Financing strategy

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Authors: Amplo Kaya (AMPLO Inversión de Impacto)

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Overall project responsibility: Julian Zimmermann (GIZ)

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EXECUTIVE SUMMARY

This deliverable presents a replicable financial instrument for Energy Communities in Colombia under the Climate and Financial Transition (CFT) approach. The instrument is designed in response to a structural diagnosis that emerges consistently from the financial analysis: the main barrier to scaling Energy Communities is not the absolute scarcity of capital, but the absence of a financing structure capable of aligning initial investment requirements, gradual cash flow generation, and the institutional characteristics of community-based projects.

Energy Communities represent a strategic opportunity for Colombia's energy transition because they combine climate, territorial, and social objectives within a single operational model. They can contribute to renewable energy deployment, reduction of energy costs, increased local participation in energy management, and greater resilience in underserved territories. However, these projects also present a financial profile that differs significantly from that of conventional infrastructure. They require relatively high upfront investment, generate revenues gradually, and are often implemented through organizations with limited credit history, heterogeneous administrative capacities, and weak access to traditional collateral. Under these conditions, standard commercial financing instruments are not well suited to their needs.

The financial instrument proposed in this deliverable seeks to bridge that mismatch. It is structured as an integrated mechanism that combines two complementary components. The first is a blended finance structure that enables the initial investment by combining catalytic capital, concessional financing, and community or local contributions. The second is a Results-Based Payment Mechanism that operates during implementation and early operation to strengthen the project's financial profile through incentives linked to verifiable technical and financial performance. These two components are not conceived as independent tools, but as parts of a single financing logic designed to improve both initial viability and long-term sustainability.

The blended finance component addresses the central challenge of project bankability. In many Energy Communities, the cash flow profile does not support fully commercial debt from the outset, while the organizations involved rarely possess the type of balance sheet strength or enforceable collateral required by lenders. For this reason, the instrument combines sources of capital with different risk-return expectations. Catalytic capital performs an initial risk absorption function and improves the financial conditions under which debt can be mobilized. Concessional financing provides the core repayable funding needed to finance productive and energy assets under terms that are compatible with gradual revenue generation. Community or equity contributions strengthen local ownership and internal discipline, without becoming a prohibitive barrier to entry.

The instrument is built around a cash flow–based financing approach. In this model, repayment capacity is assessed not on the basis of asset liquidation value, but on the project's ability to generate stable, traceable, and disciplined operational cash flows. This has two major implications. First, the design of the instrument gives central importance to dedicated collection accounts, mandatory payment prioritization, reserve mechanisms, and ring-fenced financial management rules. Second, governance is not treated as a secondary operational issue, but as a structural component of bankability. In the absence of traditional collateral, financial governance, technical discipline, and independent verification act as partial functional substitutes for asset-based guarantees.

The Results-Based Payment Mechanism complements this structure by introducing a dynamic source of financial strengthening over time. It is not intended to finance CAPEX directly, nor to replace repayment obligations. Instead, it operates as a conditional incentive linked to verified outcomes such as technical performance, collection discipline, reserve maintenance, or, where relevant, territorial and climate impact. Once verified, these payments can be applied to early debt amortization or reserve reinforcement, improving solvency indicators and reducing liquidity risk over time. In this sense, the mechanism functions as a contingent credit enhancement tool that rewards performance and progressively improves the project's financial resilience.

The instrument also incorporates a clear revenue logic. Energy Communities are expected to generate operating cash flows through savings schemes, energy service payments, compensation arrangements, anchor demand, or other structured collection models. The objective is not to force all projects into a single revenue template, but to ensure that each financing structure is aligned with a realistic and monitorable flow profile. The analysis therefore emphasizes that the financial viability of these projects depends not only on how they are financed, but also on how revenue is organized, collected, protected, and prioritized throughout the project cycle.

A further contribution of this deliverable lies in the mapping of actors capable of supporting each component of the instrument. Catalytic capital may be mobilized through public entities, territorial governments, climate funds, or international cooperation institutions that are willing to absorb higher levels of early-stage risk in pursuit of climate and development outcomes. Concessional financing may be provided by development finance institutions, public banks, or dedicated green lines operating under cash flow–based lending criteria. Results-based payments may be financed through public climate policy instruments, international climate finance facilities, and potentially private organizations interested in verifiable climate or territorial outcomes. In parallel, energy operators and technical service providers can play a relevant role in mitigating technical risk, while local governments can reduce institutional uncertainty through the incorporation of projects into planning instruments such as territorial development plans and land-use planning frameworks.

The instrument's replicability depends on more than the availability of funding. It also depends on the standardization of key governance and implementation conditions. In this regard, the deliverable identifies four institutional dimensions that are essential to financial credibility: financial governance, cash flow management, technical stability of the asset, and independent verification. Together, these functions ensure that repayment discipline and project performance do not rely on discretionary decisions, but on predefined structures capable of protecting the integrity of the design over time.

From a public policy perspective, the proposed instrument has broader relevance beyond individual projects. First, it demonstrates that scaling Energy Communities requires a structural financing solution rather than isolated subsidies or fragmented pilot initiatives. Second, it shows that concessional debt can be mobilized toward community-based energy projects when repayment is organized through cash flow protection and governance mechanisms instead of conventional collateral. Third, it creates a framework for linking public and climate finance more effectively to measurable operational outcomes, thereby improving both financial discipline and policy impact.

In summary, this deliverable does not propose a conventional credit line or a stand-alone subsidy mechanism. It proposes a structured financing instrument specifically designed to make Energy Communities bankable and scalable under Colombian conditions. Its core value lies in combining catalytic capital, concessional debt, conditional performance incentives, and a governance model capable of protecting operational cash flows over time. Under this approach, financing ceases to be a residual constraint and becomes a strategic enabler of territorial energy transition.

INTRODUCTION

The energy transition in Colombia has progressed toward models that seek not only to diversify the energy mix through renewable sources, but also to promote greater territorial participation in energy generation and management. In this process, Energy Communities have emerged as a mechanism that articulates climate, social, and economic objectives, enabling local actors to participate directly in energy production, consumption, and governance.

These types of initiatives represent an opportunity to strengthen energy resilience, reduce costs for users, promote technological adoption, and contribute to meeting emissions mitigation targets. However, their consolidation faces structural challenges associated with the structuring, financial closure, and implementation phases. The distributed nature of the projects, the relatively small scale of the investments, and the diversity of stakeholders involved generate technical and financial complexities that exceed traditional energy infrastructure financing models.

Additionally, the limited credit experience of community organizations, the financial sector's perception of risk, and the transaction costs associated with structuring small and medium-sized projects create a gap that hinders capital mobilization. These constraints not only affect the viability of individual projects but also limit the possibility of scaling the model at a territorial level.

Within the framework of the Climate and Financial Transition (CFT) approach, it is necessary to develop financial instruments that address these barriers structurally, promoting efficient risk allocation, the mobilization of public and private resources, and the consolidation of replicable mechanisms. The CFT approach was chosen because it provides a framework for assessing Energy Communities not only as climate and energy initiatives, but also as projects that must achieve financial viability and long-term operational sustainability. In this sense, the approach links climate transition objectives with the financial conditions required to make projects implementable and scalable, with particular attention to repayment capacity, institutional feasibility, and the alignment between risk allocation and project cash flow. Structuring these instruments is therefore central to strengthening the financial sustainability of Energy Communities and expanding their contribution to the country's energy transition.

I. Deliverable Objectives

General objective

To define and structure a replicable financial instrument that facilitates the design, financial closure, implementation and sustainability of Energy Communities in Colombia under the CFT approach, ensuring coherence between the projected cash generation capacity of the projects, their organizational structures and the conditions of the national and international financial market.

Specific objectives

A. To characterize the typical financial needs of Energy Communities in their different stages of development, in order to identify capital requirements, limitations in access to financing and the elements that affect their bankability.
B. Identify and systematize financial instruments used in distributed generation projects and community energy schemes at the national and international level, classifying them according to their nature, source of resources and applicability in territorial contexts.
C. Analyze the existing gaps between traditional financial instruments and the organizational, operational and financial characteristics of Energy Communities under the CFT approach.
D. To propose the structure, adjustment or combination of a financial instrument that allows for improved alignment between the generation of project cash flows and the available financing conditions, promoting its replicability and scalability.
E. Define the structural elements of the proposed instrument, including its financial architecture, operating logic, and application criteria in the Colombian context.

II. Methodology

The financial instrument was developed through a two-tiered analytical process. The first tier involved the financial characterization of Energy Communities using the CFT approach, based on consolidated financial models from previous deliverables. The second tier consisted of a comparative analysis and structuring of the proposed instrument, through a systematic review of existing mechanisms and their adaptation to the Colombian context.

A. Financial characterization of Energy Communities

The instrument's design is based on empirical evidence derived from financial modeling developed in previous phases of the project. These models allowed for the identification of structural patterns in the economic configuration of Energy Communities, particularly regarding cost structure, revenue time profile, initial investment requirements, and cash flow behavior under different scenarios.

The analysis included the systematization of technical and economic variables associated with the design and assessment of energy community schemes, including collective self-generation and distributed generation configurations, as well as different renewable generation technology options contemplated in the model**, such as** generation system sizing, initial investment estimates (CAPEX), operation and maintenance costs (OPEX), revenue collection structures or savings schemes for users, as well as relevant macroeconomic assumptions. Based on these inputs, cash flows were projected over multi-year horizons, and key financial indicators were calculated, including debt service coverage ratio (DSCR), payback periods, and sensitivity to variations in generation and revenue collection.

The modeling process identified recurring constraints: high concentration of investment in the initial stage, gradual revenue generation, limited financial margins, and high sensitivity to operational deviations. These characteristics define the maximum sustainable leverage capacity and establish quantitative parameters for structuring the instrument.

Consequently, the proposed financial design is based on conditions observed in real-world scenarios and not on abstract theoretical assumptions, ensuring consistency between the structured scheme and the effective cash generation capacity of this type of project. In this sense, the financial model should be understood primarily as a financial viability tool, aimed at identifying the economic behavior, cash flow profile, and leverage limitations of Energy Communities under different scenarios. Building on that foundation, the proposed financial instrument seeks to translate these findings into a financing structure that responds to the actual funding needs of Energy Communities in Colombia.

This is particularly relevant in contexts where projects cannot rely on traditional collateral, where communities may not have sufficient own resources to finance the investment, and where access to capital depends on the design of innovative and combined instruments capable of aligning financial requirements with the institutional and operational realities of these initiatives.

B. Methodology for identifying and structuring the financing strategy

Based on the above characterization, a process was developed to identify and evaluate financial instruments applied in distributed generation projects, community energy transition and cooperative schemes, both at the national and international levels.

The analysis included mechanisms promoted by development banks, climate funds, international cooperation and public entities, which were classified according to their nature (equity, debt, grant or hybrid schemes), risk allocation structure, institutional requirements and activation conditions. This mapping was used not only to identify available instruments, but also to assess the financing logics underlying different intervention models.

Subsequently, a compatibility assessment was conducted between these instruments and the structural characteristics identified in Energy Communities. This assessment considered the coherence between each mechanism and the projected flow profile, the typical organizational capacity of the communities, the Colombian regulatory environment, and the potential for territorial replicability.

As part of this methodological process, alternative financing approaches were also considered. These included, for example, revolving fund structures and models based exclusively on non-reimbursable support, without a blended finance component or concessional debt. While such alternatives may be more suitable in specific cases, particularly for smaller communities or in contexts with very limited institutional capacity, they were considered insufficient as the main design basis for this instrument. Revolving fund models tend to require stronger repayment discipline and a level of portfolio management capacity that may be difficult to sustain across heterogeneous territorial contexts. Approaches based exclusively on grants or non-reimbursable financing may reduce short-term financial pressure, but they do not necessarily create a scalable structure capable of mobilizing additional capital or strengthening medium-term financial sustainability.

For this reason, when existing instruments were not fully compatible with the observed constraints, structural adjustments or instrumental combinations were proposed under blended finance schemes, incorporating catalytic and concessional components, as well as incentives conditioned on verifiable performance. This combination was selected because it provides greater flexibility in risk allocation, allows the financing structure to better reflect the gradual cash generation profile of Energy Communities, and creates a more robust pathway for balancing affordability, bankability, and long-term sustainability.

The methodological result is not a list of funding sources, but the structuring of an integrated instrument that articulates complementary functions such as closing gaps, financing assets, mitigating risks and alignment by performance, under criteria of financial sustainability and efficient risk allocation.

CONTEXT AND FINANCIAL BARRIERS

The consolidated financial analysis of Energy Communities under the CFT approach constitutes the starting point for structuring a financial instrument applicable at the national level. Based on the comprehensive modeling developed in previous deliverables, it was possible to identify structural patterns in the economic configuration of these types of projects, particularly in relation to their investment profile, cash flow generation, expected profitability, and leverage capacity.

The results show that Energy Communities have distinct characteristics compared to conventional energy infrastructure projects. Initial investment is typically concentrated in long-life assets with high acquisition and installation costs, while revenues materialize gradually over time, generally through savings schemes, compensation, or pay-per-use energy services. This time mismatch between investment and cash flow generation, coupled with relatively tight financial margins, limits their ability to access standard commercial financing terms.

Additionally, the community-based organizational structure introduces further complexities. The lack of a collective credit history, the heterogeneity in administrative capacities, and the need for clear rules for managing collections affect the risk perception of traditional lenders. In this context, financial viability depends not only on access to capital but also on the coherent structuring of mechanisms that organize the flow of resources, protect operations, and reduce uncertainties associated with technical and financial performance.

For this reason, financing Energy Communities cannot be approached as simply identifying an isolated source of funding. It requires a financial architecture that combines instruments with complementary functions throughout the project cycle: enabling the preparation phase, securing the initial investment, ensuring operation and maintenance, providing for the replacement of critical assets, and strengthening long-term sustainability. The design of a generic financial instrument must therefore begin with an understanding of these structural needs and the enabling conditions required for its effective implementation in different territorial contexts.

I. Mapping of financial instruments applied to Energy Communities

To inform the structuring of the proposed financial instrument, a mapping of mechanisms used to finance energy communities and distributed generation projects was conducted across different regulatory contexts and market development levels. The purpose of this exercise is not to present an exhaustive list of alternatives, but rather to organize the instruments according to their function within the project cycle and the minimum conditions typically required for activation.

This approach allows us to move from a fragmented view of financing options to a systemic understanding, where each mechanism is understood as part of a coherent structure. In this sense, the analysis is developed from two complementary perspectives: the phase of the project cycle in which the financial need arises, and the financial function that the instrument fulfills within the overall architecture.

A. Classification by project cycle phase

In Energy Communities, financial needs are not limited to closing the CAPEX. Sustainability often depends on the availability of resources and clear rules to cover operation and maintenance, asset replacement and contingencies, as well as mechanisms that streamline revenue collection from the outset.

The classification by phases makes it possible to identify at what point in the cycle each instrument is activated and what type of enabling requirements it usually demands, such as legal formalization, minimum governance, financial traceability and monitoring capacity.

Table 1- Classification by Project Cycle Phase

Cycle phase	Primary financial need	What it usually covers	Typical instruments	Key conditions
Preparation and structuring	Turning an idea into a feasible and bankable project	Studies, design, social engagement, permits, technical and financial structuring	Non-reimbursable contributions, funded technical	Minimal formalization, basic governance agreements, supporting documentation, monitoring capacity

Cycle phase	Primary financial need	What it usually covers	Typical instruments	Key conditions
			assistance, catalytic resources[1]	
Investment and implementation	CAPEX closure and installation	Equipment, associated infrastructure, installation, commissioning	Co-financing, subsidies, equity contributions or patient capital[2], concessional debt, leasing	Technical support, implementation plan, defined supplier or operator, purchasing route, traceability
Operation and sustainability	Continuity of service and financial management	Operation and maintenance (O&M), replacement, contingencies, collection management	Dedicated account, reserve fund, insurance, collection mechanisms, performance incentives	Collection rules, defined roles, flow control, O&M plan, accountability
Scaling and improvement	Replicate, expand, or improve the solution	Capacity expansion, technological improvements, user expansion, optimization	New rounds of co-financing, additional debt, demand agreements, performance payments	Evidence of performance, revenue stability, documented management, mature governance

B. Classification by financial function

The second lens organizes the instruments according to the financial function they fulfill within the structure. This approach is especially useful for designing a generic instrument, as it allows for identifying which structural gaps need to be addressed and which combinations are necessary to ensure viability and sustainability.

From this perspective, instruments can fulfill functions such as closing viability gaps, financing assets with deferred payments, protecting cash flow, mitigating risks, stabilizing income, or aligning performance incentives. This interpretation facilitates the construction of combined architectures, in which each component addresses a specific need and reduces a particular constraint identified in the financial characterization.

[1] In the present context, "catalytic resources" refers to non-commercial resources deployed at early stages to reduce initial risk, support project preparation, and enable the subsequent mobilization of additional financing.
[2] Equity contributions or patient capital: long-term resources contributed to the project or the energy community, with limited short-term return pressure and greater flexibility in repayment timing, aimed at supporting the scheme's financial sustainability and maturation.

Table 2- Classification by financial function

Financial function	What does it seek to achieve?	Typical instruments	Relevance indicators
Closing viability gaps	Reduce pressure on users and improve affordability	Co-financing, subsidies, non-refundable contributions	Tariffs or revenue do not cover full CAPEX; social investment is needed
Asset Financing	Acquire equipment and infrastructure with deferred payments	Concessional debt, commercial debt, leasing	There is an expected cash flow and minimum repayment capacity, and the supplier and asset are defined.
Cash flow protection	Prioritize critical expenses and avoid operational decapitalization	Collection account, reserve fund, prioritization rules	Risk of discretionary use of funds, need to ensure O&M and replacement
Risk mitigation	Reduce perceived and real risk to enable access and continuity	Partial guarantees, insurance and coverage	Warranty restrictions, exposure to operational contingencies, risk of interruptions
Income stabilization	Reduce cash flow uncertainty and improve bankability	Anchor client, demand agreements, service contracts	Existence of a stable payer, need to reduce collection volatility
Alignment by performance	Encourage measurable results and improve management	Payments for results, performance bonuses	Measurable indicators, possibility of verification, institutional interest in performance

II. Types of recurring financial instruments

The financial functions introduced in the previous section provide the analytical basis for understanding how different financing needs emerge in Energy Communities. Building on that framework, this section shifts the focus from financial function to instrument type, identifying the concrete mechanisms most commonly used to address those needs in practice.

A comparative review of national and international experiences shows that, although regulatory and territorial contexts vary, Energy Communities tend to face similar financial constraints. As a result, certain instruments recur not because of institutional replication, but because they respond to common structural challenges such as initial investment gaps, repayment limitations, weaknesses in financial governance, exposure to operational risks, and revenue volatility.

In this context, the purpose of the present section is not to introduce a new functional classification, but to organize the main instruments used in comparable experiences under homogeneous criteria that facilitate comparison in terms of coverage, implementation phase, structural advantages, limitations, and primary financial function. This makes it possible to connect the abstract functions presented in the previous section with the concrete financing mechanisms through which they are typically operationalized.

The following table therefore presents the most recurrent instruments identified in the analysis and links each of them to its main financial function within the overall financing structure of Energy Communities.

A comparative analysis of national and international experiences shows that, although regulatory and territorial contexts vary, Energy Communities tend to face similar financial constraints. Consequently, certain instruments appear recurrently not due to institutional replication, but because they address common structural weaknesses: initial investment gaps, repayment limitations, weaknesses in financial governance, exposure to operational risks, and revenue volatility.

Table 3- Financial instruments

Instrument	Primary financial function	What it covers	Application phase	Advantages	Limitations
Co-financing and subsidies	Closing viability gaps	CAPEX and, in some cases, project preparation	Implementation	Reduces pressure on tariffs and revenue collection, improves viability, and lowers the need for debt	Institutional processes and timelines, rigidity in execution, and high documentation requirements
Non-refundable contributions	Closing viability gaps / Enabling preparation	Preparation, capacity strengthening, and partial CAPEX	Preparation and start-up	Closes capacity gaps, enables implementation conditions, and reduces initial risks	Competition for resources, reporting requirements, and dependence on calls for proposals
Equity contributions or patient capital	Closing viability gaps / Asset financing	CAPEX without immediate repayment and equity strengthening	Implementation	Reduces cash flow pressure, supports community or non-profit structures, and improves affordability	Requires clear management rules and alignment of contributor objectives
Concessional or development debt	Asset financing	CAPEX financed under favorable terms and conditions	Implementation	Offers longer repayment terms and possible grace periods, improves bankability, and reduces financial cost relative to commercial debt	Requires repayment discipline, reliable collection structures, and demanding evaluation procedures
Commercial debt	Asset financing	CAPEX or specific project components	Implementation	Provides direct access where solvency and guarantees exist and may close financing gaps quickly	Higher financial cost, strong guarantee requirements, and sensitivity to collection volatility

Instrument	Primary financial function	What it covers	Application phase	Advantages	Limitations
Equipment leasing or financing	Asset financing	Equipment financed through scheduled payments linked to the asset	Implementation	Reduces acquisition barriers, structures payments over time, and may require fewer traditional guarantees	Strict contractual conditions, dependence on supplier arrangements, and exposure to operational disruptions
Partial guarantees	Risk mitigation	Credit enhancement to enable debt or improve pricing and tenor	Structuring and implementation	Reduces perceived risk and may unlock financing where guarantees are insufficient	Does not replace repayment capacity, depends on activation conditions, and is subject to guarantor criteria
Insurance and coverage	Risk mitigation	Asset protection and operational continuity	Operation	Reduces the financial impact of contingencies and protects service continuity	Recurring costs, exclusions, and technical requirements to maintain coverage
Collection account and reserve fund	Cash flow protection	O&M, asset replacement, contingencies, and financial discipline	Operation	Protects critical expenditures, reduces liquidity risk, and improves transparency	Requires governance and control and may create internal tensions regarding use rules
Anchor client or demand agreements	Income stabilization	Income stabilization through more predictable demand or payment flows	Structuring and operation	Reduces cash flow uncertainty, improves bankability, and facilitates access to financing	Dependence on a single actor, contractual complexity, and concentration risk
Results-based or performance-based payments	Alignment by performance	Incentives conditioned on verifiable indicators	Operation or scaling	Aligns incentives, improves management, and may provide additional resources linked to results	Requires robust measurement and verification and may involve complex institutional design

III. Typical instrument combination structures

The analysis of different types of financial instruments shows that no single instrument, in isolation, can simultaneously address the needs for initial investment, operational startup, and long-term sustainability. In practice, the most robust systems combine mechanisms that fulfill complementary functions, creating hybrid financial architectures.

These combinations do not follow a single recipe, but rather recurring patterns that emerge when seeking to balance three objectives: affordability for users, financial sustainability of the project, and reduction of the risk perceived by external funders.

Catalytic structures are characterized by a significant amount of non-reimbursable resources or equity contributions that reduce the need for borrowing and allow for the protection of operations from the outset through clear collection and reserve rules. Leveraged structures incorporate concessional debt or asset financing when a minimum repayment capacity exists, complementing it with cash flow protection mechanisms. Meanwhile, revenue-stable structures rely on demand agreements or anchor clients that reduce volatility and improve access to financing.

The following table summarizes these combination patterns, identifying the frequent components, the contexts in which they are usually used, and the enabling conditions that determine their effective implementation.

Table 4- Typical instrument combination structures

Typical structure	Frequent components	It is used when	Main value	Enabling conditions
Catalytic structure	Co-financing or non-refundable contributions + collection account and reserve fund	High affordability is required, and repayment pressures should be avoided.	Close the investment gap and protect operational sustainability from the start	Collection rules, basic governance, minimum traceability, payment prioritization agreements
Leveraged structure	Co-financing or patient capital + concessional debt or leasing + collection account and reserve fund	There is a minimum payment capacity and financing is required for higher-value assets	It allows for CAPEX financing with compatible conditions and reduces operational risk by protecting cash flow.	Credible projected cash flow, collection discipline, defined O&M roles, basic management capacity
Revenue-stable structures	Anchor client or demand agreements + asset financing + collection account and reserve fund	There is a relatively stable payer that can anchor the flow.	It improves bankability by reducing income volatility and facilitates access to financing	Contractual capacity, measurement and billing, clear service levels, reliable operations management

The mapping above organizes the most commonly used instruments and typical combination configurations in Energy Communities, facilitating their interpretation by project phase and financial function. This framework allows for the identification of structural gaps and compatibility criteria between mechanisms, forming the basis for structuring a generic financial instrument that articulates complementary functions under a coherent, replicable architecture applicable in the Colombian context.

CONCEPTUAL FRAMEWORK OF THE INSTRUMENT

The preliminary analysis shows that the main limitation to the expansion of Energy Communities in Colombia lies not in the lack of financial resources, but in the absence of an architecture that allows for their coherent integration with the structural characteristics of these projects. The combination of high initial investment, gradual cash flows, community organizational structures, and heterogeneous administrative capacities creates a risk profile that does not fit traditional infrastructure financing models.

In this context, this chapter develops the structuring of a generic financial instrument, conceived as a replicable and scalable mechanism under the CFT approach. The instrument is not limited to providing capital but rather organizes complementary financial functions within a single architecture: reducing viability gaps, financing assets, mitigating risks, and aligning performance incentives.

The design is based on a central principle: the financial sustainability of an Energy Community depends as much on its capital structure as on the quality of risk allocation and disciplined cash flow management. Consequently, the proposed instrument integrates catalytic, concessional, and performance-based components under a blended finance model, aimed at improving bankability without placing disproportionate burdens on the communities.

I. Selected structure

The analysis developed in the previous sections led to a central finding for the structuring of the instrument: Energy Communities do not face only a constraint in access to resources, but a deeper mismatch between their financing needs לאורך the project cycle and the instruments available under conditions compatible with their operational and institutional realities. In other words, the problem does not lie solely in capital scarcity, but in the absence of a financial structure capable of responding in a differentiated way to needs that evolve over time and cannot be adequately covered by a single source of financing.

This point is particularly relevant in the case of Energy Communities. Unlike other infrastructure projects, these initiatives combine a high concentration of upfront investment, gradual and often uncertain cash flow generation, limited availability of enforceable collateral, heterogeneous institutional capacities, and a strong dependence on organizational and collection arrangements that must be consolidated during implementation. Under these conditions, assuming that a single financing source can efficiently support the entire project cycle from preparation to operation and scaling is not only unrealistic, but financially inadequate. Project preparation, investment closing, operational stabilization, and the strengthening of long-term sustainability respond to different risk profiles, time horizons, and financing needs, and therefore require differentiated financial functions.

Based on this premise, different configurations were assessed. Schemes based primarily on subsidies, co-financing, or non-reimbursable contributions offer clear advantages in terms of affordability and reduction of short-term financial pressure. They are particularly useful for covering preparation costs, closing viability gaps, or reducing the share of investment that must be absorbed by the project itself. However, when considered as the main financing structure, they present significant limitations. Their availability depends on programmatic decisions, institutional windows, or fiscal resources that are not always predictable or sustainable over time. Moreover, while they can alleviate short-term financial pressure, they do not necessarily create a replicable structure capable of mobilizing additional financing or strengthening financial discipline and medium-term sustainability.

At the other end of the spectrum, structures based predominantly on debt or asset financing may provide a clear route to finance CAPEX where repayment capacity is sufficient, collection rules are consolidated, and management mechanisms are robust. However, their applicability to Energy Communities is more limited. In many cases, projected cash flows remain incipient, financial margins are narrow, and traditional collateral is absent. Under these conditions, a structure based exclusively on debt tends to impose financial requirements that do not match the project's actual risk profile, limiting access and excluding precisely the types of communities that the instrument is intended to enable.

Configurations based on income stabilization mechanisms, such as demand agreements, anchor clients, or contractual arrangements capable of reducing revenue volatility, were also considered. These structures can be highly effective in specific contexts and, when available, they significantly improve bankability. However, their applicability depends on conditions that are not systematically present across all Energy Communities, territories, or organizational typologies. For this reason, while they may constitute valuable complementary components, they do not by themselves provide a sufficiently broad and replicable basis for a generic instrument at national scale.

Similarly, results-based payment mechanisms offer important value as tools for incentive alignment and progressive strengthening of the project's financial profile. They make it possible to link resources to verifiable performance, improve solvency, and reinforce operational discipline. However, when considered in isolation, they do not resolve the initial financing gap, nor do they substitute for the need for a base structure capable of closing the investment and organizing cash flow from the outset. Their nature is complementary and contingent: they strengthen a prudent initial design, but they cannot replace it.

As a result, the comparative assessment of alternatives showed that the most appropriate response was not to rely on a single instrument or an exclusive source of financing, but on a combination capable of articulating distinct financial functions within a single structure. Under this logic, the combination of blended finance and a Results-Based Payment Mechanism was identified as the most consistent option with the observed constraints and with the objective of building a replicable instrument. The blended finance component makes it possible to address the initial investment gap through a more flexible allocation of risk, combining resources with different risk tolerances and repayment conditions that are better aligned with gradual cash flow generation. The Results-Based Payment Mechanism complements this foundation by introducing a progressive strengthening mechanism, linked to verifiable technical and financial performance, which improves the project's resilience over time without replacing the need for initial financial discipline.

The selection of this structure also responds to a sequencing consideration. The project does not face a single static financing need, but rather a trajectory of requirements that evolves from preparation and structuring, through CAPEX closing, and into operational stabilization, contingency management, and eventually scaling. The proposed instrument is intended precisely to respond to that sequence, avoiding a fragmented treatment of project needs and allowing different financial functions to be activated coherently as the project advances. This capacity to accompany the project cycle through complementary components is one of the main advantages of the selected design over the alternatives considered.

In this sense, the selected structure is not conceived as a rigid solution or a uniform template for all cases. Its strength lies in offering an adaptable basis that preserves financial coherence across diverse territorial contexts. Compared with the other options assessed, it has a decisive advantage: it makes it possible to balance, within a single design, the affordability required by communities with limited capacities, the bankability needed to mobilize repayable financing, and the medium- and long-term operational sustainability of the project. For this reason, the selected combination derives not only from the availability of existing mechanisms, but from their effective capacity to respond to the financial, institutional, and territorial logic that characterizes Energy Communities in Colombia.

II. Nature and purpose of the instrument

The proposed instrument is an integrated financial structure that combines two complementary components: a blended finance scheme and a results-based incentive module. Its design does not simply aggregate existing tools but rather addresses the need to simultaneously tackle structural constraints identified in Energy Communities under the CFT approach, particularly those related to access to capital, risk profile, and operational sustainability.

The blended finance component forms the structural basis of the instrument. Its function is to combine capital with different risk and return profiles, including catalytic resources, concessional financing, and local contributions, within a coherent framework that reduces the average cost of capital and improves the project's bankability. This component primarily addresses the gap between the magnitude of the initial investment required and the gradual capacity for cash generation, as well as the limited creditworthiness that characterizes many community-based organizational structures.

However, simply combining different sources of capital does not guarantee consistent technical performance or sustained financial discipline over time. For this reason, the instrument incorporates a second component: a results-based payment scheme that introduces a conditional incentive linked to the achievement of verifiable indicators. This module allows financing to be aligned with operational and financial results, and where appropriate, with social or environmental goals associated with a just energy transition.

From a conceptual perspective, both components fulfill distinct but interdependent functions within the same structure. Blended finance operates primarily during the structuring and implementation phase, addressing capital access gaps and distributing investment risk more efficiently. Results-based payment is activated during the operational phase, introducing performance-linked incentives that reinforce financial discipline, strengthen solvency over time, and improve the resilience of the project once implementation risks begin to decline.

The integration of these mechanisms responds to a principle of financial coherence: the sustainability of Energy Communities depends not only on the initial closing structure, but also on the incentives that guide behavior during operation. Designing both components in isolation would generate partial solutions. Their combination allows the instrument to address initial viability, bankability, and long-term performance within a single framework that can accompany the project across different stages of maturity.

In this sense, the instrument is not configured as a conventional fund or line of credit, but as a modular financial structure designed specifically for the organizational, economic, and territorial characteristics of Energy Communities in Colombia. Its objective is not to assume that all projects will converge toward full financial independence under purely commercial conditions, but rather to create a structured pathway through which projects can progressively strengthen their financial profile over time. For some communities, particularly those operating in more challenging territorial or socioeconomic conditions, a degree of catalytic or concessional support may remain structurally necessary. For others, however, the instrument is intended to create the conditions for reduced dependence on concessional resources as operational performance, revenue stability, and institutional capacity improve.

Accordingly, the instrument should be understood not as a permanently static concessional structure, but as a platform for financial maturation. Its long-term objective is to stabilize projects, strengthen repayment capacity, and improve financial discipline to the point where greater participation of non-concessional or private capital becomes feasible in selected cases. This transition is not assumed to occur automatically, nor uniformly across all Energy Communities, but it is part of the intended direction of the design. In practical terms, this means that the instrument is compatible with the future incorporation of refinancing or graduation features for projects that demonstrate sustained operational and financial performance over time.

This orientation is also consistent with Colombia's Just Energy Transition agenda. The instrument is intended not only to mobilize financing for decentralized renewable energy initiatives, but also to do so in a way that reflects territorial inequality, differentiated institutional capacities, and the need for inclusive access to energy transition opportunities. By combining affordability, risk-sharing, and performance incentives, the instrument supports a transition pathway in which communities that would otherwise remain excluded from conventional financing mechanisms can participate under more realistic and equitable financial conditions.

At the same time, the instrument is not intended to apply as a rigid template across all territorial contexts. Its underlying logic is common, but its calibration is expected to vary according to project conditions, particularly between SIN and ZNI settings. These two contexts differ materially in terms of revenue logic, operational complexity, logistics, institutional support, and exposure to technical and regulatory risk. As a result, the relative weight of catalytic capital, the strength of reserve requirements, the design of governance arrangements, and the sequencing of performance incentives may need to be adjusted accordingly. The instrument should therefore be understood as a unified structure with context-sensitive calibration, rather than as a uniform financial package applied identically across all Energy Communities.

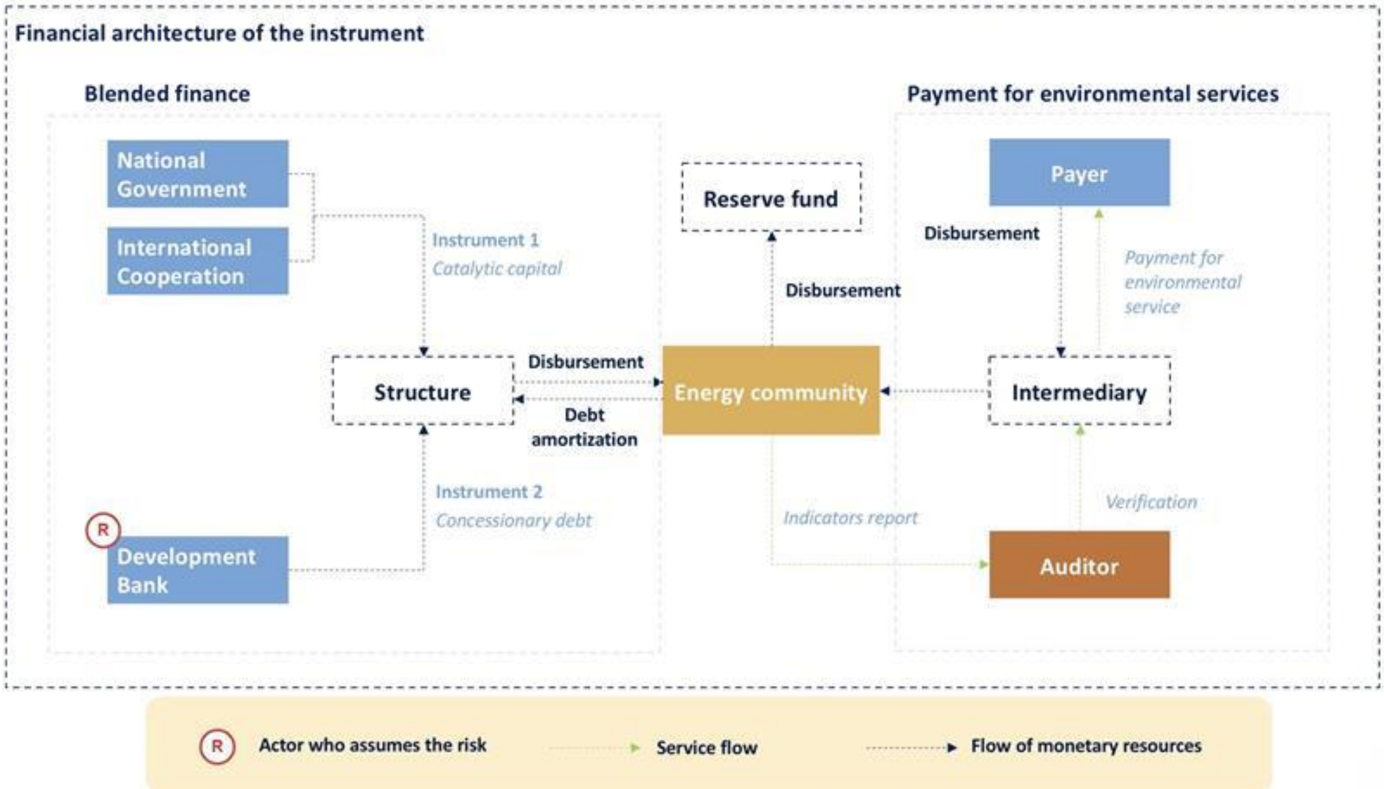
Under this approach, the selected instrument structure is designed to combine three objectives that are rarely achieved simultaneously in conventional financing models: affordability for communities with limited capacities, bankability for the mobilization of repayable capital, and operational sustainability over the medium and long term. Its purpose is therefore not only to enable investment, but to organize financing in a way that is consistent with the actual constraints, trajectories, and transition potential of Energy Communities in Colombia.

III. Financial architecture of the instrument

The financial architecture of the instrument is built around two complementary components: a blended finance structure that enables the initial investment through differentiated risk allocation, and a Results-Based Payment Mechanism that strengthens the project's financial profile during operation through verifiable performance incentives. Both components are organized within a cash flow–based structure supported by explicit financial management rules and defined institutional responsibilities.

This design responds to a core constraint of Energy Communities in Colombia: limited access to traditional collateral and restricted eligibility for commercial financing. Under these conditions, bankability depends less on asset-based guarantees and more on the combination of risk-sharing capital, disciplined cash flow management, and mechanisms that progressively reduce financial exposure as the project matures. Within this framework, debt may be provided by development banks and, in some cases, by commercial banks, depending on the project's risk profile, maturity, and the availability of adequate risk mitigants. In a complementary manner, the scheme may also incorporate additional risk mitigation instruments, such as guarantees and insurance, where relevant to reduce risk, strengthen lender confidence, and support the project's operational sustainability.

Figure 1- Financial architecture of the instrument



The following sections describe each component in greater detail and explain how their interaction allows the instrument to address initial investment needs while reinforcing medium- and long-term financial sustainability. The architecture also recognizes that international cooperation may play a dual role by providing both financial resources and technical assistance for project structuring, preparation, and strengthening, particularly at early stages. In some cases, this role may be channeled through specialized funds or facilities aimed at closing project preparation gaps or supporting climate finance access. However, given that this proposal is presented at a pre-feasibility level, the instrument is intentionally set out as a simplified base structure, which may later be complemented or refined depending on the specific conditions of each community, territory, or project.

This financial logic depends not only on the combination of capital layers and performance incentives, but also on a governance structure capable of protecting cash flow, enforcing payment priority, and assigning critical responsibilities in a verifiable manner. Governance should therefore be understood as a precondition of bankability within the instrument, rather than as a subsequent administrative layer. Its detailed institutional design is developed in a later section, but its role is already embedded in the functioning of the capital structure described below.

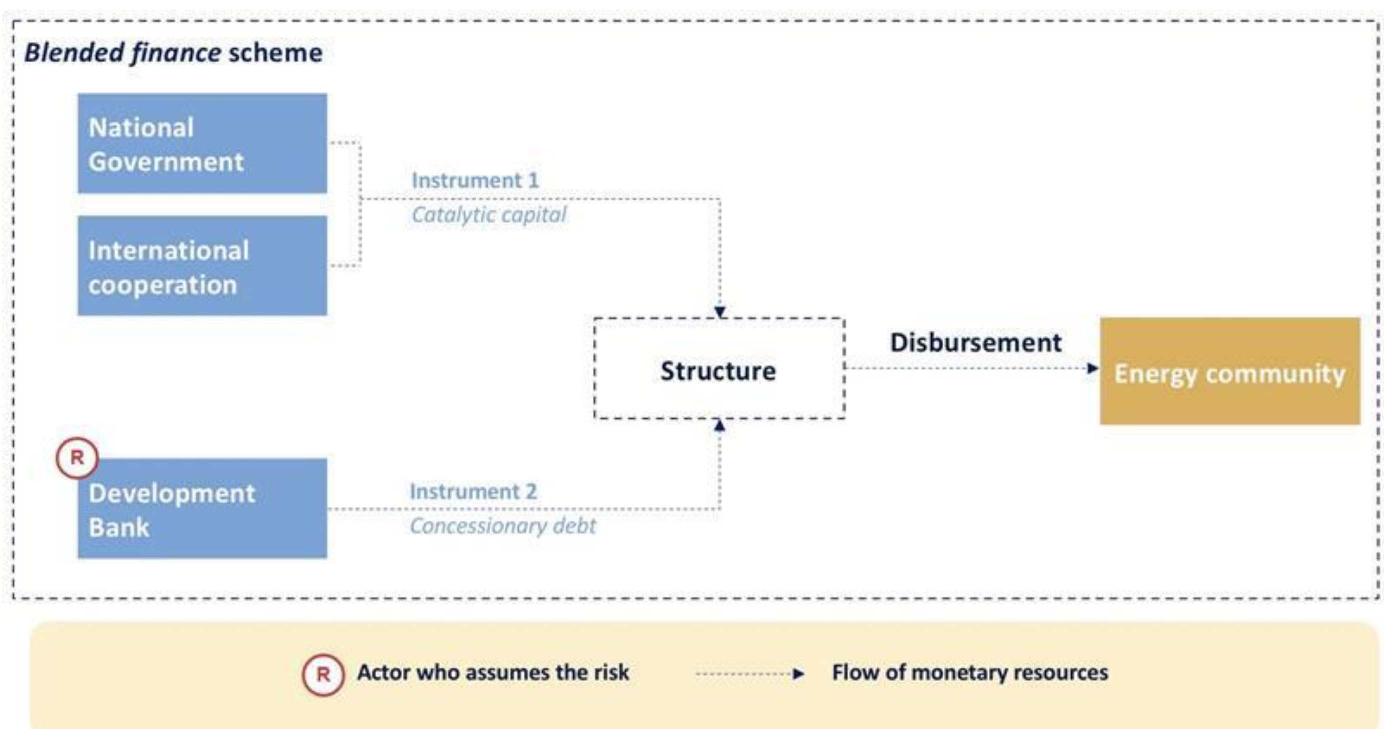
A. Blended Finance structure

Blended finance constitutes the structural component of the instrument and allows for the mobilization of repayable resources to Energy Communities that lack traditional collateral and a consolidated credit history. In the present design, blended finance is understood primarily as the combination of capital with different risk-return profiles within the public, concessional, and development finance spectrum, including catalytic capital, concessional debt, and local contributions. These local contributions not only help close the initial financing gap, but also strengthen the community's commitment to the long-term sustainability of the project by aligning incentives around its care, operation, maintenance, and continuity. At the same time, the instrument is intended to create the conditions under which greater participation of non-concessional or private capital may become feasible over time as projects demonstrate stronger operational and financial performance, a process in which technical assistance can play an enabling role by strengthening the structuring, management, and capacities required to reach more robust financing conditions.

Its logic is based on the strategic combination of catalytic capital and concessional financing within a flow-based architecture, where risk mitigation does not rely on the enforcement of real collateral, but on the financial design of the scheme.

In the context of Energy Communities, financed CAPEX does not represent a solid guarantee from a credit perspective, due to its low recovery value and the difficulties of implementation in community settings. For this reason, the bankability of the instrument must be built through a structure that redistributes risk in the pre-operational stage and establishes clear rules for managing cash flow during operation.

Figure 2- Blended finance scheme



The operation of Blended finance can be understood in the following stages:

1. **Definition of CAPEX and capital structure:** During the financial structuring process, the total investment amount required is determined together with the appropriate combination of catalytic capital and concessional financing and, where feasible, complementary local contributions. In many target cases, particularly among low-income Energy Communities, upfront community capital may be absent or very

limited, so the base structure is not designed to rely on it as a general condition for financial closing. This distribution is defined based on projected cash generation capacity and prudent sustainability criteria.

2. **Catalytic capital contribution:** Catalytic capital is incorporated as a higher-risk component, either through direct contributions to CAPEX or as a subordinated position within the financial structure. Its function is to partially absorb the initial risk and improve financial indicators such as debt service coverage, reducing pressure on future cash flow. This component corrects market failures associated with positive environmental and social externalities that are not fully reflected in project revenues.

3. **Disbursement of concessional financing:** Once the structure is strengthened with catalytic capital, the repayable component is activated. Concessional financing funds energy assets under conditions aligned with the actual revenue generation curve, including extended terms and grace periods compatible with the start of operations. The concessional nature of the project is justified by the mandate for energy transition and territorial development, while maintaining repayment discipline.

4. **Implementation of the protected flow structure:** The granting of concessional financing is contingent upon the implementation of financial management architecture based on a dedicated account and explicit cash flow prioritization. Operating revenue is organized in a predefined order that prioritizes covering operating and maintenance costs, establishing reserves for contingencies and replacement, and subsequently servicing the concessional debt. This structure protects the operational continuity of the asset and mitigates credit risk.

5. **Stepped allocation of risk:** The combination of catalytic capital and concessional financing creates a progressive distribution of risk. Catalytic capital assumes greater risk tolerance in the initial phase; the concessional financier assumes credit risk mitigated by structural subordination and flow rules; the Energy Community assumes operational risk under defined governance. The resulting architecture does not eliminate risk but organizes it coherently and in a way that is compatible with the community nature of the project.

Overall, blended finance allows Energy Communities to overcome the structural constraint on access to credit they face. In its initial form, the instrument relies mainly on catalytic and concessional resources to make projects financeable under current conditions. However, its medium-term purpose is also to improve project maturity and financial discipline to the point where refinancing or greater participation of non-concessional or private capital may become possible in selected cases. By replacing traditional collateral with a protected cash flow structure and a tiered risk allocation, the instrument creates conditions not only for immediate financing, but also for progressive financial integration over time.

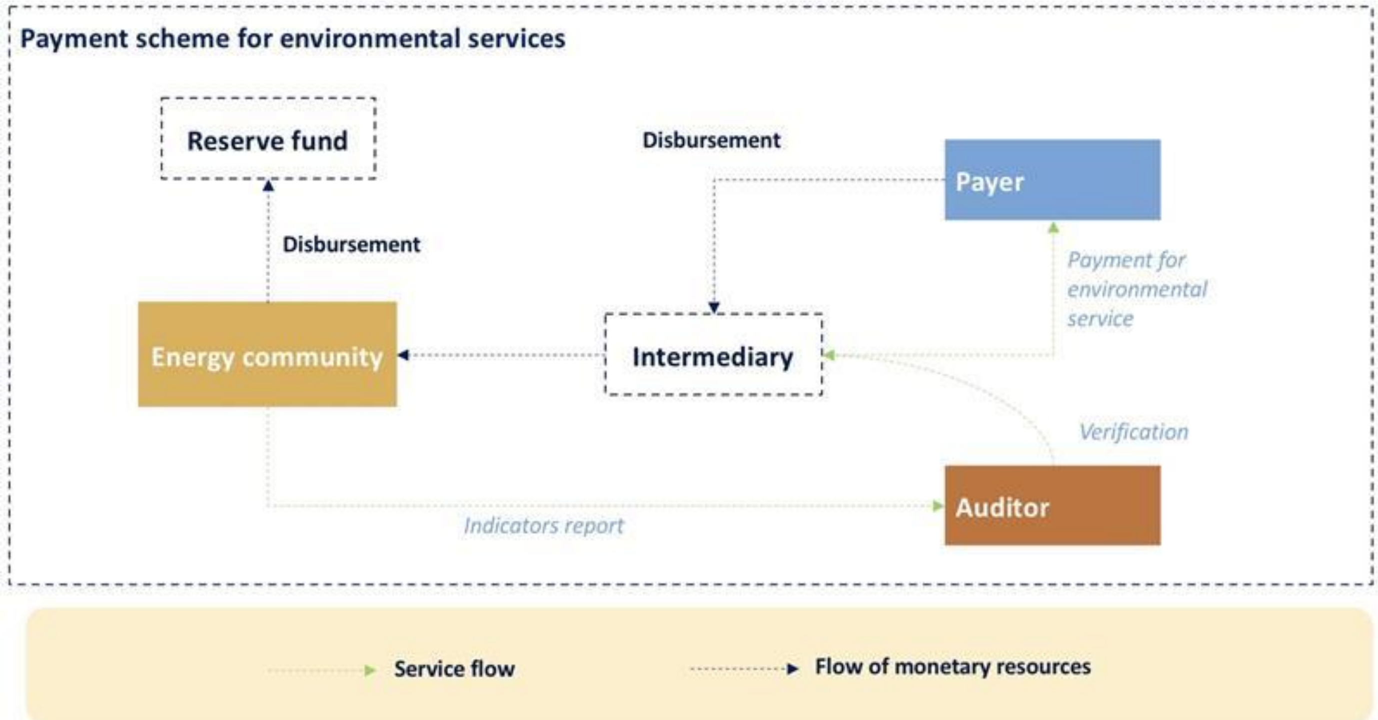
B. Results-Based Payment Mechanism

The Results-Based Payment Mechanism constitutes the dynamic component of the instrument's financial architecture. While blended finance enables the initial closing of the investment through a structural redistribution of risk, results-based payment operates during the operational phase and aims to progressively reduce the project's financial exposure based on its actual performance.

This mechanism does not finance initial CAPEX, nor does it replace structural repayment obligations. I**ts function is to act as a complementary financial strengthening mechanism during operation, once the project is already**

functioning under its agreed repayment structure. In this sense, debt service remains the responsibility of the Energy Community and must be covered from operating cash flows under the established payment priority rules. Results-based payment may, however, be used for voluntary early amortization or reserve reinforcement once performance has been verified and the incentive has been disbursed.

Figure3- Results-Based Payment Scheme



The operation of the mechanism follows a structured sequence:

1. **Contractual definition of indicators:** During the financial structuring phase, the performance indicators that enable the incentive are established, together with the minimum activation thresholds, measurement methodology, and verification requirements. These indicators must be objectively measurable and directly linked to the project's operational or financial stability, while also being consistent with the guidelines and criteria of the relevant actors involved in the mechanism. Their definition should be agreed ex ante by the relevant parties involved in the mechanism, including the institutional payer and the financing structure, and should be formalized at financial closing to avoid discretionary interpretation during implementation, including by the entity responsible for administering the mechanism. Where disagreement arises during design, the indicator framework should be resolved through the governance arrangements established for the instrument, including, where necessary, technical validation by an independent party.

2. **Administration of the mechanism through the intermediary:** The operation of the results-based payment mechanism requires an administrative arrangement capable of coordinating it at both system and project level. At system level, this role should be performed by an intermediary or designated facility manager responsible for coordinating the relationship with the payer, consolidating project-level information, overseeing monitoring and verification processes, and channeling disbursements in accordance with the agreed rules of the instrument. This function could, for example, be performed by a public or mixed entity mandated to manage performance-based incentives, a development bank, a specialized fund or facility, or a fiduciary vehicle with sufficient capacity to manage verification, traceability, and payments linked to the

achievement of results. At project level, the Energy Community or its legally constituted implementing entity remains responsible for operational performance, reporting, and compliance with the agreed indicator framework. This administrative layer is essential to ensure consistency, traceability, and scalability across multiple projects.

3. **Operation under financial discipline:** The Energy Community begins operation under the cash flow management structure defined in the instrument. Revenue is channeled through a dedicated account and applied according to the agreed payment priority, ensuring coverage of operation and maintenance, reserve formation, and scheduled debt service. The dedicated account should be managed under the project-level financial control arrangements defined for the project, whether through the Energy Community itself under binding rules, a designated project-level financial administrator, or another formally agreed administration mechanism. Compliance with payment priority rules is therefore not left to discretion, but is subject to the contractual and institutional controls described in the governance structure of the instrument.

4. **Monitoring results:** During the operating period, the results corresponding to the agreed indicators are recorded and consolidated, including technical performance of the system, collection discipline, and maintenance of reserves. The monitoring system should be defined as part of the project's operational design and treated as an integral requirement of the mechanism, rather than as an external or optional layer. Its costs should therefore be incorporated into the project's financial planning from the outset. In contexts such as ZNI, where stable connectivity may be limited, the monitoring approach may require adapted arrangements, including local data capture, periodic synchronization, simplified reporting protocols, or hybrid systems combining digital and manual validation. Project-level information should then be transmitted through the administrative arrangement of the mechanism for review and subsequent verification.

5. **Independent verification**: An independent third party certifies compliance with the agreed indicators using predefined methodologies. This certification is a necessary condition for activating the incentive and is intended to reduce discretion and information asymmetries among the Energy Community, the payer, and the financing parties. Depending on the design of the instrument, this function could be performed by audit firms, specialized technical verifiers, certification bodies, independent consultants, or institutions with experience in results monitoring and verification. The verification process must be coordinated through the administrative arrangement of the mechanism, which consolidates the relevant documentation and facilitates the interface between project-level reporting and the independent verifier. The frequency of verification should be defined in proportion to the size of the project, the expected disbursement amount, and operational complexity. In most cases, annual verification cycles will be more appropriate than highly frequent cycles, particularly for smaller-scale projects. Verification costs must also remain proportionate to the expected incentive amount; otherwise, the mechanism would lose practical effectiveness. This implies that both the costs associated with the administrative arrangement and those corresponding to verification must be structured efficiently so that the net incentive remains material and useful for the project. For this reason, the instrument should favor standardized, proportional, and scalable verification arrangements, avoiding situations in which transaction or administrative costs absorb an excessive share of the expected benefit. The verification design should favor standardized and scalable approaches, especially in remote contexts such as NIZs, where logistical access may be limited.

6. **Conditional disbursement of the incentive:** Once the results are verified, the institutional payer, such as a public entity, climate fund, or cooperation mechanism, makes the conditional disbursement through the

administrative arrangement defined for the mechanism, typically coordinated by the intermediary or designated facility manager. Depending on the design of the instrument, this role could, for example, be performed by ministries or public entities with relevant sectoral responsibilities, subnational governments, public or mixed funds with a climate or territorial mandate, international cooperation agencies, development banks operating performance-based facilities, or specialized programs created to recognize verified results. The incentive is not transferred as unrestricted operating income and cannot be used for current expenditures. In practical terms, the viability of this component depends on the prior identification of a committed payer and on the existence of an agreed disbursement framework before project implementation. The mechanism should therefore not be treated as structurally active unless a payer has been secured through a contractual, programmatic, or otherwise binding arrangement. Where no such payer is in place at financial closing, the base financing structure must remain viable without relying on this component.

7. **Structural application of the incentive:** The disbursement is applied directly through the agreed project-level financial structure, either through early repayment of the outstanding concessional loan balance or by strengthening the reserve fund. In both cases, the effect is structural: it improves solvency indicators, reduces liquidity risk, and decreases future financial exposure. However, early repayment should not be treated as an automatic application. Its use should be subject to prudential criteria, particularly in contexts where the project remains exposed to material operational or asset-related risks. In the event of heightened residual vulnerability, for example exposure to theft, asset damage, or severe disruption, reserve reinforcement may be more appropriate than accelerated debt reduction. In some cases, this logic may also be complemented by risk mitigation instruments such as insurance, where they are feasible and relevant to the project structure. However, given that this proposal is presented at a pre-feasibility level, the incorporation of such instruments should be assessed according to the specific conditions of each energy community and the scheme ultimately structured. The mechanism should therefore preserve flexibility to prioritize resilience before deleveraging where project conditions require.

To ensure financial coherence, eligible outcomes must focus on dimensions that directly impact project stability. These include technical performance indicators such as minimum availability levels or adjusted generation, financial discipline indicators such as collection levels or debt service coverage maintenance, and, when required by the funding source, territorial or climate impact indicators. The following table presents a reference framework of outcomes that can be linked to the mechanism.

Table 5- Reference Framework of Measurable Results

Strategic dimension	Structural indicator	Reference threshold	Verification	Financial application	Rationality
Technical performance	System operational availability	≥ 95% per year	Certified technical registration	Early repayment	Reduces operational risk
Technical performance	Actual vs. adjusted projected generation	≥ 90%	Validation against technical model	Amortization or reserve	Stabilizes income
Financial discipline	Level of effective collection	≥ 90% turnover	Audited financial statements	Debt reduction	Strengthens repayment capacity

Strategic dimension	Structural indicator	Reference threshold	Verification	Financial application	Rationality
Financial discipline	minimum contractual DSCR	≥ 1.2	audited financial model	Balance reduction	Improves solvency
Operational sustainability	Reserve fund at minimum level	≥ 100% threshold	Dedicated account verification	Reserve reinforcement	Reduces liquidity risk
Territorial impact (optional)	Reduction of energy expenditure	≥ X % baseline	Comparative validation	Amortization or expansion	Internalize externalities
Climate impact (optional)	Certified avoided emissions	According to official factor	Technical certification	Amortization or reinvestment	Justify climate finance
Territorial impact (optional)	Effective number of beneficiaries	≥ X% of defined target	Validated user or beneficiary registry	Amortization or reinvestment	Reflects the reach and ownership of the scheme

To preserve simplicity and scalability, the instrument should limit the number of mandatory indicators, prioritizing at least one technical and one financial indicator. The inclusion of social or climate indicators may depend on the source of funding for the incentive.

Overall, the Results-based payment mechanism transforms the financial architecture into an adaptive system: the project is not only financed under a protected flow structure, but also progressively improves its financial profile as it demonstrates verifiable and sustained performance. Its effectiveness, however, depends on proportional monitoring and verification requirements, the prior commitment of a payer, and governance arrangements capable of ensuring that the mechanism operates as a complement to rather than a substitute for the project's core repayment discipline.

IV. Capital structure of the instrument

The capital structure of the instrument represents the quantitative translation of the integrated financial design described in the preceding sections. Its configuration must adhere to verifiable prudential criteria and the inherent structural constraints of Energy Communities: high concentration of initial investment, gradual revenue generation, limited equity capacity, and the absence of traditional collateral.

In this context, defining the optimal structure does not aim to maximize leverage, but rather to preserve intertemporal cash flow stability and resilience to moderate technical or financial deviations. The calibration must be based on financial modeling under baseline and sensitivity scenarios, incorporating variations in energy generation, revenue levels, and operating costs.

A. Capital structure under Blended finance

The initial financial closing must be self-sustaining without considering resources from the performance-based payment mechanism. This principle is essential to avoid structural dependence on conditional incentives and to guarantee solvency from day one.

The capital structure proposed in this section is grounded in the project revenue logic and cash flow assumptions developed in the business model and financial viability analysis prepared in previous deliverables. In practical terms, the repayment capacity assessed here is based on revenue streams such as self-consumption savings, compensation or net-billing [3]arrangements where applicable, anchor demand or service agreements where available, and other structured collection mechanisms linked to the project's operating model. The materialization and stability of these revenues depend on project type, regulatory conditions, technical performance, and collection discipline. For this reason, the capital structure must be read together with the underlying business model logic, since the resulting cash flows remain sensitive to variations in regulation, effective collection rates, and operational performance.

The combination of catalytic capital, concessional financing, and community contributions must be defined based on the maximum sustainable leverage capacity identified in the financial model. This capacity is determined by evaluating debt service coverage ratio (DSCR)[4] under a baseline scenario and under reasonable stress scenarios, ensuring that the project maintains the ability to cover operation and maintenance, establish minimum reserves, and meet financial obligations without relying on additional injections of capital.

Based on the financial modeling developed for this instrument, complemented by comparative references from community distributed generation projects and prudential criteria commonly used in small-scale infrastructure structuring, indicative capital structure ranges were identified as a reference for calibration:

- Catalytic capital: 15% – 30% of CAPEX
- Concessional financing: 50% – 70% of CAPEX
- Community or equity contribution: 5% – 15% of CAPEX

These percentages should not be understood as fixed rules, but as indicative ranges derived from a combination of model-based calibration, comparative evidence, and expert financial judgment. Their purpose is to illustrate the balance required between initial risk absorption and sustainable leverage under the cash flow conditions typically observed in Energy Communities.

The level of catalytic capital must be sufficient to improve debt service coverage under conservative scenarios, such as moderate reductions in revenue generation or collection, without unnecessarily displacing the share of repayable resources. When catalytic capital is too low, the sensitivity of the DSCR to technical or collection-related deviations increases significantly; when it is excessive, the instrument's multiplier effect is reduced, and its fiscal scalability becomes more limited.

Concessional financing constitutes the core repayable component and should be limited to the maximum sustainable service capacity. In prudential terms, this implies maintaining a DSCR above 1.0x in the baseline scenario. Exceeding that threshold increases the probability of liquidity stress in the event of operational deviations.

[3] Net-billing: a scheme under which electricity generated and not consumed instantaneously can be injected into the grid and economically recognized through a compensation or payment, in accordance with the applicable regulatory conditions.
[4] Debt Service Coverage Ratio (DSCR) measures the project's ability to meet scheduled debt service from its operating cash flow. A DSCR above 1.0x indicates that projected cash flow is sufficient to cover debt payments.

Where local or community contributions exist, they may play a useful role in strengthening ownership and internal alignment. However, their scale should reflect the actual capacity of the territory and should not become a barrier to access. From a financial perspective, their role is not to absorb systemic risk, but to reinforce commitment and local discipline where feasible.

Taken together, this configuration allows for a prudent financial closing in which debt is supported by cash flow stability rather than traditional collateral. The resulting structure distributes risk in stages: catalytic capital absorbs early exposure, concessional debt is supported by collection discipline and protected flow rules, and the Energy Community assumes operational responsibility under clear governance arrangements.

B. Impact of performance-based pay on the financial structure

The Results-based-payment-mechanism introduces a dynamic dimension to the capital structure, but it is not part of the initial closing. Its function is to progressively improve the project's financial profile as consistent technical and financial results are achieved during operation.

From a quantitative perspective, and under upper-bound modeled scenarios, the accumulated incentive could represent a cumulative amount broadly equivalent to around 10% of CAPEX, strictly contingent on compliance with contractual indicators and the continued availability of the payment mechanism. This figure should be understood as an indicative ceiling derived from financial model simulations and prudential calibration criteria, rather than as an average or guaranteed value. Its relevance lies not in increasing operating income, but in its potential impact on debt reduction or reserve reinforcement.

When the incentive is applied to early repayment of concessional financing, the debt balance decreases at a faster rate than originally anticipated. This produces a progressive improvement in debt service coverage in subsequent years and reduces the lender’s credit exposure. The effect is cumulative, provided that the mechanism remains active and disbursements continue to be triggered under the agreed conditions.

When the incentive is used to strengthen the reserve fund, the project increases its capacity to absorb technical contingencies or temporary income fluctuations. This reinforcement reduces liquidity risk and the probability of default arising from transient stresses, particularly in the first years of operation.

Results-based payment does not correct structural deficiencies in the initial design, nor does it replace financial discipline. Its function is to consolidate an already prudent structure, generating a downward trajectory of risk as operational performance stabilizes. If material weaknesses become apparent during operation, for example because initial cash flow assumptions prove too optimistic, the appropriate response is not to rely on the incentive as a substitute, but to activate corrective measures within the project’s governance and financial management framework, including operational adjustment, technical support, or financial restructuring where necessary.

Structurally, the combination of a conservative initial setup under blended finance and a performance-based incremental improvement mechanism allows the instrument to address both initial credit constraints and the need for longer-term financial strengthening. However, the cumulative effect of the mechanism depends on the continuity of the institutional payer’s commitment over time. For this reason, progressive improvements in the project’s credit profile should only be incorporated into forward-looking financial assumptions where payer commitment has been secured through contractual, programmatic, or other binding arrangements for the relevant period. Where such commitment is not fully secured, the mechanism should be treated as an upside-point rather than as a structurally guaranteed source of financial improvement.

V. Sources of financing and alignment of actors

The viability of the proposed instrument depends on identifying and coordinating actors with distinct mandates, capabilities, and institutional objectives. The defined financial architecture, combining blended finance with results-based payments, requires that each component be financed by entities whose risk profile and strategic horizon are consistent with their role within the framework.

In the Colombian context, potential sources can be analyzed according to the instrument's three structural components: catalytic capital, concessional financing, and resources allocated to the results-based payment mechanism. The participation of local stakeholders and energy operators is integrated within each of these components according to their role and level of risk exposure. This participation, however, should not be interpreted as implying that community-based financial contributions are always expected. Given the socioeconomic profile of many target Energy Communities, upfront community capital may be absent or very limited, so the instrument is not designed to rely on it as a general condition of applicability.

A. Catalytic capital

Catalytic capital requires actors with an explicit mandate for territorial development, energy transition, or climate mitigation, and with the capacity to assume greater risk tolerance without demanding commercial financial returns.

In this instrument, catalytic capital is defined primarily by the financial function it performs absorbing part of the initial risk, improving the project's bankability, and enabling the mobilization of additional repayable financing. Depending on the legal nature of the receiving entity and the applicable institutional framework, this component may take different forms, including non-reimbursable contributions, subordinated debt, or equity-like and patient capital structures where such treatment is feasible. The specific form adopted is relevant because it affects accounting treatment, repayment obligations, eligibility conditions, and the financial rights associated with the instrument.

At the international level, this role can be assumed by bilateral and multilateral cooperation agencies such as the European Union, the Green Climate Fund (GCF), or the Global Environment Facility (GEF). Their interest lies in promoting positive externalities like emission reductions, institutional strengthening, and energy inclusion, that are not fully captured in the project's cash flow.

At the national level, this function can be fulfilled by the Ministry of Mines and Energy, the Fund for Non-Conventional Energy and Efficient Energy Management (FENOGE), the National Planning Department (DNP), and resources from the General Royalties System allocated to the energy transition. These actors align with sectoral goals for decarbonization, closing territorial gaps, and fulfilling climate commitments.

Municipalities and regional governments can participate as contributors of catalytic capital when Energy Communities projects are incorporated into the Territorial Planning Plan (POT) or into municipal and departmental development plans. Inclusion in these planning instruments facilitates the allocation of public investment resources and provides territorial coherence to the project.

In specific cases, energy operators may participate alongside the catalytic layer through subordinated or longer-tenor capital positions, not as providers of purely catalytic capital in the developmental sense, but where there is a clear strategic rationale for doing so. Such participation would only be plausible if the operator expects an indirect or longer-term commercial benefit, for example through territorial positioning, future service revenues, portfolio expansion, operating contracts, or enhanced access to new distributed generation markets. In this sense, operator participation should be understood as strategic risk-taking with a commercial logic, rather than as mission-driven capital comparable to public or climate-finance catalytic resources.

The use of catalytic capital should therefore be assessed under a multiplier-effect criterion: its purpose is to enable additional repayable financing and improve the initial risk profile, not to replace the repayment structure altogether. Within the proposed instrument, catalytic capital is justified to the extent that it allows projects that would otherwise remain excluded from financing to reach a level of viability and bankability compatible with their territorial and institutional conditions.

For the purposes of this instrument, the multiplier effect should be understood as the amount of additional repayable financing mobilized per unit of catalytic capital deployed. Given the risk profile and socioeconomic characteristics of the target Energy Communities, the instrument does not assume a uniform benchmark equivalent to those used in more mature infrastructure markets. As an indicative reference, a catalytic capital multiplier in the range of approximately 1.5x to 3x may be considered reasonable in early-stage applications, with the expectation that stronger projects or more stable contexts could progressively support higher leverage over time. This range should be treated as an operational reference for calibration and performance assessment, rather than as a fixed requirement.

B. Concessional financing

Concessional financing constitutes the central repayable component of the instrument and the main mechanism for mobilizing capital toward Energy Communities. Its structuring requires a rigorous analysis of the project's risk profile, since, in the absence of traditional collateral, the sustainability of the loan depends fundamentally on the stability and predictability of the operating cash flow.

Unlike commercial debt, concessional debt is justified when there is consistency between the financier's institutional mandate and the public benefits generated by the project. In the Colombian context, entities such as FINDETER, Bancoldex, Banco Agrario, as well as programs channeled through the Inter-American Development Bank (IDB), the International Finance Corporation (IFC), and KfW Development Bank, have powers and strategic objectives aligned with financing sustainable infrastructure, the energy transition, and territorial development. The institutional incentive for these entities is not limited to financial returns but also incorporates public policy goals, compliance with climate commitments, and the expansion of green portfolios.

In these types of projects, credit evaluation cannot be based on asset sales as the primary source of repayment, but rather on the project's structural capacity to generate sufficient and disciplined cash flow. Debt must therefore be structured using a cash flow-based financing approach, supported by a dedicated account, explicit payment priority rules, and mandatory establishment of operating and replacement reserves. The strength and traceability of collections become the cornerstone of the risk analysis.

A core condition of this structure is the existence of an identified borrowing entity with the legal capacity to receive and repay concessional financing. In the context of Energy Communities, this borrower should not be understood as the community in an informal or purely social sense, but as the legally constituted entity through which the project is implemented and financially managed. Depending on the case, this role may be assumed by a cooperative, association, community-based enterprise, special-purpose vehicle, utility-linked operating entity, or another legally valid structure capable of entering into financing agreements, managing the dedicated account, and assuming repayment obligations. The specific borrower model may therefore vary across projects, but the existence of a legally capable counterparty is a necessary condition for the operation of the concessional debt component.

Credit risk in Energy Communities is complex in nature. It comprises a technical component related to the performance of the generation system, a financial component linked to revenue stability, and an institutional component related to the territorial and regulatory continuity of the project. Concessional debt is only viable when these factors are managed coherently within the financial structure.

In this context, power operators or generators do not act as concessional financiers, given that their structure is driven by commercial logic rather than a public development mandate. However, they can play a significant role in mitigating technical risks. Entering operation and maintenance contracts with minimum availability guarantees, penalty clauses for poor performance, and remuneration schemes partially contingent on technical performance reduces the likelihood of operational deviations that could impact the project's cash flow. In situations where the operator has sufficient financial strength, a limited guarantee could be structured, exclusively linked to technical failures under its direct control. This arrangement does not transfer the entire credit risk to the operator, but it does improve the project's risk profile for the financier.

The institutional dimension of risk can be reduced through the formal integration of the project into territorial planning instruments. Incorporating Energy Communities into the POT and municipal or departmental development plans strengthens programmatic stability and reduces the uncertainty associated with changes in administration or local priorities. In this sense, municipalities and departments do not necessarily act as direct lenders of concessional debt, but they do contribute to improving the institutional risk environment that influences credit evaluation.

In the initial stages of implementing the instrument, when a consolidated performance history is not yet established, it may be necessary to supplement concessional debt with partial risk mitigation mechanisms, such as guarantees provided by the National Guarantee Fund (FNG) or first-loss schemes backed by international cooperation. These mechanisms do not replace the repayment obligation or financial discipline, but they can broaden credit eligibility in contexts where the perception of risk is high.

The concessional debt within this instrument is based on a combination of cash flow financing, contractual mitigation of technical risk, territorial institutional stability, and, when necessary, partial credit risk coverage. This configuration allows for the mobilization of repayable capital under conditions compatible with the community-based nature of the model and with the objectives of energy transition and sustainable development in Colombia, without disproportionately transferring financial risk to the operator or relying on equity guarantees that are nonexistent in most of these schemes.

C. Resources for the results-based payment mechanism

The results-based payment mechanism requires a funding source whose allocation logic is geared toward rewarding verifiable performance, not financing assets. Unlike catalytic capital and concessional debt, this component is disbursed only when predefined goals are met through independent measurement and verification processes. Its viability depends on the existence of institutional or corporate actors interested in linking resources to measurable results in energy policy, climate impact, or territorial development.

At the national public level, entities such as the Ministry of Mines and Energy, the Ministry of Environment and Sustainable Development, and the Fund for Non-Conventional Energy and Efficient Energy Management (FENOGE) are structurally aligned with this mechanism, as their mandates include targets for distributed renewable energy generation, emissions reduction, energy efficiency, and strengthening community-based schemes. Payment conditional on results allows budget execution to be linked to specific performance indicators, reducing the risk of inefficient allocations and strengthening the traceability of impact.

International cooperation, including that of KfW Development Bank, the European Union, and multilateral climate funds such as the Green Climate Fund (GCF), can also play a significant role when incentives are linked to verifiable climate outcomes or institutional strengthening in vulnerable territories. This approach aligns with international climate finance frameworks that prioritize measurable results over simple disbursements for implementation.

Additionally, the mechanism can attract participation from private organizations interested in financing verifiable climate outcomes as part of their decarbonization commitments or ESG strategies. In this case, the incentive is not direct financial return, but rather the achievement of corporate emissions reduction targets, the strengthening of sustainable value chains, or territorial positioning in the energy transition. In practical terms, this pathway would require the identification of corporate actors whose sustainability objectives are aligned with measurable project outcomes, followed by the structuring of a results-based commitment linked to predefined indicators, verification protocols, and disbursement conditions. Private participation should therefore be understood as an optional but potentially relevant payer pathway, provided that the commitment can be formalized through sufficiently clear contractual or programmatic arrangements before the mechanism is treated as active.

Corporate participation can be structured in various ways. In its simplest form, it can take the form of voluntary climate contributions linked to technical indicators of emissions reductions or energy performance, without necessarily generating tradable carbon credits. This approach reduces structuring costs and avoids the complexities associated with formal certification.

In larger-scale scenarios, and where technical and economic feasibility exists, the certification of emission reductions under recognized standards could be explored, always guaranteeing environmental integrity, traceability, and the absence of double counting with national inventories or NDC commitments. This option should not be understood as a standard pathway for individual Energy Community projects, since formal credit generation often involves transaction costs and methodological requirements that are disproportionate to their scale. Its role within the instrument is therefore limited and selective, and it would be more realistically applicable to larger projects or aggregated portfolios where certification costs can be distributed across a broader asset base.

At the territorial level, municipalities and regional governments can act as institutional payers when the results directly contribute to goals included in their development plans or environmental commitments defined in the POT. Coordination with territorial planning instruments strengthens the legitimacy of the incentive and facilitates its incorporation into local budgets focused on sustainability.

The credibility of the mechanism depends on a robust system of independent measurement and verification. Activation of payments must be subject to clear indicators, predefined methodologies, and external technical auditing. Within this framework, the energy operator can contribute indirectly through performance contracts aligned with the same indicators that determine the institutional incentive, strengthening coherence between technical performance and financial improvement without assuming additional credit risk.

It is crucial to emphasize that payment for results does not replace the structural sustainability of the initial financial closure, nor does it act as a loan guarantee. Its function is to progressively improve the project's financial profile as operational performance and climate impact are consolidated. This contingent nature preserves financial discipline and avoids structural dependence on external resources.

Strategically, the convergence of national energy transition goals, international climate commitments, and corporate decarbonization objectives creates an opportunity to channel resources toward Energy Communities with verifiable impact. When structured according to principles of environmental integrity and financial traceability, the results-based payment mechanism can become an effective tool for aligning public, private, and local incentives around measurable sustainability outcomes.

VI. Governance and administration of the instrument

The proposed instrument is based on a cash flow–based financing approach, in which repayment capacity depends not on the execution of assets as collateral, but on the stability, traceability, and discipline of operational collections. In this model, governance does not fulfill a secondary administrative function but rather constitutes the structural support that enables the mobilization of repayable resources.

In conventional infrastructure projects, credit risk mitigation relies on real collateral, capital solvency, or contracts with high-quality credit payers. In Energy Communities, these conditions are not usually present. Consequently, risk reduction must be built through explicit flow management rules, functional separation of critical responsibilities, verifiable control mechanisms, and a clear administrative arrangement capable of operating both at instrument and project level.

This implies that the project’s institutional framework is integrated into the financial design from the outset. The dedicated account, the mandatory payment priority, the establishment of reserves, the independent verification, and the assignment of administrative responsibilities are not contingent operational decisions, but rather structural conditions that allow for partial compensation for the absence of traditional guarantees.

Under this logic, governance acts as a structural credit enhancement mechanism: it transforms organizational discipline into effective financial mitigation. Only on this basis is the incorporation of concessional debt and the activation of incentives conditioned on verifiable performance viable.

A. Institutional components of the instrument

Financing through this mechanism is viable when the project’s functions are defined and integrated from the financial closing stage through the contractual and operational design. The capacity for collection and the protection of cash flow do not depend on subsequent administrative decisions, but rather on the explicit assignment of responsibilities that streamline financial management, reduce discretion, and guarantee traceability to third parties.

These responsibilities must operate at two distinct but connected levels. At system level, the instrument requires an administrative function capable of coordinating the portfolio as a whole. This role may be assumed by an intermediary or designated facility manager responsible for consolidating information across projects, coordinating the interface with capital providers and institutional payers, overseeing monitoring and verification processes, and channeling disbursements in accordance with the agreed rules of the instrument. At project level, administration is carried out by the legally constituted entity implementing the Energy Community or, where required, by a designated project-level financial administrator. This role includes management of the dedicated account, compliance with the payment waterfall, reserve maintenance, project-level reporting, and operational coordination with the independent verifier.

This distinction between instrument administration and project administration is essential for replicability and scale. Without a defined administrative arrangement at system level, the instrument would remain conceptually coherent but operationally fragmented. Without clear project-level administration, the discipline of the cash flow structure could not be effectively enforced.

In the proposed instrument, these responsibilities are structured around four interdependent dimensions: financial governance, cash flow management, technical stability of the asset, and independent verification. The coherence among these dimensions allows for the translation of financial rules into effective risk mitigation mechanisms, ensuring that project sustainability depends not on individual will but on predefined structures.

- **Financial governance**
  This dimension preserves design consistency throughout the project cycle. Its responsibility is to ensure compliance with structural conditions such as payment priority, mandatory reserve establishment, contractual obligations to funders, and the conditions for triggering results-based payments. In the pre-operational stage, this function is fulfilled through the validation of financial closing and the formalization of binding commitments. In the operational stage, it prevents discretionary alterations that could weaken collection discipline or compromise the instrument’s stability. From a risk perspective, this function mitigates institutional uncertainty and strengthens contractual stability.

- **Cash flow management and liquidity protection**
  It constitutes the operational core of the mechanism. Its structural function is to ensure that revenue generated from energy operations is channeled through a dedicated account and applied according to a predefined prioritization rule. This sequence covering operation and maintenance, establishing or replenishing reserves, and subsequently servicing debt is not a routine administrative decision, but an essential financial condition. In the pre-operational stage, differentiated accounting systems and binding internal rules are implemented; during operation, the orderly allocation of resources is executed, and periodic reports are generated. This discipline partially compensates for the lack of collateral and constitutes the foundation of trust for the concessional debt.

- **Technical stability of the asset**
  Technical performance determines the consistency of the projected cash flow and, therefore, the repayment capacity. For this reason, technical execution is an integral part of the financial mechanism. Operation and maintenance contracts must incorporate performance standards, availability indicators, and continuous monitoring schemes aligned with the project's financial commitments. When technical performance is contractually linked to clear obligations and verifiable mechanisms, operational risk is structurally reduced.

- **Independent verification and traceability**
  This dimension reduces information asymmetries between the Energy Community, funders, and payers of performance-based incentives. At the initial stage, it validates baselines and methodologies associated with indicators; during operation, it certifies technical and financial results when this is necessary to activate incentives or report contractual compliance. This component is especially relevant where international cooperation or climate finance resources are involved, since verifiability is a condition of legitimacy. At system level, its effectiveness also depends on an administrative arrangement capable of consolidating project-level evidence and coordinating the interface with the independent verifier.

The interaction of these functions transforms governance into a structural credit enhancement mechanism. This is not an idealized organizational model, but rather a system designed to convert institutional discipline into effective financial risk reduction. In Energy Communities, where loan recovery cannot rely on asset foreclosures, cash flow protection, technical stability, and external verification replace physical collateral as the foundation of bankability.
Consequently, the sustainability of the instrument depends less on the timely availability of resources and more on the ability to maintain binding financial rules, clearly differentiated functions, and verifiable control mechanisms that preserve the consistency of the design over time.

B. Component integration and risk mitigation

The structured financial instrument for Energy Communities consists of three interdependent layers:

1. Capital structure under Blended finance.
2. Payment mechanism for results.
3. Institutional architecture of administration and control.

Each layer fulfills a distinct function within the risk mitigation scheme.

Table 6- Instrument Characteristics

Layer	Component	Structural function	Activation moment	Mitigated risk	Mitigation mechanism
Blended finance capital structure	Catalytic capital	Partial absorption of initial risk	Financial closing	Early investment risk	Structural subordination
	Flow-based concessional debt	Repayable financing compatible with gradual cash generation	Implementation and operation	Credit risk	Dedicated account and mandatory priority
Payment for results mechanism	Payment for results	Progressive improvement of the financial profile	Operation	Risk of financial deterioration	Early amortization or reinforcement of reserves
Institutional architecture of	Financial governance	Preserve financial rules	Entire cycle	Institutional risk	Contractual supervision

Layer	Component	Structural function	Activation moment	Mitigated risk	Mitigation mechanism
administration and control	Flow management	Protect liquidity and discipline	Operation	Liquidity risk	Mandatory application of payment sequence
	Technical execution	Ensure asset stability	Implementation and operation	Operational risk	Contracts with performance standards
	Independent verification	Reduce information asymmetries	Operation	Information risk	External certification of indicators

The interaction of these components does not eliminate risk, but organizes it through complementary financial and institutional mechanisms. Together, the three layers of the instrument create a coherent mitigation structure that supports bankability under the operating conditions of Energy Communities.

C. Replicability of the instrument

The replicability of the instrument does not imply applying identical percentages in all territories, nor reproducing the entire financial and governance structure independently for each Energy Community. Rather, it means preserving structural coherence across diverse organizational contexts through a standardized framework that can be applied repeatedly with calibrated adjustments according to project conditions.

In practical terms, the instrument is not intended to be fully rebuilt from scratch for each individual Energy Community. Given the administrative complexity and transaction costs associated with blended finance, payment-for-results arrangements, monitoring, verification, and protected cash flow rules, practical scalability depends on the existence of a centralized or semi-centralized vehicle at instrument level. This overarching structure, operated through the intermediary or designated facility manager, should provide the common architecture for portfolio coordination, capital channeling, reporting, verification oversight, and contractual standardization, while individual communities enter the instrument through project-specific implementation arrangements.

Under this logic, smaller or less administratively mature communities are not expected to manage the full institutional complexity of the model on their own. Instead, scalability depends precisely on separating what must be standardized and centrally administered from what can remain specific to each project. The instrument can therefore accommodate heterogeneous communities to the extent that a shared administrative and contractual platform reduces transaction costs, limits discretionary redesign, and preserves bankability conditions across multiple operations.

This requires minimum conditions: mandatory discipline in managing the flow, standardized contracts, verifiable indicators, and a clear separation of responsibilities between instrument-level administration and project-level implementation. When these conditions are met, the instrument can scale geographically without depending on ad hoc negotiations in each case.

Table 7 – Replicability Dimensions

Dimension	Structural condition	Effect on scalability

Financial discipline	Dedicated account and mandatory priority	Maintains a homogeneous credit profile
Standardization	Common contracts and indicators	Reduces transaction costs
Verifiability	Indicators auditable by third parties	Enables climate finance
Institutional capacity	Clear functional separation	Reduces added risk
Territorial integration	Alignment with local planning	It provides programmatic stability

In short, the sustainability and expansion of this instrument depend not only on the volume of available resources, but also on the ability to maintain binding financial rules, differentiated institutional roles, and verifiable traceability within a structure that can serve multiple communities simultaneously. In this framework, governance acts not only as a structural risk reduction mechanism, but also as the basis for scaling the instrument beyond isolated project-by-project structuring.

CONCLUSIONS AND RECOMMENDATIONS

The analysis developed in this deliverable suggests that the main constraint affecting the expansion of Energy Communities in Colombia is not simply the lack of financial resources, but the absence of a financial architecture capable of aligning available resources with the economic, organizational, and territorial characteristics of these projects. Energy Communities do not fit the assumptions that underpin conventional infrastructure finance. They typically combine high upfront investment requirements, gradual and sometimes volatile cash flow generation, limited equity capacity, heterogeneous administrative maturity, and little or no access to traditional collateral. Under these conditions, the main challenge is not only to mobilize capital, but to organize it in a way that is compatible with the actual structure of project risk and repayment capacity.

A first key insight emerging from the analysis is that Energy Communities cannot be adequately financed through a single instrument or a single source of capital across the entire project cycle. Preparation, financial closing, operational stabilization, reserve building, and eventual scaling respond to different financing needs, time horizons, and risk profiles. This explains why conventional approaches based exclusively on grants, debt, or isolated subsidies tend to produce partial solutions. The proposed instrument is therefore designed as an integrated architecture that combines differentiated financial functions within a single framework. In this sense, its added value lies less in the invention of completely new financial components than in the way those components are structured, sequenced, and linked to one another.

A second key insight is that, in the context of Energy Communities, bankability depends less on physical collateral than on the quality of governance and the protection of cash flow. Because loan recovery cannot realistically rely on asset foreclosure in most of these projects, financial viability must be built through protected flow structures, dedicated accounts, mandatory payment priority, reserve mechanisms, technical performance discipline, and verifiable monitoring. This means that governance is not a secondary operational feature, but a financial precondition of the model. The analysis supports the expectation that a structure combining catalytic capital, concessional debt, and payment for results can improve access to finance only if it is embedded in a governance arrangement capable of enforcing these disciplines in practice.

A third key insight is that scalability cannot be understood as the repeated reconstruction of the full financial architecture for each individual Energy Community. Such an approach would likely be too costly and institutionally demanding, particularly in smaller or less administratively mature communities. The analysis therefore suggests that practical scalability depends on a centralized or semi-centralized administrative structure capable of operating the instrument across multiple projects. In this logic, the replicable element is not the project-by-project duplication of the full mechanism, but the existence of a shared contractual, administrative, monitoring, and verification platform through which multiple communities can access a common financial architecture with calibrated adjustments. This is particularly important in contexts where local institutional capacity is limited and where transaction costs would otherwise undermine feasibility.

The instrument should therefore not be understood as universally applicable in identical form across all contexts. Its underlying logic is common, but its calibration must vary depending on project conditions. This point is especially relevant when considering the differentiated contexts identified in the broader analytical work, including the distinction between SIN and ZNI territories, as well as variations in poverty levels, administrative capacity, and organizational maturity.

In SIN contexts, where grid connection conditions, revenue visibility, operational support, and payment discipline may be comparatively stronger, the instrument can be expected to support relatively greater leverage and a clearer pathway toward gradual financial maturation. In such cases, the role of catalytic capital may be more limited in relative terms, reserve requirements may be calibrated with lower precautionary intensity, and the transition toward refinancing or greater participation of non-concessional capital may be more plausible over time, provided that operational and financial performance are sustained.

In ZNI contexts, by contrast, the instrument is expected to require a more conservative configuration. Greater logistical complexity, higher operational uncertainty, weaker connectivity, and more fragile payment environments imply that catalytic capital may need to play a stronger role, reserve requirements may need to be more robust, monitoring and verification arrangements may need to be adapted to low-connectivity conditions, and the administrative support provided through the instrument may need to be more intensive. In these cases, the objective is not to force equivalence with more mature market environments, but to preserve financial coherence under more demanding operating conditions.

Similarly, communities with lower administrative capacity or greater poverty should not be expected to carry the institutional burden of the full model on their own. In these contexts, the instrument would be expected to function more effectively when a larger share of administration, reporting, monitoring coordination, and contractual standardization is handled at instrument level rather than left entirely to project-level structures. By contrast, communities with stronger institutional capacity and more stable revenue conditions may be able to assume greater project-level administration and operate within a lighter support framework. The analysis therefore supports a differentiated application of the instrument according to context, rather than a uniform template.

These conclusions should be interpreted as expected implications derived from the diagnostic work, the financial modeling, and the comparative analysis of financing structures, rather than as demonstrated implementation results. The instrument has not yet been deployed in practice, and the claims made in this document should therefore be understood as forward-looking design implications supported by the available evidence. The relevance of the proposed structure lies in its analytical consistency with the constraints identified, but its ultimate effectiveness will depend on implementation quality, institutional coordination, and the ability to maintain discipline across the financial and governance components of the model.

From a public policy perspective, the analysis points to several implications. First, expanding Energy Communities at scale requires more than isolated subsidy windows; it requires a financial architecture capable of combining public, concessional, and performance-based resources under rules compatible with community-based projects. Second, mobilizing repayable capital into these contexts depends on governance quality as much as on financing availability. Third, the payment for results component should be treated as a complementary strengthening mechanism, not as a substitute for prudent initial financial structuring. Fourth, practical scalability requires an institutional arrangement capable of standardizing administration and reducing project-level transaction costs.

On that basis, the following recommendations are proposed. They are organized in sequence, distinguishing between enabling conditions and implementation steps, and each recommendation is linked to the gap it seeks to address and the primary actor best positioned to lead it.

A. Enabling conditions

1. Establish a dedicated concessional financing window for Energy Communities based on cash flow rather than traditional collateral.

   Primary addressees: Ministry of Mines and Energy, FINDETER, Bancóldex, Banco Agrario, development finance partners.

   This recommendation responds to the finding that conventional debt structures are generally incompatible with the repayment profile of Energy Communities. A dedicated concessional line should be designed around protected cash flow, payment waterfalls, reserves, and project-level governance rather than asset-based guarantees. This is a prerequisite for mobilizing repayable capital into projects that would otherwise remain excluded from financing despite having socially and territorially valuable outcomes.
2. Define a standardized framework for payment-for-results indicators, verification, and disbursement rules.

   Primary addressees: Ministry of Mines and Energy, Ministry of Environment and Sustainable Development, FENOGE, climate finance actors, institutional payers.

   This recommendation responds to the need for simplicity, verifiability, and consistency in the operation of the performance-based component. A standardized framework should define a limited set of core indicators, threshold logic, verification frequency, and acceptable uses of disbursement. Without such a framework, the payment-for-results mechanism risks becoming too discretionary, too expensive to verify, or too fragmented to scale.
3. Develop or clarify the regulatory and institutional conditions required for community-based projects to operate under protected cash flow arrangements.

   Primary addressees: Ministry of Mines and Energy, relevant regulatory entities, sector agencies, territorial authorities.

   This recommendation responds to the fact that the proposed instrument depends on legal and operational arrangements that are not always explicit in current practice. Potential regulatory or institutional adjustments may include clearer recognition of legally eligible borrower entities for Energy Communities, operational feasibility of dedicated accounts and mandatory payment priority structures, guidance for collective collection arrangements, simplified treatment for aggregated small-scale projects, and the incorporation of performance-based incentives into public or climate-finance programs. The purpose is not necessarily to create a wholly new regulatory regime, but to remove ambiguities that could prevent implementation.
4. Define a centralized or semi-centralized facility management structure for the instrument.

   Primary addressees: Ministry of Mines and Energy, FENOGE, development finance institutions, implementing partners.

   This recommendation responds directly to the finding that project-by-project reconstruction of the full architecture would be too complex and costly. A facility manager or administrative intermediary should be established to coordinate portfolio-level reporting, capital flows, monitoring oversight, verification interfaces, and standardization of contractual arrangements. This is a core enabling condition for replicability, especially in communities with limited administrative maturity.

B. Implementation steps

1. Pilot the instrument through a differentiated portfolio rather than through isolated individual projects.
   Primary addressees: Ministry of Mines and Energy, Ministry of Finance and Public Credit, FENOGE, development finance partners, implementing entities.
   This recommendation responds to the need to test the instrument under real operating conditions while preserving analytical comparability across contexts. A pilot portfolio should include a range of cases across SIN and ZNI contexts, different levels of poverty and institutional capacity, and different revenue configurations. This would allow calibration of capital structure, reserve policy, administrative support, and verification requirements before broader deployment.
2. Apply the instrument through differentiated configurations according to territorial and institutional context.
   Primary addressees: Facility manager or intermediary, implementing entities, public sector sponsors. This recommendation responds to the tension between a common architecture and diverse project conditions. The instrument should not be deployed as a one-size-fits-all package. Instead, its application should be guided by criteria such as grid context, poverty conditions, payment reliability, and institutional capacity. In practice, this means that SIN projects may support relatively stronger leverage and lighter reserve structures, whereas ZNI projects may require stronger catalytic support, more robust liquidity protection, and closer centralized administration. This contextual differentiation should become an explicit implementation rule rather than an implicit assumption.
3. Develop standardized contractual templates, financial governance guidelines, and monitoring protocols for project-level implementation.
   Primary addressees: Facility manager or intermediary, implementing partners, development finance actors. This recommendation responds to the need to reduce transaction costs and prevent discretionary redesign at project level. Standardized templates should cover dedicated account rules, payment priority, reserve conditions, reporting formats, verification interface requirements, and roles of project-level administrators. This would help translate the instrument from a conceptual architecture into an operational model capable of repeated application.
4. Strengthen the integration of Energy Community projects into territorial planning instruments and public investment pipelines.
   Primary addressees: Municipalities, departmental governments, Ministry of Mines and Energy, planning authorities.
   This recommendation responds to the institutional risk dimension identified in the analysis. Inclusion of projects within POTs, development plans, and territorial energy transition agendas can improve programmatic continuity, facilitate co-financing, and strengthen the legitimacy of long-term public support. This is especially important where political turnover or fragmented local priorities might otherwise weaken project continuity.

In summary, the proposed instrument should be understood not as a finalized proof of concept, but as a structured financing hypothesis grounded in the diagnostic and financial evidence developed throughout the project. Its central contribution is to show that financing Energy Communities requires a differentiated architecture capable of combining catalytic support, concessional debt, performance-based strengthening, and governance discipline under a coherent framework. Its expected value lies in improving the compatibility between financing conditions and the actual operating realities of community-based energy projects.

If implemented with a differentiated territorial lens, a centralized or semi-centralized administrative platform, and clear enabling conditions, the instrument could become more than a financing mechanism for individual projects. It could serve as a practical pathway for translating Colombia's energy transition objectives into territorially grounded and financially viable community-based operations. Under that perspective, financing ceases to be treated as an isolated barrier and becomes part of the institutional architecture required to make the territorial energy transition operational.