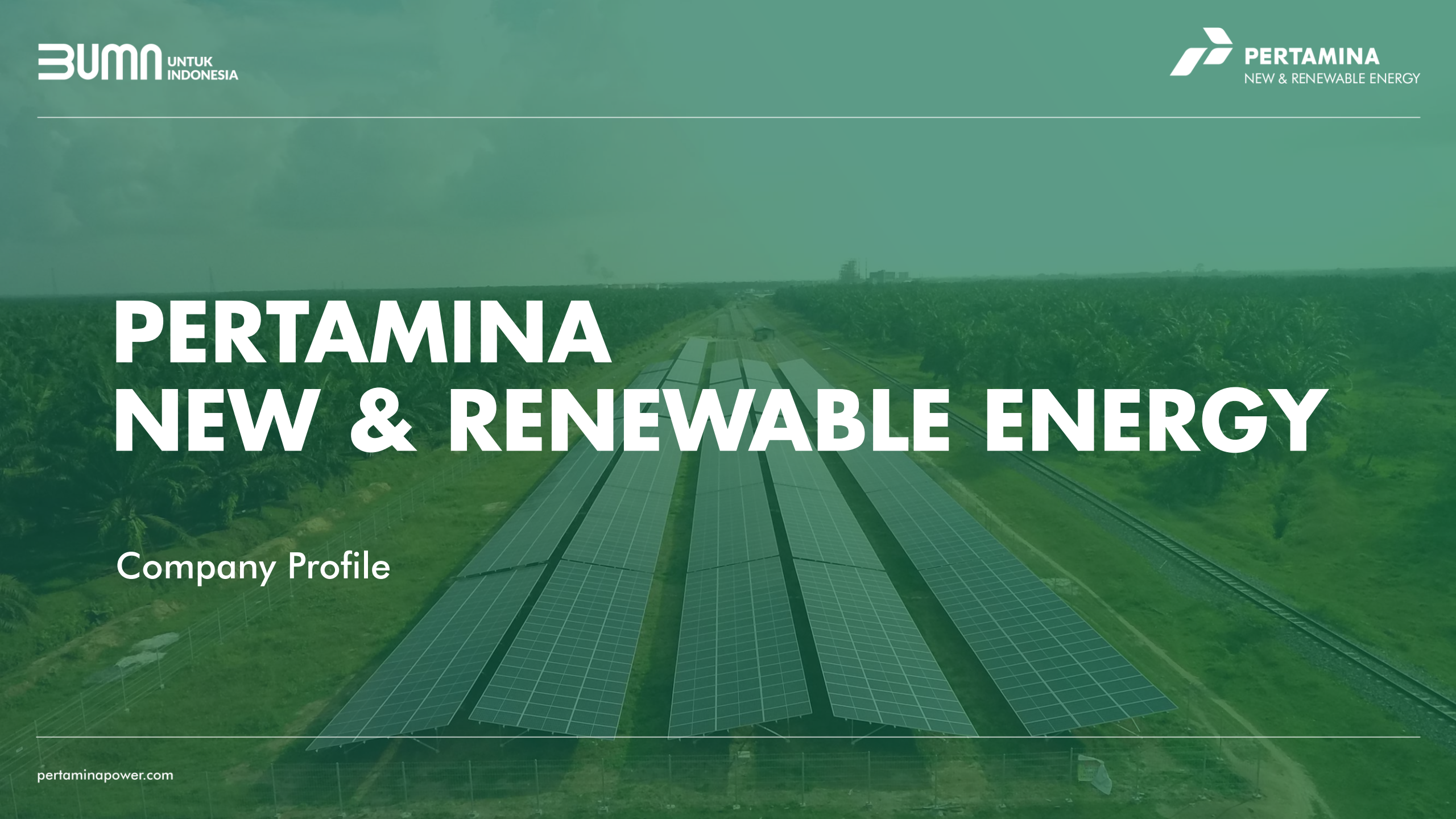
BUMN UNTUK INDONESIA

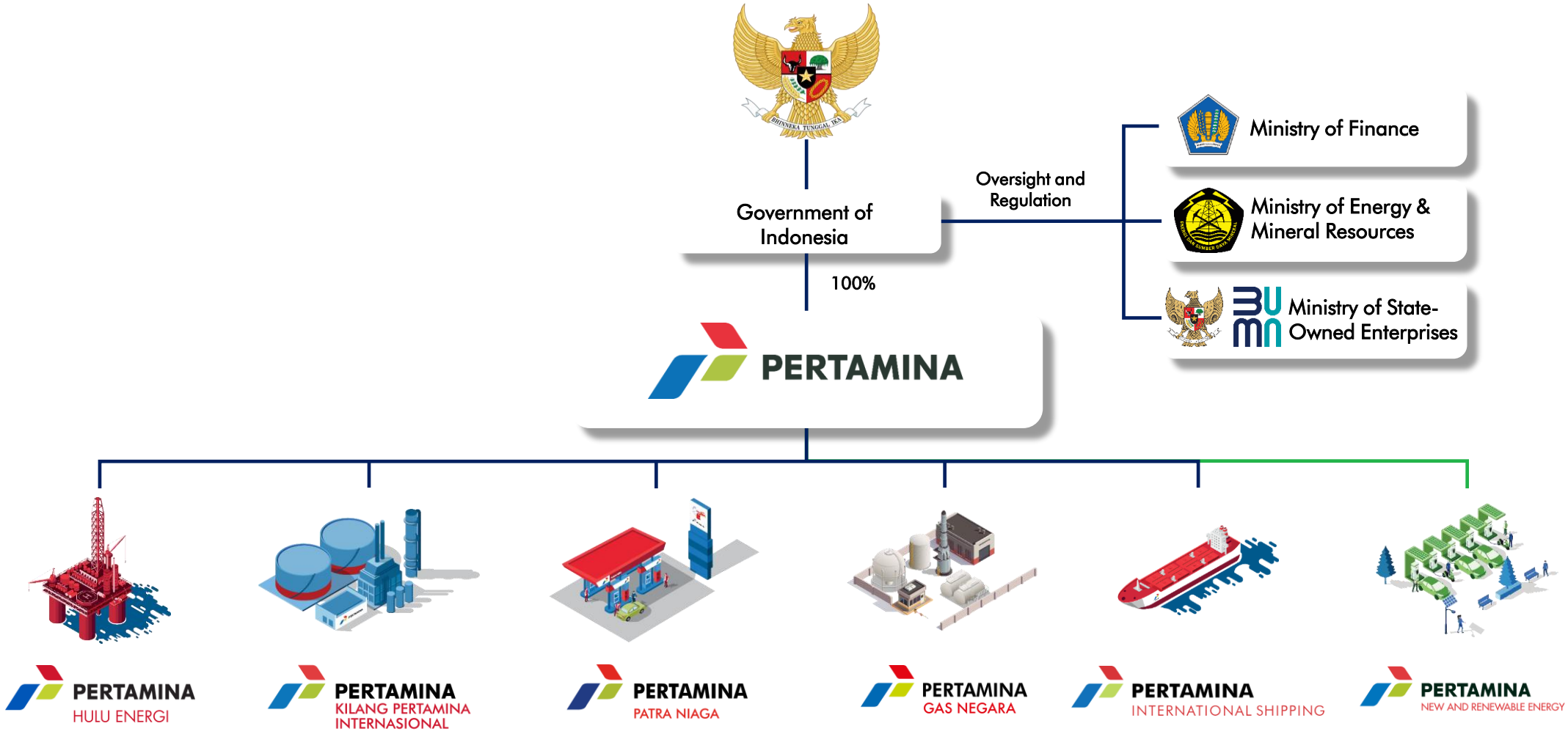
PERTAMINA
NEW & RENEWABLE ENERGY



PERTAMINA NEW & RENEWABLE ENERGY

Company Profile

Pertamina is Mandated to Ensure The Indonesia's Energy Security Through 6 Sub-Holdings



Pertamina's Commitment & Achievement to Sustainability

Pertamina Sustainability Policy

"PERTAMINA's ambition is to be a leading and reputable Global Energy Company and to be recognized as:

- Environmentally Friendly Company
- Socially Responsible Company
- Good Governance Company"

Pertamina Sustainability Committee

Chairperson : President Director & CEO

Members :

1. Strategy, Portfolio & New Ventures Director
2. Finance Director
3. Logistics & Infrastructure Director

Adherence to International Standards

Guiding Principles

- 17 Goals
- National Determined Contribution
- International Labor Organization

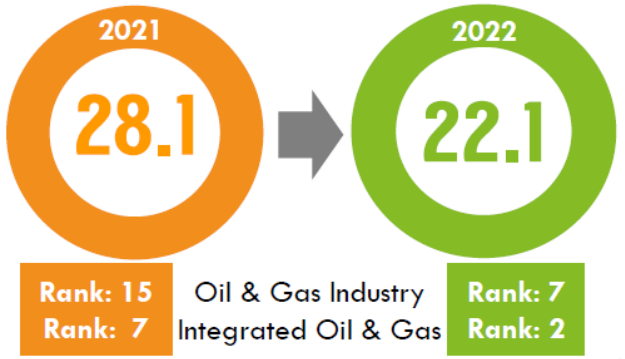
Participation to International Initiatives

UN Global Compact, CDP, World Benchmarking Alliance

International Best Practices in Operation

ISO 14001:2015	Environmental Management
ISO 45001:2018	Occupational Health and Safety
ISO 50001:2018	Energy Management
ISO 37001:2016	Anti Bribery Management System
ISO 27001:2013	Information Security Management Systems
ISO 26000:2010	Social Responsibility
ISO 31000:2018	Risk Management

Pertamina's ESG Performance & Achievement



Note: lower score is better

Risk Level	SEVERE RISK	MEDIUM RISK
Rating Date	Feb 2021	Sep 2021
Methodology	Core Rating	Comprehensive Rating
Type	Unsolicited	Solicited

One of Pertamina's Group suabsidiary also receiving the best ESG rating in the world for its sector :

PERTAMINA GEOTHERMAL ENERGY

Negligible Risk
1st Ranking in Utilities Sector
1st Ranking in Renewable Power Production

Pertamina is Moving Ahead on Energy Transition While Enabling Energy Security for Indonesia

GOALS

Aspiration:
Scope 1 & 2: Net Zero Emission by 2060

STRATEGIC INITIATIVES

Decarbonization of business	New business building
Energy efficiency	Renewables
Green power generation	EV Charging and Swapping
Loss reduction (e.g., flare, methane)	Clean Hydrogen (manufacturing, transport)
Fleet electrification	Nature-based solutions
Static equipment electrification	Battery and EV
Carbon capture and storage (own use)	Biofuels
Low/ zero carbon fuel for fleets	Integrated CCS/ CCUS service
	Carbon market business

ENABLERS

Reporting (carbon accounting), performance management and Pertamina Internal Carbon Price

Sustainability organization, capabilities

Stakeholder engagement

Pertamina Green Business Initiatives

Estimated 2060 capacity and cumulative capex up to 2060

Biofuels
200+ kbpd capacity for HVO and HEFA
$5-10 bn

Renewables
60 GW to fulfil 15% market share
$50-55 bn

CCS/CCUS
~60 MTPA capacity of E2E CCS/CCUS business
$20-25 bn

Battery and EV
80 GWh battery prod. capacity
~800,000/yr E2W production
~1.5 TWh charging stations
$3-5 bn

Hydrogen
3 MTPA for transport, industry
$45-50 bn

Carbon business
20+ mn tCO2 carbon credits generated by 2030

~25-30 Mn
Tonnes CO2 abated (Scope 1 & 2) in 2060

~30-40 Bn
Revenue per year from new green businesses

~2%
Contribution to Indonesia's Net-Zero aspirations (Scope 1 & 2)

Pertamina New & Renewable Energy is Focused for Energy Security from Renewables and Future Business

Key Milestone

- **26 October 2016**

  PT Pertamina Power Indonesia (PPI) was first established as a *strategic project company of* Pertamina.

  PERTAMINA POWER INDONESIA

- **13 June 2020**

  PPI was appointed as a Power & New Renewable Energy (NRE) Subholding which is responsible for the consisting of exploration and production of NRE sources.

- **8 August 2021**

  Legal End-State as **Subholding Power & NRE ("PNRE").**

  PERTAMINA NEW & RENEWABLE ENERGY

Vision

Energizing People and Planet with Green Energy

Mission

Leading Pertamina Energy Transition towards NZE

The 3 Strategic Pillars of PNRE

Low Carbon Solutions	Renewable Energy	Future Businesses
• Gas to Power • Decarbonization • Energy Conservation • Nature Based Solutions (NBS)	• Geothermal • Solar • Biogas • Wind • Tidal	• Battery and EV Ecosystem • Clean Hydrogen • Carbon Business

Award & Recognition

PFI AWARDS 2018 — Jawa-1 LNG-to-Power project as Asia Pacific Power Deal of The Year, by Project Finance International (PFI) awards

IJGlobal Awards 2018 — Jawa-1 Gas-fired Power of The Year in Asia Pacific by IJ Global Awards (Project Finance & Infrastructure Journal)

PNRE have a Portfolio of Subsidiaries Who Engage in Renewables and Future Business

PERTAMINA NEW & RENEWABLE ENERGY

SUBSIDIARY

69%

PERTAMINA GEOTHERMAL ENERGY

Established :
2006

Other Shareholders :
MASDAR, PERTAMINA PEDEVE INDONESIA

PUBLIC

Line of Business :
Geothermal Energy Business with a total capacity of ~600 MW in 15 Operational Work Areas

AFFILIATION

40%

JAWA SATU POWER

Established :
2016

Other Shareholders :
Marubeni, sojitz

Line of Business :
Power Plant and responsible to manage Jawa-1 Project 1,760 MW

26%

JAWA SATU REGAS

Established :
2018

Other Shareholders :
PT Humpuss, Marubeni, sojitz, MOL Mitsui O.S.K. Lines

Line of Business :
Domestic Sea Transportation for Special Equipment

25%

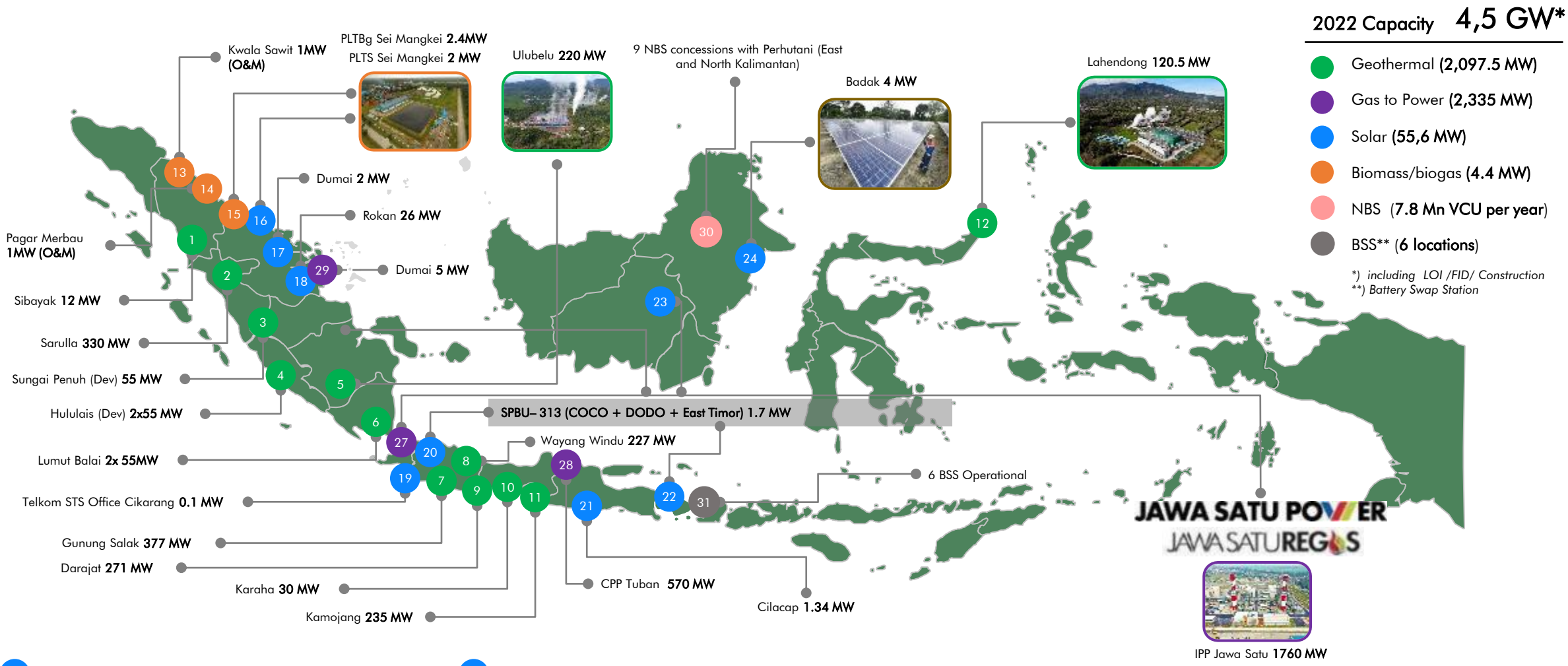
IBC Indonesia Battery Corporation

Established :
2021

Other Shareholders :
MIND ID Mining Industry Indonesia, PLN, antam

Line of Business :
Battery & EV Industry

Current PNRE's Total Capacity is 4,5 GW with Potential Additional Capacity in The Future



25 Captive Solar PV Pertamina 2022[1]. 15.5 MW (various locations)

26 Eksternal Solar PV 2022[2] 2.9 MW (various locations)

1). Include PLTS R&P (6,5 MW) PLTS C&T (4,8 MW), PLTS IML (2,5 MW). PLTS Non-SH (0,9 MW), PLTS SH Gas (0,7 MW) PLTS PNRE (0,1 MW) dan PLTS SHU (0,01 MW)

2). Include PLTS UGM (0.3 MW), PLTS AP II (2.3 MW), dan PLTS Jababeka (0,2 MW)

Composition of Board of Directors and Board of Commissioners

Dannif Danusaputro
Chief Executive Officer

Norman Ginting
Director of Project & Operations

Fadli Rahman
Director of SPBD

Said Reza Pahlevy
Director of Human Capital & Corporate Services

Iman Hilmansah
Director of Finance

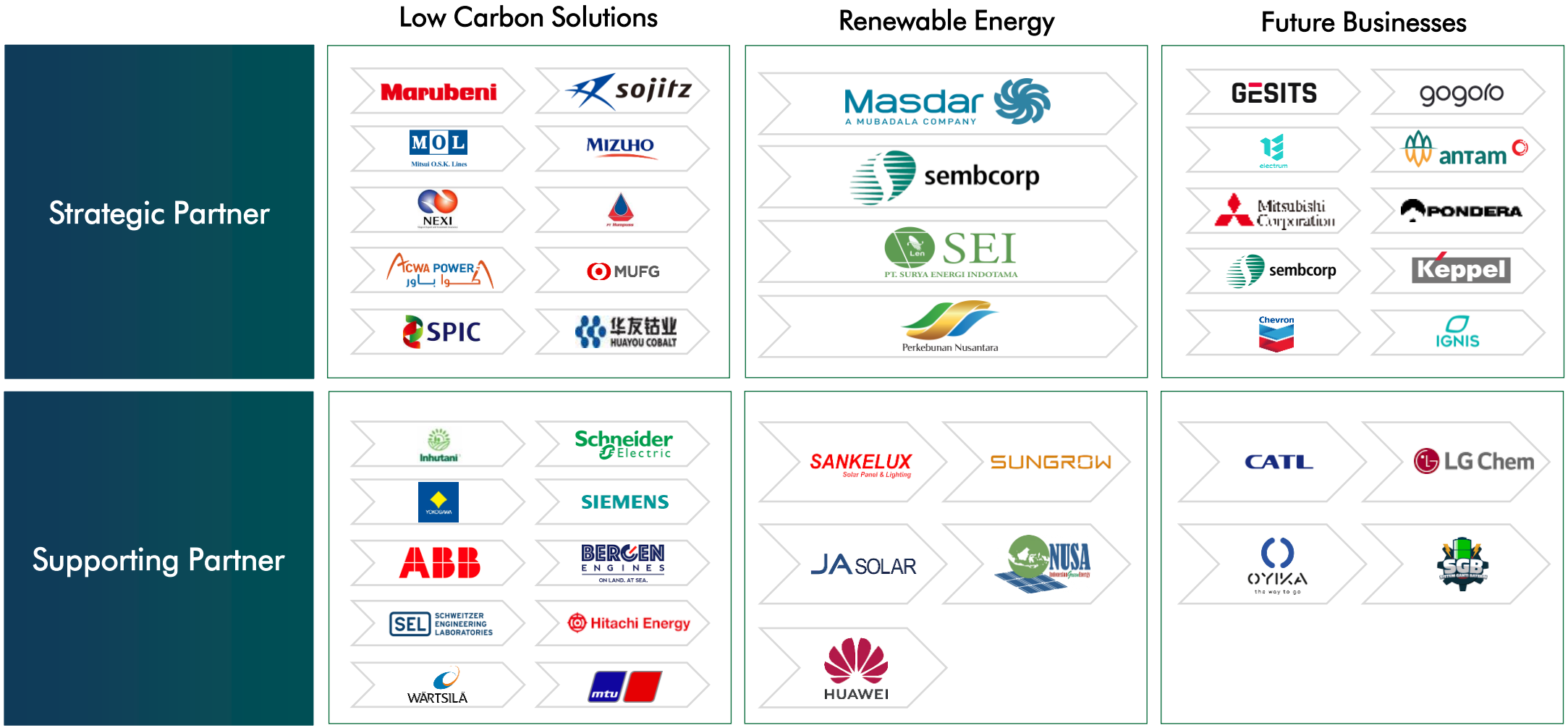
Ajar Budi Kuncoro
Commissioner

Ida Nuryatin Finahari
Commissioner

Dwi Agus Setiawan
Commissioner

Budiman Parhusip
Commissioner

Partnered with Well Known and Prestigious World Class Institutions



Highlights of PNRE Milestones

2016

- PERTAMINA POWER INDONESIA
  The Company was established
- JAWA SATU POWER
  The establishment of PT Jawa Satu Power (JSP)

2018

- JAWA SATU REGAS
  The establishment of PT Jawa Satu Regas
- MOU the development of a 1.200 MW IPP in Bangladesh with BPDB (Bangladesh Power Development Board)

2020

- **Commercial Operation Date (COD) of 2,4 MW Sei Mangkei Biogas Power Plant**
- Groundbreaking of the Sei Mangkei 2 MWp Solar Power Plant

2021

- PERTAMINA GEOTHERMAL ENERGY
  Legal End-State as Subholding Power & NRE, as parent company for PT Pertamina Geothermal Energy
- COD Solar Power Plant RU IV Cilacap with a capacity of 1,34 MW COD PLTS
- COD Solar Power Plant Sei Mangkei with a capacity of 2 MW

2022

- PERTAMINA NEW & RENEWABLE ENERGY
  Launching of Brand Transformation for Pertamina NRE
- Groundbreaking of Rokan Solar Power Plant with a capacity of 25 MW
- Transfer of shares ownership of IBC from PT Pertamina (Persero) to PT Pertamina Power Indonesia (Pertamina NRE)

IPO of PT Pertamina Geothermal Energy (PGEO) Have Just Been Successfully Executed

PERTAMINA GEOTHERMAL ENERGY

Geothermal Exploitation

- 6 Geothermal Areas
- 3 Development Project
- 3 Exploration Initiation
- 5 Joint Operation Contract

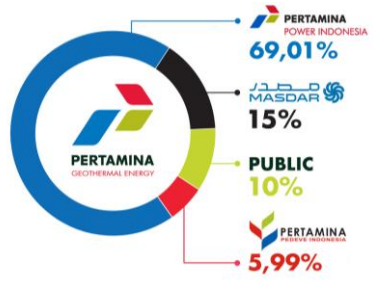
Establishment

Deed of Establishment No.10 dated 12 Desember 2006

Subsidiaries

- Geothermal Energi Seulawah
- PERTAMINA PGE KOTAMOBAGU

Company Structure



- 672 MW Own Capacity
- 1.205 MW Joint Operations
- 15 Location Across Indonesai
- 25% Public Shares
- IDR 875,- IPO Price
- IDR ~8,5 Tn Proceed Received

BUMN UNTUK INDONESIA

PERTAMINA
NEW & RENEWABLE ENERGY

THANK YOU

pertaminapower.com

CONTACT

Pertamina New & Renewable Energy

PT Pertamina Power Indonesia
Pertamax Tower Lt. 12, Grha Pertamina
Jl. Medan Merdeka Timur No. 11-13
Jakarta Pusat, 10110, Indonesia

021-3815111 Ext: 2172

https://pertaminapower.com/

@pertaminapowerid

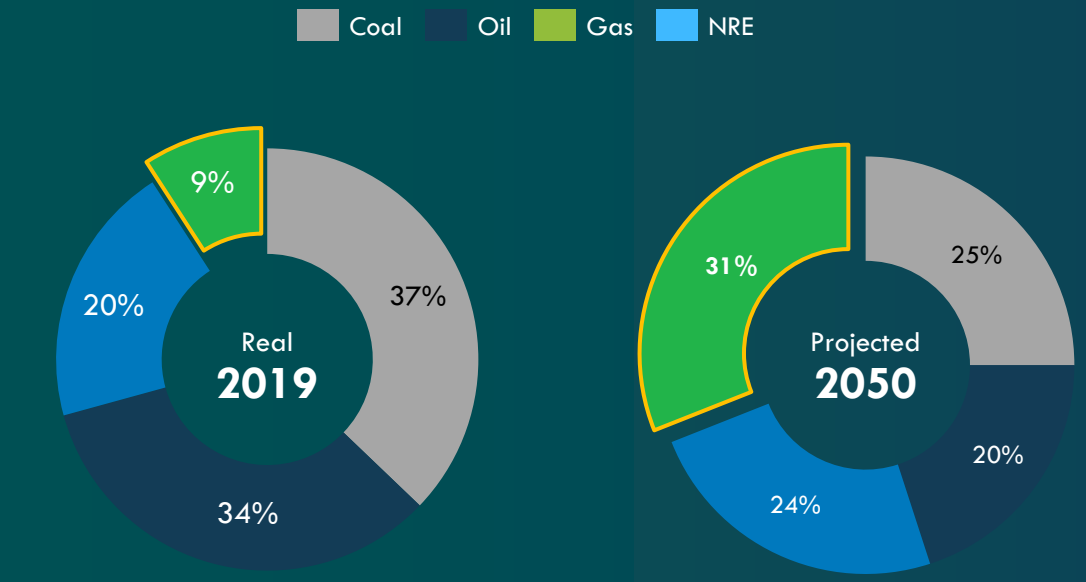
Pertamina Power Indonesia

Pertamina Power Indonesia

Indonesia has developed a robust strategy to embrace energy transition and sustain energy security

National Grand Energy Strategy (GSEN)

Current mix (2019) & Targets (2050)



Energy Consumption: 0.8 TOEcap.
Electricity Consumption: 1084 Kwhcap.

Energy Consumption: 3.2 TOEcap.
Electricity Consumption: 7000 Kwhcap.

Global & National Commitment

Current mix (2019) & Targets (2050)

United Nations Climate Change

Indonesia Enhanced NDC

RPJMN 2020-2024

↓ 32-43%

National GHG Emission Reduction Target from BAU by 2030

↓ 915

Million Ton
Unconditional Emission Reduction Target (CM1)

↓ 358

Million Ton
Target Contribution from Energy Sector (CM1)

"Membangun lingkungan hidup, meningkatkan ketahanan bencana dan perubhan iklim"

Main Agenda of RPJMN

75-78

Indeks Kualitas Lingkungan Hidup
IKLH Achievement Target by 2024

27%

National Carbon Emission Reduction Target by 2024

Highlights | Pertamina develops biofuel products to support beyond B30 implementation in Indonesia and potential export demand

1

HVO Production
Dumai Refinery

Capacity	Feedstock
1.0 kbpd	RBDPO

Bioavtur
(Sustainable Aviation Fuel)

2

HVO Production
Cilacap Refinery

Capacity	Feedstock
0.8 kbpd	RBDPO

Revamping Phase 1

Capacity	Feedstock
3.0 kbpd	RBDPO

Revamping Phase 2
(2025 plan)

Capacity	Feedstock
6.0 kbpd	UCO/CPO

Pertamina Renewable Diesel

Certii-cation ISCC

Target Market

3

Grass Root Refinery
Plaju (plan)

Capacity	Feedstock
20 kbpd	CPO/UCO

Key milestones:

- Sept 2021: Bioavtur J2.4 test flight
- June 2022: trial Renewable Diesel for electricity generator at Jakarta e-Prix
- Oct 2022: Renewable Diesel first shipment of HVO to Singapore

B35-B40
Beyond B30 target

200 kbpd
2060 HVO and HEFA cap.

$5~10B
Capital investment needed

Other potential products

FAME (max blending 30%)	**DPME** (high grade FAME)
HVO (PertaminaRD)	**BIO JET FUEL**
BIO NAPHTA	**BIO LPG**

Highlights | Clean Hydrogen potential – alternative for fossil-based energy carrier and addressing emissions in hard to abate industries

Demand centers | Priority locations | Other supply locations

1 Batam Bintan Clean H2 Cluster Export
- H_2 Floating solar
- Strategic partner: sembcorp, IGNIS
- Power Source
- Target Market

2 Mainland Sumatera Clean H2 Cluster Export
- H_2 Geothermal
- Strategic partner: Keppel, Chevron
- Power Source
- Target Market

3 Cilegon Clean H2 cluster Domestic
- H_2 SMR & CCS
- H_2 Wind & Solar
- Strategic partner: PONDERA, IGNIS, KRAKATAU STEEL
- Power Source
- Target Market

4 North Sulawesi Green NH3 cluster Export
- NH_3 Geothermal
- NH_3 Solar
- Strategic partner: TEPCO, Jera, NEDO
- Power Source
- Target Market

5 Sumatera-Java Blue NH3 Domestic
- NH_3 SMR & CCS
- Strategic partner: Mitsubishi Corporation, PUPUK INDONESIA
- Power Source
- Target Market

10%
Global addressable market by 2040

1.8 Mtpa
H_2 eq capacity by 2040

$25~30B
Capital investment

$4~5B
Annual Revenue by 2040

Highlights | Renewable energy potential – maximizing Indonesia's potential of renewable resources and ensuring energy security

Highlights | Solar power potential – maximizing Indonesia's potential of renewable resources and ensuring energy security

1 | Installed in Internal Customers


Rokan PSC


Badak


Cilacap Refinery


Dumai Refinery


PIS Logistics


Marketing Reg III


Geothermal Kamojang


TBBM Pengapon


TBBM Surabaya


TLPG Balongan


Grha Pertamina


Tj. Sekong


PTPL Cilacap


MOR V


TBBM Tuban


PTPL Gresik

2 | Installed in External Customers


Sei Mangkei


Telkom Data Center (TDC) Office


Mitratel


Gambir


UGM


AP II Kualanamu

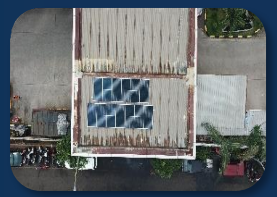

AP II Banyuwangi


AP II Soekarno Hatta

3 | Installed in Pertamina Gas Station


SPBU COCO Bali


SPBU DODO Bali**


SPBU Tangerang

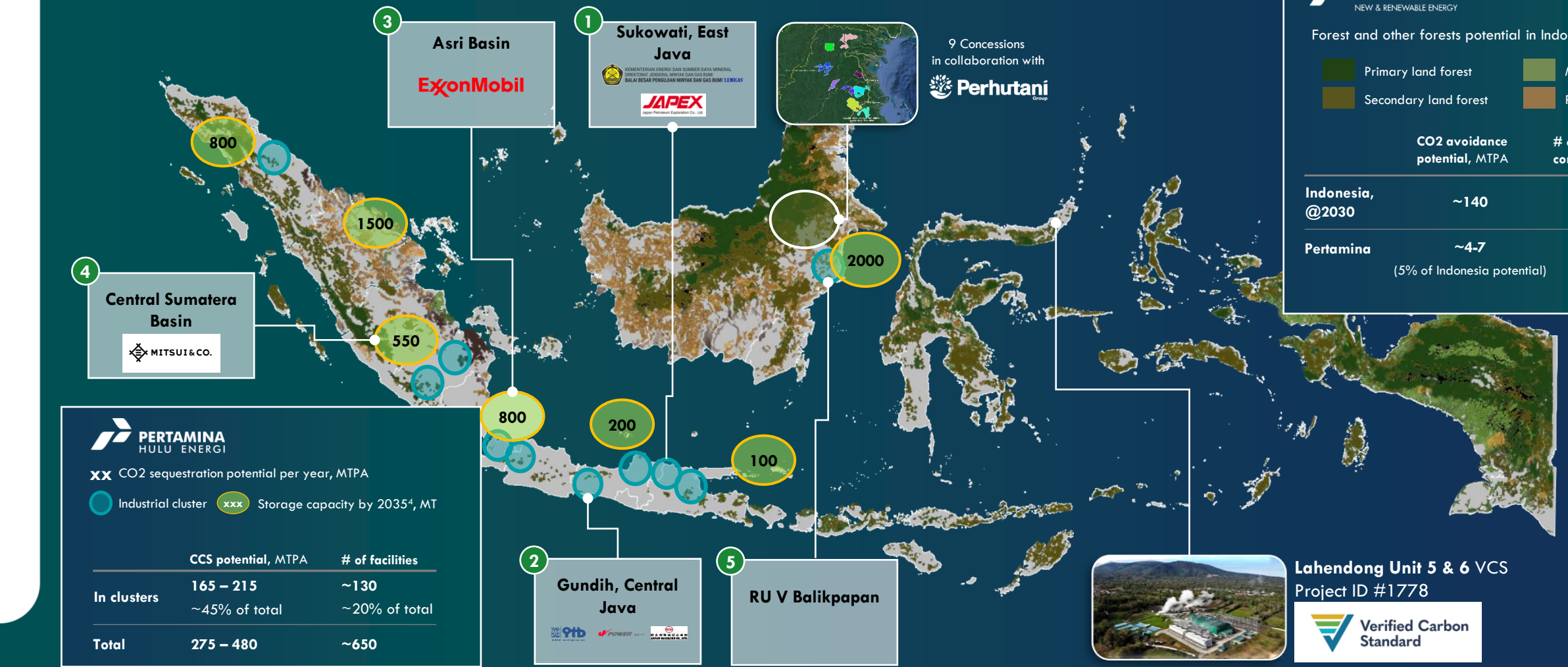

SPBU Cikarang


SPBU Tendean


SPBU Cipularang

332
Gas Stations (SPBU)

Highlights | Carbon sink potential – leveraging Pertamina's upstream capabilities and Indonesia's forest potentials



PERTAMINA NEW & RENEWABLE ENERGY

Forest and other forests potential in Indonesia

- Primary land forest
- Secondary land forest
- Mangrove
- Peatlands

	CO2 avoidance potential, MTPA	# of concessions
Indonesia, @2030	~140	>500
Pertamina	~4-7 (5% of Indonesia potential)	9-12

PERTAMINA HULU ENERGI

xx CO2 sequestration potential per year, MTPA

Industrial cluster | xxx Storage capacity by 2035[4], MT

	CCS potential, MTPA	# of facilities
In clusters	165 – 215 (~45% of total)	~130 (~20% of total)
Total	275 – 480	~650

Lahendong Unit 5 & 6 VCS
Project ID #1778

Verified Carbon Standard

Several key challenges remain, hampering aggressive NRE development in Indonesia

Competitiveness vs Existing Sources

- **High licensing cost,** while NRE **tariff is lower than national BPP** (or no more than 85% of regional BPP[1])
- **Enormous land requirements** to reach scalability (e.g. to Green hydrogen and solar PV)

Early Stage of Technological Capability

- Development and improvement of key technologies are still ongoing, **LCOE have not reach the level of fossil fuels.**
- Expertise and breakthrough NRE projects in Indonesia are still limited

Uncertainty in Regulatory Framework

- Law for New Energy and Renewable Energy (UU EBET) is still **under discussion** and waiting for formalization.
- **Other supporting regulation** (e.g Carbon Trading, Carbon Tax) **yet to provide incentives** for accelerating NRE development

Dynamics of External Factors

- **Geopolitical tension and energy crisis** in Europe have increased global oil prices and demand.
- Increasing demand in NRE development **were not balanced by increasing technology suppliers and raw materials.**

Pertamina NRE commits to drive development of two main sectors through collaboration - accelerating implementation of green ecosystem

Non-Exhaustive

Carbon

Carbon Ecosystem Development

- BUMN – Kementerian Badan Usaha Milik Negara Republik Indonesia
- SRN – Sistem Registri Nasional
- IDX – Indonesia Stock Exchange, Bursa Efek Indonesia
- ICDX Group
- Perhutani Group
- Perkebunan Nusantara
- PT. EMI (Persero) – Energy Management Indonesia
- IDSurvey – Testing · Inspection · Certification
- Pertamina Foundation
- Pertamina Geothermal Energy

And more..

Carbon Offsetting Customers

- Carbon Trading for Coal-fired IPP
- Pertamina Hulu Energi
- Pertamina Kilang Pertamina Internasional
- Pertamina Patra Niaga
- MIND ID – Mining Industry Indonesia
- SIG
- Bukit Asam – beyondcoal
- PLN
- Pupuk Indonesia Holding Company

And more..

EV

Supply & Infrastructure

- Pertamina New & Renewable Energy
- PLN
- IBC – Indonesia Battery Corporation
- Angkasa Pura | Airports
- Jasamarga – Indonesia Highway Corporation
- KAI
- Wika Industri Manufaktur
- Wika Industri & Konstruksi
- GESITS
- MIND ID – Mining Industry Indonesia
- Antam
- Len

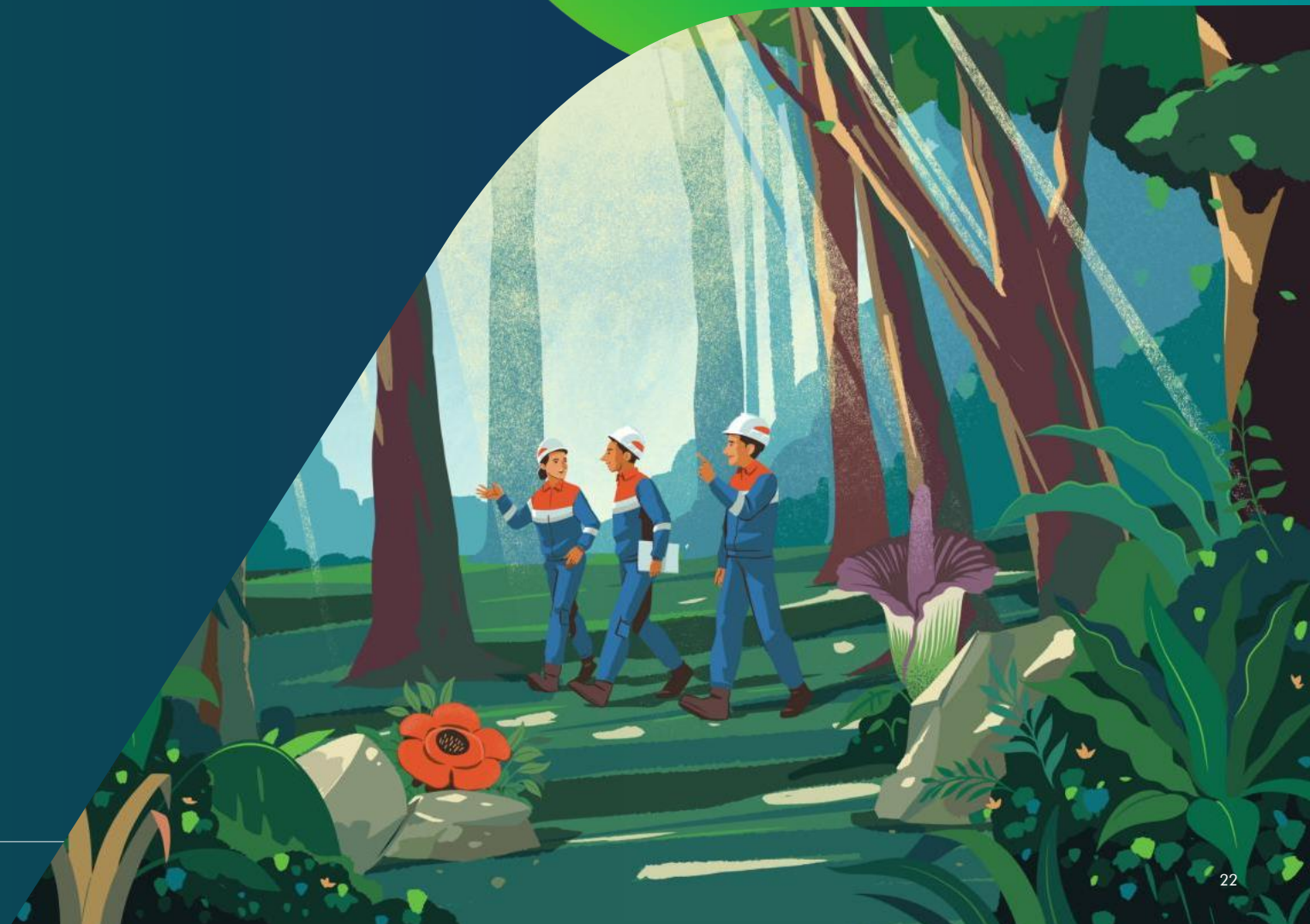
Demand Creation & Marketing

- BUMN – Kementerian Badan Usaha Milik Negara Republik Indonesia
- PLN
- Telkom Indonesia – the world in your hand
- IBC – Indonesia Battery Corporation
- PAR
- mandiri
- BRI
- BNI

Financing Support

- mandiri
- BRI
- BNI

LOW CARBON SOLUTIONS



Gas to Power | PNRE has pipeline of ~8 GW Gas to Power Projects

Existing Project

JAWA SATU POWER
JAWA SATU REGAS



~1,7 GW
Target operation by 2023

Our Partners:

Marubeni, sojitz, MOL Mitsui O.S.K. Lines, PT Humpuss, JBIC, NEXI, ADB, MUFG, MIZUHO

Pipeline Project

~8,1 GW
Accumulated Target Operation by 2030

Our Partners:

ACWA POWER, Marubeni, SPIC, 华友钴业 HUAYOU COBALT, PERTAMINA, bintang alumina indonesia

Energy Efficiency | PNRE can provide an end-to-end solution for Energy Efficiency & Reliability Enhancement to the Customer

PNRE's solution covers various segments of utilities: power generation, T&D, substation, etc

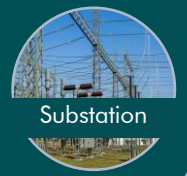
Energy Conservation Scope

- Energy Efficiency
- Reliability Enhancement

Assets


Power Generation


Transmission& Distribution


Substation


Other Utilities

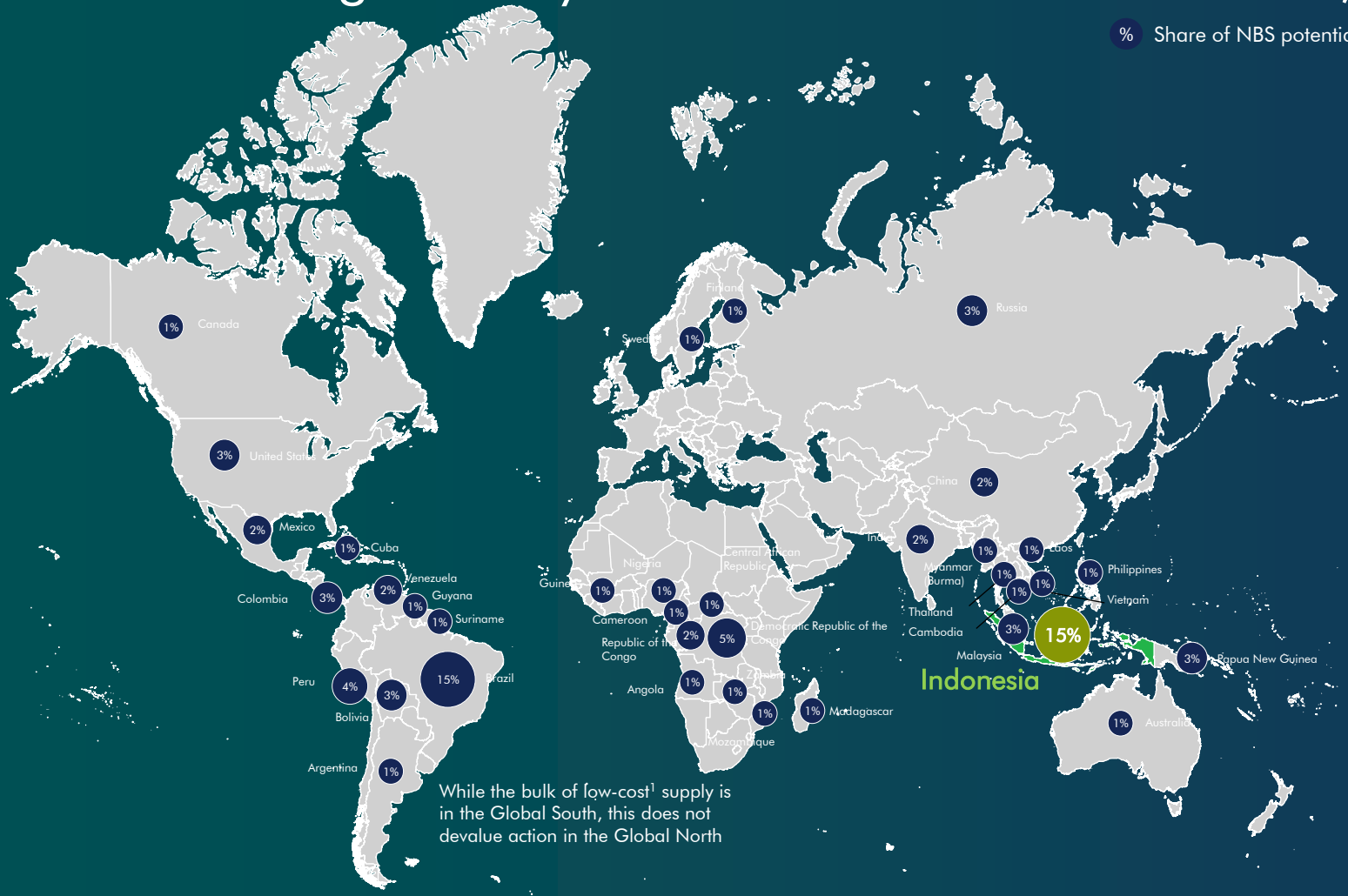
Assessment → **Technical Solution** → **Implementation**

- Equipment Remaining Lifetime Assessment
- Power System Reliability Assessment
- Energy Audit
- Other assessment

Technical Challenges	Alternative Solution
Unoimized Design	Clean/RE based Power Solution
Aging Infrastructure	Reliable Power Design
Inefficient Operation System	Efficient Power Design
System Responsiveness Issues	Equipment Upgrade
Protection Fault	Equipment Replacement
Stability Issues	Automation/SCADA
Frequency Restoration	Stability Technology e.g. DRUPS
etc	etc

- Reliability Enhancement Program
- Energy Efficiency Program

Nature Based Solution | Indonesia has the 2nd largest global low cost NBS potential which will significantly contribute to achievement of 1,5oC pathway



#1
of world fauna species

>120
Mn Ha of forest area

#2
largest mangrove cover with 4mn Ha

>900
Forest concessions

17%
largest tropical rainforest and peatland cover

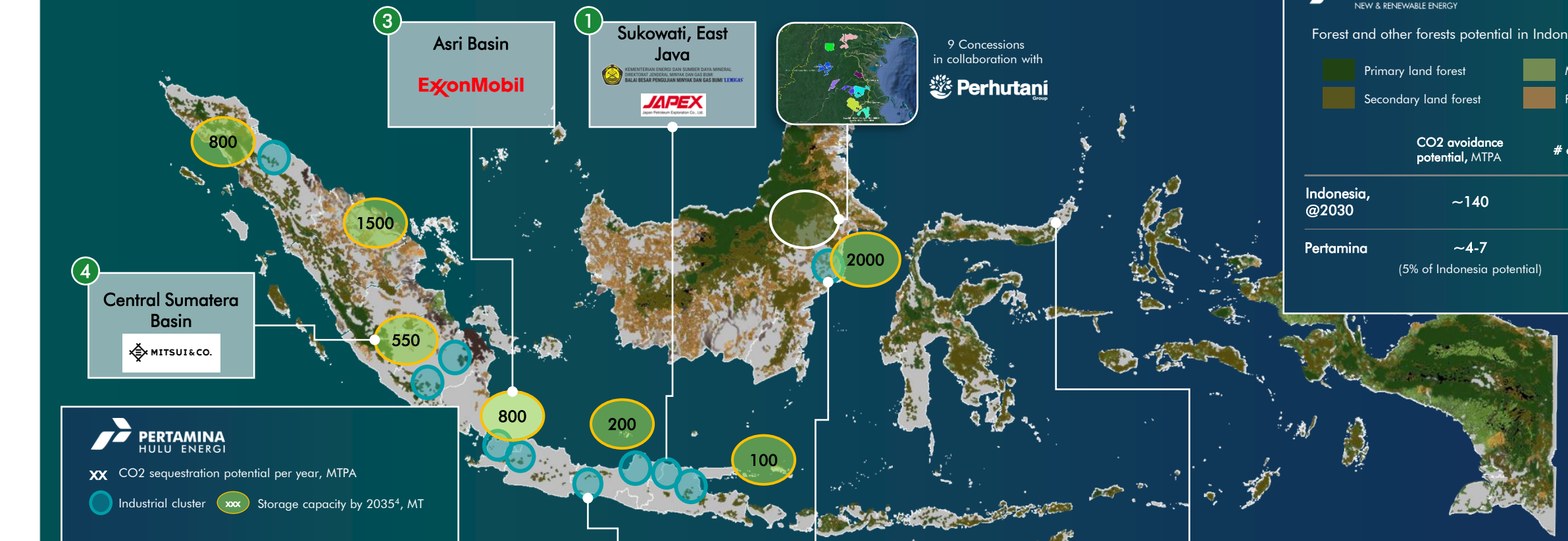
~15%
Contribute to supply of global NBS potential

~300
Bn tons CO_2 carbon stored in Indonesian land, up to 40x annual GHG emission from fossil fuels

3X
Growth rate compared to trees planted in non-tropical area, will increase effectivity of CO_2 storage.

Represented on the map:
Lower-cost[1] potential (high- medium feasibility NBS) Countries with a share of NBS potential that is 1% or greater

Nature Based Solution | Carbon Sink Potential – Leveraging Pertamina's Upstream Capabilities and Indonesia's Forest Potentials



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Lahendong Unit 5 & 6
VCS Project ID #1778

Verified Carbon Standard

Carbon Business | Types of Carbon Credit Projects

Technology solutions

Renewable Energy
Biomass, geothermal, hydro, solar, wind

Energy Efficiency
Waste heat recovery, process efficiencies, insulation of buildings

Tech-based Removals
Direct Air Carbon Capture and Storage, Bio Energy Carbon Capture and Storage

Waste Disposal
Waste management, wastewater, biogas

Household Devices
Clean cookstoves, water purification devices

Transport
Electrification, lower fuel use (e.g., biofuels)

Natural Climate Solutions (NCS)

Forestry
Afforestation, reforestation, improved forest management (IFM), conservation (REDD+)

Blue Carbon
Restoration or avoiding conversion of mangroves, wetlands, seagrass

Other Land Use
Grassland management, restoring or avoiding conversion of peatlands

Agriculture / Soil Carbon
Rice methane, improved fertilizer management, no- and low-till agriculture, cover crops

- Carbon Credit or Carbon Offset are mechanism which an individual or an organization can **compensate** their CO2 emission through certified emission reduction projects that **absorb or reduce CO^2 emissions**
- Each Carbon Credit corresponds **1 tCO2e** that was not emitted into the atmosphere.

Carbon Business | PNRE has established a strong end-to-end Carbon Business Capabilities, with Aim to Support Domestic and Global Carbon Offsetting Demand

Project Development & Credit Sourcing → Trading & Sales

Sources

PNRE's NBS projects

Financing: ADB, AFD, And others…

Repayment

NBS Co.

Carbon Credits ↑ | Project Costs ↓

Perhutani Group
- Compensation Fee
- Project Set up Costs
- Opex

Other internal sources*



PERTAMINA GEOTHERMAL ENERGY | PERTAMINA KILANG PERTAMINA INTERNASIONAL | Badak LNG

Other developers



And others..

Eliot & Luther | FAIRATMOS | RIMBA COLLECTIVE Nature Positive Supply Chains

Platforms*

Aggregator

Carbon Trading Co.

PNRE as carbon market aggregator

Carbon trading desk

Guidelines | Platforms | Inventory Management

Potential off-takers

NON EXHAUSTIVE - PRELIMINARY

End-users

PERTAMINA HULU ENERGI | PERTAMINA KILANG PERTAMINA INTERNASIONAL | PERTAMINA PATRA NIAGA

SIG | MIND ID Mining Industry Indonesia | Chevron | Shell | PetroChina

INPEX | VOLKSWAGEN CLIMATEPARTNER | And others…

Traders*

eco securities | south pole | And others…

Platforms*

RENEWABLE ENERGY

Renewable Energy | Maximizing Indonesia's Potential of Renewable Resources and Ensuring Energy Security

Renewable Energy | PNRE aims to be one of the biggest Renewables Player in Indonesia

Existing Projects and Long Term Target

Geothermal

0.7 GW
Existing capacity of Own operation (6 WK)

1.2 GW
Existing Capacity of Joint operation (4 WK)

~1.8 GW
Target own operation by 2030

Solar PV

45+ MWp
Installed Capacity (end of 22)

350+
Location (end of 22)

~1.2 GW
Target own operation by 2030

Biogass/Biomass

4,4 MW
Installed Capacity

3
Power Plant

~117 MW
Target by 2030

Under Development Projects

Wind
55 MW
(target by 2030)

PONDERA

To be explore

Tidal

Nuclear

Solar Power | Maximizing Indonesia's Potential of Renewable Resources and Ensuring Energy Secutiry

1 | Installed in Internal Pertamina 37.5 MWp


Rokan
26 MWp

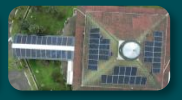

Badak
4 MWp


RU IV Cilacap
1.3 MWp


RU II Dumai
2 MWp


Logistik PIS
0.12 MWp


MOR III
0.4 MWp


Kamojang
0.02 MWp


TBBM Pengapon
0.05 MWp


TBBM Surabaya
0.05 MWp


TLPG Balongan
0.12 MWp


Grha Pertamina
0.04 MWp


Tj. Sekong
0.085 MWp


PL Cilacap
0.27 MWp


MOR V
0.04 MWp


TBBM Tuban
0.24 MWp


PL Gresik
0.48 MWp

PERTAMINA HULU ENERGI
PERTAMINA KILANG PERTAMINA INTERNASIONAL
PERTAMINA INTERNATIONAL SHIPPING
PERTAMINA GAS NEGARA
PERTAMINA PATRA NIAGA
PERTAMINA NEW AND RENEWABLE ENERGY

2 | Installed in Ext Pertamina 5 MWp


Sei Mangkei 2MWp


Telkom Data Center (TDC)
Office 0.105 MWp


Solar PV Mitratel
0.006 MWp


Solar PV Gambir
0.04 MWp


UGM 0.3 MWp


AP II Kualanamu
0.7 MWp


AP II Banyuwangi
0.035 MWp


AP II Soekarno Hatta
1.5 MWp

ANGKASA PURA II INDONESIA'S AIRPORT COMPANY
Perkebunan Nusantara
Telkom Indonesia the world in your hand
KAI

3 | Installed in Pertamina Gas Station 1.7 MWp


SPBU COCO Bali


SPBU DODO Bali**


SPBU Tangerang


SPBU Cikarang


SPBU Tendean


SPBU Cipularang

332
Gas Stations
(SPBU)

PASTI PAS!
GREEN ENERGY STATION

Solar Power | Pertamina NRE as Solutions for Solar PV Development

PNRE offers solar energy solution for commercial and industrial with advantages of:

Financing

- **Competitive Financing** from strong engagement with financial institutions
- **Strong financial capabilities** backed up by Pertamina Group for project development.

Portfolio

24.5 GWp
Installed capacity (including Masdar & Sembcorp)

50+
Separated cities

350+
Completed projects

Network

- PNRE has advantage to **leverage network** from Pertamina Group
- Strategic partnerships with large global players in NRE (Masdar, Sembcorp, Tepco, etc.)

Resources

- **Access to industry experts,** and;
- **Experienced PNRE** personnel across division (e.g., Commercial, Technical, Legal, Finance, etc.)

Quality

- **High HSSE standards** adoed from decades of operation in the industry;
- Provide **best-in-class quality** while maintaining **competitive timeline**

Ongoing Projects | Strengthening presence with focus of Large Scale Development

Operating Oil Field

3 Locations

200 MWp Estimated Capacity

220 Mt CO_2 Reduction

Industrial Company

4 Locations

100 MWp Estimated Capacity

110 Mt CO_2 Reduction

Industrial Estate

50 Locations

20 MWp Estimated Capacity

22 Mt CO_2 Reduction

Our Partners..

Operating Oil Field		Industrial Company		Industrial Estate	
Offtaker	Development Partner	Offtaker	Potential Partner	Offtaker	Potential Partner
PERTAMINA	Masdar – A Mubadala Company	Industrial Company	Masdar – A Mubadala Company; sembcorp	Industrial Estate	Masdar – A Mubadala Company; sembcorp

FUTURE BUSINESSES

EV & Battery Ecosystem | PNRE Net-Zero Initiative

PNRE, along with IBC and C&T, have executed multiple projects and strategic partnerships across the entire EV Value Chain

	Battery			E2W OEM		E2W infrastructure		Value added services	
Electric Vehicle value chain	Raw materials & mining	Battery production & sales	Battery 2nd use / recycling	E2W production & sales	E2W value add services	Infra dev. & production	Installation, maintenance & operation	Software platform, digital VAS	Battery rental
Project Owner(s)	IBC, PERTAMINA NEW & RENEWABLE ENERGY			IBC		PERTAMINA NEW & RENEWABLE ENERGY	PERTAMINA PATRA NIAGA		
Collaborator (s)	LG Energy Solution, CATL, antam			GESITS		electrum, Grab, gogoro, GESITS			

EV Ecosystem projects in operation

1 — Feb 2022 (PERTAMINA PATRA NIAGA)

Jakarta Commercial Pilot

500 units E2W

14 units BSS

2 — Aug 2022 (PERTAMINA NEW & RENEWABLE ENERGY, PERTAMINA PATRA NIAGA)

Bali Commercial Pilot

120 units E2W

6 units BSS

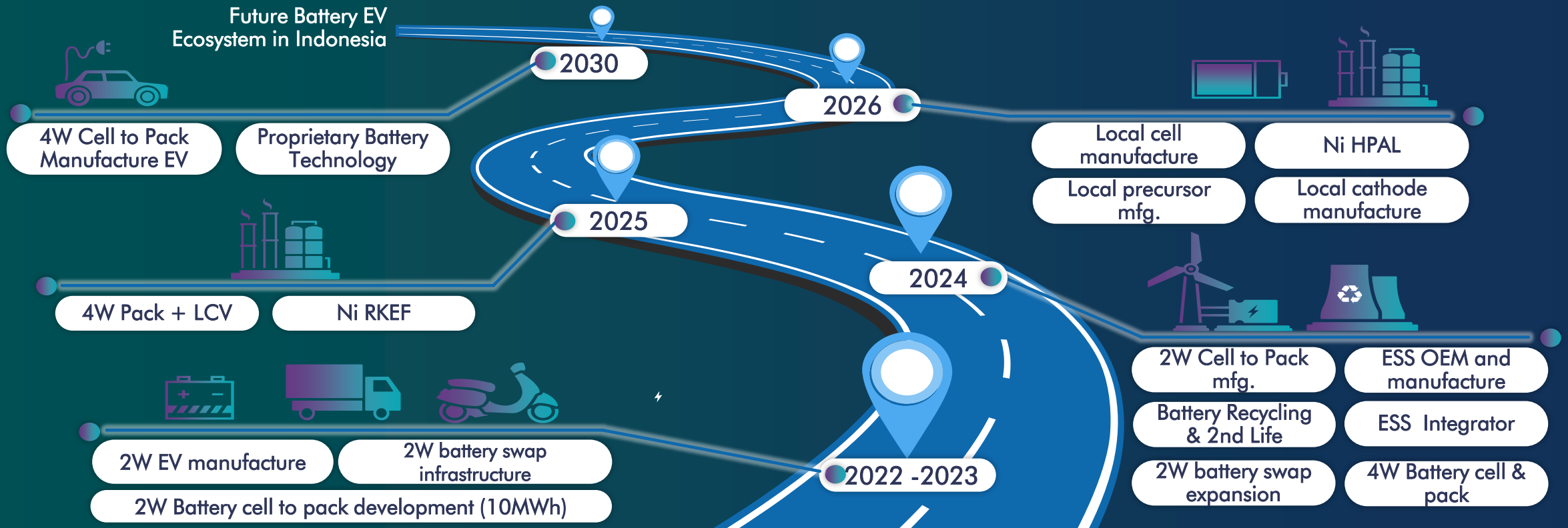
3 — 2023 (IBC, PERTAMINA NEW & RENEWABLE ENERGY)

- E2W Manufacturing.
- 2W Battery Pack Mfg.

Hence opening several key opportunities for future development

- Large-scale infrastructure deployment
- Proprietary technology development
- Policy formulation & advocacy

Battery & Ecosystem | Through IBC, Pertamina NRE, MIND ID, Antam & PLN are Developing an End-to-End EV Battery Value Chain



The end-to-end EV Battery value chain develop with aims to reduce CO2 emissions by 9 Mtpa[1] and fuel imports by 29.4 mio barrels/year

Clean Hydrogen | Pertamina NRE Aims to be a Leading Hydrogen Exporter and Champion of Indonesia Hydrogen Economy

	2022 - 2026	2027 - 2030	2031 - 2040+
PNRE aspiration	**First mover** in Southeast Asia	**International market** priority and cultivate domestic demand	**Leading H2 exporter** and champion of **Indonesia H2 economy**
Scale, H2e	**50-200 ktpa**	**500-1,000 ktpa**	**>2,000 ktpa**
Focus	• Launch pilot H2 and NH3 projects for export • Establish partnerships	• Scale up export volume for both H2 and NH3 • Cultivate domestic market	• Develop at-scale production • Build Indonesia H2 economy

Main use-cases

- Power (co-firing)
- Transportation
- Chemicals, steel & refining
- Marine

Clean Hydrogen | Alternative for Fossil-Based Energy Carrier and Addressing Emissions in Hard to Abate Industries

Demand centers *Priority locations* *Other supply locations*

1 Batam Bintan Clean H2 Cluster Export
- H_2 Floating solar
- Strategic partner: sembcorp, IGNIS
- Power Source
- Target Market

2 Mainland Sumatera Clean H2 Cluster Export
- H_2 Geothermal
- Strategic partner: Keppel, Chevron
- Power Source
- Target Market

3 Cilegon Clean H2 cluster Domestic
- H_2 SMR & CCS
- H_2 Wind & Solar
- Strategic partner: PONDERA, IGNIS, KRAKATAU STEEL
- Power Source
- Target Market

4 North Sulawesi Green NH3 cluster Export
- NH_3 Geothermal
- NH_3 Solar
- Strategic partner: TEPCO, JERA, NEDO
- Power Source
- Target Market

5 Sumatera-Java Blue NH3 Domestic
- NH_3 SMR & CCS
- Strategic partner: Mitsubishi Corporation, PUPUK INDONESIA
- Power Source
- Target Market

10%
Global addressable market by 2040

1.8 Mtpa
H_2 eq capacity by 2040

$25~30B
Capital investment

$4~5B
Annual Revenue by 2040

Biofuel | Pertamina Develops Biofuel Products to Support Beyond B30 Implementation in Indonesia and Potential Export Demand

1 HVO Production Dumai Refinery

Capacity	Feedstock
1.0 kbpd	RBDPO

Bioavtur (Sustainable Aviation Fuel)

2 HVO Production Cilacap Refinery

Capacity	Feedstock
0.8 kbpd	RBDPO

Revamping Phase 1

Capacity	Feedstock
3.0 kbpd	RBDPO

Revamping Phase 2 (2025 plan)

Capacity	Feedstock
6.0 kbpd	UCO/CPO

Pertamina Renewable Diesel

Certii-cation: ISCC

Target Market

3 Grass Root Refinery Plaju (plan)

Capacity	Feedstock
20 kbpd	CPO/UCO

Key milestones:

- Sept 2021: Bioavtur J2.4 test flight
- June 2022: trial Renewable Diesel for electricity generator at Jakarta e-Prix
- Oct 2022: Renewable Diesel first shipment of HVO to Singapore

B35-B40
Beyond B30 target

200 kbpd
2060 HVO and HEFA cap.

$5~10B
Capital investment needed

Other potential products

FAME max blending 30%	DPME high grade FAME
HVO Pertamina RD	BIO JET FUEL
BIO NAPHTA	BIO LPG