Alternative Models for Transmission Financing in Indonesia

May 2026

CLIMATE POLICY INITIATIVE

ACKNOWLEDGMENTS

The authors would like to express their gratitude to Indonesia Energy Transition Implementation Joint Office (Rumah PATEN/ Rumah Perancangan Aksi Transisi Energi Nasional), especially Chairperson Edo Mahendra and the transmission working team (Angel P. Mangeka, Gitta A. Septiani, Ady S. Nugroho, Gafar Ali, Unita, Patricia Adinatha, Shabrina H., Mardhiyyah Anggun, Rio Kaswiyanto), PT Perusahaan Listrik Negara (PLN), and ClimateWorks Foundation, including Husni Mubarok and Rui Luo, for their partnership and support throughout this study.

We greatly appreciate the insights and valuable inputs via Focus Group Discussions from staff of the Coordinating Ministry of Economic Affairs (CMEA), Ministry of Energy and Mineral Resources (MEMR), Ministry of Finance (MoF), PT Sarana Multi Infrastruktur Persero (PT SMI), Danantara, and other key government institutions.

We also thank CPI communications colleagues Rob Kahn, Rindo Saio, Kirsty Taylor, and Yehezkiel Tumewu for editorial review and communications support, Elana Fortin for graphics, and Denny Kosasih for freelance layout support. We acknowledge and thank CPI CEO Barbara Buchner for her overall guidance on this project.

AUTHORS

Luthfyana Larasati

Tunjung Putri

Tiza Mafira

Khalifa Akbar

CONTACT

Luthfyana Larasati:
luthfyana.larasati@cpiglobal.org

ABOUT CLIMATE POLICY INITIATIVE

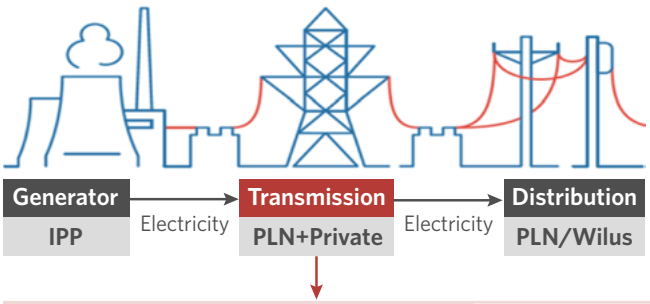
CPI is an analysis and advisory organization with deep expertise in finance and policy. Our mission is to help governments, businesses, and financial institutions drive economic growth while addressing climate change. CPI has offices in Austria, Brazil, India, Indonesia, South Africa, the United Kingdom, the United States, and Vienna.

EXECUTIVE SUMMARY

Indonesia's ambitious yet vital expansion of its electricity transmission infrastructure will require novel approaches to tap new pools of finance. The The state-owned electricity firm PLN's Electricity Supply Business Plan (RUPTL) 2025–2034 targets approximately 47.76 thousand circuit kilometers of transmission lines and substations, requiring an estimated total investment of USD 24 billion. This expansion is critical to meet rising electricity demand, integrate renewable energy, improve grid reliability, and address Indonesia's geographic challenges as an archipelagic nation. However, PLN has limited ability to provide all of the funds needed to deliver on RUPTL targets.

To address this challenge, this report evaluates five project financing models that could enable greater private investment in the Indonesian grid: leasing, joint ventures (JVs), public-private partnerships (PPPs), infrastructure investment trusts (InvITs), and collective investment schemes for infrastructure (CIS-DINFRA), as defined in Figure ES1.

Figure ES1. Alternative project finance models



Leasing	Private entities lease transmission assets to SoE, with no large upfront investments. It allows spreading costs over time through lease payments.
Joint Venture (JV)	SOEs and private investors co-own transmission assets, sharing financial risks and returns while maintaining strategic oversight by the SOE.
Public-private partnership (PPP)	A long-term collaboration where private partners finance and build the transmission with government support and potential availability payments.
Investment Trust (InvITs)	Transmission assets are pooled into a trust, allowing investors to buy units and obtain stable returns. It scales up the financing through institutional investors
CIS-DINFRA	Revenue-generating transmission assets are securitized, backed by future cash flows. This structure unlocks liquidity.

Source: *CPI analysis (2026)*

All of the proposed models shift financing from PLN's current corporate-level finance models toward project finance structures. These structures rely on core project finance principles, including the use of special purpose vehicles (SPVs), non- or limited-recourse debt, and long-term revenue contracts, allowing risk sharing, improved access to capital, and enhanced financial sustainability for PLN.

Each financing model presents distinct benefits and trade-offs. Leasing and JV models are relatively easy to implement and reduce upfront capital requirements, but with limited scalability and liquidity. PPPs attract private capital and spread risks through government-backed availability payments, but these arrangements involve greater complexity and long-term commitments. InvITs and CIS-DINFRA provide the strongest potential for scale and capital market access by monetizing assets or future revenues, though they require more advanced regulatory frameworks and higher setup costs.

Overall, **InvITs and CIS-DINFRA are the most scalable and liquid options suitable for long-term capital mobilization** and balance sheet optimization**. PPPs offer a balanced approach with strong risk allocation** but depend heavily on government support. Meanwhile, **leasing and JVs are more practical for near-term implementation** for projects with lower complexity.

To ensure successful implementation, all models require three foundational policy enablers as follow:

I. **A dedicated transmission fee** to ensure predictable revenue streams,

II. **Off-balance sheet treatment** similar to PLN's treatment of Independent Power Producers (IPPs) to preserve PLN's financial capacity, and

III. **Targeted fiscal support** such as subsidies, guarantees, or availability payments to bridge gaps between regulated tariffs and investors' return expectations.

The report further recommends that PLN prioritize regulatory engagement — particularly with the Financial Services Authority (OJK) — to enable off-balance-sheet treatment and develop supportive frameworks. In parallel, PLN should conduct market sounding to assess investors' appetite, clarify institutional roles, and define clear criteria for selecting financing models aligned with its strategic objectives. These steps are essential to mobilize private capital effectively and ensure timely delivery of Indonesia's transmission expansion goals, supporting both national electrification and the renewable energy integration.

CONTENTS

1. INTRODUCTION

1.1 NEED FOR GRID ENHANCEMENT

Indonesia requires an extensive buildout of transmission lines and substations to integrate renewable sources into its energy system. The following factors contribute to the urgency of expanding transmission networks to foster both the country's economic growth and clean energy transition:

I. **Rising electricity demand**: Economic growth and population growth are driving higher electricity consumption. As stated in the RUPTL, PLN has mapped potential electricity demand of 511 TWh across Indonesia by 2034. Expansion of transmission networks is expected to generate more investment in manufacturing and digital infrastructure.

II. **Reliability and access:** Many regions, especially in Eastern Indonesia, have limited or unstable electricity supply. Expanding transmission networks will yield more stable voltage, reduce outages, and widen access to electricity, which in turn will strengthen social and economic development.

III. **Integration of renewable energy (RE)**: Indonesia failed to meet its ambitious target of achieving a 23% RE share in its energy mix by 2025, highlighting the significant challenges facing the country's energy transition and the need for accelerated action to support RE penetration in the years ahead. Transmission infrastructure plays a critical role in enabling this transition by facilitating the integration and distribution of RE across the archipelago. Since key renewable resources such as solar, wind, hydro, and geothermal are often located far from major demand centers, expanding and modernizing transmission networks are essential to connect generation sites with urban and industrial load centers efficiently and at scale.

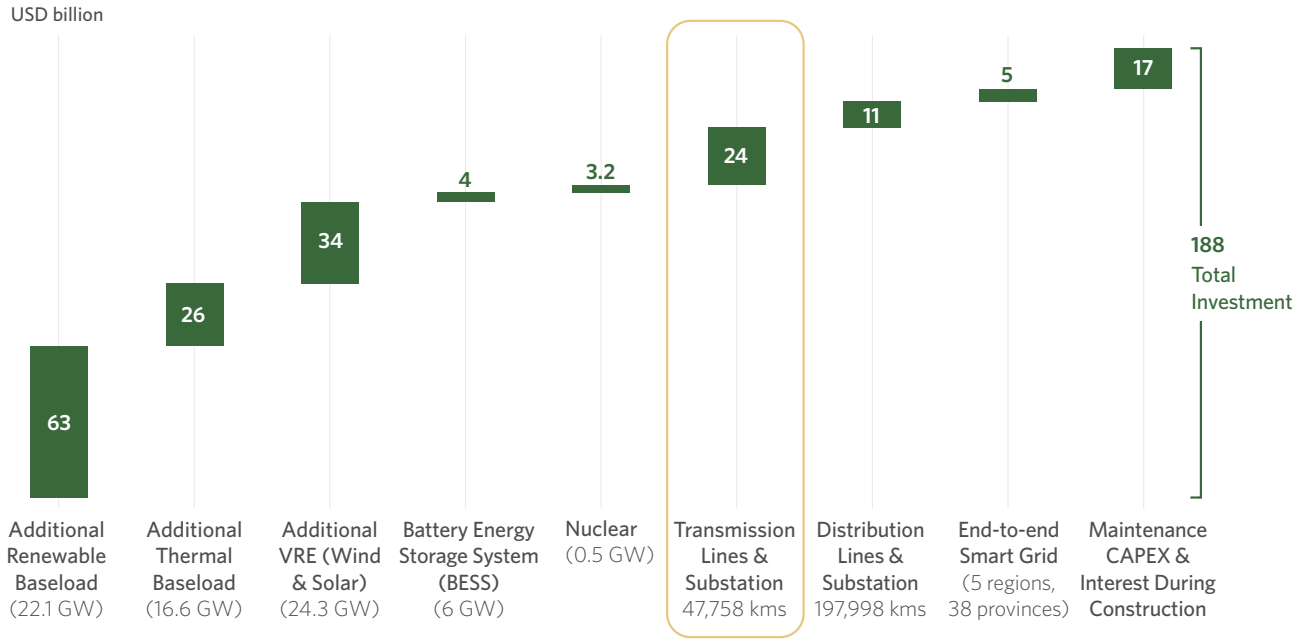
IV. **Geographic challenges**: Electricity distribution is complex across Indonesia's more than 17,000 islands. Without interconnection, surplus power generated in one location cannot easily be transmitted to another, limiting efficiency and increasing the overall system costs. Expansion of transmission networks can help connect grids across islands, improving efficiency and reducing reliance on costly local generation.

1.2 PLAN FOR IMPROVEMENT

Indonesia RUPTL 2025–2034 targets approximately 47.76 thousand circuit kilometers of transmission lines and substations, requiring an estimated **total investment of USD 24 billion** (around IDR 420 trillion)[1] or around USD 2.4 billion per annum. Figure 1.1 details the investment breakdown of all transmission infrastructure components.

1 USD 1 = IDR 17,492 as per the Bank Indonesia currency exchange on 8 May 2026

Figure 1.1. New and renewable energy (NRE) and enabling infrastructure investment needed under RUPTL 2025-34, USD billion



Source: *PLN (2025)*

Given the scale required to build these transmission assets, state-owned PLN has limited ability to raise all the necessary funds, as it risks overleveraging PLN's balance sheet and constraining its borrowing capacity.

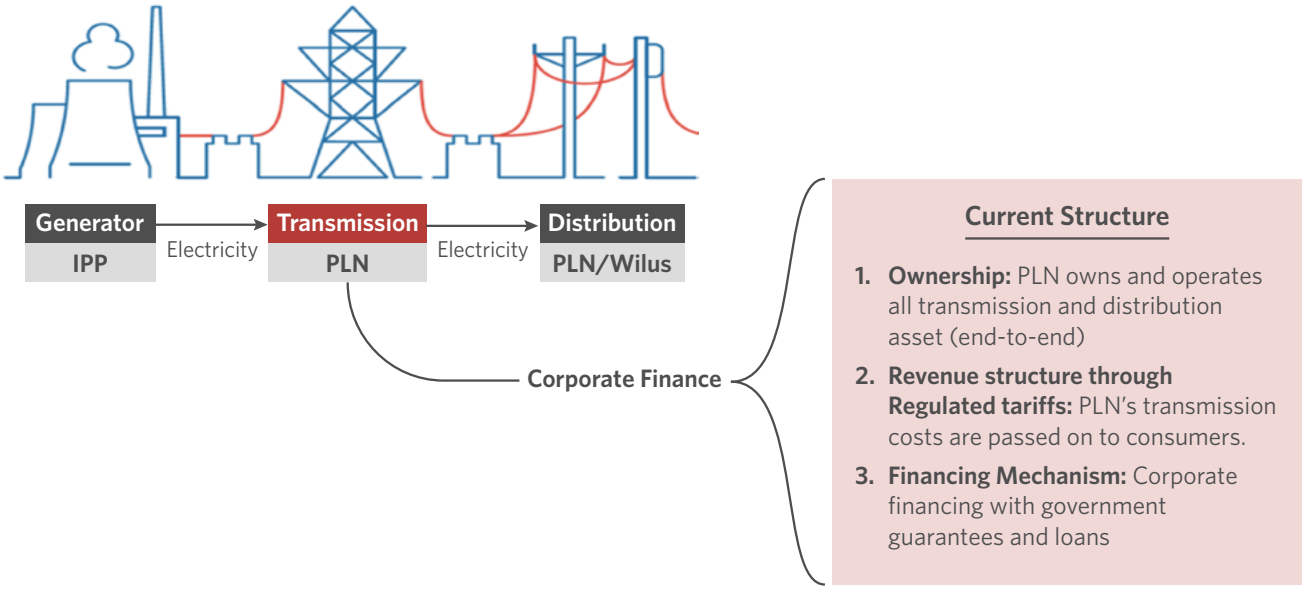
2. FINANCING GRIND EXPANSION BEYOND PLN CORPORATE FINANCE

2.1 CURRENT STRUCTURE AND CHALLENGES

As a vertically integrated utility, PLN controls electricity generation, transmission, distribution, and retail. Transmission assets are largely state-owned, operated by PLN, and financed primarily through PLN's corporate balance sheet. Unlike electricity generation, which often involves private independent power producers, transmission has limited private involvement due to regulatory restrictions.

Transmission and distribution projects are bundled at the planning stage but financed separately. Transmission tariffs are regulated and set by the government, ensuring cost recovery but limiting flexibility. Similarly, distribution projects are often supported by government subsidies to ensure affordability.

Figure 2.1 Existing business model for transmission



Source: *PLN validation (2025)*

With PLN's existing corporate finance structure, transmission projects are often:

I. **Capital-intensive in nature,** requiring strategic financing structures and predictable revenue frameworks to ensure long-term financial sustainability.

II. **Limited in terms of financial attractiveness, usually with single-digit returns.** A key factor impacting financial returns is a restricted, regulated tariff based on cost recovery that limits the variability of revenue models.

III. **Reliant on corporate finance (e.g., direct borrowing and internal cash flow), imposing pressure on PLN's balance sheet**. Transmission finance is typically heavily reliant on corporate balance sheets, requiring adherence to specific financial ratios that can constrain funding capacity. This dependence may limit scalability and increase the financial exposure of PLN. Alternative financing models are needed to diversify funding sources and reduce balance sheet pressures.

IV. **In receipt of government support**. The introduction of private financing must consider the impact of existing government subsidies and support mechanisms to ensure regulatory alignment, which leads to prerequisites for successful business cases.

2.2 ENABLING PRIVATE PARTICIPATION BY SHIFTING TO PROJECT FINANCE

Project-level financing models that diversify financing, improve operational efficiency, and enable private sector participation can help meet the RUPTL transmission expansion targets while also maintaining PLN's financial sustainability. As corroborated through reality check meetings, interviews, data validation, and focus group discussions with relevant stakeholders, project finance captures investor interest because it shifts risk from PLN's balance sheet, creates bankable structures, and offers investors clearer returns tied to the asset itself rather than PLN's corporate debt.

Project finance can help address PLN's financial constraints through the following features:

- **Special purpose vehicles (SPVs)** as separate legal entities to own and operate transmission assets.
- **Non- or limited-recourse financing** under which (private) lenders rely on project revenues (e.g., transmission fees, availability payments) rather than PLN's corporate finance, therefore reducing pressure on PLN's corporate balance sheet.
- **Revenue certainty to private investors** through long-term contracts with PLN or government guarantees that ensure predictable cash flows.
- **Distributing risks** (e.g., for construction, operation, and demand) among sponsors, contractors, and offtakers, offering an attractive set-up for both PLN and the private sector.

While these options offer attractive features, they present significant changes compared to the existing corporate finance structure, as explored in Table 2.1.

Table 2.1 Comparison of current corporate finance vs. alternative business models

Some of these models present significant changes compared to BAU, which may require certain enablers

Challenge Addressed		Corporate finance (BAU)	Project Finance: Leasing	Project Finance: Financial ownership (Joint Venture)	Project Finance: Public-Private Partnership (PPP)	Project Finance: Investment Trust (InvIT)	Project Finance: CIS DINFRA
Capital Needs	Land acquisition	PLN	Private	JV	Government/ PLN	Trust	PLN
	Land ownership	PLN	Private	JV	Government/ PLN	Trust	PLN
	Construction cost	PLN	Private	JV	Private	Trust	Special Purpose Vehicle (SPV)
	OM Cost	PLN	Private	JV	Private	Trust	Special Purpose Vehicle (SPV)
Financial Returns	Asset owner*	PLN	Private, then transfer to PLN	JV, then potential transfer (as agreed by parties)	Private, then transfer to Gov't or PLN	Trust	PLN
	Revenue (transmission Fees)	N/A – transfer pricing applied	Leasing tariff / transmission fee payment by PLN during concession	PLN pays transmission fee to JV	PLN pays transmission fee + Gov't covers Availability Payment	PLN pays transmission fee to Trust (OpCo Owner)	PLN pays transmission fee to SPV
	Regulatory basis **	Regulation exists	UU 30 2009, MEMR 11 2021, PP 14 2012	UU 30 2009, Investment Law 25 2007	UU 30 2009, PP 38 2019, and further regulatory framework	Requires regulatory framework	DINFRA (Peraturan OJK No. 52/ POJK.04/2017)
Off-Balance Sheet	Financing	Equity, loans from MDBs and commercial banks	Not included in the investment cost	Main source of financing would be from PLN and private	Loans from MDBs and commercial banks	Unit issuance (equity) to sponsors and unitholders	Diversified funding sources but there's a risk of negative carry and short tenor
	Accounting Standards	Standards are used	PSAK 73, IFRS 16	PSAK 12, IAS 28, IAS 31, IFRS 11	PSAK 73, IFRS 16	IFRS 12 (Investment Funds)	IFRS 9, IAS 39

*Asset transfer is subject to agreement | Significant change from BAU | Minor or no change from BAU

Source: *CPI analysis based on validation meetings and market assessment (2026)*

*** UU 30 2009 on Electricity, MEMR 11 2021 on Electricity Business Implementation, PP 14 2012 on Electricity Supply Business Activities, PP 38 2019 on Types and Tariffs of Non-Tax State Revenue Applicable to the Ministry of Law and Human Rights.*

The challenges above may require certain enablers further discussed in the section below.

2.2.1 KEY ENABLERS TO ENHANCE PROJECT FINANCE VIABILITY

As transmission projects are capital-intensive and face unique financing challenges, several policy adjustments and enablers are required to make them bankable and attractive to private capital:

TRANSMISSION FEES AS A DEDICATED REVENUE STREAM

To date, transmission and distribution projects are bundled together in planning but financed separately. To enable a project finance structure and better estimate investment costs, PLN needs to explore a "transmission fee" as a dedicated revenue stream for transmission projects. A dedicated transmission fee would ensure predictable cash inflows tied to transmission, allowing investors in these assets to recover costs and returns. Without a fee, transmission costs are currently bundled into overall electricity tariffs, making it harder to isolate these revenue streams to strengthen project viability.

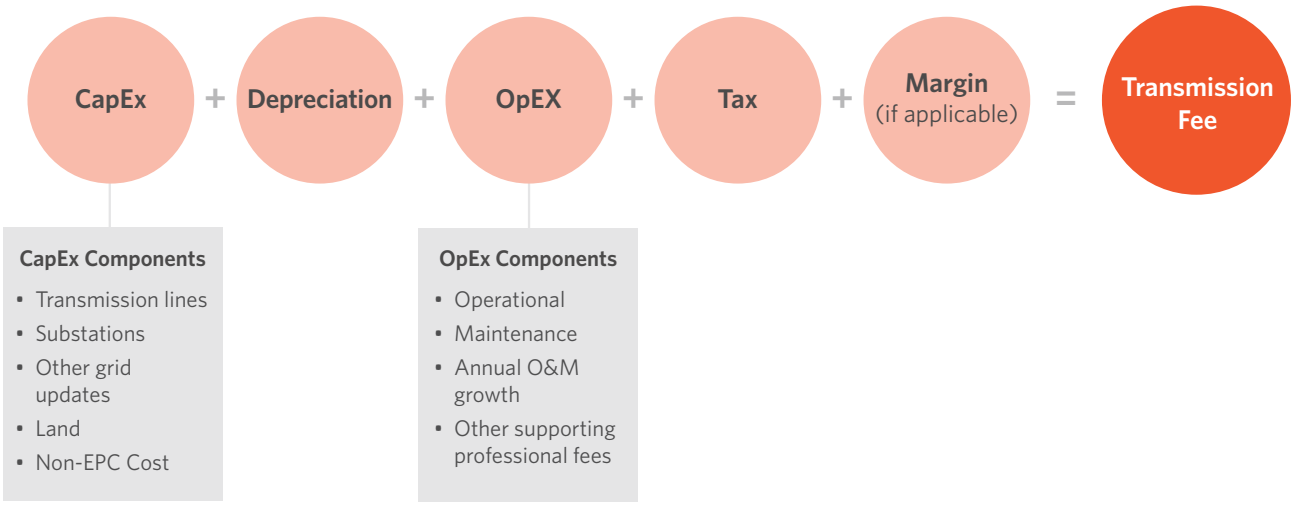
Many countries (e.g., India, Philippines) have already imposed dedicated transmission charges to attract private investment in grid infrastructure (see Annex 1.3). Based on the practices observed in those countries, this report explores two types of revenue models, variable and fixed fees, as formulated below:

Table 2.2 Two types of transmission fee

Transmission fee type	Calculation
Variable	kWh transfer of electricity x IDR per kWh
Fixed	Annual fixed fee over the life of the contract period, assuming the contract period is equal to the asset's economic life

Offering the option of variable or fixed fees would provide flexibility for investors. Fixed fees cater to investors seeking revenue certainty and lower risk exposure, whereas variable fees appeal to investors with higher risk appetite and allow them to capture higher demand potential in exchange for higher returns. A well-designed revenue model can transform transmission assets into infrastructure investments with steady yields attractive to institutional investors, particularly in project finance that relies on stable, ring-fenced revenues to secure debt and equity. This will create a transparent, predictable, and dedicated fee framework to ensure cost recovery and investor confidence.

Figure 2.2. Transmission fees are structured to ensure full cost recovery and improve financial attractiveness

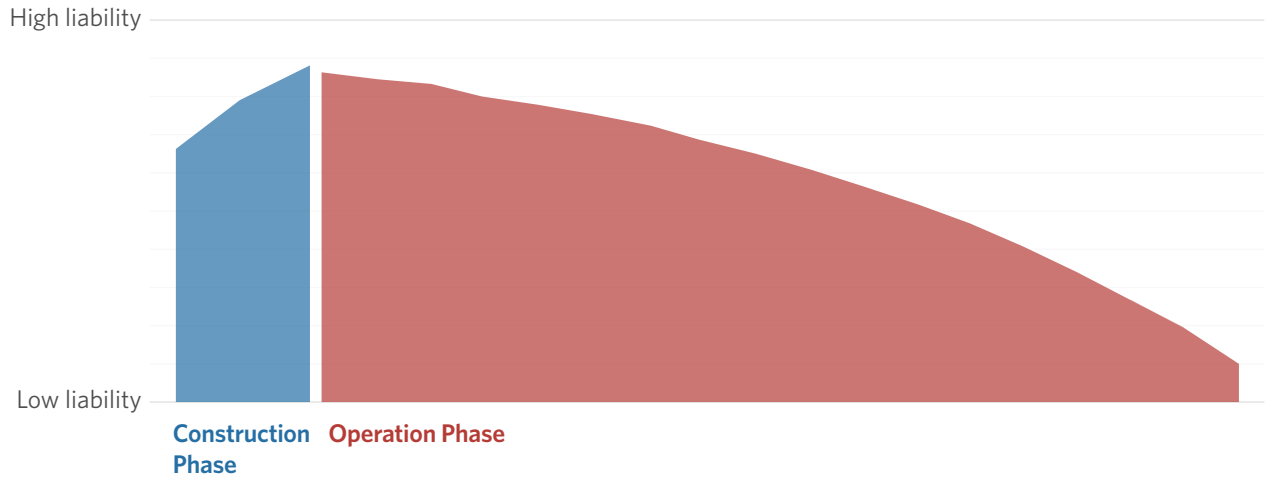


Source: *CPI analysis based on benchmarking and PLN and MEMR validations (2026)*

SPECIAL BALANCE-SHEET TREATMENT TO WAIVE LIABILITY RECOGNITION

Under service concession agreements IFRIC 12 and IPSAS 32, an asset of a service concession arrangement must be recognized as a liability by the grantor (i.e., PLN). This regulation could affect all proposed models, with varying impacts on their balance sheets. The largest liability would occur just after construction is completed and will gradually decrease each year until the useful life of each asset ends. However, with a prolonged infrastructure development timeline, the effect may also continue for a longer period, as shown in Figure 2.4.

Figure 2.3. Prolonged infrastructure development and liability incurrence timeline



Source: *CPI analysis, modified from various resources (2026)*

While a liability waiver for off-balance sheet financing is not a prerequisite for implementation, it would materially improve balance sheet flexibility for PLN. Waiving liability recognition at the start of the project would allow PLN to pursue large-scale transmission expansion without overburdening its already constrained balance sheet, while also creating space for private capital participation. Off-balance sheet treatment ensures PLN can continue financing other critical projects while transmission is funded separately. As transmission projects face risks such as land acquisition delays, construction overruns, and demand uncertainty, this structure enables risk-sharing between PLN, the government, and private investors.

Given the regulatory precedent set by the Financial Services Authority (OJK) in Article 3 of POJK 6/POJK.04/2017, transactions under a power purchase agreement (PPA) may be treated as regular sales transactions. Within this framework, power generation projects are commonly developed by independent power producers and governed by long-term PPAs with PLN. This eliminates the need for PLN to recognize power generation assets as liabilities on its balance sheet, thereby preserving its financial ratios, borrowing capacity, and financial covenants. While this regulation applies to generation assets, it sets a precedent for similar treatment to be extended to transmission and distribution lines in the future.

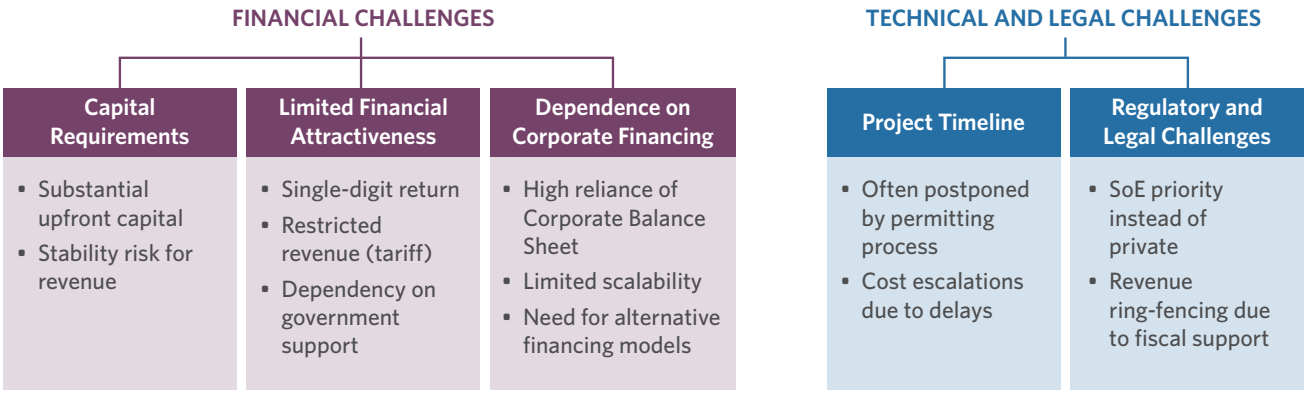
ADDITIONAL FISCAL SUPPORT

As the proposed alternative models are best executed at the project level with the introduction of a transmission fee, such a fee would likely differ from the existing transmission tariff. Existing tariffs are set under a regulated cost-recovery framework designed for PLN's balance sheet financing, while the transmission fees under a project finance of the proposed models may be higher to reflect investor returns, debt service, and risk premiums. Fiscal support, whether through viability gap funding, subsidies, or guarantees, allows the government to absorb this difference, enabling investors to achieve required returns while keeping electricity affordable for consumers. Under Finance Minister Regulation PMK 20/2025 on Electricity Subsidy Allocation, such an arrangement is legally feasible, as the current transmission tariff is already covered under that framework.

2.2.2 ADDRESSING PLN'S FINANCIAL CHALLENGES

To ease PLN's financial burdens, this report assess several alternative financing models that focus on participation of the private sector — domestic and international — bridging the financing gap and support the timely execution of the transmission buildouts required under the RUPTL. Figure 2.5 outlines key challenges for transmission project financing addressed in this report.

Figure 2.4. Key challenges for financing transmission projects

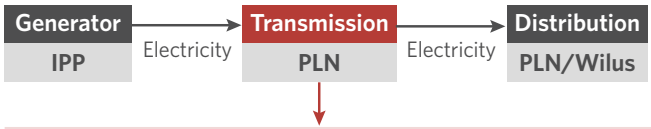


Source: *CPI analysis 2026*

3. ALTERNATIVE MODELS FOR TRANSMISSION FINANCING

Five specific business models, executed at the project level, can be considered and adopted to meet the funding needs of the RUPTL while maintaining PLN's financial sustainability. These are summarized in Figure 3.1 and discussed in detail below.

Figure 3.1 Alternative project finance models



Leasing	Private entities lease transmission assets to PLN. This requires no large upfront investments of the SOE and allows it to spread costs over time through lease payments.
Joint Venture (JV)	PLN and private investors co-own transmission assets, sharing financial risks and returns while maintaining strategic oversight by the SOE.
Public-private partnership (PPP)	A long-term collaboration where private partners finance and build the transmission infrastructure with government support and potential availability payments.
Investment Trust (InvITs)	Transmission assets are pooled into a trust, allowing institutional investors to buy units and obtain stable returns.
CIS-DINFRA	Revenue-generating transmission assets are securitized, backed by future cash flows in order to unlock liquidity.

Source: *CPI analysis (2026)*

3.1 APPROACH AND METHODOLOGY

Energy transmission infrastructure is traditionally state-owned, so private involvement requires new frameworks, including the proposal of revenue models. The selection of these models was supported by benchmarking countries already implementing non-corporate finance transmission financing, including Singapore, Japan, and India (see Annex 1).

We explored the following aspects to build a business case for each model:

I. **Scope:** Identify targets for transmission lines, substations, and capacity.

II. **Stakeholders:** PLN, government regulators, private investors, lenders.

III. **Market**: Including demand forecasting, grid reliability needs, and benchmarking studies from other countries.

IV. **Policies** that impact the financial aspects of business cases, such as tariff framework for regulated transmission tariffs and cost recovery mechanisms, ownership models to indicate points of entry for private participation, as well as government financial support to identify subsidies, guarantees, and climate finance opportunities.

Models are built on assumptions (i.e., growth rates, discount rates, market conditions) based on information from various sources of references, documents, reality check meetings, validation interviews, as well as FGDs with key stakeholders (e.g., PLN, Ministry of Energy and Mineral Resources, Ministry of Finance, Coordinating Ministry of Economic Affairs, PT Sarana Multi Infrastruktur, and Danantara).

It is further assumed that there are minimal regulatory barriers for project finance. This is akin to the case for independent power producers, which entails private sector participation while still maintaining PLN's control over the transmission assets. In each of the proposed models, the following conditions apply:

I. Long-term contracts

II. Indicative regulated returns through revenue models

III. PLN retains control and oversight over transmission assets , and

IV. Liability waiver for off-balance sheet treatment (i.e., POJK 6 or similar regulation for transmission).[2]

The capital structure of private operating companies in the modeling is assumed to comprise 70% debt and 30% equity, following a standard and conservative financing model for infrastructure project finance. This ratio is frequently employed for projects with stable, long-term contracted cash flows, such as toll roads, RE, power generation, which may also include transmission assets.

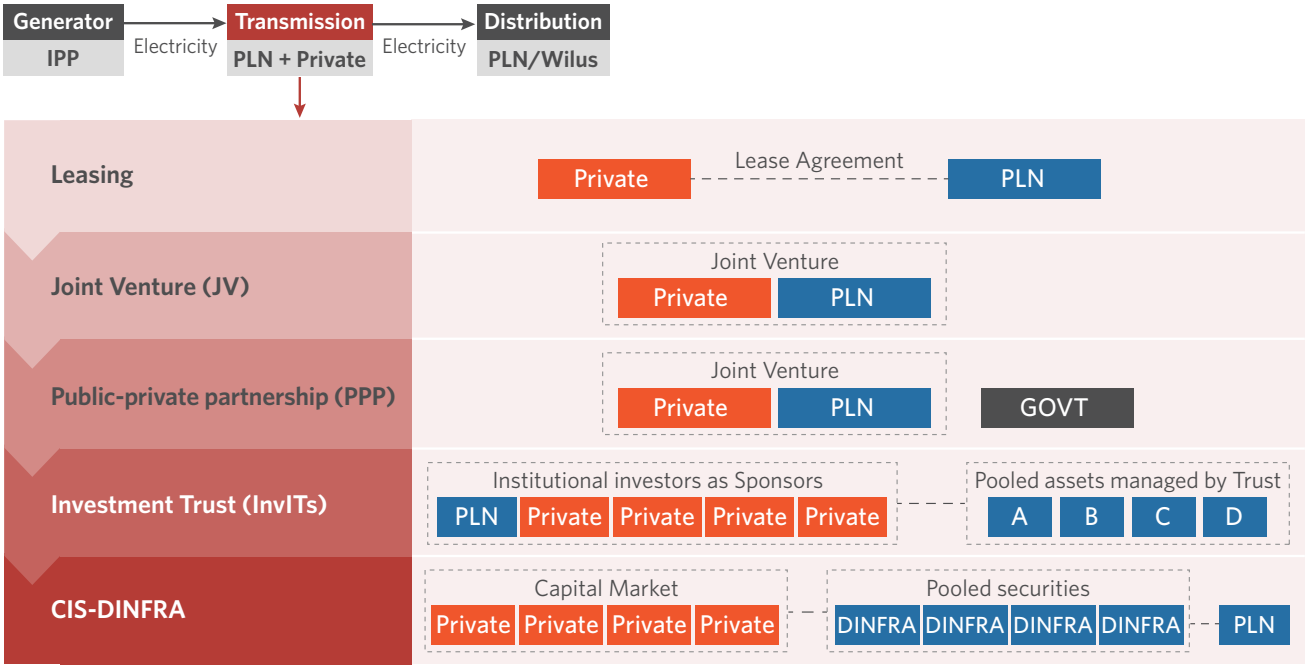
The financial modeling results for each model were compared in terms of potential scalability and liquidity. We also quantitatively and qualitatively assessed implementation costs based on the simulation. Accounting treatments follow International Financial Reporting Standards (IFRS) and Indonesia Financial Reporting Standards (PSAK), with the assessment scope only covering financial aspects.

3.2 PLN PARTICIPATION IN EACH MODEL

We analyze each model's potential financial viability, with consideration of PLN's role and financial implications of the transaction structure (Figure 3.2).

2 As of time of writing POJK 6 is applied to power generation IPPs, enabling private sector participation. It was issued to cater to the Presidential Regulation 4/2016 regarding the Acceleration of Electricity Infrastructure Development. For comparison, this study also considers the impact of PLN's accounting treatment of right-of-use assets particularly in the beginning of the project, should the waiver not be applied.

Figure 3.2. Options for PLN participation in the alternative financing models



The level and form of PLN participation (including its subsidiaries) in each proposed model are summarized below.

Table 3.1 Level and form of PLN participation in the proposed models

	Leasing	JV	PPP	InvITs	CIS-DINFRA
Structure	PLN leases transmission assets from a private investor or SPV.	PLN forms a JV company with private investors to develop and operate transmission assets.	Private sector builds, finances, and operates transmission assets under concession; government provides guarantees in the form of Availability Payment.	Transmission assets pooled into a trust or fund, units sold to investors.	Future transmission fee revenues securitized into tradable instruments.
PLN (or subsidiary) role	Pays lease fees to the asset owner.	Equity partner, co-owner.	Offtaker of transmission services, minority partner.	Asset contributor or anchor investor (or sponsor).	Originator of receivables.
Financial implications	Off-balance sheet treatment possible; reduces upfront CapEx burden but requires long-term fixed payment commitments.	Shared risk and returns; requires PLN equity contribution but reduces financing pressure.	Enables large-scale private participation; Requires further regulatory development and fiscal support, e.g., for availability payments.	Unlocks capital from existing assets; provides liquidity and attracts institutional investors (e.g., pension funds, sovereign wealth funds, infrastructure funds, etc). This requires forming a regulatory framework.	Provides upfront financing by monetizing future cash flows; requires a stable tariff framework and investor confidence.

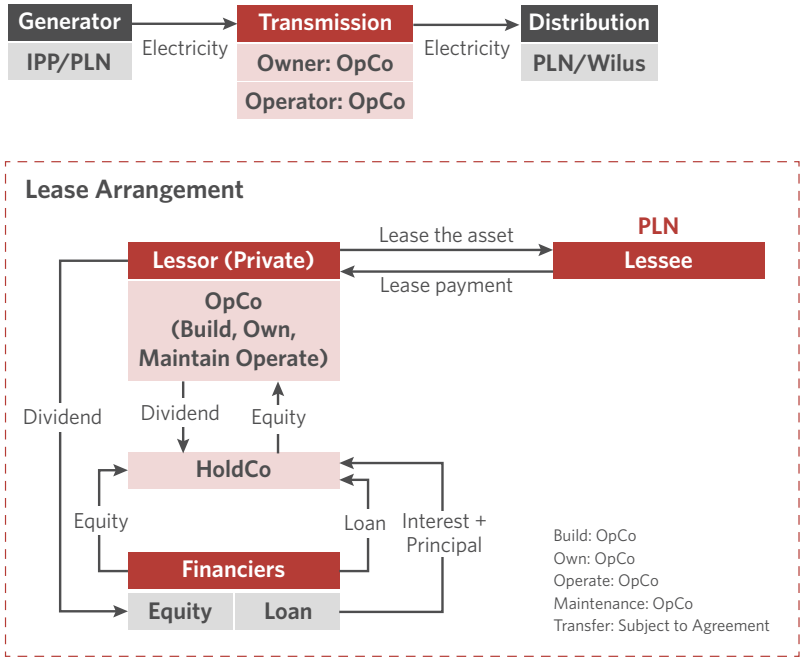
3.3 DEEP DIVE INTO EACH MODEL

This section provides more details on the transaction structure and present the summary result of financial model simulations. Each model offers a different balance of risk allocation, financing burden, and PLN participation. The decision of which model to choose may vary across circumstances and should consider regulatory flexibility, PLN's financial capacity and business strategy, availability of fiscal support, and investor appetite.

3.3.1 LEASING

Leasing enhances capital efficiency and risk sharing by minimizing upfront costs, but long-term payment obligations and balance sheet impacts require strategic financial planning. Figure 3.3 depicts a leasing arrangement for developing transmission assets with the private sector actor as the one who builds, owns, operates, and maintains the asset.

Figure 3.3. Illustration of the leasing model for transmission projects



OpCo: Operating Company – Private

- Entity that designs, builds, operates, and maintains the transmission asset
- **Owns the asset** and leases the infrastructure to PLN
- **Capital structure:** Typically 70:30 debt-to-equity for conservative infrastructure project finance
- **Revenue model:**
  - Contracted payments from PLN as user of the asset

HoldCo: Holding Company – Private

- Establishess and finances OpCo

Lessee – PLN/PLN Subs

- **Pay leasing fee** to OpCo

Source: *CPI analysis, validation meetings (2025)*

The leasing arrangement could be structured as follows

1. **Accounting Standard**: Following IFRS 16 and PSAK 73, PLN, as the lessee, consolidates right-of-use assets and lease liabilities on its balance sheet, reflecting long-term financial commitments and how the asset is fully dedicated to serving PLN.
2. **Lease Payments:** PLN makes periodic (fixed) lease payments to the private asset owner, providing the private party with a return on investment and to service any debt obligations tied to the asset.
3. **Depreciation treatment:** The right-of-use asset is depreciated over the lease term, while lease liabilities incur interest expenses.

4. **Roles:** A private operating company (OpCo) is responsible for financing, constructing, owning, operating, and maintaining the transmission infrastructure. All capital expenditures, debt obligations, and construction risks are borne by that party throughout the lease term.
5. **Transfer of assets:** Depending on the lease agreement, there may be provisions to transfer ownership of the transmission assets to PLN after the lease term or upon fulfilling certain conditions.

The opportunities and challenges offered by leasing to PLN and private actors are listed in Tables 3.2 and 3.3.

Table 3.2 Opportunities offered by leasing

For PLN	For private sector
• **Optimized Capital Allocation:** Leasing structures reduce upfront capital requirements, allowing entities to allocate resources to higher-priority investments and strategic initiatives • **Improved Financial Flexibility:** Predictable lease payments enhance cash flow management, supporting overall financial stability and facilitating long-term planning • **Risk Diversification in Project Delivery:** By transferring ownership responsibilities to private entities, leasing models mitigate risks associated with construction and long-term asset ownership • **Operational Focus:** With ownership managed externally, operational entities can concentrate on service delivery and network performance, enhancing efficiency	• **Steady Revenue Stream:** Leasing to PLN provides a predictable revenue stream, improving cash flow stability and reducing financial risk. • **Market Expansion:** Participation in transmission projects opens new markets for private companies, allowing them to expand beyond traditional generation projects. • **Access to Concessional finance:** Private lessors may gain access to concessional finance options, blended finance, or guarantees from development banks or government programs aimed at incentivizing private investment in public infrastructure. • **Risk Diversification:** Leasing arrangements with PLN allow private investors to diversify their portfolios with infrastructure assets that have low correlation to other sectors, spreading their risk profile.

Table 3.3 Challenges of Lease

For PLN	For Private Sector
• **Long-Term Lease Obligations**: Leasing creates fixed payment obligations, which could strain PLN's financials if revenue from electricity tariffs does not increase proportionally to the costs. • **Rate of Return and Tariff Pressures**: Leasing may lead to higher operational costs, which could impact tariff setting if PLN cannot pass these costs to consumers, affecting its financial stability and competitiveness. • **Debt vs. Lease Accounting Implications**: Leasing commitments may be recognized as financial liabilities on PLN's balance sheet, impacting key financial ratios and potentially affecting PLN's credit rating and borrowing capacity. • **Exchange Rate and Inflation Risks**: If lease payments are denominated in foreign currency, PLN could face foreign exchange risks, especially if lease terms are long and the Indonesian Rupiah depreciates. Inflation could also increase the real cost of lease payments over time.	• **High Initial Investment**: Transmission infrastructure requires substantial initial capital, and recovering these costs through leasing can take time, leading to a slow return on investment. • **Capital Recovery Uncertainty**: Recovery of capital through leasing can be uncertain if demand projections are not met or if regulatory changes alter the expected revenue stream from PLN. • **Inflation and Interest Rate Sensitivity**: Changes in interest rates and inflation can impact the financing structure and profitability of leasing agreements, potentially increasing the cost of capital or diminishing real returns for the lessor. • **Political and Regulatory Risks**: Financial returns may be impacted by policy changes, new regulations, or shifts in government priorities regarding private sector involvement in infrastructure, especially if tariffs or leasing terms are subject to regulatory review. • **Inflation and Interest Rate Sensitivity**: Changes in interest rates and inflation can impact the financing structure and profitability of leasing agreements, potentially increasing the cost of capital or diminishing real returns for the lessor.

ACCOUNTING TREATMENT OF LEASE

Based on the accounting standards IFRS 16 and PSAK 73, the recognition of lease liability can be exempt only if the asset is considered as low value and the lease is considered as short-term (less than 12 months), as shown in Figure 3.4.

Figure 3.4. Two exemptions for off-balance sheet treatments.

IFRS 16: Two Exemptions that Allow Off-Balance Sheet

	Low Value Exemptions	Short-Term Exemption
Exemptions Criteria	Where a lease has a value that is not material to the company. The value depends on the size of the company, but it usually ranges from USD 10,000) to USD 100,000 • The underlying asset does not have high dependency or interrelation with other assets	Any lease with a term of less than 12 months, which has no "buying" option. This may include leases such as equipment rentals.
Cons	**Low-value exemption can become costly**: • When the low-value exemption is used, a company must agree on the low-value threshold in the context of their company and industry. • it doesn't take into account the EBITDA improvements that can be gained from putting low-value leases on the balance sheet from the beginning.	**Short-term exemptions aren't always the right option**: Once a company has a lease for more than 12 months, it becomes a liability

PSAK 73: Scope of Exemptions

- Leases for the purpose of exploration or mining of minerals, oil, natural gas and similar non-renewable resources (PSAK 64: Exploration and Evaluation Activities in Mineral Resources Mining);
- Lease of biological assets within the scope of PSAK 69 Agriculture owned by the lessee;
- Service concession agreements within the scope of ISAK 16 Service Concession Agreements;
- Intellectual property license granted by the lessor within the scope of PSAK 72 Revenue from Contracts with Customers;
- Rights owned by the lessee in a license agreement within the scope of PSAK 19 Intangible Assets for items such as films, video recordings, stage works, manuscripts (written works), patents and copyrights.

Source: *CPI analysis on applicable accounting standards (2025)*

However, due to the nature of transmission assets, a liability waiver is required to apply a new fixed revenue model. If the waiver is applied to the transmission asset, similar to under the POJK 6, this eliminates initial recognition in the balance sheet of lease liability at the beginning of the project, and only records the transmission fee in the income statement.

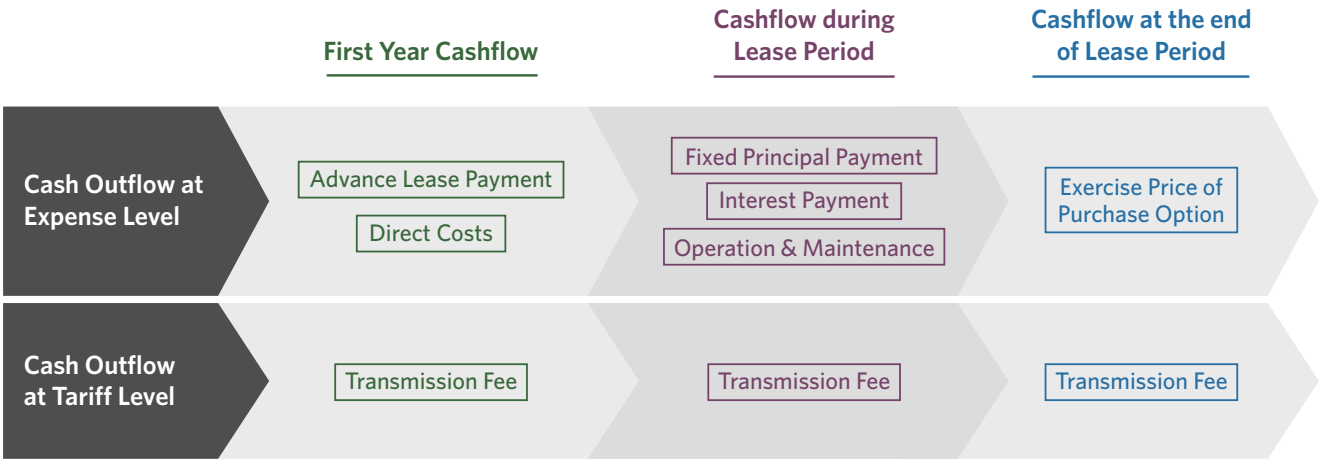
If the waiver is not applied, PLN will have to recognize lease liability on its balance sheet at the present value of lease payments, and right-of-use assets equivalent to it. See below for subsequent implications on PLN's book and the estimated amount of lease liability that should be recognized based on a simulated projection in the lease financial model.

Figure 3.5. Accounting treatments without liability waiver.

Initial Recognition	**Lease Liability:** PLN should recognize a lease liability at the present value of future lease payments. This includes fixed payments, variable payments (if based on an index or rate), and any residual value guarantees or purchase options if they are likely to be exercised. **Right-of-Use (ROU) Asset:** Concurrently, PLN recognizes an ROU asset equivalent to the lease liability, adjusted for any initial direct costs, prepaid lease payments, and any dismantling or restoration obligations.
Subsequent Measurement	**Amortization of ROU Asset:** PLN should amortize the ROU asset over the shorter of the asset's useful life or the lease term. This amortization expense is typically recognized on a straight-line basis in the income statement. **Interest on Lease Liability:** The lease liability should be measured at amortized cost using the effective interest rate method. Each period, PLN records an interest expense on the lease liability and reduces the liability by the lease payments made.
Impact on Financial Statement	**Balance Sheet:** The ROU asset and lease liability increase total assets and liabilities, respectively, which may impact financial ratios such as debt-to-equity. **Income Statement:** Amortization of the ROU asset and interest on the lease liability are recognized separately, leading to higher expenses in the earlier years of the lease (due to the interest component). **Cash Flow Statement:** Lease payments are split into interest (operating cash flow) and principal (financing cash flow) components, with only the interest portion affecting operating cash flows.
Variable Lease Payments	If the lease includes variable payments based on usage or performance (e.g., demand-based lease payments), PLN may record these expenses in the income statement as they occur, rather than including them in the initial lease liability.
Reassessment and Modification	**Reassessment:** If there are changes in lease terms, such as the likelihood of exercising purchase options or adjustments to variable lease payments, PLN should reassess the lease liability and adjust the ROU asset accordingly. **Lease Modifications:** In cases of lease modifications, the accounting treatment depends on whether it is considered a separate lease or an adjustment to the existing lease. PLN would either remeasure the lease liability and adjust the ROU asset or treat it as a new lease.

In addition, a leasing arrangement without a waiver would impact the operating cash flow from the additional revenue and lease principal payment, while the financing cash flow would be impacted by the interest payment, as illustrated in Figure 3.6.

Figure 3.6. Implications on cash flow for leasing without waiver



Source: *CPI analysis (2025)*

The financial statement implications of non-waiver treatment will increase total liabilities, which will eventually affect some of PLN's financial covenants (Figure 3.7).

Figure 3.7. Overall financial statement implications if the waiver is not applied

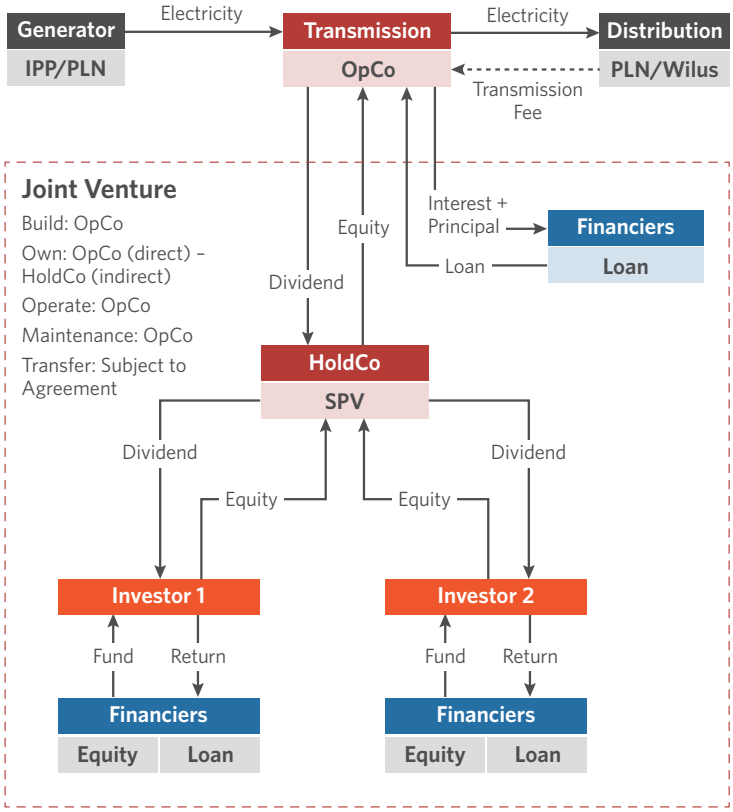
Balance Sheet Impact	**Increase in Total Assets and Liabilities:** Recognizing right-of-use (ROU) assets and lease liabilities increases PLN's total assets and liabilities. The lease liablity can make PLN's debt-to-equity ratio appear higher, potentially affecting its credit rating and borrowing capacity.	**Leverage:** Increased liabilities raise leverage and may constrain future borrowing terms.
Income Statement Impact	**Amortization and Interest Expenses:** The ROU asset is amortized over the lease term, and the lease liability incurs interest expense, together forming the total lease-related expense. This frontloads expenses due to declining interest expense over time, resulting in higher initial expenses than the straight-line expense method.	**Impact on Profitability:** Front-loading expenses can initially reduce PLN's profitability, particularly in the early years of the lease, as both amortization and interest expenses are recognized. As interest expense decreases, the impact on profitability stabilizes.
Cashflow Impact	**Reclassification of Lease Payments:** The cash flow statement reflects lease payments as: **Interest Payments:** Reported in operating activities, **Principal Payments:** Reported in financing activities.	**Impact on Operating Cash Flow:** Under this structure, only the interest portion impacts operating cash flows, while principal is part of financing. This may improve PLN's cash flow from operating activities on paper, potentially favoring some metrics related to cash flow health.
Impact on Key Financial Ratios	**Earnings Before Interest, Taxes, Depreciation, and Amortization (EBITDA):** Since the lease expenses are split into amortization and interest (rather than being recognized as an operating lease expense), PLN's EBITDA might appear higher. This could be beneficial for financial metrics tied to EBITDA, such as **EBITDA margin** or **debt/EBITDA ratio**.	**Debt-to-EBITDA Ratio:** The inclusion of lease liabilities as debt increases total debt, which may increase the debt-to-EBITDA ratio. This ratio is critical for lenders and rating agencies in assessing PLN's debt capacity.
Financial Risk and Sensitivity	**Interest Rate Risk:** If lease payments are subject to variable rates or indexed adjustments, PLN may face exposure to interest rate fluctuations, impacting both the lease liability and periodic interest expenses.	**Exchange Rate Risk:** If lease payments are in a foreign currency, PLN's costs may vary with exchange rate fluctuations, which can create an added layer of financial risk and potential volatility in expenses.

Source: *CPI analysis (2025)*

3.3.2 JOINT VENTURE

Joint ventures (JVs) offer a structure where PLN and private investors co-own transmission assets, sharing financial risks and returns. It enables capital infusion from the private sector while maintaining strategic oversight by the PLN, as depicted in Figure 3.8.

Figure 3.8 Illustration of a JV model for a transmission project



OpCo: Operating Company/SPV – Private
- A standalone transmission entity that can be owned as a project. The entity that gets equity injection from multiple potential stakeholders (JV).
- OpCo is financed by HoldCo and may be hybrid with debt
- **Capital structure:** 70D+30E
- **Revenue scheme:**
  - Fixed fee - Receive annual fixed transmission fee (similar concept to a leasing fee)
  - Variable fee = kWh transfer x IDR per kWh

HoldCo: Holding Company – PLN Subs & Private
- HoldCo is a company that holds ownership in the OpCo. HoldCo raises debt and receives equity from its investors. It then uses this capital to inject equity into OpCo.
- **Capital structure:** 50D+ 50E; 51% HoldCo ownership in Opco

Impact to PLN Book:
PLN Cost (PLN P/L)* = leasing fee (fixed)/ transmission fee (variable) to OpCo
HoldCo's interest and tax = PLN Cost
*waiver from OJK for PSAK73 is needed for off-BS
Potential income = Dividend from HoldCo
Impact to Private:
OpCo's revenue leasing fee (fixed)/transmission fee (variable) paid by PLN

Source: *CPI analysis, validation meetings (2025)*

The JV model is structured as follows:

1. **PLN and private sector roles in the structure**

   - PLN (or its subsidiary) is a part of the HoldCo, a company holding ownership in the OpCo. The HoldCo raises debt and receives equity from its investors to inject as equity in the OpCo. If PLN (or its subsidiary) takes the role of the HoldCo, and holds 51% of the OpCo, with a 50-50 debt and equity portion, then it will be considered to have significant influence over the asset owned by the OpCo.

   - Private entity (OpCo): A standalone transmission entity that can be owned as a SPV, which receives equity from multiple potential stakeholders via the JV. The OpCo may be financed by the HoldCo and may be combined with debt. The capital structure of the OpCo is assumed to comprise 70% debt and 30% equity, following a standard and conservative financing model for infrastructure project finance.

2. Under the IFRS, the **distinction between contol and significant influence** is important to determine appropriate accounting treatment. JV models follow IFRS 10 (Consolidated Financial Statements), IAS 28 (Investments in Associates and Joint Ventures), and PSAK 15.

   - **Control (IFRS 10) - Ownership Threshold for Control**: Generally, having more than 50% of the voting rights gives an investor control over an investee. However, control may exist with lower ownership if the investor has: (i) Contractual rights or other mechanisms that give it the power to direct relevant activities (e.g., board control, rights to appoint

key management); (ii) De facto control if the investor holds a large minority interest (e.g., 40%) where other shareholders are widely dispersed, effectively giving the investor control.

- **Significant Influence (IAS 28 and PSAK 15) Ownership Threshold for Significant Influence**: Generally, 20% to 50% of the voting rights indicates significant influence. However, an investor could have significant influence with lower ownership if there are additional indicators of influence over the investee's financial and operating policies.

3. **Revenue model:** two fee options can be applied:
    - Fixed = Receive annual fixed transmission fee (similar concept to a leasing fee)
    - Variable = kWh transfer x IDR per kWh

JVs offer both opportunities and challenges, as outlined in Tables 3.4 and 3.5.

Table 3.4. Opportunities offered by JVs

For PLN	For private sector
• **Capital Access**: Reduced need for PLN's own capital through private funding. • **Risk Sharing:** Mitigated financial exposure by sharing costs and risks with the partner. • **Revenue and Profit Growth:** New income streams and potential profit share. • **Enhanced Creditworthiness:** Improved credit through the JV's financial standing. • **Higher ROI Potential:** Profitable ventures may yield high returns on investment	• **Market Access:** Entry into Indonesia's energy market through resource pooling (larger project scale and shared resources) • **Risk Sharing and innovation:** Shared financial and operational risks, with exchange of technology and best practices. • **Local Expertise:** Benefit from PLN's regulatory and operational knowledge. • **Incentives:** Potential tax benefits and subsidies. • **Reputation Boost:** Enhanced credibility through public partnership.

Table 3.5. Challenges of JVs

For PLN	For private sector
• **Complex Accounting:** Consolidation requirements may impact financial ratios and add complexity. • **Profit Sharing:** Reduced share of JV profits due to revenue division with the partner. • **Long-Term Financial Commitments:** Exit or buyout costs could limit financial flexibility. • **Partner Dependency:** Financial instability of the partner may affect JV stability. • **Debt and Leverage Implications:** JV may increase overall leverage, impacting borrowing capacity. Long-term liabilities could strain financial ratios and limit future funding opportunities. • **Currency Risks:** Exchange rate fluctuations could affect profits in foreign-funded JVs.	• **Complex Governance:** Joint decision-making can be slow and difficult. • **Regulatory Hurdles:** Navigating local compliance can be resource-intensive. • **Financial Risk:** High investment and long-term commitments. • **Profit sharing based on dependency on PLN performance**: Reduced ROI due to shared profit, with reliance on PLN's strategic decisions and performance. • **Exit Barriers:** Complex and costly to exit the JV, in addition to exposure to economic and exchange rate fluctuations.

PLN'S ACCOUNTING TREATMENT OF THE JV

Assuming that PLN has significant control of the transmission asset, the company records the cost of its initial investment in the JV, with the subsequent treatment as detailed below in Figure 3.9.

Figure 3.9. Overall financial statement implications of the JV in PLN's books

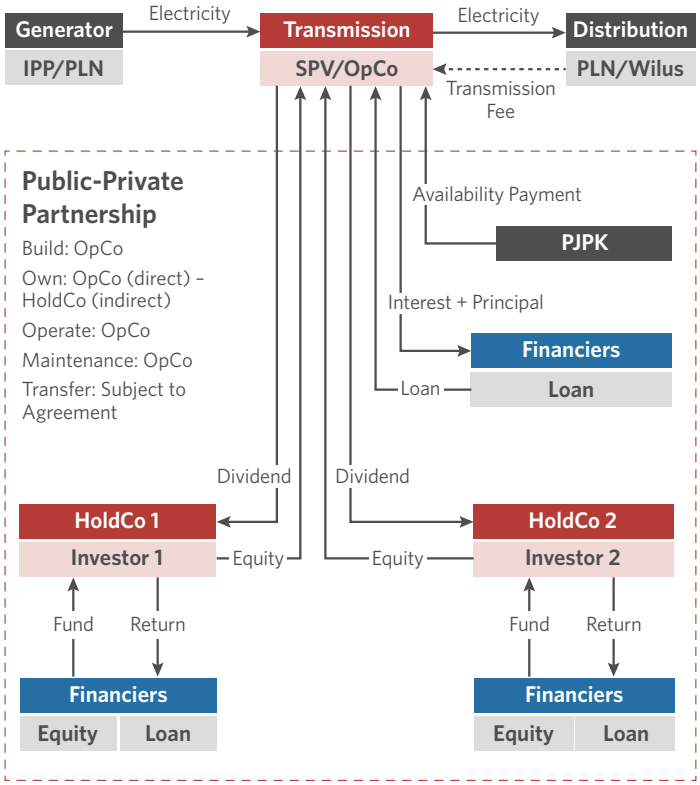
Balance Sheet	**Investment as a Single Line Item:** Instead of consolidating assets and liabilities, PLN will report its net investment in the JV as a single line item The JV's individual assets and liabilities do not impact PLN's balance sheet directly.	**Less Impact on Leverage:** Since the JV's liabilities are not consolidated, PLN's leverage ratios are less impacted, avoiding increases to PLN's debt profile.	
Income Statement	**Share of Profit or Loss:** PLN will report its share of the JV's profits or losses as a single line item in its income statement, labeled "Share of Profit (Loss) of JV." This allows PLN to recognize earnings from the JV without impacting its revenue and expense lines.	**Stable Profitability Metrics:** Since only the share of profit or loss is included, PLN's revenue and operating margins are unaffected by the IV's operations, which can make its core profitability metrics more stable.	
Cashflow Statement	**Dividends as Cash Inflow:** Cash dividends received from the JV are recorded as inflows in operating activities. However, PLN will not include the JV's entire cash flow, only the dividends received, which makes PLN's cash flow less reflective of the JV's full activities.	**No Direct Impact on Operating Cash Flow:** Since the JV's operational cash flows are not consolidated, PLN's reported cash flows from operations remain solely from its own activities, with only dividend income from the JV reflected.	
Other Financial Impacts	**Impairment Testing:** The investment in the JV is subject to periodic impairment testing. If the JV's fair value falls below its carrying amount, PLN would need to recognize an impairment loss, which could impact its net income.	**Lower Capital Commitments:** Using the equity method reduces the impact of the JV's capital expenditures on PLN's financials, which can improve PLN's overall capital expenditure profile.	
Impact on Financial Ratios	**Debt-to-Equity Ratio:** Only the net investment is included, usually resulting in a lower debt-to-equity ratio.	**Current Ratio:** Not impacted as JV's current assets and liabilities are not consolidated.	**Return on Investment (ROI):** Only the net earnings and net investment affect ROI, which can appear higher or lower depending on the JV's profitability.

Source: *CPI analysis (2025)*

3.3.3 PUBLIC-PRIVATE PARTNERSHIP

Public-private partnerships (PPPs) are conceptually similar to JVs, with the difference being the availability payment provided by the government, which can lower the risk for private entities (Figure 3.10).

Figure 3.10. Illustration of a PPP model for a transmission project



OpCo: Operating Company/SPV – Private

- A standalone transmission entity that can be owned as a project. The entity receives equity injection from private and public stakeholders (PPP).
- OpCo enters into an agreement with PJPK to access annual AP to maintain the targeted IRR project
- **Capital structure:** 70D + 30E
- **Revenue model:**
  - Fixed fee = Receive an annual fixed transmission fee
  - > Variable fee = KWh transfer x IDR per KWh
  - Additional revenue from AP

HoldCo: Holding Company - PLN Subs

- HoldCo is a company established to hold ownership in the OpCo. In PPP structure, the HoldCo raises debt and receives equity from its investors. It then uses this capital to inject equity into the OpCo.
- Capital structure: 100E; 60% HoldCo ownership in OpCo

PJPK - Government side/ AP Provider

- As the provider/administrator of infrastructure in accordance with the Law (e.g., Ministers, Agency Heads, SOES/ROES)

- **Impact on PLN and Private entity books:** same as JV structure.
- The only difference is **AP as additional revenue to Private**

Source: *CPI analysis (2025), validation meetings (2025)*

The PPP model structure is as follows:

1. In a PPP arrangement, such as the one where the government institution acts as the PJPK (Government Contracting Authority), the accounting treatment for PJPKs under the IFRS depends on the project structure, especially the treatment of assets and liabilities. The PJPK would generally not recognize the transmission asset on its balance sheet. This is because the asset is controlled by the privately owned Implementing Business Entity (BUP) during the concession period, and the risks and rewards associated with the asset remain with the private sector. Under this model, the PJPK also acts as an availability payment provider.
2. Under IFRS 16 (Leases), if the PPP includes lease elements or opts for a fixed transmission fee, then the same treatment will be applied as for a lease. Under IFRS 9 (Financial Instruments), the liability would be measured at amortized cost, with subsequent adjustments for interest and repayment of principal.
3. PLN and private actors' roles in the structure:
   - The financial model assumes that PLN (or its subsidiary) acts as the HoldCo and holds 60% of OpCo, with 100% equity financing to OpCo/SPV.
   - Private OpCo: as described in Section 3.3.
   - The key differentiation from the JV model described above is that the PPP secures government support in the form of availability payment, with transmission fee adjustments needed to ensure cost recovery.

4. **Revenue model:** There are two fee options that can be applied:
    - Fixed = Receive annual fixed transmission fee (similar concept to a leasing fee)
    - Variable = kWh transfer x IDR per kWh
    - Additional revenue stream from availability payment

Table 3.6. Opportunities offered by PPPs

For PLN	For private sector
• **Enhanced Investor Appeal:** Using an availability payment model makes the project more attractive to private investors, as it provides a predictable revenue stream with reduced demand risk. • **Reduced Upfront Capital Requirements:** PLN does not need to allocate significant upfront funds for construction, preserving liquidity for other strategic investments. • **Performance-Based Payments**: Payments to the private sector only begin after the transmission asset becomes operational, ensuring that PLN's expenditure aligns with asset performance and minimizing financial risks from non-performing projects.	• **Stable Revenue through Availability Payments**: The private actor is paid through availability payments, ensuring predictable income independent of demand fluctuations. This reduces revenue volatility and financial risk. • **Reduced Market and Demand Risk**: Since repayment is tied to availability and not dependent on electricity demand, the private sector avoids exposure to fluctuations in market usage or demand, making the project more financially secure. • **Enhanced Financial Feasibility**: The repayment process ensures clear revenue paths, which can attract equity and loan financing. The certainty of payments from PLN after project milestones can enhance the attractiveness of the project to potential financiers • **Partnership with a State Entity**: Working with PLN as a PJPK provides credibility and stability to the project, which can boost the private partner's profile and trustworthiness in future projects.

Table 3.7. Challenges presented by PPPs

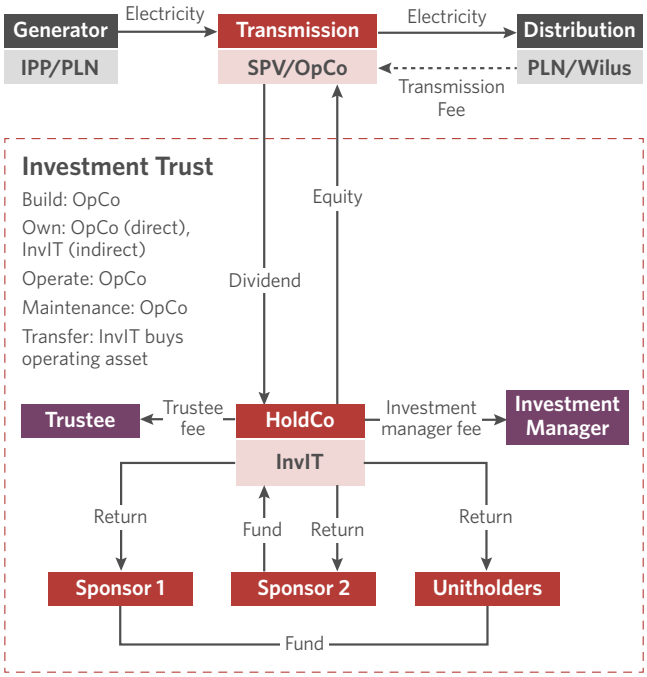
For PLN	For private sector
• **Long-Term Financial Commitment**: The availability payment model creates a long-term financial obligation for PLN, which can strain cash flow and financial flexibility if electricity revenues fluctuate or are insufficient. • **Limited Control Over Construction and Maintenance**: While outsourcing construction and major maintenance to the private sector can be beneficial, it may limit PLN's influence over timelines and quality assurance, posing operational risks. • **Inflation and Currency Risk**: availability payment agreements may include clauses that adjust payments based on inflation or currency fluctuations, potentially increasing costs if not managed carefully.	• **Upfront Capital Investment**: The private partner is responsible for the initial capital required for the construction and maintenance, which can be substantial and involve financial risk if cost overruns occur. • **Operational and Maintenance Responsibility**: Although PLN operates the transmission, the private sector remains accountable for maintaining it. This entails ongoing costs and the risk of unexpected maintenance expenses or technical failures. • **Financing and Risk Management**: Securing financing for large-scale infrastructure projects can be challenging, particularly if lenders perceive risks in political stability or economic conditions. Effective risk mitigation strategies are essential.

The accounting treatment and overall financial statement of PPP are similar to those of a JV. The key difference is that the availability payment will need to be allocated by the government entity that acts as PJPK**.**

3.3.4 INVESTMENT TRUST

The investment trust (InvIT) model can provide PLN with a mechanism to monetize existing transmission assets, converting them into liquid capital to be reinvested in other projects. It allow private sponsors to share the returns generated from the transmission assets, diversifying their revenue streams. The trust provides liquidity, as units can be traded on capital markets. Figure 3.11 depicts the arrangement of InvITs.

Figure 3.11. Illustration of InvITs for a transmission project



Impact on PLN Book:
PLN Cost (P/L)-leasing fee (fixed)/transmission fee (variable) to OpCo
Potential income = Proceed from divestment of HoldCo to InvIT (+asset revaluation); Dividend from OpCo

Impact on Private:
OpCo's revenue-leasing fee (fixed)/transmission fee (variable) paid by PLN

OpCo: Operating Company/SPV - Private
- A standalone transmission entity that can be owned as a project.
- During construction, OpCo is 100% equity financed by HoldCo
- **Revenue model:**
  - Fixed fee - Receive annual fixed transmission fee from PLN
  - Variable fee - KwH transfer x IDR per KwH from PLN

HoldCo: Holding Company - Private
- HoldCo is the listed investment vehicle that then invests in SPVs/ projects, and OpCo can be assumed to be a compressed Holding SPV+Project Company.
- After construction, HoldCo transfers asset ownership (OpCo) to Invit

Investment Trust/InvIT - SOE Holding
- InvIT buys 100% OpCo from HoldCo at COD, i.e., asset owner after construction

Investment Manager: An entity responsible for managing the assets within the investment trust. It makes strategic decisions on behalf of unitholders, including asset acquisition and disposal, and receives a management fee for its services.

Trustee: An independent party that holds the legal title to the trust assets on behalf of the unitholders. The trustee ensures the investment trust is managed in compliance with applicable regulations and the trust deed and is entitled to a trustee fee.

Sponsor - PLN (or Sub): The original developer or owner of the infrastructure assets, who initiates the formation of the investment trust. Sponsors typically inject assets into the trust and may retain a portion of units.

Unitholders: Investors who purchase units in the investment trust. They provide capital to the trust and, in return, receive periodic returns from the performance of the underlying infrastructure assets, such as dividends.

Source: *CPI analysis (2025), validation meetings (2025)*

The InvITs model is referenced to India's IndiGrid (See Box 1) and is structured as follows

1. Similar to the previous model, the OpCo is set as an SPV that owns and constructs the project. During construction, the OpCo is 100% financed by HoldCo.
2. There is a transfer of ownership or economic rights of transmission assets (lines, substations) into an investment trust after OpCo has completed the construction of the transmission assets. The trust becomes the legal entity holding the assets. It is assumed that the SOE holding entity acts as an InvIT, which buys 100% of the OpCo from the HoldCo at Commercial Operation Date (COD).

3. The trust issues units/shares to investors (e.g., pension funds, sovereign wealth funds, infrastructure funds), who receive returns from the trust's cash flows (transmission fees, regulated tariffs). Institutional investors gain exposure to long-term, stable infrastructure returns without directly managing assets.
4. PLN and private sector roles in the structure
    - Private (OpCo): A standalone transmission entity that can be owned as a project SPV. The entity receives equity from multiple potential stakeholders, a HoldCo and may also receive debt. The capital structure of the OpCo is assumed to comprise of 70% debt and 30% equity, following a standard and conservative financing model for infrastructure project finance.
    - Under this model, HoldCo is also funded by a private entity. HoldCo is the listed investment vehicle that then invests in SPVs/projects, and the OpCo can be assumed to be a compressed Holding SPV+Project Company with 100% equity finance. After construction, the HoldCo transfers asset ownership from the OpCo to Invit. The OpCo continues to operate and maintain the transmission assets under a management contract.
    - PLN (or its subsidiary) takes part as a sponsor of the InvIT by retaining a significant shareholding to maintain control by subscribing to unit trusts.
5. Revenue model: There are two options that can be applied
    - Fixed fee = Receive annual fixed transmission fee (similar concept to a leasing fee)
    - Variable fee = kWh transfer x IDR per kWh

Table 3.8. Opportunities offered by InvITs

For PLN	For private sector
• **Increased Capital for Infrastructure Investment:** An InvIT structure opens pathways for significant private and institutional capital into the transmission sector, with participation and support from PLN and other SOEs, facilitating development and modernization. • **Enhanced Financial Liquidity:** This model can provide PLN with a mechanism to monetize existing transmission assets, converting them into liquid capital that can be reinvested into other projects or initiatives. • **Attractive Returns for Investors:** With stable, regulated revenue streams from transmission fees, the investment trust can offer investors reliable and predictable cash flows, making it an attractive investment option for those seeking steady income. • **Risk Sharing:** Financial risk is spread across PLN, private sponsors, and other unitholders. This reduces PLN's financial exposure and leverages private participation and sharing of investment risks.	• **Access to Capital and Liquidity:** Opportunity to invest in Indonesia's transmission sector: Participating as a sponsor in the investment trust can open up Indonesia's transmission sector for private investors. • **Risk Mitigation and Diversified Investment Returns:** Investment trusts allow private sponsors to benefit from a share of the returns generated from operating transmission assets, providing certainty of returns even as new assets are developed. • **Long-Term Revenue Potential:** The investment trust model provides potential for stable, long-term returns from the transmission infrastructure managed by the trust, ensuring continuous income over the lifecycle of the assets. Unitholders can also participate in the buying and selling of the units.

Table 3.9 Challenges of InvITs

For PLN	For private sector
▪ **Regulatory Barriers:** Establishing investment trusts would require significant regulatory reforms to allow private investment in state-controlled sectors like transmission, currently monopolized by PLN. ▪ **Market Readiness:** Indonesia's capital markets may need further development to support the liquidity and transparency necessary for publicly traded investment trusts. ▪ **Asset Valuation and Transfer:** Accurately valuing and transferring state-owned infrastructure assets to a trust could be complex and might face resistance due to political or public sentiment.	▪ **Complex Regulatory Environment:** Participating in an investment trust arrangement requires navigating complex regulatory and compliance requirements, which can be resource-intensive and may delay project execution. ▪ **Control Limitations:** The trust model may limit the direct control private sponsors have over asset management and decision-making, which can affect operational strategies and profitability.

The InvIT model is nascent in Indonesia and has not yet been tested in the market. To date, Presidential Regulation 80/2011 limits the use of trust funds to grant funds provided by one or several grant providers managed by an institution as trustee. However, the issuance of Law No 4 Year 2023 (UU P2SK) on Development and Strengthening of the Financial Sector sets the regulatory basis to explore two types of trust-like structures: SPVs for securitization and Trust Fund Managers (Trustees) who manage assets on behalf of the beneficiary, both of which are conceptually applicable for transmission assets.

Figure 3.12. Potential enabling regulation for InvITs applications on transmission projects in Indonesia

Existing Regulation on Trust

President Regulation 80 2011

We note that to date, the underlying legal basis available is regulated under Presidential Regulation No. 80 of 2011 on Trust Fund (PR 80/2011). However, PR 80/2011 limits the definition of trust fund for grants only where trust fund means grant fund given by one or several grant providers which is managed by an institution as trustee for specific use purposes (Article 1 (2) of PR80/2011).

→

Regulatory Implication

Trust under Law on the Development and Strengthening of the Financial Sector (UU P2SK) - Law No 4 Year 2023

Section Five: Financial Market Development, **Paragraph 1**: Management of Financial Instruments and/or Trust Fund Management, Article 34

This section outlines the adoption of trust structures based on the **common law** system in Indonesia. Implementation rules are still required and will need to address the following areas, including but not limited to:

1. **Trust Management:** Trusts may be managed by individuals or legal entities authorized by the Financial Services Authority (OJK).
2. **Taxation:** Tax implications at the time of asset transfer to the trustee for management.
3. **Asset Return:** Return of managed assets to the beneficiary.
4. **Recourse of Assets/Liabilities:** Determination of full or limited recourse regarding assets and liabilities within the trust structure.

Further regulatory clarification required to ensure proper implementation.

Article 34 of the P2SK Law regulates two types of trust-like structures:

1. Special Purpose Vehicles (SPV) for securitization
2. Trust Fund Managers (Trustees) who manage assets on behalf of the beneficiary

This provision provides a robust legal foundation for establishing commercial trusts in Indonesia.

Source: *CPI analysis (2025)*

Accounting treatment for InvITs follows IFRS 9, where unitholders must classify their InvIT units as either fair value through profit or loss (FVTPL) or fair value through other comprehensive income (FVOCI). Additionally, InvITs are required to distribute at least 90% of net distributable cash flows to unitholders. These distributions can be in the form of dividend or interest income.

Figure 3.13. Accounting treatments for Investment Trust.

Investment in InvIT Units	**Initial Investment:** When unitholders purchase units in an InvIT, it is recorded as an investment asset on their balance sheet. **Valuation Changes:** Since InvIT units are often traded on the stock exchange, their value can fluctuate. For publicly traded units, the investment is generally marked to market (adjusted to current market value) periodically, impacting unrealized gains or losses in the holder's financials.
Income from Distribution	**Dividend and Interest Income:** InvITs like IndiGrid are required to distribute at least 90% of net distributable cash flows to unitholders. These distributions can be in the form of: • **Dividend Income:** A portion of the distribution might be treated as a dividend, which unitholders record as investment income on their income statement. • **Interest Income:** Part of the distribution might also be interest, depending on the InvIT's structure, which would also be reported as investment income. Return of Capital (ROC): Some distributions may be considered a return of capital, which reduces the unitholder's initial cost basis in the investment rather than being taxed as income. This return is not recorded as income but rather as an adjustment to the investment cost.
Capital Gains or Losses on Unit Sales	**Sale of Units:** If a unitholder sells their InvIT units, **any difference between the selling price and the original purchase price** results in a capital gain or loss. **Unrealized Gains/Losses:** If the InvIT units are marked to market, any changes in fair value (without actual sale) may be recorded as **unrealized gains or losses**. For individuals or entities required to report fair value adjustments, these unrealized gains/losses appear on the income statement.
Tax Implications for Unitholders	**Tax on Dividends and Interest:** Income from dividends and interest is generally taxable for unitholders, although specific tax treatments may vary by jurisdiction. **Capital Gains Tax:** Selling InvIT units may incur capital gains tax, depending on the holding period and applicable tax rates in the unitholder's jurisdiction. **Return of Capital (ROC) Adjustments:** Since ROC reduces the cost basis of the units, it may impact capital gains tax upon eventual sale, as a lower cost basis increases the potential taxable gain.
Financial Statement Reporting	**Balance Sheet:** Investment in InvIT units is listed as a non-current or current asset, depending on whether the units are held long-term or for trading. **Income Statement:** Dividends, interest income, and realized gains/losses are reported here, impacting overall net income. **Cash Flow Statement:** Distributions received (dividends, interest) are reported in the **cash flow from operating activities**. Proceeds from the sale of units are reported in **cash flow from investing activities**.

Overall financial statement implications of InvITs are summarized in Figure 3.14. If the InvIT is structured to be independent of PLN (i.e., PLN holds less than 50% ownership), the assets and corresponding liabilities would not appear on PLN's balance sheet.

Figure 3.14. Overall financial statement implications of InvITs in PLN books

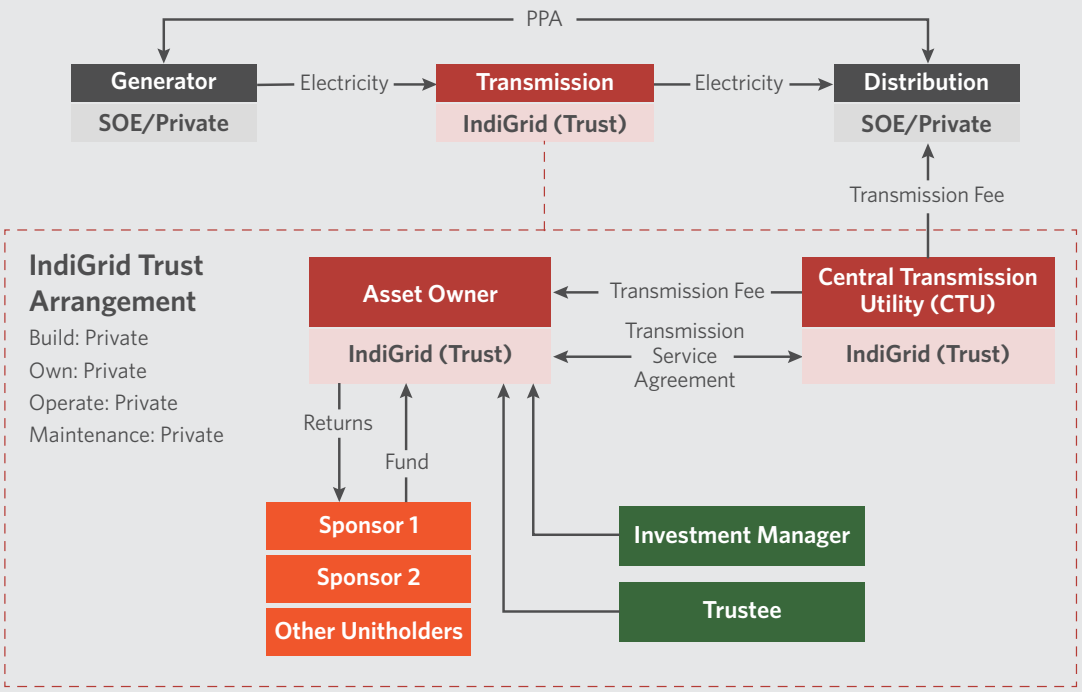
Asset Ownership and Off- Balance Sheet Treatment	**Transfer of Assets to InvIT:** By transferring transmission or distribution assets to the InvIT, PLN can deconsolidate these assets from its balance sheet, reducing its asset base.	**Off-Balance Sheet Financing:** If the InviT is structured to be independent of PLN (... PLN holds less than 50% ownership), the assets and corresponding liabilities would not appear on PLN's balance sheet, leading to an asset-light model for PLN.
Debt Reduction and Improved Leverage Ratios	**Debt Transfer to InvIT:** The assets transferred to the InviT are often accompanied by associated debt or financing obligations. This transfer would reduce PLN's liabilities, thereby improving leverage ratios like debt-to- equity and debt-to-EBITDA.	**Lower Interest Expenses:** With debt offloaded to the InviT, PLN could see a reduction in interest expenses, potentially improving net income and cash flow.
Capital Raise and Liquidity Improvement	**Upfront Capital from Asset Sale:** As a sponsor, PLN could receive upfront capital from the sale or transfer of assets to the InvIT, providing a significant cash inflow. This capital could be used to fund new projects or pay down debt.	**Potential for Recurring Income:** While PLN would no longer own the assets directly, it would likely retain units in the InvIT, earning income through periodic distributions. (dividends or interest) based on InviT cash flows.
Income from Management Fees (if applicable)	**Management and Operational Role:** If PLN or its subsidiary were to serve as the investment manager or operations manager of the InvIT, PLN could earn management fees, providing a steady revenue stream. This fee-based income could diversify PLN's revenue sources beyond traditional electricity sales.	
Impact on Financial Ratios	**Improved Return on Assets (ROA):** With fewer assets on the balance sheet but continued income through distributions or management fees, PLN's ROA would likely improve, reflecting more efficient asset utilization.	**Improved Return on Equity (ROE):** By reducing debt and raising capital through asset sales, PLN could see an increase in ROE, as lower interest expenses and additional revenue contribute to higher net income relative to equity.

Source: *CPI analysis (2025)*

Box 1. IndiGrid Investment Trust Arrangement

IndiGrid is India's first and largest power transmission Infrastructure Investment Trust (InvIT). It owns, operates, and manages power transmission networks and renewable energy assets across India. Established in 2016 and listed on the Bombay Stock Exchange and National Stock Exchange, IndiGrid operates under regulations set by the Securities and Exchange Board of India.

Figure 3.15. IndiGrid InviT transaction structure



IndiGrid's portfolio includes 49 transmission lines, 15 substations, and 19 solar projects, delivering reliable power throughout the country. The trust generates revenue through long-term transmission service agreements and PPAs for its transmission and solar assets, respectively. These agreements provide stable and predictable cash flows, as they are typically long-term contracts with fixed charges.

Investment mechanism

- **Unit Issuance:** IndiGrid raises capital by issuing units that are traded on stock exchanges, allowing investors to buy and sell them like shares. The funds raised are used to acquire and manage income-generating infrastructure assets.
- **Distributions:** SEBI regulations mandate that InvITs distribute at least 90% of their net distributable cash flows to unitholders, at least semi-annually. IndiGrid has a track record of consistent quarterly distributions, offering investors a steady income stream.

While India and Indonesia's transmission sector are both natural monopolies, India has some private involvement operating under license. Based on benchmarking, below are key features of India vs. Indonesia power sector market.

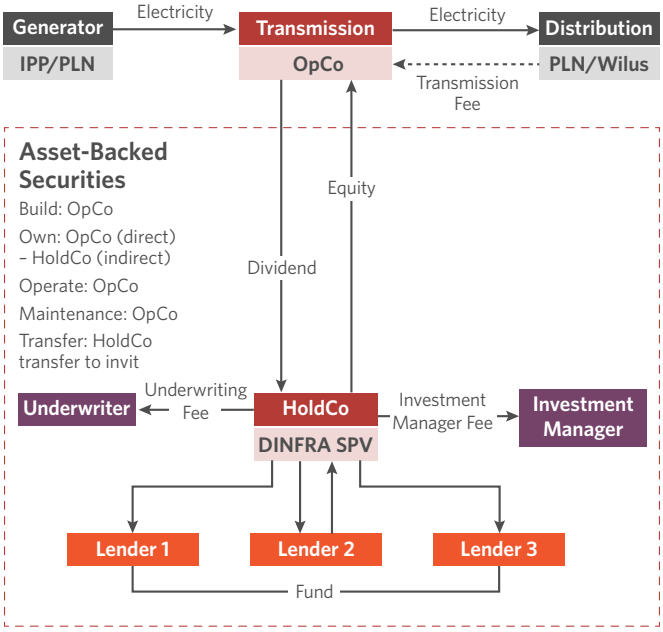
Figure 3.16. Comparison of power sector market between India and Indonesia

	India	Indonesia
Market Structure	The market is unbundled with separate companies for generation, transmission, and distribution, creating space for both public and private sector players across each segment. Regulatory bodies like the Central Electricity Regulatory Commission (CERC) and State Electricity Regulatory Commissions (SERCs) facilitate competition, especially in generation and trading, and oversee transmission and distribution tariffs.	The electricity market is largely dominated by Perusahaan Listrik Negara (PLN), the state-owned utility, which operates as a vertically integrated monopoly. PLN is responsible for electricity generation, transmission, and distribution, with limited private sector involvement mainly through Independent Power Producers (IPPs) supplying power to PLN under long-term contracts.
Generation	Both public and private companies compete in generation. Renewable energy growth has introduced more private players, making it an oligopolistic and competitive market.	PLN manages most power generation, with IPPs supplying through contracts but without direct competition in retail markets.
Transmission	Power Grid Corporation of India Limited (PGCIL) is the central utility, but there are also state utilities and some private players operating under license, making it a regulated natural monopoly with some private involvement.	PLN monopolizes transmission infrastructure, with no competing companies.
Distribution	While most distribution remains state-owned, several cities have private distribution companies, especially in urban areas, creating some regional monopolies within a competitive regulatory framework.	PLN has full control of electricity distribution throughout the country, with no private discoms.

3.3.5 COLLECTIVE INVESTMENT SCHEME FOR INFRASTRUCTURE

A collective investment scheme for infrastructure (CIS-DINFRA) links diversified infrastructure portfolios with private capital markets through asset securitization of future transmission revenues (e.g., transmission fees) into tradable financial instruments, as shown in Figure 3.17. This approach would allow PLN (or a subsidiary) to monetize predictable cash flows upfront, attracting private and institutional investors.

Figure 3.17. Illustration of a CIS-DINFRA for transmission projects



Impact on PLN Book:
PLN Cost (P/L) = leasing fee (fixed)/transmission fee (variable) to OpCo
Potential income = Divedend from HoldCo

Impact on Private:
OpCo's revenue = leasing fee (fixed)/transmission fee (variable) paid by PLN

OpCo: Operating Company/SPV - Private

- A standalone transmission entity that can be owned as a project.
- During construction, OpCo is equity financed by HoldCo, may be hybrid with debt and re-financed by ABS after COD
- **Revenue model:**
  - Fixed fee = Receive annual fixed transmission fee from PLN
  - Variable fee - KwH transfer x IDR per KWH from PLN

HoldCo: Holding Company-PLN/ PLN Subs

- HoldCo serves as the entity that issues ABS.
- This is because ABS is a financing instrument, not a business model, and is therefore flexible in terms of issuer identity.
- **Capital structure:** 100% D (ABS) ; 100% HoldCo ownership in OpCo

Underwriter and Investment Manager: In principle, same role as under Invit Model. In ABS, especially corporate-or SPV-issued, the the trustee role is replaced by Underwriter, often a bank or fiduciary service.

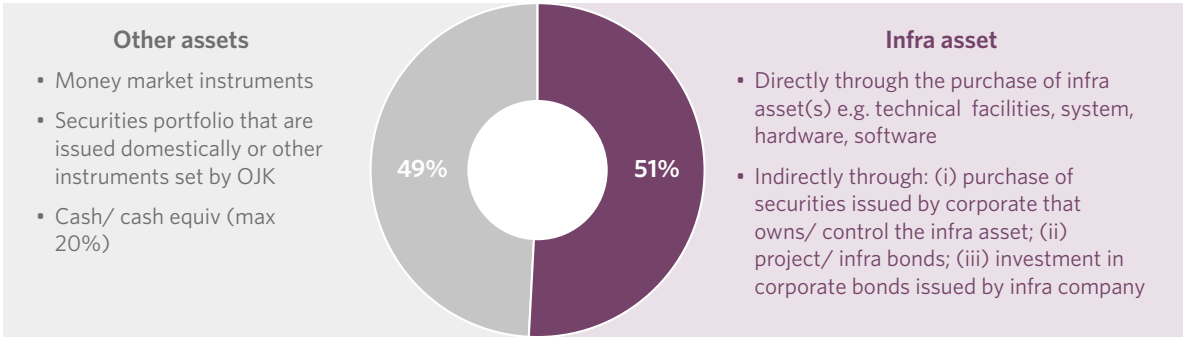
Lender: Lenders are the investors who purchase the asset-backed securities. From a legal and financial standpoint, they provide upfront funds to the issuing entity (e.g., HoldCo or Trust) and, in return, receive scheduled payments (returns) backed by the cash flows of the underlying transmission assets. In this structure, they are treated as creditors rather than equity holders.

Source: *CPI analysis, validation meetings (2025)*

The CIS-DINFRA is structured with a 20-year maturity to reflect real-world applications and will be refinanced until the end of asset life. This differs from other models mentioned before, where transactions are structured for a 40-year asset life.

This approach allows a mixed pool of infrastructure assets, creating more flexibility. According to OJK Regulation No. 52/POJK.04/2017, a DINFRA's investment portfolio can only be implemented under the mechanism shown in Figure 3.18, with a pool of assets that can be used as underlying of DINFRA, including the infrastructure for transportation, road, water, waste management, electricity, renewable energy, and other infrastructure.

Figure 3.18. CIS-DINFRA investment portfolio based on OJK Regulation



Source: *IDX (2025)*

A CIS-DINFRA is structured as follows

1. Similar to the previously described models, an OpCo is set as an SPV that owns and constructs the project. During construction, the OpCo is 100% financed by a HoldCo.
2. PLN (or a subsidiary) transfers rights to future transmission fee receivables into a SPV.
3. The SPV issues CIS-DINFRA to investors, backed by these receivables. These receivables are redirected to the SPV, which uses them to pay interest and principal to CIS-DINFRA holders.
4. PLN and private sector roles in the structure:
    - PLN (or a subsidiary) acts as HoldCo, the originator of CIS-DINFRA, which provides receivables (future transmission fees).
    - Private OpCo: as in the above sections, a standalone transmission entity that can be owned as an SPV receiving equity from multiple potential stakeholders (JV). The OpCo is financed by the HoldCo and may also receive debt. The capital structure of the OpCo is assumed to comprise of 70% debt and 30% equity, following a standard and conservative financing model for infrastructure project finance. The OpCo continues to operate and maintain transmission assets.
5. Revenue model: There are two fee options that can be applied:
    - Fixed = Receive annual fixed transmission fee (similar concept to a leasing fee)
    - Variable = kWh transfer x IDR per kWh

Table 3.10. Opportunities offered by CIS-DINFRA

For PLN	For private sector
• **Diversified Portfolio of High-Quality Project & Infrastructure Debt:** More flexible mix of operational assets and assets in construction which benefit from appropriate credit mitigants (e.g., sponsor completion guarantees, sponsor support) • **Upfront Capital Mobilization:** Monetizes future revenues to fund new transmission projects. • **Liquidity and Scalability:** Units can be listed and traded, unlike direct project equity with multiple transmission projects can be pooled into one securitization scheme.	• **Attractive Returns for Investors:** With stable, regulated revenue streams from transmission fees, the CIS-DINFRA offers investors reliable and predictable cash flows, making it an attractive investment option for those seeking steady income**.** • **Options for Refinancing post CoD:** opens pathways for significant private and institutional capital into the transmission sector with a mechanism to securitize future cashflow of operational assets, converting them into liquid capital that can be reinvested.

Table 3.11. Challenges of CIS-DINFRA

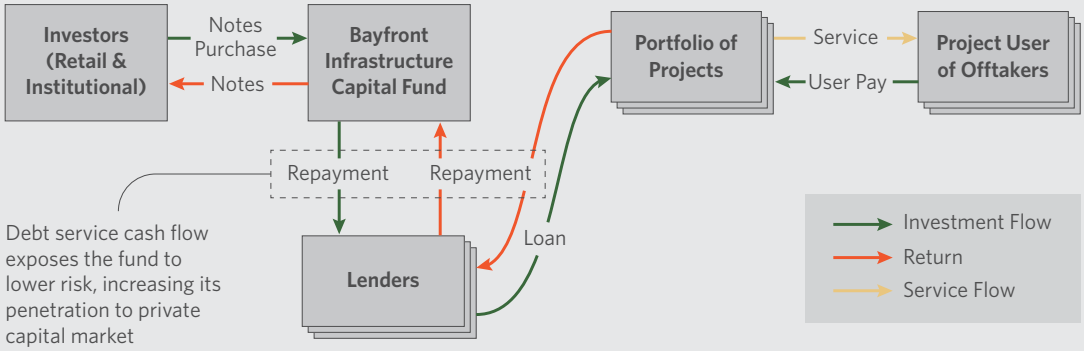
For PLN	For private sector
• **Limited number of CIS-DINFRA** originators in Indonesia, which are mostly restricted to SOEs and banks. • **The securitization process is significantly longer** and more complex compared to other funding options such as bond issuances or bank loans. • **Indonesian commercial entities also face debt-to-equity ratio (DER) restrictions,** which limit the extent of securitization: According to MoF Regulation No. 169/PMK.010/2015, a company's DER (total liabilities/total equity) may not exceed four to one. When a company issues securitization, a Securitization Debt account appears under liabilities, meaning that an increase in securitization-related debt will raise the company's overall liabilities. If this increase is not offset by a proportional rise in equity, it will result in a higher DER, potentially breaching regulatory limits	• **Tariff Stability**: Requires strong regulatory framework to ensure receivables are predictable. Moreover, credit enhancement, such as government guarantees or fiscal support may be needed to attract investors. • **Complex Structuring:** Legal, tax, and accounting frameworks must support securitization. • **Market Depth**: Indonesia's capital markets must be deep enough to absorb CIS-DINFRA issuances.

CIS-DINFRA has been previously tested and implemented for infrastructure assets, such as for a toll roads portfolio in Indonesia in 2019 and for ports in Singapore (see Box 2)**.** This widens the opportunity to replicate the previous issuances and adjust to the need of transmission projects.

Box 2. Singapore's Bayfront Infrastructure Capital IV infrastructure fund

The figure below shows the transaction flows and key transaction parties of Bayfront Infrastructure Capital IV (BIC IV).

Figure 3.19 Structure of BIC IV



BIC IV's key transacting parties includes BIC as a sponsor, with the following roles:

(i) Source the Portfolio from Originating Banks and execute loan/bond transfers.

(ii) Liaise with credit rating agencies to obtain credit assessments on the portfolio assets and credit ratings for Rated Notes.

(iii) Lead the structuring and execution of the transaction.

BIM Asset Management Pte. Ltd as collateral manager is responsible for:

(i) Managing and monitoring the performance of the portfolio assets.

(ii) Maintaining credit assessments on the assets and credit ratings of the Rated Notes.

(iii) Handling any replenishment and disposition of the portfolio assets (if required) and all voting requirements for the portfolio assets;

(iv) Providing information and management services in conjunction with the Transaction Administrator.

(v) Managing investor relations.

Figure 3.20. BIC IV Portfolio diversification across 40 projects in 15 countries.

Country where project is located	Number of Collateral Obligations	Aggregate Principal Balance outstanding (US$ million)	Percentage of Aggregate Principal Balance outstanding in Portofolio
Indonesia	7	93.9	22.9
India	6	66.7	16.3
Jordan	3	29.2	7.1
Brazil	3	28.7	7.0
Qatar	2	28.5	7.0
China	3	25.0	6.1
Mauritania	1	24.0	5.9
Vietnam	2	23.2	5.7
Saudi Arabia	1	20.0	4.9
Oman	6	17.1	4.2
United Arab Emirates	2	15.0	3.7
Bangladesh	1	14.8	3.6
USA	1	11.0	2.7
Kuwait	1	8.2	2.0
Malaysia	1	5.0	1.2

The Fund features key aspects that improve its inancial and commercial viability, such as:

(i) Diversified Portfolio of High-Quality Project & Infrastructure Debt: 40 project and infrastructure loans and bonds across 33 projects in APAC, the Middle East, the Americas and Africa; RE as the largedst single sub-sector at ~30%, across 15 countries of project and 10 industry subsectors.

(ii) **High Quality Assets with Credit Enhancement Features:** 83.5% of the portfolio at inception relates to operational projects; 16.5% relates to projects in advanced stages of construction and which benefit from appropriate credit mitigants, e.g., sponsor completion guarantees, sponsor support; 48.7% of the portfolio at inception are investment-grade assets, i.e. Moody's Rating Factor of 610 (Baa3) or lower

(iii) **Stable and Predictable Cash Flows**: Static pool with limited replenishment rights within a 3-year replenishment and 3-year non-call period; Offtake agreements with reputable and creditworthy counterparties; 78.7% of the portfolio involves project borrowers that need to maintain minimum debt service coverage ratios as one of their financial covenants; Natural FX and interest rate hedge – US$-denominated and floating rate SOFR-based assets and liabilities

(iv) **Dedicated Aaa-rated Sustainability Tranche**: 29.9% of the Notes issued are to be fully allocated to a portfolio of eligible green and social assets that meet the eligibility criteria stated in Bayfront's Sustainable Finance Framework; 33.4% of the portfolio at inception relates to green assets (RE projects and energy efficiency data centres)

Figure 3.21. BIC IV Security Tranches

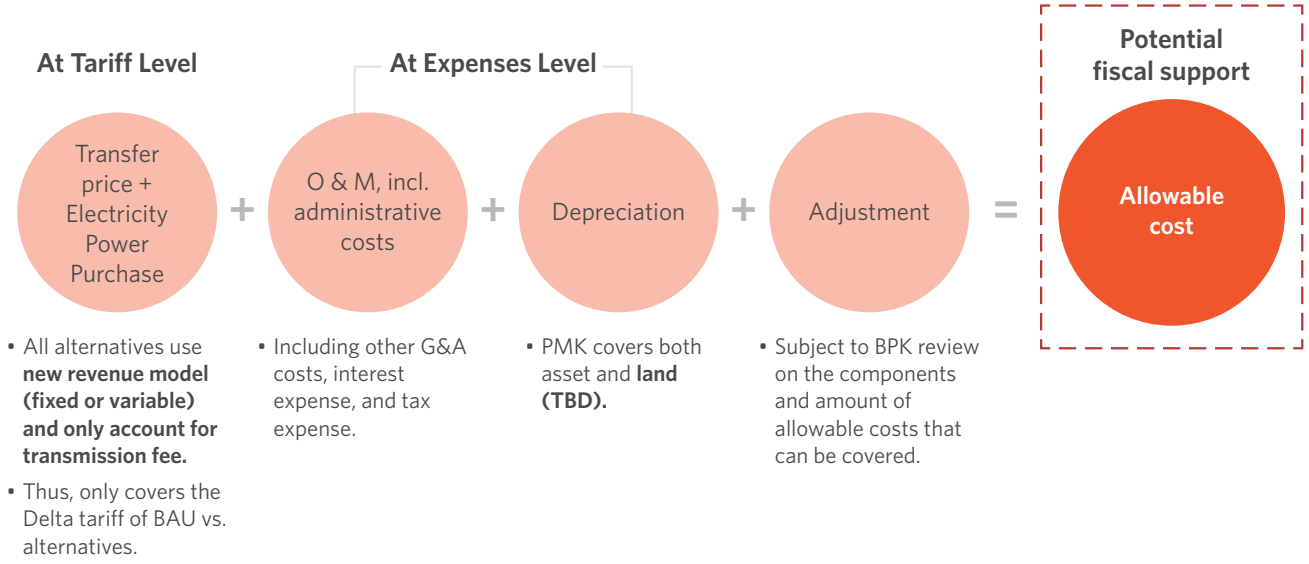
It is possible to mix project with varying degrees of risk and profitability, however majority of the portfolio should be of Aaa tranche to make it attractive for private investors

Class	Principal Amount	Issue Price	Initial Interest Rate	Maturity Date	Ratings (Moody's)
Class A1 Notes	US$170,600,000	100.00%	Benchmark + 1.50%	11 April 2044	Aaa (sf)
Class A1-SU Notes	US$115,000,000	100,00%	Benchmark + 1.425%	11 April 2044	Aaa (sf)
Class B Notes	US$54,500,000	100.00%	Benchmark + 2.25%	11 April 2044	Aa1 (sf)
Class C Notes	US$31,600,000	100.00%	Benchmark + 4.90%	11 April 2044	Baa1 (sf)
Class D Notes	US$13,000,000	100.00%	Benchmark + 3.50%	11 April 2044	Unrated

4. POTENTIAL FISCAL SUPPORT

Finance Minister Regulation PMK 20/2025 on Electricity Subsidy Allocation regulates fiscal support for electricity subsidies through reimbursement of Electricity Supply Cost (BPP) components. To date, its scope is primarily tied to generation and supply costs for electricity tariffs. Transmission projects are not directly covered under the allowable cost structure. However, all models proposed in Section 3 would include a new transmission fee, equivalent to the existing tariff for transmission. That means fiscal reimbursement under the BPP is applicable only if the transmission fee is recognized as part of electricity provision subsidies, though the final decision is subject to approval of the Audit Board of Indonesia (BPK). Figure 4.1 captures the key cost components that are allowable to be covered by fiscal support.

Figure 4.1. Allowable costs for potential fiscal support



5. CONCLUSION AND ACTION POINTS

5.1 CONCLUSION

Indonesia's energy transition and growing electricity demand require major expansion of transmission infrastructure and new approaches to mobilize capital at scale. This report demonstrates that alternative project finance structures — including leasing, joint ventures, PPPs, InvITs, and CIS-DINFRA — can help mobilize private capital while reducing pressure on PLN's balance sheet.

Each model offers different advantages in terms of scalability, liquidity, implementation complexity, and risk allocation. InvITs and CIS-DINFRA offer the best combination of scalability and liquidity but require higher implementation costs and strong regulatory framework. Leasing and JVs are easier to implement but are limited in terms of scalability and liquidity. PPPs sit in the middle as they are scalable with fiscal support but costly to structure.

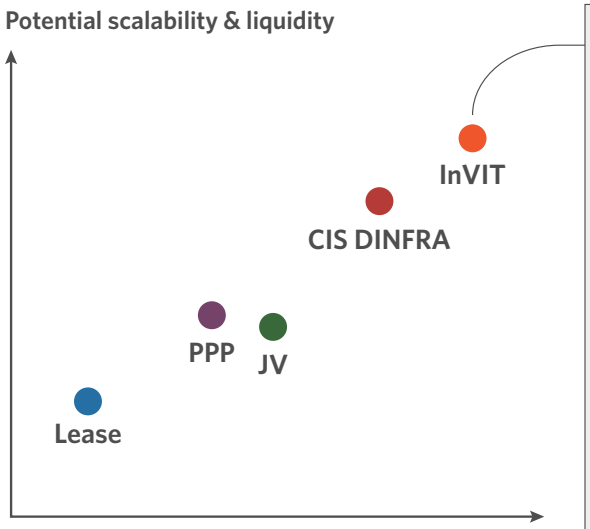
Successful implementation will depend on enabling policies, particularly the establishment of dedicated transmission fees, supportive accounting and regulatory treatment for off-balance-sheet financing, and targeted fiscal support mechanisms. Strategic fit and fiscal support required by each model are summarized in the table below.

Table 5.1. Strategic fit and fiscal support requirement for the proposed models

Alternative model	Type of fiscal support required	Best fit for PLN strategy
Leasing	▪ Government guarantees for PLN's lease payments. ▪ Possible tariff/transmission fee subsidies to ensure affordability.	▪ Lease reduces upfront CapEx burden for PLN, thus it best suits for liquidity preservation, it is favorable if PLN's strategy is **cash flow management** and short-term liquidity preservation.
JV	▪ Tax incentives for private partners. ▪ State capital injections (PMN) to strengthen PLN's stake via a HoldCo.	▪ JV emphasizes sharing of risk and capital, which is favorable if PLN's strategy is partnership-driven expansion while retaining partial control.
PPP	▪ availability payment to support PLN's payment obligations. ▪ Potential use of viability gap funding to cover early construction period.	▪ PPPs attract private capital, and spread risk. This is favorable if PLN's strategy is **leveraging private efficiency while focusing on renewable integration**.
InvIT	▪ Tax incentives for fund investors. ▪ Regulatory support for asset transfer and securitization.	▪ An InvIT unlocks capital without adding debt. It is favorable if PLN's strategy is **balance sheet optimization and capital recycling.**
CIS-DINFRA	▪ Government guarantees to enhance credit rating of CIS-DINFRA. ▪ Policy support for securitization framework.	▪ A CIS-DINFRA provides upfront liquidity, diversifies investor base. It is favorable if PLN's strategy is **financial innovation and tapping capital markets.**

Based on the type and estimation of fiscal support required by each model, the following figure and table further map the position of each model when assessed against two market indicators — potential scalability and liquidity and implementation costs.

Figure 5.1. Comparative assessment of market indicators for alternative models



InVIT has scalability and liquidity potential as demand grows...

1. Pooling capital efficiently and access to capital
2. Stable cash flow, offers liquidity
3. Lower financing cost: Collective investment reduces reliance on expensive debt

...but, imposes the highest implementation cost

1. **Legal structure challenges and regulatory hurdles.** InVIT has to be set up as a contractual collective investment scheme rather than a corporate structure, making it less flexible compared to Singapore or Malaysia, where a trust can be listed as a company.
2. **Double taxation risk** at the trust and investor levels
3. **High compliance and reporting costs** due to strict disclosure, auditing, and governance requirements

Implementation costs, comprise of:

- **Finance costs** related to cost of fund, such as interest, tax, compliance and reporting
- **Regulatory & legal costs.** The higher the uncertainties, the higher the potential need for updates on the current framework

Table 5.2. Comparison of potential scalability, liquidity, and implementation costs among alternative models

Model	Potential scalability and liquidity	Implementation costs
Leasing	Low scalability as the lease contract needs to be set up for each transmission project. Liquidity depends on PLN's ability to honor lease payments; attractive for investors seeking stable cash flows but with limited secondary market trading.	Low setup cost compared to PPPs; contractual structuring and government guarantees add moderate complexity.
JV	Moderate scalability—capital mobilization limited to partner appetite. Liquidity low, as JV equity stakes are less tradable.	Medium implementation cost; requires negotiation of governance, equity contributions, and risk-sharing.
PPP	Moderate scalability if structured with availability payment and pontentially viability gap funding and guarantees, but heavily rely on government support. Liquidity moderate—depends on long-term availability payments and bankable PPAs.	High transaction costs due to legal, regulatory, and risk allocation complexities; long lead times for financial close
InvIT	High scalability—can pool multiple transmission assets, attract institutional investors. Liquidity strong, as units are tradable on capital markets.	High setup cost—requires regulatory framework, asset transfer, and tax incentives.
CIS-DINFRA	High liquidity—CIS DINFRA can be traded in capital markets, appealing to diverse investors. Scalability depends on securitizable cash flows (transmission fee, availability payment).	High implementation cost, but the regulatory basis and precedent transactions are available. It requires securitization infrastructure, credit enhancement, and government guarantees.

5.2 ACTION POINTS

As a next step, we recommend PLN to initiate formal engagement with the Financial Services Authority (OJK) to explore the possibility of obtaining a regulatory waiver or clarification that would allow transmission infrastructrure financing models to be treated off-balance sheet with POJK No. 6/POJK.04/2017 as the precedent.

Furthermore, institutional roles for the involved ministries and relevant authorities must be clarified across all stakeholders, including responsibilities for fiscal support, waiver mechanisms, and the designation of the appropriate trustee for an investment trust model.

PLN must define key financial, legal, and operational indicators to guide the selection and priority of suitable transmission financing business models. In addition, market sounding is critical to assess whether private investors are willing to participate at acceptable pricing and risk levels. This involves engaging private and institutional investors to test their appetites for different structures. Feedback from the market can be used to identify where targeted de-risking is necessary to crowd in private capital.

Lastly, the business models can be adapted for cross-border interconnections under the ASEAN Power Grid. This would require harmonization of regulatory frameworks and cost-sharing mechanisms, in which successful application would support broader regional power trade.

6. ANNEX

6.1 ANNEX 1. BENCHMARKING OF COUNTRIES' TRANSMISSION FINANCE MODELS

Benchmarking studies of transmission financing in other countries were conducted to provide references and insights for the development of alternative models for transmission financing. The studies focused on identifying applicable financing structures, institutional arrangements, and best practices that could be adapted to the Indonesian context.

6.1.1 AUSTRALIA

1. AUSTRALIAN ENERGY MARKET OPERATOR (AEMO)[7]

AEMO revised its Transmission Use of System (TUOS) maximum allowable revenue and updated the TUOS pricing to reflect latest costs and TUOS charges set by Aemo Victorian Planning (AVP) are designed to recover the costs associated with delivering shared prescribed transmission services in the state of Victoria. The overall revenue requirement and the way it is distributed across prescribed service categories are calculated in line with the National Electricity Rules (NER), as well as AEMO's Revenue and Pricing Methodologies.

In setting the TUOS revenue requirement, AVP typically bases its calculations on its draft budget for the upcoming financial year. Any difference between the draft and final budget—resulting in over-recovery or under-recovery—is adjusted in the following regulatory period.

Revenue components:

a. **Prescribed TUOS Services – Locational**

   Locational TUOS charges represent the cost of accessing and using the transmission network at different connection points. These charges are intended to promote efficient use of the network by reflecting demand levels during periods when the transmission system is most heavily used. A specific locational price is determined for each connection point, and the corresponding charge is calculated based on that price and the customer's demand at that location. Under AVP's pricing methodology, 50% of the maximum allowed revenue for prescribed TUOS services is recovered through the locational component.

b. **Prescribed TUOS Services – Non-locational**

   Non-locational charges are used to recover the remaining portion of AVP's annual revenue requirement for prescribed TUOS services. Unlike locational charges, these prices do not vary by connection point. The non-locational rate is set either as an energy-based charge or a capacity-based charge, and it applies uniformly across all locations. Under AVP's pricing methodology, 50% of the maximum allowed revenue for prescribed TUOS services is assigned to the non-locational component. This amount is then adjusted to account for intra-regional settlement residues, over- or under-recovery from the previous year, AEMO's

National Transmission Planner (NTP) fees, and any shortfall or excess in locational revenue resulting from the ±2% cap applied to locational price changes.

c. **Prescribed Common Services**

Common services cover the shared costs associated with planning, managing, and operating the transmission network. These include expenses related to control centers and buildings, protection and safety systems, land and easements for network infrastructure, and land tax.

Charges for common services are set either on an energy basis or a capacity basis. In both cases, the applicable rate is uniform across all connection points and does not vary by location.

d. **System strength transmission services**

The services cover the costs of ensuring the network meets Victoria's projected system strength needs. These requirements are intended to maintain adequate fault levels and support stable voltage waveforms, particularly as more inverter-based resources connect to the grid.

A System Strength Unit Price (SSUP) is established for each designated system-strength node in the transmission network. The SSUP at each node reflects the specific costs and service requirements associated with maintaining system strength at that location.

TUOS Pricing Methodology

These prices apply to metered usage at terminal stations. Terminal stations are where the assets owned by distribution businesses and other transmission-connected customers connect to the shared transmission network. As per AVP's Pricing Methodology, locational charges for FY25 are calculated at each terminal station by:

a. Identifying the half-hour period in each of the twelve months over the period from 1 July 2022 to 30 June 2023 when terminal station demand was highest.

b. Calculating the average of the twelve-monthly connection point half-hour demands (in megawatts [MW]) at the time of the terminal station's monthly maximum demand.

c. Multiplying the locational price ($/MW) that applies to each terminal station by the demand.

Common service charges and non-locational charges for FY25 are either:

a. Energy price multiplied by metered energy at the connection point from 1 July 2022 to 30 June 2023; or

b. Capacity price multiplied by the contract-agreed maximum demand for the connection point applicable during FY25. Capacity price is available only where a customer's agreement with AVP nominates a fixed maximum demand and a penalty for exceeding it.

System Strength Unit Price (SSUP) Calculation Method

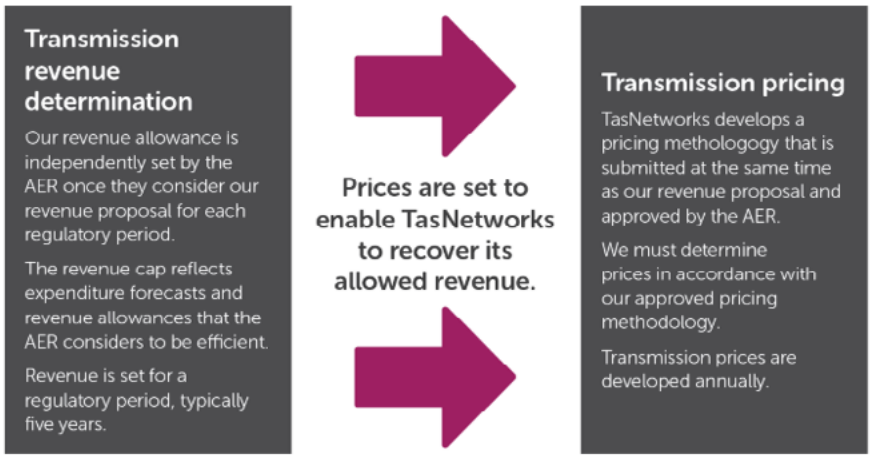
The SSUP is a price per MVA that reflects the forecast long-run average costs of providing System Strength Transmission Services at the relevant system strength node. It is calculated by dividing the total forecast long-run capital and operating cost of providing an efficient quantity of system strength at a system strength node over a period of 10 years by the total forecast system

strength hosting capacity provided by that system strength node over a period of 10 years. The SSUP is calculated once at the start of each 5-year system strength charging period, and applies for the duration of that system strength charging period, subject to annual indexation in accordance with AVP's Pricing Methodology.

2. TASNETWORKS[8]

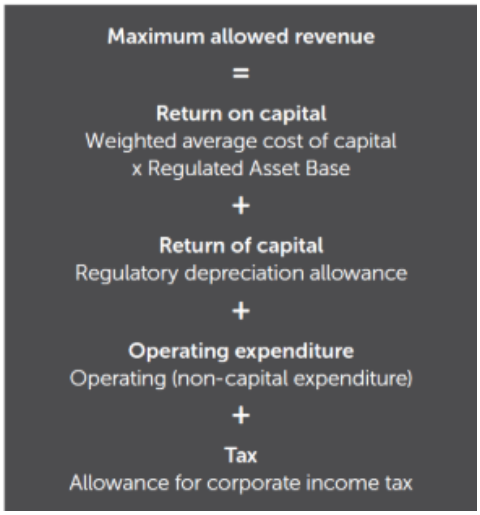
TasNetworks operates as a regulated network business, with most of its revenue determined by the Australian Energy Regulator (AER). The AER establishes the maximum allowable revenue for each year within a regulatory determination period, which typically spans five years. Each year, TasNetworks develops a pricing methodology that requires AER approval. This methodology translates the approved revenue allowance into customer tariffs. Both the revenue cap and the pricing methodology processes (Figure 6.1) and revenue building block (Figure 6.2) are governed by the National Electricity Rules (NER).

Figure 6.1. Transmission Revenue Determination of the Australian Energy Regulator (AER) based on the National Energy Rules



Source: *TasNetworks (2025)*

Figure 6.2. Revenue Building Blocks of AER



Source: *TasNetworks (2025)*

Allocation of Charges for Transmission Services

The pricing process outlines how prices are developed and aimed at recovering the allowed revenue each year. Transmission businesses are asset-intensive; therefore, prices for transmission services are largely allocated based on asset values in the following categories:

a. Connection assets – Assets that connect generators, loads and other networks to the shared transmission network

b. Shared network assets – Assets that transmit electricity between generation and load customers and serve many customers

c. Other assets – Assets that support the operation of our network and our business, such as control centers, office buildings and IT systems. These assets provide common services to all customers

Prescribed transmission services are split into four service categories, and prices are developed for each category of service (Figure 6.3):

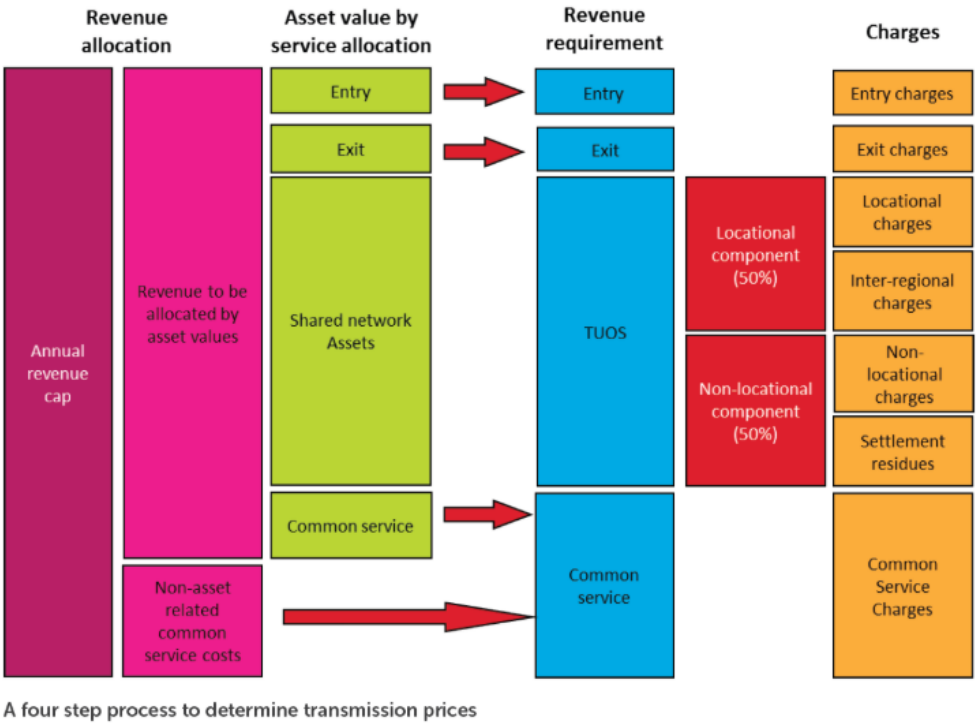
a. Entry services – Connection services provided to generators (this is the only service category that applies to generators)

b. Exit services – Connection services provided to our distribution network and load customers who are directly connected to the shared transmission network

c. Common transmission services – Services that provide equivalent benefits to all users without any differentiation based on their location

d. Transmission Use of System Services (TUOS) – Services that provide benefits to users depending on their location within the transmission system and that are shared to a greater or lesser extent by all users across the transmission system

Figure 6.3. Four-step process to determine transmission prices in Australia



Source: *TasNetworks (2025)*

6.1.2 UNITED KINGDOM

BRITNED

The Dutch and British transmission systems are connected by a 1,000 MW Interconnector between Maasvlakte in the Netherlands and the Isle of Grain in England, known as BritNed Development Limited ("BritNed")[11]. The Interconnector supports electricity trading in both directions and is operated by BritNed. BritNed offers third parties the right to use the Interconnector. BritNed operates as an independent transmission operator that allocates interconnector capacity to third parties through explicit auctions (long-term, day-ahead, and intraday), with terms defining who can participate, how auctions are conducted, how capacity is used, and how payments and disputes are handled. Unlike a vertically integrated utility model, transmission access is treated as a structured, market-based service with clearly defined rights and obligations for all participants on a non-discriminatory basis.

A central feature is the auction-based allocation of Physical Transmission Rights (PTRs) across multiple timeframes (annual, seasonal, quarterly, monthly, weekly, day-ahead, and intraday). Capacity is awarded through merit-order bidding, subject to a reserve price and detailed auction specifications. Auction results publish marginal prices, allocated capacity, number of participants, and congestion income. This demonstrates how transmission capacity can be transparently priced and allocated through market mechanisms, an approach relevant for jurisdictions considering cross-border interconnections or competitive transmission access frameworks.

The financial architecture is constructed in mechanisms where participants must pay for allocated capacity even if they do not ultimately use it, making transmission rights firm financial commitments. The rules require collateral in the form of bank guarantees or cash deposits, and each participant is subject to a continuously updated credit limit. Late payments trigger interest, collateral calls, and potential suspension. This credit-secured structure is critical for managing counterparty risk and ensuring bankable, revenue-backed transmission operations.

The framework also includes mechanisms such as Use-It-Or-Sell-It (UIOSI) and Use-It-Or-Lose-It (UIOLI), along with defined procedures for reduction periods, forced outages, and curtailment. These provisions prevent capacity hoarding, promote efficient utilization of the interconnector, and establish transparent rules for handling congestion or system constraints. Clear secondary trading and curtailment rules are essential for maintaining market confidence and operational fairness in any transmission system that introduces tradable capacity rights.

Finally, the access rules are embedded within a robust legal and regulatory framework, including defined dispute-resolution procedures, suspension and termination rights, regulatory notification requirements, and coordination among transmission system operators. This highlights that market-based transmission models require not only technical infrastructure but also institutional, financial, and legal frameworks to function effectively. BritNed provides an example of how interconnector transmission assets can operate under commercially disciplined, transparent, and regulatorily supervised arrangements.

6.1.3 INDIA

INDIGRID INVESTMENT TRUST

IndiGrid[12] is India's first and largest Infrastructure Investment Trust (InvIT) in the power transmission sector. It owns, operates, and manages power transmission networks and renewable energy assets throughout India. IndiGrid is registered with SEBI (Infrastructure Investment Trusts) Regulations, 2014. following the InvIT Regulations. InvITs have emerged as a key vehicle for infrastructure investments, helping churn developers' equity capital into newer development.

An InvIT is a pooled investment vehicle that enables individual and institutional investors to invest in infrastructure projects and earn a portion of the distributable income as a return. InvIT is designed as a tiered structure, with the Sponsor setting up the InvIT, which in turn invests in eligible infrastructure projects, either directly or via special-purpose vehicles (SPVs). Although like a Mutual Fund (MF), an InvIT is a pooled investment vehicle, however, while an MF invests in different stocks or bonds on its investors' behalf, InvITs invest in different income-generating infrastructure projects to own, operate and manage them until the end of respective concession periods. Table 6.1 compares MF and InvIT.

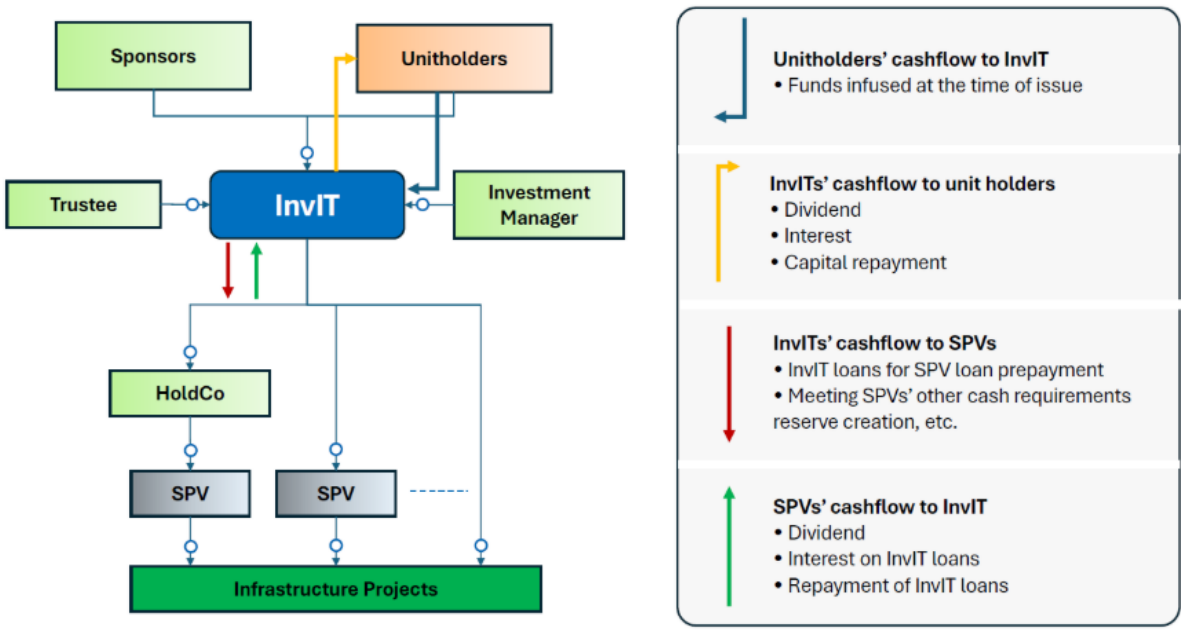
Table 6.1. Comparison of Mutual Fund and InvIT

Parameter	Mutual Fund (MF)	Infrastructure Investment Trust (InvIT)
Underlying investment/ asset	Stocks and bonds	Infrastructure projects (roads, transmission lines, telecom towers, pipelines, etc.)
Management of investment	Managed by Fund Manager/ CIO	Managed by Investment Manager Entity
Unit purchase	MFs (excluding ETFs) are not traded on exchanges and are to be bought directly from fund companies or via brokers	Like shares of equity companies, units on publicly listed InvITs can be traded on stock exchanges
Risk exposure	Carry high exposure to stock market volatility	Primary dependence on the performance of underlying infrastructural assets

Source: *Authors' analysis based on IndiGrid Factsheet (2025)*

An InVit raises capital from investors through primary issuances and debt from lenders while being within the prescribed Net Debt to AUM threshold. It acquires commercially operational infrastructure assets (at least 80% of the AUM) from developers through a combination of debt and equity funding. Finally, the InVit collects revenue generated through the assets while managing their operations and maintenance and gives back at least 90% of Net Distributable Cash Flow (NDCF) generated through the assets to its investors (unitholders) in the form of Distribution Per Unit (DPU). Structure and cash flows in India InvIT are highlighted in Figure 6.4.

Figure 6.4. Structure and Cashflow of India's InvIT



Source: *CPI analysis based on IndiGrid Factsheet (2025)*

FEATURES AND BENEFITS OF AN INVIT

In India, InvITs such as IndiGrid Investment Trust are designed under a strong regulatory framework that makes them relatively secure and transparent investment vehicles for infrastructure assets. Key regulatory provisions require InvITs to distribute at least 90% of net distributable cash flow to unit holders on a semi-annual basis, ensuring consistent income for investors. Additionally, a minimum of 80% of the portfolio must consist of operational infrastructure assets, which reduces construction risk and stabilizes cash flows. Financial discipline is further reinforced through a leverage ceiling of 70% and mandatory AAA credit ratings, while governance safeguards include unit-holder approval for major decisions and board representation for investors holding more than 10% of units, strengthening investor oversight and accountability.

These regulatory features enable InvITs to play an important role across the infrastructure value chain. They provide a long-term financing mechanism for operating infrastructure assets, allowing developers to monetize completed projects and recycle capital into new infrastructure development. At the same time, InvITs introduce higher governance standards and transparency in infrastructure asset management, while enabling retail and institutional investors to access diversified infrastructure investments that were previously difficult to access directly. As a result, InvITs offer relatively stable, low-risk investment opportunities for long-term investors, with steady cash distributions and potential capital appreciation, while simultaneously supporting infrastructure development. Table 6.2 recapitulates the growth of InvITs in India and globally.

Table 6.2. Growth of InvITs in India and Globally

As of FY 2023	US	Singapore	Japan	UK	India
Year of introduction	1960	1999	2000	2007	2014
Number of publicly listed active REITs/ InvITs	160	38	58	49	8
Maximum leverage cap	No limit	45%	No limit	No limit	REIT: 49% InvIT: 70%
Market capitalization (INR Bn)	~99,500	~5,500	~8,750	~5,500	~1,000
% of stock market cap	4.7%	14.3%	2.5%	2.0%	0.3%

Source: *S&P CapIQ as of November 2023; NAREIT as of September 30, 2023, IndiGrid presentation (2025)*

6.1.4 CHINA

STATE GRID CORPORATION OF CHINA[13]

There are several financing structures recommended to support the development of large-scale transmission infrastructure while managing financial risk and reducing the capital burden on the transmission utility. These models aim to mobilize private and international financing while maintaining operational reliability and strategic control of transmission assets. Each model uses a different combination of project ownership, financing responsibility, and operational control to distribute risks between the utility, investors, and contractors.

Across the models, a Transmission Service Charge (TSC) mechanism is typically used as the main revenue structure. This charge compensates investors or service providers for capital investment, operational costs, and expected returns. The TSC may include fixed components to cover capital costs and variable components linked to performance indicators such as operational availability or service quality. Adjustments for currency fluctuations, inflation, or pass-through costs can also be incorporated to maintain financial viability over the project lifetime.

The three models differ mainly in ownership structure, balance sheet implications, and risk allocation. In the Managed Service model, the transmission asset remains owned by the utility while private partners operate and manage the asset. In the BOOT model, private investors finance, build, own, and operate the asset for a concession period before transferring it to the utility. Meanwhile, the EPC+F model relies on export credit financing tied to equipment procurement, where contractors arrange financing while the utility remains the borrower. These distinctions influence investor appetite, regulatory requirements, and the overall financial impact on the utility.

1. Managed Service Model (BMT)

The Managed Service model (Build–Manage–Transfer) allows a private service provider to finance and manage the development of transmission infrastructure while the ownership of the asset remains with the utility. A special purpose vehicle (SPV) is typically established to

handle financing and project implementation, supported by equity from investors and debt from financial institutions. The SPV constructs the transmission asset through EPC contracts and operates it under a service agreement with the utility.

What distinguishes the Managed Service model from the others is that the asset stays on the utility's balance sheet while operational responsibilities are delegated to the private partner. The service provider receives a Transmission Service Charge covering capital recovery, operating costs, and equity returns. Risk is shared between the investor and the utility, and the utility maintains strong control over asset performance and operational standards. This structure is suitable for strategic or high-risk projects where the utility wants to retain ownership but still leverage private sector expertise and financing.

2. BOOT Model

The BOOT model (Build–Own–Operate–Transfer) gives investors greater responsibility for the project lifecycle. Private investors finance, build, and operate the transmission infrastructure through a project company established for the project. During the concession period, the investor owns the asset and recovers its investment through a Transmission Service Charge paid by the utility under a long-term transmission service agreement.

The key difference from the Managed Service model is that the asset is owned and financed by the private investor during the concession period, meaning it can be treated as off-balance sheet for the utility. Investors also bear most of the financial and operational risks, including construction, financing, and performance risks. At the end of the agreed operating period, the asset is transferred back to the utility. This model can reduce the utility's capital burden but typically results in higher service charges due to the higher risk assumed by investors.

3. EPC + Financing Model (EPC+F)

The EPC+F model (Engineering, Procurement, Construction plus Financing) is structured around export credit financing arrangements. In this model, the EPC contractor or equipment supplier arranges financing, often supported by export credit agencies, to fund the construction of the transmission infrastructure. The utility remains the borrower and repays the loan over time, typically with sovereign guarantees or government backing, depending on the structure.

Unlike the Managed Service and BOOT models, the EPC+F model does not introduce a separate project company responsible for ownership and operation of the asset. Instead, the contractor focuses on delivering the infrastructure while facilitating access to long-term financing from international lenders. This model is usually easier to implement and can offer competitive financing costs due to export credit support, but it does not significantly shift risk away from the utility, and the financing obligation typically remains on the utility's balance sheet.

6.1.5 COMPARISON OF OTHER COUNTRIES: UK, GERMANY, AUSTRALIA, US

International benchmarking in precedent countries exists. Table 6.3 compares the existing transmission business in the UK, Germany, Australia, and the US, which is regulated under the relevant authorities.

Table 6.3. Comparison of transmission business regulation

UK	Germany	Australia	US
▪ Office of Gas and Electricity Markets (OFGEM) oversees the economic regulation, bids and terms and conditions for offshore transmission projects in the UK. ▪ OFGEM offers a Cap and Floor regime, which, through a bidding process, allows a maximum/ minimum revenue that transmission operators can earn	▪ The Federal Network Agency (BNetzA) oversees the regulation of electricity transmission networks, and the network tariff regulation comprises the Incentive Regulation Ordinance (ARegV) and the Electricity Network Charges Ordinance (StromNEV). ▪ Under the ARegV, BNetzA sets an annual revenue cap for network operators over the next five years. However, for special investments such as offshore transmission, this revenue cap may be increased.	▪ The Australian Energy Regulator (AER) oversees the economic regulation of electricity transmission and distribution networks. The AER sets the maximum allowed revenue (MAR) that network companies can earn. ▪ AER reviews and approves revenue proposals from network companies, considering operational expenditures and investment plans in line with the National Electricity Rules (NER).	▪ The Federal Energy Regulatory Commission (FERC) regulates transmission rates, terms and conditions of transmission projects for most parts of the states, excluding. states that have regulated electricity markets. ▪ FERC reviews formula rates submitted by utility companies and approves the desired return rate in accordance with the "formula rate protocol flow".

Source: *Kansai Electric Power workshop material (2025)*

In terms of revenue structure, investors' return is structured to cover capital costs, operating costs, depreciation costs, tax allowance and investor's return, with a cap in some countries (Table 6.4).

Table 6.4. Comparison of the revenue structure of transmission businesses

UK	Germany	Australia	US
▪ The Cap and Floor set a Regulatory Asset Value (RAV), for which the cap/ floor allowances are paid for the RAV, OPEX, plus tax allowance ▪ • The Cap is calculated using a Capital Asset Pricing Model (CAPM) to calculate the Cost of Equity = Risk-free rate + Equity Beta (Equity Risk Premium – RPI adjustment*) ▪ The Floor refers to the cost of Debt, which is calculated using the Yields of "GBP Non-Financials 10+ years" Indices and the British Government securities	▪ BNetzA sets the annual revenue cap for each network operator (TSO) based on their actual past operating costs, a rate of return on investment defined by BNetzA and efficiency benchmarks including transmission operators from other EU countries. ▪ For special investments like offshore transmission projects, the revenue cap is raised to cover the capital costs comprising depreciation, interest on borrowed capital, return on equity, trade tax and operating expenses.	▪ AER sets the allowed rate of return, a weighted average of the return on debt and equity. The return on equity (ROE) is determined through CAPM, using comparators and benchmarks. ▪ Allowed Revenue = (Regulatory Asset Base (RAB) x Weighted Average Cost of Capital (WACC)) + Depreciation + Operating Expenditure + Tax Allowance +/ Incentives + Pass-Through Items	▪ Allowed return rate, return on equity (ROE), is set by FERC, where ROE methodology is based on 3 models (Two step DCF, CAPM and Risk premium). ▪ Transmission Rates Formula: Cost of Services = O&M + Depreciation Expense + Other Expenses + Income Taxes + Other Taxes –Other Revenue + Allowed Return

Source: *Kansai Electric Power workshop material (2025)*

KEY INTERNATIONAL PRECEDENT

The NeuConnect HVDC interconnector between the United Kingdom and Germany as a key international precedent for transmission infrastructure projects. The project involves the development of a subsea high-voltage direct current (HVDC) interconnector with a transmission capacity of approximately 1,400 MW, a cable length of around 720 km, and an operating voltage of 500 kV DC. This large-scale interconnection project is designed to facilitate cross-border electricity exchange and enhance the integration of renewable energy resources between the two countries.

From a commercial perspective, the project adopts a revenue structure that differs across jurisdictions. On the UK side, the project applies a cap-and-floor availability payment mechanism, which sets minimum and maximum revenue thresholds to balance investor returns and consumer protection. Meanwhile, on the German side, the project uses a cost-plus availability payment structure, allowing investors to recover project costs along with a defined return. This dual approach helps provide stable and predictable revenues for investors while limiting the risk of excessive tariffs for electricity consumers, making the model a relevant reference for designing transmission PPP schemes in Indonesia.

From these international examples, several design principles emerge:

1. Availability-based payment reduces revenue risk: Transmission investors prefer availability payments rather than usage-based tariffs because power flow is controlled by the system operator (PLN).
2. Government support is often required for first projects: Guarantees, regulatory clarity, or revenue caps are commonly used to de-risk early transmission PPP projects.
3. Interconnector projects often use HVDC technology: HVDC is typically chosen for long-distance or submarine transmission links, similar to the proposed Indonesia inter-island projects.
4. Transmission PPP structures rely on SPVs: Projects are usually developed through a special purpose vehicle (SPV) financed with 70–80% debt and 20–30% equity.

climatepolicyinitiative.org