

PT PERTAMINA (PERSERO)

Investing in Sustainable Biofuel

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Gas and New Renewable Energy Director
20th August 2015



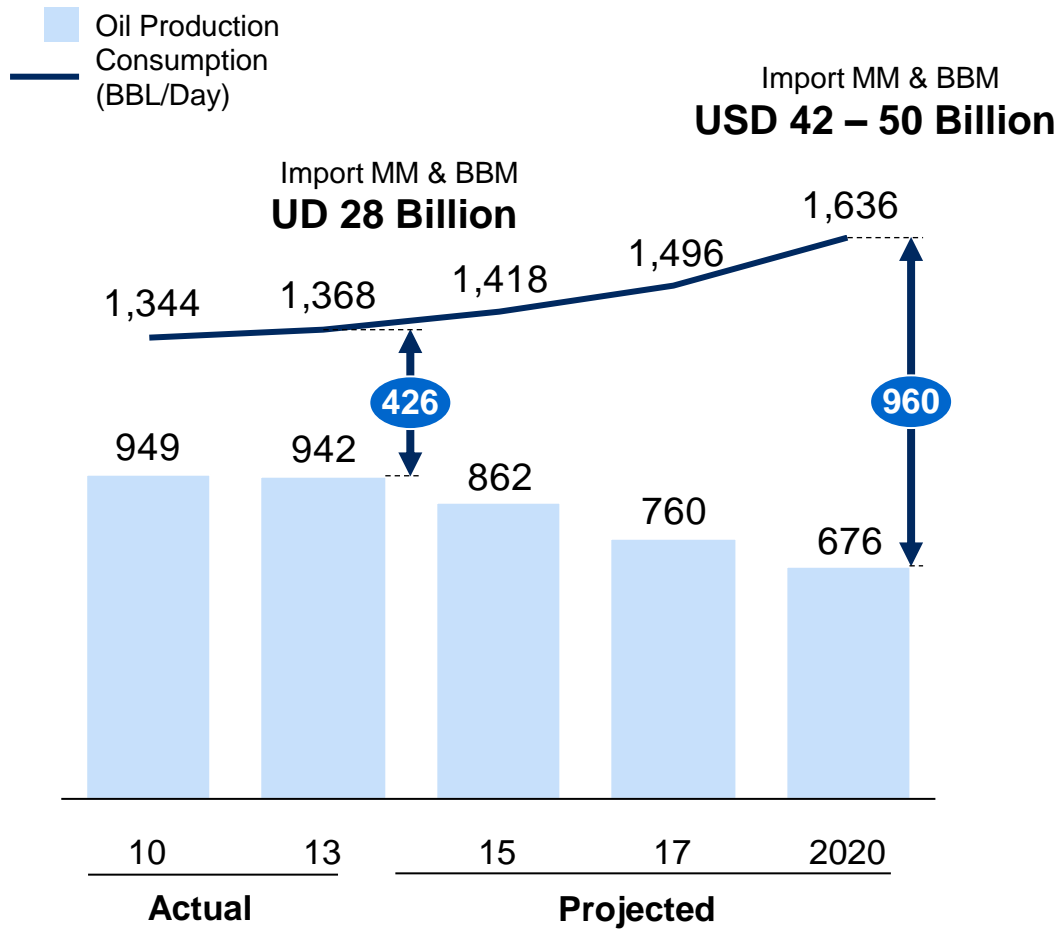
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Agenda

- Background
- Pertamina Future Strategic Developments in Biofuel
 - Co Processing
 - Integrated Stand Alone Refinery
- Conclusions



With growing fuel demand and the National production continues to decline, in 2020 crude oil & fuel imports projected to reach USD 50 Billion



- Deficit in trade balance due to energy – oil & gas
- Indonesia potentially → biggest fuel importer in the world by 2019 *)
- Indonesia's Oil Reserve : 12-14 years

1 2010-2020 growth projected based on projected product growth of 1.8% CAGR
 *) Craig Stewart, Indonesian Petroleum Association Chairman 2015

As of November 2014 : Indonesia is the Largest importer of Gasoline & top 5 importer of Gas oil



Largest importer of Gasoline in the world :

	<u>Barrel/Day</u>
INDONESIA	355,000
MEXICO	340,000
UNITED KINGDOM	150,000

Gas oil Volume import

	<u>Barrel/Day</u>
INDONESIA	290,000

Pertamina as State-owned enterprises have seen the growing importance of renewable energy and it is reflected through changes in our vision and mission



Vision To be a world class national oil **energy** company



Mission To carry out integrated core business in oil, gas, & **renewable** based on strong commercial principles

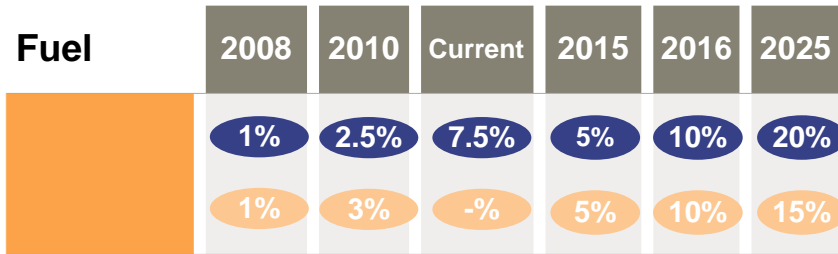


Value Clean; Competitive; Confident; Customer Focus; Commercial; Capable



Government has aggressively set new biofuels policy, which require biofuel players to blend up to 20% in 2016

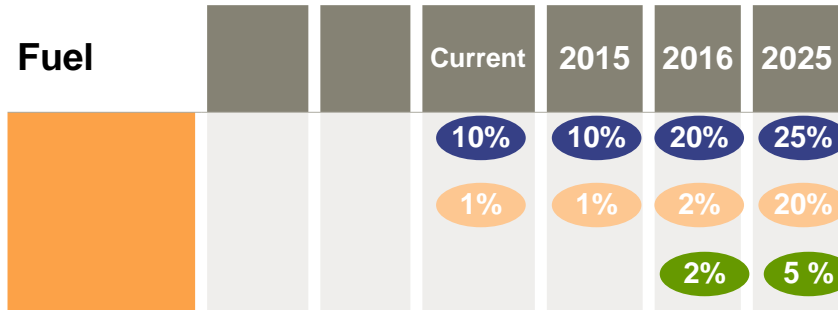
Old blending mandate



● Biodiesel (PSO&NPSO)
 ● Bioethanol

Doubled by 2016

New blending mandate



● Biodiesel
 ● Bioethanol
 ● BioAvtur (BioJet)

New MEMR Regulation No. 12 year 2015



Being an SOE, Pertamina will comply to the aggressive mandate, as long as it is **economically viable**

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PERTAMINA's Aspiration in 2025 : 13,9 Million KL from Biofuels

**“Pertamina's target 2025 :
15% of Fuel sales from
Biofuels; equal to 245.000
boepd”**

Why 2nd G ?

Biodiesel 1st Generation (FAME) will hit a blending wall at 20% due to technical issues.

2nd Generation of Biofuel can act as a drop in fuel, with no max limitation.

Wave 3

Grow 2G platform (if technology develops) and/or further roll out 1.5G technology

Wave 1

Establish domestic production with proven 1G technologies and available feedstocks

Wave 2

Develop advanced 1.5G (Green Diesel) leveraging same feedstock or improved ones

- GREEN DIESEL
- BIO AVTUR
- 2nd Generation BIO ETHANOL

2018

2025

Bioethanol, FAME/Biodiesel

Improved biodiesel¹ characteristics

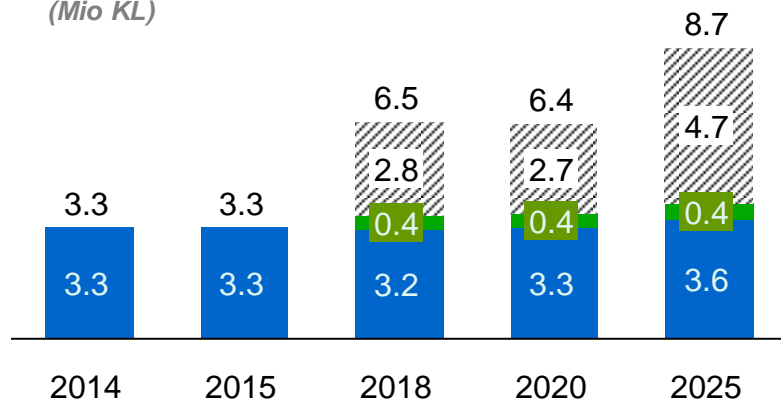
As well as Algae based Biofuel (3G)



Unfortunately, there is still a huge gap between national supply and demand of Biofuel until 2025, large investment opportunity in biofuels projects and Pertamina is open for Co-partnership

Bio/Green Diesel Demand & Opportunities

(Mio KL)



To cover National Mandate, Indonesia need more than

10 Green Diesel Refineries cap. 10,000 bbl/day in upcoming 10 years

- Other Partnership opportunity
- Green Diesel partnership with Pertamina
- 1 G Transesterification/FAME

As an initial step, partnership are open for

- 1 Green Diesel Refinery,
- 1 Bioethanol refinery and
- 1 Bioavtur refinery. (marked as green color)

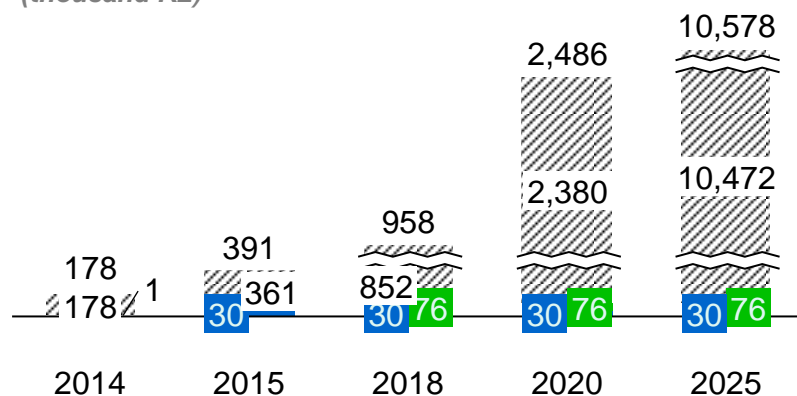
To cover National Mandate, Indonesia need more than

100 Bioethanol Refineries cap. 76,000KL/year in upcoming 10 years

- Other Partnership opportunity
- Bioethanol partnership with Pertamina
- 1G Yeast Bioethanol

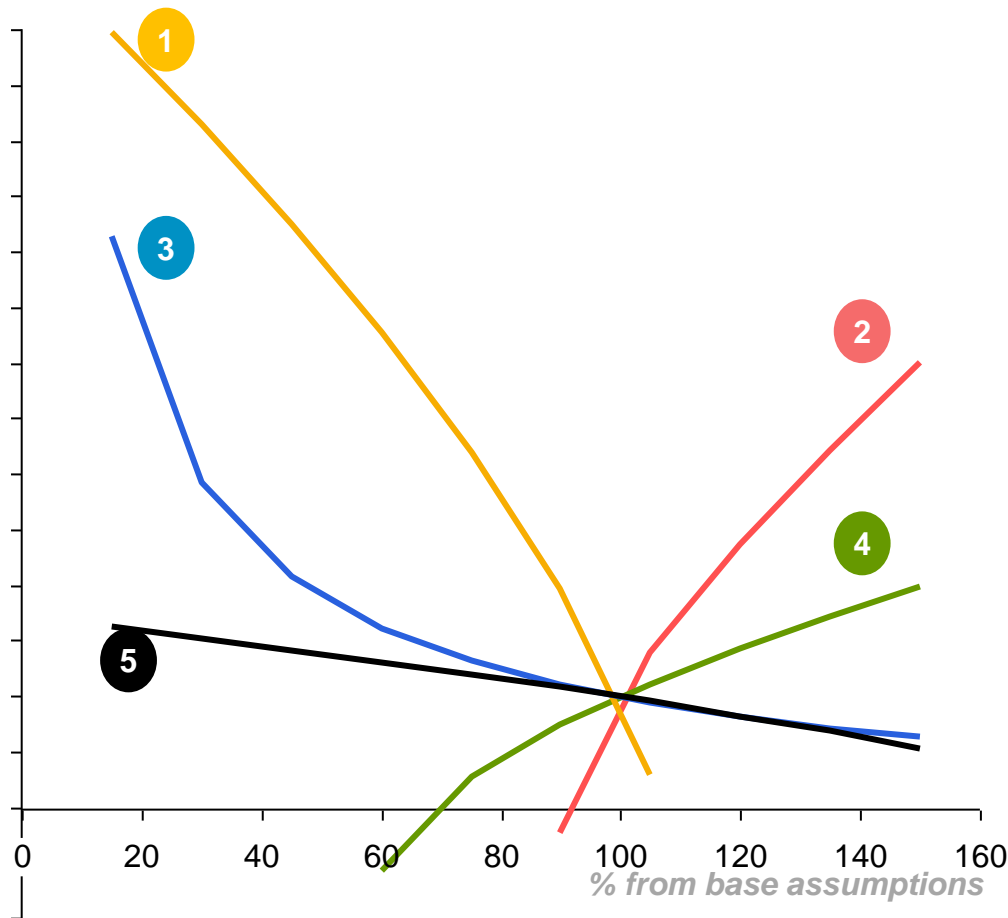
Bioethanol Demand & Opportunities

(thousand KL)



Pertamina should put concern on these 5 key success factors, mainly in securing the profitability of the investment of all Biofuel plant

% Return

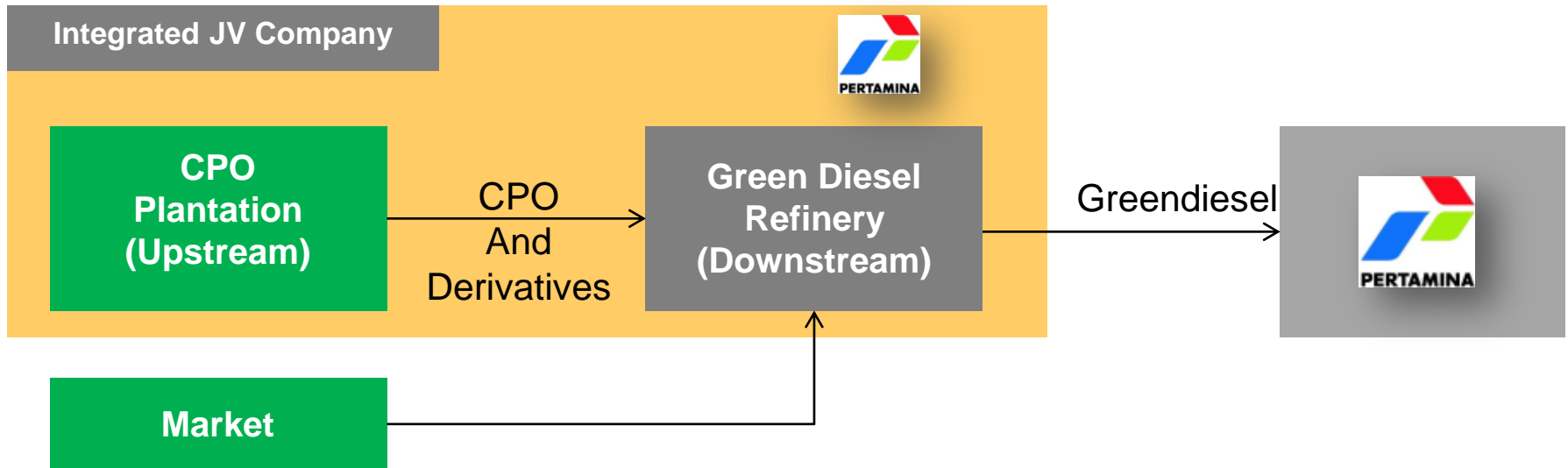


When one variable is being simulated, Other variable will remain constant (*ceteris paribus*), the result as follow :

- 1 Feedstock Price**
Feedstock price (eg. CPO and derivatives) is the most volatile variable among all. A little changes in price will bring a huge impact to the project return.
- 2 Product Price**
Main product price is the most volatile variable among all, as well as feedstock price.
- 3 Capex**
Has to be maintained to safeguard the project economics
- 4 Side Product Price**
Side product such as naphtha, and LPG will help the project economics more feasible
- 5 Opex**
Operating cost such as Hydrogen cost, fixed overhead and G&A will have less impact than any other observed variable.

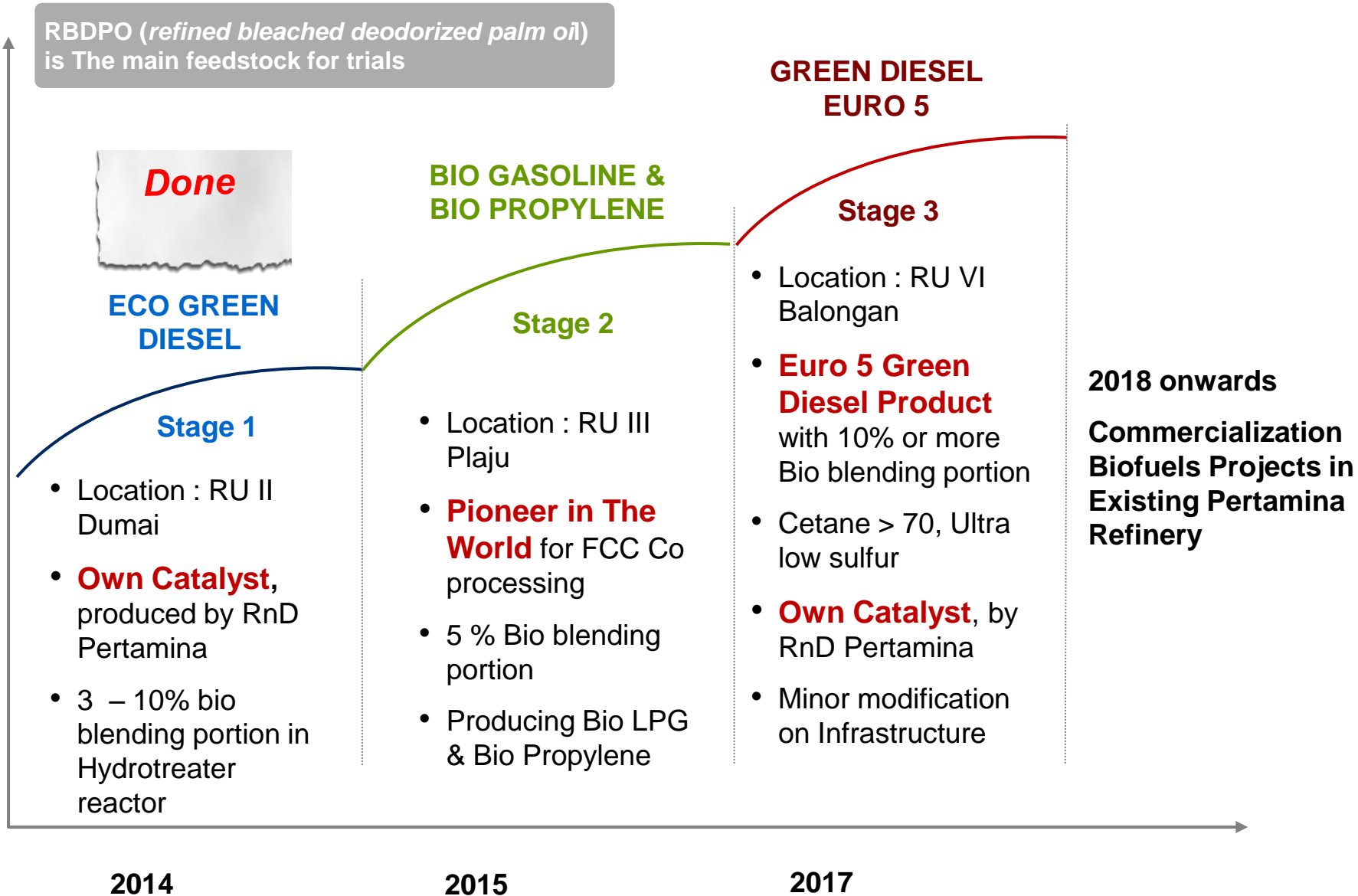
Typical Joint Development scheme with partners : Integrated Business Concept will be the *Key Success Factor* in this business. Scheme ex. is for Green Diesel Project

At the 1st step into the business, our target is to build an integrated JV company, with 90,000Ha CPO plantation to support our 10,000 bbl/day greendiesel/BHD refinery that will produce **EURO 5-equal Diesel Product**



- 'Biofuel project will be feasible and sustainable an integrated business model from upstream to downstream'
- Pertamina is not an expert on plantation, thus we are inviting plantation company to become one of our strategic partner in developing and end to end biofuel business scheme

A quick win in Biofuels : Co Processing in our existing Refinery



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Conclusions

- Indonesia will face an energy challenge in the future, Biofuel will play a very strategic role.
- PERTAMINA consistently supports government's biofuel mandate and will target 15 % of sales will be from biofuels in 2025
- PERTAMINA is committed to develop 2nd Generation biofuels with integrated project approach
- Partners in Plantation and Process Licensor plays an important role in 2nd generation Biofuels projects
- Total investment required for all 3 Biofuel projects is 1.8 bio USD (incl. Upstream investment). Projects coverage is up to 5% of total demand
- Pertamina still holds majority market shares in National fuel demand. Partnering with Pertamina will be a strategic decision for investor.





THANK

YOU

