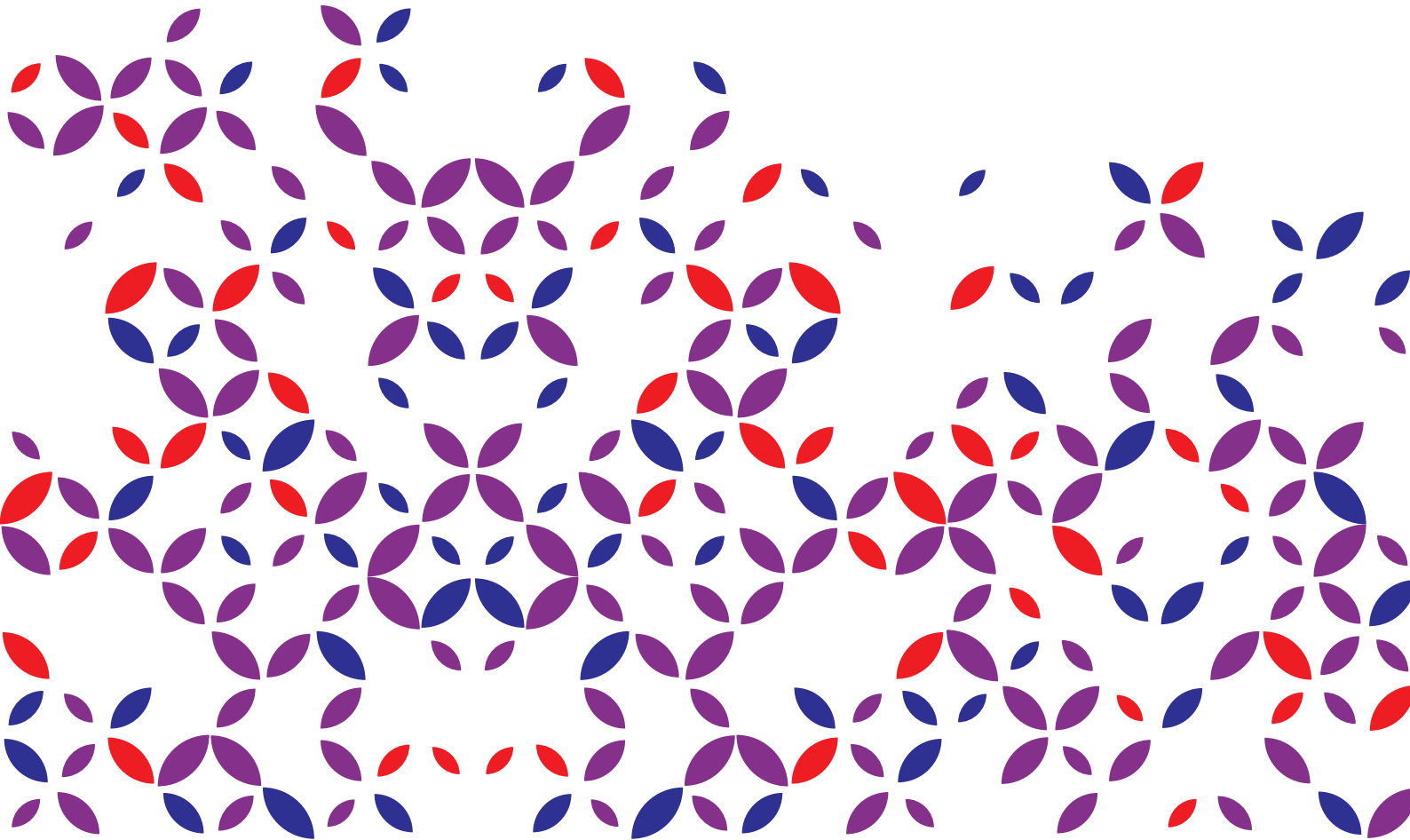
Sri Lanka Integrated National Financing Framework (INFF)

Financing Strategy for an Inclusive and Equitable Renewable Energy Transition

September 2025



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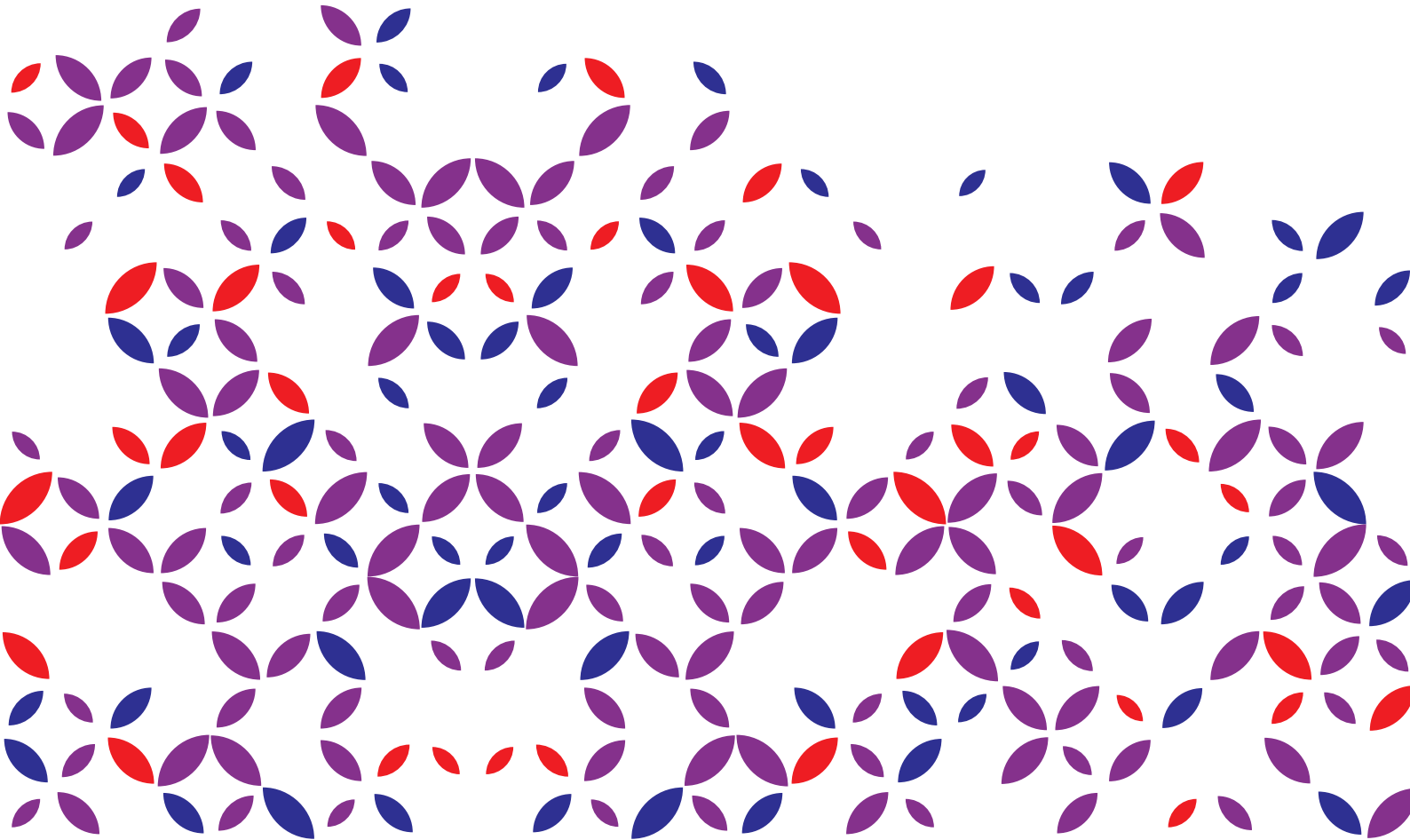


Table of Contents

1. Introduction

1.1 Background – The INFF Process

The Integrated National Financing Framework (INFF), adopted by over 85 countries globally serves as a planning and delivery tool to strengthen planning processes and overcome existing impediments to mobilise financing for sustainable development and the SDGs at the national level. It analyses a range of financing sources, domestic public resources, aid and development cooperation, and domestic and international private finance – and provides actionable recommendations that allow countries to develop a strategy to increase investment, manage risks, and achieve sustainable development priorities, aligned with national development priorities.

In Sri Lanka, an energy sector focused INFF was developed through a process led by the Ministry of Energy with support and technical collaboration from the United Nations Development Programme (UNDP). The process of developing the Sri Lanka INFF has involved extensive consultations across government, private sector, development partners and academic institutions over the course of two years including through three financing dialogues convened jointly by the Government of Sri Lanka and UNDP. This has culminated in the development of the INFF financing strategy for an inclusive and equitable renewable energy transition in Sri Lanka.

1.2 Context

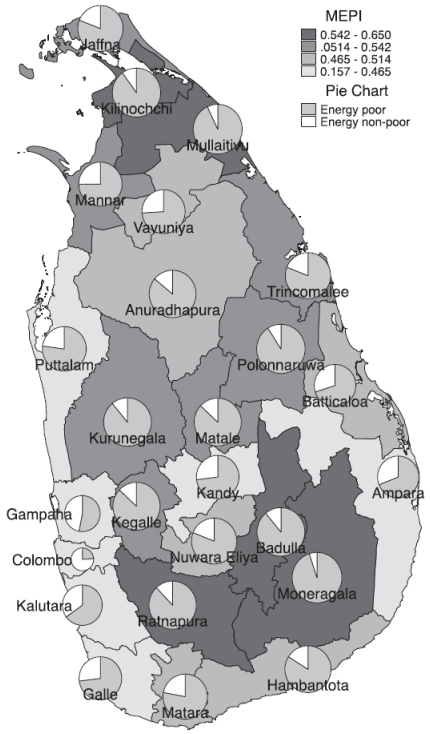
Sri Lanka has achieved near-universal electricity access in recent years officially reaching about 100% electrification by 2016[1]. This is a remarkable achievement as in Sri Lanka electrification is defined as actual household connections, not just proximity to a distribution line as in some other countries in the region. However, access alone does not equate to affordable, adequate energy for all. Amid a severe economic downturn in 2022, energy prices skyrocketed; fixed and variable electricity tariffs respectively rose by 705% and 290%, and LPG and kerosene prices respectively spiked by 225% and 290% straining household budgets[2]. Part of this challenge was structural: Sri Lanka's energy supply depends heavily on imported oil (32.5%) and coal (12.6%)[3]. Global fuel price shocks and a foreign currency crunch, thus, quickly translated into domestic shortages and price surges as seen in 2022. By 2023, Sri Lankans were paying 2.5 to 3 times more for electricity than their South Asian neighbours[4]. These cost surges led many low-income families to cut back on essential energy use bringing forth energy affordability as a critical challenge. Recent World Bank estimates indicate that poverty has more than doubled since 2019, with an estimated 23.4% of Sri

[1] ADB 2023
[2] UN-HABITAT Sri Lanka Country Report 2023
[3] SLSEA 2022
[4] Public Finance.lk

Lankans below the poverty line in 2024[5], and energy poverty - the inability to access sufficient modern energy - has likely risen in tandem. In fact, over 32% of urban poor and plantation estate households are now considered energy-poor[6]. The high prices and the economic crisis have thus pushed a significant share of the population into energy insecurity, although their households are connected to the grid.

Energy poverty in Sri Lanka is both widespread and structurally embedded. Based on the Multidimensional Energy Poverty Index (MEPI) calculation by Jayasinghe et al (2021), the national incidence of energy poverty was estimated at 71.6%, with an average deprivation intensity of 60.2%, yielding an overall MEPI score of 0.431. Disparities are evident across both sectoral and provincial classifications. By sector, the estate areas record the highest levels of energy poverty, nearly three times that of urban areas. By province, Uva registers the highest MEPI score (0.589) compared with just 0.246 in the Western Province which includes Colombo. At the district level, visual mapping shows clusters of energy deprivation across multiple provinces (Figure 1), with especially acute deficits in cooking energy, refrigeration, and access to communication and cooling appliances. Although electrification rates are high nationally, these figures mask considerable variation in the affordability and utility of energy access. For example, households in rural and estate areas often possess electricity connections but lack the means to use appliances that would meaningfully enhance their wellbeing. Income is not a sufficient proxy for energy deprivation as 67.8% of energy-poor households are not income-poor and only 5.5% fall into both categories[7]. This shows that energy poverty in Sri Lanka cannot be explained by income poverty alone but reflects broader deficits in affordable and adequate energy use.

[5] World Bank 2024
[6] UN-HABITAT Sri Lanka Country Report 2023
[7] Jayasinghe et al 2021



Note: **Western**: Colombo, Gampaha, Kalutara; **Central**: Kandy, Matale, Nuwara Eliya, **Southern**: Galle, Matara, Hambantota; **Northern**: Jaffna, Mannar, Vavuniya, Mullaitivu, Kilinochchi; **Eastern**: Batticaloa, Ampara, Trincomalee, **North Western**: Kurunegala, Puttalam, **North Central**: Anuradhapura, Polonnaruwa; **Uva**: Badulla, Moneragala; **Sabaragamuwa**: Ratnapura, Kegalle

Figure 1: District Level Distribution of the MEPI

Source: Jayasinghe et al 2021

Energy poverty in Sri Lanka has a pronounced gender dimension. Women, who traditionally shoulder most cooking and household chores, are disproportionately affected by lack of access to clean and modern energy. Only about 36.9% of Sri Lankans used clean fuels for cooking in 2023, up from 16.7% in 2000[8]. This means nearly two-thirds of households, predominantly in rural areas, still rely on traditional biomass, such as firewood, typically burned in open fires or rudimentary stoves. While improved biomass cookstoves, such as the Anagi, are available and deliver health and efficiency gains, up-to-date data on their adoption rates are limited. The burden of collecting firewood and the health impacts of indoor smoke fall largely on women. The WHO estimated around 17,408 annual deaths in Sri Lanka are attributable to indoor air pollution from solid fuels[9]. Household air pollution causes more than half of all deaths from pneumonia in children under five years of age[10]. Women and young children in energy-poor households, thus, face heightened health hazards. In rural areas, women also bear the opportunity cost of time lost to gathering fuel wood, time that could otherwise be spent on education or paid work. A 2021 study confirmed

[8] IEA 2023
[9] WHO 2025 (WHO's Global Health Observatory provides the latest estimates of household air pollution-attributable deaths based on 2019 data)
[10] MoE 2022

significant disparities in energy poverty by the gender of the household head and other socio-demographic factors[11]. Female-headed households, which constitute over a quarter of Sri Lankan homes[12], often have lower incomes and may struggle more to afford modern energy services. Moreover, during the 2022 crisis, rural women farmers were especially hard-hit by fuel and power shortages, which compromised their productivity and resilience[13]. Energy poverty, thus, is not gender-neutral; women experience more severe consequences due to cultural roles and economic inequities.

During the 2022 economic crisis, Sri Lanka's MSMEs faced acute energy-related disruptions that compounded their financial and operational vulnerabilities. Across sectors, energy access and affordability emerged as critical stress points, particularly for businesses involved in manufacturing, transport, and service delivery. A survey by the Department of Census and Statistics found that 54% to 60% of MSMEs across all scales reported severe impacts from electricity supply interruptions and fuel scarcity, with the service sector most affected. More than 50% of MSMEs in each category (micro, small, and medium) in the service and industrial sectors cited electricity outages as a major challenge, while 60%–75% of firms faced fuel-related challenges. For enterprises reliant on energy-intensive processes, the cumulative effect of electricity rationing, high diesel prices, and limited forex for importing critical inputs forced cutbacks or outright closure. Approximately 9% of micro, 2.7% of small, and 1.3% of medium MSMEs closed due to energy-linked disruptions tied to the broader economic crisis. In response, many adopted extreme coping strategies such as liquidation of personal and company assets, debt restructuring, and operational contraction[14]. The crisis revealed how energy insecurity, whether due to price shocks or supply unreliability, poses an existential threat to Sri Lanka's MSME sector, especially in the absence of institutional support and adaptive financing mechanisms.

Energy poverty has until recently been an overlooked issue in Sri Lanka's policy discourse. Sri Lanka's energy policies historically have prioritized electricity expansion over other household energy needs. The country made impressive progress extending the electrical grid achieving 100% electrification rate, but paid comparatively less attention to cooking energy and other basic energy needs. Likewise, transport fuel affordability and sustainable mobility have not received the same strategic emphasis as electric power generation. The result is a narrow definition of 'energy access' in policymaking, often equated simply with electricity connection. Such an electricity-centric approach overlooks the multidimensional nature of energy poverty. A household may be connected to grid but still cook over an open fire, or be unable to afford enough electricity or gas to meet its needs. By focusing disproportionately on electricity infrastructure,

[11] Maneka et. al. 2021
[12] UNWomen 2021
[13] UNDP 2024
[14] DCS 2023

policy makers have not fully addressed these other deficits. Hence, a more holistic energy strategy is needed that advances not only access to reliable and affordable electricity, but also clean cooking solutions, sustainable transport fuels, and, where relevant, heating and cooling, to achieve universal access to modern energy services.

1.2 Core Dimensions of the Renewable Energy Transition

A renewable energy transition in Sri Lanka involves two core dimensions: energy security and energy equity. The overarching goal is to achieve:

> *Cleaner energy options that strengthen national **energy security** while promoting greater **energy equity** for all Sri Lankans.*

Energy security in the context of Sri Lanka need to encompass reducing import dependence and strengthening resilience of energy supply chain. The 2022 crisis revealed the extent to which Sri Lanka's reliance on imported oil, coal, and LPG could cripple the economy when global prices surge or local currency reserves deplete. Extended blackouts ensued not because there was no power infrastructure per se, but because the country could not pay for fuels. Hence, energy security in the Sri Lankan context is first and foremost about reducing import dependence - whether by accelerating domestic renewables (solar, wind, and limited hydro expansions), tapping into offshore gas resources, or improving interconnections that let Sri Lanka purchase electricity more flexibly from regional partners at competitive rates. It also entails smarter management of existing power assets, shoring up the grid, cutting costly oil-fired generation where possible, and ensuring adequate fuel supply. Security also means strengthening resilience. For Sri Lanka, resilience includes the capability to cope with shocks, from currency crises to natural disasters, without letting entire communities go dark or resort to cooking over open fires. Building resilience may entail diversifying the mix of power plants, expanding distributed generation, and adopting storage solutions that can keep essential services running. In essence, energy security is a supply-side priority that aims to ensure Sri Lankans have a steady and stable flow of electricity and fuels, regardless of external shocks.

On the other hand, energy equity is about fair distribution of the benefits and burdens of energy production and use. As discussed in the preceding Section 1.1, Sri Lanka's poorest bear disproportionate hardships related to energy access and affordability. A renewable energy transition needs to tackle these accessibility and affordability gaps while also improving energy efficiency at point of use. Equity also concerns who participates in and benefits from the new energy investments and policies. Households, social and business communities, and civil society actors - especially women, youth, and those in underserved regions - need be meaningfully involved in shaping the design and delivery of energy services. Without mechanisms for participation, even well-intended policies risk reinforcing exclusion. Equity needs to be understood as a demand-side priority focused on how energy is accessed, used, and experienced by Sri Lankans in their

everyday lives, and on designing transition pathways that reflect the needs and realities of those most at risk of being left behind.

1.3 Need of the INFF Financing Strategy for Renewable Energy Transition in Sri Lanka

Sri Lanka's pursuit of a renewable energy transition unfolds in a context defined by constrained fiscal space, elevated sovereign risk, and systemic institutional gaps in energy sector governance. The energy mix continues to rely heavily on fossil fuels (52% of primary supply) and traditional biomass (31%), which remains the main source of cooking fuel for over two-thirds of households[15]. Non-biomass renewables account for just 17% of the total energy supply, and electricity demand is low per capita electricity consumption stood at only 646 kWh in 2023, and average monthly household usage was 65.4 kWh, a level consistent with subsistence consumption[16]. This low consumption is sometimes cited as a sign of energy efficiency, but in Sri Lanka's case it largely reflects structural constraints, limited industrial energy use, and affordability-driven under-consumption.

While nearly all households are connected to the national grid, access does not equate to affordability. Reforms initiated under the Electricity Act 2024 seek to modernize the sector and lay the foundation for competitive procurement and unbundled operations. However, these structural reforms are occurring alongside an urgent need to scale investment; meeting the nationally adopted target of 70% renewable electricity by 2030 will require front-loaded capital mobilization, with total investment needs estimated at USD 15–30 billion through 2035 to support both generation and system-wide integration[17]. The power sector's capital expenditure needs are front-loaded, and annual requirements are several times higher than historical investment flows. Public budgets have sharply contracted, and sovereign borrowing capacity remains limited due to the ongoing debt restructuring process.

Between 2013 to 2022, almost 70% of electricity sector financing was provided by multilateral international financial institutions (IFIs), but new commitments have slowed since Sri Lanka's default in 2022[18]. Domestic financing remains untapped due to inadequate instruments, regulatory rigidities, and the absence of scalable, creditworthy energy-sector investment vehicles.

The private sector faces persistent barriers to engagement. High exchange rate volatility, lack of currency hedging mechanisms, and the unavailability of internationally bankable PPAs have kept foreign capital largely on the sidelines. While recent large-scale renewable energy tenders have introduced US dollar-

[15] DFA UNDP 2024
[16] Ibid.
[17] Ibid.
[18] Ibid.

denominated tariffs, most contractual terms still fall short of investor expectations. Payment security arrangements, foreign exchange convertibility, and enforceable dispute resolution mechanisms remain areas of concern.

Tariff reform implemented in August 2022, under pressure from the IMF program, restored a degree of financial viability to the CEB[19] but at significant social cost. Household electricity disconnections more than doubled in 2023 compared to pre-crisis levels, and over one million residential accounts were temporarily suspended due to non-payment. Though lifeline subsidies are in place for low-usage consumers (under 60 kWh/month), affordability remains a challenge across all income groups. Simultaneously, rooftop solar adoption has grown among high-consumption households, many of whom previously cross-subsidized others. This shift threatens the stability of the cross-subsidy mechanism and emphasizes the need to reconfigure pricing structures in a manner that accounts for evolving consumption patterns while protecting the grid's financial base.

Adoption of clean cooking solutions remains limited, with only about 36.9% of the population using modern fuels and technologies[20]. The main barriers are affordability and entrenched reliance on biomass as firewood remains the cheapest and most culturally accepted option for many households. Supply chain weaknesses further constrain uptake, with distribution networks for LPG and improved biomass stoves still underdeveloped in rural and estate areas. As a result, despite universal electrification, most households continue to rely on biomass for cooking, exposing them to health and environmental risks. Progress is also hampered by the absence of a dedicated institutional mechanism to coordinate and scale clean cooking efforts leaving responsibilities fragmented across energy, health, gender, and social protection sectors.

International climate finance remains an underutilized channel. While a number of energy projects financed by ADB, JICA, and others have included mitigation components, Sri Lanka has not secured significant support from global funds such as the GCF or GEF. Access barriers include limited institutional

[19] CEB faced massive financial challenges prior to August 2022, primarily due to nearly eight years of unchanged electricity tariffs despite escalating supply costs. This led to a widening disparity between the average cost of supply and the average price of electricity pushing the entire energy sector into a dire state. CEB's retained earnings plummeted to a cumulative loss of LKR 598,047 million (US$ 1,609.35 million) by the end of 2022, and its trade payables, mainly to Ceylon Petroleum Corporation (CPC) and Independent Power Producers (IPPs), swelled to LKR 277,032 million (US$ 745.50 million) by the same time causing local commercial banks to reduce lending to the electricity sector and charge premium interest rates. To rectify these severe financial issues affecting the electricity sector and wider economy, and mandated by the IMF-supported reform program, the government was compelled to fully implement the tariff methodology based on full cost recovery principles in August 2022. These energy pricing corrections in 2022 and afterwards have rectified the situation, and removed long-standing subsidies in energy pricing (DFA UNDP 2024). In 2023, for the first time since 2015, CEB reported profit.

[20] IEA 2023

readiness, weak monitoring/reporting systems (MRV), and project fragmentation. Moreover, the absence of a national results framework aligned with climate action and social equity principles has limited the ability to present investment-grade programmatic proposals to international partners.

These findings point to the need for a more coherent financing framework that integrates equity, affordability, and resilience into the core of Sri Lanka's energy transition. Addressing structural investment gaps, de-risking private capital flows, and embedding social objectives into sector financing will require coordinated fiscal instruments and cross-sectoral alignment. The proposed INFF Financing Strategy responds directly to these constraints by offering a platform to operationalize equity-focused renewable energy transition goals.

The INFF Financing Strategy is needed to realign the financing architecture with the country's social, equity, and resilience objectives. Its primary purpose is to strengthen the bridge among three critical interconnects: (i) the interconnect between technical transition goals and social equity outcomes, (ii) the interconnect between sectoral investment planning and cross-government coordination, and (iii) the interconnect between macroeconomic constraints and financing instruments available to deliver inclusive energy access. The strategydoes not introduce new targets or policy instruments. Rather, it serves as a coordinating mechanism that operationalizes equity-linked energy priorities through the fiscal and financial systems.

The INFF Financing Strategy provides a platform to address these weaknesses and frame a more credible proposition to development partners. It offers a consolidated investment framework that can serve as a reference point for project selection, donor coordination, and climate finance engagement. This is especially critical in the context of limited fiscal space, growing pressure for debt-neutral financing, and the need to demonstrate that future energy finance, whether from MDBs, blended facilities, or carbon-linked instruments, contributes not only to mitigation outcomes, but to nationally defined social equity goals. The strategy offers a framework for how the energy transition is understood – both as a fiscal and social contract.

2. Supply-Side Energy Financing Strategies for Advancing Energy Security

2.1 Energy Infrastructure

2.1.1 Generation

Sri Lanka has committed to source 70% of electricity from renewable sources by 2030. Achieving this objective will require the addition of approximately 5 GW of new renewable capacity[21], primarily from solar,

[21] World Bank 2024

wind, and hydro. The country must also rapidly transition away from coal and oil-fired generation, which continues to impose a significant fiscal burden and exposes the power sector to global fuel price volatility. Meeting these targets will require a balanced portfolio approach of scaling up both utility-scale generation (such as solar parks and wind farms) and distributed systems, while also investing in modern grid infrastructure to accommodate variable, decentralized power flows. Without adequate reform in procurement, project preparation, and financial de-risking, however, the current institutional and investment apparatus will not be capable of supporting this scale of transformation. Strategies to operationalize the generation targets include:

ST1: Create a Centralized Renewable Project Preparation Facility

Sri Lanka's renewable energy pipeline has long been hindered by upstream project-level bottlenecks. Fragmented responsibilities across land acquisition, environmental clearance, and feasibility assessment have created unpredictable timelines and heightened development risk. While investor interest exists, several projects fail to reach financial close due to unclear site appraisals, incomplete permitting, and poor-quality technical or financial studies. This undermines competitiveness during procurement and forces developers to internalize excessive early-stage costs, which are reflected in risk premiums, reduced participation, or higher bid prices, especially in competitive tenders with limited site preparation.

A centralized Renewable Project Preparation Facility (RPPF) can resolve these issues by delivering fully prepared, investment-ready sites to competitive tenders. The RPPF's core mandate could include site identification and zoning in collaboration with provincial governments and the Land Commissioner General's Department, followed by resource mapping and grid access planning in partnership with CEB-Transmission. It could also manage environmental and social due diligence in coordination with the Central Environmental Authority, and generate standardized pre-feasibility reports, including load flow analysis and cost estimates. It could also direct engage with technical, legal, and financial advisors to structure viable public-private delivery models. This will minimize uncertainties for developers, shorten time to financial close, and reduce the premium typically demanded for unstructured project risk. Project preparation costs can be supported by cost recovery from successful bidders. To avoid overburdening the state budget, the RPPF can be funded through a combination of technical assistance from development partners, and cost recovery mechanisms, i.e. fees paid by winning developers. This would build on Sri Lanka's existing 'fully facilitated project' or 'investment solicitation' model adopted in 2016 by SLSEA and CEB, which has already helped advance several renewable projects to PPA stage, but would institutionalize it under a dedicated, multi-agency facility with enhanced upstream capacity, standardization, and funding support.

Key to success would be strong interagency coordination and an autonomous governance structure that safeguards technical decisions from undue influence. The RPPF needs to be staffed with sector experts capable of delivering credible documentation that meets foreign investors, MDB and climate fund requirements. Without pre-packaged, de-risked sites, even well-structured tenders may fail to attract competitive bids. To improve bankability, the RPPF design could proactively reflect lessons from recent

stakeholder feedback on the new SPPA, particularly concerns that curtailment clauses and output guarantees create investment uncertainty. Output-based thresholds for small RE could be avoided in tender-linked PPAs to reflect natural variability and avoid replicating utility-scale thermal IPP obligations inappropriate for small renewables. International precedents like Indonesia's IIGF and Argentina's RenovAr show that institutionalizing project preparation is central to achieving scale, especially when blended finance and guarantees depend on clear, bankable project pipelines. The Maldives have also benefitted from pre-structured site allocation and bundled procurement package enabling mobilization $42 million in private solar investment, supported by concessional finance and donor-backed guarantees. Sri Lanka's facilitation mechanism could follow a similar model packaging permits, land access, and grid connection into a single project offering. Once operationalized, this would also strengthen the credibility of upcoming auctions signalling project readiness and reducing delays that have historically driven up costs.

ST2: Launch Standardized, Competitively Procured IPP Tenders to Scale Renewable Generation

Some previous cases of unsolicited proposals and bilateral PPA negotiations has created a fragmented procurement environment that deters private investment. Without transparency, standardized documentation, or clear timelines, even well-intentioned developers have faced uncertainty during bid preparation, approval processes, and financial closure. The Electricity Act 2024 now offers legal basis for open, competitive access to the generation market. To translate this into investment-ready opportunities, the Ministry of Energy (MoE) may consider institutionalizing a dedicated renewable procurement unit with the authority to design and manage tenders using bankable, pre-approved templates for renewable energy plants exceeding a capacity of 10 MW.

This procurement unit could launch technology-differentiated auctions based on grid compatibility and site-specific constraints. It couldengage early with local authorities and land commissions to assemble viable project sites, particularly in provinces where solar and wind potential is high but investment has been limited. Standardized bid packages could include clear interconnection requirements, PUCSL-cleared PPAs, and a predictable timetable from bid submission to award..

The effectiveness of this procurement reform will depend on consistency of political commitment through each tender cycle, with legal protections in place to insulate procurement from undue interference. Tariff approvals too must align with the actual cost of capital and risk premium, so that winning bids can be finalized without renegotiation or delay. CEB's transmission planning needs to evolve to accommodate generation zones prioritized through these tenders. Without these parallel measures, procurement reform will yield limited returns.

ST3: Establish a Payment Security Mechanism and Mitigate Currency Risk

Sri Lanka's ability to mobilize private capital into utility-scale renewables will remain constrained unless investor concerns around payment reliability are directly addressed. Delays in PPA payments and volatility of exchange rates during the crisis have raised the risk premium demanded by developers and financiers. To mitigate this, the government could consider establishing a ring-fenced Payment Security Mechanism (PSM) supported by multilateral guarantees and embedded into the structure of future PPAs.

The PSM could be built around a dedicated escrow account capitalized through a revolving buffer fund, administered independently from CEB operations, with a reserve of at least 3 months' worth of payment obligations. The escrow could partially be capitalized through a small surcharge on the current cost-reflective tariffs, which will directly go to the escrow rather than going into general CEB revenue. In the event of payment default, this reserve would provide liquidity, while additional protection could be triggered via a partial risk guarantee (PRG) from the MDBs. Currency volatility, similarly, could be hedged through donor-supported synthetic forward contracts[22] or concessional credit-linked derivatives[23] offered by the Central Bank. All de-risking mechanisms would be transparently disclosed before tendering so that developers can incorporate these protections into their financial models and submit tariffs accordingly. To address bankability concerns flagged by private developers and financial institutions, deemed energy payments could be included in the PSM design where curtailment is due to transmission or grid balancing constraints. This aligns with international norms and addresses risks that current curtailment clauses render SPPA contracts non-financeable

This model has been used effectively in comparable contexts. In Nigeria and Zambia, escrow-backed PRG instruments enabled project developers to access long-tenor commercial debt despite off-taker distress. The World Bank is already exploring a de-risking platform which will establish a PSM for CEB obligations under PPAs, using IDA guarantees and MIGA political risk insurance[24]; the government need to formalize the framework, secure donor support, and include the mechanism within its IPP tender packages.

[22] A synthetic forward contract operates like a regular forward contract for currency but is set up using a combination of different financial instruments (swaps and options), making it more flexible or cost-effective in certain conditions. It essentially lets a project developer fix an exchange rate in advance for a future date, limiting exposure to currency volatility.

[23] Concessional credit-linked derivatives involve donor or central bank support to reduce the cost of hedging. For instance, the central bank could offer currency swaps at below-market rates, or a development partner might subsidize part of the hedging premium, lowering the overall cost to IPPs.

[24] World Bank 2024

2.1.2 Transmission

Modernizing and expanding the transmission grid is essential to carry new renewable generation and improve reliability. Priorities include building high-voltage lines and substations to connect high wind and solar zones to load centres, upgrading the aging grid to handle variable renewable energy (VRE), and reducing transmission losses. However, decades of centralized ownership, weak cost recovery, and planning fragmentation have left the transmission sector under-capitalized and institutionally constrained. The 2024 Electricity Act, which mandates the unbundling of CEB and establishes a dedicated transmission entity, presents a critical opportunity to reset governance and investment models. The strategies below outline how Sri Lanka can reposition transmission as both an enabler of renewable energy and a bankable infrastructure asset class:

ST4: Enforce Execution Discipline and Prioritize Bankable Transmission Projects

Sri Lanka's transmission infrastructure cannot deliver the scale of interconnection required for 5 GW of new renewables without structural reform in governance and planning. For years, transmission development has been constrained by centralized public ownership, weak coordination between planning and operations, and the absence of cost-reflective tariffs. These limitations have blocked credible long-term investment planning and have led to project bottlenecks that risk stranding renewable generation. With the unbundling provisions of the 2024 Electricity Act, the government has a window to establish a functionally independent transmission company with a clear operational, financial, and planning mandate.

The National Transmission Network Service Provider (NTNSP), proposed to be established under the Electricity Act 2024, has been mandated to develop and maintain the national grid. PUCSL has implemented a cost-reflective tariff mechanism with multi-year revenue caps[25], and the CEB was in charge of preparing a 10-year Long-Term Transmission Development Plan (LTTDP) is prepared every two years in alignment with generation expansion plans. However, this planning framework has had limited success in infrastructure delivery. Transmission investments identified in successive plans often remain unexecuted, stalling renewable integration and eroding investor confidence in the power sector. The issue is not one of planning or tariff adequacy, but of fragmented accountability, absence of prioritization, and lack of regulatory pressure on delivery timelines.

To address this, MoE could introduce a structured regulatory mechanism to monitor and enforce project execution under the LTTDP. The NTNSP, once established, could be required to submit a publicly disclosed, project-level implementation report each year, identifying progress, bottlenecks, and revised delivery timelines. MoE/PUCSL could publish a formal regulatory opinion on execution performance and link transmission tariff adjustments to tangible delivery milestones. In parallel the NTNSP could conduct a

[25] PUCSL 2025

prioritization exercise within the LTTDP to identify a core set of strategically essential, financially actionable projects to be pursued in the next five years.

Given the current fiscal and financing constraints, it is necessary to acknowledge that not all projects in the LTTDP can be pursued concurrently. Prioritization could be based on clear criteria: alignment with near-term generation additions, availability of co-financing or guarantees, land and permitting readiness, and system-wide reliability benefits. PUCSL could vet the short-listed pipeline for bankability and require the NTNSP to submit project-specific briefs covering safeguards, procurement modality, and financing strategy. Institutionalizing this delivery-focused LTTDP oversight will shift the transmission utility's role from a passive planner to an accountable executor which is critical for absorbing the next wave of renewables and accessing climate-linked grid finance.

ST5: Mobilize Climate-Aligned Capital for Transmission Infrastructure

Although transmission has traditionally been viewed as a public utility function, there is growing international precedent for financing key grid investments through climate-linked instruments[26]. This is particularly the case where such infrastructure enables large-scale renewable integration, reduces curtailment, or strengthens resilience to climate-related stress. Sri Lanka has yet to pursue this path systematically. While transmission investments are included in long-term plans, they are rarely structured or presented in a form compatible with climate finance modalities. This represents a missed opportunity.

To pursue climate-aligned capital for transmission infrastructure, the government could begin by identifying a shortlist of high-impact transmission projects and prepare project concept notes aligned with climate mitigation and adaptation objectives. These notes could demonstrate how each investment contributes to reduced emissions (through renewable dispatch or reduced grid losses), increased climate resilience (cyclone-resilient designs), or equity-aligned transition goals (rural electrification). To operationalize this strategy, the Ministry of Finance (MoF) and MoE could embed climate-aligned transmission financing in Sri Lanka's broader climate finance strategy, particularly within the Climate Prosperity Plan, GCF Country Program, and forthcoming NDC3.0. The NTNSP could be tasked with preparing a climate finance annex to the LTTDP, identifying eligible investments and co-financing structures. A pipeline of 3–5 technically appraised, emissions-linked projects could be developed in partnership with developed partners with clearly identified roles for grants, guarantees, and concessional loans. This pipeline could be designed to meet readiness criteria for vertical funds, including environmental and social safeguards, monitoring indicators, and GHG mitigation metrics.

[26] Examples: Climate-linked finance for transmission projects in Ukraine and India

ST6: Structure Hybrid PPP Models for Transmission That Retain Public Control but Unlock Private Delivery and Capital

Introducing private capital into transmission development in Sri Lanka will require addressing structural frictions that deter private sector engagement; specially, the inability to exercise operational leverage, non-transperant procurement environments, and lack of contractual clarity over returns. The government's intention to retain majority ownership in grid infrastructure, while justified from a sovereignty and security standpoint, rules out conventional fully private BOOT models and requires hybrid arrangements that allow operational participation without formal asset control. The most practical structure in this context is a corporatized joint venture SPV, where the NTNSP holds a 51% stake and the remaining equity is held by a private consortium. This SPV would be governed under a shareholder agreement that clearly separates ownership control from day-to-day operational management, with board powers, dividend rights, and procurement authorities negotiated upfront. Specially, the public partner's control must be ringfenced to strategic matters like tariff compliance, national security, and capital expenditure ceilings, while allowing the private party to oversee procurement, construction supervision, and O&M functions under a performance-linked service contract. This split-control design is important for making such partnerships investable while preserving state control.

To secure investor confidence, each transmission PPP project could have its revenue stream clearly identified within the broader transmission tariff approved by PUCSL. This can be done through a project-specific revenue allocation mechanism, which isolates the cash flows and links payments to availability, reducing investor risk while maintaining the integrity of the overall tariff system[27]. This allocation could be formalized as a carve-out within the multi-year transmission revenue cap, approved ex ante, for each PPP project and disclosed in public tariff review documents. To complement this structure and further reduce risk premiums, Sri Lanka could explore availability-based payment mechanisms in which the SPV is

[27] While PUCSL already applies a cost-reflective tariff methodology to determine the total allowed revenue for the transmission utility, what private investors require in a PPP structure is not just system-level cost recovery, but project-specific revenue visibility. To address this, the NTNSP could commit to ringfencing revenue streams for each PPP-backed project within the broader transmission tariff framework. This means allocating a clearly defined portion of the approved revenue cap to each transmission PPP, tied to its performance and availability, and disclosing this allocation in NTNSP's regulatory filings. Such disaggregated revenue treatment ensures that private investors are insulated from the operational or financial underperformance of unrelated assets and can predict their cash flows based on their specific project's contractual obligations. PUCSL can operationalize this without altering the existing methodology by requiring a revenue allocation annex in each tariff submission, and linking project-level disbursements to availability metrics already embedded in the SPV's concession or shareholder agreements. This form of ringfencing is essential to reduce perceived revenue dilution risk and enhance the bankability of PPPs while preserving the integrity of the unified transmission tariff framework.

remunerated based on operational uptime rather than volumetric wheeling charges[28]. This model, applied in Brazil, Chile, Peru, and recently in India's TBCB transmission lines[29], eliminates demand risk and aligns investor returns with predictable grid performance, particularly for high-voltage interconnectors or storage-linked substations. Further, to mitigate investor concerns around exit risk and illiquidity of minority shares in a state-dominated SPV, the government could commit to a pre-agreed exit mechanism backed by either a floor price or a put option exercisable after the initial recovery period. Such a mechanism may be supported through a DFI-backed risk-sharing facility or subordinated equity participation by a donor-funded transmission development trust.

To prevent regressive impacts of availability-based payments, which will ultimately be transferred to consumers, PUCSL could consider imposing binding affordability safeguards during tariff approval. These may include: (i) absolute caps on PPP-linked cost pass-through to lifeline and low-volume residential users; (ii) mandatory distributional impact assessments and independent affordability assessments before approving any cost recovery; and (iii) full publication of PPP payment obligations and revenue assumptions in public tariff review documents. If a proposed PPP results in unsustainable burdens on lower-income consumers, the project must be restructured prior to procurement. Without such ex ante regulation, tariff shocks could undermine public trust in PPPs and erode support for transmission sector reform.

Given that private investors will only enter if credible upstream project preparation is undertaken, each proposed PPP project would need to be de-risked prior to tender, with land, grid interface, and environmental approvals cleared. A dedicated Transmission PPP Cell could prepare these projects. This unit could also publish a standard transmission PPP tender package, including a model shareholders' agreement, risk allocation matrix, indexed availability payment schedule, and dispute resolution protocol. In cases where minority equity participation is commercially unattractive or already saturated, private capital can also be mobilized through a mezzanine finance tranche structured as subordinated quasi-equity with no board control, but return rights linked to project performance. The Treasury could retain veto power over any refinancing or conversion rights embedded in such instruments to safeguard majority ownership and strategic control. Where local political resistance exists, Sri Lanka could adopt a two-tier structure, where asset ownership remains with the state entity, but an O&M contract with equity-linked profit-sharing

[28] In the context of transmission, availability-based payment mechanisms refer to contractual arrangements where the private partner (SPV) is compensated based on the infrastructure's availability and operational readiness - i.e., its capacity to transmit electricity when required - rather than the actual volume of electricity wheeled through the line. This model shifts the revenue basis from variable usage to fixed performance, reducing exposure to demand fluctuations and curtailment risk. It provides predictable cash flows for investors while ensuring that the public utility pays only when the infrastructure is maintained at agreed operational standards.

[29] Examples: Availability-based payment structures for transmissions projects in Brazil, Chile, Peru, India

is awarded to a private partner, analogous to lease-operate-transfer models in regulated sectors elsewhere. The key to success lies not in preserving generic PPP labels, but in offering investors bankable, enforceable project rights and stable, transparent return mechanisms, even while keeping formal control with the state.

ST7: Advance Cross-Border Grid Interconnection with India to Unlock Regional Power Trade and Tap Export Potential for Powering Green-Powered Data Centres

The proposed India–Sri Lanka HVDC interconnection is a high-value grid investment with potential to unlock regional power trade and improve the bankability of renewable energy projects in Sri Lanka. It can balance variability from renewables, unlock climate finance at scale, unlock the rich wind resource potential and open an export channel to the region and meet India's rising demand for 24/7 carbon-free electricity, particularly in states hosting hyperscale data centre clusters[30]. A 1,000 MW, ±400 kV HVDC interconnection between Madurai and New Anuradhapura has already been technically validated by joint studies conducted by CEB and Power Grid Corporation of India (PGCIL), with route options defined, system stability confirmed, and a base-case project cost estimated at USD 406 million[31]. However, despite its technical feasibility, the project remains unimplemented due to unresolved issues in institutional structuring, flow configuration, and market access. The absence of a dedicated transmission cooperation framework and formal commercial negotiation channel has further delayed progress. Unless these issues are addressed, Sri Lanka risks missing a transformative opportunity to position itself within a dynamic regional electricity market.

The interconnection's economic viability depends on enabling two-way trade, rather than treating Sri Lanka as the sole importer. Earlier joint modelling indicated that import-only configurations yield low or negative internal rates of return under most fuel price scenarios. By contrast, structuring the HVDC line as a bidirectional interconnector could enhance returns by enabling Sri Lanka to export surplus solar generation during daytime hours and access seasonal balancing capacity from India. This would also improve the bankability of domestic renewable energy projects in wind-rich Northern and Eastern provinces by providing access to larger and deeper power markets in India and, potentially, Bangladesh. These latent export benefits must be explicitly monetized in the economic appraisal framework, using forward contracts or modelled avoided curtailment metrics. These market access benefits could be explicitly valued as part of a revised project viability framework and linked to forward power sale agreements or grid access protocols.

[30] Mercom 2024
[31] MoEP 2025

To advance the interconnection from feasibility toward implementation, the Government of Sri Lanka may consider re-engaging with Indian counterparts through a reconstituted Joint Interconnection Taskforce involving the NTNSP, the MoE, and relevant Indian agencies such as the PGCIL. A phased development strategy beginning with a 500 MW monopole configuration could provide an operational starting point while allowing for future scale-up. Establishing a formal transmission cooperation agreement is important to clarify asset boundaries, operational rights, and dispatch arrangements on both sides of the link. Regulatory harmonization will also be necessary for enabling a stable cross-border operating environment and investor confidence. The NTNSP[32] could integrate the HVDC link into Sri Lanka's Transmission Development Plan as a regulated asset, while PUCSL[33] may consider adopting an availability-based cost recovery aligned with regional practice and suited to the operational characteristics of a cross-border HVDC interconnector (Table 1). The National System Operator (NSO)[34] could develop the trading operations framework and lead the legal and procedural design for international scheduling, reserve exchanges, and congestion allocation, in alignment with the terms of its license under the Sri Lanka Electricity Act of 2024.

Table 1: Regional Cross-Border Transmission Tariff, Financing, and Institutional Models

Interconnection	Tariff Structure	Financing Model	Legal/Institutional Arrangements
India–Bhutan	Bilateral cost-plus tariffs under long-term PPA; Bhutan also trades on Indian Power Exchange in small volume	Indian grants, soft loans, and technical support for hydro projects and grid assets	Bilateral intergovernmental agreements; Bhutan's NTGMSP (National Transmission Grid Master Plan); multiple 400/220/132kV links in place
India–Nepal	Bilateral pricing; Nepal imports seasonally and also exports during wet season; limited power exchange trade	Joint investments in cross-border transmission (e.g., Dhalkebar–Muzzafarpur line); bilateral arrangements for evacuation lines from new hydro projects	Operates under India's Cross Border Trade Guidelines; synchronous grid interconnection; Nepal Electricity Authority and India's PGCIL coordinate operations
India–Bangladesh	Fixed bilateral tariffs; 1000 MW via HVDC	Mix of public and private financing including Adani	400 kV HVDC and AC interconnections; power

[32] Owner and developer of transmission infrastructure, including expansion and interconnection assets.

[33] Responsible for tariff setting, licensing, market oversight, and regulatory approvals.

[34] Have the exclusive right of trading electricity with other countries.

Interconnection	Tariff Structure	Financing Model	Legal/Institutional Arrangements
	and 1600 MW via dedicated IPP plant; pricing through PPA	Group investment; grid infrastructure supported by bilateral financing	trade governed by bilateral MoUs; future expansion tied to PSMP (Power Sector Master Plan) of Bangladesh
India–Sri Lanka	Tariff structure under planning; likely HVDC cost-based or availability-based model	Proposed to be developed as a regulated asset base; potential multilateral support envisaged for HVDC interconnection	Transmission link under study; would require bilateral agreement and regulatory harmonization; not yet operational
Afghanistan–Pakistan	CASA-1000: wheeling tariff for transit countries; structured under cost recovery and transmission fee model	IFI-led financing: World Bank, Islamic Development Bank, etc.; partial risk guarantees and escrow mechanisms in CASA-1000 design	Governed by CASA-1000 Intergovernmental Agreement; multilateral legal framework covering Pakistan, Afghanistan, Kyrgyzstan, and Tajikistan
India–Bhutan–Bangladesh (proposed)	Envisioned to use regional tariff structures; could be linked to Indian market prices or power exchange mechanisms	Still conceptual; expected to require blended finance, regional coordination, and multilateral agency participation	Would require trilateral legal arrangements; BIMSTEC Grid Interconnection Coordination Committee (BGICC) could serve as a platform for coordination

Created primarily based on information contained in UNESCAP 2024

On financing, the project could be framed explicitly as a climate and resilience investment and positioned within both the Climate Prosperity Plan and the GCF country programming pipeline. Its eligibility is grounded in three co-benefits: (i) reduced curtailment of domestic renewables, (ii) displacement of fossil peakers via regional balancing, and (iii) enhanced resilience through cross-border reserve sharing. The MoF, in collaboration with the NTNSP, could prepare a dedicated investment prospectus. A regional financing package involving ADB's SASEC platform could be pursued, with viability gap support structured as availability payments in the first 3–5 years. The proposal could highlight that Google's 24/7 carbon-free

goal[35] and Meta's 100 % renewable matching[36] create potential anchor-buyer credibility for long-term green-power offtake. SAREP and BIMSTEC have both expressed interest in expanding cross-border energy trade[37], and their platforms can be used to harmonize technical standards and provide peer support on regulatory readiness.

With India advancing its green energy corridors and regional grid initiatives such as One Sun One World One Grid (OSOWOG) vision, the timing is strategically aligned. Sri Lanka could treat the HVDC project as a priority infrastructure transaction and activate the necessary regulatory, financial, and diplomatic mechanisms to move it toward implementation while positioning itself as a provider of green power for India's digital-economy growth.

2.1.3 Distribution

Despite Sri Lanka's extensive electrification, its power distribution systems remain technologically stagnant and economically strained. The utilities lack the systems needed to manage demand or integrate distributed energy. These gaps affect both urban and rural areas, with reliability shortfalls especially common in estate sectors and low-income regions. While pilot efforts show that smart grid features are technically viable, large-scale deployment is held back by cost barriers, limited utility autonomy, and regulatory gaps. For a renewable energy transition, distribution reform needs to go beyond efficiency; financing models need to target service equity, operational performance, and digital readiness across all regions. The following strategies target financing, performance, and equity in distribution:

ST8: Implement Distribution Corporatization Mandated by the Electricity Act 2024 to Enable Operational Autonomy and Financial Accountability

Sri Lanka's distribution sector is currently managed by four CEB regional divisions and the semi-autonomous Lanka Electricity Company (LECO). It faces deep-rooted structural and performance challenges, including service unreliability, high technical and commercial losses[38, 39], and poor consumer engagement despite near-universal electrification. Tariff under-recovery, fragmented billing and collections have weakened the sector's financial viability. The result is a distribution system ill-equipped to absorb decentralized energy flows, adopt smart grid technologies, or attract investment for modernization.

The Electricity Act of 2024 provides a legal mandate to address these deficiencies. It requires that generation, transmission, and distribution be restructured into separate corporate entities under the

[35] Google 2024
[36] Meta 2025
[37] MoEP 2025
[38] PUCSL 2023
[39] CEB 2023

Companies Act. While transmission restructuring is already underway, corporatization of distribution remains pending. CEB's four distribution licensees (DL1 – DL4) continue to operate as divisions of the parent utility, lacking the governance, financial autonomy, and accountability mechanisms necessary for performance-based regulation or creditworthiness. To fulfil the Act's intent and unlock downstream reforms, the government could prioritize moving decisively to operationalize distribution corporatization.

This means legally incorporating each regional distribution zone as a separate state-owned company with a defined license boundary, board of directors, and audited financial accounts. Governance structures need to be insulated from undue interference and aligned with commercial accountability: boards could be composed of independent professionals, and performance could be measured through PUCSL-defined KPIs such as loss reduction, outage frequency, billing efficiency, and customer satisfaction. Annual performance audits and public disclosure of operational metrics needs to be institutionalized. Specially, PUCSL could link revenue caps and tariff approvals to cost-reflective inputs and verifiable service outputs for each corporatized entity.

Corporatization of distribution authority it is a precondition for financial sustainability and external investment. Development partners and climate financiers are unlikely to support distribution upgrades or smart grid deployment in the absence of financially ringfenced, auditable utility platforms. While LECO's superior performance in metering, billing, and reliability partly reflects its compact, high-density, and affluent service area, its semi-autonomous governance model and early digital integration offer transferable lessons. These include improved accountability, data-driven operations, and customer responsiveness. Replicating key elements of this model appropriately adapted to the operational realities of larger and more dispersed service areas, can strengthen the investment readiness of distribution entities and create credible off-takers for future ESCO contracts, digital service vendors, and green finance instruments.

ST9: Use Results-Based and Output-Based Financing to Upgrade Grid Performance and Expand Service Equity

With the distribution sector undergoing structural reform under the Electricity Act 2024, attention needs to now shift to mobilizing investment for performance improvement and service equity. Many distribution zones (particularly those serving estate communities, rural settlements, and social infrastructure) continue to suffer from persistent losses, reliability shortfalls, and infrastructure deficits. These challenges are no longer about grid access alone, but about delivering measurable improvements in service quality, efficiency, and consumer trust. In a constrained fiscal environment, where traditional input-based grants are no longer tenable, Sri Lanka will need to adopt financing instruments that link disbursement to independently verified results, whether in technical performance or service coverage.

To bridge this financing and service gap, Sri Lanka could explore the use of results-based financing (RBF) and output-based aid (OBA) instruments to fund performance-linked upgrades and equity-focused service expansion. These mechanisms are not intended to finance the full operational needs of distribution entities, but rather to support targeted capital investments and reform-linked upgrades that may not be financially viable through tariff revenues alone. Disbursements would be structured in tranches based on verified improvements such as reductions in technical and commercial (AT&C) losses, increases in collection efficiency, voltage stabilization in low-income areas, or the number of new connections with validated service reliability. To coordinate such support, the government could establish a National Distribution Performance and Equity Fund. This fund would pool concessional climate finance, donor grants, and targeted budget subsidies, and allocate them through two focused windows: (i) a performance window, rewarding utilities for meeting specific reliability and efficiency benchmarks, and (ii) an equity window, supporting verified service improvements in underserved areas including transformer upgrades, reconductoring, or service extensions to schools, clinics, and small enterprises. Both windows would operate in alignment with the broader tariff and investment planning framework, not in place of it.

To support practicality, the fund's disbursement structure could follow a blended model. Each project or distribution entity could receive a modest baseline allocation primarily to cover essential hardware or mobilization costs, followed by variable disbursements tied to independently verified outcomes. Rather than adopting an all-or-nothing approach, partial results could trigger proportionate payouts, maintaining continuity of investment while rewarding better performance. Where results fall short, PUCSL and donors could provide structured technical support, with clear corrective timelines. Performance targets could also be differentiated based on baseline conditions, recognizing that progress in high-loss or low-capacity zones may follow a different trajectory than in commercially viable areas.

The equity window, in particular, could rely on output-based aid, with disbursements tied to independently verified service expansion, such as the number of households connected with verified supply quality, or number of rural clinics and schools provided with improved grid reliability. Where operationally feasible, the fund could include a performance-based sub-granting window for small-scale, equity-focused interventions. Local distribution zones, registered cooperatives, or competitively selected ESCOs may be eligible to implement predefined works or service delivery improvements, such as transformer upgrades or rural grid extensions under performance contracts. This model may offer cost advantages in underserved or remote areas where utilities face higher fixed costs or logistical constraints. Local capacity, outcome-linked disbursements, and competitive delivery mechanisms can promote cost discipline and reduce overheads compared to centrally managed utility approaches, particularly in remote or low-demand areas where utility-led delivery may be less efficient. All sub-grants would be subject to compliance with national

procurement law and donor safeguard requirements, including independent audit and results verification. The licensed distribution utilities could retain oversight of grid interface standards and compliance.

By linking funding to delivery, rather than inputs, this strategy will help overcome both fiscal constraints and governance inertia. It will provide incentives for the newly corporatized distribution entities to align investment plans with measurable service outcomes. It will also allow the state and its development partners direct scarce concessional finance where it has the highest impact, whether in technical loss reduction or social equity. When transparently administered and independently verified, RBF and OBA can anchor the financial model for a more inclusive distribution sector.

ST10: Digitize the Distribution Grid to Enable Demand-Side Management and Distributed Energy Integration

Sri Lanka's distribution grid lacks the digital infrastructure needed to manage real-time demand, integrate distributed energy, or operate performance-based networks. Most metering is still analogue, customer data is fragmented, and utilities have no visibility below the substation level. Without digital infrastructure, core functions like fault detection, load balancing, or time-of-use billing remain impossible undermining both financial performance and grid flexibility.

The priority is large-scale smart metering, automated billing, and basic control room functionality. In principle, commercial and high-volume residential consumers could finance their own meters, either upfront or through utility-managed amortization via the tariff. But in practice, few utilities in Sri Lanka have the working capital or credit headroom to pre-finance national-scale meter procurement. Bulk purchases reduce per-unit cost and ensure interoperability, but require access to short- or medium-term capital that many utilities, still under restructuring, cannot secure. LECO's smart meter manufacturing facility offers an opportunity to support standardized, locally sourced deployment at scale, reducing lead times and foreign exchange exposure. However, even with local manufacturing and pooled procurement, cost recovery remains a constraint, particularly in low-income and estate sectors where tariff collection is weak and meter costs may not be recoverable through amortization.

Blended financing is justified in this case not to subsidize consumers, but to overcome utility-side liquidity and market-entry barriers. Donor-backed concessional loans or guarantees can enable utilities to structure pooled procurement, avoid fragmented deployments, and implement cost recovery over time. In high-risk areas, targeted subsidies can protect low-income households while ensuring grid readiness. At the system level, digital feeder monitoring and automation can reduce technical losses and operating costs; these benefits that justify treating this as infrastructure finance, not just consumer hardware. PUCSL could define the metering cost recovery mechanism and set performance standards for vendors. Each utility could submit a time-bound digital roadmap, linked to PUCSL-approved capex plans. Where feasible, ESCOs or

vendor-financed models can support deployment in high-density or municipal zones, particularly for non-residential loads like public lighting and pumping. LECO's smart metering pilots in Colombo show that such systems can reduce billing errors, improve collections, and enhance service transparency when paired with digital billing.

The financing challenge is about making smart infrastructure bankable. With ringfenced revenues, procurement scale, and regulatory clarity, smart grid investment can attract concessional climate finance, commercial term loans, and vendor credit. Without those enablers, utilities will remain locked out of the very systems they need to operate a renewable-ready grid.

However, a digitalized and decentralized grid will introduce new technical and operational vulnerabilities, related to cybersecurity and systems resilience. Financing frameworks will need to explicitly account for these risks. Grid modernization strategies that use advanced metering, automated distribution and remote control will need to budget for cybersecurity and system protection measures. PUCSL, the MoE, and the NTNSP could require all smart grid financing proposals to incorporate a minimum cybersecurity safeguard package. Development partners may also be engaged to co-finance grid cybersecurity upgrades through targeted grants or concessional instruments.

ST11: Develop Green Distribution Bonds to Mobilize Domestic Capital for Grid Modernization

Modernizing Sri Lanka's distribution grid will require sustained financing well beyond the reach of public budgets or concessional financing. While external development finance will remain important, the goal could be to fund long-term investment in distribution infrastructure increasingly through domestic capital markets. Sri Lanka's pension funds, insurance companies, and commercial banks hold significant pools of long-dated capital but lack access to well-structured, climate-aligned infrastructure products.

Once distribution companies are corporatized and placed under cost-reflective tariff regimes, they can begin to operate as independent, credit-seeking public utilities. At that point, the issuance of green distribution bonds will become viable. These bonds, issued either by individual corporatized utilities or a central pooled vehicle, could be backed by ringfenced distribution revenues and aligned with ICMA's Green Bond Principles. Proceeds would be used to finance eligible investments such as grid digitalization, energy efficiency upgrades, or infrastructure that supports distributed renewable integration.

To enable this, the Ministry of Finance, Central Bank, and PUCSL could jointly develop a green bond framework for the distribution sector, specifying project eligibility criteria, monitoring requirements, and repayment structures. Distribution companies must maintain transparent, independently audited financials and demonstrate stable cash flows linked to their regulated tariff structures. Where credit strength remains

weak, partial guarantees or first-loss protection development partners could be used to improve the bond's credit rating and attract institutional buyers. A pilot bond could be issued once at least one or two distribution companies meet the prerequisites: legal corporatization, audited financials, and PUCSL-approved capex plans. An aggregation vehicle like a Distribution Infrastructure Financing Facility could be considered to reduce transaction costs and standardize project screening across licensees.

This strategy is not an immediate solution. It depends on the groundwork laid by earlier reforms: the legal and operational separation of distribution entities, and improved utility performance. But as these conditions are met, green bonds can provide a scalable, predictable source of capital to fund grid modernization, and align local savings with the long-term investment needs of Sri Lanka's energy transition.

2.1.4 Storage

As Sri Lanka advances toward its renewable electricity targets, balancing supply and demand will require a broader systematic approach to flexibility. The growing share of solar and wind, concentrated in specific geographies and peaking at times misaligned with demand, risks over-generation during certain periods and supply deficits in others. While utility-scale storage, particularly batteries, can help manage short-term variability and grid congestion, it is capital-intensive and not the only pathway. A national balancing strategy needs to integrate multiple complementary levers: regional interconnection with India to enable cross-border power exchange, time-shifting through distributed generation with embedded storage (such as behind-the-meter solar-plus-battery systems), demand-side management, and electrification of sectors such as transport (e.g., railways) that can absorb excess renewable energy during off-peak hours. These alternatives can absorb excess energy, reduce curtailment, and delay the need for expensive storage or peaking capacity. Storage could therefore be viewed not as a default solution, but as one of several flexibility tools to be evaluated based on cost, system value, and readiness. Planning, regulation, and financing frameworks must be designed accordingly, identifying where storage is the least-cost option and ensuring it is integrated with broader grid and sectoral strategies. The following strategies outline how storage can be deployed where most valuable, as part of a broader system balancing strategy:

ST12: Establish a Regulatory Framework for Energy Storage as a Distinct Infrastructure Class

Sri Lanka's Electricity Act 2024 references energy storage in two key provisions: Section 11(1)(a) empowers the National System Operator to procure energy storage capacity through competitive tendering, and Section 20 includes energy storage in the definition of services eligible for PPPs. However, the Act stops short of defining storage as a distinct infrastructure class or providing guidance on how it could be owned, licensed, dispatched, or compensated. This legal ambiguity leaves storage developers, utilities, and financiers without a clear basis to structure bankable projects or integrate storage into system planning. In

practice, this means that even donor-supported battery pilots cannot be scaled without ad hoc regulatory treatment and larger private investments are unlikely to proceed.

To address this, PUCSL could issue regulatory guidelines, supported by the MoE and other sector entities, to establish a formal treatment of energy storage across the electricity value chain. At a minimum, the regulation could:

- define energy storage as a standalone infrastructure class, eligible for licensing and inclusion in power system planning, separate from generation or demand;
- clarify which entities may own or operate storage assets and under what licensing or contractual arrangements, including provisions for standalone IPPs and utility-owned assets[40];
- establish permissible payment mechanisms (e.g. availability payments, flat monthly fees, regulated tariffs);
- specify how storage-related costs may be integrated into the tariff methodology, either through the transmission or generation cost base, and under what PUCSL approval process;
- provide standard commercial terms for storage procurement, including contract duration, dispatch obligations, penalties, and performance guarantees.

Countries like India[41] and Chile[42] have enabled storage investment through clear licensing frameworks, defined market access, and payment structures tied to grid services. India's regulator has recognized both co-located and standalone battery projects for market participation, while Chile's 2023 reforms formally integrate storage into grid dispatch and capacity remuneration frameworks.

Sri Lanka requires regulatory clarity to encourage private sector investment in storage. Treating storage as an investable, revenue-earning infrastructure class is the key first step. All subsequent strategies on procurement, planning, or financing depend on this foundation.

ST13: Structure Targeted Procurement and Financing Models for Grid-Scale Storage

While NSO has legal authority to procure energy storage under the Electricity Act 2024, high capital costs and uncertain revenue streams remain major obstacles to scaling investment. Battery energy storage systems (BESS) are not cost-competitive with conventional generation on a per-kWh basis, and there is no

[40] While the Electricity Act empowers the NSO to procure storage, no regulatory guidance currently exists to define how these assets are owned, financed, or integrated into the system.

[41] Ministry of Power, India 2023

[42] Garrigues 2023 , Garrigues 2024

ancillary services market to monetize their flexibility value. A battery may deliver measurable savings by avoiding ramping costs, deferring transmission upgrades, or firming renewable output, but if there is no contractual mechanism to pay for these services, private investment will not materialize. Nor can the utility self-finance major storage assets without external support, given its fiscal constraints.

That said, grid-scale storage may be justified in specific locations such as solar-saturated zones, weak feeder endpoints, or high-demand urban pockets, where it can reduce peak capacity needs, defer transmission upgrades, or lower system ramping costs. These opportunities could be identified through system-level planning processes, such as the LTGEP and TDP, which could assess where flexibility gaps are likely to emerge. However, procurement could proceed only where project-level analysis confirms that storage is the most cost-effective solution relative to other technically viable alternatives such as localized transmission reinforcement, flexible generation, or targeted deployment of dispatchable distributed energy. Broader balancing solutions like regional interconnection, sector electrification, or national demand-side programs should be planned in a coordinated manner, even if governed through separate institutional pathways (Box 1). This distinction will allow grid-scale storage to be deployed selectively, where it adds measurable system value, rather than generalized technology targets.

Box 1: Separate Institutional Pathways for Flexibility Options

Not all flexibility solutions can or could be evaluated within a single procurement process. While grid-scale storage competes directly with localized operational alternatives like peaking generation or substation upgrades, broader flexibility levers such as demand-side programs, cross-border interconnection, or rail electrification needs to be planned, regulated, and financed through separate institutional channels. Recognizing these distinctions is essential for coordinated system planning and sound investment decisions.

Flexibility Option	Planning/Implementing Entity	Decision Mechanism
Grid-scale storage	NSO, PUCSL, with TDP input from NTNSP	Competitive procurement by NSO; storage use cases identified in LTGEP and TDP
Transmission upgrades	NTNSP	TDP, PUCSL approval
Flexible generation	CEB-GEN, IPPs, with PUCSL oversight	LTGEP, tendering
Cross-border trade	MoE, ERD-Ministry of Finance, Ministry of Foreign Affairs, NSO	Bilateral negotiation and MoU-based planning
Rail electrification	Ministry of Transport, MoE	National transport strategy; sector electrification plans

Demand-side response	SLSEA, PUCSL, Distribution Licensees	Regulatory reform, program design

Where procurement is warranted, commercial structures need to be simple and bankable. For early-stage projects, availability-based contracts where investors are paid for capacity readiness and receive variable payments for energy dispatch offer predictable cash flows and have proven effective in comparable markets. In India, SECI and Gujarat DISCOMs have awarded storage tenders based on fixed monthly capacity payments[43]. However, other models may also be appropriate depending on ownership structure and financing source. For utility-owned storage, regulated cost recovery through the distribution, transmission, or generation tariff base may be more appropriate depending on the storage asset's function and integration in the power system. For co-located solar-plus-storage projects, bundling storage into energy PPAs may reduce integration risks and financing complexity. PUCSL needs approve a menu of standardized procurement models, allowing flexibility while securing investor confidence and fiscal discipline.

Table 2 How to Make Storage Bankable

Mechanism	Purpose
Availability-based contracts	Revenue stability
Hybrid solar+storage PPAs	Bundled energy + flexibility
Blended finance (including concessional loans)	Lower WACC, makes tariffs affordable
Cost recovery via regulated asset base	Utility-led deployment, enables non-IPP models
Donor-backed risk instruments	De-risking for first movers, crowds in private investment

To reduce financing costs and improve bankability, Sri Lanka needs to actively seek concessional and blended finance for early projects. MDBs can provide viability gap support, subordinated capital, or partial guarantees to reduce the risk premium for storage investors[44]. Transaction advisory support to structure PPP-compatible contracts could also be pursued. Hybrid solar-plus-storage projects, procured through joint

[43] Mercom 2024

[44] Under the Electricity Act 2024 the NSO is tasked with procuring energy storage and ancillary services to manage the intermittent nature of renewable output, whereas ownership of transmission assets sits with the NTNSP. NTNSP revenue, in turn, is regulated on a cost-reflective 'allowed-revenue' basis; tariffs must permit recovery of reasonable costs and return on the Regulated Asset Base (RAB). If large, first-wave battery costs were pushed onto that RAB, the allowed revenue, and therefore end-user tariffs, would rise. Ring-fencing storage in a dedicated, blended-finance vehicle will let Sri Lanka tap MDB concessional tools without inflating the NTNSP's balance sheet or breaching its cost-of-service framework. MDB guidance on battery-storage PPPs shows that blended-finance vehicles, often with viability-gap grants or subordinated debt, are needed to reach bankability in emerging markets (World Bank 2023).

RE auctions, can be used to deploy storage at lower marginal cost. In this model, the developer includes a storage component to deliver evening power or firm capacity, and the utility pays a blended tariff. This model can reduce curtailment and improve dispatch reliability without needing separate storage tenders.

Financing bankable storage is not only about securing capital; it's about managing long-term risk. Embedding storage into grid planning, applying fit-for-purpose procurement models, and securing early concessional support can help Sri Lanka move cautiously from isolated pilots toward a financially viable storage strategy. The goal is not to scale storage arbitrarily; Sri Lanka does not need a pipeline of storage projects now; the first priority is a bankable, accountable framework for flexibility procurement.

ST14: Enable Distributed Storage Through Public Sector Procurement and Access-Oriented Financing

Most rooftop solar systems in Sri Lanka today are grid-tied and do not include batteries[45]. While net metering allows consumers to offset daytime usage, there is no viable financial case for small-scale storage due to high upfront costs, absence of time-of-use pricing, and lack of mechanisms to monetize reliability or peak shifting. As a result, distributed storage[46] has not yet emerged as a meaningful segment in Sri Lanka's energy system.

However, targeted use cases for distributed storage do exist, particularly for public sector institutions and critical service delivery in rural and underserved areas. These include hospitals, rural clinics, schools, water pumping stations, and public safety infrastructure where necessary. In such cases, battery-backed solar systems can enhance service continuity, reduce diesel dependency, and support resilience goals. The World Bank–supported COVID-19 response project, which deployed solar-plus-battery systems in rural hospitals in the Northern Province, demonstrated the feasibility of distributed storage for critical services[47]. More recently, JICA has committed approx. USD 8 million to install rooftop solar systems at three major government hospitals reinforcing the case for donor-supported renewable energy investments in essential public facilities[48]. These examples confirm that solar deployment for resilience in public infrastructure is already underway and provide a foundation upon which storage-specific interventions can be layered where appropriate.

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[45] PUCSL 2023

[46] Distributed storage is not simply smaller-scale grid storage. It has different cost drivers, beneficiaries, and financing logic. Attempting to scale it through the same tools as utility-scale procurement is likely to fail. A targeted, public value-oriented approach is more realistic for Sri Lanka's current stage.

[47] World Bank 2020

[48] JICA 2024

To develop this segment, the government could focus on structured public procurement and access-linked financing models. This includes:

- solar-plus-storage systems for public facilities, procured centrally and delivered via competitive turnkey contracts or delegated to local governments with technical oversight from distribution licensees;
- output-based grants for distributed storage in low-reliability grid areas, disbursed based on validated service improvements (reduced outages, continuity of critical loads);
- concessional credit lines or challenge funds for cooperatives, municipalities, or community-based organizations to finance localized micro-storage applications under an approved vendor or installer framework.

PUCSL and the MoE could consider publishing technical and regulatory guidance on distributed storage , particularly in light of emerging plans to introduce a dedicated tariff for solar-plus-battery systems supplying electricity during the night peak. This guidance should ideally clarify interconnection rules, safety and metering standards, and whether exported battery power qualifies for compensation under revised net billing or feed-in schemes. With a cabinet-approved promotional tariff under preparation, such clarity will be critical for shaping investor confidence and technical feasibility. Distribution licensees could parallelly be required to identify priority feeder zones with persistent reliability issues, and incorporate distributed storage options into their medium-voltage development plans.

Distributed storage is not a technology that will scale on its own in Sri Lanka. But by targeting high-impact public service applications, leveraging donor-funded solar initiatives, and linking investment to service delivery, the government can create a viable entry point. This strategy would complement grid-scale investments and demonstrate how energy storage can enhance public infrastructure resilience, social equity, and consumer trust.

2.2 Bioenergy

Sri Lanka has considerable untapped biomass potential with scope to expand investment and coordination. Biomass already contributes over 40% of national primary energy supply, primarily through informal household and thermal applications, but remains almost entirely absent from national energy strategies despite the directions set in the National Energy Policy 2019. Though Cabinet declared Gliricidia as Sri Lanka's fourth plantation crop in 2005, this policy was never translated into land allocation, regulated markets, or feed-in frameworks[49].

[49] Bio Energy Sri Lanka

Beyond plantation-based biomass cultivation, Sri Lanka also has significant potential for downstream bioenergy applications. Biogas from waste and agricultural residues is well suited for decentralized institutional energy needs or as a cleaner cooking fuel in rural areas. These models are already technically proven and in limited operation, but they remain disconnected from national market structures. This is partly because there is no institutional program to facilitate village- or municipal-scale biogas development, nor a technical certification mechanism for distributed systems. Unlocking Sri Lanka's bioenergy potential will require policy support, coherent governance, financing, and market development strategy to connect viable supply chains to real markets. Strategies towards that end include:

ST15: Establish a National Bioenergy Coordination Framework for Policy Alignment and Market Development

Sri Lanka's bioenergy sector suffers from persistent institutional fragmentation. While several agencies, including the Sustainable Energy Authority (SLSEA), the Ministry of Agriculture, the MoE, and provincial councils hold mandates related to biomass, waste, and rural energy, there is no designated body with the authority to coordinate planning, regulation, or sectoral integration. This fragmentation has led to policy stagnation and regulatory inertia. An example is the 2005 Cabinet declaration of Gliricidia as Sri Lanka's fourth national plantation crop, which was never followed by land allocation, institutional oversight, or integration into national agricultural or energy policy.

To address this institutional gap, the government could consider establishing a formal National Bioenergy Coordination Platform. This platform could bring together MoE, SLSEA, the Central Environmental Authority, the Ministry of Environment, the Sri Lanka Standards Institute, and the relevant agencies in agriculture, forestry, and industry. The platform should ideally be housed under an entity that has cross-sectoral authority needed to align agriculture, energy, land, and environment mandates something no single line ministry can achieve. The Central Environmental Authority could participate alongside the Ministry of Environment so that both permitting and climate policy are aligned with national bioenergy priorities. The platform's mandate could include developing a national bioenergy roadmap with sub-sector targets such as biogas for rural health and education facilities, and biomass fuel switching in agro-processing. A Sri Lanka Standard on sustainable fuelwood, developed under a UNDP-supported initiative, has been adopted by many industries and is currently in active use. The same program also trained a pool of qualified auditors to assess supply chain sustainability, supporting a resilient and credible biomass supply that has reliably met industrial thermal energy demand since 2018. Building on this foundation, the platform could also clarify institutional responsibilities, designate a lead agency for regulatory oversight and project facilitation, and guide the phased adoption of standards for fuel quality, emissions control, and feedstock traceability. The platform could also serve as the institutional home for coordinating land use policy so that crops like Gliricidia or rubber seed oil are integrated into plantation landscapes without compromising food

production or ecological value. To be effective, this structure must be backed by a formal Cabinet decision and linked to national energy and climate governance instruments, including SLSEA's energy transition planning and the Ministry of Environment's carbon mitigation strategy.

ST16: Introduce Enabling Regulations for Feedstock Collection, Blending, and End-Use Substitution

Sri Lanka has a strong technical and economic case for expanding bioenergy, but uptake remains limited partly due to the absence of enabling regulations. Although a Sri Lanka Standard on sustainable fuelwood was developed under a UNDP-supported initiative and is used by many industries according to the SLSEA, there is no binding national regulatory framework to govern biomass fuel quality, blending limits, or authorized use in standby generators, or industrial boilers. In the absence of fuel standards and licensing provisions, private sector users face compliance risks and procurement uncertainty, despite strong interest from companies with ESG mandate. Public institutions, while not legally prohibited from using biofuels, lack technical standards or procurement guidance that would allow for systematic substitution of petroleum products with certified biofuels.

To close these gaps, the government could consider introducing a Biofuels Regulation Act[50]. This legislation could establish fuel quality standards and lab certification requirements for biogas blends. The Act could also provide legal recognition for private-sector use of certified biofuels in boilers, and generators, subject to performance and emissions benchmarks. Codifying these rules will reduce regulatory uncertainty, support investment in waste-to-fuel conversion technologies, and unlock a commercially and environmentally beneficial biofuel market that remains stalled today for lack of basic legal architecture.

ST17: Mobilize Concessional and Performance-Based Finance for Industrial Fuel Switching and Rural Bioenergy Deployment

Though bioenergy is cost-competitive on a per-unit energy basis, particularly when substituting diesel or furnace oil in thermal applications, most project proponents in Sri Lanka face structural financing constraints. Working capital limitations, lack of collateral, and the absence of concessional credit lines have left many technically viable bioenergy proposals stranded at the concept or licensing stage. Even where feedstock is secure and technology is proven, projects remain non-bankable due to high upfront capital requirements and underdeveloped risk-sharing mechanisms. This is particularly relevant for medium-scale fuel switching in sectors such as coir production, floriculture, tea processing, hospitality, and light industry, where diesel and furnace oil are widely used for heating, backup generation, or low-grade

[50] Different countries in the Asia-Pacific region have adopted biofuels regulatory framework. Examples include: Philippines Biofuels Act of 2006; Indonesia Presidential Instruction No. 1/2006 on Biofuels; Malaysia Biofuel Industries Act of 2007; Timor-Leste Fuel, Biofuel and Lubricant Quality Regulation (Regulation No. 1/2014).

thermal energy. In parallel, rural integrated models such as Gliricidia-linked agroforestry combined with dairy, paddy, or biogas offer clear productivity and resilience benefits but remain financially out of reach for smallholders without grant-linked financing or community aggregation models.

To address these barriers, the government could consider establishing a dedicated bioenergy finance facility. The facility would offer blended financing solutions targeted at fuel-switching projects with verified diesel or furnace oil substitution, while also supporting rural bioenergy deployment through output-based disbursement mechanisms. Early-stage support could focus on cost-shared feasibility assessments, equipment financing guarantees, and concessional credit windows potentially with donor backing.

International examples demonstrate the transformative effect of targeted financing in unlocking bioenergy transitions. India's biomass gasifier program, implemented through the Indian Renewable Energy Development Agency (IREDA), provided capital subsidies and structured loans that enabled small industries to shift away from diesel, especially in rural zones where grid reliability was weak[51]. In Kenya donor-backed models allowed tea factories and agro-industrial clusters to establish biomass energy companies that reduced fossil fuel dependence and stabilized thermal energy costs[52]. These cases show that the key constraint is not private sector willingness, but the structure of finance, particularly the availability of concessional or performance-linked instruments that derisk investment and shorten payback periods.

In Sri Lanka's case, the same logic applies. Without targeted financial tools, fuel substitution projects will continue to depend on pilots or one-off champions. A structured facility, grounded in emissions reduction metrics, verified fuel displacement, and transparent monitoring protocols, would allow both commercial and rural actors to scale bioenergy use, embed cleaner fuels into national energy policy.

ST18: Leverage Foreign Impact Investment and Catalytic Capital to Accelerate Private Sector Entry into Bioenergy

Although bioenergy is technically viable and economically competitive in many end uses, Sri Lanka's private sector lacks the financial depth and risk tolerance to undertake large-scale biogas, or biomass energy ventures without external support. At the same time, global impact investors, blended finance funds and facilities and climate-aligned private funds are actively seeking investable projects in clean energy that deliver rural incomes, resource circularity, and verified emissions reductions. Bioenergy in Sri Lanka aligns with these mandates but remains off the radar due to the absence of investable project pipelines, weak

[51] IREDA , EAI
[52] Kibet and Letema 2024 , ETP Global,

market visibility, and the lack of a credible government-backed vehicle to structure transactions and mitigate risk.

To attract such capital, the government could work with SLSEA, the Board of Investment, and the Ministry of Finance to develop a dedicated bioenergy impact investment window. This could identify and package commercially and socially investable projects, such as Gliricidia-based captive boiler systems, or waste-to-biogas plants for agro-processing, aligned with investor priorities around social inclusion, rural livelihoods, and climate mitigation. It could also engage with international blended finance platforms to design catalytic instruments such as subordinated equity, first-loss tranches, or outcome-linked returns. Within the Board of Investments (BOI) and special zone frameworks, a clear set of guidelines needs to be issued to prioritize bioenergy investments that deliver verified rural employment, low-emission energy access, and agricultural value addition. The government also could coordinate with multilateral and bilateral development finance institutions to co-anchor investments through concessional co-funding that derisks private equity and commercial debt.

To function effectively, this strategy must be supported by reliable project screening, transparent licensing and land-use regulations, and a dedicated technical assistance window to help early-stage developers reach financial close. The goal is to structure bioenergy as a commercially investable sector with social returns and clear revenue models. Properly executed, catalytic impact investment can revive project pipelines, attract new developers, and accelerate a scalable transition pathway that embeds equity and long-term accountability into Sri Lanka's energy sector.

ST19: Develop a Carbon Credit–Backed Model for Household and Community-Scale Bioenergy Deployment

Carbon finance offers a key opportunity to scale household and community-level bioenergy systems in Sri Lanka as a climate-linked rural energy service. Sri Lanka can draw practical lessons from Nepal's Biogas Support Program (BSP), which scaled over 250,000 biogas digesters using a combination of community outreach, microfinance, and carbon revenue. Through carbon aggregation and issuance under the Clean Development Mechanism, BSP sold more than one million tons of verified emission reductions to the World Bank's Carbon Fund, creating a stable revenue stream that helped cover household costs and sustain program operations.

Sri Lanka's potential lies in adopting a similar decentralized strategy: enabling household biogas, or institutional biodigesters in rural, estate, and peri-urban areas, financed in part through verified carbon credits. The Climate Change Secretariat, in collaboration with SLSEA, could operationalize a program within existing institutions to support qualified bioenergy projects in accessing carbon markets. This program could offer technical guidance on emissions accounting, project validation, and monitoring protocols

consistent with internationally accepted methodologies, enabling household and community-scale projects to access carbon revenue either through verified credit issuance[53] or advance financing structures backed by forward purchase agreements[54] or results-based donor programs[55]. Given widespread capital constraints among rural households and community institutions, Sri Lanka could prioritize carbon-linked results-based financing models that allow for partial upfront disbursements to cover initial installation costs. Donor-supported programs, such as World Bank's Ci-Dev or GIZ's EnDev, offer funding is released in two tranches: an initial grant or concessional payment based on physical deployment, followed by performance-linked payments upon verified emissions reductions. This structure is well-suited for biogas digesters and community-scale bioenergy systems, where commercial financing is otherwise inaccessible.

The primary goal of this strategy is creation of carbon-revenue-backed deployment models that can reduce the cost of access for end users while attracting concessional or private capital. By linking funding to verified emissions reductions, Sri Lanka can align climate mitigation with local energy access and rural development objectives. However, to make this pathway viable at scale, further regulatory alignment will be necessary. Distributed bioenergy systems must be clearly defined as eligible under national carbon crediting frameworks[56], with simplified procedures for registration, emissions tracking, and credit issuance. Ownership rights over verified emissions reductions must also be clarified. These foundational measures will ensure that early RBF-backed deployments are not isolated pilots, but stepping stones toward a sustainable, carbon-linked bioenergy market.

3. Demand-Side Energy Financing Strategies

3.1 Industry

Sri Lanka's industrial sector is central to the economy, contributing over 14% to GDP and employing nearly 30% of the workforce. The sector remains heavily dependent on carbon-intensive energy sources, with petroleum products and coal together accounting for 21% of total industrial energy use in 2021, and

[53] Carbon credits are typically issued post-verification of actual emissions reductions using approved methodologies. For household and community-scale energy projects, this usually involves third-party validation and monitoring over time.

[54] Forward purchase agreements allow developers to monetize expected carbon credits by selling them in advance at a pre-agreed price. Buyers may be private firms, compliance buyers, or donor-backed carbon funds willing to take delivery risk in return for early access to credits.

[55] RBFs such as those supported by the World Bank's Carbon Initiative for Development (Ci-Dev), or GIZ disburse funds upon delivery of certified climate outcomes. In some cases, partial advance payments are made to enable implementation, with balance linked to verified performance.

[56] As per SLCF, as of 2024, projects registered under Sri Lanka's national carbon crediting scheme (SLCCS) include small hydropower, rooftop solar PV, and reforestation-based emission reduction activities. No bioenergy or biogas projects have yet been credited under SLCCS.

electricity, comprising another 21%, largely sourced from fossil-based generation pending the transition to a higher share of renewables. Biomass, which accounts of 58% of energy use in industries, is sourced informally and its sustainability is uncertain. Efficiency potential in industrial systems is significant: cost-effective savings equal to 43–45% of energy use in industrial pumps, and over 30% in fans and compressed air systems are achievable using existing technologies. However, uptake remains limited. Most firms lack the capital, technical capacity, and structured support to undertake equipment upgrades or process improvements. Small and medium enterprises are particularly constrained by poor access to credit, exposure to energy price shocks, and delayed post-crisis recovery[57].

Sri Lanka's domestic financial system is not equipped to support industrial decarbonization at the scale and pace required. There is currently no dedicated credit facility for industrial energy transition, and existing green finance offerings remain fragmented, institution-specific, and poorly integrated into mainstream lending portfolios. Most banks do not offer green products tailored to industrial borrowers, and where such loans exist, they are priced above what firms are willing or able to pay; often with interest rates more than double borrower expectations. Maturities are short, collateral requirements are high, and eligibility screening lacks technical depth, limiting uptake even for projects with clear savings potential. Financial institutions report a lack of standard tools for evaluating decarbonization investments, including methodologies for projecting energy savings, standardized deal structures, and sector-specific risk benchmarks[58]. In most cases, lending decisions default to conventional asset-based credit frameworks, effectively excluding SMEs and capital-light retrofit projects. Green lending remains siloed; restricted to isolated units within a few commercial banks, without institution-wide processes, performance targets, or internal capacity to manage energy-linked credit portfolios

This misalignment is compounded by the absence of national credit-enhancing instruments, consistent market demand, or comprehensive regulatory requirements that directly incentivize industrial decarbonization. Sri Lanka has made important progress in developing energy management frameworks including appliance-level standards, the Energy Efficiency Building Code (2021), and benchmarking regulations for selected service sectors such as supermarkets and banks[59]. However, most energy-consuming industrial sectors are not yet subject to binding performance thresholds or emissions-linked investment requirements. As a result, many firms perceive limited commercial rationale to pursue clean energy upgrades, and financial institutions continue to see low demand for dedicated green lending products. Without complementary policy measures to reduce verification costs, link financing to

[57] UNIDO 2024
[58] UNIDO 2024
[59] See here SLSEA's published standards on lighting and appliance efficiency, the revised Energy Efficiency Building Code (2021), and energy benchmarking regulations for selected service sectors under ISIC codes.

measurable energy performance, and activate demand through procurement and export compliance, the financing gap for industrial energy transition is likely to persist.

ST20: Develop Transitional Loan Products via Public-Private Collaboration, Not New Credit Facilities

Creating new, standalone credit lines or special-purpose green funds is not feasible under current macro-fiscal conditions. A more viable strategy is to expand access to finance by scaling green loan products already offered by commercial banks, using accredited national institutions to channel concessional refinancing, subject to successful proposal development and approval by international vertical funds or IFIs. Any interest rate reduction must come from concessional capital already mobilized through international partners, not national budget or CBS's own balance sheet. This will avoid fiscal exposure while still enabling participating banks to improve loan affordability and extend tenors, which are currently constrained by the short-term nature of domestic deposit funding. Most bank deposits in Sri Lanka mature within three months to two years, limiting the ability of banks to support multi-year industrial energy investments without refinancing support. Similar strategy has previously been successful in Sri Lanka, where ADB-supported rooftop solar loans were delivered through local banks at interest rates of 6–8%, compared to current commercial rates exceeding 15%.

ST21: Standardize Project Evaluation and Technology Classification to Reduce Investment Risk

A core barrier to scaling finance for industrial decarbonization in Sri Lanka is the absence of standardized methods to evaluate project viability and energy savings. Financial institutions remain reluctant to lend for energy efficiency upgrades because existing audit results vary in quality, lack independent validation, and offer no consistent framework to assess performance risk. As a result, most banks revert to conventional asset-based lending, which excludes SMEs and retrofit projects with no fixed collateral.

To address this, the Sustainable Energy Authority, together with the Central Bank and Ministry of Industries, could establish a national system for verifying energy savings in industrial projects. This system could offer clear technical standards, a registry of certified verifiers, and alignment with the CBSL Green Finance Taxonomy to ensure coherence between technical validation and financial classification. This would enable banks to base credit decisions on projected performance, not borrower profile alone.

The CBSL could publish and regularly update a pre-approved technology list of common industrial decarbonization measures[60]. The list could include cost and payback benchmarks under local conditions,

[60] Bangladesh Bank does something similar, but its list covers a broader range of green-eligible investments beyond decarbonization.

energy savings estimates, and eligibility guidance for green lending. Focus could be placed on technologies with strong market uptake and proven financial returns, such as LED retrofits, solar thermal, and biomass boilers, rather than speculative or unfamiliar options. By de-risking both the technical and financial profile of eligible measures, this strategy would reduce diligence costs for banks, boost borrower confidence, and help generate replicable, finance-ready investment pipelines.

ST22: Leverage NBFIs to Expand Access to Equipment-Level Finance for SMEs

SMEs in Sri Lanka face persistent financing barriers for industrial decarbonization. These include high collateral requirements, limited credit histories, and project sizes that are too small for commercial banks but too large for microfinance channels. Most industrial decarbonization investments, such as motors, biomass boilers, or solar thermal, are typically equipment-level upgrades. These assets are better suited to lease or asset-backed finance, which is the core business model of many NBFIs. Over 75% of NBFI portfolios are in loans and leases[61], typically asset-backed products suited to equipment finance. While CBSL extended green finance guidelines to NBFIs in 2022, these remain underutilized, and no targeted green lending instruments are currently active in the sector[62]. Commercial banks, by contrast, focus on larger, collateral-backed lending and are less equipped to handle this segment.

To enable NBFI participation without relying on public subsidy or new concessional capital, CBSL and the SLSEA could focus on regulatory and structural enablers. This includes issuing clear eligibility guidance under the CBSL Green Finance Guideline, including formal recognition of green equipment types suitable for SME leasing. CBSL, in collaboration with selected NBFIs and industry associations, could facilitate the development of standardized loan templates for a small set of pre-approved technologies with strong market uptake and cost-saving potential. SLSEA could provide the corresponding technical specifications, including performance benchmarks and eligibility criteria. These measures would allow NBFIs to extend existing leasing and term loan models to clean equipment, using their own capital and risk models, without relying on external refinancing. A limited pilot, with transparent tracking of repayment performance and uptake, could demonstrate commercial viability and justify further expansion over time. This will build on existing market capacity, and avoid premature dependence on concessional mechanisms.

Even with regulatory and structural enablers in place, risk and collateral requirements remain a binding constraint for NBFIs seeking to scale SME lending. The proposed National Credit Guarantee Institution (NCGI) could help overcome this constraint by offering partial credit guarantees for loans targeting pre-approved technologies. By absorbing a portion of the default risk, the NGCI could enable NBFIs to lend

[61] UNIDO 2024

[62] Ibid.

more flexibly, without distorting pricing. If designed with simplified eligibility and claim procedures tailored to lease-based products, the guarantee could significantly improve NBFI risk appetite and unlock credit to underserved SME segments.

This strategy complements the two preceding ones by targeting a different institutional layer. While commercial banks and DFIs may lead on long-tenor loans through concessional refinancing, NBFIs are better positioned to serve smaller SMEs through lease-based equipment finance. However, both depend on a common set of enabling tools such as verified technology lists and standard audit protocols to structure and scale green lending.

ST23: Create Market Demand for Low-Carbon Industrial Production Through Green Procurement, Export Alignment, and Consumer Incentives

Financial institutions and industrial firms in Sri Lanka currently see limited commercial rationale to invest in decarbonization because there is no regulatory mandate or market-based demand for low-carbon goods and services. Most banks report that green lending remains low not only due to project-level credit risks but also because there is no indication of premium pricing or preferential market access for low-emission production. On the industry side, firms see no compliance requirement or procurement advantage that would justify capital investment in clean energy upgrades[63]. As a result, both lenders and borrowers lack clear incentives to prioritize decarbonization.

To address this structural gap, the government may consider initiating a two-track approach to stimulate demand-side pull. First, public procurement policy could be revised to activate green sourcing as a market lever. The Public Finance Circular could be amended to allow for price–performance criteria in government tenders, incorporating life-cycle emissions or energy efficiency standards for industrially produced goods such as cement, paper, plastics, and apparel. A phased introduction of green procurement criteria beginning with high-volume categories would send a clear demand signal to producers. While the scale of domestic procurement is limited relative to total industrial output, public sector demand can still play a strategic role in mainstreaming green compliance standards and demonstrating local viability of low-emission production models.

While green public procurement is a key starting point, it will not, on its own, generate sufficient market pull to drive large-scale investment in low-carbon industrial production. Consumer-facing incentives will also be necessary to shape broader demand and reward cleaner manufacturing practices. One option is to introduce a basic environmental labelling scheme for selected industrial goods, such as packaging, building

[63] UNIDO 2024

materials, or household items, supported by differentiated VAT treatment. Products certified as low-emission could be made eligible for reduced VAT rates, while higher-carbon goods could remain at the standard rate or face modest surcharges. This would send a clear signal to both producers and consumers, encouraging cleaner production without requiring new fiscal outlays.

Export competitiveness could also be actively aligned with greening efforts. Many of Sri Lanka's industrial sectors, particularly apparel, tea, and rubber-based goods, are already integrated into global value chains where emissions performance is increasingly monitored. Targeting premium export segments, including through compliance with emerging carbon disclosure requirements (such as CBAM in the EU), could offer a more scalable commercial incentive for decarbonization than domestic consumer demand. Partnerships with large international buyers and export-oriented branding strategies could help local producers capture modest but strategic price premiums for greener goods, while also avoiding future exclusion from regulated markets.

Together these measures would help establish a consistent demand signal across both public and private markets, giving firms a clearer commercial rationale to invest in cleaner production methods. By linking credit access, purchasing incentives, and fiscal policy to emissions performance, the government can gradually shift industrial investment decisions toward low-carbon outcomes without relying on new subsidies or regulatory overreach. This demand-side alignment is essential to complement supply-side financing reforms and unlock private capital for industrial decarbonization at scale.

3.2 Transport

Sri Lanka's transport sector is the largest source of energy-related emissions, contributing over 50% of national CO_2 output[64]**, and remains structurally exposed to fossil fuel price volatility, supply insecurity, and high system-level economic costs**. Road transport accounts for nearly 90% of total transport sector GHG emissions[65]. Despite this, the current mobility model is locked into unsustainable patterns of private vehicle growth, fuel import dependence, and underinvestment in public and low-carbon transport. In its updated NDC, the government has identified thirteen mitigation actions in the transport sector, including public transport system improvements, promotion of electric and hybrid vehicles, suburban rail modernization, freight modal shift, and expanded non-motorized transport options[66]. These are not backed by a single comprehensive policy or investment plan but form the starting point for aligning future public and private capital toward decarbonization and access goals. A renewable energy transition in transport could,

[64] UNESCAP 2023
[65] Ministry of Transport 2021
[66] MoE 2021

therefore, prioritize demand-side strategies that are financially executable, targeted to high-impact segments, and structured to address both emissions and affordability without assuming large-scale public spending or universal technology shifts. Strategies towards that end include:

ST24: Rationalize and Reprioritize Fiscal Instruments to Support Affordable Low-Carbon Mobility

Sri Lanka's fiscal regime for transport has long been characterized by ad hoc tax policy and weak investment signalling. While vehicle taxation levels are among the highest in the region, they have failed to contain motorization[67]. Fuel pricing, which is now linked to a cost-reflective formula, is volatile, and there is no coordinated policy on how electricity tariffs could treat EV charging. The current system creates uncertainty for investors, suppresses formal sector fleet renewal, and offers no consistent incentive for efficient or clean mobility transitions.

A revised fiscal policy could focus on correction, not concession. Stabilizing and rebalancing transport taxation will be important for the Ministry of Finance to support efficient and affordable mobility. Sri Lanka's current vehicle tax structure generates high fiscal yields but offers no consistent economic signal for technology transition. Rates are frequently revised, applied unevenly across vehicle categories, and disconnected from broader transport or climate objectives. This volatility creates uncertainty for importers, lenders, and consumers, while doing little to curb fuel dependence or encourage cleaner alternatives. A more rational structure is needed; not to lower tax revenue, but to make it more predictable, transparent, and supportive of policy goals.

The MoF could begin by stabilizing tax treatment for low-cost electric two- and three-wheelers, which are the most viable electrification segments in the short term. Of Sri Lanka's total vehicle fleet of around 6.7 million in 2021, motorcycles accounted for 54% and motor tricycles constituted 16%[68]. While electric variants still form a small fraction of this base, their cost parity (Table 3) and operational suitability make them the most practical entry point for demand-side transition. Fixing their tax treatment over a defined multi-year period would offer planning certainty without requiring new fiscal expenditure. Instead of offering

[67] Vehicle purchase prices in Sri Lanka are among the highest globally due to steep import duties and cumulative taxes. Sri Lanka's average vehicle price index is 150.75, compared to a global average baseline of 100. Among developing countries with GDP per capita under USD 6,000, Sri Lanka ranks 8th out of 81 countries, with prices 23% higher than the group average. Effective tax rates on internal combustion engine (ICE) vehicles have ranged between 150% and over 600%, depending on engine type and fuel. For example, diesel vehicles above 2,500cc faced taxes as high as 574% in 2015 and over 600% in 2019. Despite these high rates, Sri Lanka has seen sustained growth in private vehicle ownership. International comparisons show that Sri Lanka's motorization rate, measured by vehicles per 100 people, exceeds many higher-income countries, when adjusted for GDP per capita. Source: UNESCAP 2023

[68] Ministry of Transport 2021

rebates or exemptions, which the government cannot afford, tax rates for these vehicles could be fixed for a defined multi-year period and published publicly to give investors and buyers planning certainty. At the same time, higher tax rates can be maintained, or gradually increased, for private vehicles with high per-vehicle fuel consumption, such as large-engine passenger cars, luxury dual-purpose vehicles, and older diesel vans. These categories deliver low social utility relative to their import cost, fuel use, and emissions footprint. Maintaining or increasing tax incidence in these segments will allow the government to preserve overall revenue neutrality while stabilizing tax treatment for more efficient, widely used vehicle classes such as 2Ws and 3Ws.The objective is to preserve fiscal space while improving the quality of the price signal: to make clean, efficient vehicles more bankable without new subsidies.

Table 3: Lifetime Cost Comparison – Two- and Three-Wheelers

Vehicle Type	Cost Type	ICE (LKR)	Electric (LKR)
Motorcycle	Economic Cost[69]	1,029,268	699,618
	Financial Cost[70]	1,306,716	925,901
Three-Wheeler	Economic Cost	2,351,222	1,409,146
	Financial Cost	3,230,571	1,778,746

Data source: UNESCAP 2023

A defined EV tariff for early commercial charging with basic time-of-use could also be introduced. Sri Lanka currently lacks a defined electricity tariff for EV charging, which creates uncertainty for early-stage operators and hinders private investment in charging infrastructure. PUCSL could introduce a dedicated tariff category for EV charging stations. The tariff could incorporate a basic time-of-use structure, with differentiated rates to encourage off-peak charging and improve grid stability. This can be implemented using standard industrial metering without requiring smart meter upgrades. While the number of commercial chargers remains limited today, a clear and predictable pricing structure will be essential to de-risk future private investment and align electricity planning with transport demand. No household-specific tariff is needed at this stage as the number of residential users charging EVs at home is too small to justify the administrative cost and system complexity of introducing a new domestic tariff category. This limited, well-targeted reform can close a policy gap at minimal administrative or fiscal cost.

ST25: Limit E-Bus Deployment to Structured Urban Pilots and Integrate with Suburban Rail for Scalable Low-Carbon Mobility

[69] Economic cost includes lifetime fuel, maintenance, and capital costs based on actual utilization data and real cost of electricity at Rs 60/kWh.

[70] Financial cost includes interest, taxes, and full financial outlay from the user's perspective under standard loan conditions.

As of January 2023, the Sri Lanka Transport Board (SLTB) - state-owned enterprise responsible for operating government bus services in Sri Lanka - maintained a fleet of 6,998 buses, of which only 5,094 were operational. Over 1,100 of these were more than 15 years old, and nearly 30% of the fleet was inactive due to aging stock and poor maintenance. Despite significant spending on fuel (Rs. 36.68 billion) and maintenance (Rs. 2.52 billion) in 2022, there is no clear accounting of how rehabilitation funds were used or whether any buses were restored to service[71]. This indicates that the current fleet model is inefficient and SLTB currently lacks the capacity to lead capital procurement as a vehicle for transition. Moreover, as of 2021, buses constituted only around 1% of Sri Lanka's total vehicle fleet[72]; large-scale investment in bus decarbonization would have limited impact on overall transport emissions or energy use, and should not be prioritized in the current fiscal context.

Full-scale electrification of Sri Lanka's public bus system is neither financially nor institutionally viable in the short to medium term. Instead of pursuing system-wide fleet replacement, the government could limit e-bus deployment to targeted urban corridors where passenger density, route regularity, depot access, and verified local grid capacity create the minimum conditions for cost-effective electrification.

Given these limits, a more scalable public transport decarbonization option would be to prioritize suburban rail electrification and its integration with local bus services for first- and last-mile connectivity. Designs are already in place to upgrade and electrify the suburban rail network covering Rambukkana, Avissawella, Kalutara South, and Negombo–airport, serving the current 0.4 million daily rail users and targeting a potential increase to over one million daily passengers[73]. Aligning future e-bus pilots with electrified rail corridors could improve last-mile access, reduce road congestion, and enable greater mode shift from private transport to low-carbon public systems.

Towards that end, the Ministry of Transport may consider issuing a policy directive that classifies e-bus deployment as a service reform, not an infrastructure investment program. This means the state could not purchase buses. Instead, it could restructure bus service contracts in selected municipalities, starting with Colombo, to allow competitively procured multi-year operating concessions where the operator owns or leases the e-bus fleet and is paid through a per-kilometer service fee indexed to input costs. Capital support from development partners could be requested only for charging infrastructure, depot readiness, and transaction assistance; not for vehicles. MDBs may be approached to co-finance depot upgrades or offer concessional finance to private fleet operators, but only where the local authority can commit to a

[71] National Audit Office 2023

[72] Ministry of Transport 2021

[73] CEB

viable payment mechanism. To make these corridor pilots bankable demand forecasting must be completed upfront, fleet procurement could be aggregated to achieve minimum scale for financing, local grid capacity must be assessed before deployment. Expansion beyond pilot corridors could depend on operational results, cost data, and distributional impacts. This will avoid fiscal exposure, and align deployment with actual financing capacity and grid conditions. A phased, corridor-based approach that combines targeted e-bus pilots with electrified rail hubs can offer higher system-level impact and operational realism.

3.3 Household and Commerce

Sri Lankan households now face the highest electricity tariffs in South Asia, more than double the regional average, and residential electricity use constitutes 40% of national consumption, well above the global average of 28%. Electricity demand is inelastic, and the burden is disproportionately heavy for low-income, elderly-headed, and female-headed households[74]. More than one million households experienced disconnection in 2023 due to non-payment. Yet despite these conditions, most current energy financing strategies, tariff reform, rooftop solar, and demand-side efficiency, are oriented toward grid-connected, creditworthy users, excluding the poorest households and informal commercial actors. There are no targeted electricity affordability instrument, no appliance financing mechanism, and no dedicated household transition program.

Clean cooking represents the largest unresolved financing and transition gap. According to the Multidimensional Energy Poverty Index (MEPI) calculated by Jayasinghe et al.[75] (2021), lack of access to modern cooking fuel accounts for 57% of MEPI, making it the single largest contributor. Over 70% of Sri Lankan households still use firewood or other traditional biomass, such as firewood or crop residues, typically burned in open fires or basic stoves as their primary cooking fuel, including in households that have electricity connections. The MEPI analysis also reveals that energy poverty disproportionately affects female-headed households, rural and estate communities, and households in the Northern, Eastern, and Uva provinces. The data further shows that nearly 68% of energy-poor households are not income-poor, indicating that energy deprivation is not only a matter of affordability but also of service delivery, awareness, and availability. Even middle-income households revert to biomass when modern fuels become unaffordable or unavailable indicating the fragility of cooking energy access.

Small commercial users and informal service providers, especially in rural and peri-urban areas, face parallel challenges. Many operate without formal credit access, rely on inefficient electrical appliances, and

[74] Kumara and Nimal 2025
[75] Jayasinghe et al 2021

have limited ability to upgrade to energy-efficient or renewable-powered systems. These users fall outside existing energy finance models as they are not targeted by commercial credit, , and are not recognized in any clean energy eligibility framework. The challenge across both households and micro-enterprises is not capital cost alone but the absence of market-recognized delivery mechanisms, demand aggregation, and protection from energy price volatility. Any credible household and commerce energy financing strategy must therefore address affordability, access to clean fuels, and energy service equity; particularly for groups that cannot engage with formal energy markets under current conditions. Doing so is essential to ensure that Sri Lanka's energy transition delivers inclusive benefits and avoids deepening social and spatial inequality.

ST26: Rebalance Electricity Support Through Targeted Transfers Without Expanding the Subsidy Envelope

In August 2022, Sri Lanka implemented a long-delayed cost-reflective electricity tariff framework, fulfilling commitments under its IMF-supported fiscal reform program. This reform ended the blanket under-pricing of electricity and reintroduced a structured cross-subsidy mechanism; households consuming under 60 kWh per month now receive tariff discounts, while those in higher blocks pay more to fund those subsidies. Although this shift restored sector solvency, it has not been sufficient to prevent access loss. Over 1 million residential disconnections were recorded in 2023, a 100% increase from pre-crisis levels. Meanwhile, average household electricity consumption fell to just 65.4 kWh/month, despite universal grid connection indicating widespread under-consumption even for essential needs.

While there is a broad correlation between income and consumption, Sri Lanka's current system treats low consumption as a proxy for vulnerability which risk being a flawed assumption in certain contexts. Not all low-consuming households are poor; some urban or solar-equipped households qualify for subsidies despite strong repayment capacity. On the other hand, many poor households consume slightly above the subsidy threshold due to schooling needs, or inefficient appliances, and are excluded from support. As a result, the current policy leaks resources to non-poor households while failing to protect genuinely vulnerable users, especially those on the margins of energy poverty. A targeted affordability mechanism was thought of earlier, when the MoE planned a study to identify eligible groups and funding options. However, the study was never conducted, and no vulnerability-linked electricity transfer program exists today.

Introducing a new subsidy scheme is not fiscally feasible in the short-term at least. However, the government can reallocate a fraction of the existing cross-subsidy pool that is already built into the tariff structure to fund a narrow, capped electricity rebate, targeted through existing social protection infrastructure. While Sri Lanka's social protection system remains fragmented, it does provide operational entry points for identifying income-vulnerable households. Household-level income screening under current

programs can be used to approximate electricity vulnerability. Under a pilot, electricity distribution licensees can match verified beneficiary IDs to registered household electricity accounts and apply a fixed monthly rebate (e.g., LKR 200–400) as a bill credit. Where meter accounts do not align (e.g., renters or multi-tenant households), the rebate can be disbursed via existing social assistance payment systems. This mechanism does not require new infrastructure; only integration and reconciliation of beneficiary and utility data systems. To maintain accuracy in targeting, the eligibility list could be periodically updated using the latest data from the Welfare Benefits Information System (WBIS). PUCSL and the relevant social protection authority could establish a data-sharing system for this purpose. PUCSL may additionally conduct a biennial review of the affordability mechanism, covering rebate adequacy, financial sustainability, and coverage trends. This process would help protect vulnerable users while preserving tariff transparency and system balance.

To maintain fiscal neutrality, the rebate could be financed from within the existing tariff system without requiring new government subsidies. A small, progressive surcharge of LKR 0.05–0.15/kWh could be applied to consumption blocks above 90 kWh/month, where users already face the highest tariffs and act as net contributors to the cross-subsidy pool. The resulting 'affordability reserve' could be used to disburse capped, quarterly rebates to households identified through the Welfare Benefits Information System (WBIS).. The total fund size could be fixed in advance and reviewed annually.

However, this mechanism could only be treated as a transitional solution. As higher-consuming households increasingly adopt rooftop solar and reduce grid purchases, the volume-based subsidy base will shrink, potentially undermining the pool's viability. In the medium to long term, a renewable energy transition will require shifting away from volumetric cross-subsidies toward a structural affordability model. This will require introducing a dedicated affordability instrument embedded in Sri Lanka's broader social protection system. That long-term mechanism could take the form of a nationally capped electricity top-up transfer, disbursed through existing or future social assistance delivery platforms. It could be funded through a combination of redirected cross-subsidies, a modest 'solidarity surcharge' on high-usage households or high-voltage commercial users, and, over time, an earmarked share of fuel excise revenue or carbon tax, once introduced. Embedding affordability protection within the welfare system, rather than the utility tariff, will help maintain financial sustainability while reinforcing equity and political legitimacy in the energy transition.

The logic is to protect access without expanding cost. This targeted affordability mechanism would complement, not replace, existing tariff blocks, and prevent electricity exclusion among groups most affected by inflation, income volatility, or seasonal energy shocks. Over time, as macroeconomic conditions

improve, the targeting criteria and financing envelope can be adjusted based on performance and fiscal space.

ST27: Establish a Publicly Facing Clean Cooking Transition Facility

With 70% of households still dependent on firewood or biomass and 57% of energy poverty attributable to lack of clean cooking access, Sri Lanka's decarbonization and equity agenda cannot move forward without a dedicated cooking energy transition program. Clean cooking interventions fall between the mandates of the energy, health, poverty, and gender sectors. Interventions such as LPG access, e-cookers, solar cookers, improved cookstoves, or improved biomass systems are typically too small to be financed through commercial credit and too fragmented to qualify for infrastructure-scale energy finance. Without a purpose-built delivery mechanism, neither the public sector nor development partners have a clear channel to support widespread adoption at scale.

The challenge is not only financial and institutional, but also behavioural. Even among middle-income households, clean cooking uptake remains fragile, many revert to traditional biomass use (such as firewood and crop residue) when LPG prices spike or when fuel availability is uncertain. Deep-rooted habits, familiarity with open-fire cooking, and a lack of awareness about health and environmental risks contribute to continued use of inefficient traditional stoves, as distinct from improved biomass stoves which offer reduced emissions and fuel savings. These behavioural dimensions compound the financing challenge and require integrated delivery models that include sustained user engagement and community-led awareness campaigns.

Affordability constraints are further compounded by distribution bottlenecks and the absence of demand aggregation. Households in rural and estate areas may lack consistent access to LPG, modern cookstoves, or alternative fuels not only because of affordability, but also due to weak distribution systems and fragmented procurement channels. High delivery costs, supply gaps, and the absence of pooled community-level procurement result in volatile pricing and uneven product availability. These factors undermine both affordability and access, limiting the effectiveness of market-based solutions.

To fill this institutional gap, a Clean Cooking Transition Facility could be developed through joint leadership by relevant agencies to align efforts across energy, health, and social equity mandates. This facility could finance last-mile access, adoption incentives, and community-based delivery models in rural and estate areas where deprivation is highest, using results-based financing and output-based grants as the core modalities. Disbursements could be tied to independently verified outcomes, such as sustained use of clean cooking systems or reduced firewood consumption, rather than just equipment distribution. To overcome behavioural and informational barriers, the facility could fund targeted user education, peer-led demonstrations, and village-level engagement via trusted community agents. To address distribution

constraints, it could support local delivery partnerships, pooled procurement mechanisms, and bundled clean cooking packages delivered through cooperatives, schools, or women's groups. Delivery models may specifically include women-led dissemination of clean cooking technologies and thus support broader gender and livelihood co-benefits.

Given Sri Lanka's fiscal constraints, this facility cannot and could not rely on public budget resources. Instead, it could be positioned for blended international co-financing. Thematic donor mandates on climate mitigation, health outcomes, and gender equity are directly aligned with the co-benefits of clean cooking. These linkages make the facility a viable candidate for financial and technical support from institutions such as the GCF, GEF, health-specific funds, or international platforms like EnDev, SEforALL, or the Clean Cooking Alliance. Early-stage support could be secured through technical assistance grants, with downstream financing tied to verified social and environmental outcomes. To improve bankability, the facility could be designed to integrate MEPI data, community verification systems, and simplified monitoring protocols that meet international climate and health MRV standards.

This is not a subsidy program in the conventional sense. It is a targeted, time-bound transition instrument to de-risk adoption, build delivery infrastructure, and formalize clean cooking within Sri Lanka's public financing and development planning systems. When coupled with a complementary carbon-credit-backed financing model for household and community-scale bioenergy (as proposed in ST19), this facility can serve as a deployment platform for verified clean cooking assets, unlocking additional financing through carbon markets. Without such a mechanism, the clean cooking gap will persist and the structural inequality it reflects will continue to undermine both the credibility and inclusiveness of the energy transition.

ST28: Expand Energy-Efficient Appliance Access and Equipment Finance for Households and Informal Enterprises

Low-income households and informal commercial users, such as food vendors, rural shops, and small-scale service providers, often rely on outdated or inefficient appliances, which significantly increase their electricity intensity relative to income. These users face both absolute and relative energy burdens, not because of excessive consumption, but due to inefficient end-use technologies and the lack of access to modern alternatives[76]. Informal users, who operate outside formal banking channels, face parallel constraints in upgrading equipment, compounding energy poverty and affordability stress.

To address this, the MoE, with support from SLSEA, could launch a targeted appliance financing scheme in collaboration with appliance vendors, MFIs, and cooperative networks. The program would aim to

[76] Kumara and Nimal 2025

formalize and scale vendor-facilitated instalment plans for SLSEA-listed efficient appliances such as refrigerators, induction cookers, and LED lighting. Under this model, approved vendors would offer appliances on credit to consumers, either directly or through MFI-partnered channels, with repayment periods structured over 6 to 18 months. These arrangements would not require formal banking relationships or fixed employment status, making them accessible to informal workers and small businesses.

To mitigate repayment risk and reduce markups, the program could certify vendors through a public registration scheme tied to technical standards and fair-pricing principles. Participating vendors would be required to stock only high-efficiency models pre-approved by SLSEA, such as those rated a minimum of three stars under the ongoing energy labelling programme, and transparently disclose credit terms and warranty coverage. MFIs and leasing companies would act as financial intermediaries where needed, underwriting repayment and supporting customer selection, while cooperatives and community networks, especially in estate or peri-urban areas, could serve as aggregators for bundling orders and negotiating lower unit costs. To further mitigate repayment risk, the program could allow for basic pre-qualification checks using existing mobile billing histories, utility receipts, or micro-business licenses as substitutes for formal credit scoring.

4. Strengthening the Enabling Environment for Renewable Energy Transition

4.1 Policy Stability and Regulatory Coherence

Policy and regulatory consistency remain a precondition for mobilizing long-term finance into Sri Lanka's energy sector. In recent years, reversals in procurement processes, delays in tariff adjustments, and inconsistencies in licensing have contributed to increased investor risk. These factors have also raised the cost of capital and constrained the flow of concessional and private financing. While the Electricity Act 2024 offers a renewed legal framework, implementation risks remain if policy signals are not reinforced by predictable regulatory processes.

Clarity on regulatory timelines and decision processes could improve sector performance and reduce uncertainty. A forward-looking regulatory roadmap, jointly maintained by PUCSL, the MoE, and the MoF, may help align tariff adjustments, PPA approval procedures, and procurement schedules with sectoral planning cycles. Linking this roadmap to formal consultation procedures and public disclosure may also strengthen investor confidence.

Regulatory roles across institutions could benefit from greater delineation. PUCSL's responsibility for tariff methodology, investment review, and performance monitoring may carry greater weight if planning documents such as the LTGEP and TDP are regularly cross-checked for regulatory alignment. Transparent

review of delays in project licensing, dispute resolution, and procurement approvals could also improve accountability across agencies.

Where feasible, mechanisms that promote regulatory coherence across the sector could support more consistent financing outcomes. One option under consideration is a permanent coordination platform involving PUCSL, NTNSP, MoE, MoF, and other relevant institutions, to review major regulatory proposals and assess their consistency with the national energy and fiscal frameworks. Experience in comparable contexts suggests that transparent rule-making and predictable implementation frameworks tend to attract more diverse sources of financing and reduce the premium associated with perceived policy risk. Formalizing these practices in Sri Lanka's transition roadmap may help support both credibility and capital flow over the medium term.

4.2 Inter-Institutional Coordination

Effective coordination across institutions is central to operationalizing Sri Lanka's renewable energy transition. Multiple agencies hold mandates for policy, regulation, planning, and implementation. The MoE leads policy formulation, the CEB oversees generation and grid operations, PUCSL regulates tariffs and licensing, and SLSEA promotes renewable energy development. Additional roles are held by the MoF the Climate Change Secretariat, and subnational authorities. In practice, delays in project approvals, inconsistent interpretation of regulatory requirements, and fragmented decision-making have contributed to under-execution of planned investments.

Recent policy developments provide an opportunity to improve alignment. The Electricity Act 2024 mandates unbundling of generation, transmission, and distribution entities, creating clearer institutional boundaries. The General Policy Guidelines for the Electricity Industry (2021) and subsequent Cabinet decisions establish generation targets and procurement rules that apply across agencies. However, alignment between planning instruments such as the LTGEP, Transmission Development Plan, SLSEA's Renewable Energy Resource Development Plan 2021–2026, and resource zoning initiatives remains partial. Gaps in coordination have led to duplicated feasibility work, delays in grid access planning, and uncertainty over project sequencing.

Structured coordination mechanisms could help address these inefficiencies. A standing inter-agency working group, linked to the MoE, may serve to align planning assumptions, clarify permitting responsibilities, and review major investment decisions before execution. This group could draw on inputs from PUCSL, SLSEA, CEB, NTNSP, and the MoF, supported by technical review procedures and fixed review cycles. Institutional coordination is also relevant for grid integration, where distributed generation and new transmission projects require joint oversight to avoid bottlenecks or stranded assets.

In the context of constrained public resources and growing reliance on external finance, coordination between line agencies and financing institutions is also important. Parallel engagement by development partners with different institutions has sometimes resulted in overlapping project pipelines or disconnected financing initiatives. A common platform for investment screening and donor engagement may reduce duplication and improve alignment with national priorities. Embedding coordination functions within the implementation framework of the INFF could support consistency across public investment planning, regulatory approvals, and concessional finance mobilization. This may in turn contribute to more timely project delivery, reduced transaction costs, and greater investor confidence in the sector.

4.3 Green Skills, Workforce Transition, and Local Participation

The renewable energy transition in Sri Lanka presents both an employment opportunity and a workforce readiness challenge. While large-scale solar, wind, and distributed energy systems create direct and indirect job potential, current institutional arrangements and training systems remain poorly aligned to emerging labour market demands. The Climate Prosperity Plan (CPP), launched in 2023, estimates that green jobs linked to climate mitigation and adaptation could grow from 38,500 in 2022 to over 333,000 by 2040 under an accelerated implementation scenario[77]. These projections include roles in renewable energy, reforestation, water resource management, and energy-efficient infrastructure. However, the absence of a dedicated national green jobs strategy means that projected growth is not yet matched by a coherent set of institutional, technical, or financial enablers.

The readiness of Sri Lanka's TVET system to meet green labour market demands remains limited. A recent review of 33 public TVET institutions found only three certified programmes directly aligned with emerging green occupations, primarily in solar photovoltaic installation and environmental engineering[78]. Broader offerings in areas such as electric mobility, energy auditing, or circular production are absent. In the absence of nationally recognized green job classifications, skill standards, or certification frameworks, TVET providers face difficulty in identifying training priorities or validating emerging competencies. Curriculum development appears fragmented, with some institutions piloting renewable energy courses through donor-funded projects, but without a system-wide strategy or coordination platform. Engagement between industry and training institutions remains informal, and few mechanisms exist to systematically track evolving employer needs. The lack of labour market information on green employment trends further constrains curriculum reform. Countries such as Indonesia and Ghana have responded to similar constraints through structured green job readiness assessments, supported by national policy frameworks.

[77] Wijesinha 2024
[78] Ibid.

Comparable tools, supported by partners such as the ILO, could provide a foundation for Sri Lanka to define occupational standards, develop modular curricula for priority roles, and establish cross-sectoral protocols for skills planning. A national taxonomy of green occupations grounded in Sri Lanka's transition pathway and validated by industry could serve as a reference for both formal and informal training providers. These measures would help align the TVET system with future workforce needs, strengthen employability, and improve the credibility of training credentials across core green sectors.

Local participation in the green economy too remains limited beyond short-term employment during construction phases of infrastructure projects. The potential for community-based job creation, particularly through decentralized renewable energy systems, has not yet been fully realized. Emerging evidence from comparable contexts suggests that productive use of electricity such as for agro-processing, refrigeration, or small-scale manufacturing, can generate up to four times more jobs than the energy sector itself[79]. In Sri Lanka, off-grid solar deployments in agriculture and rural services have shown promise but remain fragmented and largely donor-driven. Linkages between renewable energy investments and local enterprise development are weak, in part due to the absence of targeted financing instruments or local hiring clauses in project design. Training and employment provisions are seldom embedded into concession agreements or procurement frameworks. There is also no mechanism to coordinate between developers, local authorities, and training providers to align skills development with project timelines. Expanding job creation from decentralized systems will require more structured integration of local employment targets into public procurement, as well as mechanisms to connect vocational training with spatially identified investment pipelines. Support for small and informal enterprises, particularly in the agriculture, services, and light industry sectors, could further broaden participation in the green transition, especially in underserved districts. These interventions would help translate national energy and climate investments into visible, equitable labour market gains at the local level.

4.4 Economic Diversification through the Renewable Energy Transition

Beyond its environmental and energy security objectives, Sri Lanka's renewable energy transition also offers a pathway to structural economic diversification. As global energy systems decarbonize, energy availability and cost competitiveness are becoming defining factors in determining the location of new industries. Countries with access to stable, low-cost renewable electricity are increasingly well positioned to attract energy-intensive sectors, including data infrastructure, precision manufacturing, and component assembly for global clean technology supply chains. Sri Lanka's geography, solar and wind resource base, create potential advantages in this front.

[79] UNDP Internal Bulletin

One area of strategic interest is the siting of digital infrastructure such as data centres. Demand for hyperscale computing is growing rapidly, driven by advances in artificial intelligence, cloud services, and machine learning applications. With western markets facing capacity constraints, rising energy prices, and climate-related operational risks, there is growing interest in offshoring data workloads to cost-stable, low-emission locations. Countries such as Malaysia and Indonesia have begun to capture this opportunity by marketing renewable-powered data hosting zones. Sri Lanka's potential to support such models, particularly through solar-powered colocation centres in the dry zone or repurposing state land near high-voltage substations, may warrant exploration. Realizing this potential would require grid reliability, high-bandwidth connectivity, and streamlined permitting frameworks tailored to digital infrastructure investment.

Opportunities for renewable-linked diversification also exist in light industrial and agro-processing segments. Microgrids and distributed generation can expand processing capacity in rural areas, especially for post-harvest treatment, refrigeration, and packaging. These productivity gains can support rural non-farm employment and strengthen supply chains. Domestic assembly of solar modules, inverters, or battery systems may emerge as a viable sector, particularly if integrated into concessional project procurement frameworks that incentivize local value addition.

To translate these opportunities into real diversification outcomes, Sri Lanka may need to couple renewable deployment with location-specific investment facilitation, tailored tax or regulatory incentives, and export-oriented industrial development plans. Energy affordability, reliability, and carbon intensity are increasingly used as screening criteria by international investors. Positioning the renewable transition as a competitiveness enabler, rather than a compliance cost, can align energy policy with broader growth and employment goals. This linkage between decarbonization and diversification may prove critical in sustaining support for the transition and expanding its economic returns.

5. Conclusion

Sri Lanka's path to a renewable energy transition is inseparable from its macroeconomic recovery, fiscal constraints, and deepening social inequalities. The current financing model which is focused around supply-side infrastructure and concessional loans, has supported grid expansion and renewable capacity additions but has failed to address affordability, access gaps, or the structural inequities that define energy poverty. While renewable energy has the potential to lower long-term system costs, affordability for end-users depends on tariff structures, cross-subsidy design, and grid cost recovery. Tariff reductions may not reach low-income consumers if debt servicing, network losses, and modernization costs are absorbed through the tariff base. Without course correction, Sri Lanka risks delivering a green transition that meets technical targets but sidelines vulnerable households, small enterprises, and underserved regions.

On the supply side, unlocking investment into generation, transmission, and distribution will require a shift from fragmented procurement and donor dependence toward standardized project pipelines, risk-mitigated contracts, and climate-aligned financing models. For this, private and institutional finance must be mobilized, particularly in grid modernization, storage, and distributed renewables, through regulatory clarity, cost-reflective pricing, and bankable revenue frameworks. The INFF Financing Strategyoutlines how hybrid PPPs, availability-based payments, and green bonds can be structured within Sri Lanka's legal and fiscal constraints.

On the demand side, equity-linked investments remain critically underdeveloped. Strategies proposed in this strategy, such as time-bound affordability rebates, appliance access programs, SME credit facilities, and clean cooking transition instruments, are not subsidy expansions. They are corrective tools to ensure that tariff reforms and capital investments do not amplify exclusion. These instruments will be structured to preserve fiscal neutrality, crowd in donor co-financing, and rely on simplified verification mechanisms for disbursement. Clean cooking access, in particular, must be elevated to a core financing priority, with structured deployment platforms, carbon finance linkages, and gender-aligned delivery models.

Demonstrating strong social performance, alongside mitigation ambition, will strengthen Sri Lanka's case for accessing future climate finance, bilateral support, and concessional instruments at scale. The INFF Financing Strategy creates that bridge. It aligns fiscal tools, social policy instruments, and regulatory levers into a coherent framework that supports both fiscal resilience and equitable energy outcomes.

Annex 1: Implementation Prioritization Matrix

ST Code	Strategy (concise)	1-2 yrs	3-5 yrs
ST1	Centralised renewable project preparation facility		
ST2	Standardised competitive IPP tenders		
ST3	Payment security and foreign-exchange buffer		
ST4	Transmission execution discipline programme		
ST5	Climate-aligned capital mobilisation for transmission		
ST6	Hybrid PPP models for transmission lines		
ST7	India–Sri Lanka HVDC interconnection		
ST8	Distribution corporatisation (CEB divisions)		
ST9	Results-based grid-upgrade fund		
ST10	Grid digitisation (smart meters, SCADA)		
ST11	Green distribution bonds		
ST12	Storage licensing and tariff rules		
ST13	Targeted procurement of grid-scale storage		
ST14	Distributed storage in public services		
ST15	National bioenergy coordination platform		
ST16	Feedstock and blending regulations		
ST17	Concessional finance for industrial bioenergy switch		
ST18	Bioenergy impact-investment window		
ST19	Carbon-credit rural bioenergy model		
ST20	Transitional green-loan products		
ST21	Standardised audit and technology protocols		
ST22	NBFI-led SME equipment finance		
ST23	Demand pull via green procurement and export alignment		
ST24	Rationalised transport fiscal signals		
ST25	Urban e-bus pilots linked to rail hubs		
ST26	Targeted electricity affordability transfer		
ST27	Clean-cooking transition facility		
ST28	Appliance and micro-enterprise finance scheme