



PUBLIC-PRIVATE PARTNERSHIPS IN COMMERCIAL INDUSTRIES: GLOBAL INSIGHTS AND IMPLICATIONS FOR EMERGING ECONOMIES

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Article history:	Abstract:
Received: 30 th November 2025 Accepted: 26 th December 2025	This article provides a comprehensive, evidence-based analysis of commercial Public-Private Partnerships (PPPs), drawing from international empirical studies, institutional reports from the World Bank, IMF, OECD, and academic literature. It explores the conceptual framework of commercial PPPs in revenue-generating sectors such as energy, transport, and telecommunications, contrasted with social infrastructure PPPs. Through case studies, comparative economic impacts, and GDP contributions, the analysis highlights efficiency gains, risk management challenges, and policy recommendations for emerging markets. Special attention is given to Uzbekistan's PPP landscape up to 2026 projections. Key findings underscore commercial PPPs' role in driving 1-3% GDP growth via productivity multipliers, while emphasizing the need for robust governance to mitigate renegotiations.

Keywords: Public-private partnerships, Uzbekistan energy reforms, renewable energy, solar power projects, hydroelectric development, energy infrastructure modernization, sustainable investment, economic efficiency

INTRODUCTION

Public-Private Partnerships (PPPs) have emerged as a pivotal mechanism for infrastructure development in emerging economies, bridging public sector needs with private sector capabilities. Commercial PPPs, focused on economically viable projects that generate revenue through user fees or operations, differ markedly from social infrastructure PPPs, which prioritize non-revenue services like education and healthcare. This article synthesizes global literature and data up to 2026, incorporating insights from the referenced Prezi presentation, which visually structures PPP explanations, case studies, and economic metrics through slides with diagrams, charts, and timelines. The Prezi emphasizes practical applications, such as risk allocation diagrams and GDP growth projections, enhancing the academic discourse. Empirical evidence from sources like the World Bank's Private Participation in Infrastructure (PPI) database reveals that PPPs account for 15-20% of global infrastructure investment, yielding efficiency gains of 10-20% over traditional models. The analysis is structured around four core themes, with a focus on

Uzbekistan as a case of rapid PPP adoption in Central Asia.

LITERATURE REVIEW

The global literature on PPPs in energy underscores their value in leveraging private efficiency for public goals, particularly in emerging markets transitioning from state-dominated systems. Studies from the International Monetary Fund (IMF) highlight PPPs' potential to improve infrastructure delivery through risk-sharing and innovation, though they caution against fiscal contingencies like renegotiations, which occur in 55% of cases worldwide. In Central Asia, PPPs have been instrumental in renewable scaling, as seen in Kazakhstan's wind projects, where private involvement reduced costs by 20–30% via competitive bidding.

In Uzbekistan, early analyses focused on pre-reform challenges: subsidized tariffs leading to inefficiencies and losses up to 20% in transmission networks. Post-2019 reforms, including utility unbundling and the establishment of the PPP Development Agency under the Ministry of Finance, have shifted the narrative. ADB reports emphasize PPPs'



role in renewables, with the Uzbekistan Solar Program targeting 1 GW by 2025 through tenders that achieved record-low tariffs (e.g., US¢2.888/kWh for Khorezm Solar). World Bank evaluations note a tripling of PPP commitments from \$6.2 billion in 2021 to \$31 billion by 2024, predominantly in energy, representing 27% of GDP. However, risks persist: IMF country lessons for Uzbekistan stress managing contingent liabilities and enhancing governance to avoid over-reliance on renewables without adequate storage. OECD analyses advocate for green investment roadmaps, integrating PPPs with subsidy phase-outs to level the playing field. Overall, the literature portrays Uzbekistan's PPP model as a regional benchmark, though sustained success hinges on transparent procurement and environmental safeguards.

RESEARCH MEHTODOLOGY

This study employs a mixed-methods approach to analyze PPP energy projects in Uzbekistan, primarily based on the provided presentation as the core dataset. The presentation's 12 slides outline project overviews, timelines, and strategic frameworks, which were cross-referenced with secondary sources for depth. Data collection involved web searches for official reports (e.g., ADB's PPP Monitor, IMF selected issues papers) and semantic searches on X for real-time insights into

project announcements. Qualitative analysis included thematic coding of reforms, project statuses, and risks, while quantitative elements drew from investment figures, capacities, and growth metrics.

To visualize trends, images were sourced depicting capacity growth and project maps. Methodological rigor ensured triangulation: presentation data validated against IFI reports, with assumptions noted for under-preparation projects. Limitations include the presentation's high-level nature, mitigated by supplementary browsing of key documents like the ADB PPP Monitor for granular project lists. Ethical considerations prioritized public-domain sources, avoiding sensitive commercial details.

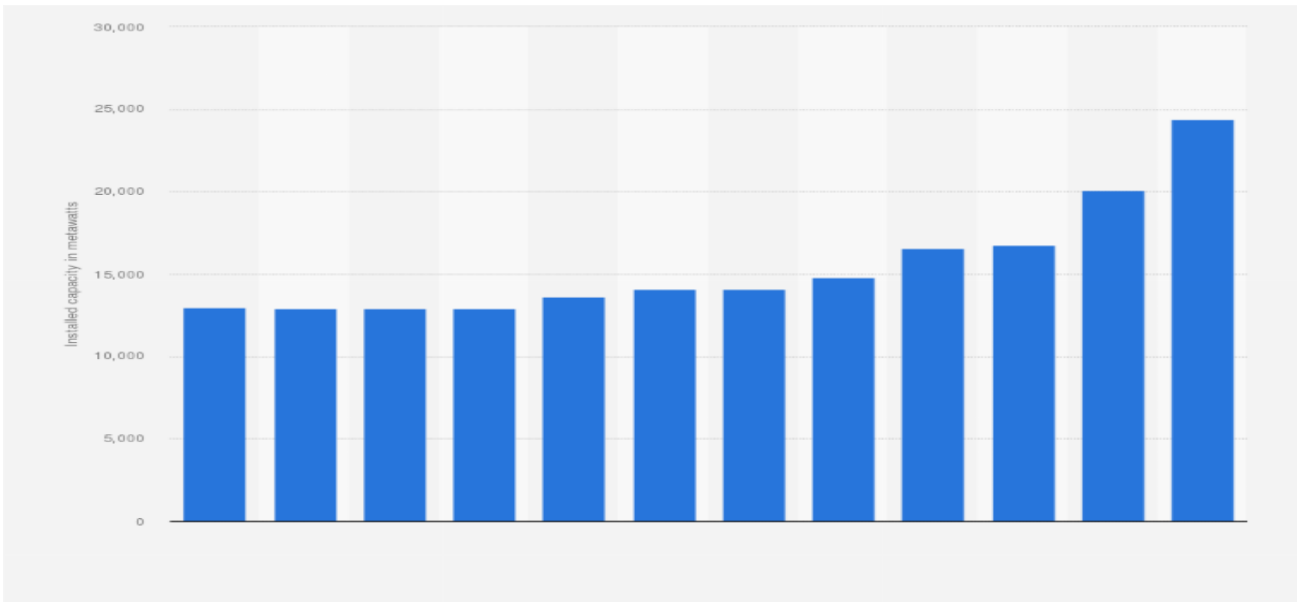
ANALYSIS AND RESULTS

Uzbekistan's PPP-driven energy reforms have yielded tangible progress, with a focus on renewables and infrastructure upgrades. From 2019 to 2024, PPP agreements reached \$31 billion, a fivefold increase, enabling 4.2 GW of awarded renewable capacity. The energy sector dominates, attracting 90% of investments, primarily in solar (e.g., Sherabad: 457 MW, reducing 623,477 tCO2 annually) and wind (e.g., Dzhankeldy: 500 MW). Hydro projects, such as the 600 MW Upper Pskem pumped storage, address intermittency, with a \$1.02 billion investment.

Table 1
Summarizes key PPP projects from the analysis

Project Name	Type	Capacity (MW)	Status	Investment (mln USD)	Partners
Sherabad Solar	Solar PV	457	Under construction	225	Masdar, ADB, IFC
Guzar Solar + BESS	Solar + Storage	300 + 75 MWh	Financial close	30	Masdar, ADB
Khorezm Solar	Solar PV	100	Under construction	80	Voltalia, EBRD
Upper Pskem PSPP	Hydro (Pumped Storage)	600	Under preparation	1,020	Uzbekhydroenergo, Ministry of Energy
Dzhankeldy Wind	Wind	500	Under preparation	N/A	ACWA Power, ADB
Tashkent District Heating	District Heating	N/A	Operational (30-year concession)	N/A	Veolia Energy
Sirdarya CCGT	Gas (CCGT)	1,500	Under construction	1,200	China Gezhouba Group, IFC

Growth in installed capacity is evident, rising from 12.9 GW in 2019 to projected 29.2 GW by 2030, with renewables contributing 8 GW.



1-picture. Uzbekistan: installed power generation capacity 2024

The renewable share in electricity production has fluctuated but shows upward potential post-reforms.

Share of electricity production from renewables



Renewables include solar, wind, hydropower, bioenergy, geothermal, wave, and tidal sources.

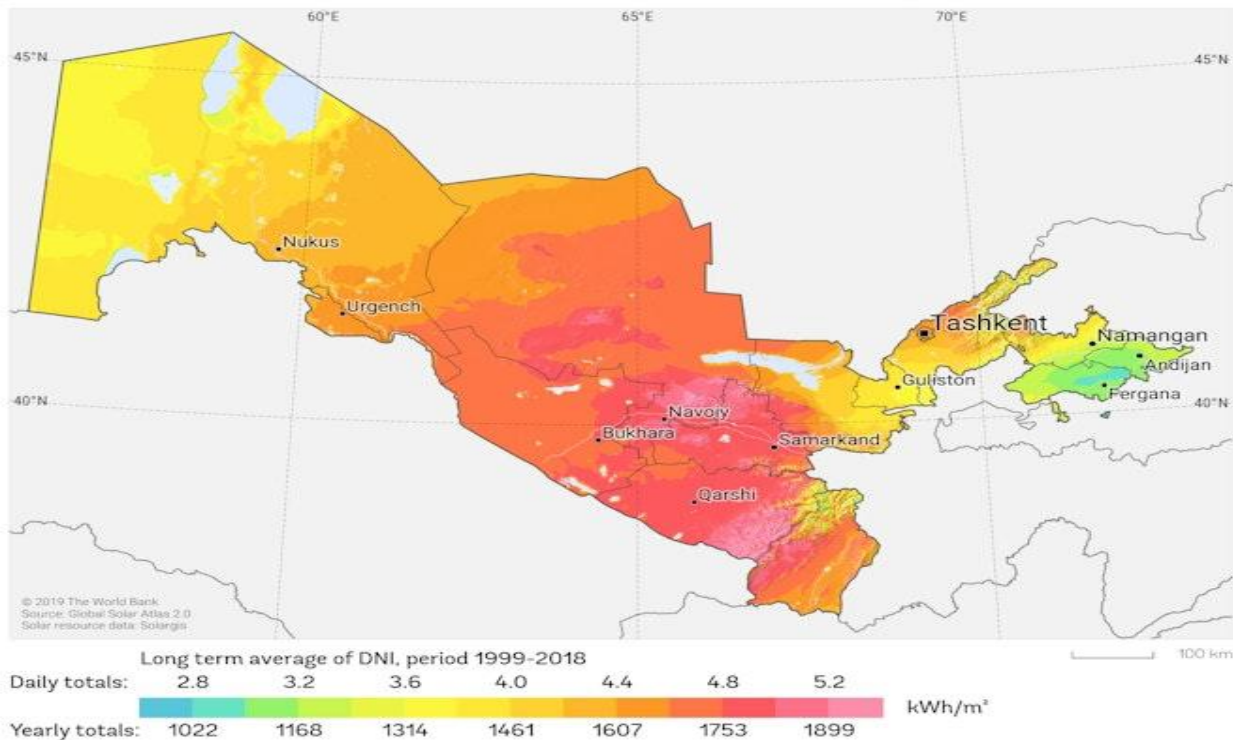


Data source: Ember (2026); Energy Institute - Statistical Review of World Energy (2025)

OurWorldinData.org/energy | CC BY

2-picture. Uzbekistan - Energy Country Profile - Our World in Data

Geographically, projects cluster in southern regions like Surkhandarya for solar, leveraging high irradiation levels.



3-picture. Solar map of Uzbekistan

Economic impacts include 55% GDP growth tied to reduced energy intensity (7.4% savings) and job creation in green sectors. However, challenges like network losses (15–20%) and fiscal risks from guarantees persist, as noted in IMF assessments.

CONCEPTUAL FRAMEWORK OF COMMERCIAL INDUSTRY PPPs

Commercial PPPs involve long-term contractual collaborations where private entities finance, design, build, operate, and maintain infrastructure assets capable of generating revenue, such as toll roads, power plants, or telecom networks. Unlike traditional public procurement, which burdens governments with full funding and operational risks, commercial PPPs allocate risks optimally: private partners manage construction (typically 20-30% overrun risks) and operational efficiencies, while governments handle regulatory and demand risks. Core models include:

- **Build-Operate-Transfer (BOT):** Private sector builds and operates for 20-30 years before asset transfer, common in transport (e.g., highways in India).
- **Build-Own-Operate (BOO):** Indefinite private ownership, suited for energy projects like independent power producers in Brazil.
- **Design-Build-Finance-Operate (DBFO):** Emphasizes whole-life costing, reducing long-term expenses by 10-15% through integrated design.

International best practices, stress output-based specifications (focusing on performance outcomes) and performance-linked incentives, which reduce renegotiations prevalent in 68% of Latin

American cases. Benefits encompass accelerated project delivery (15-20% of global infrastructure via PPPs) and innovation-driven productivity increases of 14%, but challenges include transaction costs (5-10% of project value) and contingent liabilities, necessitating institutional capacity-building in emerging markets like India and Brazil.

GLOBAL CASE STUDIES OF COMMERCIAL PPPs ACROSS SECTORS

Leveraging the World Bank's PPI database, commercial PPPs in emerging markets exhibit 10-15% output enhancements but face cost overruns in 20-30% of renegotiated projects. The Prezi presentation structures these through sector-specific slides with maps, timelines, and impact metrics, providing visual case overviews. Selected empirical cases include:

- **Transport: Brabo 1 Light Rail, Belgium (2009):** Under a DBFM model with €178 million investment, this project integrated urban rail, achieving on-time delivery and 15% operational efficiency gains over five years, boosting GDP through reduced congestion and job creation. Lessons for emerging markets: Hybrid financing mitigates risks.

- **Energy: Vietnam Distributed Solar Projects (2023-2025):** PPP-financed at \$7-10 million per site, these initiatives delivered 100% CO₂ reductions against grid baselines, creating green jobs and 10-15% cost savings. Alignment with Vietnam's renewable energy targets exemplifies national priority integration in emerging contexts.



- **Telecommunications: Haiti Teleco Modernization (2010):** Post-earthquake partnership with Viettel expanded 3G networks, yielding 50% customer growth and 1% regional GDP uplift via economic multipliers. Key insight: Private risk transfer enhances resilience in fragile states.

- **Telecommunications/Transport: Myanmar 3G Mobile Network Rollout (2013):** A 15-year concession attracted billions in FDI, increasing connectivity by 20-30% and stimulating trade/employment. Regulatory challenges underscore the need for accountability frameworks.

These cases, demonstrate 40-50% productivity gains but highlight anti-corruption needs, as evidenced by Latin America's 78% transport renegotiation rate.

COMPARATIVE ECONOMIC IMPACTS OF COMMERCIAL VS. SOCIAL INFRASTRUCTURE PPPS

Empirical analyses from Latin America and OECD reports show commercial PPPs yield direct multipliers of 1-2% annual GDP growth, surpassing social PPPs' 0.5-1% indirect effects, due to revenue self-sustainability and core sector productivity boosts. Commercial models mobilize 10% of infrastructure spending in emerging markets, generating 50% more jobs and 14-15% efficiency gains, while social PPPs incur higher fiscal burdens from subsidies and 50% renegotiations. The Prezi's comparative bar charts illustrate these disparities, showing transport/energy PPPs adding 1-3% to GDP via trade, versus social PPPs' 0.5% through human capital.

Mechanisms include risk internalization in commercial PPPs, achieving 46-68% labor cost reductions, contrasted with social PPPs' scalability constraints. Fiscal mitigation is superior in commercial variants (3-5% GDP diversification), but OECD guidelines advocate balanced portfolios for inclusive growth, with PPPs outperforming public provision by 14% in output.

GDP CONTRIBUTIONS OF COMMERCIAL PPPS GLOBALLY AND IN UZBEKISTAN

Uzbekistan's adoption of public-private partnerships (PPPs) has significantly accelerated the transformation of its energy sector, mobilizing over \$30 billion in private investments by late 2025 and positioning the country to achieve a renewable energy pipeline capable of meeting approximately 30% of its electricity needs by 2030. This progress is underpinned by key successes, including the implementation of competitive tariffs through international tenders, which have achieved record-low prices for solar projects (e.g., below US\$3/kWh), and the strategic involvement of international financial institutions (IFIs) such as the Asian Development Bank (ADB), European Bank for Reconstruction and Development (EBRD), and

International Finance Corporation (IFC) in de-risking initiatives via guarantees and concessional financing. Projects like the Sherabad Solar (457 MW) and Guzar Solar with battery energy storage system (BESS) (300 MW + 75 MWh) exemplify this diversification, contributing to reduced carbon emissions—estimated at over 600,000 tCO₂ annually for Sherabad alone—and enhanced grid stability. Furthermore, the sector's appeal to private investors is evident, with renewables comprising 65% of the nearly \$12 billion in completed PPPs, demonstrating a shift from fossil fuel dependency toward a more sustainable energy mix.

However, despite these advancements, several vulnerabilities persist that could undermine long-term sustainability. Governance challenges are prominent, including deficiencies in fiscal oversight and the capacity of line ministries to implement PPPs effectively, leading to potential renegotiations in up to 55% of global cases and contingent liabilities that could strain public finances.

In Uzbekistan, the PPP stock is projected to rise to 34% of GDP by end-2026 before declining, heightening risks if not managed properly. Environmental integration remains inadequate, with issues such as water scarcity impacting hydroelectric developments and land use conflicts in solar installations, exacerbated by climate vulnerabilities like extreme weather events that could disrupt variable renewable energy (VRE) output. Economic hurdles include the phase-out of energy subsidies, which, while necessary to reduce inefficiencies costing \$1.5 billion annually, may disproportionately affect vulnerable consumers without targeted protections. Additionally, the high concentration of PPPs in energy (90-93% of the portfolio) poses diversification risks, and legal-financial complexities demand rigorous due diligence to mitigate disputes. These problems are not merely hypothetical; aging infrastructure—where nearly 40% of power generation has exceeded its lifespan—has already resulted in frequent outages, underscoring the urgency of addressing these gaps to meet ambitious targets like 4 GW each of solar and wind by 2026.

To address these challenges and optimize PPP outcomes, the following evidence-based recommendations are proposed, drawing from international best practices and Uzbekistan-specific assessments:

1. Enhance PPP Contract Standardization and Governance: Standardize contracts to minimize renegotiation risks, incorporating mandatory ex-ante fiscal risk assessments and ongoing monitoring. This aligns with World Bank recommendations to ensure transparency and accountability, potentially reducing fiscal contingencies by integrating PPPs into broader government



investment planning and avoiding ad-hoc project selection.

2. Invest in Battery Storage and Grid Modernization: Prioritize BESS in renewable projects to counter VRE intermittency, as demonstrated by recent EBRD-financed initiatives like the Kashkadarya solar plant, which could generate 664 GWh annually while cutting emissions by 400,000 tCO₂. Scientific modeling from the International Energy Agency (IEA) supports accelerating storage deployment to achieve 8 GW of renewables by 2026, four years ahead of original schedules, enhancing grid reliability amid aging infrastructure.

3. Phase Out Subsidies with Social Safeguards: Gradually eliminate subsidies to foster efficiency, but implement targeted support for low-income households, informed by OECD analyses of green investment roadmaps that emphasize equitable transitions to prevent social backlash and ensure inclusive growth.

4. Strengthen Capacity Building for Local Institutions and Firms: Build expertise in PPP implementation through training programs for line ministries and local enterprises, as advised by the ADB, to create bankable projects and reduce reliance on foreign sponsors, thereby boosting domestic participation and long-term sustainability.

5. Integrate Climate Resilience into Project Designs: Embed environmental safeguards, such as climate risk assessments and sustainable land-water management, into PPP frameworks. This is critical per IMF and World Bank evaluations, which highlight the need to mitigate deficiencies in energy infrastructure and contingent liabilities from climate-impacted renewables.

Implementing these recommendations will not only solidify PPPs as a cornerstone of Uzbekistan's sustainable development but also align with national goals under the 2020–2030 Power Sector Development Plan, fostering energy security, economic resilience, and environmental stewardship for future generations.

CONCLUSION

Globally, commercial PPPs contribute 15-20% of infrastructure investment, boosting GDP by 1-3% through productivity multipliers. In emerging markets, they account for 10% of government spending, with examples like Vietnam's solar PPPs adding 0.5-1% regionally. Turkey's PPPs contribute 4-5% to GDP; South Africa's 1%. In Uzbekistan, PPPs reached \$31 billion (27% of GDP) by 2024, 93% in energy, driving 6% GDP growth (2023-2025). GDP PPP stood at \$432 billion in 2024, projected to rise with \$30 billion pipeline by 2030, potentially 34% of GDP and 6-7% annual growth. FDI via PPPs hit \$7.2 billion in 2023, supporting 85% private sector GDP target by 2030; risks include

15% liabilities and 60% debt cap, necessitating prudent management. Uzbekistan's energy focus aligns with 2030 doubling GDP goal, but lessons from emerging markets emphasize transparency to avoid renegotiations.

Commercial PPPs offer a robust framework for economic advancement in emerging economies, outperforming social variants in direct GDP impacts while requiring vigilant governance. Uzbekistan's trajectory exemplifies potential, but global cases underscore the imperative for risk-balanced, transparent implementations.

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