Kellogg x Morgan Stanley Sustainability Investing Challenge 2025

Powering Nusantara, The Sustainable Capital City of Indonesia

ATTAN DES BUYARS TOT BUTAN





Agenda 01 02 03 **Overview Solution** Investment Returns 04 05 06 The Implementation **Risks &** Impact & Expansion Mitigation

01 Overview



Jakarta, Indonesia's Capital, is not Liveable At All



Horrifying traffic and parking situation that takes up 5 years of an average person's lifetime



4x New York population density at 16k/km² living in indecent condition

Annual 'Great Jakarta Flood' causing economic loss of up to USD1bn per year

Subsiding land at a rate of 25cm/year in Jakarta's Northern coastal area

Moving to Sustainable Capital City NUSANTARA



In 2022, Indonesia government finalized the plan to move the capital city to Nusantara ("IKN"), located in East Kalimantan. It is targeted to be fully completed by 2045, commemorating 100 years of Independence



Lack of Power Infrastructure Slows Overall Progress



Weak private investment interest creates poor progress realization

1%

USD2.4bn

Private investment realization from 2023-2024

Total Private investment in the form of MoU Commitment

Over-reliance on the already-tight state funding. Lags in private investment compared to similar new city megaproject in Saudi

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Year announced	2019	2017
Funding committed	USD8.8bn in state-budget commitment	USD500bn in global investment
Private Sector Investment/ realization	USD2.6bn / 1%	USD220bn / 100%
Investment status	MoU stage	Fully Committed
FDI share of total GDP	0.2%	12%
Completion confidence	35% (proven delayed)	70% (progressing)

Lack of Stable Power Source cited a huge concern, hence should be top priority investment

- IKN is planned to be 100% renewable powered by 2045
- By 2024, only 10MW is running. Based on our analysis, this can only cover 1% of the energy need
- Currently, still powered by diesel and nearby coal grid causing frequent blackouts
- Companies are reluctant to move in fears of blackout



Indonesia's Growing Awareness of Net-Zero Climate Action



Large-scale coal plants near Jakarta drives PM2.5 levels to triple WHO limits. As of 2024, coal and fossil fuels still supply 90% of national power: highlighting the urgency for a renewable energy transition



The Crossroad Solution

- Support renewable energy
- Raise capital through green finance instruments
- Measure & control risk through unique structure
- Leverage Indonesia's green financial hub neighbor, Singapore's, strong position in the global financial market
- Encourage coal phase-out through carbon credit incentive
- Empowering the indigenous communities
- Expand pipeline of global investors
- Adhere to international ESG standards

02 Solution



Building the Renewable Energy Ecosystem through Financing

How Our Structure Works?



Capital Injection

- Establish GAF
- · Leveraging funding on bond market
- Debt to Equity: 80% / 20%

Risk Isolation via SPV

- Capital injected into SPV to fund RE projects
- Ensuring full control over the UoP and phased capital injection schedule

RE Projects & Coal Transition

 Investment in RE projects, with carbon credits generated by the coal transition plan





Bundled Financing for Renewable Energy Project



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GAF will select a portfolio of separate RE projects of various sizes and risk profiles (refer to page 11). The bundled projects will have staggered construction periods to ensure reliable and well-timed cashflows



Setting Up the Renewable Energy Ecosystem for Success



Ground Solar Power Plant



Rooftop Solar Power Project



Commercial Energy Storage Station



RE Education Center

Ground Solar Power





Leverage East Kalimantan's Exceptional Solar Resource Potential



- Expected investment: USD 650 Mn
- Lending rate to projects: **5.5%-6.5%**
- Expected timeline: 3 months
- Planned capacity: ~1,400 MW
- Project phases: **10**
- Construction period per phase: 9-15 months
- Long term PPA with national grid PLN
- Distribution and transmission infrastructure construction collaboration

Rooftop Solar Power



Affordable Clean Energy in Step with Urban Residential Development



- Expected investment: USD 100 Mn
- Lending rate to projects: 5.5%-6.5%
- Expected timeline: 3 months
- Planned capacity: ~189 MW
- Project phases: Gradually aligning with the residential buildings' development
- Construction period per phase: 6-9 months
- Short term PPA with residents
- A net metering mechanism applies, allowing customers to offset electricity bills



Commercial Energy Storage Station







Energy Storage to Safeguard Against Uncertainty

- Expected investment: USD 350 Mn
- Lending rate to projects: **5.5%-6.5%**
- Expected timeline: 3 months
- Planned capacity: ~625 MW
- Project phases: 10 phases
- Construction period per phase: 9-15 months
- Aligning with the solar power plants' construction plan
- Currently used as backup power for 72 hours, with potential for future electricity sales

Renewable Energy Education



Empower Local Communities with Technical Employment



- Expected investment: USD 200 Mn
- Lending rate to projects: 3.5%-4.5%
- Expected timeline: 3-4 months
- Planned training workers: ~13,800 ppl
- Project phases: Gradually aligning with the power plants construction
- Training timeline: 6-9 months
- Indonesia has a 1.7 Mn of RE workforce gap for 2060 Net Zero goal
- With 30% of new clean energy jobs requiring technical training (ADB), a dedicated training center is essential



Parallel Coal Transition



GAF simultaneously will own and operate nearby coal-fired power plant ("CFPP") as contribution from GOI in exchange for equity (19.5%) in GAF and returns of investment through proceeds of carbon credit sale. Below are identified coal plants to target



	CFPP #1	CFPP #2	CFPP #3	CFPP #4			
Name	East Kalimantan Balikpapan Bay	East Kalimantan 4	Embalut, East Kalimantan	East Kalimantan FTP-2			
Counterparties	CFPP Management Team						
Natural retirement ⇔ accelerated	2047 ⇒ 2032	2047 2050 2044 ⇔2032 ⇔2035 ⇔2029		2050 ⇒ 2035			
Instrument for Funding	Sustainability-Linked Bond ("SLB"), 7.5%-8.5% landing rates						
Est. Capital (USD mn)*	108	98	29	98			

GAF will simultaneously raise funds through **issuance of SLB** to refinance existing loans and retire the CFPP 15 years ahead of its operational lifespan

*) assumption based on existing coal phase-out project by JETP

Raising Green Capital Through SGX



With the combined ticket size and sustainable asset, GAF will raise debt at lower rates through green bonds mainly via the Singapore Exchange ("SGX")

Green Bond "GB"

Interest Rate: 5.5%-6.5%

- Proceeds exclusively allocated to projects with clear environmental benefits
- Strictly excluding high-emission activities such as oil and coal-related projects
- Enhancing environmental accountability





Ground Solar Power Plant



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Energy Storage Station

Sustainability Linked Bond "SLB"

Interest Rate: 7.5%-8.5%

- Proceeds can be used for general purposes
- Issuer commits to achieving predefined, measurable ESG performance targets
- Financial penalties like coupon step-ups apply if the targets are missed





CFPP Transition Program

Social Bond "SB"

Interest Rate: 3.5%-4.5%

- Dedicated to funding projects with positive social outcomes
- Including healthcare, education, affordable housing, and support for vulnerable populations





Renewable Energy Education Center

Carbon Credit Returns to Equity Holders



Through direct renewable energy transition, simultaneous coal phase out, and co-benefit from the RE ecosystem, we can maximize the carbon credit quality certified by Verra under Gold Standard



03 Investment Returns



Returns Simulation

Our structure is estimated to yield an overall returns of c.14% p.a., reflecting risk-mitigating nature of the structure to the bond investors, and higher risk and return profile for equity investors from VCM add-on

Key Assumptions

- LTV of 70%
- Carbon credit price of USD10/MtCO₂
- Equally amortizing loan over 15
 20 years repayment period
- 10% of coal-plant salvage value
- With our low interest rate (5.5% 6.5%p.a.), payment-in-kind, and a certain power offtake to PT PLN, RE projects should be able to fulfill its full amortizing repayment obligation.
- Lending rate is passed through from the bond to the project finance to minimize the borrowing costs



Intense period of capital drawdown through project financing debt for the bundled projects

Simultaneously, phases-based drawdown, **coal-plant proceeds and off-set from avoidance carbon credit work together to stabilize cash flow** in the first few years

Ground Solar Plant

Off-grid Solar Power



All the targeted coal plants are retired, drawdowns on renewable project are turning to full repayments





Returns Simulation (cont.)



We have run sensitivity analysis on the returns to test the impact of voluntary carbon market ("VCM") price volatility and the salvage value of the coal plant. Based on our analysis, the fund return can range from 12.7% - 18.1% p.a. depending on the VCM market and salvage value of the targeted coal plants

		VCM price	/ Metric To	nne CO2								
		4	6	8	10	12	14	16	18	20	22	24
ē	0%	12.7%	13.1%	13.5%	13.9%	14.3%	14.6%	15.0%	15.3%	15.6%	16.0%	16.3%
t ált	10%	13.3%	13.7%	14.1%	14.4%	14.8%	15.1%	15.5%	15.8%	16.1%	16.5%	16.8%
e <	20%	13.9%	14.2%	14.6%	15.0%	15.3%	15.6%	16.0%	16.3%	16.6%	17.0%	17.3%
ag ag	30%	14.4%	14.8%	15.1%	15.5%	15.8%	16.2%	16.5%	16.8%	17.1%	17.4%	17.7%
oa alv	40%	15.0%	15.3%	15.6%	16.0%	16.3%	16.6%	17.0%	17.3%	17.6%	17.9%	18.2%
S S	50%	15.5%	15.8%	16.2%	16.5%	16.8%	17.1%	17.4%	17.8%	18.1%	18.4%	18.7%

The returns are on net fee basis, including :

o ction ts	 Advisors: financial advisors Verifications International litigation lawyers Accountants Technical consultants for construction & ESG-related Government administration Internal control advisory 	0.5% annual management fee		 Administrative fee & taxes Regulatory compliance Reporting & audits ESG related compliance and advise Insurance Contingent legal fees Carbon credit trade fees
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04 The Impact



A Responsible Solution

GREEN ARCHIPELAGO

GAF will ensure ESG compliance and implement updated ESG, financial, and operational reporting standards and adhere to transparency and sustainability goals by engaging relevant third-party advisory and supervisory services



Impact: Under UN 17 Sustainability Goal





Core ESG Issues Approach



Indigenous Rights

UNDRIP Framework

Align with the United Nations Declarations of Human Rights of Indigenous People principles

Impact Benefit Agreement

Documentation of Impact Benefit Agreement and its implementation

Education Empowerment

Through programs held at Renewable Energy training center



Value Chain Transparency

Monitoring & Remediation

Comprehensive disclosures of contractors and raw material suppliers and information

Capability Building

Engaging value chain partners to improve their management practices to incorporate sustainability

Labor Policies

Documentation of labor policies and proof of accountability, require health and safety certification

05 Risk & Mitigation



Risk & Mitigation



	Risks	- Drivers	Q Mitigation		
	Construction Delay	Supply chain disruptions, workforce shortages, or lack of coordination	 Implement delayed drawdown based on milestone completion Bundle projects with staggered timelines to diversify risk 		
Technology Risk	New Technology Breakthrough	Breakthrough in alternative RE options with higher efficiency	Phases construction drawdown allows flexibility to adapt in case of shifting target project		
Policy Risk	Changing Law	Sudden shifts in regulation that may alter project economics or legality	 Retain legal team to monitory regulation Involve multilateral organization i.e. IFC or ADB as investor for possible mediation 		
	Political Shift	Shift in political dynamic may overlook the IKN-related development projects	 IKN and energy transition are national priority status GOI equity through CFPP retirement scheme ensures aligned interests 		

Risk & Mitigation (Cont'd)



	Risks	Drivers	Q Mitigation		
	Carbon Credit Price Volatility	 Voluntary carbon market prices is volatile with less mature standards 	 Transition is parallel with coal retirement, maximizing carbon credit quality Sensitivity analysis 		
Market Risk	Default Risk	 Failure to fulfill payment obligations 	 Conduct strict operational and financial oversight CFPP equity from government incentivize timely payment as equity returns 		
	FX Risk	FX volatility may impact cash flow at the project level and ability to repay	 Project financing agreement denominated in fundraising FX The 30% of the capital owner to the project to provide guarantee on smooth repayment 		
Land Related Risk	Land Addressing	Land clearing may face challenges due to indigenous rights, unclear land titles, or environmental restrictions	 IKN land has mostly been cleared by the GOI Mandates Indigenous people engagement strategy as stipulated in slide 25 to project owners Conduct regular indigenous rights audit 		

06 Implementation & Expansion



Implementation Setup Timeline





Phased Construction Timeline





Sustainability Strategy: Monitoring & Reporting



Key ESG Issues	Internal Monitoring	External Verification
EnvironmentalClimate riskWaste management	 TCFD-aligned climate risk disclosures Maintain inventory of hazardous vs. non- hazardous waste, track total waste generated 	 Third-party audits of emissions TCFD-aligned climate risk disclosures verified by ESG rating agencies or consultants Waste audits by certified third-party assessors
 Social Labor rights Health & safety Development programs 	 HR audits of wage policies, contracts, and grievance mechanisms Internal audits of PPE compliance and incident reporting Track employee participation in training and upskilling 	 Employee survey done by 3rd party Health & Safety ISO certification check on contractor/supplier Attendance monitoring of training given by the Renewable Energy Training Center or independent 3rd party
GovernanceSupply chain transparencyESG performance reporting	 Implement supplier ESG scorecards and self-assessments on existing & pipeline Ensure timeliness and completeness of focused metrics 	 3rd -party assurance on supply chain data 3rd -party assurance on internal ESG reporting by credible impact consulting firms

Identified Potential Partners





Target Bond & Carbon Credit Investors





Scalability Among Regions

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IKN

NUSANTARA

100% of 1.9GWh total

electricity demand

Indonesia

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2060 Net Zero Plan

\$ USD66 bn annual funding gap

USD47 bn Market Addressable / year ASSOCIATION OF SOUTHEAST ASIAN NATIONS

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ASEAN

Clear Net Zero Plan:





USD200 bn Annual Green Investments Need

Build Nusantara As the One That Stands

Global Team from Rotman School of Management





Shuying Wan Rotman Full-Time MBA 2026, VP of Rotman Energy and Natural Resources Association







Jack Vanaselja

Rotman Full-Time MBA 2026, Rotman Student Investment Fund





Anita Sukendar

Rotman Full-Time MBA 2026, President of Rotman Net Impact Association



Edward Dayog

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Special Thanks to our Mentors





And others not mentioned here for confidentiality purposes including past finalist, Capital Projects Advisory team from Indonesia Infrastructure Finance, personal conversation with the Consulate General of Indonesia in Toronto, Rotman Sustainability Strategy Professor, and PhD candidate in Kalimantan Anthropological Studies from University of Toronto

Appendix



IKN Solar Plant Construction Progress

As of January 2025

LN Nusantara Power has completed the construction of the 50MW Solar Power Plant (PLTS) in IKN. The project was inaugurated by President Prabowo Subianto alongside 36 other electricity sector projects.

The IKN Solar Power Plant has already shown positive impacts on reducing carbon emissions in Indonesia. In a short time, this plant has managed to save 983.95 tons of coal from being used and avoid 1,170 tons of CO2 emissions, equivalent to planting 1,600 trees.

Raising Green Capital Through SGX



Singapore Exchange is the largest financial center in Southeast Asia ("SEA") with the largest foreign capital Asset Under Management and strong adherence to transparency



STABLE

Rated stable AAA by S&P and Fitch Rating, Aaa by Moody's

LARGEST FOREIGN ASSET UNDER MANAGEMENT IN SEA

Singapore manages USD4tn in foreign assets, with USD141bn in FDI alone in 2023., with 1,200+ private funds and 400+ banks

GREEN BOND GRANT SCHEME

Monetary Authority of Singapore will subsidize green bond issuance costs up to SGD100,000 per issuer. This helps in reducing the fundraising costs

STRONG CLIMATE-RELATED DISCLOSURE REQUIREMENT

Clear monitoring, Reporting, and Verification protocol. Mandatory data traceability, require public access, proof of additionality and permanence, stakeholder consultation and grievance mechanism

STANDARDIZED CARBON CREDIT GRADING

Core Carbon Principles aligned

EASE OF DOING BUSINESS

Rank #2 globally for ease of doing business from its professional public service and favorable tax environment

Singapore Leads VCM in Southeast Asia





- Carbon Tax Since 2019. Implemented under the Singapore Carbon Pricing Act
 - Emitters can use high-quality international carbon credits to offset up to 5% of taxable emissions
- International Collaboration: Signed Implementation Agreements (IAs) with multiple countries
 - Supports global climate action under Paris Agreement and Article 6.
 - Accredited Credit Sources: Agreements with Verra and Gold Standard for recognized carbon credits
- **Carbon Market Development:**
 - Voluntary Carbon Market (VCM) since 2021
 - Introduced standardized spot contracts and millions of carbon credit trades. Plans for a carbon futures contract to improve risk management and price discovery

INDONESIA

- Carbon Tax under development
 - The government is formulating carbon tax regulations, with initial implementation targeting the power generation sector, followed by expansion to fossil fuel transportation

Indonesia

Carbon Market development:

- Launched IDX Carbon in January 2025, offering 1.78 million CO₂ eq credits from five power plants
- Plans are underway to introduce forestry-based carbon offsets, integrating standards like Verra, Gold Standard, and Plan Vivo

Avoidance Carbon Credit Market: Scorecard & Pricing



	Additionality	Permanence	Verifiability & Monitoring	Leakage	Co-benefits	Est. Price per MTCO ₂
High	project wouldn't exist without credit revenues	Storage > 100 years	Transparent – frequent 3 rd party audits, remote sensing/sensors	Minimal to no leakage risk, well- contained system	Improves biodiversity, local income, health outcomes	USD30 – 500
Medium	Some uncertainty: may have partial financial or policy support.	30–100 year	Less frequent monitoring	Potential indirect leakage	Neutral, unclear benefit	USD10 – 29
Low	Likely would have happened anyway (profitable without credits)	< 30 years or high reversal risk	Self-reported, unverified data	High leakage, with poor boundary control	Possible harm or displacement of communities /ecosystem	USD1 – 9
Weightage	35%	25%	15%	10%	10%	

Notes: The remaining 5% is developer risk (how credible is the project developer)

Source: Sylvera, carbon credit exchanges

Singapore Leads Fundraising in Southeast Asia





Green Bond Issuance Precedent in SGX



Issuer	PT PERTAMINA GEOTHERMAL ENERGY TBK							
Shareholder	PT Pertamina (Persero) (Indonesia National Power Company holds 68.83%)							
Issue Date	April 27, 2023							
Issue Size	USD400,000,000 (net USD 397mm)							
Coupon	5.15%							
Payment	Semi-annual							
Maturity	April 2028							
Use of Proceeds	 use the net proceeds from the offering for the repayment in full of the borrowings outstanding under the Bridge Facility This use of proceeds meets the Eligibility Criteria that are described in the Company's Green Financing Framework ("Framework") Investments and expenditures related to the construction, operation, transmission, and procurement of geothermal sources, including: Geothermal power plants with direct emissions of <100g CO2/kWh Geothermal site exploration Other geothermal-related activities such as supply of steam, steam generation obtained a Second Party Opinion (the "SPO") from a consultant with recognized environmental expertise to provide an opinion on the environmental benefits of the Framework as well as the Framework's alignment to the four core components of the Green Bond Principles 2021, Green Loan Principles 2021 and ASEAN Green Bond Standards 2018 	Below the list some of PGE's project No Project Name 1 Kamojang LP 2 Lahendong BU #1 3 Lahendong BU #2 4 Lahendong BU #3 5 Lahendong LP 6 Ulubelu BU #1 7 Ulubelu BU #3 9 Ulubelu BU #3 9 Ulubelu BU #3 10 Hululais Ext A (bukit daun) 11 Lahendong 7 & 8 12 Lumut Balai 2 13 Hululais 1 & 2	t that planned for the Capacity (MW) 5 5 10 10 15 10 10 10 10 10 10 10 30 40 55 5 110	next 36 months Estimated Environmental Impact 31,426 tCO2e/year in avoided emissions 26,433 tCO2e/year in avoided emissions 52,865 tCO2e/year in avoided emissions 52,865 tCO2e/year in avoided emissions 77,627 tCO2e/year in avoided emissions 63,032 tCO2e/year in avoided emissions 63,032 tCO2e/year in avoided emissions 58,076 tCO2e/year in avoided emissions 201,899 tCO2e/year in avoided emissions 232,882 tCO2e/year in avoided emissions 387,920 tCO2e/year in avoided emissions 695,207 tCO2e/year in avoided emissions				

Market & Capacity Assumptions: Solar Plant





Market & Capacity Assumptions: Off-grid Solar





% area utilisation for power plant no. of panels per sqm capacity per panel (W)

80%
0.5
350



Market & Capacity Assumptions: Solar Energy Storage





Market & Capacity Assumptions: Training Center



