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100% RENEWABLES SOLUTIONS PACKAGE

Public-private partnerships in renewable energy



This solution is part of a package of solutions meant to guide local and regional governments in implementing a local renewable energy transition by providing guidance on mechanisms, applications or technologies that can help accelerate their climate and energy action.

It was produced as part of the 100% Renewables Cities and Regions Roadmap project, which supports nine cities and regions across Argentina, Indonesia and Kenya to develop bankable renewable energy projects and in-depth local strategy and action plans to achieve one hundred percent renewable energy. The 100% Renewables Cities and Regions Roadmap project is implemented by ICLEI – Local Governments for Sustainability and funded through the International Climate Initiative (IKI), which is implemented by the Federal Ministry for Economic Affairs and Climate Action (BMWK) in close cooperation with the Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection (BMUV) and the Federal Foreign Office (AA).

DISCLAIMER

All cities are unique. The Solutions Gateway has been developed as an advanced knowledge catalogue to provide an overview of possible Low Emissions Development Solutions. The Solutions and Packages it contains provide guidance on general conditions, which may not correspond to the existing conditions in your city or jurisdiction. The consultation and use of the Solutions Gateway does not waive the need for the Local Government to assess the feasibility of a Solution or Package in the local context in its city or jurisdiction, prior to implementation. Please note that the impacts, benefits and co-benefits indicated are generally valid but may not materialize in particular circumstances.

ABOUT SOLUTIONS GATEWAY

[Solutions Gateway](#) is an online resource platform for Local Governments where they will be able to find possible Low Emissions Development (LED) Solutions for their cities.

In the context of the Solutions Gateway, Solutions are processes, or groups of actions, which Local Governments can implement to deliver climate change mitigation results and enhance local sustainable development. Taking an integrated approach, and focusing on Local Governments usual responsibilities and roles, Solutions include core actions as well as enabling and multiplying actions essential to maximize their effectiveness and efficiency. These include policy, regulatory, governance, capacity building, awareness raising, stakeholder engagement, etc.

ABOUT ICLEI – LOCAL GOVERNMENTS FOR SUSTAINABILITY

ICLEI – Local Governments for Sustainability is a global network working with more than 2,500 local and regional governments committed to sustainable urban development. Active in 125+ countries, ICLEI influences sustainability policy and drives local action for low emission, nature-based, equitable, resilient and circular development. ICLEI's Members and team of experts work together through peer exchange, partnerships and capacity building to create systemic change for urban sustainability.

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1. INTRODUCTION

Public-private partnerships (PPP) are a form of cooperation between the public and private entities to jointly develop, own, finance, operate or maintain infrastructure projects, including renewable energy projects. It is essentially a risk-mitigation arrangement for both parties—providing guaranteed returns for the private sector, while allowing the public sector to fulfill public infrastructure needs. The private sector typically provides financing, expertise, and technology for the project, while the public sector provides support through policies, regulations, and public services and even limited financing. The compensation itself depends on the structure and PPP arrangement/contract. PPPs are applicable to all kinds of projects, however are most favorable for capital-intensive infrastructure investments. Local governments can benefit from PPP arrangements to develop RE projects.

1.1 RELEVANCE

Not all governments have PPPs directly embedded into policymaking, but they can be an alternative source of investment for infrastructure projects for local governments and PPPs can provide a mechanism for the public sector to leverage private sector expertise, innovation and financing to develop and operate renewable energy projects. PPPs can help to reduce the financial burden on the public sector and can result in a more efficient use of the government's budget.

Renewable energy projects often involve significant financial risks due to high initial investment costs and long payback periods. PPPs allow risk-sharing between the public and private sectors, mitigating financial burdens on both sides. The private sector partner is typically responsible for the risks of designing, building, financing, operating, and/or maintaining the project, while the public sector partner retains ownership of the assets and provides certain services, such as land acquisition, regulatory oversight, and/or performance guarantees, among others. By sharing the risks of the project between the public and private sectors, PPPs can help to ensure that the project is completed effectively.

Private sector involvement in PPPs brings in innovation and cutting-edge technology. The private sector is often at the forefront of technological advancements in renewable energy. Collaborations through PPPs enable the transfer and implementation of these technologies in large-scale projects. PPPs in renewable energy projects can also foster local economic development by creating job opportunities, supporting local industries, and improving infrastructure in the regions where renewable energy projects are implemented. As renewable energy projects typically have long-term implications for the environment and the economy, the combined resources and commitment of parties in PPPs, can ensure the sustainability and continuity of these projects beyond short-term goals.

1.2 SDGs ADDRESSED

- **SDG 7:** Ensure access to affordable, reliable, sustainable and modern energy
- **SDG 9:** Build resilient infrastructure, promote sustainable industrialization and foster innovation
- **SDG 11:** Make cities inclusive, safe, resilient and sustainable
- **SDG 13:** Take urgent action to combat climate change and its impacts
- **SDG 17:** Revitalize the global partnership for sustainable development

1.3 MAIN IMPACTS

- PPPs can provide alternative sources of financing for infrastructure projects by shifting a large amount of the investment cost to the private sector (depending on the PPP structure). This can help ease the pressure on government budgets while still fulfilling their targets.
- PPPs can enable access to the private sector's expertise to ensure that the project is implemented well and sustainable in the long-term, especially in the energy sector. PPPs can provide an opportunity for the private sector to transfer knowledge and know-how to the public sector, which can help to build capacity to handle other similar projects.
- PPPs can be structured to also enable the achievement of public goals, such as developing local industry or providing skills training or employment for the local community, or mitigating environmental impacts.

1.4 BENEFITS

BENEFITS TO THE GOVERNMENT

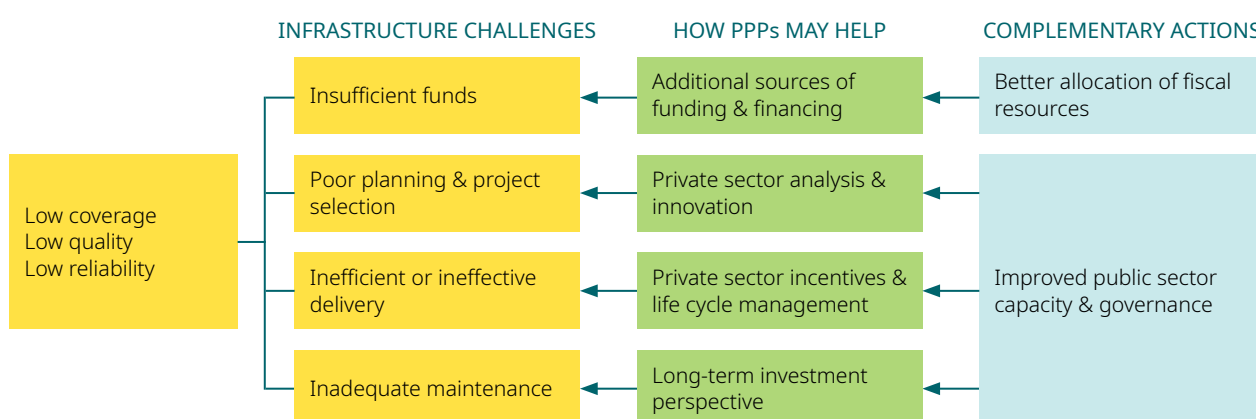


Figure 1: Benefits of PPPs for governments. Source: [3]

- PPPs can provide alternative sources of financing for infrastructure in situations where governments face financing constraints by shifting the high upfront investment cost to private finance.
- In PPP models, most of the risks during construction and operation and maintenance of infrastructures are shifted to business entities/private sector actors, depending on the type of PPP.
- A PPP is expected to bring advanced technical solutions and innovation from the private sector to ensure high-quality infrastructure and expertise.

BENEFITS TO COMMUNITIES/BENEFICIARIES

PPP projects can provide a range of benefits for people and communities. Some of these benefits include:

- improved access to goods and services via high-quality infrastructure;
- enhanced job creation and economic opportunities during the construction and operation of infrastructure projects, as well as the potential development of local supply chains and economic clusters;
- improved community involvement and ownership of the renewable energy project;
- transfer of knowledge and skills to build and boost the local capacity;
- long-term sustainability by ensuring that infrastructure projects are designed and operated in an environmentally-, socially- and economically-sustainable manner.

1.5 SUGGESTED INDICATORS FOR MONITORING RESULTS

RENEWABLE ENERGY FROM THE PROJECT

- Renewable energy generation [MWh/year]
- Access to clean energy [% of population in the city/region]
- Greenhouse gas emissions reduction [tCO₂e/year]
- Jobs created from the project [number/year]
- Environmental performance

GENERAL INDICATORS

- PPP projects in the city/region [number/year]
- Investment volumes in PPP projects [currency/year]
- PPP project pipeline [details of project/year]
- PPP as a percentage of total infrastructure spending [% of currency/year].

DURING OPERATIONS UNTIL END OF CONTRACT

- Benefits of the infrastructure e.g., by monitoring the number of users or beneficiaries of infrastructures [qualitative];
- Quality and quantity of infrastructures delivery (e.g., for PPP in renewables, the government should monitor the installed capacity, performance of power generation, regular monitoring of the served areas, etc.) [qualitative].

1.5 TYPICAL LOCAL GOVERNMENT ROLES

- Lead long-term planning for sustainable energy development.
- Create policies and regulations that support the development of renewable energy projects.
- Community engagement to garner support for renewable energy projects.
- Identify suitable sites or areas for renewable energy projects and facilitate the development process by providing information on land availability, environmental impact assessments, and other necessary clearances.
- Provide access to public lands or existing infrastructure (such as rooftops, public buildings, or landfills) for renewable energy projects, and/or securing necessary rights-of-way or permits for the installation of renewable energy infrastructure.
- Financial support: grants, loans, or subsidies to encourage private sector participation in renewable energy projects, or even facilitate low interest rates with banks.
- Monitor the implementation and ensure compliance with environmental regulations, safety standards, and obligations outlined in PPP agreements.
- Risk mitigation associated with renewable energy projects, such as land acquisition, permitting delays, or bureaucratic hurdles, through guarantees or insurance mechanisms.

2. INTEGRATED SOLUTION OVERVIEW

	Enabler Actions	Required Actions	Multiplier Actions
Policy	<ul style="list-style-type: none"> • Map private sector competencies and facilitate cooperation • Support development of a legal and regulatory framework at the national level that provides a stable and predictable environment for PPPs • Develop local policies and regulations that promote renewable energy development and support private sector participation • Align PPP planning with local government development planning • Assess procurement processes, options, and best practices for PPP projects at a local level • Create financial incentives to encourage private sector investment in renewable energy projects. 	<ul style="list-style-type: none"> • Developing a procurement strategy that outlines the process for selecting private sector partners and the criteria that will be used to evaluate bids • Identify infrastructure needs and assess their suitability for a PPP • Embed the project management/oversight into a relevant governing entity/department • Identify relevant sectoral regulations that may drive or hinder the PPP project e.g. local contents for solar, etc. 	<ul style="list-style-type: none"> • Provide a vision for long-term investment priorities and orient towards goals that serve the public • Develop power purchase agreement (PPA) guidelines where possible to provide a guaranteed price for renewable energy generated by the project • Encourage community engagement and participation in the project to increase local ownership and support for the project • Investigate crowdfunding mechanisms that also allow citizens to invest in renewable energy projects.
Stakeholders and Awareness	<ul style="list-style-type: none"> • Conduct and institutionalize robust stakeholder analysis and engagement as part of project development to improve the success rates of the project, including relevant communities and civil society organizations • Building trust and relationships between the public and private sector partners to ensure that the project is seen as a partnership and not just a transaction 	<ul style="list-style-type: none"> • Establish effective communication channels between the public and private sector partners to ensure that all stakeholders are informed and engaged throughout the project • Engage with the local community and civil societies to ensure that the project meets their needs and is acceptable to them, and is inclusive of marginalized groups, such as women, youth, and indigenous communities, and that their needs and perspectives are taken into account 	<ul style="list-style-type: none"> • Involve stakeholders throughout the project lifecycle, especially in early stages, to help ensure that the project is sustainable, meets the needs of the local community, and gains public support • Facilitate private sector partners to engage in local community development activities, such as providing training and employment opportunities, including through the PPP contract if possible

	Enabler Actions	Required Actions	Multiplier Actions
Stakeholders and Awareness	<ul style="list-style-type: none"> Engage with relevant stakeholders including agencies both in central and local government that are involved in the PPP, depending on the nature of the project Create a platform for stakeholder feedback and participation to ensure that the project is meeting its intended goals and that stakeholders voices are heard. 	<ul style="list-style-type: none"> Establish a monitoring and evaluation system that allows the public sector partner to assess the performance of the project, and the private sector partner's compliance with the terms of the PPP agreement. 	<ul style="list-style-type: none"> Providing opportunities for local communities and marginalized groups to participate in the project, such as through energy crowdfunding or community ownership models. Developing an education and awareness campaign to promote the benefits of renewable energy and the PPP model to increase public support for the project.
Governance	<ul style="list-style-type: none"> Develop a clear and transparent legal and regulatory framework that supports PPPs and promotes private sector investment in renewable energy infrastructure projects Develop guidelines and best practices for PPPs for future projects Align the project to national/ stage government plans and ensure coordination across all levels of governance (multi-level governance). 	<ul style="list-style-type: none"> Provide effective oversight and monitoring mechanisms to ensure compliance with regulations and project agreements Establish clear roles, responsibilities, and decision-making processes for all stakeholders involved in the project Ensure effective communication and collaboration among all stakeholders Enact accountability and transparency mechanisms, such as regular reporting and independent audits, to ensure that project objectives are met and that the project is delivering value for money. 	<ul style="list-style-type: none"> Leverage the project to drive economic development or attract additional investment Use the project as a model for replication in other areas.
Capacity Building	<ul style="list-style-type: none"> Provide capacity building for public sector partners to ensure they have the necessary expertise and resources to effectively manage and monitor a PPP project Facilitate interaction and networking among government officials, private sector participants, and other stakeholders to build knowledge on the varying priorities for PPPs. 	<ul style="list-style-type: none"> Regularly update and improve capacities of local governments to understand PPP foundations, preparation, structuring, and transactions. 	<ul style="list-style-type: none"> Collaborate with international organizations or donors, or academia, on technical assistance and strengthening the understanding of PPPs at the local government level. Collaborate with other local governments and networks to learn about best practices for PPPs in the energy sector Implement a knowledge-sharing platform among the stakeholders involved in the project.

	Enabler Actions	Required Actions	Multiplier Actions
Technical	<ul style="list-style-type: none"> • Develop technical standards and guidelines for the design, construction, and operation of renewable energy infrastructure projects • Provide technical assistance to government officials and private sector partners on technologies and project design for PPP implementation • Facilitate the use of new and innovative technologies in renewable energy infrastructure projects. 	<ul style="list-style-type: none"> • Ensure that the technical design and specifications of the project meet industry standards and regulations • Conduct technical and financial feasibility studies for the project • Develop detailed engineering designs for the project • Select the appropriate technology and equipment for the project • Ensure that the project meets all necessary safety and environmental standards • Identify the technical aspects and risk of the type of RE that will be procured under the PPP scheme • Monitor the progress of PPP planning, preparation, transaction, until construction and operation. 	<ul style="list-style-type: none"> • Ensure that the project itself is likely to be viable, across technical, financial etc. terms; technical aspect is crucial for the successful development of a PPP-based renewable energy infrastructure project.
Finance	<ul style="list-style-type: none"> • Provide financial incentives for private sector participation in renewable energy infrastructure projects and facilitate access to financing • Seek financial institutions' advice in designing and financing a PPP project and identify the bankability gap that must be overcome to succeed in project implementation • Create a bankable project structure with proper risk sharing and mitigation. 	<ul style="list-style-type: none"> • Identify fiscal capacity available for the preparation of the PPP and fulfilling payment obligations • Identify the market demand and user willingness to pay for the infrastructure services to ensure the feasibility of the PPPs • Identify potential support from other levels of government, such as government guarantees, viability gap funding, and project development facilities that can be utilized • Develop a robust financial plan and business model for the project, with or without involving external experts • Identify and secure funding sources for the project, such as grants, loans, or private equity • Negotiate project agreements with private sector partners and financial institutions • Structure the project to minimize financial risks for both the public and private sector partners. 	<ul style="list-style-type: none"> • Proper government support in terms of financial risk mitigation will increase the bankability of PPP projects and attractiveness for investors, shifting funding from high government-based capital expenditure (CAPEX) spending to PPP • Leverage the project to attract additional investment and further drive economic development • Enhance the project's financial sustainability through the implementation of revenue-generating mechanisms such as carbon credits, green certificates, or feed-in tariffs • Build capacity in local communities and SMEs to participate in the project's financing, such as community share ownership, crowdfunding, or micro-finance.

3. WORKFLOW /PROCESS PHASES

3.1 PREPARATION

The preparation stage of any PPP-based renewable energy infrastructure project involves steps to ensure the creation of a viable, well-structured project, attractive to potential private sector partners. These stages are:

- **Identifying the project:** The first step is to identify the specific project and assess whether it is a suitable option for a PPP. The project should have a clear public benefit, be technically and economically viable, and be suitable for private sector involvement.
- **Market assessment:** This stage includes analyzing the market for the RE project, assessing the demand, the competition and the regulatory environment, and identifying the potential private sector partners and investors as a part of ensuring its bankability. This can be part of existing studies such as pre-feasibility or feasibility.
- **Project structuring:** This stage includes developing the project structure, including the legal, financial, and technical aspects of the project. This includes determining the project's ownership, financing, revenue, and risk-sharing arrangements.
- **Due diligence:** This stage includes conducting a detailed analysis of the project, including the technical, financial, legal, and environmental aspects of the project. This is to ensure that the project is viable, and that all the necessary information is available to potential private sector partners. Potential partners should also be vetted to ensure their reliability and the timely completion of deliverables.
- **Developing the procurement strategy:** This stage includes developing a procurement strategy that outlines the process for selecting private sector partners and a clear evaluation criteria that will be used to evaluate bids.
- **Drafting the Request for Proposal (RFP):** This stage includes drafting the RFP which includes all the necessary information required for the private sector partner to understand the project and submit a proposal.

3.2 APPROVAL

The approval stages in PPP-based renewable energy projects can vary depending on the specific country and project. However, some common stages that are typically required include:

- Approval of procurement (this stage includes the process of selecting the private sector partner, through competitive bidding or direct negotiation, to develop and operate the project, and reaching agreements on the terms of the partnership)
- Approval of the feasibility study
- Approval of an environmental and social impact assessment
- Approval of the grid connection from the national or local utility to ensure that the connection is technically feasible and complies with safety regulations and other obligations
- Approval of project design and engineering.

3.3 PROCUREMENT

- Pre-qualification
- Request for Proposal (RFP) and procurement of business entity/bidder/ auction
- Winner determination through a clear evaluation criteria

- PPP contract signing, with clear roles and responsibilities
- Financial close of the project.

3.4 IMPLEMENTATION

- Construction of the project, including hiring subcontractors where needed
- Operations, as determined in the PPP agreement and depending on the type of PPP structure
- Maintenance, as determined in the PPP agreement and depending on the type of PPP structure.

3.5 MONITORING

During the monitoring stages of PPP-based renewable energy infrastructure projects, there are several key variables that need to be considered until the end of the concession period. These include:

- **Project progress:** Monitoring the progress of the construction of the project to ensure that it is on schedule and within budget. This includes regular site inspections, progress reports, and review of construction plans and schedules.
- **Quality control:** Ensuring that the project is being constructed to the required quality standards, including compliance with technical specifications, safety standards, and environmental regulations.
- **Financial monitoring:** Monitoring the financial performance of the project to ensure that it is financially viable and sustainable. This includes reviewing financial reports, assessing revenue streams and costs, and monitoring any financial guarantees provided by the private sector partner.
- **Compliance monitoring:** Ensuring that the private sector partner is complying with the terms of the PPP agreement, including performance standards, service levels, and reporting requirements.
- **Community engagement:** Monitoring the private sector partner's engagement with the community, including assessing the impact of the project on the community, and any benefits that are being provided.
- **Environmental and social monitoring:** Monitoring the environmental and social impact of the project, including compliance with environmental and social impact assessments, and any mitigation measures that have been put in place.
- **Performance monitoring:** Monitoring the performance of the project, including assessing the availability, reliability, and energy efficiency of the project, and any maintenance or upgrades that are required.
- **Exit strategy:** Developing an exit strategy for the end of the concession period, which includes assessing the options for transferring ownership and operation of the project back to the public sector, and any necessary decommissioning and rehabilitation of the site.

The monitoring process needs to be done regularly. It is essential to ensure that the project is meeting its intended goals and that the private sector partner is fulfilling its obligations under the PPP agreement. This will help to ensure that the project is sustainable in the long-term and that the public sector partner is getting the best value for money.

4. REALITY-CHECK

This solution is applicable for local/regional governments (LRG) that want to promote the development of RE projects through a PPP mechanism. This is most suitable for large, capital-intensive projects and in situations where the LRG does not necessarily have the resources or capacities to undertake the entire project on its own. It is also best-suited

to situations where there is a strong public benefit to be realized from the project. Owing to their complexity and longer timelines, PPPs are also most likely to take root in contexts with a relatively stable business environment with policy certainty and manageable costs for accessing finance. An enabling external environment can be created by managing risks and their perception, such as through risk-mitigation measures, transparent procurement and evaluation criteria, and a stable policy environment with a long-term vision, among other measures.

4.1 REQUIRED PRE-CONDITIONS

- **Legal and regulatory framework:** A clear legal and regulatory framework is essential for PPPs to provide a stable and predictable environment for private sector partners. This includes laws and regulations governing PPPs, procurement, and private-sector involvement in the energy sector.
- **Political and administrative stability:** Political and administrative stability is important to ensure that the project can be completed without interruption and that the government is able to fulfill its obligations under the PPP agreement.
- **Financial viability:** PPPs require significant private sector investment, so it is important to ensure that the project is financially viable and that there is a sufficient revenue stream to repay the private sector's investment.
- **Technical feasibility:** The renewable energy resource should be available, and the site should be suitable for the project. A technical feasibility study should be done to assess the potential costs and benefits of the project.
- **Community support:** PPPs need community support to be successful. It is important to assess the potential impact of the project on the community and to engage with the community to ensure that the project meets their needs and is acceptable to them.
- **Private sector participation:** PPPs rely on private sector participation, so it is important to ensure that there is a sufficient level of private sector interest and that the private sector partner has the necessary experience and qualifications to develop and operate the project.
- **Transparency and good governance:** PPPs require transparency and good governance to ensure that the process is fair, open, and competitive. This includes clear procurement procedures, transparency in decision-making and the ability to hold the private sector partner accountable for the performance of the project.

4.2 SUCCESS FACTORS

- **Clear project objectives:** The project objectives should be clear, measurable and aligned with the overall goals of the city or region.
- **Adequate preparation and local government commitment:** Adequate preparation, as well as LRG commitment are critical to ensure that the project is well-structured, viable, and attractive to potential private sector partners. This includes conducting a feasibility study, environmental and social impact assessments, and developing a detailed project structure with guarantees and insurance mechanisms to protect both private and public sector parties.
- **Strong legal and regulatory framework:** A strong legal and regulatory framework is essential for PPPs to provide a stable and predictable environment for private sector partners. This includes laws and regulations governing PPPs, procurement, and the renewable energy sector, the government's commitment to fulfill obligations in the PPP project (which can be shown through previous PPP experience, starting with simpler projects such as roads), and the government's leadership in coordination with various parties and strategic decision making
- **Transparency and good governance:** Transparency and good governance are essential to ensure that the process is fair, open, and competitive. This includes clear procurement procedures, transparency in decision-making, and the ability to hold the private sector partner accountable for the performance of the project.

- **Capacity building:** PPPs require capacity building to ensure that the public sector partner has the necessary expertise and resources to effectively manage and monitor the project.
- **Community engagement:** Community engagement is critical to ensure that the project meets the needs of the local community and is acceptable to them.
- **Adequate financing:** Adequate financing is critical to ensure that the project is financially viable and that there is a sufficient revenue stream to repay the private sector's investment.
- **Strong private sector participation:** Strong private sector participation is critical to ensure that the private sector partner has the necessary experience, qualifications, and financial capability to develop and operate the project.
- **Effective monitoring and evaluation:** Effective monitoring and evaluation are critical to ensure that the project is meeting its intended goals and that the private sector partner is fulfilling its obligations under the PPP agreement.
- **Flexibility:** Flexibility is important to manage the changes that might happen during the project, such as changes in demand, technology, and regulations.

4.3 FOLLOW-UP NEEDED AND/OR RECOMMENDED

- Ensure proper project planning and preparation, and subsequently the execution of the project.
- Utilize all possible central government facilities and support to conduct proper PPP planning and preparation.
- Engage with international donors/organizations to provide technical assistance and knowledge transfer regarding PPP structuring and transaction.
- Conduct the transaction/procurement transparently in accordance with national procurement regulations.
- Establish monitoring processes to ensure the project proceeds on time and is accountable.

4.4 BARRIERS

There are several barriers that can impede the development of PPP projects. Some examples of these barriers include:

- **Lack of regulatory framework:** PPP projects require a clear and stable regulatory framework, which sets out the rules and procedures for procurement, contract management, and dispute resolution. In the absence of a clear regulatory framework, private sector partners may be reluctant to invest in PPP projects. Therefore, efforts should be made to develop such a robust framework, including through partnerships and collaborations if needed.
- **Lack of capacity:** PPP projects require a high level of technical and financial expertise, as well as a strong project management capacity, which may be lacking in some governments. Collaborating with academia or other institutions could help with technical assistance and training.
- **Political instability:** Political instability can create uncertainty and risk for private sector partners, which can make PPP projects less attractive.
- **Complex procurement processes:** PPP projects are often characterized by complex procurement processes, which can be time-consuming and costly, and which can discourage private sector participation. Transparency and stability in processes can help address this barrier.
- **Limited access to finance:** PPP projects often require significant upfront investment, which may be difficult to secure in some countries, especially in developing countries. Risk mitigation measures or viability gap funding through national governments or international institutions can be explored to address this.
- **Lack of transparency and accountability:** PPP projects often involve large sums of money and long-term contracts, which can create opportunities for corruption and abuse of power, which can further deter the participation of private sector actors. Transparency and enforcement can be improved to tackle this.

4.5 RISKS

Below are typical risks of PPP-based infrastructure projects.

- **Construction and completion risks:** These risks include the risk of delays or cost overruns during the construction phase, and the risk that the project may not be completed on time or to the required standard. Effective monitoring and associated penalties can help mitigate this. PPP contracts often include detailed performance standards and service level agreements, which provide clear expectations for the private sector partner's performance and help to ensure that the project is delivered on time and to the required standard.
- **Operational risks:** These risks include the risk of poor performance or failure of the private sector partner to meet the terms of the contract, and the risk of unforeseen maintenance or repair costs. Performance guarantees and/or insurance should be agreed on in the contract to mitigate the fallout from this risk.
- **Financial risks:** These risks include the risk that the private sector partner may not be able to secure financing for the project, or that the project may not generate sufficient revenue to meet its financial obligations. Financial risk-mitigation measures should be explored, as should revenue-securing methods such as Power Purchasing Agreements (PPAs). Ring-fencing the project through a special purpose vehicle (SPV) can also insulate the private and public sector partners from exposure to further risk.
- **Political and regulatory risks:** These risks include the risk of changes in government policies or regulations that may affect the project, or the risk of political instability that may affect the ability of the project to proceed. These are hard to account for and mitigate, but governments can put out long-term policies and legislation to manage this risk, as well as specific measures that ensure the predictable and fair operation of the energy market, and the security of investments.
- **Environmental and social risks:** These risks include the risk of negative impact on the environment and local communities due to the project. Robust assessments and stakeholder engagement at the early stages of the project can help mitigate this risk.

Additional risk considerations for renewable energy projects include:

- **Technology risks:** These risks include the risk that the technology used in the project may not perform as expected, or that it may become obsolete before the end of the project.
- **Market risks:** These risks include the risk that the project may not generate sufficient revenue to meet its financial obligations, due to changes in energy prices or demand.
- **Weather and environmental risks:** These risks include the risk of damage to the project caused by severe weather or other natural events, and the risk of negative impact on the environment.

5. CLIMATE CHANGE MITIGATION POTENTIAL

The need for rapid and growing investments in renewable energy projects to decarbonize our energy supply has reached a critical stage. All financing options should be explored by relevant responsible entities, including local and regional governments. These are essential to enable the deployment of a wide range of solutions, whether decentralized or centralized. Public-private partnerships are one such option that can result in effective delivery of infrastructure projects that provide a range of public benefits, while allowing the possibility of reduced investment and risk for the public sector. In addition to the environmental benefits, large PPP projects can also further help local economic development and the growth of a local supply chain, further embedding the ability to undertake renewable

energy projects in the future. However, the exact contribution of each project to climate change mitigation depends on its individual technical specifications.

6. NATIONAL – SUBNATIONAL INTEGRATION IN THE CONTEXT OF THIS SOLUTION

6.1 BENEFITS TO LOCAL GOVERNMENT

- PPP can be alternative funding for infrastructure projects in which governments face financing constraints, by shifting the high upfront investment cost to private finance, and enabling the realization of local climate and energy goals.
- Given that there could be differences in business environments, credit-worthiness etc. at a sub-national level, local governments can help pioneer certain PPP structures that are suitable for their context, thus contributing to the creation of an enabling environment for PPPs for the country as a whole.

6.2 BENEFITS TO OTHER LEVELS OF GOVERNMENT

- National governments can use PPP use cases from the sub-national level to further develop its PPP frameworks, keeping in mind the differing sub-national contexts, and relying on successful projects to bolster the formation of a growing and stable business environment.

7. RESOURCES/SUPPORT

7.1 CASE STUDIES

MALDIVES EXPLORING A 20 MW OUTER ISLANDS SOLAR PPP PROJECT

The island nation of Maldives is undertaking a 20 MW solar power plant, to be established under Asian Development Bank (ADB)-supported 'Preparing Outer Islands for Sustainable Energy Development Project'. Maldives' Ministry of Environment, Climate Change and Technology (MOE) plans to have this 20 MW capacity developed as a mix of land, rooftop and nearshore floating solar installations in 20 outer islands of the country, structuring it as a PPP. The selected winner will be expected to design, build, finance, own, operate and maintain the project, with the selection criteria based on the lowest tariff offered while meeting minimum technical, financial, and other relevant criteria. The power generated will be supplied to state owned utility Fenaka under a 15-year power purchase agreement (PPA) [4].

PPPS FOR RENEWABLE ENERGY PROJECTS IN GUJARAT, INDIA

The main power distribution company (DISCOM) in the Indian state of Gujarat, the Gujarat State Electricity Board, attempted to address its dire financial situation through PPP-based projects across a number of sectors. It was unable to attract private investment or invest in capacity. It launched the 'Gandhinagar Photovoltaic Rooftop Program' that opted for a PPP-based delivery method with a competitive bidding approach. The private sector was responsible for building, financing, owning, operating, and maintaining the systems, while the rooftop owners received a monthly fee to allow the developer to use their rooftop. The main factors that supported the success of the program included

national-level political and financial support through the “Jawaharlal Nehru National Solar Mission (JNNSM)” that focused on reducing the costs of the solar power generation; as well as Gujarat’s state-level solar energy plan and policy, launched in 2009. These policy supported the better and faster implementation of projects, which attracted both domestic and foreign investors. The government also adopted a competitive bidding system that resulted in a significant reduction in the tariffs. In a technical sense, the rooftop systems were easy to install as they avoided complicated land acquisition processes and associated approvals from the government. In addition to the benefits generated by producing renewable electricity in a decentralized manner, this program offered a proof-of-concept that rooftop energy systems were technically and financially viable. The Gujarat government responded by replicating the same program in multiple cities, including Vadodara. Vadodara became the second city to adopt a similar policy in 2014, and owing to a number of factors such as having learned from the experience of Gandhinagar, as well as due to the falling costs of solar, the implementation time and cost for the Vadodara project were lower [5].

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