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The Just Transition Transaction (JTT) in Southeast Asia

Application to Indonesia, Vietnam, and the Philippines

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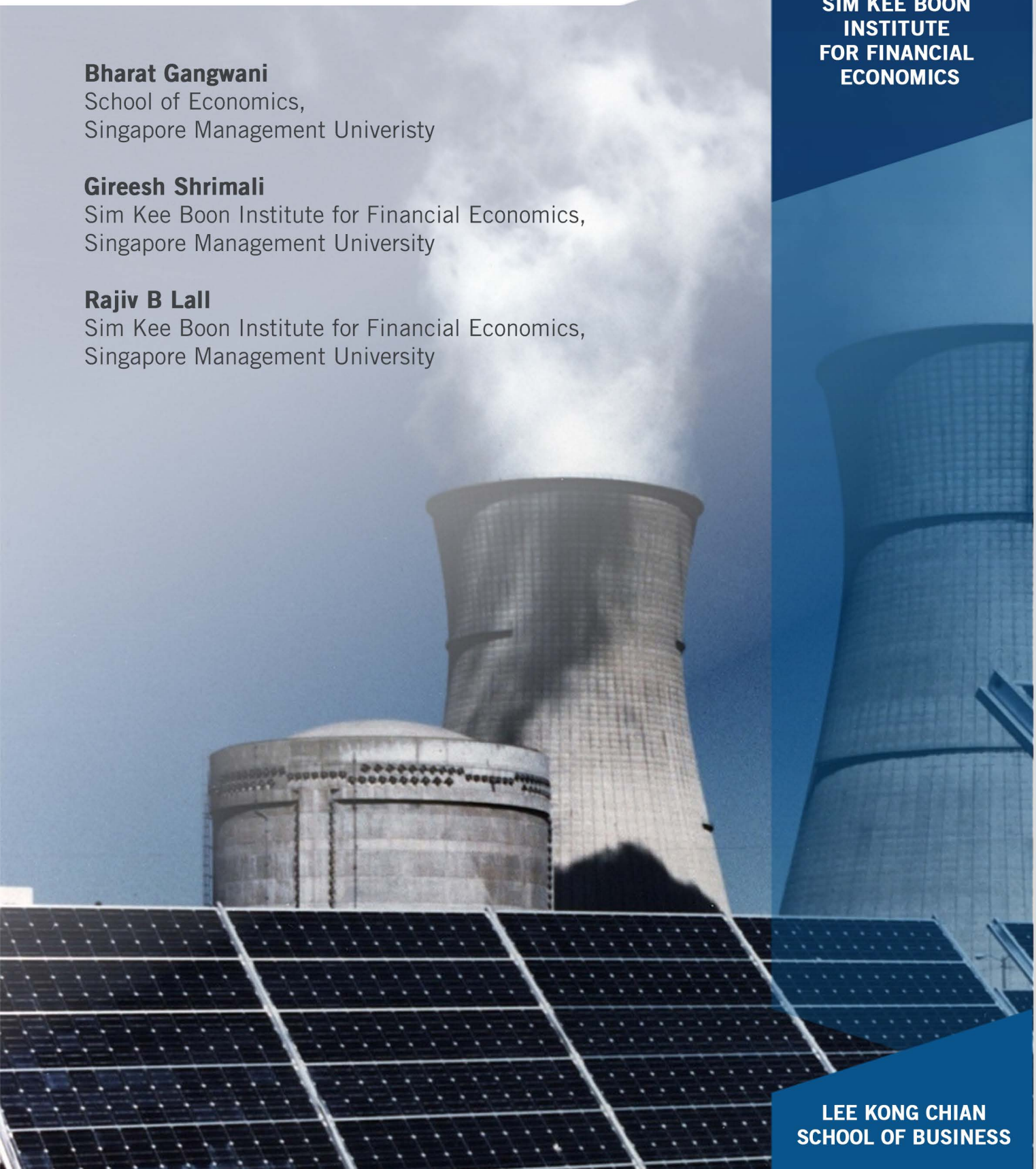

LEE KONG CHIAN SCHOOL OF BUSINESS

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Application to Indonesia, Vietnam, and the Philippines

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Abstract

The Just Transition Transaction (JTT) was developed for South Africa to support its coal retirement and greening of its national utility, ESKOM. We first use South Africa as a reference case study to deconstruct the JTT and develop a framework of *necessary* and *conducive* features for its application to other countries. We then use this framework to evaluate the JTT's suitability for supporting a green transition in key South-East Asian countries, specifically Indonesia, Vietnam, and the Philippines. We find that, while the JTT is suitable for Indonesia and Vietnam, it is not as suitable for the Philippines. Finally, we present a tiered JTT as a model to encourage a green transition at a supranational level and propose avenues for specific research to apply the JTT to Indonesia and Vietnam.

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1 Introduction

Countries in South-East Asia (SEA) remain reliant on coal to supply their growing energy demand. However, as hydro, and solar energy plants become more fiscally attractive, it opens them up to stranded asset risk and higher future energy costs (Caldecott et al., 2016). Given sufficient international attention and investment, countries like Indonesia, Vietnam and the Philippines can pivot their power sectors towards adopting greener energy infrastructure in line with the 1.5° pathway detailed in the Paris Agreement. Several international frameworks and mechanisms are being explored to deliver finance for and to encourage this transition.

The Just Transition Transaction (JTT) is one such mechanism (Steyn et al., 2021). It is a concessionary sovereign loan proposed to a developing country (South Africa) which aims to further its carbon mitigation commitments, pivot to greener sources within its energy production mix, and retire coal. Developed economies countersign the proposed debt to allow the developing country to reduce its cost of borrowing and thereby incentivise it to commit to a more ambitious mitigation pathway compared to its prevailing national commitments. The added mitigation, measured in gigatonnes (Gt) of Carbon Dioxide (CO2), can be set off against the country's interest payments on the debt at an agreed upon dollar per tonne rate over the repayment schedule. Hence, the developing country would be incentivised to reduce its grid CO2 emissions by investing in renewable energy and dismantling inefficient or coal energy infrastructure to reduce its overall cost of borrowing.

At the outset of the loan, the country would need time after renewing its infrastructure, implementing energy market reforms, and developing renewable energy capacity, before it is able to measure its mitigation performance. During this time, the sponsoring countries can tie the loan disbursement or interest payment concessions to key milestones to ensure accountability. Examples of milestones include unbundling of the developing country's national utility to promote efficiency, privatisation reforms, establishment of an energy market regulator or developing key green infrastructure or grid capabilities. If the country does not meet its planned CO2 reductions trajectory or other milestones in any period, it can even be punished through deductions to the loan's concessional terms or overall principal, loan acceleration or imposition of additional milestones for the country to meet depending on the terms negotiated.

This paper discusses the applicability of the JTT to the region with an emphasis on the aforementioned three countries. Section 2 discusses key methodological considerations in using South Africa as a case study for comparative analysis with South Asian countries. Section 3 contains an overview of JTT's implementation in South Africa. Using South Africa as a reference point, it identifies key necessary and conducive features for the applicability of the JTT to any sovereign. Section 4 develops a comparative analysis between Indonesia, Vietnam, and the Philippines with an emphasis on their characteristics such as the structure of their energy markets, current carbon emissions pathways, renewable energy initiatives, and future debt requirements. We analyse these characteristics for their overlap with the necessary and conducive features of the JTT before closing with an evaluation of the overall suitability of the JTT for the countries and how it can be adapted to better tackle regional challenges. Section 5 then concludes with policy implications and future work.

2 Methodology

The paper utilises South Africa as a base case for the application of the JTT. It evaluates its energy market structure, fiscal plans, and renewable initiatives to identify features which make it poised for a transition supported and incentivised by debt forgiveness such as the JTT. These features are formulated into a framework of necessary and conducive conditions which can be applied to any country to evaluate its suitability for a JTT-like transition mechanism. Since these conditions are derived from a single case study – JTT in South Africa – we believe that they are exhaustive in the corresponding context. However, these conditions may evolve as further best practices for similar transactions are established around the world.

The paper engages in theory-building by advancing a generalised framework for conditions which support a debt-forgiveness driven transition based on a case study of South Africa. Wherever possible, the transmission mechanisms we identify are backed by empirical economic literature, a feature emphasised by Eisenhardt, Graebner (2007) and Gerring (2004) for case studies which build theory. In the parlance used by Gerring, within the population of countries, we identify South Africa as our sample case and unit to formulate the matrix and evaluate its feasibility via application to three other units: Indonesia, Vietnam, and the Philippines.

Focusing on a single country allows us to consider its relevant economic and political features in-depth and enhance case comparability across countries. In contrast, in a cross-sectional study featuring countries where transition is supported by debt-forgiveness, the causal mechanisms identified may be more abstract and less comparable across cases. The limited number of countries where transition mechanisms have been implemented, especially ones structured around debt-forgiveness, was also a practical consideration in motivating our research design focused on the case study approach.

3 JTT and South Africa

Meridian Economics first proposed the JTT for the Republic of South Africa (SA) to fast-track investment in its renewable energy infrastructure, coal retirement and the unbundling of its national utility. SA's vertically integrated national utility, ESKOM makes it especially poised for the application of the JTT, with the promise of greater CO2 reductions than SA's current pledge. In November 2021, SA was promised $8.5 billion dollars by the United Kingdom, United States and the European Union to fund its just energy transition at the COP26 (Sguazzin & Cele, 2022). While the loan quantum is only half of the $16 billion recommended by the JTT, the deal suggests JTT's increasing political viability as stakeholders pressure developed country governments towards demonstratable action for climate justice like supporting the transition of middle-income countries.

"Making Climate Capital Work", a 2022 report by the Blended Finance Taskforce and Centre for Sustainability Transitions found that SA needs a cumulative $250 billion dollar investment over the next three decades to retire its coal energy plants, expand its grid infrastructure and transition successfully to green energy. The report estimates that the private sector would contribute two-thirds of this finance with public sources making up the rest. The $8.5 billion dollar pledge is likely to fulfil $40 billion of SA's transition requirements, according to Andrew Johnstone, CEO of Climate Fund Managers (*Making Climate Capital Work*, 2022). SA's ability to leverage this JTT pledge amount and transition into a net-zero economy is determined by factors like its vertically integrated energy market, current carbon emissions pathway, scalability of existing reductions initiatives and the availability of international finance.

3.1 ESKOM: SA's Vertically Integrated National Utility

ESKOM is SA's completely nationalised utility and a monopoly in all three segments of the energy market. It generates 95% of its power and handles 100% of the transmission and distribution (Steyn et al., 2021). Its status as government-run national utility and a lack of competition have led to significant degradation of its stations over the last fifteen years, making them difficult and expensive to run. Its coal expansion plans also have been subject to considerable time and cost overruns. The SA government also regulates ESKOM's tariffs and prevents them from rising sufficiently to cover efficient costs to appease customers. Despite this, plant mismanagement and climbing debt repayment costs have led to a 300% increase in energy costs for customers, leading to grid defection and declining sales over the last 11 years.

Due to all these factors, ESKOM faced a total debt of R400 billion by the end of July 2021 with expected debt servicing costs of R74 billion for the 2022 fiscal year and a debt-to-equity ratio that stood at 2.62 (ESKOM, 2022). Meanwhile, it predicted a net loss after tax of R9.1 billion in March 2022 over the preceding six months due to a lack of cost-reflective tariffs, debt servicing and grid expansion costs. Given its consistent underperformance, the SA Treasury has had to bailout ESKOM on multiple occasions: R56 billion in FY2021, R21 billion in 2022 and R33 billion per year for the next 5 years exclusively for short-term debt servicing (Steyn et al., 2021). However, none of these bailouts have been sufficient in reducing ESKOM's debt to serviceable levels and as its capital condition worsens, decreasing its credit rating, it must replace its expiring debt with more expensive debt, entrapping it in a negative credit cycle. While ESKOM's financial liabilities and the complications its monopoly status poses for new entrants in the energy market make it unfavourable for green investors, its absence would increase the cost and difficulty of financing a renewable energy transition in SA.

A single national utility like ESKOM makes it easier to initiate reform due to the ease of communicating with, incentivizing, or penalizing one party, especially if the borrowing sovereign owns the entity. It also makes it easier to measure the progress made towards the green energy transition and hold the company accountable. A national utility's power agreements are more transparent compared to bilateral Power Purchase Agreements (PPAs) between private parties. A report by Urbani et al. (2021) at PwC and RES4Africa found that private companies are likely to be deterred from renewable energy investments due to lack of easy access to the transmission grid or conventional beliefs about higher costs associated with renewables. Without government support, this may give rise to greater uncertainty within renewable investment projects compared to coal plant investments. Having an established national utility as a counterparty to purchase agreements with renewable energy plants can instill confidence in investors. Hence, despite the inefficiency costs that ESKOM currently incurs within its operations, its national utility status allows it to function as an effective channel for the deployment of the pledged funds for a just transition and is conducive for the application of the JTT.

3.2 Current Carbon Emissions Pathway and Planned Initiatives

SA generated 451.96 Mt of CO_2 emissions in 2020 with 87% of these being contributed by coal (Ritchie et al., 2020). 42% of these emissions were generated within the energy sector alone (Steyn et al., 2021). The highly carbon-intensive nature of SA's economy can pose a challenge to trade and competitiveness in the future. Its concentration in carbon-dominant exports opens it up to environmental tariffs by its trading partners. Switching to a pathway oriented towards greater renewable energy is both environmentally and economically potent. However, meeting the 1.5° temperature-rise Paris-aligned decarbonisation pathway requires an additional 5 to 6 GW of renewable capacity each year. This would result in 4 Gt of total CO_2 mitigation over the next decade. However, at its current pace of mitigation as specified in its Integrated

Resource Plan 2019 (IRP), SA would mitigate between 2 to 3.4 Gt of CO2 only. The presence of distinct baseline and Paris-agreement trajectories allows the JTT to finance mitigations which have a total monetary value equivalent to the difference between the two trajectories multiplied by the $/t rate.

With the concessionary funding proposed under the JTT, SA would commit to regulatory objectives otherwise difficult to achieve (Steyn et al., 2021). These include:

- ESKOM unbundling into sufficiently capitalized entities separately handling power generation, transmission, and distribution. These new entities can act as counterparties for power purchase agreements, energy investments and as rapid developers of necessary renewable energy infrastructure.
- Tariff reforms to reflect the efficient costs associated with power provision and allowing ESKOM's unbundled entities to become self-sufficient.
- Creation of an energy market regulatory authority to further market reforms.
- More rounds of South Africa's Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) to improve competition within SA's energy markets and ease credit conditions for future renewable investments. A liberalised energy market would also allow SA's energy producers to leverage growing international green finance for their projects.
- Progressive coal phaseout (accelerated plants' retirement, reduced coal operations and stoppage of expansion plans), development of new renewable energy infrastructure to replace legacy coal supply and ensuring adequate connection and transmission to the grid.
- Provision of retraining and support schemes for coal miners alongside supporting infrastructure (initiatives promoting industrialization, educational and regional upliftment) especially in the Mpumalanga region due to its concentration in coal.

3.3 Future Debt Requirements

In addition to these milestones, SA also has to guarantee ESKOM's deteriorating finances and back its Power Purchase Agreements with Independent Power Producers to maintain ESKOM's credibility (Steyn et al., 2021). Currently, SA guarantees more than 77% of ESKOM's debt, exposing it to greater credit risk, putting downwards pressure on its credit rating and increasing its borrowing costs. With $12 to $13 billion worth of South African Government's International Bonds (SOAF) maturing, SA aims to raise R600 billion in foreign debt in the coming decade.

The JTT is therefore synergistic with SA's carbon mitigation and debt financing plans. The country can achieve green objectives like ESKOM unbundling, IRP acceleration, energy grid expansion, carbon taxation, sector emissions targets and transition support programmes for the Mpumalanga region in exchange for the concessions received on its interest rate payments. Whether JTT debt is denominated in dollars or rands, SA can easily incorporate it at a concessionary interest rate within its planned foreign and domestic debt portfolio. Hence, the JTT is extremely compatible with SA's objectives and debt financing plans. Therefore, SA acts as a ready reference to identify the crucial features *necessary* and *conducive* to apply the JTT and as a benchmark for its overall suitability for any other country.

3.4 Key Elements of the JTT

Several features of South Africa make the country especially poised for the application of the JTT. We can split these into a framework of *necessary* and *conducive features* and use it evaluate the JTT's suitability for the countries in SEA. By necessary conditions, we mean conditions without which JTT would not have

happened in South Africa. Where, by conducive conditions, we mean conditions that made it easier for JTT to happen. A quick summary of these features, and their application in the context of SA, is available in Table 1.

Table 1: JTT's Necessary and Conducive Conditions for South Africa

Country	Necessary Conditions			Conducive Conditions			
	Distribution dominant firm	Pathway gap	Open to future debt	Vertical integration	Public ownership	Coal concentration	Green initiatives
South Africa	✓	✓	✓	✓	✓	✓	✓

Necessary elements of the JTT debt financing model are listed as follows. Conditions labelled *NR* refer to required features of the JTT's recipient country while features labelled *ND* are a function of the donor countries, or the specific negotiations undertaken for the JTT.

NR 1.0 Dominant firm in the distribution sector

A dominant player in the distribution segment of the developing country's energy market can act as a counterparty for the sovereign loan, renewable energy regulation, new power purchase agreements and other international finance. It also allows for better transparency in energy transactions, greater accountability to the proposed milestones and easier mitigation measurement. Without a dominant player, it would be difficult to propose and enact green reform in a coal-dominant economy.

A dominant distribution firm would also increase the leverage a government has to implement green reforms. A competitive market structure provides generation companies with alternative supply channels and increases information asymmetry between companies and regulators, increasing the cost and ineffectiveness of regulation (Freeman et al., 2021). Hence, the ease of implementation of green reforms under the JTT and their effectiveness is likely to be correlated with the degree of market power held by a firm in the energy distribution market.

NR 2.0 Gap between baseline and Paris emissions trajectories

The developing country's baseline CO2 emissions trajectory based on its current emissions targets, renewable energy initiatives and energy market reforms must be above the 1.5° Paris Agreement aligned mitigation pathway. The JTT compensates the developing country for the value generated by the transaction which is equal to the difference between these trajectories. If the developing country has already achieved the Paris pathway or has mitigated CO2 beyond it, the JTT is no longer necessary.

NR 3.0 Openness to Future Debt

Commitment to raise future government debt by the developing country to finance renewable initiatives, coal retirement or a just transition for its coal-reliant communities. Existing plans to raise debt allow the JTT to easily fit into the country's loan-repayment profile without affecting other policy priorities like foreign exchange rate, foreign reserves, or the national budget.

ND 1.0 Dollar per tonne of CO2 emissions

Dollar per tonne ($/t) rate used to calculate the monetary value of the mitigation achieved by the developing country. The rate should theoretically be higher or equal to the marginal cost of CO2 mitigation for the country to act as a sufficient incentive. Else, the country would prefer repaying the loan on the scheduled, unsubsidised terms instead as a part of its existing debt servicing plans. Hence, it is higher for developing countries which have already made significant strides in renewable investments and coal retirement and face higher marginal costs for CO2 mitigation.

ND 2.0 Sponsoring countries

Developed country governments which supply the financial value of the CO2 mitigations by guaranteeing part of the debt obligations or subsidising the interest payments, lowering the developing country's cost of borrowing. This is the sole means to compensate the developing country for its carbon mitigations as a part of the transaction.

In the absence of any of these necessary conditions, the JTT framework is inapplicable for supporting coal transition in any developing economy. Next, we list features conducive for the JTT debt financing model. Conducive features are not a necessary condition for the JTT but their presence in any transitioning economy makes the JTT framework easier to negotiate and implement. Like necessary features, conditions determined exclusively by recipient countries are labelled *CR* while conducive conditions which are a product of negotiations are labelled *CD.* Furthermore, we map the conducive features to the necessary features according to their relevance – e.g., CR 1.1 and CR 1.2 below are mapped to NR 1.0, CR 2.1 and CR 2.2 are mapped to NR 2.0, and so on.

CR 1.1 Vertically integrated monopoly

A vertically integrated public utility in the developing country's generation, transmission, and distribution energy markets. While vertical integration in the energy market is not a necessary condition, it makes the implementation of green reforms easier to impose relative to a privatised market for the same reasons as highlighted above in NR 1.0. Additionally, transitioning to a low-carbon trajectory requires transforming the entire system, including generation (to low-carbon sources), distribution (to increase energy efficiency and reduced losses), and transmission (to exploit system-level balancing required for intermittent and variable renewable energy). A vertically integrated monopoly is advantageous for governments initiating these changes.

CR 1.2 National utility

Public ownership of the utility further simplifies the politics and coordination associated with using a sovereign-backed loan to finance its unbundling and implementing green reforms through it.

CR 2.1 Coal concentration

Heavy coal concentration within the developing country's energy sources, reducing the marginal cost of carbon mitigation and the $/t rate offered as a part of the JTT, reducing the extent of monetary support delivered by developed countries and easing negotiations.

CR 2.2 Green initiatives

Existing green energy initiatives and goals which can be incorporated into the JTT's milestones. They also suggest an overlap in priorities with the country's government and a more amicable working relationship.

CD 3.0 Bullet Loan with Mitigation-sculpted Interest Payments

Loan profile with bullet principal repayment and mitigation sculpted interest payments. We can structure the loan profile such that larger interest repayments come due only as the developing country realises its mitigation measures, allowing it to fully capitalise on its interest payment concessions and minimise the overall size of the loan.

Given this framework, we can use the necessary and conducive conditions labelled NR and CR to evaluate the fit of any SEA economy with the JTT. We look at how well SEA countries' energy markets, renewable commitments and fiscal plans overlap with NR and CR conditions which are correspondingly numbered. Hence, recipient country conditions numbered 1.0, 1.1 and 1.2 are covered in subsection one for each country, conditions 2.0, 2.1 and 2.2 are discussed in subsection two while condition 3.0, the country's openness to future debt, is evaluated in each country's final subsection.

4 Applicability of JTT to SEA

Energy markets in SEA are dominated by coal, with expansion plans underway in Indonesia and the Philippines despite the stranded asset risk posed as renewables become more cost-effective. The Asian Development Bank (ADB, 2021) noted that energy efficiency in SEA remained largely untapped due to several reasons including a lack of adequate regulation, local expertise, finance for energy efficiency projects, regional cooperation, noncompliance with global best practices and the reluctance to embrace new technology or changing status quo.

Companies use bilateral agreements to execute power trade deals in SEA over reverse auctions, with the PPAs signed containing extremely limited disclosures. As a result, missing transparency breeds uncertainty and elevated risk within renewable investments for private producers. According to the ADB, "this has led to information asymmetry, conflicts of interest, high transaction costs, uncompetitive pricing, and often poor-quality services." Additionally, a lack of interconnection among national power grids and infrastructure to accommodate variable renewable energy has stalled trade in power within the region, further reducing its appeal.

4.1 Indonesia

Table 1: JTT's Necessary and Conducive Conditions for Indonesia

Country	Necessary Conditions			Conducive Conditions			
	Distribution Dominant Firm	Pathway gap	Open to future debt	Vertical integration	Public ownership	Coal concentration	Green initiatives
Indonesia	✓	✓	✓	✓	✓	✓	✓

Indonesia is compatible with all features of the JTT and is the next best candidate for its application after South Africa.

4.1.1 PLN: Indonesia's Vertically Integrated National Utility

Akin to ESKOM, PLN is Indonesia's 100% state-owned monopoly handling generation, transmission, and distribution. It controls, owns, and operates approximately 70% of the power generation capacity in Indonesia (PLN, 2021) and is the sole buyer of electricity produced by IPPs, including renewable energy. It also controls 100% of the transmission and distribution networks, satisfying NR and CR conditions 1.0, 1.1 and 1.2 which pertain to the public ownership of a vertically integrated national utility.

4.1.2 Gap in Emissions Pathways

Coal made up 58% of all the power generated in Indonesia in 2017 (Gray, Kok, et al., 2018a), satisfying CR 2.1 regarding significant coal concentration in the economy. Coal power plants create 35% of all CO2 emissions in Indonesia. Indonesia's new Energy Business Plan (RUPTL) 2021-30 aims proposes key initiatives aligned with the JTT which support a green transition. Renewable Energy accounts for half of the new power capacity addition under the RUPTL 2021-30 (Tam et al., 2021). The RUPTL also updates Indonesia's objective to reduce carbon reductions more than 29% by 2030 and achieve net zero by 2060. The increasing cost competitiveness of renewable energy compared to coal has desirably put upwards pressure on these baseline CO2 reductions (Gray, Kok, et al., 2018a).

IPPs also have a greater role to play in the additional power production. Of the total 40.6 GW of additional capacity planned in the RUPTL 2021-30, the government has earmarked 65% for private developers. Overall, Indonesia aims to supply 23% of its total electricity from renewables by 2025 (Tam et al., 2021). This is higher than the target in its RUPTL back in 2018, largely due to lower energy demand overall and a decrease in coal-powered energy consumption (Gray, Kok, et al., 2018a). Its green initiatives and the existence of a baseline pathway fulfill CR 2.2, but these policies are insufficient in meeting the carbon mitigation pathway required by the Paris Agreement.

Coal and gas continue to make up a sizable proportion of the new capacity addition despite recent announcements to ban new coal-buildouts starting 2022. Since Indonesia's coal infrastructure is already quite young, adding more today may mean locking in emissions and increasing transition costs, pushing net zero further away. While Indonesia also introduced a carbon tax on coal power plants in April 2022 (Tam et al., 2021), many analysts have found Indonesia's coal tax to be too low with companies favoring to pay the tax rather than invest in renewables. In early 2018, Indonesia also implemented a price ceiling of US$70/t for coal sold to the PLN which translated into $1.3 billion subsidy by the coal mining industry (Bridle et al., 2019). Combined with caps on IPP and PLN tariffs, it led to cheaper coal production, excess supply, and a reduction in the viability of renewable IPPs due to their higher baseline costs. (Climate

Analytics & NewClimate Institute, 2021b) estimate that coal would make up 64% of electricity generation by 2030, significantly higher than the 10% maximum proposed within the Paris-aligned pathway. Hence, despite Indonesia's notable green initiatives, it fulfills the NR 2.0 condition of a gap between its baseline and Paris-aligned pathways.

The problem of excess coal supply is exacerbated by PLN's demand estimates and long-term PPAs. Hamdi & Adhiguna (2021) found that PLN has been overestimating coal energy demand consistently since 2015 and supplying excess coal on both fronts: by developing new power plants which are underutilized and committing to excessive coal purchases via long-term PPAs. Consequently, the national utility has had to buy more power than forecasted. These long-term PPAs are the largest contributors of PLN's debt with its finances worsening as it realizes its PPA obligations, renewable energy becomes cheaper and coal energy demand falls. Without addressing these issues, PLN is unlikely to be able to sufficiently reduce the future carbon concentration in its energy generation.

The JTT framework can incentivize the Indonesian government to pivot its attention towards these issues. Initiatives like market liberalization, PLN's privatization and the establishment of an energy market regulator can also be negotiated as milestones within the JTT. PLN privatization will make government support or bailouts more uncertain and can compel IPPs and PLEs to renegotiate the terms of their PPAs.

4.1.3 Future Debt Requirements

RUPTL 2021 estimates total power capacity addition costs at $9.14 billion annually. The plan expects PLN to finance $5.14 billion of that amount which is higher than the utility's prior annual State Equity Participation valued at $0.6 billion. Indonesia would also require an additional $35 billion for renewable energy expansion and to achieve its target of generating 23% of its overall capacity from renewables. To support this transition, the RUPTL 2021 identifies funding options like internal funds, state equity participation and loans. Its loans can include foreign debt, government debt, commercial bonds, other commercial banking loans or even foreign grants, allowing the Indonesian government and consecutively PLN to absorb the JTT funds within such a debt portfolio, satisfying NR 3.0.

The Energy Transition Mechanism by the Asian Development Bank provides funding for the retirement of coal plants at least 15 years old. They target to retire 50% of the coal plants in Indonesia, Vietnam and the Philippines over the next 10 to 15 years (Asian Development Bank, 2021; Tam et al., 2021). However, this initiative is unable to support Indonesia in a complete transition away from coal since 66% of its power plants are only less than 10 years old, disqualifying them from ADB support and increasing the cost for their early retirement. Forty percent of Indonesia's coal plants are also IPPs with whom PLN has signed 15–20-year PPAs, making their early retirement further unlikely. Conversely, the JTT milestone-incentive structure could propel Indonesia towards market liberalization compelling IPPs and PLE to renegotiate their PPAs. It would also provide adequate financing options to support the RUPTL's milestones in its transition.

4.2 Vietnam

Table 1: JTT's Necessary and Conducive Conditions for Vietnam

Country	Necessary Conditions			Conducive Conditions			
	Distribution Dominant Firm	Pathway gap	Open to future debt	Vertical integration	Public ownership	Coal concentration	Green initiatives
Vietnam	✓	✓	✓		✓		✓

Vietnam lacks a completely vertically integrated monopoly and has lower carbon concentration in its energy generation compared to its peers in the region. Yet it fulfils most of the conditions in our framework and is suitable for its implementation. The progress made towards renewables, lower coal concentration and rapidly growing energy demand is likely to call for a higher $/t rate for the implementation of the JTT however, increasing the pressure on sponsoring countries during negotiations.

4.2.1 EVN: National Utility with Private Generation

Vietnam Electricity (EVN) is a state-owned enterprise, the single buyer of electricity and has a monopoly on transmission and distribution (Tran, 2021). Prior to 2012, EVN had a complete monopoly over generation, transmission, and distribution. The Electricity Law of 2004 restructured the EVN to encourage private players in the market. Vietnam Competitive Generation Market (VCGM) was consecutively established in 2012, allowing EVN's affiliate power generation companies and IPPs to begin selling power to a single buyer, the Electricity Power Trading Company (EPTC). Today, EVN's subsidiaries own 60% of the power generation assets with the remaining held by PetroVietnam (13%), Vinacomin (4%) and other IPPs (Gray, Kok, et al., 2018b). In 2019, the Wholesale Electricity Market (VWEM) became fully operational allowing power generators to sell electricity to industrial consumers directly. In 2017, EVN supplied 80% of the total power output via PPAs and bought the rest on the VCGM. EVN's monopoly over the transmission and distribution networks and state-ownership satisfy conditions NR 1.0 and CR 1.2 respectively, but fails to fulfill CR 1.1, the vertical integration condition.

The government also supports the EVN when it endures losses due to tariff caps making it difficult to recover efficient costs of operation. The government directed EVN to provide electricity tariff discounts amounting to VND 12.3 trillion in 2020 and VND 4.7 trillion in 2021. However, its financial situation remains better than ESKOM with a debt-to-equity ratio of 2.037 at the end of 2020 and significant government support. EVN has received guarantees, step-down loans, loans from state-owned banks at preferential rates, project subsidies and tax incentives to support its losses (FitchRatings, 2021). A drawback of such government involvement is that prevalent operational practices and beliefs among EVN's management may pose resistance to the acceptance of a JTT deal with managers and regulators perceiving the directive milestones to be intrusive or a breach of their sovereignty (The Economist, 2022).

4.2.2 Gap in Emissions Pathways

"The country's robust industrialization process has fueled a surging demand for energy in general and electricity. Vietnam is one of Asia's fastest growing energy markets due to a large population and sharp economic growth coupled with fast declining reserves in its existing oil and gas fields." (Tran, 2021)

Vietnam's national power development plans detail its baseline trajectory over the decade. The National Power Development Plan (PDP7) is the most recent official release while the government released the draft

of the updated PDP8 for 2021-2030 in October 2021. It places significant emphasis on renewable development and grid expansion to meet Vietnam's rapidly growing energy needs. The country's current power generation capacity stands at 56 GW. In 2020, coal power accounted for 34% of the total energy capacity while hydroelectricity and solar energy stood at 26% and 11% respectively. Between 2016 and 2021, Vietnam achieved the fastest growth rate in building solar capacity in the entire world. Solar photovoltaic capacity increased from 260 MW in April 2019 to 5,053 MW in July 2020 (Asian Development Bank, 2021) and has been the primary driver of growth for Vietnam's energy sector.

Vietnam's success in the rapid expansion of renewables can be attributed to its attractive feed-in-tariffs offered to renewable IPPs at $0.08/kWh for wind and $0.09/kWh for solar PV (The Economist, 2022), its efforts towards market liberalization and its striking down of red tap curtailing foreign investment in power generation. It has also planned grid expansion in the PDP8 to reduce severe congestion issues and better integrate renewable energy. Vietnam's strides towards green energy and coal retirement over the last three years are remarkable and satisfy CR 2.2 but consecutively prevent it from fulfilling CR 2.1. However, it yet fails to achieve a Paris-aligned mitigations pathway, primarily due to planned coal buildouts to serve the industrializing country's rapidly growing energy demand.

The government expects power consumption to grow 10-12% percent annually through 2030, one of the fastest in Asia. Under the PDP7, Vietnam aims to spend $950 million to develop its power generation capacity and $32.9 billion for power grid expansion over the next decade. Growing at an annual average of 5.7%, it aims to achieve a total capacity of 129.5 GW by 2030. 43% of the total capacity in 2030 would be from coal (Climate Analytics & NewClimate Institute, 2021a). The draft PDP8 also envisions an additional 10 GW of coal electricity capacity by 2045 even though coal needs to phase out by 2045 globally to meet Paris objectives. Despite large untapped offshore wind energy potential in Vietnam, it continues to increase its coal capacity, deviating further from the Paris-aligned pathway and multiplying its stranded asset risk. Therefore, it satisfies the NR condition 2.0 required for the application of the JTT.

4.2.3 Future Debt Requirements

In July 2021, the Vietnamese National Parliament unanimously passed a resolution detailing the country's financial and debt payment plan for 2021-25 (REGARDING NATIONAL FINANCIAL, BORROWING AND PUBLIC DEBT REPAYMENT PLAN FOR 2021 – 2025 PERIOD, 2021; Tung, 2021). The plan proposes an increase in overall government debt by $134 billion, out of which the Central Government will earmark $125 billion for public investment. Meanwhile, the PDP7 also approved the issuance of government bonds in domestic and foreign markets and aimed to attract foreign capital, including commercial loans, to back power projects without specifying an overall size for the borrowing (DECISION on the Approval of the Revised National Power Development Master Plan for the 2011-2020 Period with the Vision to 2030, 2016). Therefore, notwithstanding institutional inertia in accepting the JTT's milestones, Vietnam is likely to be open to the concessional capital lent under the JTT in exchange for accelerating its rapid progress towards renewables, satisfying necessary condition NR 3.0.

4.3 Philippines

Table 1: JTT's Necessary and Conducive Conditions for Philippines

Country	Necessary Conditions			Conducive Conditions			
	Distribution Dominant Firm	Pathway gap	Open to future debt	Vertical integration	Public ownership	Coal concentration	Green initiatives
Philippines	✓	✓				✓	✓

The Philippines's debt ballooned during the pandemic due to consecutive budget deficits caused by its expansionary fiscal policies meant to support recovery. Any future borrowing is likely to put it at a greater risk for default, despite the need to finance a green recovery and transition (Bala, 2022). Even if the Philippines agreed to add concessionary debt to its burgeoning burden, its pluralistic market is likely to make the organization of the transaction difficult. Leveraging Meralco to incentivise greener production sources would require significant political will and strict mechanisms to maintain accountability on the part of the private distribution company. Since the Philippines has already achieved several regulatory and market reform milestones, its $/t rate for CO2 would have to be higher as well, not just to maintain the incentives within the transaction but to convince Philippines to accept the debt in the first place. Given these hurdles, JTT is not a feasible mechanism for coal retirement and green transition in the Philippines.

4.3.1 Privatised Energy Markets: Hidden Monopolies

The Philippine Electricity Market Corporation (PEMC) governs the liberalized and competitive Wholesale Electricity Spot Market (WESM) in the Philippines. Power production and distribution are completely privatized while the National Grid Corporation of the Philippines (NGCP) operates the state-owned national grid which transmits power from power generators to regional suppliers. Most of the trade takes place via the spot market with a little over 8% negotiated through PPAs (*Annual Market Assessment Report*, 2020).

Philippines's liberal market structure has allowed it to achieve the highest electrification rates in SEA with private utilities viewing coal-fired plants as secure investments with guaranteed returns, promoting competition within the market (Gray, Ljungwaldh, et al., 2018). Biggest power generation companies by market concentration include Aboitiz (21%), San Miguel (21%) and First Gen (15%) (Department of Energy (Philippines) & Energy Regulatory Commission, 2022).

One significant utility, Meralco, a private energy distributor, supplies 80% of the entire market on the post-grid regional level. The remaining 20% comprises various regional players and more than 100 electric cooperatives (Sula, 2021). The competitive market structure would make it difficult to negotiate the terms of the JTT with multiple parties, measure their progress and hold them accountable to the milestones set. However, the distribution monopoly held by Meralco fulfills necessary condition NR 1.0 and could assist in creating incentives that compel grid providers to pivot towards green energy.

4.3.2 Gap in Emissions Pathways

Forty-three percent of Philippines energy generation comprises coal, satisfying CR 2.1. The market is heavily reliant on imported coal, creating significant exposure to international coal prices and exchange rates. However, the government has place a moratorium on new coal power plants starting 2020 (Asian Development Bank, 2021). It also approved a 500% increase in the coal tax in 2018. It is creating a roadmap for tariff increases and eliminating government involvement within the sector to attract renewable IPPs

which aligns with the objectives of the JTT as well (Gray, Ljungwaldh, et al., 2018). The Philippine Energy Plan 2012-2030 set a target of 9.9 GW of new renewable energy capacity or 35% of the total capacity by 2030. Renewable Portfolio Standards (RPS) also mandate a minimum share of renewable electricity supply for utilities. Given Philippines's liberalized market structure, RPS can be a feasible method for implementing key milestones under the JTT. Its green initiatives also fulfill condition CR 2.2. Despite the progress made, estimates by Climate Analytics & NewClimate Institute (2020) suggest that the green initiatives by the Philippines just fall shy of meeting the 1.5 degree rise Paris-aligned mitigations pathway. Philippines can improve its rating by decreasing emissions further and releasing unconditional policy targets. Hence, the gap between its baseline and Paris-aligned pathways satisfies the NR 2.0 condition.

4.3.3 Future Debt Requirements

An inability to source finance for its grid expansion and offshore exploration projects has also thwarted the country's green energy plans. This is largely because of back tax and contract sanctity issues. Regional characteristics like the lack of standardized regulation across countries has not helped, inducing uncertainty in trade commitments. Local capacity is limited and expanding slower than necessary. The Philippines would require an additional 43 GW of capacity by 2030 and is behind on developing solutions (Sula, 2021). Pandemic-fueled budget deficit also pushed the Philippines's debt over 12.76 trillion with the debt-to-GDP ratio at 63% (Bala, 2022). Both the World Bank and Philippines's new Finance secretary, Benjamin Diokno, agree on fiscal consolidation to reduce the debt burden to pre-pandemic levels which has curtailed demand for future borrowing. Hence, while the Philippines is likely to require future borrowing to be able to finance its green initiatives and post-COVID economic recovery, it is unable raise it without significant risk of default under its ballooning budget deficit and debt figures**.** Consequently, the Philippines does not satisfy condition NR 3.0, which makes JTT an unlikely candidate to support its transition.

4.4 JTT and Regional Cooperation

4.4.1 ADB's Technical Assistance to Accelerate the Clean Energy Transition in SEA

The primary mechanism for coal transition currently underway in SEA is the ADB Technical Assistance (ADB TA, 2021). Some of its aims include:

- Phasing out coal energy early within SEA while supporting local communities reliant on coal
- Scaling up renewable energy infrastructure by increasing public and private financing opportunities for clean energy investments
- Enhancing energy efficiency via reverse auctions, standardized regulation, encouraging new IPPs and unbundling national utilities
- Increasing energy sector transparency by increasing disclosures within electricity contracts, especially for fossil-fuel based power generation assets
- Enhancing regional power cooperation via trade, multilateral agreements and technical studies or pilot projects.

In pursuit of these aims, the ADB TA lists timed milestones for different SEA countries. These milestones include deadlines for measurable coal retirement, policy changes, market liberalization and sociopolitical outcomes to track the progress made by any country and within the region as whole. It also provides monetary support to governments via grants to hire consultants which can inform effective policy changes for the transition.

The ADB TA may not be enough for developing countries in the region, however, given the absence of meaningful financial assistance for its initiatives. It functions akin to a roadmap for the SEA countries but lacks sufficient financial support by developed countries – a crucial part of climate justice – to guarantee effective execution and measurable impact within the region. A parallel implementation of the JTT can help resolve this issue. Milestones under the ADB TA can be synchronized with terms negotiated under a JTT agreement between SEA countries and the sponsoring sovereigns, adding the required concessional element to the roadmap.

4.4.2 A Tiered JTT

Alongside the JTT facilitating green transition and impact at the national level, a tiered JTT can be used to influence a regional energy transition as well in SEA. There are key challenges within SEA energy markets which any incumbent nation cannot tackle itself. These include inconsistent energy standards across countries, low efficiency standards, a preference for PPAs over reverse auctions, lack of power-sharing agreements or infrastructure among others. To tackle these challenges, we propose a tiered JTT which accommodates both regional and national milestones. Within such an agreement, the achievement of national milestones would only grant a country part of the concession. Recipient countries can unlock the second tier of the concessions by achieving regional milestones like the establishment of international regimes to regulate energy standards or multilateral power trade agreements.

The achievement of regional milestones would grant additional concession separate and in addition to that of the national objectives, incentivizing countries to work together and draft relevant policies. However, the logistical and political challenges in the execution of such a proposal are likely to be multifold times greater than a JTT agreement with a singular sovereign. Despite the challenges posed, the incentive structure created, if made sufficiently concessionary and therefore attractive, can induce meaningful and lasting change in SEA and function as a model for encouraging supranational transitions globally.

5 Conclusion

Rapid growth of South-East Asian economies has accompanied a rise in living standards and associated carbon emissions. Desirable outcomes like expanding grid network and greater economic prosperity compel SEA countries to fulfil growing energy demand at a time when the world pivots away from traditionally cheap and convenient sources of energy like coal. These economies face the unique challenge of transitioning to greener energy sources while continuously developing, increasing grid access, and encouraging industry. However, as solar, hydro and wind energy become more cost-effective than coal, readily available climate finance and their state-heavy market structure puts them at the precipice of an unparalleled transition.

This paper investigates the Just Transition Transaction developed by Meridian Economies for South Africa to analyse its applicability for other countries and regions. Using South Africa as a reference case, it identifies a framework of *necessary* and *conducive* features for the applicability of the JTT to any country. It then uses this framework to evaluate the JTT's suitability for Indonesia, Vietnam, and the Philippines. The results of this comparison and evaluation are summarised in the table below.

Table: Summary of Necessary and Conducive Features for JTT's Recipient Countries

Country	Necessary Conditions			Conducive Conditions			
	Distribution Dominant Firm	Pathway gap	Open to future debt	Vertical integration	Public ownership	Coal concentration	Green initiatives
South Africa	✓	✓	✓	✓	✓	✓	✓
Indonesia	✓	✓	✓	✓	✓	✓	✓
Vietnam	✓	✓	✓		✓		✓
Philippines	✓	✓				✓	✓

Based on this framework, Indonesia fulfills all the necessary and conducive conditions and is the next-best country after South Africa for the application of the JTT to encourage a just transition. Indonesia is followed by Vietnam which lacks a complete vertically integrated national utility and has made considerable progress in reducing its reliance on coal already. Finally, we reason that the JTT is not applicable to the Philippines at all, primarily due to the unsuitability of its current macroenvironment to any additional borrowing. Even if it was open to borrowing at concessionary rates, the lack of a public monopoly is likely to make the JTT more difficult to negotiate and implement.

While we recommend Indonesia and Vietnam as suitable candidates for the application of the JTT based on the framework developed above, an actual implementation requires significant work. It will need research into the countries' baseline pathways followed in a business-as-usual scenario and associated CO2 reductions which will support negotiations with sponsoring countries. Similarly, the sponsors would require the amount of additional CO2 mitigation undertaken under the Paris-aligned pathways, and $/t rates for each country. These figures would be crucial in ensuring that the incentives in the transaction are properly structured to deliver climate justice and value for all parties. One, in the form of significant carbon mitigation which aligns the country with the 1.5° Paris decarbonization pathway and two, through sufficient monetary compensation for the developing countries which must undertake these green reforms faster than was required of their developed peers.

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