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Center for Policy and Public Management
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Empowering Indonesia's Energy Transitions through Corporate Renewable Procurement

Executive Summary

Indonesia's aspiration to achieve net-zero emissions by 2060 hinges on an accelerated shift towards renewable energy. Corporate Renewable Procurement (CRP) presents a strategic pathway to catalyze private sector engagement in clean energy deployment through mechanisms such as Power Purchase Agreements (PPAs), rooftop solar photovoltaic (PV) installations, and Renewable Energy Certificates (RECs). Despite notable interests, uptake remains limited due to regulatory uncertainties, grid access limitations, financial barriers, and institutional capacity gaps.

This policy brief examines the current landscape and evolving role of CRP in Indonesia's energy transitions. It identifies key impediments—including fragmented regulations, inadequate financing mechanisms, and limited market awareness—while also recognizing emerging opportunities, such as Indonesia's abundant solar potential, the rise of Environmental, Social, and Governance (ESG) standards, and pressure from international carbon border adjustments. The case of InJourney Airports underscores the growing but nascent momentum in corporate adoption.

To fully unlock the potential of CRP, this brief proposes three strategic policy interventions: (1) facilitating virtual PPAs and power wheeling; (2) strengthening financing and risk mitigation mechanisms; and (3) institutionalizing green procurement policies alongside targeted fiscal incentives. These measures, implemented in a coordinated manner, can address structural barriers, accelerating private sector's contribution to Indonesia's clean energy transformation.

1. Background

As the fourth most populous nation and Southeast Asia's largest economy, Indonesia faces a complex dual imperative: satisfying a rapidly growing energy

demand while simultaneously decarbonizing its energy system. As of 2023, over 60% of Indonesia's electricity generation remains dependent on coal, with renewables comprising only about 12% of the primary energy mix—well below the national target of 23% by 2025. This heavy reliance on fossil fuels presents both an environmental risk and a potential economic liability in the face of tightening global carbon regulations.

Corporate Renewable Procurement (CRP) offers a high-impact, market-based mechanism for accelerating renewable deployment. It enables commercial and industrial (C&I) entities to voluntarily source electricity from renewable energy sources, thereby reducing their carbon footprint, mitigating long-term energy costs, and meeting increasingly stringent sustainability mandates from global buyers and investors. Procurement can take multiple forms, also renewable energy doesn't need subsidies to compete with fossil fuels when it comes to building new power plants.

Cost Reduction in Solar Panel Technology

In this case, one of the procurement forms is on-site solar PV installations (e.g., rooftops). Solar panel technology is generally cheaper than traditional heavy-reliance energy sources like coal, biomass, gas, hydro, nuclear, and offshore wind mainly because of its declining installation costs, simplicity of technology, and faster deployment without fuel costs. Key points include that solar panel manufacturing and installation costs have dropped significantly in the last decade due to economies of scale and technological improvements, unlike costly and complex infrastructure needed for coal or nuclear plants. Solar energy does not require ongoing fuel purchases or extensive maintenance, which reduces lifetime expenses. The levelized cost of energy (LCOE) for utility-scale solar has become competitive with or lower than fossil fuel plants, even before subsidies.

Community rooftop solar panels produce approximately 41 grams of CO_2 equivalent emissions per kilowatt-hour of electricity throughout their lifecycle. The majority of these emissions stem from the manufacturing process and are typically offset within the first three years of use through the generation of clean energy. Over their operational lifetime, rooftop solar systems emit 12 times less carbon than natural gas power plants and 20 times less than coal-fired plants.

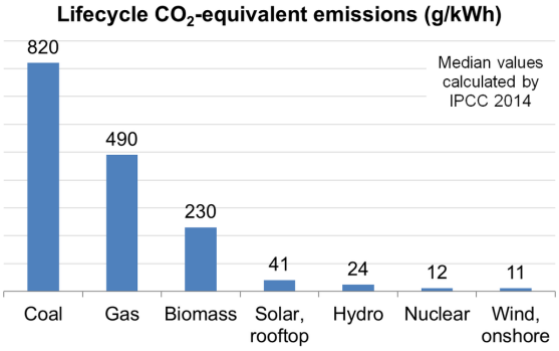

Figure 1. Solar PV Carbon Emission Factor (Wignes, 2025)

For enhancement, lifecycle emissions encompass all greenhouse gases released during a product's entire existence —from raw material extraction and manufacturing to installation, maintenance, and end-of-life disposal. These are expressed in grams of CO_2 equivalents to capture the full climate impact of different gases.

The Intergovernmental Panel on Climate Change (IPCC) estimates that producing 1 kWh of electricity from rooftop solar results in about 41 grams of CO_2 equivalents —roughly the weight of a medium-sized egg. While solar power is not entirely emissions-free, its carbon footprint is significantly lower compared to conventional fossil fuel energy sources.

The recent spotlight is in China, the costs have dropped dramatically due to advances in photovoltaic (PV) technology and massive global manufacturing scale. This includes cheaper raw materials, improved production techniques, and competitive supply chains. Economies of scale have also reduced per-unit costs as production volume increases. The rapid deployment time —often a few months to build solar farms— contrasts with years needed for coal, nuclear, or offshore wind projects.

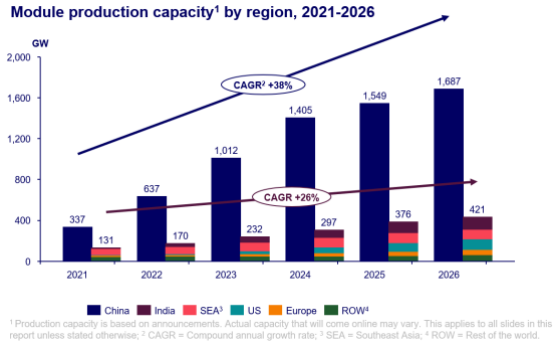

Figure 2. China is leading the way for solar manufacturing (Wood Mackenzie, 2023)

Lazard's annual cost report indicate that the LCOE for solar power now ranges roughly between $38-$78 per megawatt hour (MWh) (Storrow, 2025), while coal, gas, and biomass often range higher, and nuclear and offshore wind are usually more expensive due to capital-intense construction and maintenance costs. Existing fossil fuel plants might still have lower operational costs but require fuel expenditures and emissions controls.

However, CRP currently constitutes less than 2% of Indonesia's installed solar PV capacity—approximately 400 MW out of a 42 GW national generation base—underscoring the need for targeted policy intervention.

The Legacy of Virtual PPAs with Independent Power Producer

Power Purchase Agreements (PPAs) are contractual agreements that ensure Independent Power Producers (IPPs) have a buyer for the electricity they produce, typically at fixed prices over an extended period. This certainty helps to secure project financing, which is essential for capital-intensive power projects. In contrast to a physical PPA, where the corporate buyer assumes ownership, a virtual PPA does not involve ownership or responsibility for the physical electricity generated by the project. In Indonesia, many PPAs were signed during a period of fossil fuel reliance, locking-in coal and gas projects for decades. This results in legacy costs and overcapacity issues, making it less attractive and financially viable for renewable IPPs to enter the market.

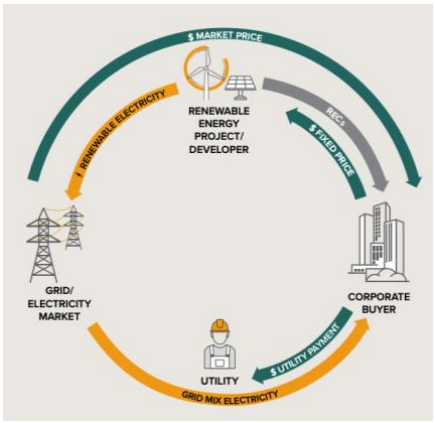

Figure 3. VPPA Transactions (Rocky Mountain Institute, 2019)

Indonesia has been taking regulatory steps accordingly. The Ministry of Energy and Mineral Resources (MEMR) introduced regulations in early 2025 targeting renewable energy PPAs with key principles designed to support IPPs of renewables better, creating more attractive terms for investments and enabling quicker deployment. Unlike in many other countries, direct corporate power purchase agreements (PPAs) are forbidden in Indonesia, as only the state-owned utility PT PLN (Persero) and private developers with specific business area licenses are authorized to sell electricity to end users.

The MENTARI program, led by the British Embassy Jakarta along with its partners, focuses on solar energy and works to create regulatory frameworks that could eventually support VPPAs. MENTARI plays a crucial role in laying the groundwork for the development of these frameworks.

RECs Representing Environmental Attributes

Renewable Energy Certificate (REC) is an Energy Attribute Certificate (EAC) that represents the environmental benefits of generating one megawatt-hour (MWh) of electricity from renewable energy sources. RECs can be issued for power produced from sources such as wind, solar, biomass, hydropower, biogas, geothermal, and landfill gas. These certificates serve as proof that electricity consumed has been matched with renewable energy generation, allowing organizations to offset their use of non-renewable electricity.

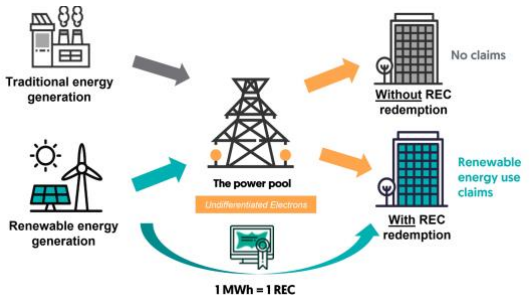

Figure 4. Concept of RECs as an energy attributes (SPGroup, 2025)

RECs are traceable. Each certificate assigned a unique serial number that ensures transparency, prevents double counting, and allows verification of ownership and usage. By purchasing RECs, consumers help stimulate demand in the renewable energy market, signaling the need for continued investment in clean energy infrastructure. This mechanism also promotes the generation of electricity that does not produce greenhouse gas emissions, supporting broader environmental and climate goals.

PLN began offering Renewable Energy Certificates (RECs) in 2020, sourcing them from various renewable power plants across Indonesia, such as Kamojang, Lahendong, and Ulubelu (geothermal), as well as Bakaru (hydropower). These certificates are issued and tracked through digital platforms, including the APX-TIGRs system based in California, which ensures each REC has a unique identifier and cannot be duplicated. Following the enactment of Bappebti Regulation No. 11 of 2024, RECs have been officially recognized as tradable renewable electricity commodities within the futures market. Only those RECs issued through a certified registry, in coordination with a clearing agency and under an approved REC Physical Contract, are eligible for trade. Once a REC is retired, it cannot be resold.

REC adoption in Indonesia has grown significantly, rising from 1.76 TWh in 2022 to 3.08 TWh in 2023—a 75% year-on-year increase. By the close of 2023, PLN had issued more than 5 TWh worth of RECs. Over 296 customers, mainly from the industrial and commercial sectors in regions such as Java, Banten, East Java, and Jakarta, had adopted RECs by the end of that year.

Earlier in 2024, MEMR Regulation No. 2 introduced uncertainty regarding the ownership of environmental attributes from rooftop solar systems, hinting that the government might claim them. This caused a temporary halt in I-REC(E) issuance for some rooftop installations. However, MEMR Regulation No. 5 of 2025 clarified that ownership of these attributes can be determined either through legal provisions or contractual agreements—such as through power purchase agreements—effectively resolving the issue. As a result, international issuers like GCC have resumed issuing I-REC(E) for qualifying rooftop solar projects.

Figure 5. I-RECs Coverage and Generation Sources [Solar, Wind, Hydro, Biomass, Geothermal] (CnerG, 2025)

In May 2025, the Indonesia Commodity & Derivatives Exchange (ICDX) received Bappebti's approval to launch the nation's first physical trading platform for RECs. The platform, which officially launched in July 2025, brings greater transparency and efficiency to REC transactions and plays a key role in advancing Indonesia's participation in the global renewable energy economy.

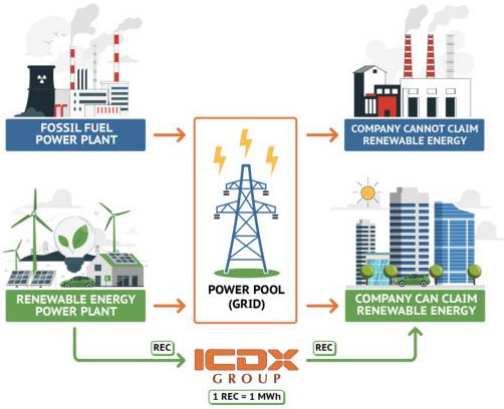

Figure 6. RECs workflow in ICDX (ICDX, 2025)

2. Key Challenges

Regulatory Barriers and Institutional Fragmentation

Indonesia's regulatory landscape for corporate renewables is complex and inconsistently applied across regions. While MEMR Regulation No. 26/2021 governs rooftop solar, key provisions—such as capacity export limits, net-metering calculations, and licensing processes—remain ambiguous. Further complications arise in the context of third-party or offsite PPAs, where regulatory silence on grid wheeling and PLN's monopoly status introduce transactional uncertainties.

The government is actively promoting renewable energy through policies such as the Presidential Regulation No. 112/2022, which sets new electricity tariffs and prioritizes renewable projects. The transition is supported by Just Energy Transition Partnership (JETP), aiming to mobilize USD 20 billion to accelerate the coal-shifting to renewables. Regulatory frameworks are also evolving, with improvements in permitting processes and the introduction of auction mechanisms to encourage private sector participation.

Despite challenges like grid constraints and regulatory uncertainties, investors' interests remain strong, particularly in solar, hydro, and geothermal energy. The issuance of Renewable Energy Certificates (RECs) and the establishment of a carbon trading mechanism further demonstrate Indonesia's commitment to meet its renewable energy targets and reduce carbon emissions in line with global climate goals.

PLN, Indonesia's state-owned utility, continues to operate as the single buyer and grid operator. Approval processes for interconnection or wheeling are often opaque, discretionary, and unevenly enforced across PLN regional offices. This regulatory opacity not only deters investor confidence but also hampers scalability and replicability of early successes.

In Indonesia, the most adopted form of "corporate PPA" is a simple operating lease arrangement. A power developer leases its power generation system—typically rooftop solar panels—to the consumer. The rental payments are structured to closely resemble the pricing mechanism of a traditional power purchase agreement (PPA) with PLN. This model allows corporations to effectively procure renewable energy without violating regulatory restrictions on electricity sales. A typical structure is illustrated below:

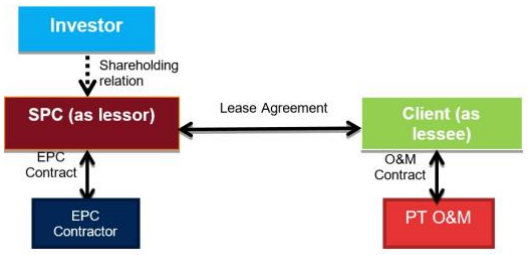

Figure 7. Corporate PPAs (Soraya, Bissett, & Sungkono, 2021)

This has led to a common belief among both developers and corporations that corporate PPAs cannot be implemented in the country. This is not entirely accurate. With the Indonesian government actively promoting rooftop solar initiatives, there is growing potential for alternative structures that allow private developers to facilitate renewable electricity supply to corporate customers.

PPA contracts often come with inflexible terms and long durations that do not align with the rapid evolution of renewable technologies or market needs. This rigidity poses risks for investors in renewables who face higher market risks compared to well-established fossil fuel assets backed by these PPAs. The inflexibility also limits the government's ability to reform power markets and optimize the energy mix for sustainability.

Limited Access to Financing and Risk Mitigation Instruments

Access to affordable and reliable financing remains a significant impediment to CRP adoption, particularly for small and medium-sized enterprises (SMEs). High upfront capital costs, limited collateral, and absence of credit enhancement instruments discourage financial institutions from

lending to less-established developers or corporate buyers. Furthermore, uncertainty in project revenue streams—owing to fluctuating tariffs, unclear net-metering arrangements, and lack of standardized contracts—exacerbates perceived risks.

(BILLIONS USD 2022)	HISTORICAL 2015	HISTORICAL 2022	ANNUAL AVERAGE REQUIRED 2026-2030	ANNUAL AVERAGE REQUIRED 2031-2035
Total EMDCs	538	773	1,784-2,222	2,219-2,805
By country/region				
China	287	511	730-853	850-947
India	55	59	253-263	325-355
Southeast Asia	28	30	171-185	208-244
Other Asia	21	23	68-85	93-112
Africa	26	32	160-203	207-265
Latin America	63	66	150-243	209-332
Europe and Eurasia	33	31	111-188	127-232
Middle East	24	21	122-202	176-318

Figure 8. Annual Clean Energy Investment in Emerging Market and Developing Countries align with SDGS and Climate Goals (IEA & IFC, 2023)

Although larger corporations may have the balance sheets to support investments, the absence of solar leasing models, green securitization tools, and concessional financing hampers the development of an inclusive and scalable CRP market. Research and development have advanced many renewable energy technologies to a point where they are technically mature and ready for broader market deployment.

A major hurdle to scaling up renewable energy projects lies in the investment gap between early-stage venture capital (VC) funding for emerging technologies and project financing for more established technologies, which often benefit from stable regulatory frameworks. Projects that face both construction and technology risks, in particular, often find it difficult to attract the necessary investment.

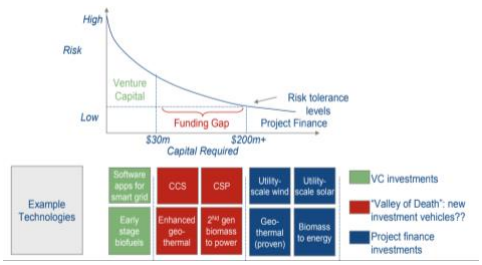

Figure 9. Funding Gap in Clean Technology Deployment (Yanosek, Hudson Clean Energy Partners, 2019)

Market Awareness and Technical Capacity Gaps

Many domestic corporations lack the institutional capacity or knowledge to navigate renewable procurement options. Internal sustainability teams often have limited expertise in structuring PPAs, evaluating renewable proposals, or negotiating long-term contracts. Legal departments frequently encounter unfamiliarity with risk allocation mechanisms in non-standard contracts, while C-suite leadership may remain unconvinced without clear short-term financial returns.

Technology transfer to developing countries holds strong appeal for efforts aimed at reducing global greenhouse gas emissions. The idea of "leapfrogging" suggests that these nations could bypass the heavily polluting stages of industrialization experienced by developed countries, moving directly toward cleaner, more sustainable technologies. This concept aligns with the Environmental Kuznets Curve, which implies that instead of following a traditional path of rising and then falling emissions (the black curve), developing countries could potentially skip over the emissions peak altogether, significantly limiting their environmental impact. However, several barriers hinder the widespread adoption of advanced technologies in these regions. To maximize the reach and effectiveness of technology transfer, these obstacles must be identified and addressed as much as possible.

One of the initial barriers identified in the literature is the term “technology transfer” itself. It often implies a one-way process where the recipient country plays a passive role, potentially undermining its capacity to actively engage with, adapt, and integrate the incoming technology. This perception may hinder effective assimilation and limit the long-term success of the transfer process.

Several more barriers exist to the successful transfer of knowledge in CRP, these identified barriers are:

- Lack of technological infrastructure in receiving country,
- Skills and resources,
- Political capacity for information dissemination,
- Power balance between stakeholders
- Local cost barriers,
- Limited investment capital,
- Difficulty of foreign technology assessment by local, and
- Poor ability to assess technology.

This capacity gap results in a risk-averse posture, with many companies deferring decisions despite alignment with ESG objectives.

Demand-Side Fragmentation and Lack of Aggregation Platforms

Indonesia ranks among the top five countries in the Asia-Pacific region for renewable energy capacity, primarily driven by hydropower and geothermal, which contribute 8% and 5% of the energy mix, respectively. The country has set ambitious goals under the Just Energy Transition Partnership (JET-P), aiming for renewables to make up at least 44% of its power mix by 2030—up from the previous targets of 23% by 2025 and 31% by 2050 for modern renewable sources like solar.

Despite these improved targets, Indonesia has yet to fully harness its vast renewable energy potential. It holds the world's largest geothermal reserves, and resources like solar and wind remain largely underutilized. Wind power, for instance, has just 1.2 MW of installed capacity compared to an estimated 9.5 GW potential. Similarly, while the Ministry of Energy and Mineral Resources estimates solar power potential at 207 GW, other assessments suggest it could reach as high as 500 GW.

Indonesia's corporate energy market is highly fragmented. SMEs, tenants in shared facilities, and commercial players without dedicated infrastructure often lack the scale, bargaining power, or legal autonomy to pursue renewable procurement individually. At present, there are no mature platforms to aggregate corporate demand, structure collective PPAs, or broker pooled procurement deals.

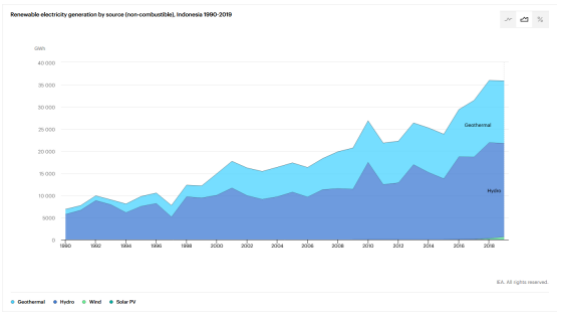

Figure 10. Electrification demand source generations in Indonesia 1990-2019 (IEA, 2022)

Without regulatory support for aggregation models such as virtual PPAs, peer-to-peer trading, or cooperative buying mechanisms—these smaller players remain excluded from the CRP landscape, limiting market depth and diversity.

3. Opportunities for Policy Leverage

Industrial Parks as Renewable Energy Ecosystems

Strategic industrial zones such as the Batang Integrated Industrial Estate and Kendal Industrial Park offer conducive environments to pilot shared renewable infrastructure. These parks benefit from regulatory streamlining, physical proximity of tenants, and strong engagement from local governments and developers. By deploying centralized solar arrays, battery storage, and waste-to-energy facilities, these parks can serve as scalable hubs for demand aggregation and efficient renewable integration.

Export Competitiveness Amid ESG and CBAM Pressures

The global shift toward low-carbon supply chains presents both a challenge and an opportunity. The European Union's Carbon Border Adjustment Mechanism (CBAM) and similar measures in other jurisdictions will increasingly penalize emissions-intensive exports. Indonesia's leading export sectors including metals, textiles, and palm oil—face mounting pressure to disclose carbon content and demonstrate decarbonization pathways.

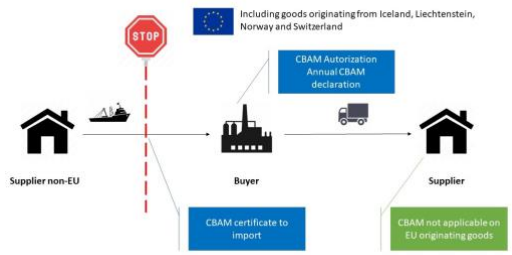

Figure 11. EU CBAM: How does it work? (Climaworks, 2021)

Proactive renewable procurement not only enhances ESG performance but positions Indonesian manufacturers as preferred suppliers in global green value chains. Early movers can gain reputational advantage, market access, and resilience against carbon pricing.

Public-Private Pilots to De-Risk Markets

Large state-owned enterprises (SOEs)—especially PLN, Pertamina, and InJourney Airports— and diversified conglomerates are well-positioned to act as anchor tenants in corporate renewable power pilot projects. These entities bring strong institutional capacity, deep infrastructure networks, and high creditworthiness, making them ideal partners for early-stage public–private test cases. For example, PLN has launched initiatives such as *Green Energy as a Service (GEAS)* and partnered with U.S. Trade and Development Agency to pilot renewable mini-grids in remote regions, helping validate new business models and signal private-sector appetite. Pertamina, through its New & Renewable Energy subsidiary, aims to grow its renewables share to 17% by 2025—primarily via geothermal projects—and has initiated green hydrogen partnerships, showing leadership in decarbonising operations and driving new value streams. Meanwhile, InJourney Airports is integrating rooftop solar installations across major airports—from Soekarno-Hatta to regional hubs—to reduce emissions and demonstrate scalable deployment in high-energy public infrastructure contexts.

By participating in corporate renewable power pilots, these institutions can significantly reduce perceived risks—both financial and technical—for smaller and less established counterparts. When PLN and Pertamina host pilot projects, they build trust, create project pipelines, and showcase viable frameworks. InJourney Airports' solar installations provide operational proof within logistical and regulatory complexity, offering lessons for private developers and policymakers alike. Their involvement encourages innovation uptake, attracts financing, and supports replication across sectors. Most critically, when such flagship projects are coupled with transparent data-sharing and publicized outcomes, they inform policy refinement, help standardize contracting structures, and unlock scalability—creating a ripple effect that can mobilize broader market development across Indonesia.

Digital Platforms and Market Transparency

Digitalization, including blockchain-enabled REC platforms, can bolster transparency, reduce transaction costs, and facilitate cross-border renewable trade. Establishing a national REC registry, integrated with energy monitoring systems, can provide verifiable claims for corporate buyers and unlock participation from international stakeholders. These systems can also inform policy planning and improve investor confidence.

4. Policy Recommendations

1. **Unlock Virtual PPAs and Power Wheeling**
   To realize the potential of corporate procurement, the government must facilitate better access between corporate buyers and renewable energy producers, including:
   - Establishing wheeling regulations to facilitate third-party access to PLN's transmission infrastructure;
   - Developing standardized virtual PPA contracts and clarifying offsite procurement protocols.

   These steps will reduce project risk, enable competition, and empower corporations to meet ambitious sustainability targets through offsite renewable sourcing.

2. **Expand Access to Finance and Risk Mitigation Mechanisms**
   To bridge financing gaps, particularly for SMEs, the government and development finance institutions should:
   - Introduce green credit guarantee schemes and risk-sharing facilities;
   - Support solar leasing, energy-as-a-service, and blended finance models;
   - Facilitate data transparency on project returns to guide financial institutions.

   Such interventions will reduce capital barriers, unlock private investment, and broaden participation in CRP beyond a few large corporations.

3. **Institutionalize Green Procurement and Fiscal Incentives**
   To build sustained market demand and incentivize early action, the government should:
   - Mandate renewable procurement targets for SOEs and public infrastructure projects;
   - Offer tax incentives, carbon credits, and depreciation allowances for renewable energy assets;
   - Establish a national registry for RE users, linked with REC verification systems.

   These measures will create long-term policy signals, reduce compliance uncertainty, and align public and private sector efforts toward Indonesia's climate goal

5. Conclusion

Corporate Renewable Procurement represents a strategic lever in Indonesia's path toward a sustainable energy future. While challenges persist, the convergence of technological feasibility, market interest, and regulatory momentum creates a timely opportunity for scale-up. By enabling policy frameworks, innovative financing, and capacity-building, Indonesia can position CRP as a cornerstone of its broader energy transition strategy.

Stakeholders including MEMR, PLN, Ministry of Finance, and private sector actors must act collaboratively to mainstream corporate renewables. With decisive action, Indonesia can not only meet its domestic energy and climate targets but also emerge as a regional leader in sustainable industrial development.

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