 5 years.

4. Recipients of personal data

The personal data processed to achieve the purposes detailed above may be communicated to ensure the correct development of the contractual relationship, as well as to comply with legal obligations imposed on the Provider and will be in relation to the following Companies and Public Bodies:

-Suppliers to whom the Provider contracts part of the services, to comply with the contractual relationship with the Client, such as companies specialized in credit recovery.

-In the event that the Client has consented, the Provider will communicate Client data to third-party partner companies or collaborators.

-Competent Public Administrations, Courts and Tribunals, and Data Protection Authorities, to comply with the applicable legal obligations.

5. Customer's Rights

The End Customer may exercise, at any time, their rights of access, rectification, deletion, opposition, limitation of their processing and portability of their personal data, when applicable, by sending an email to (_____) attaching a copy of their DNI, NIE, passport or equivalent document. The Provider will process your request within the legally established period of one month from receipt of the request. This period may be extended by a further two months if necessary, considering the complexity and number of applications.

The interested party may withdraw their consent granted at any time, opposing the processing of their data if they have granted it for a specific purpose, being able to modify their preferences at any time.

The End Customer, especially when they have not obtained satisfaction in the exercise of their rights, may file a complaint regarding data protection authority and regulations in applications[94] .

The End Customer has been informed of the Provider's Privacy and Data Protection Policy, and grants their consent for the purposes indicated below:

In (_____) to (_____) of (_____) of (_____).

Customer:

NIF/CIF:

Signature:

[94] National data protection authority and the regulations in application should be identified according of the respective country.

The End Customer declares to have read the information on the processing of personal data, contained in Clause 13 of the General Terms and Conditions of Contract. By ticking the following boxes, the Client may freely decide whether to give consent to the Provider for the following purposes:

- ☐ I agree to receive promotions, sweepstakes, and news on products and services from the Provider.
- ☐ I accept that the Provider or third-party Collaborators may, where appropriate, carry out a market analysis based on my profile, to draw up automated individual decisions that fit it.
- ☐ I agree to receive promotions, advertising and news on products and services from third party collaborators of the Provider, related to my supply contract or for services related to it.

14. COMMUNICATIONS

14.1. The Parties establish that communications made through any means at the following addresses, in addition to those made through the portal owned by The Provider, will be valid:

THE PROVIDER:

i. Contact Person: (_____)
ii. Email: (_____)
iii. Postal address: (_____)

THE END CUSTOMER:

i. Contact person: (_____)
ii. Email: (_____)
iii. Postal address: (_____)

Notices made under this Contract shall be deemed to have been given on the date of receipt by the addressee or on the date on which such service is attempted at the address indicated for that purpose.

14.2. The change of any of the domiciles of the Parties shall not be deemed to have occurred, nor shall it produce any effect in relation to this Contract, until the new domicile has been reliably notified to the other Party and fifteen (15) days have elapsed since the reliable notification.

15.- FORCE MAJEURE

If, due to "Force Majeure" (force majeure being understood as the cases set out in the applicable national legal order of each country), the Provider considers that it is not possible to comply with the obligations established throughout this Contract and Annexes, the Provider must notify the End Customer as soon as possible, the incidents that in its opinion constitute Force Majeure.

The party affected by Force Majeure must take all reasonable measures within its reach to minimize the impact that the effects of Force Majeure could generate on the fulfilment of its obligations derived from this Contract. If the affected party does not take all the measures within its reach, it will be liable to the other, understood as a breach of the Contract and the complying party may also immediately terminate the Contract and claim damages from the other party.

16.- LEGISLATION AND JURISDICTION

16.1. This Contract is subject to law (_____)[95].

16.2. The Courts of (_____)[96] shall be competent to hear all actions arising from this Contract.

And as proof of conformity, the Parties sign this Contract at the place and date indicated in the heading.

The Provider	The End Customer
The Attorney-in-Fact	The Attorney-in-Fact

[95] The law in application should be identified according of the respective country
[96] The competent should be identified according of the respective country

Specific Conditions

Identification data of the End Customer	Name:
	Representative:
	NIF
	Domicile:
	Telephone:
	Email:
Credit bank account	
Settlement method and periodicity	Transfer/Monthly
Contract Duration	End of the year
Territorial scope of the services provided by the End Customer	National
Channel number *(to be filled in by the Provider)*	

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