

# Draft UNECE Standard on Off-grid Renewable Energy PPP projects in support of the SDGs v1.0

## Public Review

### Log of comments and observations (6 November 2025)

This paper sets out comments received in response to the formal review of the draft standard issued to UNECE on 31 July 2025.

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ID	Page/line number	Comments	Proposed changes	Team leader response
1	Section IV lines 260–280	While this section outlines the VfM/VfP/VfPL framework, it lacks a clear, phased roadmap for countries with limited fiscal capacity and institutional readiness. This creates a gap between ideal objectives and realistic implementation.	<p>To enhance the practical applicability of the VfM–VfP–VfPL value framework across diverse national contexts, this Standard could benefit from a phased implementation pathway. Such a model would enable Member States to align project action with their respective policy frameworks, resource environments, and institutional development rhythms—especially in settings where universal energy access remains an urgent equity goal.</p> <p>The proposed Phased Pathway Model recognizes energy as a fundamental enabler of dignity and resilience and is composed of three stages:</p> <ol style="list-style-type: none"> <li><b>1. Basic Access Stage</b> – Ensures Tier 1–2 access for underserved populations, supporting lighting, communication, and safety. This stage typically depends on public or donor-based finance, emphasizing equity and inclusion.</li> <li><b>2. Community Resilience Stage</b> – Scales up to decentralized systems (e.g. microgrids) powering schools, clinics, and small enterprises. It lays the groundwork for institutional maturity and early PPP co-financing.</li> <li><b>3. Green Value Chain Integration Stage</b> – Embeds advanced technologies, gender-transformative participation, and climate-smart design within full PPP frameworks, contributing to broader climate justice goals.</li> </ol> <p>By offering a scalable trajectory, this approach ensures that PPP projects do not merely reflect value frameworks, but operationalize them in a just, inclusive, and adaptable manner.</p>	<p>Proposed feedback included as a footnote.</p> <p>Member States could consider a phased implementation VfM pathway that is aligned with their respective policy frameworks, resource environments, and institutional development rhythms—especially in settings where universal energy access remains an urgent equity goal.</p> <p>A scalable trajectory approach would ensure that that PPP projects do not merely reflect value frameworks, but operationalize them in a just, inclusive, and adaptable manner.</p>

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ID	Page/line number	Comments	Proposed changes	Team leader response
2	Page 3	The definition of microgrids is repetitive and unclear, with the phrase "should be defined in a localized energy grid with defined boundaries that can operate" repeated multiple times. This redundancy reduces readability and obscures the intended definition.	Revise the microgrid definition to be concise and clear. Proposed text: "A microgrid is a localized energy grid with defined boundaries, capable of operating independently or in conjunction with the main grid, typically powered by renewable sources such as solar, wind, or hybrid systems."	Suggested change made to the document.
3	Page 4	The discussion on the reliance of isolated communities on diesel-powered generation is accurate but lacks data or references to quantify the extent of this issue globally. Including evidence would strengthen the case for transitioning to renewable off-grid systems.	Add a reference or statistic, such as: "According to the International Energy Agency (IEA), over 70% of off-grid communities in sub-Saharan Africa rely on diesel generators, contributing to high costs and emissions." Include a citation to a reputable source like the IEA or World Bank.	Suggested change made to the document
4	Page 7, Line 260-262	The objectives section is vague about how the standard will support "replicable processes" and "innovative" approaches. Specific mechanisms or examples would improve clarity.	Revise to include specific examples: "The standard aims to provide guidance for replicable processes, such as standardized Power Purchase Agreements (PPAs) and risk-sharing mechanisms like Viability Gap Funding (VGF), to foster innovative financing models for off-grid renewable energy PPPs."	Suggested change made to the document
5	Page 11	The disadvantages section mentions "complex transactional costs" and "unaffordable" government budgets but does not elaborate on mitigation strategies. This limits the document's utility for policymakers.	Add a mitigation strategy: "To address high transactional costs, governments can adopt streamlined procurement processes and leverage multilateral funding (e.g., World Bank ESMAP) to subsidize project preparation costs for small-scale off-grid PPPs."	Added in a footnote.

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6	Page 12, Line 490	The description of Viability Gap Funding (VGF) and Output-Based Aid (OBA) is clear, but the document does not discuss how these mechanisms align with SDG compliance.	Include a sentence linking to SDGs: "VGF and OBA enhance project bankability while supporting SDG 7 (Affordable and Clean Energy) by ensuring equitable access to sustainable energy in underserved regions."	Comments added in a footnote.
7	Page 13, Line 531	The case study on Uttar Pradesh and Kenya highlights the BOO model's success but lacks detail on challenges faced during implementation, which could provide valuable lessons.	Add a brief discussion: "In Uttar Pradesh, BOO projects faced initial challenges with regulatory approvals, which were mitigated through stakeholder consultations and clear policy frameworks. Similar lessons from Kenya emphasize the importance of community engagement to ensure project acceptance."	Note added in footnote.
8	Page 24	The section on lowering risk perceptions for investors is repetitive, with "transactions costs versus size of project" mentioned multiple times without actionable solutions.	Consolidate repetitive text and propose a solution: "To lower risk perceptions, governments can establish dedicated off-grid PPP units to standardize contracts and reduce transaction costs, making small-scale projects more attractive to investors."	Addressed in text
9	Page 31	The discussion on SDG 12 is incomplete and contains placeholder text ("1.1.1.1..."). This undermines the document's credibility.	Replace placeholder text with specific indicators: "Off-grid renewable energy PPPs support SDG 12.2 by increasing domestic renewable energy consumption per capita. For example, projects can target a 20% increase in renewable energy access in rural areas by 2030, measured through installed capacity and household connections."	Recommendation was unclear – could be considered with further explanation.
10	Throughout (e.g., Pages 10, 14, 15, etc.)	Multiple pages contain repetitive line numbers (e.g., "405, 406" or "636, 637") with no substantive content, indicating potential OCR errors or formatting issues.	Review and correct OCR errors. Ensure each page contains meaningful content or remove placeholder text to maintain document professionalism.	Editors to address.

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11	General	The document lacks a clear executive summary that outlines key recommendations and aligns them with SDG objectives, which would aid decision-makers.	Add an executive summary at the beginning: "This standard provides a framework for designing and implementing off-grid renewable energy PPPs to support SDG 7 and SDG 12, emphasizing innovative financing (e.g., VGF, OBA), risk mitigation, and replicable models like BOO and LDO, with case studies from Uganda, Uttar Pradesh, and Kenya."	This is stated in the executive summary.
12	General	The standard does not address capacity building for local communities and governments, which is critical for long-term project sustainability.	Add a section: "Capacity building programs, such as technical training for local technicians and policy workshops for regulators, should be integrated into PPP frameworks to ensure sustainable operation and maintenance of off-grid systems."	Paragraph added to the text in section VII
13	159–167	While the "PIERS" framework is referenced, its practical application within different country contexts (especially LMICs) is not elaborated.	Include a short section or annex demonstrating how to apply PIERS practically in a low-capacity environment, using an actual country example.	The secretariat is in the process of preparing a detailed analysis of the impact of PIERS; especially for LMICs. This analysis will be published separately
14	260–266	The sentence starting "Projects with this objective (focus)" is grammatically awkward and unclear.	Rephrase to: "Such projects should aim to adopt best practices in sustainable investment, apply replicable processes, and leverage innovative expertise."	Change made in the body of the text.
15	317–319	Clearer differentiation between small-scale and large-scale off-grid systems is needed, including thresholds and relevant PPP models	Include a table comparing small vs. large off-grid projects, preferred PPP models, and financing options.	It was decided to simplify this previously and a table was removed.
16	498–511	The listed financing enhancements (VGF, OBA, etc.) are useful but not fully explained in terms of implementation barriers.	Add brief commentary on risks and common challenges for implementing each financing enhancement in practice, with mitigation strategies.	Will be added to Finance PPP Guidelines being developed

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17	570–574	The phrase “enabling environment” is overused without concrete legal examples or models.	Add sample legal clauses (e.g. from Kenya or Senegal) to illustrate how enabling PPP legislation supports off-grid RE projects.	This is addressed adequately in other institutional sources.
18	645–677	Strong legal section on land registration, but missing guidance on informal tenure contexts, common in many LMICs.	Add a paragraph on how to adapt property registration principles where formal land rights are weak or undocumented.	Text has been revised.
19	800-811	The business case preparation process is emphasized but lacks reference to capacity development needs.	Recommend adding a subsection or annex that outlines tools, training, or institutional capacity-building to support business case development for OGRE PPPs.	The UK guide is referenced.

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ID	Page/line number	Comments	Proposed changes	Team leader response
20	50-65	Off-grid renewable energy is of great importance for inclusive development and energy service delivery to remote area and remote communities who are not able to receive expensive energy service from main grid energy system. So importance of off-grid renewable energy for inclusive development (SDG9) is of significant to be reflected in the introduction part III.A The importance of grid off renewable energy.	Off-grid renewable energy promotes inclusive development and provides energy services to remote areas and remote communities. Off grid renewable energy system operate independently from main grid energy system, this is stand- alone system which is not connected to energy grid. Grid energy system extension is more costly requires large capital and investment, also time.	Part of the comment is added to text.
21	65-135	Basics, necessary requirements and needs of off-grid renewable energy PPP projects are necessary to be identified and included in part “Background and purpose”. Also main advantages of off-grid renewable energy PPP projects are necessary to be determined in this part. Also those advantages and concepts are important to be confirmed by statistical data and results indicators contributed to UN SDGs.		Comment noted.
22	87-102; 178-179 208-235	It’s better, when each country case including Germany, Ethiopia, Rwanda, Uganda, Solomon Islands and Iraq Renewable Energy would be analyzing and summarizing by PIERS methodology outcomes: Access and Equity; Economic Effectiveness and Fiscal Sustainability; Environmental Sustainability and Resilience; Replicability; and Stakeholder Engagement.		The PIERS methodology is being expanded by UNECE – this can be addressed later.

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23	179-207	It's important to determine specific outcomes for off grid renewable energy PPPs projects by PIERS methodology indicators.		The PIERS methodology is being expanded by UNECE – this can be addressed later.
24	236-259	Risk management plan for off-grid renewable energy PPP projects are important to be identified in this part. Off-grid renewable energy PPP projects bankability, output requirements and risk monitoring and review is important to be identified in this part. Additionally, cost-overrun risk and currency exchange rate risks and mitigation measures are important to be identified in this part.		Addressed in text.
25	260-324	Goal and objectives of off-grid renewable energy PPP project is important to be connected to the UN SDGs and main outcomes in detail.		Addressed in text
26	375-566	Evaluation and research methodologies of off-grid Renewable Energy PPPs models are important to be included in detail in this section. Also advantages and disadvantages are necessary to be analyzed and determined for each model of off-grid Renewable Energy PPPs on using detail indicators. Off-grid Renewable Energy PPPs project identification, screening and selection is of importance for deciding funding and financing of PPP project, so methodology of detailed analysis of PPP project is necessary to be indicated in this section for successful implementation through PPP, “PPP-ability” is necessary to be analyzed and completed for the first.		This is a stand-alone standard on off grid rather than a general tool on PPPs, where you would expect such concepts to be included.

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27	567-814	Concepts of PPP feasibility study including specifics of off-grid Renewable Energy PPPs project and models are necessary to be determined and included in this section.		This is a stand-alone standard on off grid rather than a general tool on PPPs, where you would expect such concepts to be included.
28	930-961	Specifics of private financing is important to be included in this part. Public finance has not recover full cost of infrastructure PPPs. Private financing come from private investors on equity or from banks on debt. Private financed projects need to repay interest and bring dividends to owners. Financial sustainability has impact to affordability of services to users , also VfM.		Will be addressed in PPP Finance Guidelines

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29	General comment	<p>Following internal consultation, we would like to propose that the document requires some attention to ensure that it is based on international consensus standards.</p> <p>As a general suggestion, perhaps there could be a mention that the entire project will be based on relevant international standards including those of the IEC and that implementers may contact the IEC for a list of applicable standards.</p> <p>At minimum, since the document focus on off grid renewable energy, we suggest quoting the IEC TS 62257 series (TC 82) which has played a significant role in rural electrification projects in developing regions. This series of documents is also frequently cited in relation to SDG 7 – Affordable and Clean Energy.</p> <p>We would also highlight the following:</p> <ul style="list-style-type: none"> <li>• IEC TS 62257-9-5 (TC 82) for sampling testing of off-grid solar products such as solar kits up to 350 Watts</li> <li>• IEC TS 62257-9-8 (TC 82) focus on quality specification &amp; requirement that support compliance with the testing methods defined in Part 9-5.</li> <li>• IEC 61427-1:2013 (TC 21) Secondary cells and batteries for renewable energy storage - General requirements and methods of test - Part 1: Photovoltaic off-grid application</li> </ul> <p>Other relevant documents include:</p> <ul style="list-style-type: none"> <li>• IEC 61400-2:2013 (TC 88) Wind turbines - Part 2: Small wind turbines</li> <li>• IEC TS 62257-7-2 (TC 82) - Generator set - Off-grid wind turbines</li> </ul>		<p>First reference is relevant – the following are very technical and not appropriate for the document.</p> <p>The example provided below can be included in future versions of this document if details are provided.</p>

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		<p>It could be pertinent to add reference to the <a href="#">IEC : 63318</a>: Specifications for SELV DC systems conforming to the ESMAP multi-tier framework tier 2 and tier 3 requirements for household electricity supply.</p> <p>We also have a range of cross-reference standards related to these, however as initial feedback, can leave it at this level of detail for now.</p> <p>Importantly, IEC has been conducting and funding, through its Global Impact Fund, <a href="#">an off-grid Renewable Energy PPP project</a> in support of the SDGs, which may be an opportunity to showcase or experiment how our work is complementary while giving some tangible foundations to the UNECE standard that is currently under development.</p>		

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30	361	In the proposed changes, I put some suggestions regarding the monitoring team as it is necessary for a successful PPP project.	<p>Regarding the monitoring, it should be optimal to establish a team/personnel directly responsible for contract oversight and monitoring as a content of the PPP agreement, to serve as a representative of the Grantor (and paid by the Grantor), and as a contact body for the Private Partner to help ensure the successful implementation of the Project; wherein this team will keep detailed records of contractor's performance, review and approve or reject reports if they are to be rejected. If problems are anticipated, to notify the Contracting Officer and supervisor, in writing.</p> <p>This team will assure that changes in work under the contract are not implemented before written authorization or a contract modification is issued by the Contracting Officer, because no change or commitment should be directed without prior written authorization by the Contracting Officer. Best method <i>inter alia</i> will be site visits by this team to the contractor's facility to check his performance versus scheduled and reported performance.</p> <p>This team as well, advises the Contractor that in the event the Contractor desires to propose a</p>	This recommendation has been accommodated in the document.

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			<p>change, he or she should submit the request in writing to the Contract Monitoring team and specifically identify the effect that the proposed change(s) will have on the terms of the contract (technically and/or monetarily), and if needed then it should be incorporated into the contract.</p> <p>This will ensure timely notification by the Contractor of any anticipated overrun or underrun of the estimated cost under cost-reimbursement contracts.</p>	

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31	1262-1263	Include Fault Managed Power technology in the “Emerging Trends” section. FMP systems are rated up to 450V and can deliver significant power, over significant distances without conduit and breakers and are safe to interact with as network PoE circuits. Its safety supports rapid and low-cost deployment of power distribution because it does not require a highly skilled electrician. Fault Managed Power systems are inherently smart systems, using digital technology, so management and control of these systems improve power efficiency, management and allocation.	concerns; leveraging emerging AI and/or Fault Managed Power technologies that can optimize power generation and distribution efficiency, safety, rapid workforce upskilling, and cost controls; introducing cyber	Comment provided was included.

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Alan’s comments are constructive and extensive – how much consideration do we give to them?

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32	After line 951	An Application of Blended Finance UK-Indonesia Low Carbon Energy Finance Partnership	<p><b>An Application of Blended Finance -UK-Indonesia Low Carbon Energy Finance Partnership</b></p> <p>UK-Indonesia Low Carbon Energy Finance Partnership is a UK funded, UK Embassy managed program that uses technical assistance, small catalytic grants (viability- gap funding) and brokerage to de-risk and crowd in private capital for small and medium scale renewable projects in Indonesia. Debt financing is provided by an Indonesian State-Owned development finance institution under the Ministry of Finance, as concessional loan with long-tenor debt and concession rate. In combination, the program operates as a blended-finance mechanism involving grant funding and loans to create layered capital structures that reduce first-loss and early-stage commercial risk to improve bankability. The Grant also acts as an investment catalyst, utilizing modest public funds to help unlock larger debt and private investments.</p> <p>The program through technical assistance and policy engagement also performs procurement support and policy reform, so in practice is a hybrid of blended finance. Rural tariff revenues are usually</p>	Very informative. However, it is not included as Blended finance is covered in another guide (on sustainable finance).

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			<p>insufficient to cover project finance debt service hence catalytic grants (for VGF) is integral in this hybrid system.</p> <p>Funds are utilized to develop low carbon mini-hydro projects, rooftop &amp; utility solar, off-grid solar combine with battery mini-grids across Indonesia. Emphasis is made on social impact and gender-inclusive governance.</p> <p>Community involvement is encouraged and supported, for example village co-op / local government may contribute in-kind or small equity (land, distribution fee, small tariffs), as well as participating in operations and maintenance of the project. In remote locations, it is advisable to involve village heads and local leaders in O&amp;M, to ensure sustainability and safety of installed equipment against damages and theft (usually copper wires). Poor households unable to pay for electricity and services may contribute in-kind through maintenance and cleaning of installed equipment and systems like solar panels.</p> <p>Projects successfully completed can be scaled and replicated in other off-grid regions and islands, to attract greater pools of private capital and State-Owned- Enterprise's (SOE) concessionary loan. This will result in boosting green investments throughout Indonesia, and improve the quality of life of people in remote areas.</p>	

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33	After 951 (Blended Finance Application)	Addition - New Subheading  <b>Hybrid Blended Finance</b>	<p><b>Hybrid Blended Finance</b></p> <p>The Monetary Authority of Singapore (MAS) announced that their Green Investments Partnership (GIP), a blended finance partnership under Singapore’s Financing Asia’s Transition Partnership (FAST-P) initiative, has achieved its first close with US\$510 million of committed capital from global and regional public, private and philanthropic institutions. The capital will be deployed into green and sustainable infrastructure opportunities in Southeast and South Asia across a strong pipeline of transactions.</p> <p>MAS is part of the group of investors and financiers which include the International Finance Corporation (IFC), the Australian Government represented by Export Finance Australia, the Dutch Entrepreneurial Development Bank (FMO), HSBC, Temasek, British International Investment, Bank of the Philippine Islands and Allied Climate Partners. The European Commission is supporting GIP under its Global Gateway program.</p> <p>Pentagreen Capital, the sustainable infrastructure debt financing platform established by HSBC and Temasek, serves as the fund manager for GIP. GIP will support investments in renewable energy and storage, electric vehicle infrastructure, sustainable</p>	<p>Elements of comment included in the document.</p> <p>Should be further referenced in the sustainable finance guide being developed</p>

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			<p>transport, water and waste management and other sectors critical to Southeast and South Asia’s energy transition.</p> <p>FAST-P’s diverse group of partners includes governments, multilateral development financial institutions and philanthropies, as well as private investors, commercial banks and other financial institutions. In practice, FAST-P shall provide different instruments across project stages and layered tranches. Such approach aims at de-risking “marginally bankable” sustainable infrastructure and will deploy debt (and likely mezzanine/subordinated instruments) to attract commercial capital. In sum, the green investment fund is a hybrid blended finance fund utilizing layered tranches, multiple instruments and staged financing to attract concessional and commercial capital.</p> <p>Public Private Partnerships fit well into FAST-P structure and objectives and are financed through layered structures where government, and development financial institution (DFI) support via availability payments, guarantees, and concessional tranches, improve bankability and attract private capital for senior debt and equity. The FAST-P proposed infrastructure projects are in energy, waste management, transportation and EV charging networks are suitable for PPPs.</p>	

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			<p>FAST-P could participate in PPPs in practical ways: 1) provide technical assistance and fund the project preparation that is often the bottleneck in PPP deals 2) provide concessional junior tranche or first loss equity to improve debt service coverage metrics. 3) offer partial risk guarantees such as political risk coverage, construction and payment risks or revenue support during ramp-up (availability or revenue top-ups). 4) Co-lend alongside MDBs and government loans.</p> <p>FAST-P’s focus on de-risking projects via blended structures to attract public and private lenders and investors through hybrid blended finance is innovative. The layered tranche, multiple instruments and staged financing structures will result in mitigating risks at every project phase, for example, provision of concessional first-loss makes lenders comfortable with a higher loan to value (LTV); the mezzanine increases yield for risk capital, and when the project reaches stable operation, the sponsor or refinancing vehicle replaces mezzanine with long-tenor institutional loans. This is a hybrid blended capital stack.</p> <p>The Green Investment Partnerships under Singapore FAST-P initiative, presents an opportunity for the utilization of PIERS Evaluation Methodology at a high and collective level for marginally bankable sustainable infrastructure in Southeast and South</p>	

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			Asia, to mobile and scale blended finance for Asia's energy transition. <sup>1</sup>	
34	961 onwards	<p>Under <b>Other Sources of Finance</b></p> <p>1) Financing Model for De-Risking Off-Grid Geothermal Development</p> <p>2) Monetizing Strategy for earlier revenue.</p>	<p><b>Financial Model for De-Risking Off-Grid Geothermal Development</b></p> <p>The World Bank approach in Maximizing Finance for Development (MFD) for geothermal development in Indonesia utilizes a multilayered de-risking model to support initial high risk resource funding through a local financial State-Owned Enterprise (SOE), a subsidiary of the Ministry of Finance. Through the Geothermal Resource Risk Mitigation (GREM) facility operated by the SOE, alongside concessional World Bank/GCF/CTF funds, high risk first project phase (upstream exploration, appraisal and test), are carried out by public concessional finance and grant. Instead of government subsidising a vital high-risk project, a mix of public and</p>	<p>Has been partly referenced in the document. Should be further referenced in the sustainable finance guide being developed</p>

<sup>1</sup> Accredited applicants for renewable energy and sustainable infrastructure project financing need to be cognizant of the FAST-P requirements: 1) Treat FAST-P as a partner who provides catalytic/de-risking capital. Position concessional tranche, project development TA, partial credit guarantees, subordinated debt to achieve bankable DSCRs during construction. 2) Design PPPs so payments and revenues are predictable via availability payments, minimum revenue guarantees and clear and concise PPAs. FAST-P aims to make marginal projects bankable, hence there need to be sustainable, contractually strong revenue streams.3) Prepare a staged financing plan and documents early (feasibility, procurement, environment and social impact assessment. FAST-P will require thorough project preparation before committing capital. Use TA/grant windows to overcome early hurdles.4) Currency and Off-taker mitigation must be explicit In financial model, propose matching structures and hedging strategy before presenting to blended fund managers. 5)Expect rigorous ESG ad fiduciary due diligence MAS/DFI investors will expect high standards and measurable impact metrics.

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			<p>concessional instruments are utilized to attract private downstream capital.</p> <p>Upon resource confirmation from exploration and appraisal data showing productive wells yields (flow, enthalpy, stability), and preparation of safeguards/permits, a commercial package is then presented. This includes PPA Offer, interconnection plan, environment social impact assessment (ESIA) clearance, cost estimates, and technical due diligence. Acceptance of project bankability at this stage leads to FID (financial close).</p> <p>The private investors assume development risk from FID through construction, commissioning and operations. Private risk begins at the FID, financial close milestone, having been de-risked upstream by the public facility.</p> <p>This risk mitigation finance facility and layered financial structure from the public sector to attract private capital is an example of how high risk off-grid renewable PPP projects can be developed and is applicable across other commercial sectors. Such an approach goes beyond traditional blended finance because the blend is not simultaneous but sequential and layered along the project life cycle. It has three financial windows (government drilling, public developer, private developer) and is a layered</p>	

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			<p>public-private risk-sharing model, best described as a risk-mitigation facility under the World Bank’s MFD approach.</p> <p><b>Monetizing Strategy for Earlier Revenue</b>            In geothermal development revenue can be monetized by utilizing technology to achieve early cash flow. Conventional revenue time-line is between 6-8 years after project commencement. By installing modular, small turbines (1-10MW) directly on high-flow exploration or appraisal wells, the developer can start selling power to state electricity authority or to grid, before commissioning of the power plant. This will result in earlier cash flow, within 2-3 years after exploration drilling instead of 6-8 years. This monetizing strategy has been deployed for geothermal projects in Kenya, Iceland, Indonesia and the Philippines.</p>	
35	1060	<p>Addition to Emerging Trends (after line 1060, new paragraph sub-heading.</p> <p>Innovative approach to raise Sovereign Fund for massive infrastructure projects through Project Financing Platform and Project Equity Platform PEPs, hence enhancing the role and importance of PPPs.</p>	<p><b>Alternative Sovereign Wealth Fund Model</b></p> <p>Indonesia Sovereign Wealth Fund (SWF) 2.0 has announced a novel approach to raise funds from foreign investors instead of utilizing the country’s reserve to support the country’s enormous priority projects and new capital city development. This approach is drastically different from traditional SWFs that redeploy taxpayer funds into a global portfolio of investments and securities with the aim of achieving yields above sovereign bonds. Investors</p>	<p>Has been partly referenced in the document - Should be further referenced in the sustainable finance guide being developed</p>

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		<p>Off-grid RE PPP projects can be bundled at national scale to attract social impact investors.</p>	<p>to SWF will act as anchor investors or co-investors for national priority projects such as infrastructure, rural electrification, energy and resources, healthcare, tourism, and advance technology. Later the investors funds will be directed to finance the recycling of government linked assets.</p> <p>The fund serving as anchor investor will establish a Project Financing Platform (PFP) and Project Equity Platform (PEP). The PFP would pool institutional investors for purchasing project/infrastructure loans from qualified banks in order to free up their balance sheets for originating new such loans. The PEP would pool private investors for providing “top-up equity” to meet project financing requirements. Off-grid RE PPP projects can be bundled at national scale to attract social impact investors.</p> <p>SWF 2.0 has the potential to align Government’s long term development goals instead of meeting investors short-term priorities. Nation building and new capital relocation designed as a smart and green sustainable city require massive funding both public and private, with emphasis on inclusive VfM, VfP and VfPL. Other priority projects include clean and renewable energy, low-emission transportation integration with surrounding natural forests of Kalimantan Borneo, where Indonesia’s new capital Nusantara will be located.</p>	

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36	1014	<p>Electricity Tariffs New Paragraph after line 1013</p> <p>Tariff Design must be inclusive to ensure the poor are not left behind. This is achieved through a tiered-tariff structure to ensure affordability for low-income households.</p>	<p>To achieve social impact for off-grid renewable projects, tiered tariff structure will ensure equity among consumers. Lifeline tariff ensures low-income consumers get essential electricity supply for household needs. Tariff design to elevate poverty should utilize a Lifeline coupled with tariff Blocks, one for basic consumption at specified usage and another for high use at a higher rate. Commercial tariff for commercial and institution use is charged separately at premium rate. This structure allows for cross-subsidy for poor households and ensuring sustainability through cost recovery of connection costs, local labour, O&amp;M costs and inventory replacements.</p> <p>To ensure viability and sustainability of off-grid renewable projects, government and donor aids are vital to support targeted output-based subsidy or equivalent result-based grant, until commercial anchor loads or scale reduces the levelized cost of energy (LCOE). Progressive tariff escalation in small annual increase indexed to inflation must be planned and communicated in advance.</p> <p>For projects to have an impact on the SDGs, tariff design must be inclusive to balance affordability for households with sustainability for operators, along with desired outcomes for donors and investors. Focus and effort should be directed to ensure that no one is left behind.</p>	<p>This has been included in the updated document.</p>

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37	1060 onwards	<p>New Sub Heading under Emerging Trends</p> <p><b>Tokenization of Renewable Infrastructure</b></p>	<p>Tokenization of Renewable Infrastructure</p> <p>AntChain owned by the Alibaba Group has announced US\$8.4 Billion worth of Chinese wind and solar assets are now tokenized. Real-time data from 5 million devices flows directly onto AntChain and returns are distributed via tokens. Renewable projects are made liquid, transparently tradeable on blockchain networks and accessible through fractional ownership.</p> <p>Tokenized infrastructure is a gamechanger allowing for capital, energy and data flow in real time on-chain, hence bringing physical assets into the digital financial ecosystem. At a later stage off-grid RE projects can be included, and bundled for participation. This may attract impact-focused investors, local communities and smaller fund investors who want to support social projects. Digital financial ecosystem is designed to allocate capital toward renewable energy projects both on-grid and off-grid, with transparency, sustainability and financial predictability. In AntChain model, the issuance of tokens is represented by a fractional ownership share or a claim on the future cash flows of the entire physical asset (the solar or wind farm itself). It is a digital security whose value is derived from the asset's overall financial performance, based at its core on the energy production data (kWh) which is the critical, immutable proof that gives the token its value.</p> <p>This prevents Greenwashing as the units of energy produced (kWh) along with corresponding carbon</p>	<p>Elements of the proposed change have been included in the updated document.</p>

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			<p>credit certification data (verifying how many tons of CO2 were avoided), provide undeniable proof of the environment impact which is attractive to ESG investors. The tokens are security tokens, they are regulated financial instruments (not volatile cryptocurrencies), designed for compliance with securities laws.</p> <p>Token holders stake their tokens in renewable energy pipelines, registered in tamper-proof digital record for each asset, whose terms are written into smart contracts, self- executing codes that reside on the blockchain. This digital ecosystem links rewards to verifiable energy output hence reducing speculative risks and when utilize along with power purchase agreements (PPAs), it ensures that financial obligations remain aligned with energy production, maintaining long term sustainability. The traditional PPA is hence enhanced and supercharged by smart contracts and real-time data. In sum, Tokenization of Renewable Energy PPP projects offer a transparent, scalable, efficient and clear business model that connects capital provision with clean energy development, to accelerate the global energy transition to Net Zero.</p>	

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<b>Comment Submitter</b>	Russian Federation	<b>E-mail</b>		<b>Delegation / Organization</b>	Russian Federation	<b>Date submission</b>	01.10.2025
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38		Team leader Feedback: General Comments received from the Russian Federation were not provided in the table format. They have been added by the team		UNECE will consult with the Russian Federation for feedback for inclusion in the next iteration.
39		Taking into account the recommendatory nature of the document and the flexibility of the proposed set of possible forms of cooperation between the public and private sectors, it is considered possible to <b>support the initiative</b> to adopt such a Standard.		UNECE will consult with the Russian Federation for feedback for inclusion in the next iteration.
40		At the same time, we consider it necessary to note that a number of provisions of the draft standard may <b>potentially cause difficulties</b> in its practical application within the framework of Russian regulatory policy.		UNECE will consult with the Russian Federation for feedback for inclusion in the next iteration.
		In particular, such provisions include <b>the following</b> :		
41		1. The use of criteria related to <b>benefit for vulnerable communities and gender equality</b> in evaluating progress towards the draft standard's objectives;		UNECE suggests that the PPP guiding principles and PIERS criteria should be used. The criteria will be elaborated in due course.
42		2. <b>the requirement to apply standardized solutions</b> from both operational and technical perspectives;		UNECE will consult on this comment with the Russian Federation
43		3. the critical stance regarding the <b>use of diesel generators for supplying electricity in remote and isolated areas</b> . In this context, it should be underscored that the majority of newly introduced small-scale and distributed generation facilities in the Russian Federation in such areas – even those utilizing		This concern has been addressed in the sector where diesel power is discussed.

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		renewable energy sources as the primary energy supply – still, due to the climatic conditions that necessitate enhanced reliability, typically include a backup diesel generator, given the variable nature of electricity output from renewable energy installations. Moreover, the mandatory inclusion of an energy storage system to replace a diesel generator in such hybrid power systems significantly increases the overall cost of this technical solution;		
44		4. the desirability of <b><i>involving local communities in the ownership and management of distributed generation assets</i></b> , as well as the proposed <b><i>model of joint public-private sector ownership</i></b> , which in practice is not always achievable in Russia, where such generation facilities and associated infrastructure are most commonly owned by energy companies operating in the respective territories or remain under state ownership.		Although particularly relevant to former Soviet Republics, there is merit in the concern for other countries.  This has been addressed in a footnote.
45		5. the practical form of implementation the <b><i>recommendation to reconsider the role of monopolies</i></b> which that may pose risks to revenues from autonomous access and mitigate their influence on power purchase agreements – remains unclear.		This comment is addressed in in footnote 8.

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<b>Comment Submitter</b>	Alexander Boldyrev	<b>E-mail</b>	Boldyrev_ay@mail.ru	<b>Delegation / Organization</b>	Individual, former Adviser to Nefco- The Nordic Green Bank	<b>Date submission</b>	21.08. 2025
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46	972	Repetition of “operational risks”.	“...counterparty risks; <del>operational risks</del> ; regulatory risks...”	Correction made.
47	996	Education and technical skills should be included to ensure reliable operation and maintenance of RE systems.	“..create risk; fostering technical education and re-skilling; transferring..”	Correction made.
48	985	Important to save time and resources.	“...identify and address all relevant risks in the early stage, even unexpected...”	Correction made.
49	1066	Irrevocable bank guarantees may be quite costly and can impact the bankability of projects too. Insurance should be included amid rising exposure to natural risk (In 2022 and 2023 alone, economic damages reached \$451 billion, representing a 19% increase compared to the annual average from the preceding eight years. Source: The economic cost of extreme weather events. Oxera for the International Chamber of Commerce, 2024)	“...subsidies, insurance cost, domestic bank’s reluctance to provide loans to PPP investors and high transaction costs, including costs of bank guarantees”	Included in the body of the new version.

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<b>Comment Submitter</b>	J.Akhadov, A.Komilov, E.Juraev	<b>E-mail</b>	info@nires.uz	<b>Delegation / Organization</b>	National Research Institute of Renewable Energy Sources under the Ministry of Energy	<b>Date submission</b>	22.09.2025
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50		The draft standard does not provide reference standards	Information about all recommendations should be added.	Reference documents are included in footnote 72
51		While the draft provides a strong conceptual framework, we believe it would be beneficial to include practical implementation instruments such as model PPP contracts, tariff-setting approaches, and sample risk-sharing provisions. Such additions could greatly assist governments and private partners in applying the standard in real project environments.	Information about all recommendations should be added.	UNECE - this type of document does not call for this content as it is not a reference book on PPPs.
52		The current case studies are highly valuable, yet they draw predominantly from African and Asian contexts. It would be useful to broaden the range of examples by incorporating experiences from Central Asia and CIS countries, where climatic, economic, and institutional conditions differ. This would help ensure that the standard is truly representative of UNECE member states.	Information about all recommendations should be added.	UNECE – this is a living document. When new cases are provided by countries and stakeholders they can be included in the next iteration. Any provided by you will be considered.
53		The emphasis on aligning with the SDGs is commendable. However, there remains a need for a more detailed methodology on monitoring and evaluation. We encourage the inclusion of specific indicators—such as cost per kWh, percentage of households electrified, and avoided CO <sub>2</sub> emissions—which would allow governments and financiers to assess performance more objectively.	Information about all recommendations should be added.	This level of detail is not required for this document.

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54		Access to finance is a recurring barrier in off-grid projects. We would recommend that the draft elaborate further on financing models suitable for low- and middle-income countries. Particular attention could be given to blended finance, concessional climate funds, and the role of multilateral development banks in supporting the bankability of projects.	Information about all recommendations should be added.	This will be addressed in the UNECE PPP Financing Standards being developed.
55		Beyond the enabling environment, it would be advisable to highlight concrete capacity-building measures for public authorities, especially at the local level. Strengthening legal, regulatory, and technical expertise will be essential for governments to oversee PPP contracts and ensure long-term sustainability.	Information about all recommendations should be added.	UNECE - this type of document does not call for this content as it is not a book on PPPs.
56		The document acknowledges the risk that grid extension may undermine existing off-grid PPPs. To address this, we suggest considering stronger safeguards, such as compensation mechanisms, renegotiation options, or priority partnership rights for existing operators when national grids are expanded. Such measures would provide greater certainty to investors.	Information about all recommendations should be added.	Added to recommendations.
57		Finally, we note that while the draft focuses on energy access, it would add value to explicitly recognize the importance of local content, employment creation, and technology transfer. Linking off-grid PPPs to skills development and local economic growth would strengthen their contribution to the broader SDG agenda.	Information about all recommendations should be added.	Changes made to new version of the document.

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58		Expand the technology section to include a mention of AI and digital tools for energy system optimization, citing 2025 trends for improving efficiency and sustainability.	Information about all recommendations should be added.	Changes made to new version of the document.
59		Deepen the analysis of climate resilience, including adaptation measures to climate change and risks, as in the Deloitte 2025 report.	Information about all recommendations should be added.	UNECE – as policy - does not use studies from the big four consulting companies.
60		Include current examples of green bonds and blended finance for LMIC project financing to increase investor appeal.	Information about all recommendations should be added.	Additions made.
61		The draft standard does not provide reference standards	Information about all recommendations should be added.	UNECE – the ‘reference standard’ that is important for the document is our work on PPPs for the SDGs