Key Insights from Social Licensing to Operate (SLO) in Renewable Energy Projects: Applying Lessons to Clean Hydrogen Development

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Asociación Hidrógeno Colombia is a nonprofit organization that brings together key stakeholders from the public and private sectors to promote the development of the hydrogen economy in Colombia. Its mission is to support the deployment of low-emission hydrogen technologies as a strategic pillar for decarbonization, energy security, and sustainable economic growth. The association facilitates dialogue, research, and collaboration across industries, academia, and government to position Colombia as a regional leader in clean hydrogen production and use.

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The Energy Sector Management Assistance Program (ESMAP) is a global knowledge and technical assistance program administered by the World Bank and supported by more than 20 development partners. ESMAP helps low- and middle-income countries reduce poverty and promote inclusive growth through sustainable energy solutions. Its analytical and advisory services are fully integrated into the World Bank's country financing and energy sector policy dialogue.

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Preface

The global clean hydrogen market presents a major opportunity for decarbonization and sustainable economic growth. While many countries claim to have the right conditions—such as strong wind and solar PV potential—to produce low-cost clean hydrogen, success depends on more than just favorable natural resources and available land. One critical, yet often overlooked, factor is social acceptance—earning the trust of local communities and ensuring they benefit directly from the projects developed on their land.

Through the Socioeconomic and Sustainability Workstream of the Hydrogen for Development Partnership (H4D) led by the World Bank, we developed this case study review to identify the key elements required to secure social license to operate (SLO) and promote equitable development and a Just Transition. These insights are especially relevant for countries like Colombia, where regions such as La Guajira offer abundant renewable resources but face deep social and economic inequalities.

Our goal with this study is to outline the core principles that align hydrogen project competitiveness with meaningful socioeconomic development for host communities.

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*Former President Asociación Hidrogeno Colombia
and Co-Chair of H4D Work Stream 4*

Foreword

As the world accelerates its transition to low-carbon economies, the development of clean hydrogen and industrial decarbonization projects in emerging markets and developing countries (EMDCs) must be grounded not only in technological feasibility and financial viability but also in deep social legitimacy. In this context, the concept of a Social License to Operate (SLO) has emerged as a cornerstone for sustainable and inclusive development. More than a legal requirement, the SLO reflects the ongoing trust, acceptance, and support of local communities and stakeholders—particularly those most affected by the social and environmental footprint of transformative infrastructure and energy investments.

Sustainable economic growth that creates quality jobs for local communities poses a priority for World Bank client countries. In this context social acceptance is key. This document, prepared by the H4D Partnership, in collaboration with Hydrogen Colombia, offers a comprehensive analysis of the enabling conditions, challenges, and best practices for securing and maintaining a Social License to Operate (SLO) for clean hydrogen projects. It provides practical insights for project developers, governments, financial institutions, and civil society partners on how to design inclusive, transparent, and community-anchored approaches that go beyond compliance. The study draws on real-world case studies, stakeholder consultations, and interdisciplinary research. It emphasizes the importance of early and continuous engagement, benefit-sharing mechanisms, cultural sensitivity, and the co-creation of development outcomes to foster long-term social acceptance. The report offers concrete recommendations to help ensure that social risks are effectively managed, local benefits are equitably distributed, and communities are treated as partners in development—not just as project hosts.

We hope the insights offered in this publication will inform ongoing policy dialogues, operational strategies, and financing mechanisms that not only enable climate-smart investments—but do so in a manner that is equitable, participatory, and durable.

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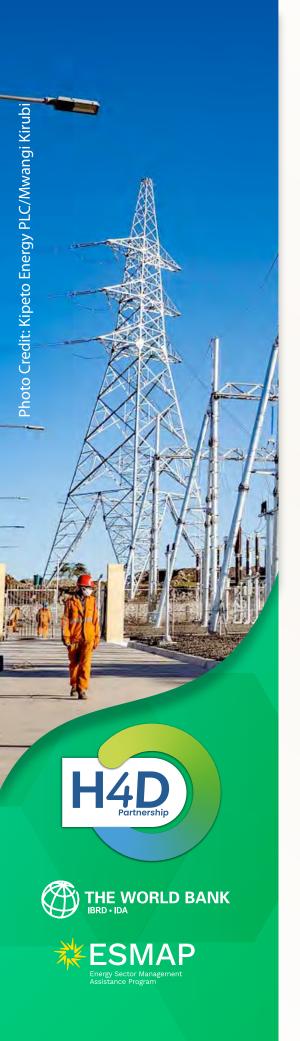
Background

As renewable hydrogen emerges as a cornerstone of the global energy transition, particularly in hard-to-abate sectors, its deployment in Emerging Markets and Developing Countries (EMDCs) faces a critical bottleneck: the ability to secure a Social License to Operate (SLO) and obtain timely environmental and social permits. These risks are not peripheral—they are central to project viability, investment readiness, and long-term sustainability.

The World Bank's Scaling Hydrogen Financing for Development report identifies several interlinked challenges that hydrogen developers and policymakers must address. First, many EMDCs lack institutional familiarity with hydrogen technologies. In several jurisdictions, hydrogen is still regulated as a hazardous substance rather than as an energy vector, leading to overly cautious permitting processes and inflated perceptions of environmental risk. This regulatory ambiguity can delay or derail projects, especially when compounded by fragmented permitting responsibilities across national, regional, and local agencies.

Second, the best renewable energy resources for powering electrolyzers are often located in ecologically sensitive or previously undeveloped areas. In such contexts, developers must conduct environmental impact assessments (EIAs) without access to reliable baseline data, increasing the complexity and cost of compliance. Moreover, the absence of clear procedural guidance for hydrogen-specific EIAs can result in inconsistent or unpredictable permitting outcomes.

Third, and perhaps most critically, projects risk facing community opposition if engagement is not initiated early and conducted meaningfully. The report highlights that poor local engagement, limited benefit-sharing, and lack of trust in the safety or fairness of hydrogen projects can erode public support. In some cases, even well-intentioned projects have been delayed or canceled due to perceptions of social exclusion or environmental harm.

In response to these challenges, this paper explores the role of Social Licenses to Operate in renewable energy projects, drawing lessons from hydropower, wind, and solar projects, and applying these insights to the renewable hydrogen sector.

Introduction

Achieving 10 GW of electrolysis capacity installed in Emerging Markets and Developing Countries (EMDCs) by 2030 necessitates large-scale infrastructure deployment throughout the hydrogen value chain, from up, to mid and downstream. This infrastructure includes renewable energy generation facilities such as solar and wind farms (upstream), hydrogen product plants utilizing electrolysis or other technologies (midstream), and dedicated transport and storage networks, including pipelines, shipping terminals, and refueling stations (downstream). However, large-scale renewable hydrogen projects in EMDCs face numerous challenges and costs, including political, economic, and social barriers. One of the most critical challenges is securing a **Social License to Operate (SLO)**, essential for project success, long-term viability, and sustainability.[1] For instance, the case of La Guajira in Colombia illustrates how non obtaining social licensing can substantially delay project execution—82% of energy projects in the region reported delays due to unresolved prior consultation processes.

Social License to Operate refers to the informal approval granted by local communities and stakeholders when they believe that a project is ethically sound, environmentally responsible, and beneficial to them.[2] Failure to obtain a Social License to Operate can result in prolonged project delays, increased costs, community resistance, and even project cancellations. Past experiences with renewable energy projects, such as hydropower developments, geothermal expansions, and renewable megaprojects have demonstrated the significant repercussions of neglecting Social License considerations.[3]

While the SLO is often depicted through ascending stages – acceptance, approval, and co-ownership – this progression is neither linear nor guaranteed. The "acceptance" stage is frequently considered the most basic level, yet it is arguably the most difficult to attain due to its multifaceted nature. Within acceptance, distinctions exist between socio-political acceptance (from governments or broader institutions), community acceptance (from directly affected populations), and market acceptance (from consumers and investors). These forms of acceptance can diverge considerably.[4] "Approval" marks a deeper level of support, where stakeholders recognize tangible benefits such as job creation and infrastructure improvements, and trust begins to solidify through transparent engagement and environmental safeguards. The highest stage, "co-ownership," involves communities actively participating in project operations and decision-making, typically through equity-sharing models, participatory governance, and long-term benefit-sharing agreements.

Trust plays a foundational role in the Social License framework – arguably more important than any procedural milestone. Research consistently shows that trust in institutions, regulators, and project developers is a primary determinant of whether a community will accept or reject an energy project.[5] Without trust, communities are more likely to perceive higher levels of risk, even when technical assessments suggest otherwise. The erosion of trust can lead to resistance or project failure regardless of the project's environmental or economic benefits. Therefore, trust must not be treated as a byproduct of engagement but rather as a prerequisite for it.

Renewable hydrogen projects, due to their reliance on land, water, and energy infrastructure, may face some challenges in obtaining a Social License to Operate. These challenges are further compounded in EMDCs by historical socioeconomic disparities, governance issues, and environmental concerns. Moreover, since renewable hydrogen production relies on renewable energy sources to ensure its sustainability and low-carbon footprint, the availability and integration of sufficient solar, wind, or hydropower capacity is a fundamental prerequisite. This paper explores the role of Social Licenses to Operate in renewable energy projects, drawing lessons from hydropower, wind, and solar projects, and applying these insights to the renewable hydrogen sector.

[1]Morrison and Lal Das (2020). Unlocking Data Innovation for Social License in Natural Resources. Retrieved February 19, 2025, from https://openknowledge.worldbank.org/server/api/core/bitstreams/63772d4f-bb4d-522a-a274-5fbaeec4aa63/content
[2]International Finance Corporation (2008). What are the Benefits of Performance Standards. Retrieved February 18, 2025, from https://www.ifc.org/content/dam/ifc/doc/mgrt/ifc-process.pdf
[3]Katutsi, V., M. Kaddu, A. G. Migisha, M. E. Rubanda, and M. S. Adaramola (2021). Overview of Hydropower Resources and Development in Uganda. AIMS Energy 9 (6): 1299–320. Retrieved February 18, 2025, from, https://www.aimspress.com/aimspress-data/aimse/2021/6/PDF/energy-09-06-060.pdf
[4]Wustenhagen, R.,Wolsink, M., & Burer, M.J. (2007). Social acceptance of renewable energy innovation: An introduction to the concept. Energy Policy, 35(5), 2683-2691. Retrieved March 26, 2025, from https://www.sciencedirect.com/science/article/abs/pii/S0301421506004824
[5]Devine-Wright, P. (2007). Reconsidering public attitudes and public acceptance of renewable energy technologies: A critical review. Retrieved March 26, 2025. From https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=8d23c43b8af92fc8a4a8668b5cd4efc5a2e2391e

UNDERSTANDING
SOCIAL LICENSE TO OPERATE

Understanding Social License to Operate

Securing a "Social License to Operate" (SLO) is essential to deploy and operate modern energy infrastructure in EMDCs. Social License to Operate is an unofficial yet powerful measure of community acceptance and approval, and it is often the deciding factor between project success and failure. Unlike regulatory approvals or legal permits, a Social License to Operate is a dynamic and evolving concept that hinges on a project's ability to engage, respect, and address community concerns. This is especially critical in the context of renewable hydrogen projects, which often require large infrastructure deployment, which can intensify local sensitivities and make community trust and co-ownership indispensable for long-term viability.

Definition and Relevance in EMDCs

Social Licenses to Operate can be defined as the ongoing acceptance and approval of a project by its stakeholders, including local communities, civil society organizations, and, in some cases, governmental bodies.[6] Informed acceptance and support from local communities is a way to de-risk large investments and establish the groundwork for sustainability, mutual social and economic benefit, and growth.[7] This unofficial yet crucial form of approval is not granted on a one-time basis but must be continually earned through responsible corporate behavior, transparent early and meaningful engagement, and tangible local benefits. Unlike official regulatory approvals, which are legally mandated, an SLO is rooted in trust, legitimacy, and the perception of fairness among impacted stakeholders. It reflects the willingness of communities to accept and support a project, which can shift over time depending on how well the project aligns with their economic, social, and environmental interests.

In EMDCs, there can often be instances of distrust towards private corporations or government-backed projects; particularly in areas where large-scale energy projects frequently intersect with fragile socioeconomic structures, political volatility, and environmental sensitivities.[8] In these areas, Social Licensing takes on a heightened level of importance. Unlike in developed economies, where regulatory frameworks are often robust and institutional governance is strong, many EMDCs suffer from weak enforcement mechanisms and institutional distrust. This lack of regulatory certainty places greater emphasis on achieving community buy-in to mitigate risks associated with protests, legal battles, and financial losses due to delays derived from non-acceptance of project development and operation.

Levels of Social License to Operate: Acceptance, Approval, and Co-Ownership

Social License to Operate can be categorized into three ascending levels, each representing a deeper degree of community integration and participation. As projects progress through these levels, the relationship between stakeholders and developers strengthens, reducing risks associated with social resistance and increasing long-term sustainability. Moving from mere acceptance to co-ownership requires consistent effort, trust-building, and meaningful local engagement. Understanding these levels is essential for project developers, policymakers, and investors aiming to ensure the success of large-scale infrastructure projects, especially in EMDCs, where social and environmental concerns are particularly sensitive. co-ownership requires consistent effort, trust-building, and meaningful local engagement. Understanding these levels is essential for project developers, policymakers, and investors aiming to ensure the success of large-scale infrastructure projects, especially in EMDCs, where social and environmental concerns are particularly sensitive.

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[6]Morrison and Lal Das (2020). Unlocking Data Innovation for Social License in Natural Resources. Retrieved February 19, 2025, from https://openknowledge.worldbank.org/server/api/core/bitstreams/63772d4f-bb4d-522a-a274-5fbaeec4aa63/content
[7]Idem.
[8]Energy Sector Management Assistance Program (2024). Hydropower: Unveiling the Socioeconomic Benefits. Retrieved February 18,2024, from https://documents1.worldbank.org/curated/en/099052324145538260/pdf/P1742021a3c29a0ff1bd8f16f1b85adf503.pdf
[9]The World Bank (2024). Integrated Environmental and Social Sensitivity Mapping – Guidance for Early Offshore Wind Spatial Planning (English). Retrieved February 18, 2025, from https://documents1.worldbank.org/curated/en/099060424173523666/pdf/P1700901ab099e04a1ad5e19ad8ccceea4a.pdf

1. **Acceptance – At this stage, the local community is neutral or only passively opposed to the project.** While there may be some level of skepticism, no significant organized resistance exists. Acceptance typically results from early consultation efforts and adequate compensation for affected stakeholders. However, it is a fragile and often temporary state, as a lack of continued engagement can quickly lead to dissatisfaction and opposition. The key to maintaining acceptance is ensuring that initial concerns – such as displacement, environmental impact, and fair compensation – are addressed openly and transparently.[9]

   Although acceptance is the most basic level of a Social License to Operate, it is not sufficient for ensuring long-term project viability. If communities feel excluded or ignored after the initial approval, discontent may surface, leading to protests or demands for negotiation. To strengthen acceptance, project developers must go beyond minimum compliance and actively foster dialogue, demonstrate corporate responsibility, and provide tangible early-stage benefits such as education programs, health services, or infrastructure development. In many cases, social investment at this stage can pave the way for stronger local support and transition into the next level of Social Licensing.

2. **Approval – The second level of Social License to Operate is achieved when communities actively support the project.** At this stage, stakeholders recognize the project's benefits, such as job creation, infrastructure improvements, and economic development. Transparent engagement, fair compensation models, and strong environmental safeguards are crucial factors in obtaining approval. Approval represents a more stable form of community support, where stakeholders not only tolerate but also advocate for the project due to the perceived advantages it brings to their region.[10]

   Unlike acceptance, which is a more passive state, approval requires an active endorsement from the community. It is built on a foundation of trust, open communication, consistent fulfillment of promises made by developers. At this stage, closing feedback loops and demonstrating responsiveness to community concerns are critical. Establishing mechanisms such as community advisory boards, grievance resolution frameworks, and participatory monitoring programs can reinforce approval by ensuring that local voices are heard and acted upon. In EMDCs, where historical mistrust of corporate and governmental entities is not uncommon, maintaining approval requires ongoing engagement and a demonstrable commitment to equitable benefit-sharing. Without these, projects risk backsliding to mere acceptance or even facing opposition if expectations are not met.

3. **Co-Ownership – The highest level of Social License to Operate is co-ownership, where communities do not just approve the project but actively participate in its operations and decision-making processes. This level is often achieved through equity-sharing models, participatory governance structures, and long-term benefit-sharing agreements.**[11] In many Indigenous communities, co-ownership is particularly critical to securing lasting support. Unlike the lower level of Social Licensing, co-ownership fosters a sense of shared responsibility, where local stakeholders become partners rather than passive beneficiaries.

   Attaining co-ownership in EMDCs is challenging due to historical grievances, lack of trust in government and corporate entities, as well as deeply rooted cultural and environmental concerns. Many communities have experienced exploitation or marginalization in past development projects, making them wary of corporate initiatives. To overcome this, developers must create transparent co-management structures, provide local employment and leadership opportunities, and implement revenue-sharing models that allow communities to benefit directly from the project's success.

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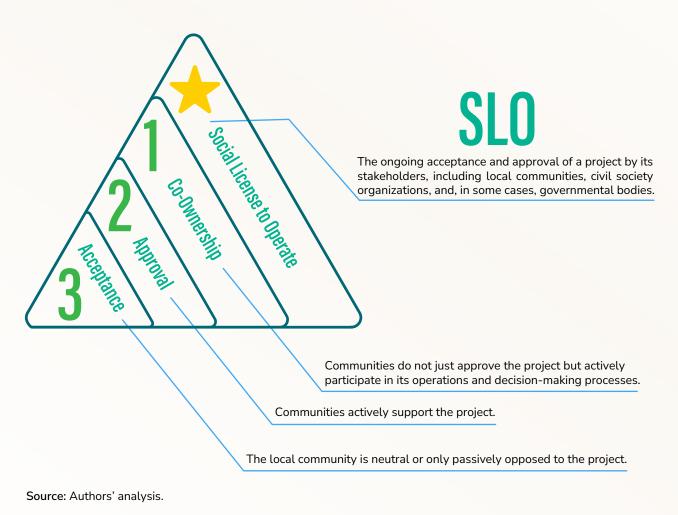
[10]Idem
[11]Morrison and Lal Das (2020). Unlocking Data Innovation for Social License in Natural Resources. Retrieved February 19, 2025, from https://openknowledge.worldbank.org/server/api/core/bitstreams/63772d4f-bb4d-522a-a274-5fbaeec4aa63/content

Co-ownership is particularly relevant for projects involving natural resources, such as renewable energy and hydrogen production, where the long-term impact on natural resources and livelihoods is a major concern. Participating community members can leverage local resources, build social capital, and increase employment opportunities at the local and regional level.[12] By incorporating community voices on early key decision-making processes – such as site selection, environmental management, and revenue distribution – companies and organizations can enhance legitimacy and ensure sustained support. Ultimately, proving that there are beneficial aspects of the project for both the local community and the environment, as well as offering a participatory role, is the best path forward for ensuring long-term stability and mutual prosperity.

As mentioned in the sections above, attaining co-ownership in EMDCs is challenging due to historical grievances, lack of trust in government and corporate entities, and deeply rooted cultural and environmental concerns. However, proving that there are beneficial aspects of the project for the local community and environment, as well as offering a participatory role, is the definition of a Social License to Operate (SLO) and creates the most viable path for all parties involved.

Figure 1. Levels of Social License to Operate: Acceptance, Approval, and Co-Ownership

SLO

The ongoing acceptance and approval of a project by its stakeholders, including local communities, civil society organizations, and, in some cases, governmental bodies.

Communities do not just approve the project but actively participate in its operations and decision-making processes.

Communities actively support the project.

The local community is neutral or only passively opposed to the project.

Source: Authors' analysis.

[12]The World Bank (2019). Improving the investment Climate for Renewable Energy. Retrieved on February 18, 2025, from https://documents1.worldbank.org/curated/en/436351574916190205/pdf/Improving-the-Investment-Climate-for-Renewable-Energy-Through-Benefit-Sharing-Risk-Management-and-Local-Community-Engagement.pdf

The Role of Social License to Operate in EMDC Large-Scale Renewable Energy Projects

The role of Social Licenses to Operate in EMDC large-scale renewable energy projects cannot be overstated. While legal and regulatory approvals remain necessary, Social Licenses to Operate serve as the foundation upon which project success, risk mitigation, and long-term success are built. Without a Social License to Operate, even legally approved projects can face severe operational disruptions and financial setbacks.

a)   Impact on project success

Several studies indicate that renewable projects with strong Social Licenses to Operate are more likely to succeed due to lower levels of community opposition, reduced legal and regulatory hurdles, and enhanced local cooperation. Projects that integrate local concerns from the beginning tend to achieve faster permitting processes and smoother implementation phases.[13]

Conversely, energy projects that fail to secure Social Licenses to Operate often face delays, increased costs, judicial procedures and, in extreme cases, outright abandonment. A prominent example is the HidroAysén hydropower project in Chile, which aimed to generate 2,700 MW of electricity in the Patagonia Region. Despite receiving initial regulatory approval, the project was ultimately canceled due to sustained and widespread opposition from environmental organizations, civil society, and local Indigenous communities. Concerns centered on the flooding of pristine ecosystems, lack of inclusive consultation, and perceived inequities in benefit-sharing.[14]

b)   Risk mitigation and long-term project viability

Social Licenses to Operate also play a critical role in risk mitigation, particularly in EMDCs where energy projects intersect with vulnerable communities and ecologically sensitive regions.   T h e risks of failing to obtain a social license to operate include:
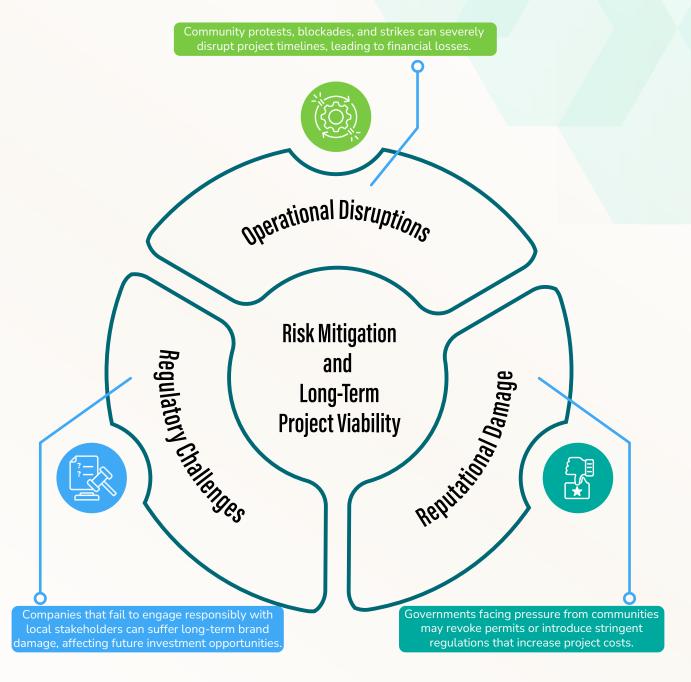
- **Operational Disruptions** – Community protests, blockades, and strikes can severely disrupt project timelines, leading to financial losses.

- **Regulatory Challenges** – Governments facing pressure from communities may revoke permits or introduce stringent regulations that increase project costs.

- **Reputational Damage** – Companies that fail to engage responsibly with local stakeholders can suffer long-term brand damage, affecting future investment opportunities.

By proactively securing Social Licenses to Operate, developers and policymakers ensure long-term project viability by fostering trust, reducing conflicts, and creating mutually beneficial outcomes.

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[13]Energy Sector Management Assistance Program (2024). Hydropower: Unveiling the Socioeconomic Benefits. Retrieved February 18, 2025, from https://documents1.worldbank.org/curated/en/099052324145538260/pdf/P1742021a3c29a0ff1bd8f16f1b85adf503.pdf.
[14]Morrison and Lal Das (2020). Unlocking Data Innovation for Social License in Natural Resources. Retrieved February 19, 2025, from https://openknowledge.worldbank.org/server/api/core/bitstreams/63772d4f-bb4d-522a-a274-5fbaeec4aa63/content

Figure 2. Risk mitigation and long-term project viability

Community protests, blockades, and strikes can severely disrupt project timelines, leading to financial losses.

Operational Disruptions

Risk Mitigation and Long-Term Project Viability

Regulatory Challenges

Reputational Damage

Companies that fail to engage responsibly with local stakeholders can suffer long-term brand damage, affecting future investment opportunities.

Governments facing pressure from communities may revoke permits or introduce stringent regulations that increase project costs.

*Several studies indicate that projects with strong Social Licenses to Operate are more likely to succeed due to lower levels of community opposition, reduced legal and regulatory hurdles, and enhanced local cooperation.

Source: Authors' analysis.

Challenges in Obtaining Social Licenses to Operate

Obtaining a Social License to Operate in EMDCs presents multifaceted challenges that stem from socioeconomic, political, institutional, environmental, and cultural dynamics. These factors can significantly influence community perceptions of large-scale energy projects, including those related to renewable energy and hydrogen development. Understanding and addressing these challenges is crucial for project developers, policymakers, and stakeholders to foster genuine, long-term partnerships with local communities

Socioeconomic Disparities

Many communities in EMDCs grapple with poverty, limited access to basic services such as healthcare, education, clean water, and energy, and significant income inequality. These socioeconomic disparities contribute to vulnerabilities that can hinder the development of trust between communities and corporate entities. In regions where past large-scale infrastructure projects have failed to deliver promised benefits—or have done so inequitably—communities are often left with deep-seated skepticism and a sense of marginalization. A project that faced some of these challenges but successfully overcame it was the Lom Pangar Hydropower Project in Cameroon. There, local fishermen reported significant disruptions to their traditional fishing practices following the dam's construction. The creation of a 590 km² reservoir altered aquatic ecosystems and fish migration patterns, making it difficult for communities to maintain their customary fishing routines. Although the reservoir eventually supported a commercial fishery with over 623 tons of fish landed during a 2016 study, the transition required new gear, knowledge, and access to landing sites—resources not readily available to all local fishers at early stages of the project.[15] Despite benefits that were brought to the rest of the country, the benefits for the local communities did not materialize equitably, exacerbating feelings of marginalization and distrust. This underscores the importance of setting realistic expectations, ensuring equitable benefit distribution, and implementing targeted socioeconomic development programs that address community-specific needs.

Moreover, limited acquaintance with innovative technologies among local communities in many EMDCs could potentially limit their ability to engage meaningfully in consultations and decision-making processes. This challenge is particularly acute in the context of emerging energy technologies—such as the production of renewable hydrogen through electrolysis—which often involve complex technical concepts that are not easily accessible to non-specialist audiences. When compounded by language barriers and limited access to formal education, these knowledge gaps can further alienate local populations and reinforce perceptions of exclusion. To address this, capacity-building initiatives—such as technology literacy programs, culturally adapted outreach, and vocational training—are essential. These efforts not only empower communities to participate actively but also strengthen their ability to advocate for equitable outcomes and long-term benefits.

[15]a. Ntungwe Ngalme (2017). Cameroon's forest people pay price for country's hydropower ambitions. Retrieved on February 18, 2025, from https://www.reuters.com/article/world/cameroons-forest-people-pay-price-for-countrys-hydropower-ambitions-idUSKBN1AB05L/ and https://www.scirp.org/pdf/ojms_2020101615492293.pdf
b. Pandong, A. N., Nsangue, B. T. N., Mbangue, E., Kodjo, N., Kontchou, M. V., Yoke, A., Tcham, L., Essola, D., & David, M. A. (2020). Ichthyofaunic Inventory and Fish Landings of Lom Pangar Hydropower Dam Reservoir in the Eastern Region of Cameroon. Open Journal of Marine Science, 10(04), 245–259. https://doi.org/10.4236/ojms.2020.104019

Regulatory and Institutional Barriers

Weak governance structures and inadequate regulatory frameworks are some of the challenges facing EMDCs. These issues can lead to inconsistent enforcement of environmental and social safeguards, corruption, administrative delays, and a lack of accountability, all of which undermine efforts to secure a Social License to Operate. When local governments are perceived as ineffective or corrupt, communities may be less likely to trust that their interests will be protected, even when formal agreements are in place. Thus, demand-driven accountability mechanisms where citizens monitor governments systematically should be considered.

In Nepal's hydropower sector, for instance, local communities expressed a strong preference for direct equity participation in projects, bypassing government-managed benefit-sharing mechanisms due to historical distrust in local governance. The Chilime Hydropower Project highlighted how citizen-led equity models can enhance local ownership and trust. A community-led equity model is a unique approach to equity sharing, where companies issue local shares directly to individual investors, aspiring to raise capital or grant equity partnerships to local communities.[19]

Environmental and Cultural Concerns

Environmental degradation, loss of biodiversity, and disruption of ecosystem services are significant concerns associated with large-scale energy projects in EMDCs. Many communities have deep-rooted connections to their natural environments, which are integral to their cultural identities, spiritual practices, and traditional livelihoods. Projects that threaten these connections often face strong opposition, particularly when environmental assessments fail to account for intangible cultural values.

A project that is discussed in further detail in this paper is the Kaligandaki Hydroelectric Project in Nepal. This project serves as case study for the intersection of environmental and cultural concerns in large-scale infrastructure development. Despite its economic benefits, the project encountered early resistance due to its adverse impacts on sacred sites, fisheries, and agricultural lands—resources deeply intertwined with local livelihoods and spiritual practices. Community consultations revealed that environmental compensation alone was insufficient to address the loss of cultural heritage, highlighting the limitations of conventional mitigation frameworks. This case underscores the critical importance of integrating cultural impact assessments alongside environmental and social evaluations.

Therefore, addressing the challenges of obtaining Social Licenses to Operate in EMDCs requires a comprehensive approach that considers the complex interplay of socioeconomic, political, institutional, environmental, and cultural factors. Project developers must invest in early, inclusive, and continuous stakeholder engagement, build local capacities, strengthen governance mechanisms, and respect cultural and environmental values to create sustainable, mutually beneficial energy projects.

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[16]Energy Sector Management Assistance Program (2024). Hydropower: Unveiling the Socioeconomic Benefits. Retrieved February 18, 2025, from https://documents1.worldbank.org/curated/en/099052324145538260/pdf/P1742021a3c29a0ff1bd8f16f1b85adf503.pdf

Strategies for Securing Social License to Operate in EMDCs

Addressing the challenges of obtaining a Social License to Operate in EMDCs requires comprehensive, context-specific strategies. Project developers, organizations (local and abroad), and policymakers must adopt proactive, inclusive, and transparent approaches that prioritize community involvement, build trust, and ensure equitable benefit distribution. The following seven strategies are essential for securing and maintaining a Social License to Operate in EMDCs:

- **Early Strategic Stakeholder Engagements (ESSE) and Stakeholder Engagements throughout the Project Lifecycle are two fundamental strategies to understanding local concerns, values, and expectations that lead to projects obtaining SLO.** These strategies offer practical guidance on stakeholder engagement through project life-cycle stages, including a strategic planning framework for early community engagement, how to establish a participatory process, and the necessity of incorporating an exit strategy from the beginning.

- **Stakeholder Mapping and Analysis** secure the identification of all relevant stakeholders, including marginalized groups, Indigenous populations, local leaders, and civil society organizations, ensures comprehensive representation. This strategy also helps uncover potential areas of conflict and collaboration.[17] by means of performing an extensive amount of research. There are some tools to assist in this process of key stakeholders' identification, for instance, Native Land Digital, which provides a map that highlight and demarks territories, languages, and even search treaties related to the region.[18]

- **Participatory Planning** encompasses the involvement of local communities in project design and decision-making processes in order to enhance their sense of ownership and can lead to more socially acceptable outcomes. Participatory approaches, such as identifying important members within the local community and inviting them to be involved in workshops and focus groups. Furthermore, the developers and community could create a joint community advisory board, which would provide a platform for everyone to be heard.[19]

- **Building Local Capacity** by empowering communities through capacity-building initiatives, such as leadership training, technical education, and financial literacy programs, enables them to engage effectively and advocate for their interests.[20]

- **Transparent Communication and Information Sharing** are cornerstones of trust-building. Clear, consistent, and accessible communication and information about project goals, potential impacts, and expected benefits can prevent misunderstandings, reduce rumors, and foster a sense of shared purpose. Among the best practices to secure transparency and information sharing are:

  - **Open Communication Channels:** Establishing multiple communication platforms, such as community meetings, information centers, social media, local radio and collaborative meetings with local organizations, ensures that information reaches diverse audiences.[21]

  - **Regular Updates:** Providing timely updates on project goals, progress, changes, and outcomes helps manage expectations and demonstrates accountability.[22]

  - **Culturally Sensitive Messaging:** Tailoring communication strategies to local languages, literacy levels, and cultural contexts ensures that messages are understood and resonate with community values.[23]

[17]International Finance Corporation (2020a). Capturing Hydropower's Promise Report Series: A Guide to Local Benefit Sharing in Hydropower Projects. https://www.commdev.org/publications/ capturing-hydropowers-promise-case-studies-on-local-benefit-sharing-in-hydropowerprojects/
[18]Idem
[19]Sunuwar, Sagar (2022). Hydropower Tourism in Kaligandaki and the Perceptions of People towards It. Data retrieved on February 18, 2025, from https://www.researchgate.net/publication/363889910_Hydropower_Tourism_ in_Kaligandaki_and_the_perceptions_of_people_towards_it
[20]International Finance Corporation (2018). Local Shares: An In-Depth Examination of the Opportunities and Risks for Local Communities Seeking to Invest in Nepal's Hydropower Projects. Data retrieved on February 25, 2025, from https://www.ifc.org/content/dam/ifc/doc/mgrt/local-sharesreport-final.pdf.
[21]Idem
[22]Ibidem
[23]Électricité de France and World Water Council (2015). Multipurpose Water Uses of Hydropower Reservoirs. Retrieved February 18, 2025 from https://www.hydroreview.com/wp-content/uploads/2015/09/ MultipurposeHydroReservoirs-SHAREconcept.pdf

- **Environmental and Social Impact Assessments (ESIAs).** This is a tool critical for identifying, evaluating, and mitigating the potential impacts of large-scale energy projects. ESIAs provide a foundation for informed decision-making and meaningful community discussions. ESIAs also ensure a set of processes and practices to consistently implement [a] company's policies" while maintaining compliance and risk control. Using the Plan-Do-Check-Act (PDCA) cycle, organizations can systematically "identify and analyze the risks and objectives," develop and implement solutions by determining "what actions will you take? Who, what, where, when, and how?" and then evaluate effectiveness by asking, "Did you see the change you expected?" This structured approach promotes continual improvement and supports long-term sustainability in ESIA processes.[24]

  - **Comprehensive Assessments:** Tools to assess impacts and develop plans to address these impacts offer important guidance. They can help pinpoint potential community needs and aspirations and highlight the types of benefit-sharing interventions that can be particularly meaningful for the local population. These include: ESIAs, Environmental and Social Management Plans (ESMPs), Livelihood Restoration Plans (LRPs), and Resettlement Action Plans (RAPs). These would all be encompassing of environmental, social, cultural, and economic dimensions, including cumulative impacts and potential risks to vulnerable populations.[25]

  - **Inclusive Consultations:** Engaging communities throughout the ESIA process ensures that their knowledge, concerns, and priorities are incorporated into impact assessments and mitigation plans.

  - **Adaptive Management:** ESIAs should be dynamic documents that evolve with project developments. Continuous monitoring and feedback loops enable timely adjustments to mitigation strategies.[26]

- **Fair compensation and benefit-sharing models** are vital for demonstrating a commitment to equitable outcomes. These mechanisms not only address the direct impacts of projects but also create opportunities for long-term community development and prosperity.[27] Some effective approaches include:

  - **Equitable Compensation:** Compensation for land, resources, and livelihoods should be based on transparent valuation methods, considering both market and non-market values, including cultural and spiritual significance.[28]

  - **Revenue-Sharing Agreements:** Allocating a portion of project revenues to local communities through trust funds, community development programs, or direct payments fosters financial inclusion and shared prosperity.[29]

  - **Local Hiring and Procurement:** Prioritizing local employment and sourcing from local businesses stimulates economic growth and strengthens community ties to the project.[30]

In conclusion, securing a Social License to Operate in EMDCs requires an integrated approach that combines early and continuous stakeholder engagement, transparent communication, robust impact assessments, and fair benefit-sharing mechanisms. By fostering genuine partnerships and addressing community needs, project developers can create sustainable, resilient energy projects that contribute to inclusive development.

[24]International Finance Corporation (2015). Environmental and Social Management System Implementation Handbook. Data retrieved on February 28, 2025, from https://www.ifc.org/content/dam/ifc/doc/mgrt/esms-handbook-general-v21.pdf
[25]Idem
[26]NS Energy (2019). Nachtigal Hydro Power Plant. Retrieved February 18, 2025, from https://www.nsenergybusiness.com/projects/ nachtigal-hydro-power-plant/.
[27]International Finance Corporation (2018). Local Shares: An In-Depth Examination of the Opportunities and Risks for Local Communities Seeking to Invest in Nepal's Hydropower Projects. Retrieved February 18, 2025, from https://www.ifc.org/content/dam/ifc/doc/mgrt/local-sharesreport-final.pdf.
[28]Électricité de France and World Water Council (2015). Multipurpose Water Uses of Hydropower Reservoirs. Retrieved February 18, 2025, from https://www.hydroreview.com/wp-content/uploads/2015/09/ MultipurposeHydroReservoirs-SHAREconcept.pdf.
[29]Energy Sector Management Assistance Program (2024). Hydropower: Unveiling the Socioeconomic Benefits. Retrieved February 18, 2025, from https://documents1.worldbank.org/curated/en/099052324145538260/pdf/P1742021a3c29a0ff1bd8f16f1b85adf503.pdf
[30]Idem

Box 1. Case study: Eastmain Hydropower Development: A model for indigenous partnership and sustainability

The Eastmain Hydropower Development in Québec, Canada, offers a compelling model for inclusive, sustainable infrastructure planning. With a combined installed capacity of 1,248 MW across the Eastmain-1 (480 MW) and Bernard-Landry (768 MW) generating stations, the project exemplifies how early and meaningful engagement with Indigenous communities can lead to socially and environmentally responsible outcomes.

From the outset, Hydro-Québec prioritized local acceptance by conducting comprehensive stakeholder mapping, which identified six Indigenous communities, including the Cree land users whose traditional hunting territories overlapped with the project area. In 2002, following the Paix des Braves Agreement between the Québec government and the Cree Nation, the communities held a formal vote and consented to the project under clearly defined conditions.

This participatory planning phase led to the creation of the Niskamoon Corporation, a nonprofit co-managed by the Cree Nation Government and Hydro-Québec. Governed by an eight-member board appointed by the Cree and three directors from Hydro-Québec, Niskamoon facilitates access to funds, training programs, employment initiatives, and collaborative research. It also plays a central role in environmental monitoring and biodiversity stewardship, integrating traditional ecological knowledge with scientific methods.

The Eastmain-1 Development became the first project globally to receive Gold-level certification under the Hydropower Sustainability Standard and was awarded the International Hydropower Association's Blue Planet Prize in 2023 for its exemplary work with Indigenous communities and biodiversity management.

This case showcases the importance of embedding Indigenous governance, co-management structures, and capacity-building mechanisms into large-scale infrastructure projects. It serves as a replicable roadmap for future renewable hydrogen projects seeking to align with international sustainability standards and secure long-term social license to operate.

Figure 3. Comparison of Challenges and Strategies for SLO

CHALLENGES

- Socioeconomic disparities
- Regulatory and institutional barriers
- Environmental and cultural concerns

SLO
SOCIAL LICENSE TO OPERATE

STRATEGIES

- Transparent communication and information sharing
- Environmental and Social Impact Assessments (ESIAs)
- Fair compensation and benefit-sharing models

Source: Authors' analysis.

CASE STUDIES ON
SOCIAL LICENSE TO OPERATE
FROM RENEWABLE ENERGY PROJECTS

CASE STUDY 1:
ITAIPU HYDROELECTRICDAM
– EARNING AND SUSTAINING
SOCIAL LICENSE TO OPERATE

Case Study 1:
Itaipu Hydroelectric Dam – Earning and Sustaining Social License to Operate

1. Project Overview and Countries Involved

The Itaipu Hydroelectric Dam is a binational project located on the Paraná River, forming the border between Brazil and Paraguay. Recognizing the untapped energy potential of the river, both countries sought to develop the resource, leading to initial conflicts over land and water rights. Diplomatic negotiations resulted in the Act of Iguaçu (1966) and later, the Treaty of Itaipu (1973), which formally established Itaipu Binacional, a jointly owned entity responsible for operating the dam.[44] Argentina, also affected by the project, entered into the 1979 Tripartite Itaipu-Corpus Agreement with Brazil and Paraguay to regulate downstream water flows.[32] The dam has become one of the most significant economic and diplomatic undertakings in the history of South American energy cooperation, with both countries equally sharing ownership and electricity output. However, Paraguay, consuming only 15% of its share, is obligated to sell the remainder to Brazil, creating a long-standing economic arrangement between the two nations.

2. Historical background

The Itaipu Dam was constructed amid political, economic, and social challenges. Over time, the dam transformed into a symbol of economic integration and energy security, providing 14 GW of installed capacity and serving as a critical electricity source for both countries.[33] The Treaty of Itaipu ensures that costs and benefits are equally distributed between Brazil and Paraguay, including construction debt, operational costs, and social/environmental mitigation measures. Over the years, the project has generated significant revenue through royalties—with Brazil and Paraguay receiving over $5.7 billion and $5.4 billion, respectively, since 1987.[34]

3. Key Challenges

While the Itaipu Hydroelectric Dam is one of the world's most successful binational infrastructure projects, it faced significant challenges that offer lessons for future developments. These challenges span social, environmental, governance, and economic issues, requiring a multifaceted approach to mitigate negative impacts and enhance long-term sustainability.

- **Social and Environmental Impacts** – The dam's construction displaced communities, altered the ecosystem, and led to concerns over biodiversity loss.

- **Governance and Transparency Issues** – Initial disfunction during construction eroded trust, requiring later reforms to improve governance and financial oversight.

- **Energy Distribution Disparity** – Paraguay's obligation to sell excess electricity to Brazil has been a source of political and economic debate, as many Paraguayans believe they should receive a greater share of benefits.

- **Historical Diplomatic Tensions** – The project required extensive negotiations, particularly with Argentina, to ensure water flow regulations and downstream impacts were addressed.

- **Ensuring Long-Term Sustainability** – While the dam provides renewable energy, concerns remain regarding climate change, water availability, and infrastructure aging.

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[31]Energy Sector Management Assistance Program (2024). Hydropower: Unveiling the Socioeconomic Benefits. Retrieved February 18, 2025, from https://documents1.worldbank.org/curated/en/099052324145538260/pdf/P1742021a3c29a0ff16f1b85adf503.pdf

[32]Global Infrastructure Hub (2020). Itaipu Hydroelectric Dam. Retrieved February 17, 2025, from https://www.gihub.org/connectivity-across-borders/case-studies/itaipu-hydroelectric-dam/.

[33]Energy Sector Management Assistance Program (2024). Hydropower: Unveiling the Socioeconomic Benefits. Retrieved February 18, 2025, from https://documents1.worldbank.org/curated/en/099052324145538260/pdf/P1742021a3c29a0ff16f1b85adf503.pdf

[34]Idem

4. Lessons learned relevant for renewable hydrogen projects

Despite its challenges, the Itaipu project has successfully integrated community engagement, economic benefit-sharing, and environmental protection, making it a valuable case study for other large-scale infrastructure projects. The following strategies illustrate how its success can be leveraged for future projects.

Transparent Governance and Anti-Corruption Mechanisms:

One of the strongest lessons from Itaipu is the importance of transparency and ethical governance. Implementing robust anti-corruption frameworks ensures that infrastructure projects remain accountable and legitimate in the eyes of stakeholders. Future projects should incorporate:

- Independent regulatory oversight to monitor financial transactions and contract awards.[35]
- Public disclosure and understanding of financial records to maintain transparency.
- Whistleblower protection laws to encourage reporting of misconduct.

These governance measures not only prevent corruption but also strengthen investor confidence and public trust.

Community Benefit-Sharing Models:

Itaipu's royalty-sharing system demonstrates how revenue from large infrastructure projects can be distributed fairly. Other projects should consider:

- Mandatory royalty reinvestment in local infrastructure, such as schools, hospitals, and roads.[36]
- Targeted development funds for affected communities to improve livelihoods, education, and social services.

These benefit-sharing mechanisms enhance local support and foster a sense of ownership among stakeholders, even at a macro-level, forcing everyone involved to care immensely about the outcome.

Environmental and Social Responsibility Programs:

Since 2003, Itaipu Binational has conducted environmental restoration and community development initiatives, setting a gold standard for sustainability. Future projects should:

- Establish early-stage social and environmental impact assessments.
- Fund reforestation and biodiversity conservation programs.
- Support community education on environmental protection and sustainable livelihoods.
- Implement grievance redress mechanisms to address local concerns before conflicts escalate.

By implementing such initiatives, it reduces the likelihood of facing strict opposition to infrastructure projects and enhances long-term social acceptance.

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[35]Global Infrastructure Hub (2020). Itaipu Hydroelectric Dam. Retrieved February 18, 2025, from https://www.gihub.org/connectivity-across-borders/case-studies/itaipu-hydroelectric-dam/.
[36]Energy Sector Management Assistance Program (2024). Hydropower: Unveiling the Socioeconomic Benefits. Retrieved February 18, 2025, from https://documents1.worldbank.org/curated/en/099052324145538260/pdf/P1742021a3c29a0ff1bd8f16f1b85adf503.pdf

Diplomatic Cooperation and Cross-Border Agreements:

Itaipu's bilateral and tripartite agreements demonstrate that successful transnational projects require diplomatic consensus. Future infrastructure projects, especially those spanning multiple countries, should:

- Establish joint governance committees to ensure fair decision-making.
- Involve all affected stakeholders in the early stages of negotiations.
- Develop legally binding treaties that clearly outline benefit-sharing obligations.

These frameworks prevent disputes and foster international collaboration.

Tourism, Cultural Outreach, and Public Engagement:

Itaipu has leveraged eco-tourism and historical exhibitions to enhance public engagement and awareness. Future projects should incorporate:

- Visitor centers showcasing the project's history, environmental impact, and technological achievements.
- Cultural heritage programs that preserve and integrate local traditions.
- Educational partnerships with universities and schools to promote STEM learning.

By making infrastructure projects accessible and educational, developers can enhance public perception and long-term engagement, as well as build a trust mechanism within the local community.
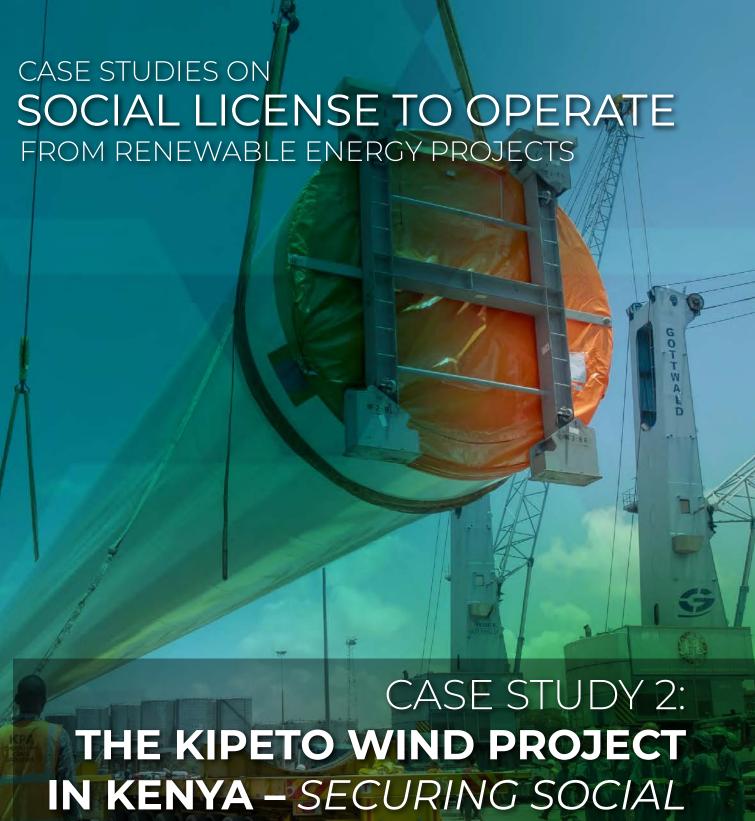
5. Key Takeaways for a Playbook on Future Hydrogen Projects

To replicate Itaipu's successful engagement and benefit-sharing model, future infrastructure projects should follow these guidelines:

- Establish Early-Stage Diplomatic and Community Consultation – Engage all affected parties before project commencement to ensure broad support.
- Implement Strong Anti-Corruption and Governance Measures – Transparency and oversight mechanisms must be in place to prevent financial mismanagement. Local communities need to be trained in how to monitor effectively the projects.
- Develop Equitable Revenue-Sharing Models – Governments should prioritize fair distribution of royalties, taxes, and infrastructure benefits.
- Commit to Environmental and Social Sustainability – Projects must integrate biodiversity conservation, water resource management, and social development initiatives.
- Leverage Infrastructure for Economic Diversification – Encourage tourism, local employment, and educational programs to maximize regional benefits beyond electricity generation.
- Ensure Long-Term Stakeholder Participation – Create ongoing platforms for community feedback, participatory governance, and adaptive policy-making.

By adopting these principles, future renewable hydrogen projects—especially those using hydro to power the electrolyzers—can build stronger Social Licenses to Operate (SLO) and foster sustainable economic growth.[37]

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[37]Energy Sector Management Assistance Program (2024). Hydropower: Unveiling the Socioeconomic Benefits. Retrieved February 18, 2025, from https://documents1.worldbank.org/curated/en/099052324145538260/pdf/P1742021a3c29a0ff1bd8f16f1b85adf503.pdf

CASE STUDIES ON
SOCIAL LICENSE TO OPERATE
FROM RENEWABLE ENERGY PROJECTS

CASE STUDY 2:
**THE KIPETO WIND PROJECT
IN KENYA –** *SECURING SOCIAL
LICENSE THROUGH INCLUSIVE
ENERGY DEVELOPMENT*

Case Study 2:
The Kipeto Wind Project in Kenya – Securing Social License through Inclusive Energy Development

1. Project Overview and Countries Involved

The Kipeto Wind Project is a 100MW wind farm located 70 km southwest of Nairobi in Kajiado County, Kenya. It is a greenfield renewable energy project aimed at increasing Kenya's clean energy capacity while fostering community development and benefit-sharing initiatives. The project is situated in a region inhabited predominantly by the Maasai people, an Indigenous community with deep cultural ties to the land.[38]

The project is developed and operated by Kipeto Energy Plc (KEP), with Actis, a global investor in sustainable infrastructure, as the majority stakeholder. From its inception, Kipeto has prioritized community engagement and benefit-sharing, ensuring that local stakeholders—especially landowners and affected communities—receive direct and long-term economic and social benefits.[39]

The area of influence for the project includes six main communities, categorized based on their proximity to wind turbines and transmission infrastructure:

- Esilanke, Olosirua, and Oloiyankalani (wind farm communities).
- Enarau, Inkiito, and Isinya (transmission line communities).

These areas were identified as primary recipients of community investment programs, with a focus on mitigating negative impacts and enhancing local benefits through a structured multi-faceted benefit-sharing framework.

2. Historical Background

Kenya has been making significant investments in renewable energy, particularly in wind and geothermal power, to reduce dependency on fossil fuels and enhance energy security. The Kipeto Wind Project was developed in response to growing electricity demand and Kenya's commitment to sustainable energy under its Vision 2030 strategy. Vision 2030 will promote the development of renewable energy as an alternative source of energy, amongst other initiatives to make Kenya a clean and prosperous country.[40]

The project was also shaped by lessons from previous energy infrastructure developments in Kenya, which highlighted the need for early stakeholder engagement, clear land agreements, and transparent benefit-sharing mechanisms to prevent land conflicts and resistance from local communities. The Maasai, like other Indigenous groups in Kenya, have historically faced challenges in land rights and inclusion in economic development projects. Thus, the Kipeto Wind Project sought to set a new standard for community integration and revenue-sharing, ensuring that both direct landowners and the broader community benefit from the investment.[41]

Unlike previous energy projects that lacked structured compensation plans for affected communities, Kipeto implemented lease agreements with landowners and designed long-term community investment strategies to ensure a fair and inclusive approach to resource development.

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[38]International Finance Corporation (2019). Local Benefit Sharing in Large-Scale wind and Solar Projects. Retrieved on February 18, 2025, from https://documents1.worldbank.org/curated/en/207441627059166610/pdf/Discussion-Paper.pdf
[39]Idem
[40]Kenya Vision 2030 (2017). Development of New and Renewable Sources of Energy. Retrieved February 18, 2025, from https://vision2030.go.ke/project/development-of-new-and-renewable-sources-of-energy/
[41]International Finance Corporation (2019). Local Benefit Sharing in Large-Scale wind and Solar Projects. Retrieved on February 18, 2025, from https://documents1.worldbank.org/curated/en/207441627059166610/pdf/Discussion-Paper.pdf

3. Key Challenges

While the Kipeto Wind Project is a pioneering renewable energy initiative, it faced various challenges, including land tenure issues, community trust, equitable benefit-sharing, and sustainable skills development.

Land Tenure and Lease Agreements – A significant challenge was navigating land ownership complexities among the Maasai people, who traditionally practice communal land ownership. Ensuring fair lease agreements required extensive negotiations to prevent conflicts and ensure all landowners received equitable compensation. Key challenges included:

- Clarifying individual versus communal land rights under Kenya's legal framework.
- Preventing land disputes among community members over lease payment distribution.
- Ensuring long-term commitments and transparency in land lease agreements.

Community Trust and Stakeholder Engagement – Given historical marginalization, there was initial skepticism about whether the community would genuinely benefit from the project. To build trust, Kipeto Energy Plc (KEP) and Actis had to:

- Conduct early and continuous community consultations to ensure inclusivity.
- Demonstrate transparency in financial and operational decision-making.
- Address concerns over potential environmental and social impacts.

Ensuring Equitable Benefit-Sharing Beyond Landowners – While landowners directly benefit from lease payments, there was a challenge in ensuring that non-landowning community members also saw long-term benefits. Without structured community-wide programs, disparities in economic gains could lead to social tensions.

Job Creation and Long-Term Economic Integration – Another key challenge was creating long-term employment opportunities for the local population beyond the construction phase. Renewable energy projects, particularly wind farms, require fewer permanent jobs once operational, posing a challenge in ensuring continued economic opportunities for the community.[42]

4. Lessons Learned Relevant for Renewable Hydrogen Projects

Despite these challenges, the Kipeto Wind Project developed a multi-faceted benefit-sharing framework that can serve as a blueprint for future renewable energy projects.

Transparent Revenue and Community Benefit Distribution – To ensure fairness and inclusivity, Kipeto designated 5% of its net profit to a Community Trust, managed by a community-led implementation committee. The trust:

- Empowers local decision-making on benefit allocation.
- Ensures funds are reinvested into community development projects.
- Creates long-term, predictable financial support for the broader community.

This approach addresses the common issue of unequal financial benefits in energy projects by ensuring that all community members—not just landowners—share in the project's success.

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[42]Idem

There was a dedicated community investment budget allocated for:

- School refurbishment projects to improve education infrastructure.
- Water borehole installations to enhance clean water access.

These initiatives were identified based on a community needs assessment, ensuring that investments aligned with real local priorities.

Skills Development and Employment Training: Recognizing the need for long-term economic opportunities, Kipeto launched a community skills-building program in partnership with Arc Skills, a global workforce training provider. The program:

- Trained 300 unemployed young people who lived in the impacted region, using a curriculum developed in consultation with the project's EPC contractor to ensure applicability.[43]
- Provided nationally recognized certifications to improve future employability.
- Ensured job placement for program participants during the construction phase, with potential employment in other projects beyond Kipeto.

This initiative demonstrates how renewable energy projects can contribute to long-term economic empowerment by integrating skills development and workforce training into their community engagement strategies.

5. Key Takeaways for a Playbook on Future Hydrogen Projects

The Kipeto Wind Project offers a valuable model for ensuring inclusive benefit-sharing, economic empowerment, and sustainable development in renewable energy projects. The following takeaways can serve as a playbook for other projects:

- Early and Inclusive Community Engagement.
- Transparent Revenue-Sharing Mechanisms.
- Address Land Ownership and Equity Issues.
- Invest in Local Infrastructure and Social Services.
- Integrate Skills Development and Employment Training.

By following these principles, future wind generation projects that will power electrolyzers can create long-term socioeconomic benefits, foster strong community partnerships, and secure lasting Social Licenses to Operate (SLO).[44]

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[43]Ibidem
[44]Ibidem

CASE STUDIES ON
SOCIAL LICENSE TO OPERATE
FROM RENEWABLE ENERGY PROJECTS

CASE STUDY 3:
GENERATING MORE THAN ENERGY – *KALIGANDAKI'S SOCIAL LICENSE AND LOCAL TRANSFORMATION*

Case Study 3:
Generating More Than Energy – Kaligandaki's Social License and Local Transformation

1. Program Overview and Countries Involved

The Kaligandaki Hydroelectric Project is a major hydropower initiative in Mirmi, Nepal, designed to generate electricity while supporting economic development in the region. As part of Nepal's broader push toward renewable energy and infrastructure expansion, the project has transformed local communities, particularly in terms of accessibility, economic opportunities, and tourism growth.

A 2022 study surveyed 162 local community members to assess how the presence of the dam and reservoir has influenced tourism development and livelihoods. The results provide a comprehensive picture of how hydropower projects can drive regional economic transformation, particularly through enhanced infrastructure, increased business activity, and improved quality of life.[45]

Mirmi, previously a rural, less-visited area, has seen notable tourism growth since the construction of the Kaligandaki reservoir. Improved road access, new businesses, and tourism-related investments have created direct and indirect economic benefits for local residents. The study aimed to understand these impacts and provide insights for future hydropower projects with potential tourism implications.

2. Historical Background

Nepal has long relied on hydropower as a key energy source, given its abundant river systems and mountainous terrain. The Kaligandaki Hydroelectric Project was developed as part of the country's broader renewable energy expansion strategy, addressing energy security concerns while fostering economic development.

Before the dam's construction, Mirmi was a remote village with limited infrastructure, low tourism activity, and minimal economic opportunities. The area lacked reliable road access, making it difficult for businesses, tourists, and local industries to thrive. The development of Kaligandaki's hydropower infrastructure changed this dynamic by:

- Improving road connectivity, making the region more accessible for tourists, businesses, and service providers.
- Increasing investments in local infrastructure, leading to new hotels, shops, and recreational centers.
- Generating electricity, providing reliable power that enabled economic activities in tourism and other industries.

Over time, Mirmi transitioned from an isolated community to a growing tourism hub, benefiting from its proximity to the hydroelectric project and improved facilities. A 2022 study surveyed local communities surrounding the Kaligandaki and found most respondents (93.2 percent) stated that hydropower had positively affected their local community, while 66.7 percent stated that they had either directly or indirectly benefited from growth in the tourism industry, and 60.5 percent said that their quality of life had improved because of the increase in tourism.[46]

[45]Energy Sector Management Assistance Program (2024). Hydropower: Unveiling the Socioeconomic Benefits. Retrieved February 18, 2025, from https://documents1.worldbank.org/curated/en/099052324145538260/pdf/P1742021a3c29a0ff1bd8f16f1b85adf503.pdf
[46]Idem

3. Key Challenges

Despite its positive impacts, the Kaligandaki Hydroelectric Project faced several challenges related to tourism development, environmental concerns, and economic disparity.

There were noticeable disparities surrounding the unequal benefits, environmental and social impact, managing sustainable tourism growth, and infrastructure and service gaps. However, this is primarily because of the rapid influx of tourists to the area, and the higher demand and necessity of needing a more synergistic approach to handle this tourism across the board.

Furthermore, large-scale hydropower projects can lead to environmental disruptions, affecting local ecosystems, river biodiversity, and land use. Some of the concerns surrounding this area were:

- Flooding of land due to the creation of the reservoir.
- Changes in fish populations and aquatic ecosystems, impacting local fishermen and traditional livelihoods.
- Increased commercialization altering the traditional character and cultural landscape of Mirmi.

There were numerous measures taken to balance these key issues. Some of the most important measures implemented went directly towards the rehabilitation of the community. Offering settlement for the Bote community, new schools, new jobs, and a plethora of fishing opportunities after the completion of the project.[47]

4. Lessons Learned Relevant for Renewable Hydrogen Projects

The Kaligandaki experience offers valuable insights for future renewable energy and hydrogen infrastructure projects:

Strengthening the Social License to Operate (SLO)
The project illustrates that SLO is not a one-time achievement but a continuous process of earning community trust through transparency, inclusion, and equitable benefit-sharing.

Equitable Benefit-Sharing Models
To avoid economic exclusion, projects must implement structured frameworks that distribute gains across all stakeholders. This includes:

- Revenue reinvestment into social programs and tourism development.
- Small business grants for non-landowning residents.
- Transparent governance of community funds.

Integrated Development Planning
Infrastructure projects should align with broader regional development goals, ensuring that energy generation is complemented by investments in education, health, and livelihoods.

5. Key Takeaways for a Hydrogen Infrastructure Playbook

To replicate Kaligandaki's success and avoid its pitfalls, future hydrogen projects should:

- Engage communities early through inclusive consultations and cultural assessments.
- Implement transparent and equitable benefit-sharing mechanisms.
- Invest in local infrastructure and social services to maximize development impact.
- Monitor environmental and cultural impacts and adapt mitigation strategies accordingly.
- Ensure long-term stakeholder participation through community advisory boards and feedback platforms.

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[47]Idem

By embedding these principles, hydrogen infrastructure can secure enduring Social Licenses to Operate and deliver sustainable, inclusive growth.

The four case studies presented above provide valuable insights into the complexities of securing Social Licenses to Operate in diverse contexts. They highlight the universal importance of community engagement, cultural sensitivity, transparent communication, and equitable benefit-sharing as foundational principles for successful and sustainable energy projects in EMDCs.

IMPLEMENTING KEY LESSONS LEARNED IN RENEWABLE HYDROGEN PROJECTS

Implementing Key Lessons Learned in Renewable Hydrogen Projects

The analysis of case studies from diverse geographical and socio-political contexts reveals several key insights that are critical for securing Social License to Operate in EMDCs. These lessons provide a framework for energy project developers and policymakers to foster sustainable, inclusive, and community-supported initiatives.

A. Importance of local partnerships:

Collaborating with local organizations is paramount to understanding and integrating community values, cultural nuances, and socio-economic dynamics into project planning and implementation. Local partnerships enhance the credibility of project developers and facilitate smoother communication channels with affected communities. These organizations often possess deep-rooted knowledge of local customs, power structures, and historical contexts, which are invaluable in navigating complex social landscapes.[48]

Successful partnerships involve more than transactional relationships; they require building long-term alliances based on mutual respect, shared goals, and continuous engagement. For instance, in the Marsabit wind project in Kenya, collaboration with local leaders and community-based organizations was instrumental in overcoming initial resistance and fostering trust.[49]

Moreover, local partnerships can act as bridges, facilitating the integration of traditional knowledge with modern technological approaches. This integration can lead to innovative, culturally sensitive solutions that are more likely to gain community acceptance. Local NGOs, community-based organizations, and Indigenous groups can also serve as monitoring entities, ensuring accountability and transparency in project implementation.

Another critical aspect of local partnerships is capacity building. By investing in local institutions and human resources, project developers can leave a lasting positive impact that extends beyond the life of the project. Capacity-building initiatives, such as training programs, workshops, and technical assistance, empower local communities to participate actively in project management and benefit-sharing arrangements. This empowerment fosters a sense of ownership and responsibility, which is key to sustaining the social license to operate over the long term.

Furthermore, strong local partnerships can enhance conflict resolution mechanisms. Local organizations often have established trust and credibility within their communities, enabling them to mediate disputes effectively and facilitate constructive dialogue between stakeholders. This proactive approach to conflict resolution can prevent minor issues from escalating into major disputes that could jeopardize the project.

B. Building trust through transparency and inclusiveness:

Trust is the cornerstone of Social Licensing. Transparent and inclusive engagement practices are essential to building and maintaining this trust. Transparency involves clear communication of project objectives, timelines, and potential impacts and honest disclosure of risks, uncertainties, and potential negative consequences.[50] This openness helps manage stakeholder expectations, reducing the likelihood of misunderstandings and fostering an environment of mutual respect.

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[48]Ibidem
[49]Ibidem
[50]Ibidem

Transparency should extend to all phases of the project lifecycle—from initial planning to implementation and post-construction monitoring. This includes sharing environmental impact assessments, financial disclosures, and regular progress reports. Providing stakeholders with access to comprehensive, understandable, and timely information ensures that they feel respected and valued as active participants in the process.

Inclusiveness ensures that all stakeholder groups, including marginalized and vulnerable populations, have a voice in the decision-making process. This can be achieved through participatory mechanisms such as stakeholder advisory panels, community liaison offices, and regular public consultations. The hydropower project in Brazil's Amazon Basin highlighted the importance of inclusiveness by involving Indigenous representatives in planning discussions and decision-making forums.[51]

Effective inclusiveness requires identifying and engaging with a diverse range of stakeholders, including women, youth, Indigenous groups, and other underrepresented communities. This diversity of voices enriches the decision-making process, leading to more comprehensive and culturally sensitive outcomes. Furthermore, inclusive practices help build social cohesion by fostering a sense of community ownership and shared responsibility for project outcomes.

Moreover, transparency and inclusiveness are not one-time activities but ongoing processes that must be maintained throughout the project lifecycle. Continuous feedback loops, grievance redress mechanisms, and adaptive management strategies help sustain trust and address emerging concerns promptly.[52] Establishing formal channels for feedback allows stakeholders to express their views, concerns, and suggestions regularly, ensuring that their voices continue to influence project decisions over time.

C. Adapting engagement strategies to local contexts:

One of the most critical lessons from the case studies is the necessity of customizing engagement strategies to fit the local context. Social, cultural, economic, and political environments vary significantly across EMDCs, and a one-size-fits-all approach is often ineffective.[53]

Context-specific engagement requires a thorough understanding of local dynamics, including traditional governance systems, social hierarchies, cultural practices, and historical grievances. For example, in Australia's East Kimberley region, addressing land-use conflicts involved tailored consultations with Indigenous leaders, recognizing their unique connection to the land, and incorporating their traditional knowledge into project planning.[54]

Adapting strategies to local contexts involves flexibility in communication methods, negotiation approaches, and benefit-sharing models. It requires sensitivity to language barriers, cultural taboos, and community-specific development priorities. This might involve using local languages in all communications, engaging community elders in decision-making processes, and aligning project timelines with local cultural or agricultural calendars.

Furthermore, adaptive strategies should be dynamic, allowing for adjustments based on ongoing feedback from the community. This includes revising engagement plans as new stakeholders emerge or as community priorities shift over time. For instance, in the case of renewable energy projects in remote regions, developers have successfully implemented participatory mapping exercises that visually capture local resource use, cultural sites, and environmental concerns, thereby fostering a deeper mutual understanding.

[51]Ibidem

[52]Morrison and Lal Das (2020). Unlocking Data Innovation for Social License in Natural Resources. Retrieved February 19, 2025, from https://openknowledge.worldbank.org/server/api/core/bitstreams/63772d4f-bb4d-522a-a274-5fbaeec4aa63/content
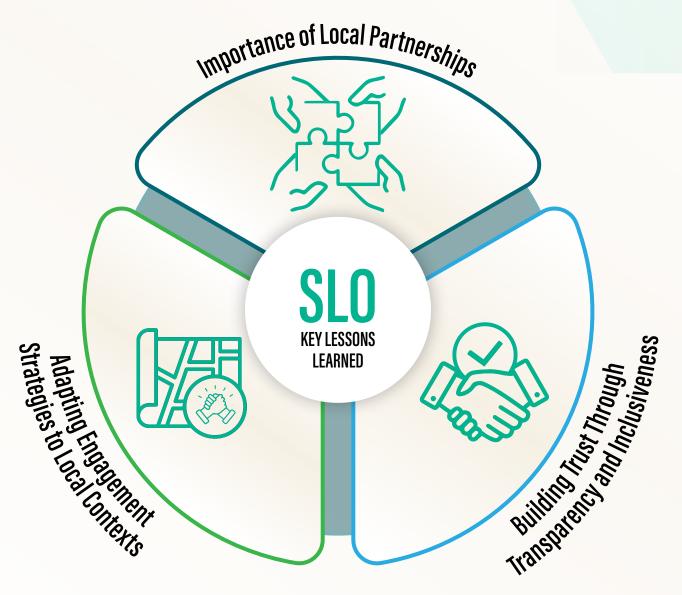
[53]Energy Sector Management Assistance Program (2024). Hydropower: Unveiling the Socioeconomic Benefits. Retrieved February 18, 2025, from https://documents1.worldbank.org/curated/en/099052324145538260/pdf/P1742021a3c29a0ff1bd8f16f1b85adf503.pdf

[54]The World Bank (2024). Integrated Environmental and Social Sensitivity Mapping – Guidance for Early Offshore Wind Spatial Planning (English). Retrieved February 18,2025, from https://documents1.worldbank.org/curated/en/099060424173523666/pdf/P1700901ab099e04a1ad5e19ad8ccceea4a.pdf

By demonstrating respect for local customs and adapting project practices accordingly, developers can significantly enhance community acceptance and project sustainability. This approach not only mitigates risks but also unlocks opportunities for co-creating value with local communities, leading to more resilient and socially cohesive project outcomes.

These key lessons underscore the importance of a comprehensive, context-driven approach to securing social licenses to operate. By prioritizing local partnerships, fostering transparent and inclusive engagement, and adapting strategies to local contexts, energy project developers can build resilient relationships with communities, mitigate social risks, and contribute to sustainable development outcomes in EMDCs.

Figure 4. Key Lessons Learned

Source: Authors' analysis.

HYDROGEN WITH COMMUNITY AT THE CORE:
CRITICAL ACTIONS TO SECURE SLO IN EMERGING MARKETS

Hydrogen with Community at the Core:
Critical Actions to Secure SLO in Emerging Markets

The lessons learned from various case studies provide a foundation for actionable recommendations tailored to renewable hydrogen developers and policymakers operating in EMDCs. These recommendations aim to strengthen the processes for securing Social Licenses to Operate, ensuring that renewable hydrogen projects are sustainable, inclusive, and beneficial to local communities.

Action 1: Implement existing Social License to Operate Frameworks for EMDCs

A comprehensive Social License framework for developers of renewable hydrogen projects in EMDCs is critical and ensures that these projects are sustainable, inclusive, and socially responsible. The framework below provides a set of clear and concise guidelines of how to obtain an SLO for renewable hydrogen projects moving forward; however, it must be adaptable to diverse cultural, socio-economic, and regulatory contexts to ensure relevance and effectiveness.

Renewable hydrogen projects developers shall introduce a Social License to Operate Framework that shall include the following sections:

- **Stakeholder Identification and Mapping:**
  - Categorize the stakeholders into three categories:
    1. Primary Stakeholders
       a. Individuals who are directly affected by the intended project (local communities, landowners, and workers)
    2. Secondary Stakeholders
       a. Individuals and businesses who are indirectly affected (regional policymakers, NGOs, investors)
    3. Tertiary Stakeholders
       a. Individuals and businesses that influence the project (academics, media, and regulatory bodies)
  - Use stakeholder mapping techniques:
    1. Survey and Interviews
       a. Individuals and businesses that influence the project (academics, media, and regulatory bodies)
    2. Public Records and Census Data
       a. Identify demographics and vulnerable groups
    3. Social Network Analysis
       a. Understand local power structures and people with influence in the community

- **Guidelines for Culturally Sensitive Engagement:**
  - Understand Local Norms and Customs:
    1. Respect community governance structures
       a. Elders, tribal councils, religious leaders
    2. Ensure materials and discussions are in local languages
  - Engage through locally trusted channels:
    1. Work with community-based organizations, religious groups, or traditional leaders
    2. Use radio, local media, and informal gatherings rather than top-down town halls.
  - Adopt inclusive approaches:
    1. Schedule meetings at times that accommodate women, workers, and marginalized groups.
    2. Provide childcare, food, and transportation to enable participation
    3. Establish feedback loops
       a. Community suggestions inform project plans

- **Risk Assessment and Management:**
  - How to conduct a social risk assessment:
    1. Identify potential risks
       a. Historical grievances
          i. Review past land disputes, industry harm, or broken promises
       b. Displacement impact
          i. Assess whether people will be relocated or lose economic opportunities
       c. Political and social tensions and grievances
          i. Determine if there are existing internal conflicts between groups

Figure 5. Developing a Social License to Operate Framework for EMDCs

Conduct risk assessment and management.

Implement culturally sensitive engagement guidelines.

Identify and map stakeholders.

Source: Authors' analysis.

Action 2: Enhancing Local Stakeholder Involvement in Project Design:

Involving local stakeholders early in a renewable hydrogen project's design phase is crucial for aligning project objectives with community priorities. This participatory approach fosters a sense of ownership and can preempt conflicts by integrating local insights into project planning.

- The second step when developing a project and attempting to obtain an SLO is including stakeholders in the planning process.
- **Strategies to enhance stakeholder involvement include:**
  - Participatory Planning Workshops
    1. Choose inclusive locations and formats
       a. Hold workshops in neutral community spaces (not government or company offices).
       b. Use interactive methods (maps, visual storytelling, and small group discussions).
    2. Diversify Representation
       a. Ensure women, youth, and indigenous groups are actively included
       b. Provide stipends or transportation to encourage participation
    3. Capture inputs and ensure follow-up
       a. Share the outcomes of these workshops transparently through a community newsletter or other local source

- ◦ Co-design initiatives and community representation
    1. How to ensure genuine co-design?
        - a. Allow communities to make decisions, not just provide feedback[55]
        - b. Implement a community advisory board with formal decision-making power[56]
        - c. Start a non-profit with both parties from the local community and project developers[57]

Action 3: Capacity Building and Knowledge Transfer:

Empowering local stakeholders with technical skills and project management knowledge for a renewable hydrogen project is vital for sustainable development and long-term project success. Capacity-building initiatives not only enhance local participation but also create economic opportunities, reducing dependency on external actors.

- • The third step when developing a project and attempting to obtain an SLO is capacity building and knowledge transfer.
- • **Effective capacity-building strategies include:**
    - ◦ Technical Training Programs
        1. Assess skill gaps within the community and the work being completed
            - a. Conduct community skill mapping to identify technical training needs
            - b. Partner with local schools and training institutions
        2. Make training practical
            - a. Offer hands-on apprenticeships within the project
            - b. Train community members on project maintenance for long-term job creation
    - ◦ Support for Local Enterprises | Integrating Local Businesses
        1. Provide procurement opportunities for local vendors
            - a. Manufacturing, construction, logistics[58]
        2. Offer micro-financing and grants for small businesses entering the clean hydrogen supply chain
        3. Create mentorship programs pairing local entrepreneurs with industry experts
    - ◦ Leadership Development Programs | Building Leadership
        1. Identify emerging leaders
            - a. Work with community organizations to select youth, women, and underrepresented leaders.
        2. Provide leadership training
            - a. Ensure leaders have formal roles in project governance once trained

Capacity building should be an ongoing effort, integrated into renewable hydrogen project timelines and budgets, with clear goals and measurable outcomes. Regular evaluations should be conducted to assess the impact of these initiatives, allowing for adjustments to enhance effectiveness. Sustainable capacity-building efforts contribute to the long-term resilience of communities, enabling them to actively participate in and benefit from energy projects well beyond the project lifecycle.

By implementing these three basic actions, renewable hydrogen developers and policymakers can create robust, inclusive, and adaptive strategies that foster strong community relationships, enhance project resilience, and contribute to sustainable development goals in EMDCs.

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[55]Energy Sector Management Assistance Program (2024). Hydropower: Unveiling the Socioeconomic Benefits. Washington, DC: World Bank. Retrieved February 18, 2024, from https://documents1.worldbank.org/curated/en/099052324145538260/pdf/P1742021a3c29a0ff1bd8f16f1b85adf503.pdf
[56]Idem
[57]Idem
[58]Ibidem

Figure 6. Recommendations for Clean Hydrogen Developers and Policymakers

Action 1:
Developing a social license to operate framework for EMDCs.

Action 2:
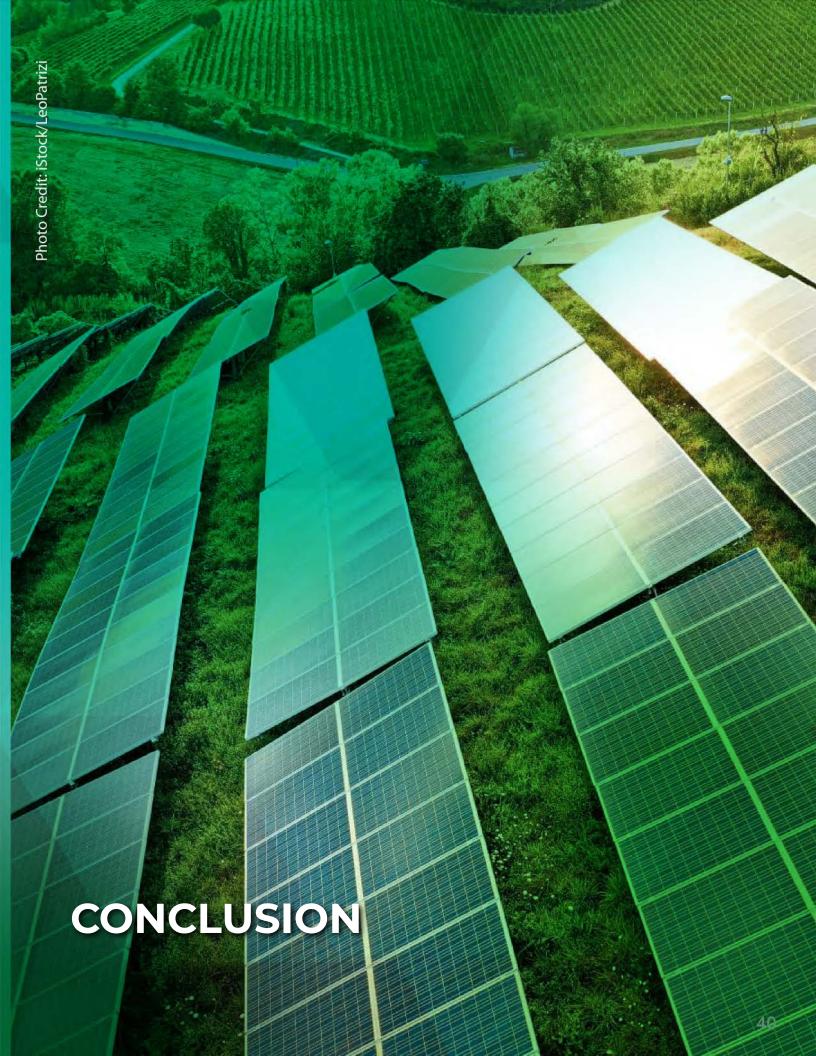Enhancing local stakeholder involvement in project design.

Action 3:
Capacity building and knowledge transfer.

Source: Authors' analysis.

CONCLUSION

Conclusion

Securing Social Licenses to Operate in Emerging Markets and Developing Countries (EMDCs) is not just a regulatory requirement but a fundamental pillar for the successful implementation and sustainability of large-scale energy projects. As demonstrated through case studies and comprehensive analyses, the process of earning a Social License to Operate transcends formal agreements and legal obligations that are rooted in trust, mutual respect, and genuine partnerships with local communities.

By respecting community concerns, involving local voices, and prioritizing equitable benefits, project developers and policymakers can create a sustainable foundation for energy projects that align with both local and global goals. The integration of social, cultural, and environmental considerations into project planning and execution not only enhances project acceptance but also contributes to long-term resilience and community well-being.

A robust Social License to Operate framework tailored to the unique contexts of EMDCs is essential. This framework should encompass clear guidelines for stakeholder engagement, risk management, and benefit-sharing, ensuring that projects are designed and implemented with the active participation of affected communities. Early and continuous stakeholder involvement fosters a sense of ownership, mitigates potential conflicts, and ensures that projects reflect the needs and aspirations of local populations.

Capacity building and knowledge transfer are critical components of this process. Empowering local stakeholders with technical skills and governance capabilities enhances their ability to actively participate in project development and management. This not only strengthens local economies but also reduces dependency on external actors, promoting self-sufficiency and sustainable growth.

Moreover, transparent communication and inclusive engagement practices are vital for building and maintaining trust. Continuous dialogue, adaptive management strategies, and effective grievance redress mechanisms ensure that community concerns are addressed promptly, fostering a collaborative environment where projects can thrive.

In conclusion, securing Social Licenses to Operate in EMDCs requires a comprehensive, context-driven approach that prioritizes local partnerships, transparent and inclusive engagement, and capacity building. Local partnerships serve not only as conduits for community perspectives but also as active co-creators of project design, implementation, and monitoring. These partnerships help ensure that project benefits align with local development priorities, reinforce accountability mechanisms, foster shared ownership, and lay the foundation for sustained community support and project resilience over time.

By embedding these principles into the core of energy project development, stakeholders can achieve sustainable, equitable, and successful outcomes that contribute to both national development goals and global sustainability targets.

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