

Pertamina Energy Outlook 2015

“Development and Challenges of Biofuel in Indonesia *to support* Implementation of Energy Mix”

By :
Ahmad Bambang
Director
PT Pertamina (Persero)

Jakarta, 3-4 December 2014

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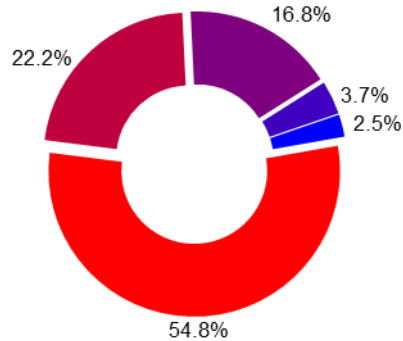
PT Pertamina (Persero)
Jln. Medan Merdeka Timur No.1A Jakarta 10110
Telp (62-21) 381 5111 Fax (62-21) 384 6865
<http://www.pertamina.com>

Government Policies : Biofuel is Projected to Contribute 5% in Energy Mix by 2025 through B30 and E20 Program

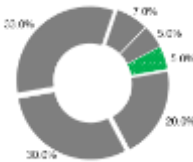
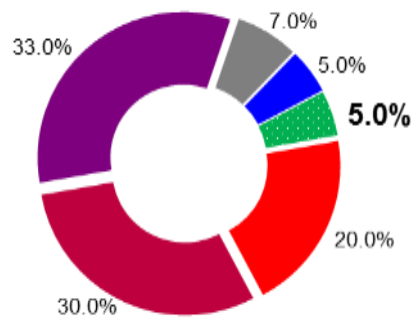
National Energy Mix by 2025

Ref: President Decree No.5 Tahun 2006

Tahun 2005



Tahun 2025



To Achieve Energy Mix target by 5% in 2025, Ministry of Energy and Mineral Resources (MEMR) had revised regulation on Biofuel roadmap as follows :

2008 – Minimum Phasing

	2008	2010	Current	2015	2020	2025	
B20	2.5%	5%	5%	10%	15%	20%	B20 E15
E15	-	7%	7%	10%	12%	15%	

Year 2008
No.32/2008
(First Rule)

2013 – Minimum Phasing

		Current	2015	2020	2025	
B25		10%	10%	20%	25%	B25 E20
E20		1%	2%	10%	20%	

Year 2013
No.25/2013
(First Rev)

Increase
50% by
2025

2014 – Minimum Phasing

		Current	2015	2020	2025	
B30		10%	10%	30%	30%	B30 E20
E20		1%	2%	10%	20%	

Year 2014
No.20/2014
(Second Rev)

Biodiesel

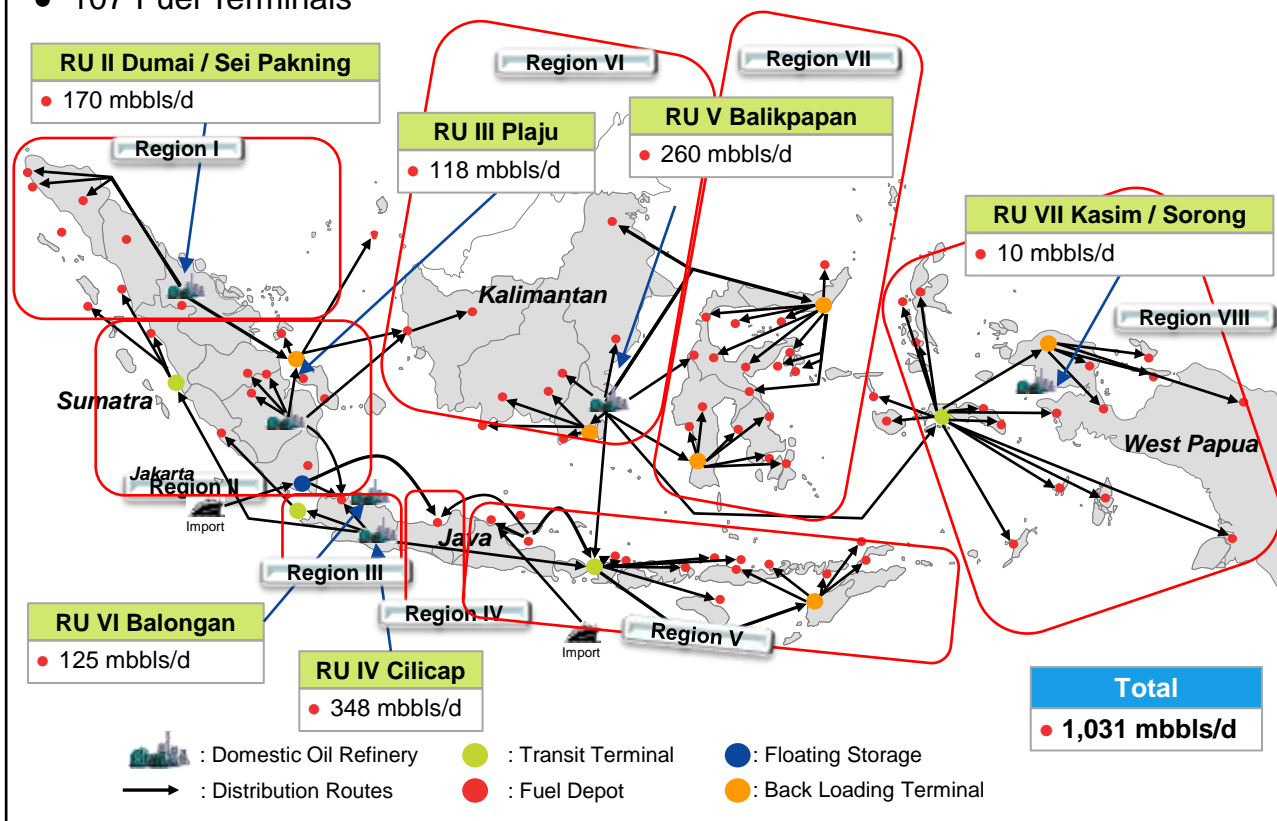
Bioethanol

In downstream sector, Pertamina's infrastructure is **READY** to serve Biofuel Implementation through 2025

Downstream Infrastructure & Distribution Network

Pertamina's capabilities in delivering Fuels (Gasoline and Gasoil) through out Indonesia with:

- 6 Refineries
- 107 Fuel Terminals



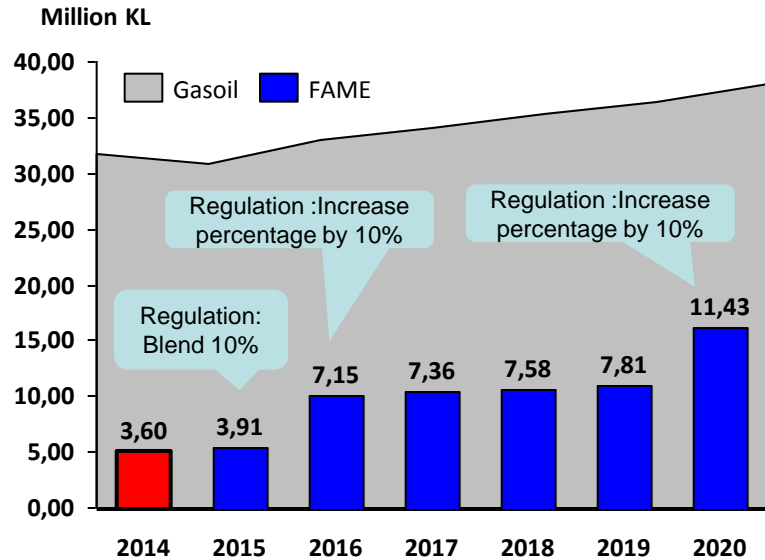
Current Highlights and Outlook

- Refinery refined products (Gasoline 88 and HSD) caters only 55.56% of domestic demand.
- In serving that demand, Pertamina own all downstream infrastructure and handle all fuels distribution network coverage.
- Now more than 95% of downstream infrastructure capable in distributing Biofuel.
- By 2025, Pertamina expects to require additional infrastructure needed (3.6 mm KL, #32 jetties, flowrate pipe 2.200 KL/hour, etc) due to demand growth that almost 1.5x than current demand.
- **Infrastructure Challenge** onward comes from:
 - LAND ACQUISITION : unclear land tenure.
 - ALLOTMENT LAND : not inline with regional planning.

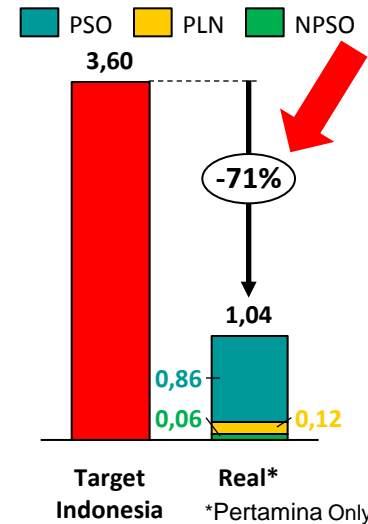
Commercial Challenges - Consumption, Export, and Price

Consumption of Biofuel is Still Below Expectation due to :

- **ACCEPTANCE** : customers resist to use biofuel for many reasons : warranty void, product availability, potential extra maintenance and so forth.
- **LIMITATION** : OEM* currently allow only up to 5% of Biofuel (B5).

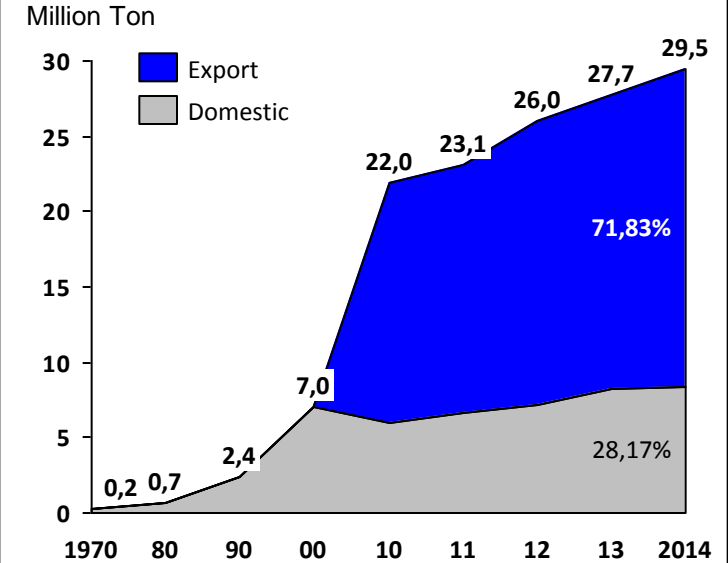


Meanwhile until Sep'14 FAME realization only :

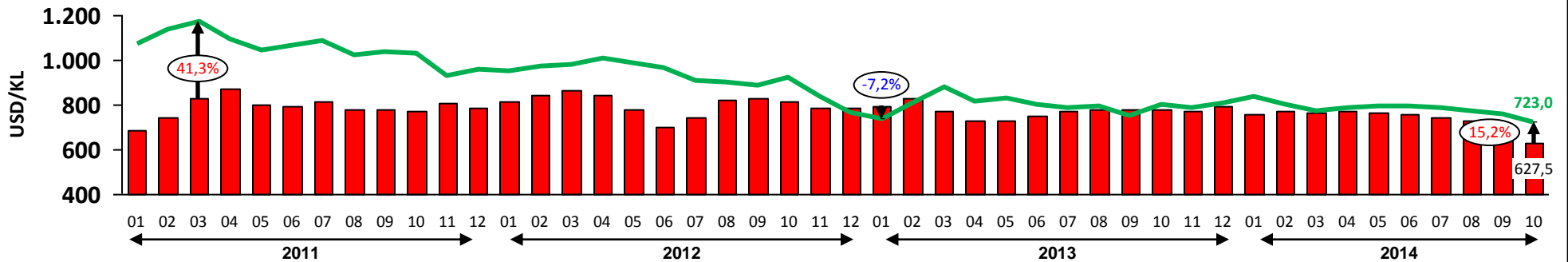


Competition with export

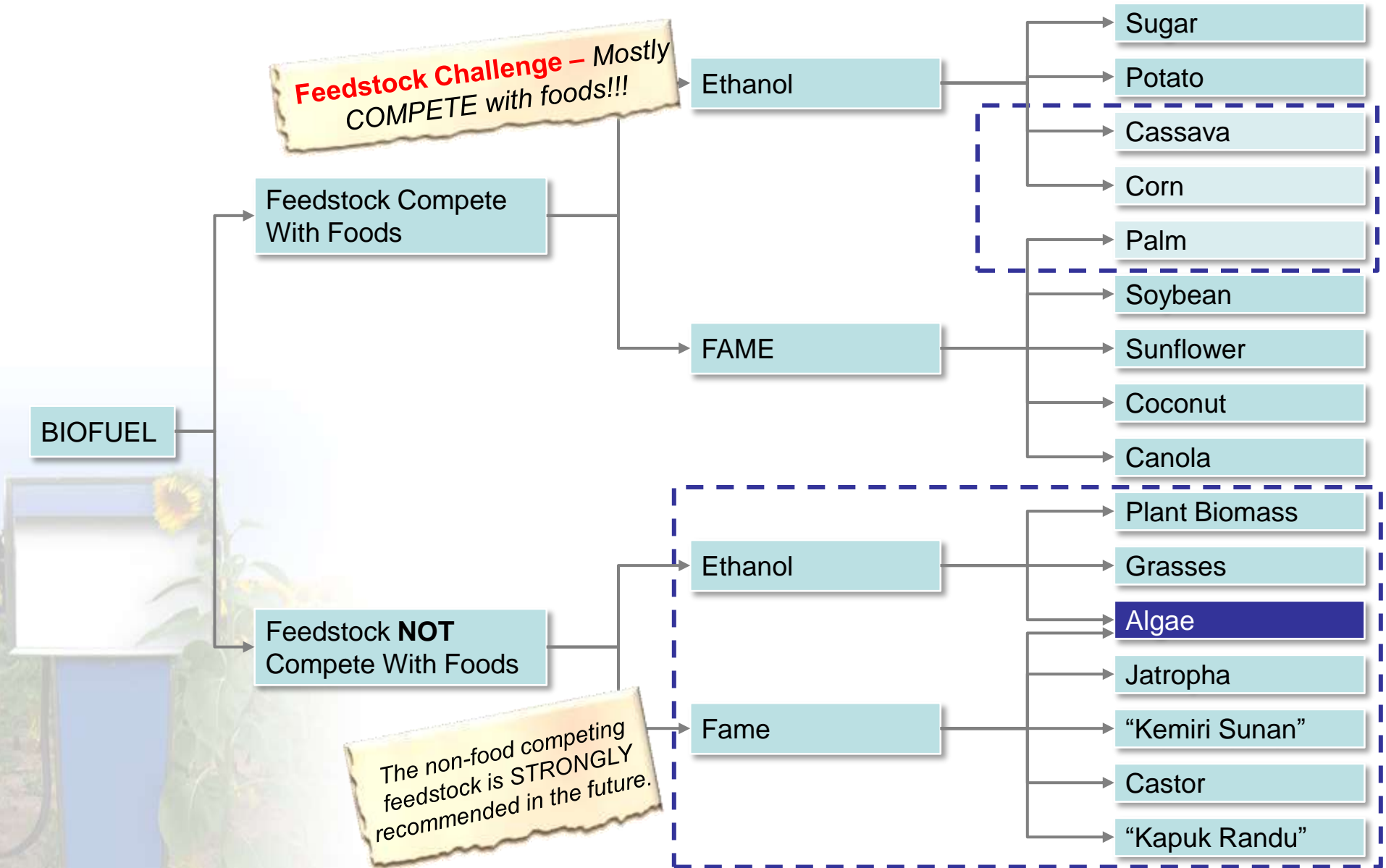
CPO sales



Historically FAME Price is Higher than Gasoil Price



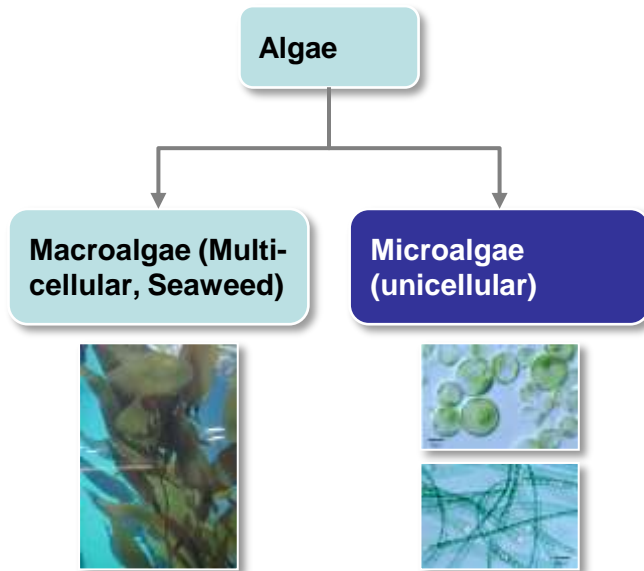
Type of Biofuel Feedstock – Potential to diversify into non-food sources



Algae is *The Most Promising Future of Biofuel That is Not Competing With Food*

What is Algae?

Photosynthetic organism in marine, fresh water, and land systems with oxygen by product



Advantages of microalgae as biofuel:

- Contributes to **reduction of carbon dioxide** emissions
- **Non-food/non-feed biomass.** (**No competition** with agriculture)
- **High oil-productivity** compared to higher plants
- No freshwater/**no land area** if use marine resources.
- Offshore cultivation: **high biomass productivity**

HUGE Potential of Algae Production as the BIGGEST Archipelago in The World

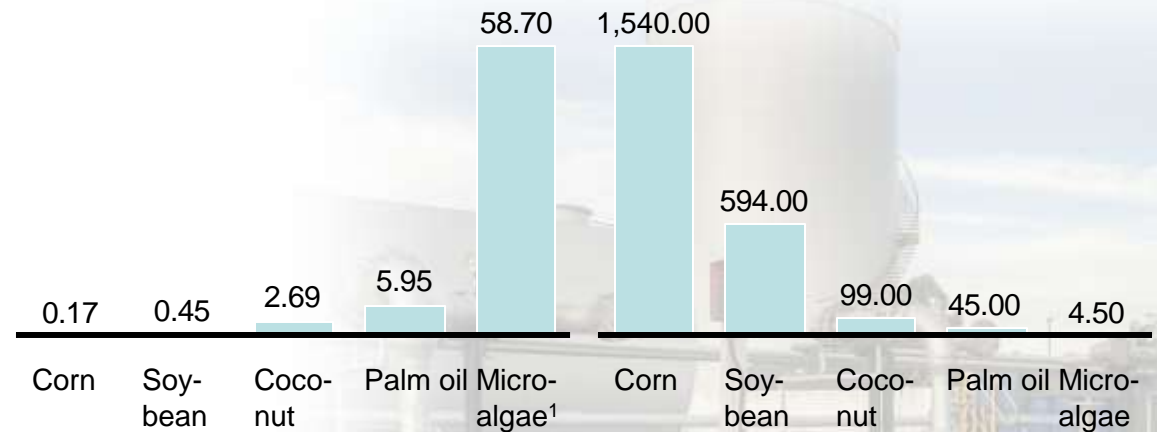


Potential of higher productivity

Productivity (KL/ha)

Land Area Needed (Mha)

With assumption for meeting 50% of all transport fuel needs of the US



¹ 30% oil (by weight) in biomass; All transportation needs in US are around 667 million KL in 2007

Biofuel Business Development **NEEDS SUPPORT** from various key stakeholders, such as government, R&D institution, and private sectors

Research & Development Support



Joint Microbiology research to find a suitable algae strains to be developed Biofuel



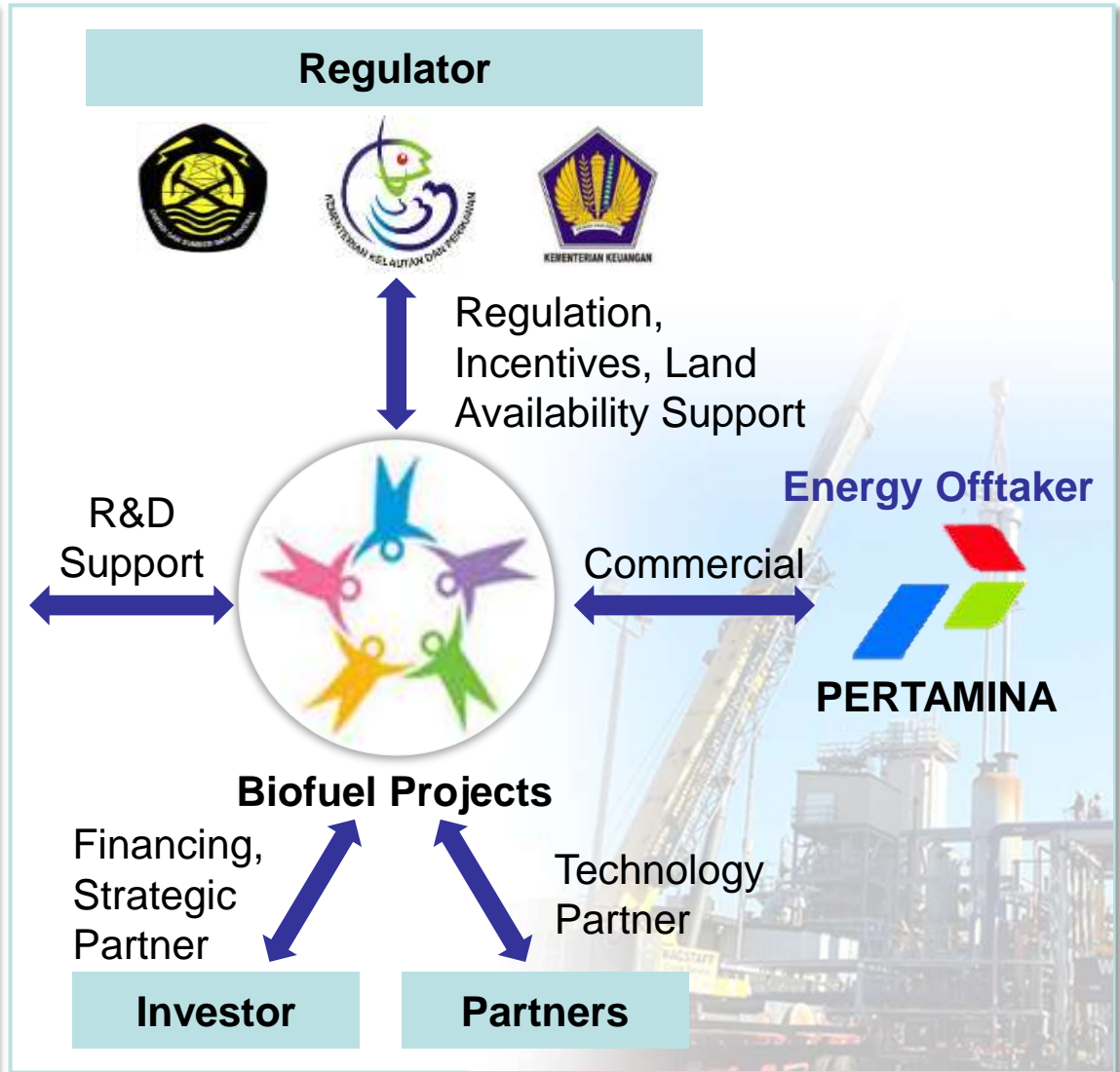
Joint-Research to develop Algae Recovery System to be developed as a Biofuel



Joint-Research to develop Algae Photo bioreactor System to be developed as a Biofuel



R&D Ministry of Marine Affairs and Fisheries



Conclusions & Recommendations

Summary of key points

- Biofuel projected to contribute 5% in Energy Mix by 2025
- Pertamina's infrastructure Ready to serve Biofuel implementation through 2025
- Several challenges in achieving the Energy Mix Target
 - Infrastructure Challenge related to land acquisition process and allotment land
 - *Commercial Challenges* related to low acceptance by customers and limitation by OEM; export incentives; and price higher than Gasoil
 - *Feedstock Challenge* related to feedstock that are competing with foods
- Alternative such as Algae can be considered
 - Algae has many advantages, e.g., *higher productivity and less land area*
 - Huge potential for production as the *biggest archipelago in the world with ±81.000 km coastline*

Suggested actions

- Overcome Infrastructure Challenge:
 - **Collaborate** with local government about future infrastructure development.
 - **Enforcement** from government related to the unclear tenure.
- Overcome *Commercial Challenges*
 - **Enforce** regulation roadmap of biofuel implementation (B30 and E20 in 2025) to all suppliers and consumers
 - **Provide** incentives to OEM to upgrade their equipment
 - **Establish** a limitation on Domestic Market Obligation (DMO) for biofuel, inline with the roadmap of biofuel implementation
 - **Ensure** that moving from subsidized fuel to biofuel does not exceed the budget of subsidized fuel
- Overcome *Feedstock Challenge*: **take actions** heading to the second and/or third generation biofuel that is not competing with food
- Consider a more focus Research and Development on Algae



Thank You

CONTACT PERTAMINA
500-000

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