The status and challenges of Indonesia biodiesel implementation programs

Policies and Status of Biodiesel Mandates

The 3rd Palm Biodiesel Conference

Sheraton Mustika Yogyakarta

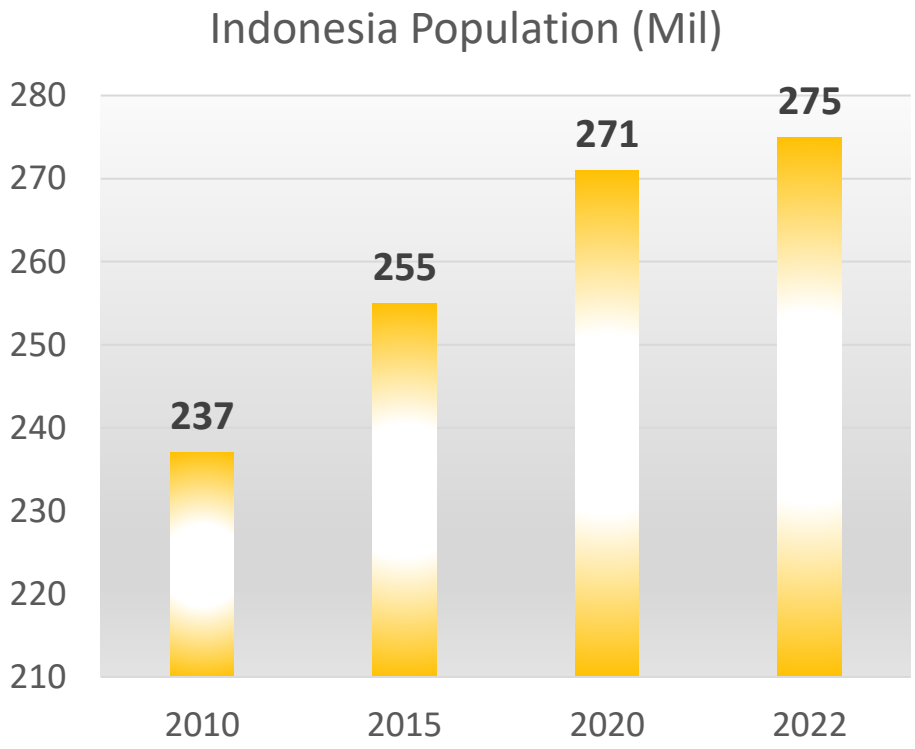
24 March 2022

By Paulus Tjakrawan

ASOSIASI PRODUSEN
BIOFUEL INDONESIA

Population & Fuel Oil Consumption Comparison

	Population (M)	Fuel Oil Consumption, liter/person/day
Brunei	471.103	6.07
Thailand	69.480	3.17
Indonesia	275.122	0.98
Malaysia	33.519	3.30
Philippines	110.818	0.60



Sources, BPS, World Do Meter, CIA Fact Book, Index Mundi.

What Drives Us to Run the Biofuel Program in 2005-2006?

Indonesia became net oil importer

- 2021 consumption ~1,16 m Barel/day, Production ~707.000 BarelL

OIL PRICE WAS APPROACHING US$ 150 per Barrel

- Today US$ 104.96/Barrel (OPEC Basket Price, 17 March 2022)

POVERTY ALLEVIATION & EMPLOYMENT OPPORTUNITY

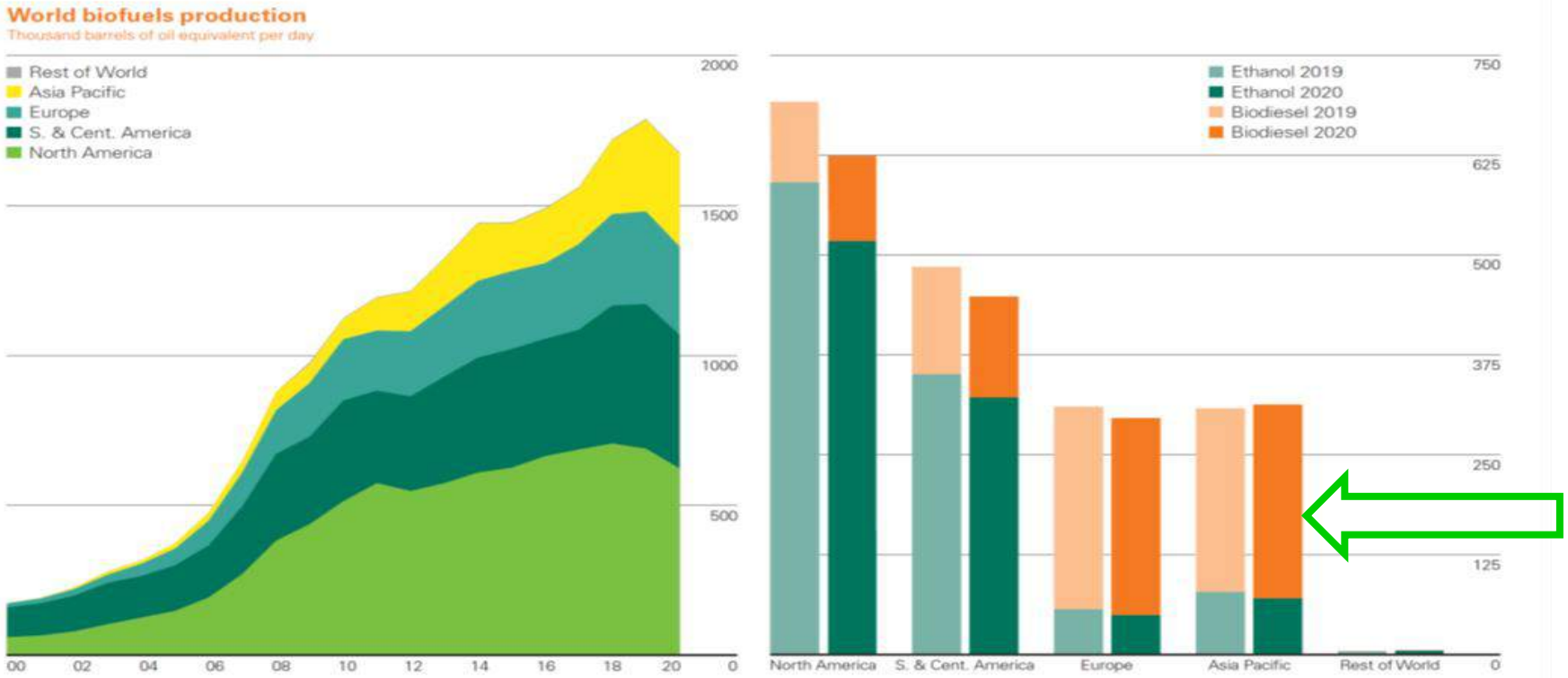
ENVIRONMENT & GHG EMISSION REDUCTION

INDONESIA BECAME THE BIGGEST PALM OIL PRODUCER

- Oil started to be produced by Royal Dutch at Telaga Tunggal 1 Well, Sumatra in 1890
- In the 70-80s, 80% of our state budget was obtained from exports of crude oil
- Around 2004 became a Net Importer
- Biofuel Program for PSO started in 2006, mandatory in 2008
- **Biofuel Program:**
  - **Energy Security & Resilience**
  - **Poverty alleviation**
  - **Environment**

Sources, MEMR, APROBI,.

World Biofuels Production



Biofuels production fell 6% globally in 2020 (113,000 barrels of oil equivalent per day or boe/d) in contrast to the 6% average growth for the 10 years prior. Moderate growth in Asia (4,000 boe/d) was more than compensated by a decline in the US (64,000 boe/d), Argentina (19,000 boe/d) and Brazil (16,000 boe/d). Asia's production was resilient due to an increase in biodiesel whereas ethanol production decreased in all major regions by 7 to 12% (107,000 boe/d globally). Biodiesel is the dominant fuel produced in Europe and Asia Pacific (making up 83% and 77% of biofuels respectively in 2020), while ethanol is the main fuel in North America (83% of total) and South and Central America (72%).

- In the last 20 years, Biofuel demands increase ten-fold
- Asia Pacific Biofuel production growth rapidly due to Indonesia Biodiesel demand

Sources, BP Statistical Review of World Energy 2021.

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INSTALLED CAPACITY OF BIODIESEL INDUSTRIES

Keterangan:

- Following Domestic Procurement (Jan–Dec 2021)
- Not following Domestic Procurement

REGION	KAPASITAS (kL)	INVESTASI (USD)
Sumatera	7.791.322	903.384.834
Jawa	5.370.634	575.794.827
Kalimantan	3.503.305	263.411.493
Sulawesi	475.862	32.620.407
TOTAL	17.141.122	1.775.211.561

North Sumatera

1	PT Sintong Abadi	
	35,000 kL	USD 2,444,000
2	PT Musim Mas (Medan)	
	459,770 kL	USD 31,339,031
3	PT Permata Hijau Palm Oleo	
	417,214 kL	USD 56,165,185

Riau

4	PT Sari Dumai Oleo	
	413,793 kL	USD 41,379,310
5	PT Intibenua Perkasatama	
	442,529 kL	USD 55,555,556
6	PT Ciliandra Perkasa	
	287,356 kL	USD 46,581,449
7	PT Pelita Agung Agrindustri	
	229,885 kL	USD 48,275,862
8	PT Pelita Agung Agrindustri	
	568,966 kL	USD 70,671,724
9	PT Sari Dumai Sejati	
	689,655 kL	USD 30,000,000
10	PT Wilmar Bioenergi Indonesia	
	1,603,448 kL	USD 158,126,118
11	PT Bayas Biofuels	
	862,069 kL	USD 85,000,000

Lampung

12	PT LDC Indonesia	
	482,759 kL	USD 78,518,519
13	PT Tunas Baru Lampung	
	402,299 kL	USD 26,962,963

Riau Island

14	PT Musim Mas (Batam)	
	896,552 kL	USD 172,364,673

Banten

15	PT Alpha Global Cynergy	
	12,000 kL	USD 3,000,000
16	PT Multimas Nabati Asahan	
	568,966 kL	USD 48,642,000

West Java

17	PT Sinar Mas Bio Energy	
	455,400 kL	USD 111,678,349
18	PT Sumiasih	
	114,943 kL	USD 26,666,667
19	PT Darmex Biofuel	
	287,356 kL	USD 57,629,630

East Java

20	PT Anugerahinti Gemanusa	
	160,920 kL	USD 48,984.354
21	PT Batara Elek Semesta Terpadu	
	780,459 kL	USD 52,618,102
22	PT Wilmar Nabati Indonesia	
	2,250,000 kL	USD 109,335,484
23	PT Energi Baharu Lestari	
	229,885 kL	USD 6,370,370
24	PT Eterindo Nusa Graha	
	568,966 kL	USD 80,548,055
25	PT Eco Prima Energi	
	579,310 kL	USD 30,099,594

Bali

26	PT Bali Hijau Biodiesel	
	360 kL	USD 222,222

South Kalimantan

27	PT SMART Tbk	
	440,517 kL	USD 59,677,951
28	PT Jhonlin Agro Raya	
	568,966 kL	USD 60,426,512

Central Kalimantan

29	PT Sukajadi Sawit Mekar	
	402,299 kL	USD 52,222,222

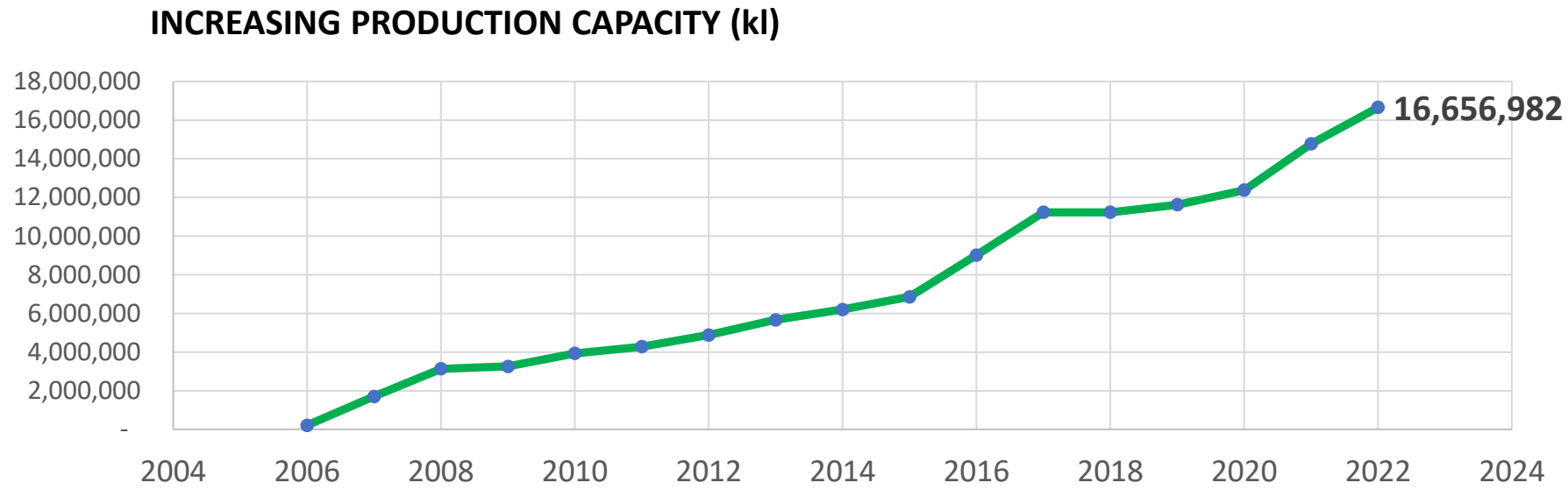
East Kalimantan

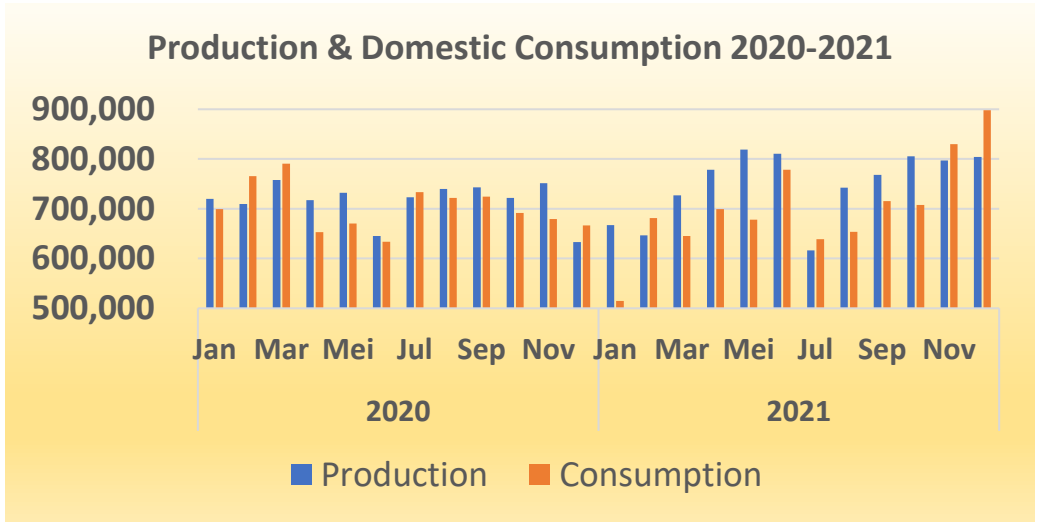
30	PT Kutai Refinery Nusantara	
	1,143,247 kL	USD 65,640,556
31	PT Energi Unggul Persada	
	948,276 kL	USD 25,444,253

North Sulawesi

32	PT Multi Nabati Sulawesi	
	475,862 kL	USD 32,620,407

Biodiesel Program Development





2020 B30

- Production **8,591,368 kl**
- Domestic **8,426,152 kl**

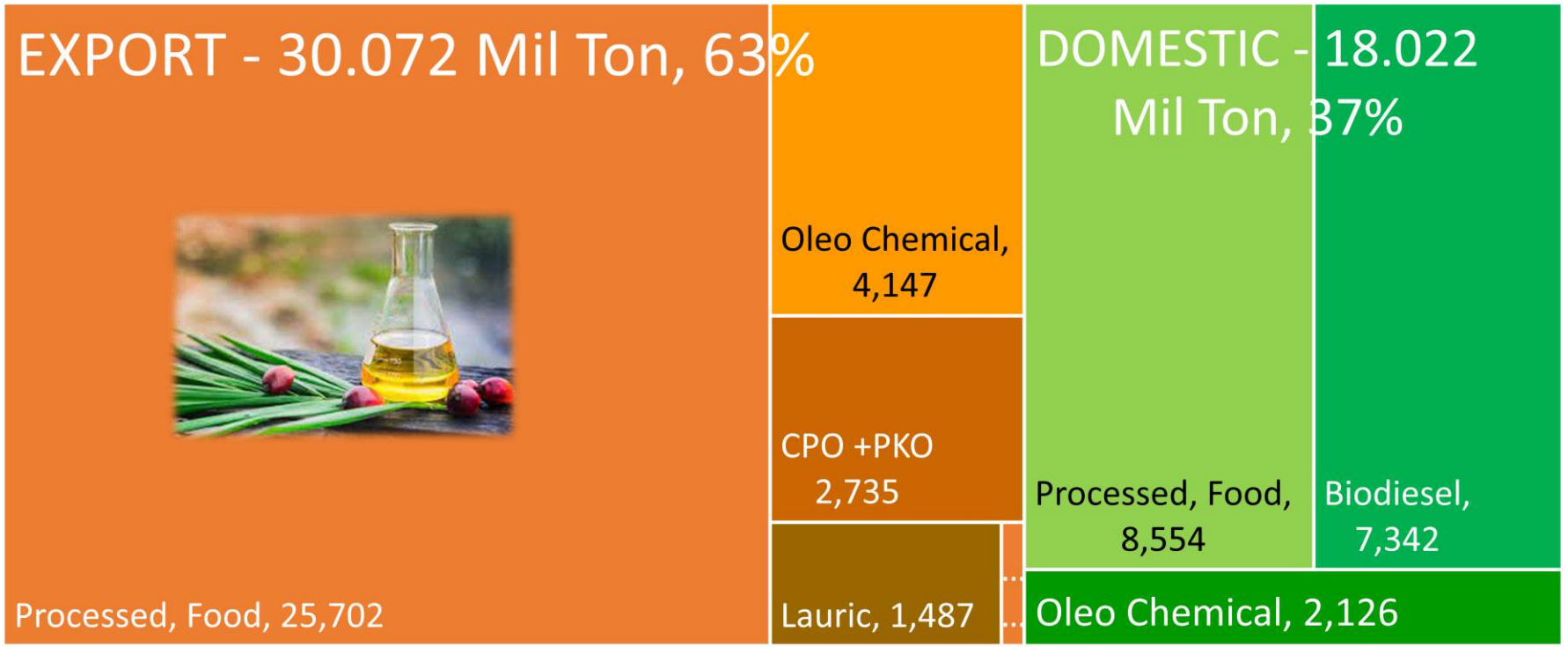
2021 B30

- Production **8,979,523 kl**
- Domestic **8,438,550 kl**

Source, APROBI

2021 Palm Oil Production & Distribution Map

2021 Production, 48.094 Mil Ton



Biodiesel Production for domestic took 15% from the 2021 Palm Oil Production

2022 projection, Biodiesel domestic will use about 17% from 2022 Palm Oil Production.

Source, APROBI, GAPKI, GIMNI, APOLIN 2021

Product Development

Biodiesel	• Projection in 2022, ~10.1 M kl and export 1 M kl. • B40 test in progress for implementation in 2022/3, • Diesel Fuels consumption ~ 30-31 million kl./year
Product Development	• Bioethanol for Pertamax, Bio-hydrocarbon fuels, HVO • Green Diesel, Green Gasoline, Bio Avtur, • Gasoline Fuels consumption ~ 28 million kl/year
Feedstock	• Cellulose, hemicellulose, or lignin • Micro algae • Biomass, Crop residue
Technology	• Unique technologies and processes that transform a wide range of plant, waste, and cellulosic molecules into hydrocarbon molecules like those produced at conventional refineries

- The development of energy from oil palm continued and heading to Bio-hydrocarbon products such as gasoline, diesel fuel also aviation fuel.
- We are keep struggling to use bioethanol in gasoline, Pertamax
- Research on micro algae and other types of raw materials continues to be explored and developed
- Of course, we also improving technology process

Source, APROBI Jan 2022

Biofuel Research Map

		Liquid	Solid	Gas	Researcher
Oil Palm		B30-B40 Bio Hidrokarbon (Diesel/D100, Bensin/G100, Avtur)	Pellet	Methane	Industry. Pertamina, ITB, IPB, 0ther University Lemigas, BRIN
Non Oil Palm	Sugar Cane	Bioethanol	Pellet	Methane	Industry, PTPN, BRIN
	Cassava	Bioethanol	Pellet	Methane	Industry, BRIN
	Sagu/sago	Bioathanol	Pellet		BRIN
	Micro Algae	Biodiesel	Pellet		IPB, UGM
	Cellulose	Bioethanol	Pellet		BRIN
	Aren/Enau/ Arenga Pinatta	Bioethanol	Pellet		Private Sector

Sumber APROBI 2022

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Considering to Environment

Indonesia has implemented the moratorium on deforestation for any use since 11 (2011) years ago, and moratorium for new Palm plantation since 2018.

Also, it has been formed Peat Restoration Board in 2016

Palm Oil Sustainability Standard RSPO (Roundtable on Sustainable Palm Oil) standard. 51% from Indonesia Plantation, 2,1 million Ha Certified

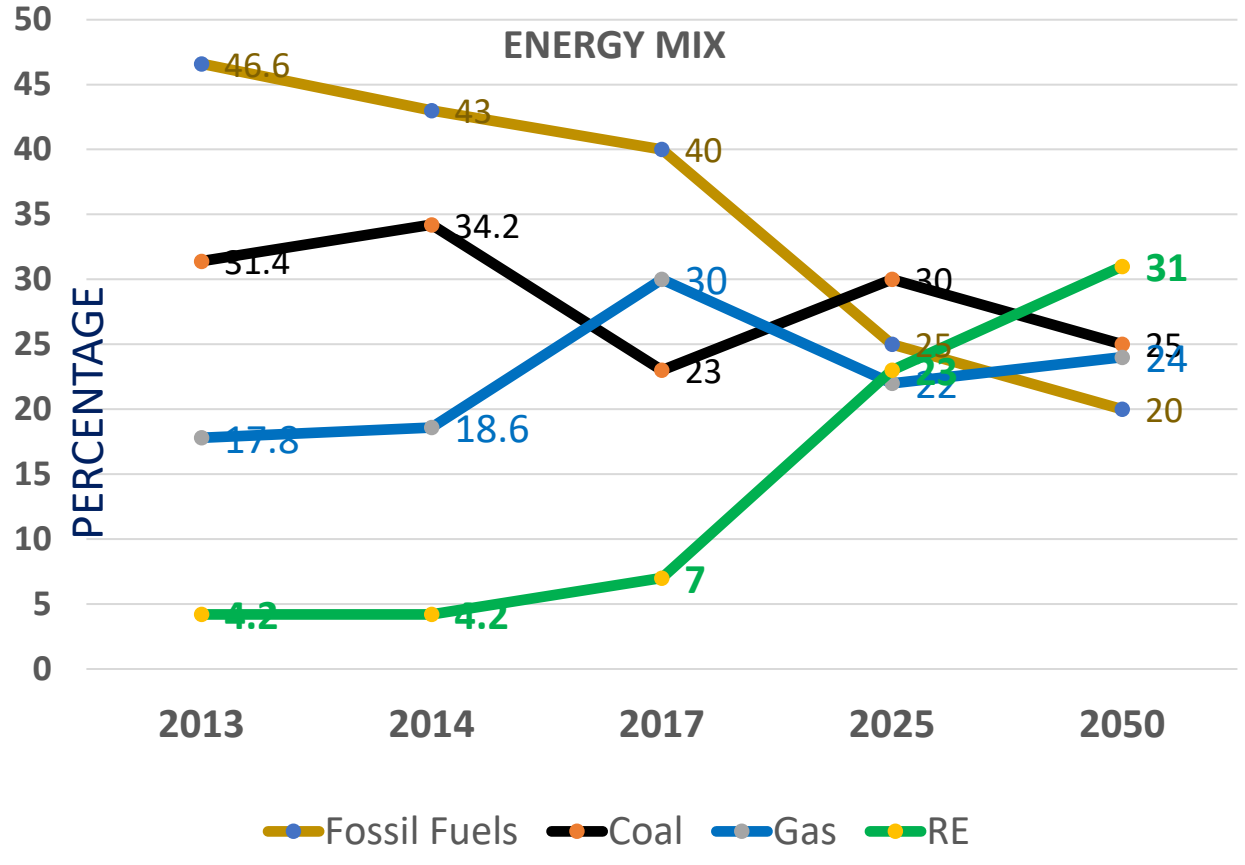
ISPO (Indonesia Sustainable Palm Oil) standard. More than 800 Indonesia plantations, 4.5 million Ha already certified. Soon we have the ISPO Down Stream and Indonesia Bioenergy Standard Indicator,

ISCC (International Sustainability & Carbon Certification), lot of Indonesian Companies certified.

Continue to develop the Biofuel environment friendly processing technology

Source, APROBI

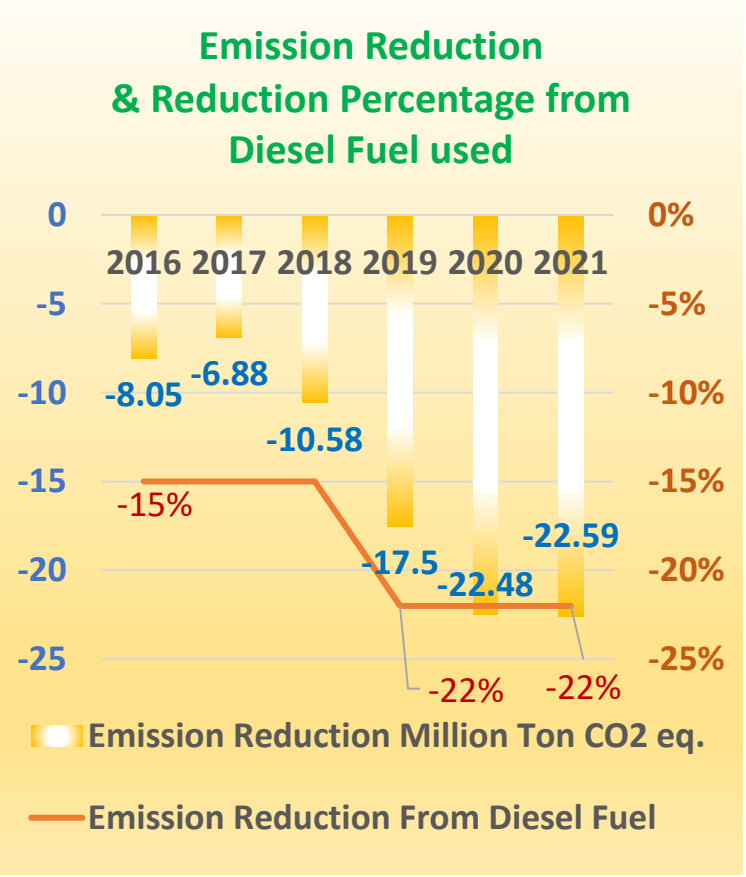
The Role of Biofuel to Achieve Renewable Energy Target of the 2050 Energy Transition



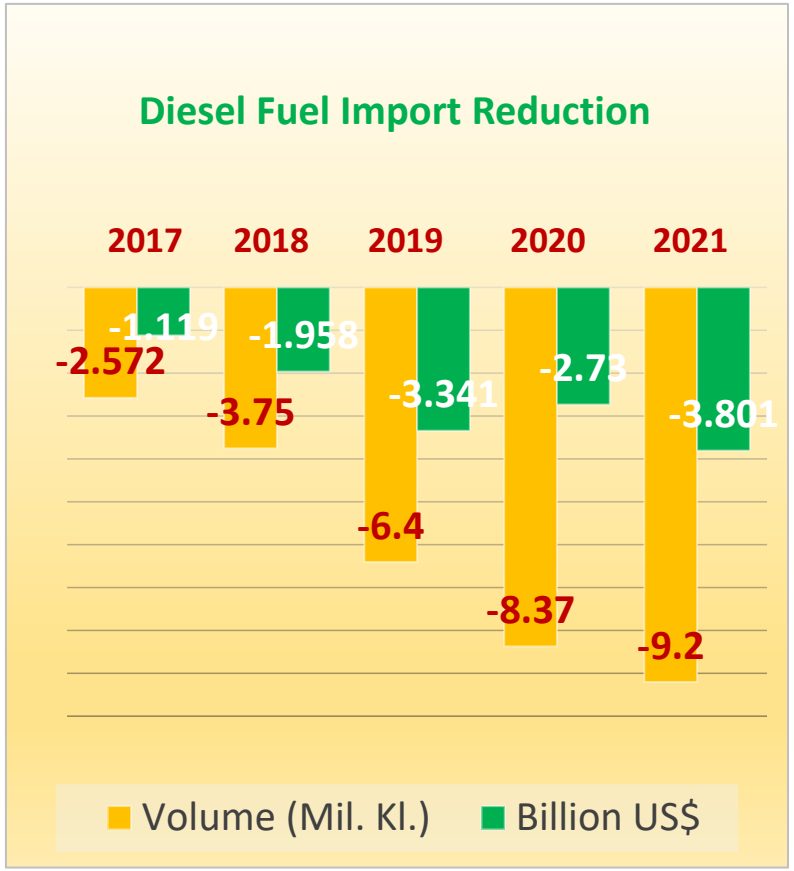
- It is seen that in 2020, Renewable Energy contributed about 10% of the target of 23% in 2025 and 31% in 2050
- Biodiesel currently has reached 30% and should be improved by percentage and volume.
- The use of *OTHER* biofuels (Bioethanol and Bio Hydrocarbon) should be started immediately and can match the usage of Biofuel to reach 31% Renewable in 2050
- It required commitment, hard work and synergy among all the stakeholders to make it happen.
- The role of the private sector is very essential

Source, MEMR, APROBI, November 2020

Emission Reduction and Energy Security

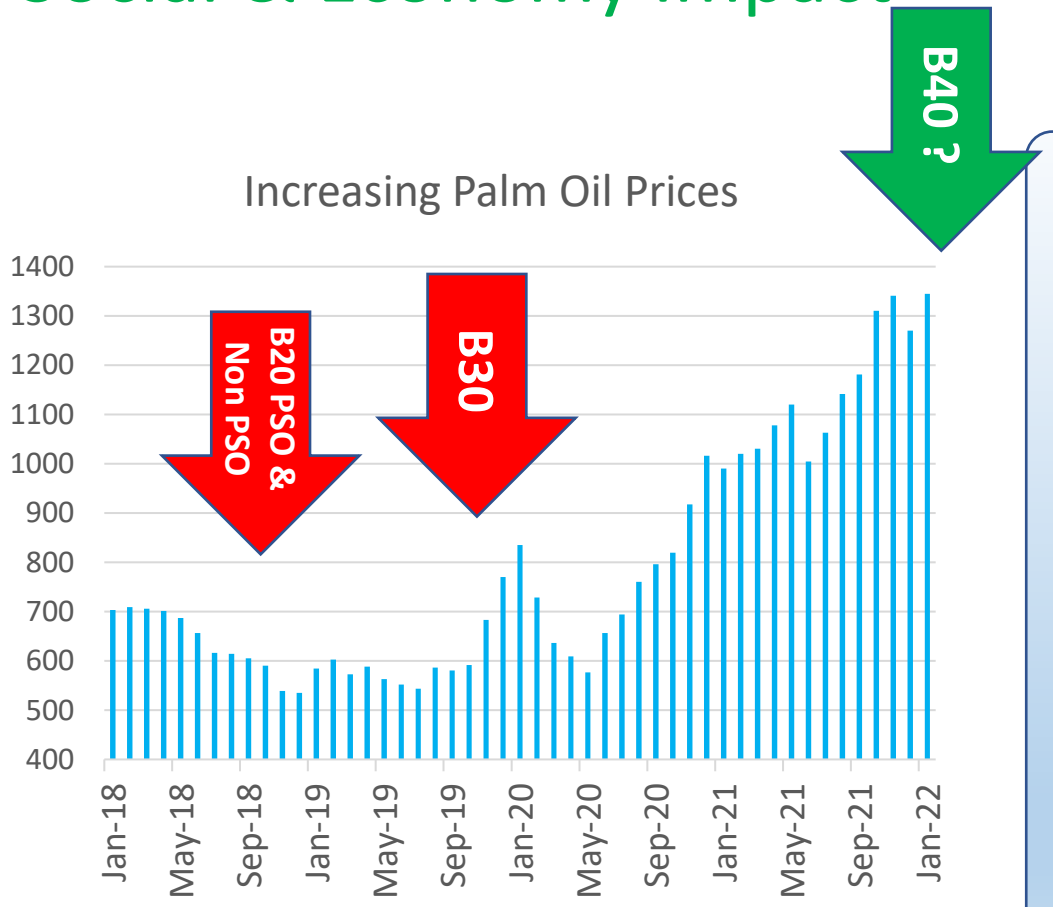


- In 2020, Biodiesel contributes about 7.8% to the GHG Emission reduction energy target as Indonesian NDC in 2030
- In 2021 Biodiesel could contribute reducing 22.59 mil. ton $CO_{2\ eq}$.
- Significantly decreasing Diesel Fuel import



Source, APROBI, 2021

Social & Economy Impact



- Shown, the effect of the B20 program for PSO and Non PSO on CPO prices in September 2018 with prices tending to increase until the end of 2019
- Early to mid-2020, there was a decline in CPO prices due to falling world oil prices and the Covid 19 pandemic
- In May 2020, CPO prices have started to improve until now .

1.392.000
UPSTREAM WORKERS

Source, APROBI, Index Mundi, Aug. 2021

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B30 Program, 2022 (Projection)

B30 ~ **10.15** mil. Kl (~**63.84** mil barrel) ~ **90** days Indonesia oil production.

24 Companies, **16.6** mil. Kl installed capacity

~**1.682.000** Upstream Workers

Increasing Farmers Income

Reducing ~**24.45** mil ton CO2 eq (7.8% from Energy & Transportation NDC Target 2030)

Source, APROBI.

What are the Challenges of Developing Biodiesel

BIODIESEL QUALITY: To meet the transportation technology demand, we are always renewing/improving our Biodiesel Quality Standard and the technology.

STAKEHOLDERS SUPPORT: We are working with the Renewable Energy Research Centre and Universities, Car Manufacture Association, Pertamina and Energy and Mineral Resources Ministry to research and to make a road test for Biodiesel program.

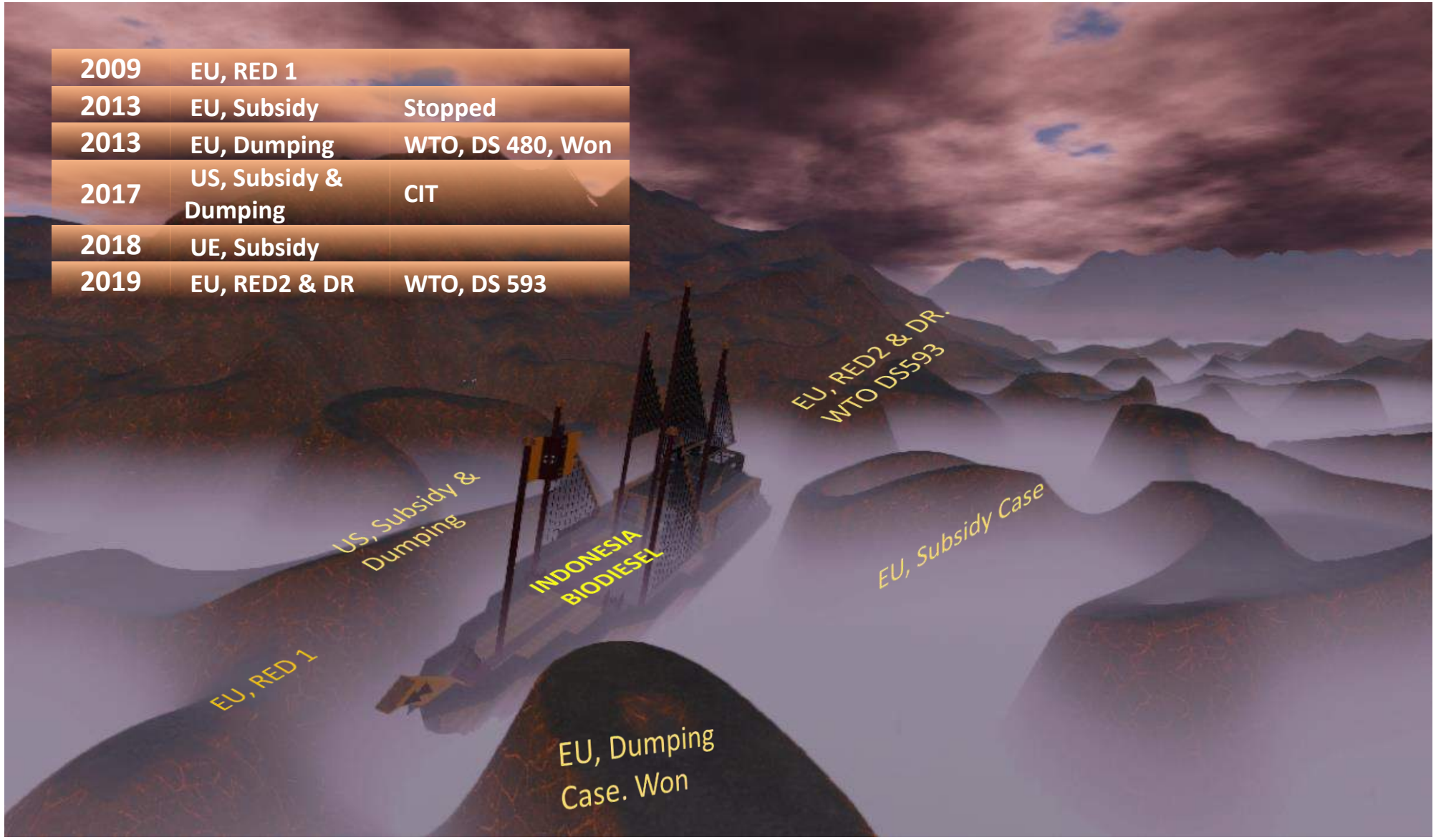
PRICING POLICIES: We have an Oil Palm Plantation Fund (OPPF) institution to support the Biodiesel mandatory implementation.

TRADE BARRIERS; EU RED II, US RFS 2, Subsidy and Anti Dumping cases from EU and US, EU Delegated Regulation on Palm Oil and Biodiesel. It causes a barrier for technology growth

Source, APROBI Jan 2022

Trade Barriers

2009	EU, RED 1	
2013	EU, Subsidy	Stopped
2013	EU, Dumping	WTO, DS 480, Won
2017	US, Subsidy & Dumping	CIT
2018	UE, Subsidy	
2019	EU, RED2 & DR	WTO, DS 593



Sources, MOT, APROBI 2021.

Efforts toward Net Zero Emissions in the Energy Transition and its Challenges

- Increasing the Implementation of Diesel Fuel Substitution
  - Biodiesel mix with Distillated Biodiesel, Diesel Bio hydrocarbons, Co-processing at the Oil Refinery, can be up to B100.
- Realizing Gasoline Substitution
  - Bioethanol (<80% in Brasilia), Gasoline Biohydrocarbon
- Realizing Avtur Substitution
  - Bio-avtur

CHALLENGES

- Accelerate the Energy Transition
- Sustainable Biofuel
- Technology
- User acceptance
- Economy- Affordable
- Cooperation

Source, APROBI Jan 2022

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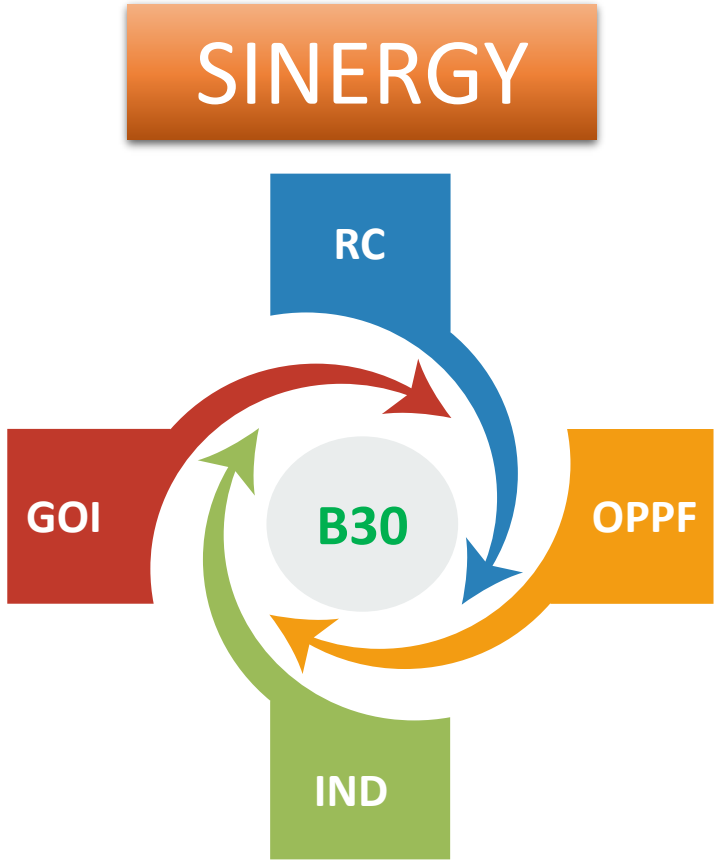
Key Word, “SINERGY”

Government

As an initiator of Biofuel development, GOI (Ministry of Agricultures, Industries, Energy, Finance, Trade), consistence to support the Biofuels program.

Industries

Biodiesel Industries, Oil & Gas/ Pertamina and others, Automotive Industry, Railways, Truck Transport Association, Shipping & Oil Palm Industries works together to implement biodiesel program



Research Center

Institute for Petroleum and Natural Gas, Agency for Assessment and Application of Technology, The National Standardization Agency of Indonesia, some Universities Research center, also Industries R&D hand in hand to develop the best quality of Biodiesel

OPPF

The Oil Palm Plantation Fund supports the R&D and testing of Biodiesel program

Source, APROBI Jan 2022

Conclusions

- Biodiesel Program Supporting the SDG's
- Reducing the Fossil Fuels Import, Resilient & Affordable.
- Significantly Impact on Economy toward to Net Zero Emission
- Answering the Climate Change Challenges, Undeniably Decreasing GHG Emission


B30 Launching

Source, APROBI, 2021

Thank-you,
Have a Nice Day &
Enjoy Yogyakarta

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