DE-RISK

GREEN PAPER

Financing Local Flexibility Markets

INTRODUCTION

The following Green Paper serves as a strategic document, outlining financial schemes for Local Flexibility Markets (LFMs) and drawing insights from the DE-RISK project's D3.4 deliverable titled "**Financial schemes: funding the customer journey via traditional and innovative mechanisms**".

This document is specifically aimed at informing decision-makers, including investors, LFM solution providers, policymakers, and local actors, about the current financial landscape and suitable mechanisms for LFMs, thereby supporting informed decision-making and future funding campaigns.

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1) IDENTIFYING FINANCING NEEDS FOR DEPLOYING TECHNOLOGIES THAT ENABLE LOCAL FLEXIBILITY MARKETS (LFMS), SUCH AS METERS, SENSORS, CONTROLLERS, STORAGE UNITS, AND SMART APPLIANCES.

The effective implementation of LFMs necessitates significant, albeit often granular, investments in various enabling technologies. These include foundational smart metering infrastructure, advanced sensors for real-time data collection, sophisticated controllers for energy flow management, diverse energy storage units (e.g., batteries, thermal storage), and a wide array of smart appliances (e.g., smart thermostats, smart plugs, electric vehicle chargers). These technologies collectively form the backbone of a responsive and dynamic LFM. While individual household investments in these assets might be relatively small, the aggregated investment across a community or a group of households can reach substantial sums. The strategic focus for financing is therefore on LFM investments that can involve a collective of household owners, particularly those organized within a legal entity such as an energy community, a cooperative, or a community of owners in a residential building. For instance, DE-RISK residential pilots suggest a theoretical LFM investment budget ranging from €15,000 to €50,000 for such aggregated projects, encompassing a strategic mix of these essential assets. This collective approach is crucial for achieving economies of scale and making projects more attractive to financiers.

2) DESCRIBING CURRENT CHALLENGES AND GAPS IN EXISTING FINANCING SYSTEMS, ESPECIALLY FOR LOCAL AND CITIZEN-DRIVEN ENERGY FLEXIBILITY SOLUTIONS.

Existing financing systems present several significant challenges and gaps for the deployment of local and citizen-driven energy flexibility solutions. A primary barrier is the persistent lack of understanding and alignment between conventional financial institutions and the unique characteristics of energy efficiency (EE) and LFM projects. Traditional banks are typically structured to finance large-scale, high-value projects with clear revenue streams, making the relatively small, distributed, and often savings-driven nature of individual or community-level LFM investments unattractive or economically inefficient due to high transaction costs. The benefits derived from EE and flexibility, often realized as cost savings rather than direct, quantifiable revenues, complicate traditional risk assessment and collateral requirements.

Further challenges include:

- High Upfront Costs: Despite long-term savings, the initial capital outlay for LFM technologies can be prohibitive for many citizens and small energy communities.
- Management and Transaction Costs: The administrative burden and costs associated with securing financing for numerous small-scale projects can be disproportionately high.
- Uncertainty of Outcomes: While projected, the exact magnitude of energy bill reductions or flexibility service revenues can carry perceived uncertainty, increasing financial risk for lenders.

- Creditworthiness and Indebtedness: Individual citizens or nascent energy communities may face difficulties meeting traditional creditworthiness criteria, or their existing indebtedness may limit access to further loans.
- Bureaucratic Hurdles for Public Funds: While public subsidies and low-interest public loans exist, they often come with complex application processes, lengthy approval times, and the requirement for beneficiaries to pay upfront for assets before reimbursement, creating significant liquidity challenges. This gap often leads to a "valley of death" where innovative, small-scale projects struggle to bridge the gap between initial development and scalable deployment due to a lack of suitable financing.

3) EXPLORING INNOVATIVE FINANCING INSTRUMENTS, INCLUDING CROWDFUNDING, THIRD-PARTY INVESTMENTS, BLENDED FINANCE, AND PERFORMANCE-BASED MODELS.

Innovative financial mechanisms are crucial for democratizing access to LFM investments and bridging the gaps left by traditional finance.

- **Crowdfunding and Crowdlending:** These collective mechanisms leverage digital platforms to enable communities and individuals to jointly invest in and benefit from sustainable energy projects.
- Crowdlending (Debt Crowdfunding): Community members act as lenders, providing capital for projects and receiving interest payments in return. This model is particularly effective for democratizing energy financing, allowing a broad base of citizens to participate and share in the financial returns of local energy initiatives. It helps overcome traditional financing obstacles by diversifying the funding source and fostering community ownership.
- Equity Crowdfunding: Investors receive a share of ownership in the project or entity.
- Debt-Securities Crowdfunding: Issuing transferable debt instruments to a large number of investors.

To better understand the comparative advantages of innovative financial tools for LFM implementation, the following table outlines key distinctions between traditional and emerging financing models.

CRITERIA	TRADITIONAL FINANCE	INNOVATIVE FINANCE (E.G., CROWDFUNDING, PPPS)
Project Size	Large-scale, centralized	Small to medium-scale, decentralized
Risk Appetite	Low, conservative	Medium to high (with de-risking mechanisms)
Accessibility	Limited (complex processes, strict criteria)	Broad (community participation, easier entry points)
Speed of Deployment	Slow (bureaucratic approval chains)	Fast (digital platforms, local action)
Return Expectation	Predictable, interest-bearing	Diverse (interest, equity share, environmental co-benefits)
Citizen Involvement	Passive (ratepayers, borrowers)	Active (co-investors, owners, decision - makers)

Example from DE-RISK Project: As an example of this modality, the DE-RISK project itself is undertaking a real crowdlending campaign for the assets of its Murcia-located Spanish LFM pilot. This initiative, detailed in Deliverable D3.5 ("Democratising the RES investments: DE-RISK crowdfunding campaign"), aims to demonstrate the practical application and results of crowdlending for LFM-related investments.

Key figures of the DE-RISK Murcia pilot project crowdlending campaign

Project Objective: To increase the scope of the DE-RISK project by incorporating a new home in Murcia (Spain) into the local energy flexibility pilot, specifically funding a photovoltaic self-consumption system and electricity consumption monitoring devices to improve Energy Efficiency (EE) and explore participation in local flexibility markets.

Borrower: MY ENERGIA ONER SL (MIW), an energy company based in Murcia, Spain.

Crowdlending Platform: ECROWD's Crowdlending Service Provider platform, licensed by the Spanish CNMV authority.

Campaign URL: www.ecrowdinvest.com/en/details/deriskprojectmurcia

Minimum Investment Amount per person: €50

Maximum Investment Amount per person: €300 (set to encourage a higher number of investors).

Start Date: September 10th, 2024.

Phase 1 (Sept 10 - 16, 2024 - Murcia City Residents): 6 local investors contributed €1,500 (average €250 per person).

Phase 2 (Sept 17 - 23, 2024 - Murcia Region Investors): 5 investors contributed €1,250 (average €250 per person).

Final Phase (Open to all): 17 investors contributed €3,750 (average €220 per person).

Date 100% Fundraising Objective Achieved: September 25th, 2024.

Date Collective Loan Formalized: October 1st, 2024.

- **Energy Saving Certificates (ESC):** Inspired by successful models like the French "Certificats d'Economies d'Energie" (CEE), this market-based mechanism incentivizes investments in energy efficiency. Energy suppliers are mandated to achieve specific energy savings targets. They can meet these targets by promoting and funding EE projects for consumers, who then receive transferable certificates representing the achieved savings. These certificates can be traded, providing an income source for the project promoter, though initial upfront investment for assets is still required.
- **Dutch GVR On-Property Tax (Betterment Tax):** Drawing inspiration from the American Property Assessed Clean Energy (PACE) model, this mechanism allows the repayment of energy efficiency investments through an existing monthly property tax bill, typically over a period

of up to 30 years. This makes energy retrofits highly affordable, as repayments are tied to the property and often structured so they never exceed the energy savings achieved, making it a powerful tool against energy poverty.

- **"MES Barcelona" Public-Private Partnership (PPP) mechanism:** The Barcelona Sustainable Energy Mechanism (MES) exemplifies an innovative PPP tool designed to co-invest with private companies. Its primary objective is to support the deployment of solar energy on rooftops and comprehensive energy retrofitting of buildings, ideally with zero upfront investment required from building owners. This model demonstrates how public entities can de-risk projects and attract private capital for urban energy transitions.
- **Italian Superbonus and Ecobonus:** These government funding schemes are significant examples of national incentives. They provide substantial tax deductions (e.g., 110% for Superbonus) on costs related to energetic renovation works and seismic improvements, aimed at improving buildings' energy ratings. These bonuses can be directly deducted from taxes or transferred to banks for financing, effectively reducing the financial burden on homeowners and stimulating a large volume of EE investments.

4) OUTLINING FINANCING PROTOCOLS AND GOOD PRACTICES TO ATTRACT BOTH PUBLIC AND PRIVATE CAPITAL.

Attracting both public and private capital for LFMs requires robust financing protocols and adherence to good practices that build trust and mitigate perceived risks.

- Transparency and Clear Communication: For collective financing mechanisms like crowdfunding and crowdlending, establishing open lines of communication, clearly defined project objectives, transparent financial reporting, and robust accountability procedures are paramount. Community members and investors need comprehensive, easily understandable information about the projects they are supporting, including expected returns, risks, and environmental impacts.
- Fiscal Responsibility and Effective Implementation: Systems must guarantee the fiscal responsibility of each actor involved and ensure the effective, verifiable implementation of energy-related investments. This includes clear contractual agreements and monitoring frameworks.
- Harmonization with National Regulations: The success of innovative mechanisms like the Dutch GVR (PACE-like models) hinges on supportive national tax regulations and the adoption of similar legal frameworks across other European countries. Policymakers should work to harmonize these frameworks to enable wider adoption.

- Aggregated Financing and Streamlined Processes: For schemes like On-Bill Recovery (OBR), close coordination and formal agreements between electricity companies (or utilities) and asset suppliers are essential. This simplifies the repayment process for consumers and allows suppliers to seek aggregated financing from banks for multiple projects, making smaller, individual projects more attractive to larger financial institutions.
- Leveraging Public Subsidies Strategically: While public subsidies often involve bureaucratic hurdles, they remain vital mechanisms of direct financial aid that align with broader energy policies. Good practice involves designing these subsidies to be less burdensome, perhaps through simplified application processes, upfront payments, or integration with other financing tools (blended finance).
- Risk Mitigation and Standardization: Developing standardized project assessment methodologies, performance monitoring frameworks, and clear legal structures can help de-risk LFM investments for private capital. This includes standardizing contracts for flexibility services and ensuring clear ownership and operational models for shared assets.

5) INCORPORATING STAKEHOLDER INSIGHTS GATHERED THROUGH INTERVIEWS AND CONSULTATIONS WITH FINANCIERS, EU OFFICIALS, AND LFM ACTORS.

While anonymized, the insights in this Green Paper are drawn from extensive consultations with financiers, EU officials, and LFM actors, ensuring cross-sectoral representation of their perspectives.

- Financiers' Perspectives: Insights from financiers highlight their preference for larger, de-risked projects with predictable revenue streams. Their reluctance to engage with small-scale, distributed energy projects stems from high transaction costs, perceived complexity, and a lack of standardized financial products tailored for EE and flexibility. This informs the emphasis on aggregation models and innovative, non-banking financing.
- LFM Actors' Needs: LFM solution providers and local actors (e.g., energy communities) consistently express a need for accessible, affordable, and less bureaucratic financing options. They often face challenges with upfront capital, managing project complexity, and navigating traditional loan applications. This drives the exploration of community-based financing, public-private partnerships, and simplified subsidy access.
- EU Officials' Priorities: Consultations with EU officials underscore the policy imperative

to accelerate energy efficiency and renewable energy deployment, align with climate goals, and foster citizen participation. Their insights point to the need for regulatory frameworks that support innovation, market mechanisms that incentivize EE, and blended finance approaches that leverage public funds to unlock private investment. The establishment of initiatives like the European Energy Efficiency Financing Coalition directly reflects these insights, aiming to create a more favorable market environment and facilitate private finance mobilization. The challenges with bureaucratic processes for public funds are also a direct feedback loop from beneficiaries and policy implementers.

6) PROVIDING POLICY RECOMMENDATIONS TO SUPPORT THE SCALING UP OF LFMS AND INTEGRATION INTO NATIONAL AND EU ENERGY MARKETS.

To effectively scale up LFMs and integrate them into national and EU energy markets, a concerted policy effort is required, building on the insights and innovative mechanisms explored.

- Promoting Supportive Regulatory Frameworks: Policymakers should actively champion and facilitate the adoption of supportive local and national regulations, such as those enabling property-assessed clean energy (PACE) or GVR-like mechanisms. These frameworks, which allow energy efficiency investments to be repaid through property taxes, are crucial for making retrofits affordable and transferable.
- Simplifying Access to Public Funding: It is critical to simplify and de-bureaucratize access to public subsidies and low-interest public loans. This includes exploring mechanisms for upfront payments, reducing administrative burdens, and ensuring that funding schemes are aligned with the specific needs and scale of LFM projects.
- Incentivizing "Green" Financing Products: Encourage and, where appropriate, mandate financial institutions to develop and offer specialized "green" loan products for LFM and EE investments, characterized by lower interest rates, flexible repayment terms, and tailored risk assessment methodologies.
- Enabling and Regulating Innovative Financial Mechanisms: Policies must actively support the growth and responsible regulation of innovative approaches like crowdfunding and crowdlending. This includes ensuring clear legal frameworks (e.g., aligning with EU regulation 2020/1503 for crowdfunding service providers) that protect investors while fostering market growth.
- Developing Transferable and Aggregated Financing Schemes: Promote and incentivize the development of financing schemes like On-Bill Recovery (OBR), where investment repayments are tied to the property's energy meter and are transferable upon sale. Furthermore, policies should facilitate the aggregation of smaller LFM projects to create larger, more attractive portfolios for institutional investors.
- Fostering Public-Private Partnerships (PPPs): Encourage the development and replication of successful PPP models, such

"MES Barcelona," where public entities co-invest with private companies to de-risk and scale sustainable energy transitions in urban and rural environments.

- Aligning National Policies with EU Energy Goals: National energy policies must be closely aligned with the overarching EU energy and climate goals for 2030 and 2050. This includes actively participating in and supporting initiatives like the European Energy Efficiency Financing Coalition, which aims to mobilize private finance and facilitate the implementation of financial instruments within EU financing programs.

To operationalize the above recommendations, the following matrix links each policy direction with the relevant institutions and actors responsible for its execution and support.

#	POLICY RECOMMENDATION	TARGET ACTORS
1	Promote supportive regulatory frameworks (e.g. PACE or GVR-like models to enable property-based financing for EE investments)	National energy ministries Tax authorities
2	Simplify access to public funding (reduce bureaucracy, enable upfront payments, align funding with LFM needs)	National managing authorities (e.g. ESIF, RRF) EU Commission (DG ENER, DG REGIO) Energy agencies Local development bodies
3	Incentivize "green" financing products (specialized loans for EE/LFMs with favorable terms)	Financial regulators Central banks Commercial and green banks Ministries of Finance
4	Enable and regulate innovative financial mechanisms (e.g. crowdfunding, crowdlending)	Financial regulators Central banks Commercial and green banks Ministries of Finance
5	Develop transferable and aggregated financing schemes (e.g. On-Bill Recovery tied to energy meters)	Utilities and DSOs Energy suppliers Consumer protection agencies National regulatory authorities
6	Foster Public-Private Partnerships (PPPs) (support local energy investments through co-investment models)	Local governments Public investment banks ESCOs (Energy Service Companies) Regional development agencies Crowdfunding platforms (ECSP)
7	Align national policies with EU energy goals (integrate LFMs into climate/energy roadmaps for 2030–2050)	National governments EU Commission (DG ENER, DG CLIMA) Transnational energy alliances (e.g. BRIDGE) Climate policy councils

CONCLUSION AND WAY FORWARD

The decarbonization and decentralization of Europe's energy systems demand not only technological innovation but also financial inclusivity and flexibility. Local Flexibility Markets (LFMs) present a transformative opportunity for citizens, communities, and new market actors to actively contribute to grid resilience, energy efficiency, and climate goals. However, realizing this potential requires a paradigm shift in how such efforts are funded, aggregated, and supported.

This Green Paper highlights the key barriers in traditional financing systems and outlines innovative instruments —such as crowdlending, performance-based models, blended finance, and property-tied repayment mechanisms— that can democratize access to clean energy investments. Through concrete examples, such as the DE-RISK Murcia pilot and forward-looking national models, it becomes clear that financing mechanisms must adapt to serve smaller, distributed, and citizen-centred energy projects.

The policy recommendations and actor mappings presented herein offer a roadmap for policymakers, financial institutions, and local actors to act decisively. But the journey does not end here. The coming phases of the DE-RISK project will further refine these tools and test them in real-world environments, including the upcoming crowdfunding initiative for the Turkish pilot.

We call on stakeholders across Europe—public and private—to co-create an energy transition that is not only technically robust but also financially just and participatory.

"A flexible, digital and decarbonized energy future cannot be built without equally flexible, accessible and inclusive financing."

REFERENCES

- DE-RISK D3.4: Financial schemes: funding the customer journey via traditional and innovative mechanisms [https://deriskproject.eu/wp-content/uploads/2024/10/DERISK_D3.4_Financial-schemes_PU.pdf]
- DE-RISK D3.5: Democratizing the RES investments: DE-RISK crowdfunding campaign

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DE-RISK the adoption of Local Flexibility Markets to unlock the safe and reliable mass deployment of Renewable Energy Systems

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Glossary of Terms / List of Abbreviations

LFM – Local Flexibility Market
Decentralized energy trading system to balance grid demand and supply locally.
RES – Renewable Energy Sources
Includes wind, solar, hydro, geothermal, and other naturally replenished energy forms.
PPP – Public-Private Partnership
Cooperative financing model between government and private sector entities.
ESC – Energy Saving Certificate
Tradable units representing verified reductions in energy use.
PACE – Property Assessed Clean Energy
Finance model allowing repayments via property tax bills.
GVR – Gebiedsfonds voor Verduurzaming (NL)
Dutch model similar to PACE for local sustainability funding.
ESCO – Energy Service Company
Firms that design and implement energy efficiency projects.
DSO – Distribution System Operator
Entity responsible for managing regional or local electricity distribution.
ICP – Investor Confidence Project
Initiative to standardize EE project development across Europe.
EEFIG – Energy Efficiency Financial Institutions Group
EU-level expert group focused on sustainable energy financing.
ECSP – European Crowdfunding Service Provider
EU-level authorised crowdfunding platform according to the EU decree 2020/1503.