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Mobilizing Green Investments and PPP Governance in the Energy Transition: Regulatory Challenges and Prospects for Morocco

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Abstract

The global energy transition demands a massive and urgent reallocation of capital toward low-carbon assets, crucial for achieving international climate objectives. However, mobilizing green investments unfolds within a landscape marked by multiple regulatory and institutional challenges. This article provides an in-depth analysis of the fragmentation of sustainability taxonomies, the diversity and heterogeneity of non-financial disclosure standards, and the persistent uncertainty regarding the prudential treatment of green assets. Additionally, the study highlights structural governance limitations in carbon markets, alongside non-financial constraints such as lengthy administrative permitting procedures and infrastructure bottlenecks. By comparing regulatory frameworks across the European Union, the United States, China, and Morocco, the research emphasizes that regulatory convergence, enhanced transparency, market integrity, and effective procedural reforms are essential conditions for lowering the cost of green capital and accelerating the energy transition. Lastly, the article offers strategic recommendations aimed at strengthening overall regulatory coherence and encouraging the integration of emerging economies into sustainable finance, thereby contributing to a more inclusive and effective global mechanism.

Keywords: Global energy transition, green finance, sustainability taxonomies, non-financial disclosure, carbon markets, regulatory convergence, emerging economies.

Introduction

The energy transition today represents one of the most strategic challenges of our time. It is not merely a technical or economic issue, but a global concern that shapes the future of societies and the sustainability of our development models. In the face of the climate emergency, as highlighted by successive IPCC reports, and in light of the international commitments undertaken under the Paris Agreement, it has become imperative to redirect financial flows massively toward low-carbon and resilient solutions. This reallocation of capital is not only a political choice; it is a sine qua non for building a sustainable future capable of limiting the destructive effects of global warming and meeting the carbon neutrality targets set for 2050.

Yet, although interest in green investments has increased significantly over the past decade, their actual mobilization remains below the levels deemed necessary by international institutions. As a researcher engaged in this field, I have observed that this situation results not only from a lack of

available capital but also from a series of regulatory, institutional, and organizational obstacles. The multiplicity of standards, fragmented regulatory frameworks, and divergences across jurisdictions create a complex and often opaque landscape, generating misunderstanding that undermines investor confidence. Moreover, the absence of a universal taxonomy for sustainable activities exacerbates greenwashing risks and complicates international project comparisons.

Beyond financial frameworks, other structural barriers hinder the growth of green finance. The insufficiency of carbon market governance mechanisms limits the credibility of offset instruments and their integration into investment strategies. Additionally, the complexity and sluggishness of administrative procedures, particularly in permit issuance or network infrastructure connection, constitute major obstacles, increasing transaction costs and delaying project implementation.

It is within this perspective that this study is situated. The objective is to identify and analyze the main regulatory challenges impeding the mobilization of green investments, by comparing different national and regional contexts—particularly those of the European Union, the United States, China, and Morocco. This comparative approach will not only highlight existing convergences and divergences but also outline potential reforms to enhance the coherence of regulatory frameworks at a global scale.

This research has a dual ambition. On the one hand, it aims to provide a rigorous scientific reflection on the conditions for successful green finance, highlighting the close links between regulation, investor confidence, and optimal capital allocation. On the other hand, it seeks to offer practical recommendations to simplify procedures, harmonize standards, and promote a fairer integration of emerging countries into sustainable finance. Indeed, it is unrealistic to expect a global energy transition without enabling these economies which face both rapidly growing energy demand and heightened vulnerability to climate change to access adequate financing.

Ultimately, this analysis fully recognizes the central role that regulatory coherence plays in reducing the cost of green capital and accelerating the transformation of global energy systems. It aims to be both an academic and operational contribution, aligned with current challenges and the growing expectations of public and private actors involved in the energy transition.

Part I – Conceptual Framework and Literature Review

1. Context and Challenges of the Energy Transition

The energy transition is now recognized as an indispensable necessity, combining economic imperatives with global climate challenges. It reflects a profound transformation of the world's energy systems, marked by the growing adoption of technologies aimed at reducing carbon footprints and promoting a more sustainable and resilient model.

In 2024, this commitment is manifested by a clear shift in investments. While spending on fossil fuels is stagnating or even declining, capital is flowing massively toward clean energy, driven by a significant reduction in the costs of renewable technologies, particularly solar photovoltaics, wind power, and storage solutions such as batteries. This trend is also supported by the increasing electrification of various sectors, including transportation, industry, buildings, and digital services (IEA, 2024), (BloombergNEF, 2025). This virtuous yet complex dynamic, however, takes place within a context marked by institutional, financial, and regulatory constraints. In emerging countries, where energy infrastructures are often insufficient, access to financing and the legal security of projects represent major obstacles (WorldBank2024b). Ensuring that projects are attractive, financially sound, and economically viable remains a core challenge. In this context, Public-Private Partnerships (PPPs) have emerged as a strategic mechanism, allowing for the pooling of resources, the allocation of risks between public and private stakeholders, and the optimization of the cost-effectiveness of energy infrastructure. By doing so, these partnerships support the accelerated deployment of low-carbon facilities, which is crucial for adhering to the climate pathways established under the Paris Agreement and for limiting global warming (Sciencespo, 2024).

In Morocco, this reality is reflected in an ambitious energy policy. The country aims to significantly reduce its dependence on imported fossil fuels through a massive expansion of renewable energy in its electricity mix, targeting 52% green electricity by 2026 (FiscolecConseil, 2025), which is exceptional on a global scale. This energy shift is supported by a clear roadmap involving major public and private investments, as well as an innovative regulatory framework encouraging PPPs to mobilize capital, improve project efficiency, and ensure alignment with international standards.

To successfully achieve this transition, Morocco must overcome intrinsic constraints related to PPP governance and the complexity of emerging markets. This involves developing robust institutional capacities, tailored contractual engineering, precise management of financial and climate risks, and an inclusive investment strategy that integrates ESG criteria and ensures citizen participation.

Thus, the energy transition, far from being merely a technological change, becomes a systemic challenge questioning governance, finance, and the very model of economic and social development. PPPs appear as a pragmatic tool to reconcile climate ambitions with economic constraints, particularly in an emerging context where Morocco positions itself as a pioneer in the energy transition in Africa and the Arab world.

2. Principles of Public-Private Partnerships and Their Role in Energy Governance

Public-Private Partnerships (PPPs) are key contractual instruments, widely adopted globally and particularly suitable in the Moroccan context to meet infrastructure needs, notably in the energy sector. These partnerships involve a long-term commitment between a public authority and one or more private operators, who design, finance, build, and operate an infrastructure or public service. In return, they receive public payments, revenues generated from direct use of the infrastructure, or a mixed model combining these revenue sources ((OCDE)., Principes pour la gouvernance des partenariats public-privé., 2012) ((OCDE)., Cadre actualisé des PPP, 2024).

At the core of PPP functioning, governance relies on several fundamental principles. First, transparency is essential to ensure clear and accountable management of public resources, maintain citizen trust, and attract private investment. Second, alignment with the public interest ensures that projects meet societal, environmental, and economic objectives, rather than being solely profit-driven. Furthermore, an optimized allocation of risks between public and private partners is crucial. Each actor must assume the risks they are best able to manage, whether technical, financial, operational, or demand-related. This dynamic risk allocation improves the cost-effectiveness of infrastructures while preventing failures ((OCDE)., Principes pour la gouvernance des partenariats public-privé., 2012).

In parallel, these principles require robust institutional capacity on the part of the public sector. Authorities must have the technical and legal competencies necessary to oversee the full PPP project cycle: from needs identification, contract preparation, and partner selection to monitoring and evaluation during the operational phase. Such capacity is critical to protect the public interest, optimize resources, and ensure projects are executed within scheduled timeframes and budgets. For example, it allows for contracts incorporating incentive clauses linked to performance, service quality, or environmental compliance, in line with energy transition objectives.

In the energy sector, where technical, financial, and environmental stakes intersect, these principles take on particular importance. The complexity of projects often large-scale and capital-intensive requires rigorous and adapted governance. PPPs thus foster innovation in infrastructure design and management, leveraging private sector expertise and investment capacity while ensuring continuity and security of services for users.

In Morocco, these principles are embedded in specific regulatory frameworks, illustrating a structured effort to professionalize and enhance the use of PPPs in energy infrastructures. The country is developing a PPP management culture based on rigorous needs assessment, thorough analysis of expected performance, and strict cost control, all aimed at maximizing the social and economic value of projects while ensuring budgetary sustainability.

Thus, PPPs, as an innovative contractual governance tool, contribute to the energy transformation. They allow the alignment of decarbonization objectives with economic development needs, while responding to the growing demands for sustainability and social responsibility.

3. Application and Prospects of PPPs in Morocco's Energy Transition

Morocco is pursuing a proactive and structured approach to accelerate the energy transition, relying on a modern legal framework dedicated to Public-Private Partnerships (PPPs). Law No. 86-12, adopted in 2014 and regularly updated, constitutes the cornerstone of this system. This law precisely defines the contractual modalities between public entities and private partners, imposing high standards for transparency, responsible governance, monitoring, and balanced risk allocation (Finances, 2024).This legal framework is designed both to meet the growing demand for modern, efficient infrastructure and to address budgetary constraints that limit the state's direct investment capacity. It thus promotes the mobilization of private capital, essential to finance large and complex projects in renewable energies, smart grids, and energy flexibility infrastructures. Such projects may include the construction of solar or wind power plants, the creation of electricity networks integrating energy storage, or green hydrogen production facilities.

The structuring of these PPP projects relies on meticulous contractual engineering to ensure economic viability, effective risk management, and adaptability to market uncertainties and regulatory changes. Public authorities' role goes beyond mere contract awarding: they must fully master the project lifecycle, ensure alignment with national strategic objectives, and oversee infrastructure maintenance and sustainability ((OCDE)., Cadre actualisé des PPP, 2024).

In practice, Morocco builds on previous successful experiences demonstrating the effectiveness of the PPP model in the energy sector. For instance, several power plants, notably the Safi thermal plant, were developed as PPPs, attracting large-scale private investment while transferring technological and managerial expertise to the public sector. These successes encourage the expansion of PPP projects, evolving toward greener and more innovative solutions.

The potential of PPPs to drive energy sovereignty and strengthen Moroccan territorial resilience is considerable. Public-Private Partnerships accelerate the deployment of low-carbon technologies, support the creation of sustainable jobs, and foster local industrial value chains in renewable energy.

Nevertheless, to maintain this momentum, several challenges must be addressed. Strengthening institutional capacities, training public actors, simplifying administrative procedures,

and implementing efficient monitoring and evaluation tools are essential to ensure the success of future projects. It is also crucial to fully integrate climate and financial risk management into contracts to guarantee investment robustness and sustainability.

Looking forward, PPP projects in Morocco are moving toward greater integration of technological innovations, including digitalization of operations, smart grids, and large-scale energy storage. Closer collaboration between public and private sectors will be required, with inclusive governance involving civil society to ensure social acceptance of projects.

Finally, alignment with international standards governance, sustainability, and transparency is a sine qua non for attracting international financing, particularly environmentally positive funding. These requirements also facilitate the integration of Moroccan projects into global value chains and strengthen the country's position as a regional leader in the energy transition.

Thus, Law 86-12 and its accompanying framework constitute an essential foundation for structuring, implementing, and ensuring the success of PPPs in Morocco's energy transition. They provide a pragmatic and effective response to investment and governance challenges while opening promising perspectives for sustainable, inclusive, and competitive energy development.

Part II – Governance of PPPs in the Energy Transition: Institutional Framework and Challenges in Morocco

Morocco has firmly committed to an ambitious energy transition trajectory, aiming to reduce its dependence on fossil fuels and significantly increase the share of renewables in its electricity mix. The country targets 52% of its installed electricity capacity from renewable sources by 2030 (Finances., 2025).In this context, the use of Public-Private Partnerships (PPPs) appears as a key strategic lever to mobilize necessary financing and accelerate the deployment of modern, sustainable infrastructure (D & Lewis , 2005) (Yescombe, 2018). This section analyzes Morocco's institutional PPP framework, governance challenges, and their implications for the success of the energy transition.

1. Institutional Framework of PPPs in Morocco

Morocco's legal framework for PPPs is based on Law No. 86-12, adopted in 2015 and subsequently amended to enhance transparency and project quality. This law governs the preparation, selection, and execution of PPP projects, emphasizing sustainability and bankability. A major innovation was the creation of the National PPP Commission (CNPPP), chaired by the Head of Government, responsible for defining strategic orientations and approving the national project program ((2024a) W. B.)

The CNPPP centralizes public decision-making, ensures coherence between national objectives (notably Morocco's CDN) and proposed projects, and strengthens institutional credibility toward investors. In parallel, the Green Budgetary Transition program (TBV), developed in cooperation with the French Development Agency, introduces a budgetary alignment logic with ESG criteria, echoing literature recommendations on integrating environmental criteria in PPPs (Sachs, Woo, Yoshino, & Taghizadeh-Hesary, 2019).

2. Governance Challenges in Energy PPPs

Despite these advances, PPP governance in Morocco faces several challenges. First, the technical and financial capacities of some administrations remain limited for overseeing the entire project lifecycle. (Hodge & Greve, 2017)emphasize that PPP performance heavily depends on the quality of public governance, clarity of responsibilities, and institutional stability.

Second, contractual engineering is a major issue: balanced risk allocation (construction, demand, currency, regulation, climate) conditions project bankability (Yescombe, 2018). In the energy context, uncertainty over energy prices, technology costs, and climate impacts increases contractual risks (Zhang & Xie, 2020). Insufficient public-sector experience may lead to cost overruns or disputes, confirming frequent criticisms of "poor PPPs" ((OCDE)., Cadre actualisé des PPP, 2024)

Finally, inter-institutional coordination and transparency in the selection process remain weak points frequently identified (Malki & N, 2022). More inclusive governance, involving local stakeholders and civil society, is recommended to enhance legitimacy and social acceptance (Mahalingam, Devkar, & Kalidindi, 16(4), 341–372.).

3. Institutional Impact on Financing and Investment Mobilization

Regulatory stability and governance quality shape investor confidence and the cost of capital ((2024b)). Empirical studies show that countries with clear and predictable frameworks attract more private investment in energy and infrastructure (Yescombe, 2018) (Rui, Wang, & Chan, 2019).

In Morocco, developing a national PPP program aims to identify and prepare a pipeline of bankable projects, integrating the expectations of donors and investors, particularly regarding ESG. This orientation meets the growing demand of financial markets for green instruments such as green bonds, representing an important opportunity to finance the transition (Flammer, 2021).

4. Case Study: Renewable Energy in the National Energy Mix

Morocco exemplifies the effectiveness of PPPs in delivering large-scale energy projects, particularly in solar and wind energy. The Noor Ouarzazate solar complex is a flagship example. This ambitious project, led by the Moroccan Agency

for Sustainable Energy (MASEN) in collaboration with multiple private and institutional partners, represents a major success in leveraging PPPs to mobilize massive international financing and promote the energy transition.

Spread over several phases, the Noor Ouarzazate complex has an installed capacity of approximately 580 MW, comprising various solar technologies such as concentrated solar power (CSP) and photovoltaics. Noor I, inaugurated in 2016, marked the beginning of a series of high-performance plants, including thermal storage capacity that allows continuous production even without sunlight, providing stability to the national grid.

The project's success relies largely on a well-designed contractual framework, balancing interests and responsibilities between MASEN, the state, and private partners investing in the infrastructure. This framework ensures secure financing conditions, suitable for the long-term and complex nature of these investments, while offering public guarantees that strengthen credibility with international institutional investors. These guarantees create a climate of trust essential for attracting sovereign funds, multilateral banks, and private investors specialized in renewable energies (IEA, 2024).

This model relies on balanced partnerships and appropriate public guarantees, reinforcing the country's credibility with institutional investors (Allouch & M, 2021). These projects have helped diversify the energy mix, reduce reliance on hydrocarbon imports, and stabilize production costs. However, their sustainability depends on consolidating institutional capacities and transparency in monitoring contractual commitments (N & El Malki, 2022). Beyond its contribution to energy diversification, the Noor Ouarzazate project has generated positive socio-economic impacts, including local job creation during construction and operation phases, as well as technology skill transfer.

However, the sustainability of these achievements closely depends on the continuous strengthening of Moroccan institutional capacities. This includes rigorous monitoring of contractual commitments, transparent operations management, and ongoing adaptation of regulatory frameworks to technological advances and environmental requirements. Effective project monitoring and management are thus sine qua non conditions to maintain investor confidence and ensure the durability of the established infrastructures.

The Moroccan model in energy PPPs, exemplified by Noor Ouarzazate, demonstrates that balanced public-private partnerships can be a powerful lever for energy transformation. These partnerships not only accelerate the transition to clean energy but also structure a strong local economic dynamic, while addressing the financial and technical constraints inherent in large renewable energy projects in a developing country.

5. Prospects for Improvement and Lessons Learned

To strengthen the governance of energy PPPs, several avenues can be considered:

Table 1: Prospects for Improvement and Levers to Strengthen the Governance of Energy PPPs in Morocco

Dimension	Improvement Areas	Concrete Actions	Expected Impact	References
Institutional Capacities	Strengthen the skills of public officials in contractual and financial engineering	Continuing education programs, specialized workshops, mentoring with international experts	Better preparation of public teams, reduction of contractual errors, optimization of project management	(Mahalingam, Devkar, & Kalidindi, 16(4), 341–372)
Digitalization	Implementation of digital tools for PPP monitoring	Development of real-time monitoring platforms, interactive dashboards, automatic alerts on performance indicators	Improved transparency, effective monitoring, problem anticipation, rapid decision-making	(Zhang & Xie, 2020)
Climate Risk Management	Systematic integration of climate risks in contracts	Climate scenario analysis, specific contractual clauses, risk mitigation funds	Reduced vulnerability to climate hazards, better financial security, compliance with sustainable finance standards	(Sachs, Woo, Yoshino, & Taghizadeh-Hesary, 2019)
Social Acceptability	Involvement of local communities and civil society	Public consultations, participatory monitoring committees, awareness campaigns	Strengthened project legitimacy, reduced social conflicts, improved acceptance and success of PPPs	(Hodge & Greve, 2017)

Source: compiled and synthesized by the authors of the article.

The table highlights four key areas to strengthen the governance of energy PPPs. Strengthening institutional capacities enables public teams to better manage projects and effectively handle risks. Digitalization provides real-time monitoring, improves transparency, and facilitates coordination among stakeholders. Integrating climate risks into contracts secures projects against hazards and ensures their sustainability. Finally, involving local communities and civil society enhances the legitimacy and acceptance of projects.

These four dimensions are complementary: enhanced management facilitates the adoption of digital tools and proactive risk management, while improved social acceptability supports the success and continuity of investments. For Morocco, the coordinated implementation of

these measures represents a strategic lever to ensure the success of PPPs within the energy transition framework.

Part III – Mobilizing green investments and PPP governance in the energy transition: regulatory challenges and prospects for Morocco

1-Fragmentation of regulatory frameworks and absence of a unified taxonomy

Mobilizing green investments within the energy transition largely depends on clear and consistent standards. However, the international situation shows significant fragmentation of regulatory frameworks. The European Union, for example, has developed a detailed taxonomy of sustainable activities aimed at guiding investors on qualifying their projects as green or sustainable (European Commission, 2021). In the United States, the approach is more sectorial and less centralized, with distinct initiatives by federal agencies and states. China, for its part, has introduced national standards for green finance, though definitions vary by province and financial institution (Sachs, Woo, Yoshino, & Taghizadeh-Hesary, 2019). This diversity creates major complexity for international investors seeking to allocate capital efficiently, especially in emerging countries like Morocco, where the national regulatory framework is still under development.

Table 2: Comparison of green taxonomy approaches at the international level

Framework/Territory	Sustainability Criteria	Covered Sectors	Level of Harmonization	Applicability to Morocco
European Union (EU Taxonomy)	Based on 6 climate objectives	Broad: energy, transport, construction	Very high, mandatory for ESG reporting	Direct source of inspiration
China (Green Bond Endorsed Project Catalogue)	Focus on CO2 reduction and energy efficiency	Energy, industry, transport	Medium, mostly domestic	Limited but relevant
Morocco (ongoing project)	In design phase	Mainly renewable energy	Low for now	Should align with EU Taxonom

Source: compiled and synthesized by the authors of the article.

In Morocco, although significant efforts have been made—particularly with Law No. 86-12 on public-private partnerships and the creation of the National PPP Commission—the absence of a unified national taxonomy remains a major barrier to the mobilization of green capital. The multiplicity of norms and the coexistence of both international and local standards make it difficult to consistently classify projects as genuinely sustainable. This fragmentation not only creates a risk of greenwashing for investors but also increases transaction costs and slows down project implementation. For instance, several solar and wind projects had to adapt their financial and technical models to meet multiple, and sometimes competing, requirements, which resulted in financing and implementation delays of several months (IEA, 2024).

To address this challenge, several avenues can be explored. On the one hand, Morocco could draw inspiration from the European taxonomy and develop a clear and centralized national framework harmonizing ESG and financial criteria for all green projects. On the other hand, closer coordination with international agencies and active participation in regional green finance initiatives would help reduce regulatory uncertainty and strengthen the credibility of projects with institutional investors. A gradual approach could be adopted, beginning with the definition of priority sectors (solar, wind, green hydrogen) and progressively expanding the taxonomy to cover the broader spectrum of sustainable energy projects.

2. Heterogeneity of Disclosure Requirements and Limited Transparency

Another major challenge to the mobilization of green investments lies in the heterogeneity of ESG reporting and non-financial disclosure requirements. International investors—particularly institutional funds and multilateral banks—require standardized and reliable information on the environmental and social impacts of projects. However, in Morocco, reporting requirements remain relatively fragmented and often depend on the financing agency or the ministry involved (Finances, 2024). This situation generates administrative duplication, delays in decision-making, and additional complexity for private actors engaged in PPPs.

Limited transparency has direct consequences on investor confidence and the cost of capital. Projects that cannot clearly demonstrate compliance with international standards are perceived as risky, which translates into higher interest rates, additional guarantees, or even outright denial of financing. This issue is particularly critical for green projects, which often require substantial upfront investments and whose profitability depends heavily on regulatory stability and visibility regarding future revenue streams (Yescombe, 2018).

To improve this situation, Morocco could implement several measures. Establishing a single national platform for ESG reporting would help harmonize the information required from different stakeholders and ensure external verification of data. Moreover, training both public and private teams on international reporting standards would enhance the quality and reliability of the information provided, thereby facilitating access to international financing (Flammer, 2021). Finally, the creation of harmonized indicators, aligned with European standards and those of the Task Force on Climate-related Financial Disclosures (TCFD), would improve project comparability and strengthen investor confidence.

Table 3: ESG Disclosure Standards and Reporting Frameworks Used in Green Finance

Standard	Scope	Main Content	Constraints for PPPs
GRI (Global Reporting Initiative)	International	Sustainability reports (social, environmental, governance indicators)	Implementation burden for small entities
SASB (Sustainability Accounting Standards Board)	USA/international	Sector-specific ESG indicators for investors	Low adoption in public PPPs
TCFD (Task Force on Climate-Related Financial Disclosures)	Global	Climate-related risks and opportunities	Lack of legal harmonization in Morocco
CSRD (Corporate Sustainability Reporting Directive)	Europe	Mandatory reporting aligned with taxonomy	Strong influence on European investors in Morocco

Source: compiled and synthesized by the authors of the article.

The regulation of Public-Private Partnerships (PPPs) integrating environmental, social, and governance (ESG) criteria continues to face several structural limitations. These include the fragmentation of regulatory frameworks, the absence of a unified taxonomy, the heterogeneity of disclosure requirements, and the still insufficient maturity of the legal framework. Added to these constraints are institutional challenges related to the governance of PPPs, which hinder transparency and investor confidence.

This table explores the main reform avenues likely to address these challenges, notably the harmonization of reporting standards, strengthening of disclosure obligations, regulatory clarification, and improvement of institutional coordination. It highlights priority levers to increase the comparability of ESG data, consolidate project credibility, and foster an environment more conducive to sustainable financing.

3. Regulatory Uncertainties and Insufficiently Mature Legal Framework

Legal framework stability and predictability are essential to attract long-term green investments. In Morocco, although Law 86-12 provides a framework for PPPs, uncertainties persist regarding several regulatory aspects, including green electricity pricing conditions, project taxation, and rules for connection to public infrastructures. Frequent regulatory changes or variable interpretations by agencies create risks for investors and complicate project financial structuring (Zhang & Xie, 2020).

The Noor Ouarzazate solar complex exemplifies these challenges. Although overall successful, contractual adjustments linked to regulatory developments required prolonged negotiations, additional guarantees, and revisions of initial financial models (Allouch & M, 2021). This experience underscores the importance of a robust and predictable legal framework to ensure the bankability of green projects and investment security.

To address these uncertainties, several mechanisms can be adopted. First, PPP contracts should include flexibility clauses allowing adjustment of certain conditions according to regulatory evolution, while protecting public interest and economic viability. Second, strengthening coordination among ministries, regional agencies, and private operators would harmonize standards application and reduce administrative delays. Finally, using legal insurance and financial instruments dedicated to covering regulatory risks could contribute to securing investment flows and lowering the cost of green capital.

4. PPP Governance and Institutional Efficiency

PPP governance is a central pillar for the success of green projects. It relies on the capacity of public institutions to effectively manage projects throughout their life cycle, from needs identification to post-construction monitoring. In Morocco, the National PPP Commission plays a strategic role by centralizing decisions and ensuring project alignment with national energy transition objectives (Malki & N, 2022). However, challenges remain: lack of interinstitutional coordination, insufficient technical skills in some ministries, slow administrative procedures, and limited local community engagement.

These constraints directly impact the mobilization of green capital. Investors seek projects managed by reliable institutions capable of ensuring investment security and respecting contractual deadlines. A governance deficit may thus increase perceived risk and the cost of capital. Moreover, social acceptability, especially in rural or sensitive areas, is a key success factor for sustainable energy infrastructure (Hodge & Greve, 2017).

To improve PPP governance, several levers can be mobilized: strengthening institutional capacities through continuous training and support from international experts, digitalizing monitoring and reporting processes, and actively involving local stakeholders. These measures would ensure better transparency, optimize risk allocation, and strengthen investor confidence. International experience shows that combining these levers significantly contributes to reducing the cost of green capital and accelerating the energy transition (Yescombe, 2018).

Conclusion

The energy transition is a major strategic challenge for Morocco, situated at the crossroads between global climate requirements and national economic ambitions. Mobilizing green investments appears as a sine qua non condition to achieve ambitious greenhouse gas reduction targets while enhancing energy resilience against geopolitical and climate hazards. This article has highlighted significant progress made by Morocco in structuring a favorable legal and institutional framework, notably through Law No. 86-12 on public-private partnerships (PPPs) and the creation of dedicated governance bodies.

However, Morocco's energy transition cannot ignore the regulatory and operational challenges that continue to hinder the full mobilization of private, especially international, capital. Fragmented standards, the absence of a true unified green taxonomy, disparities in ESG reporting requirements, and persistent legal uncertainties increase perceived investor risk. This situation results in often higher capital costs, limiting the viability and speed of implementing so-called "green" projects.

In this context, PPPs stand out as a strategic lever of prime importance. They offer a conducive framework for resource pooling, balanced risk-sharing, and integration of international sustainability standards while promoting active private sector participation. Morocco's experience, illustrated by emblematic projects such as the Noor Ouarzazate solar complex, shows that clear, inclusive governance combined with continual contractual innovation ensures the success and sustainability of energy projects within the PPP framework.

Going further, Morocco must continue efforts to harmonize environmental, social, and governance standards to increase investment clarity and security. It is also crucial to strengthen the capacities of public and private actors through targeted training, development of digital monitoring tools, and effective simplification of administrative procedures. These measures will optimize project management, guarantee transparency, and improve investor confidence.

Finally, these transformations are not limited to regulatory improvements. They must be embedded in a comprehensive strategic vision, positioning Morocco as an exemplary regional and international actor in green finance, capable of attracting the capital needed to support sustainable, inclusive, and competitive development. Thus, Morocco's energy transition will drive new economic growth, create green jobs, and enhance resilience to global climate challenges.

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