

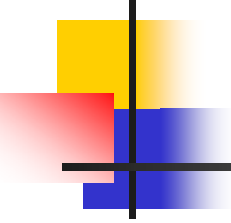


Potency of Palm and Jatropha for Biofuel in Indonesia

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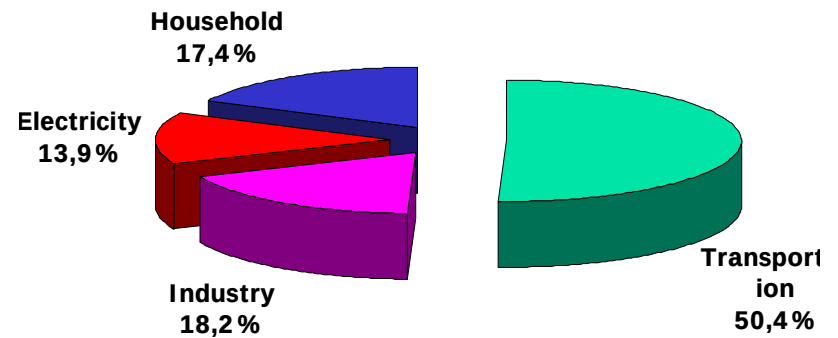
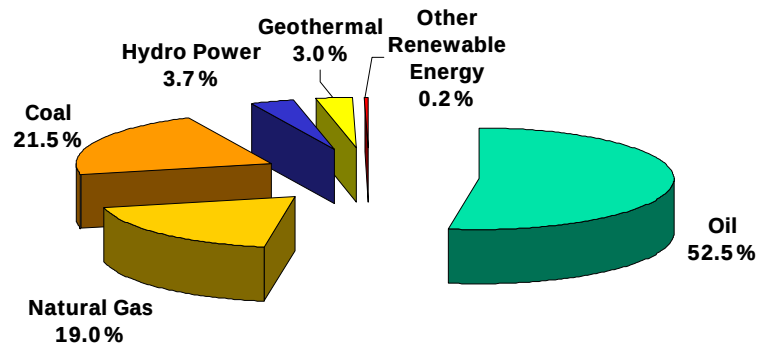
presented at:
International Conference on the Commercialization of Bio-fuels
Seoul, September 17, 2007





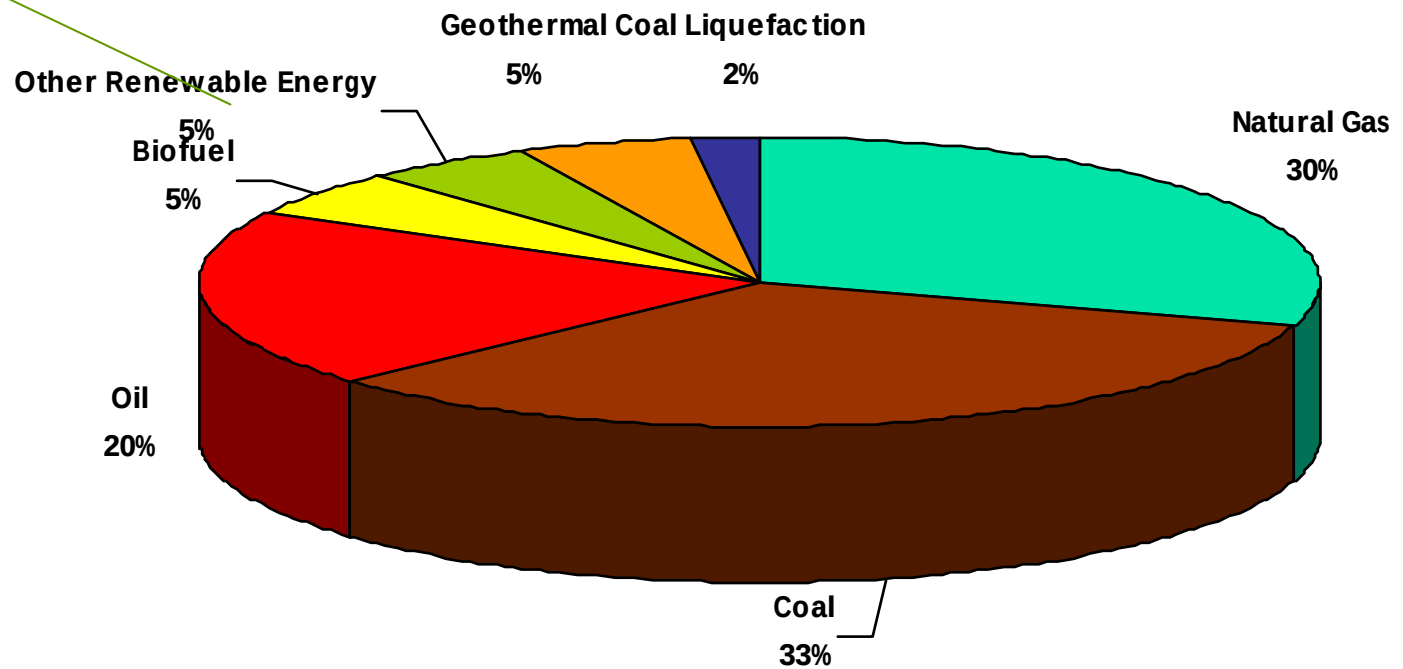
Energy Policy

Current Energy Mix and Consumption Pattern



TARGET ENERGY MIX 2025

Bioethanol
Biooil
Biodiesel



ALTERNATIVE ENERGY PROGRAM

Issues:

- Limited energy reserves
- Increasing energy consumption
- Dependency on oil (unbalanced energy mix)
- Uncertainty of international energy prices
- High domestic subsidy
- Abundant unutilized renewable energy

Strategy:

- ✓ Fossil Energy to Renewable Energy
- ✓ Energy Diversification
- ✓ Private Investment
- ✓ Economical Price

Short-term Target:

- ✓ Saving Oil and State Budget
- ✓ Utilization Gas and Coal Domestically
- ✓ Acceleration Availability and Utilization of Renewable Energy

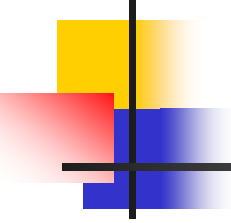
Action Program:

- ✓ Substitution for Household and Small Scale Industry
- ✓ Substitution for Transportation
- ✓ Substitution for Industry
- ✓ Acceleration on Power Plant by using Non Oil Energy
- ✓ Development of Coal Liquefaction

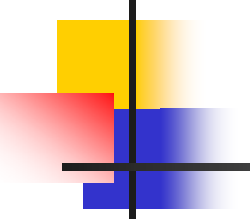
Biofuel

Coal (Briquette, Coal Liquefaction)

Gas (CNG, LPG)



Biofuel as Alternative Energy



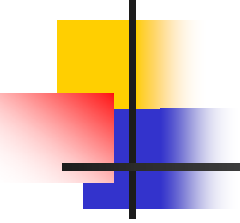
Vision and Mission

Vision:

Poverty alleviation and employment creation through development of biofuel as alternative energy to increase people's welfare.

Mission:

1. Creating employment opportunities (feedstock supply, industry, infrastructure, supporting activities).
2. Increasing rural community independency (Energy Self-sufficiency Village).
3. Increasing the role of private sector involvement.
4. Regulating biofuel business, feedstock supply, and utilization.
5. Developing business climate through incentives.



Strategy

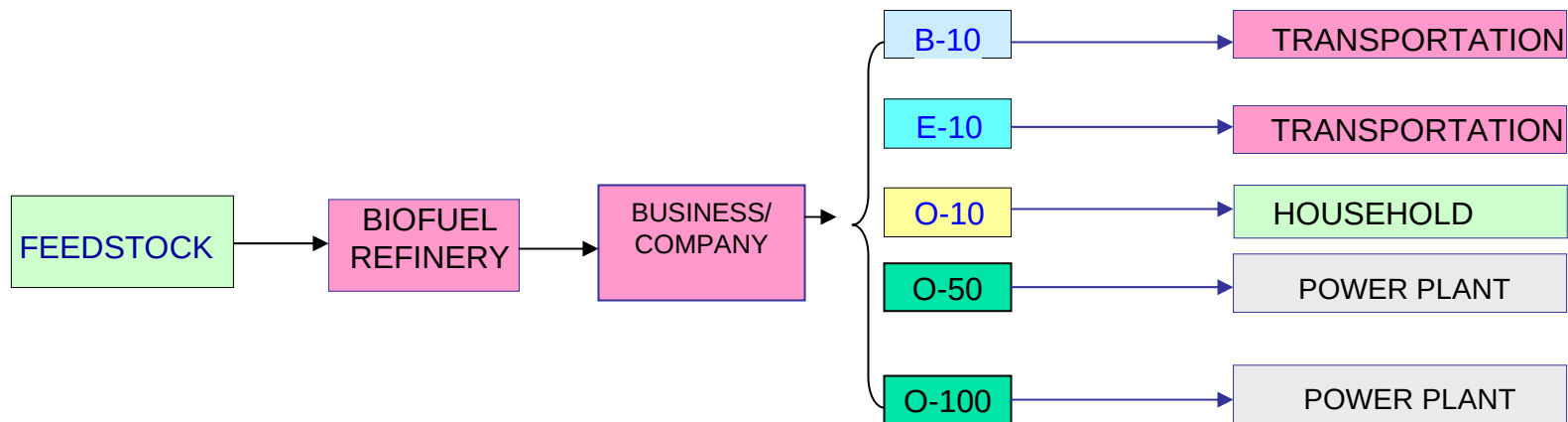
1. Developing investment and finance scheme to support biofuel program.
2. Developing price mechanism, starting from feedstock up to biofuel product.
3. Increasing local potential.
4. Increasing availability of feedstock and production needs.
5. Stipulating biofuel trading system.
6. Accelerate land availability.
7. Developing Special Biofuel Zone and Self Sufficient Energy Village.
8. Enhancing local Government and community participation in biofuel business.
9. Biofuel security supply.

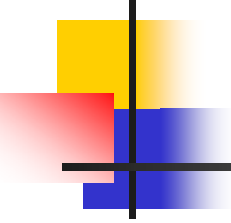
Biofuel Utilization

AVAILABILITY

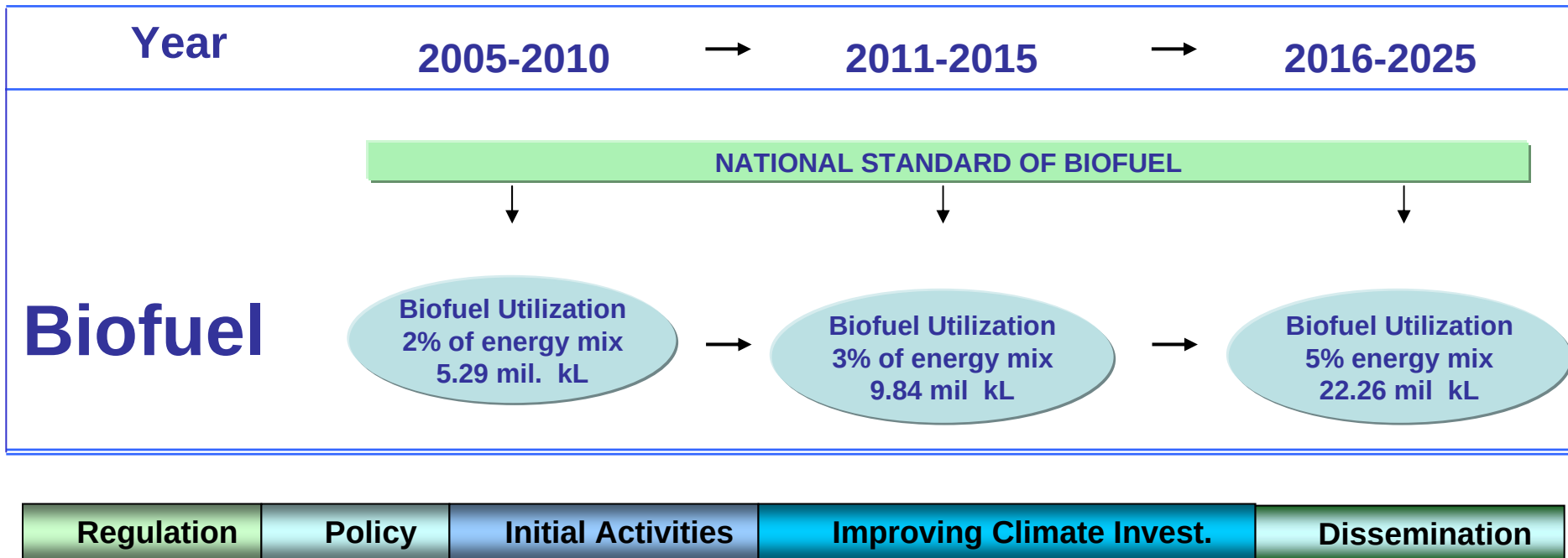
UTILIZATION TARGET UPTO 2010

USERS





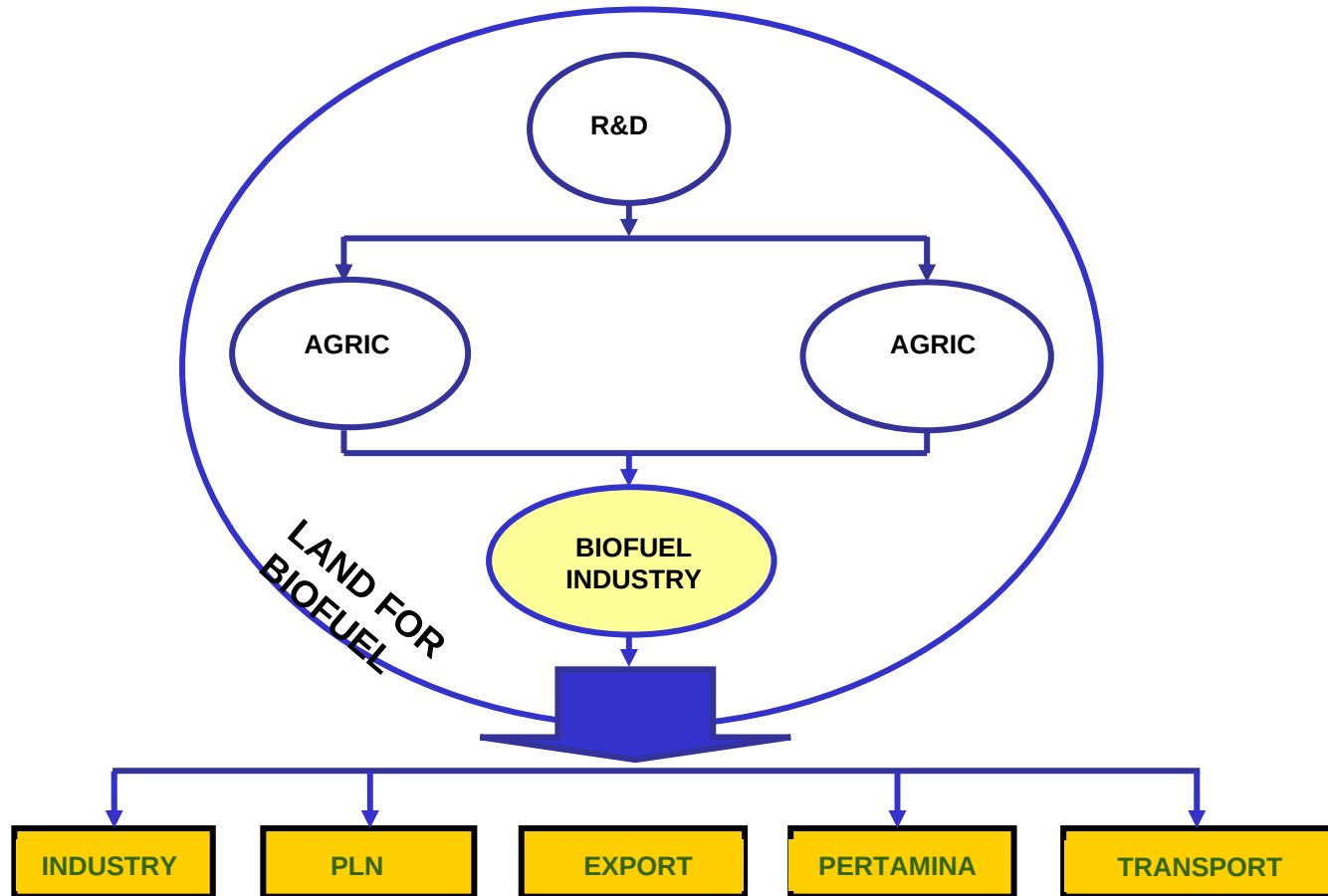
ROADMAP BIOFUEL DEVELOPMENT



Biofuel Plan (by PERTAMINA)

2007	2008	2009 -2010	2011 - 2012
↓	↓	↓	↓
Biodiesel (B-2,5) : Transportation in Java (Big City)	Biodiesel (B-5) : Transportation in Java (Big City)	Biodiesel (B-10) : Transportation in Java (Big City) Industry (5% Consumption) Electricity (5% Consumption)	Biodiesel (B-10) : Transportation in Java, Sumatera, Kalimantan (Big City) Industry (10% Consumption) Electricity(10% Consumption)
Bioetanol (E-3) : Transportation in Malang City, East Java	Bioetanol (E-5) : Transportation in 2 cities, Java	Bioetanol (E-10) : Transportation in Java Island (Big City)	Bioetanol (E-10) : Transportation in Java and Sumatera (Big City)

Concept of Biofuel Zone



Main Sources



Oil Palm



Jatropha curcas



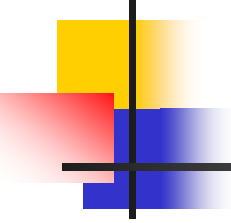
Sugarcane



Cassava



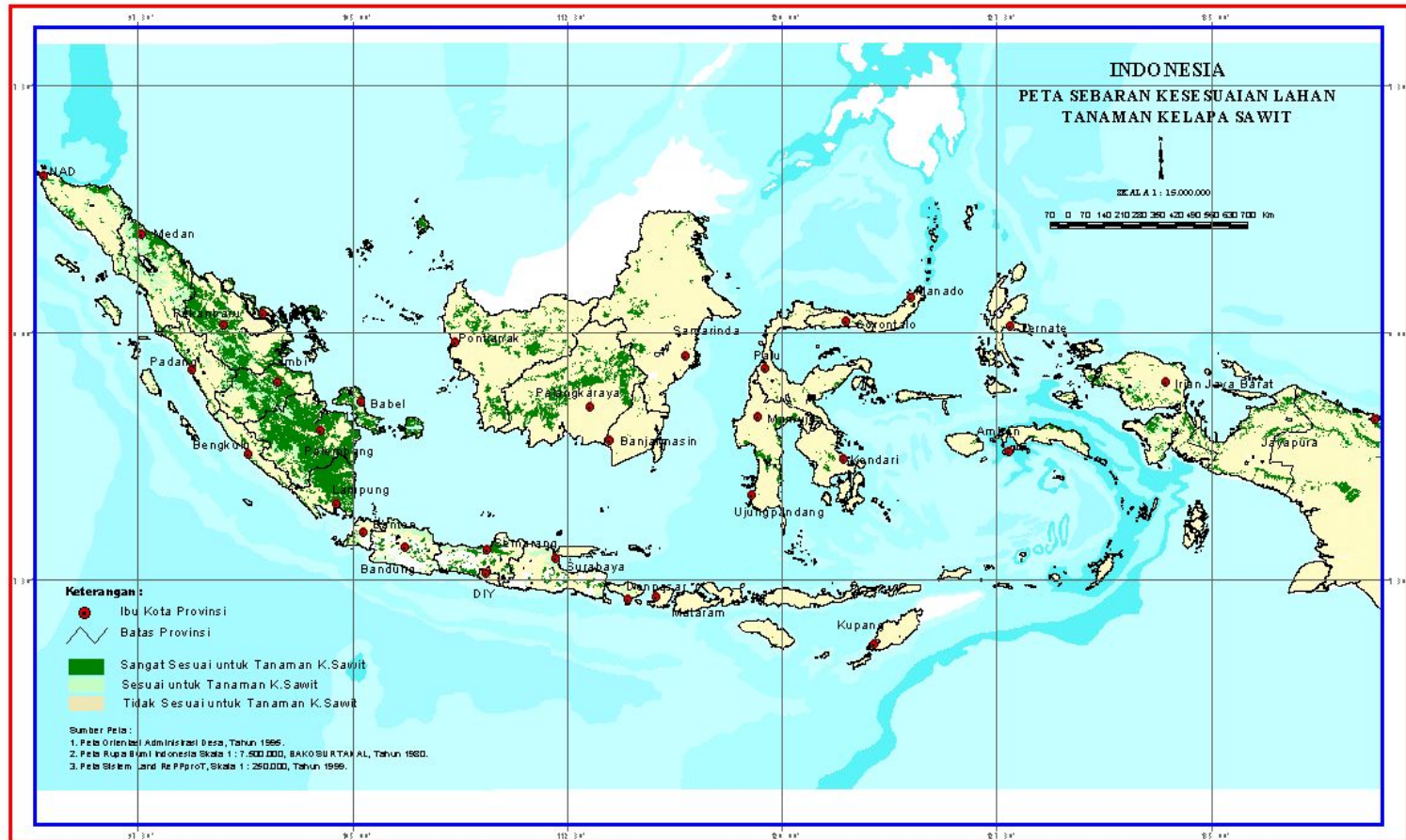
Coconut

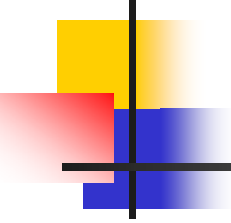


Plantation of Palm and its needs

- 1. Area: 5.6 mill. Ha (53,7 % is run by private companies, 34,2 % owned by the local farmers, and State owned/PTPN about 12,1 %).**
- 2. CPO yield: 14 mill. tons (local consumption: 3.5 mill. tons, and about 10 mill. tons is exported).**
- 3. The supply of palm oil for biofuel production is available, but the needs for cooking oil in the country should be considered, as well as for export.**
- 4. Rise of international CPO price.**
- 5. High price for domestic of cooking oil.**

Land Suitability for Oil Palm

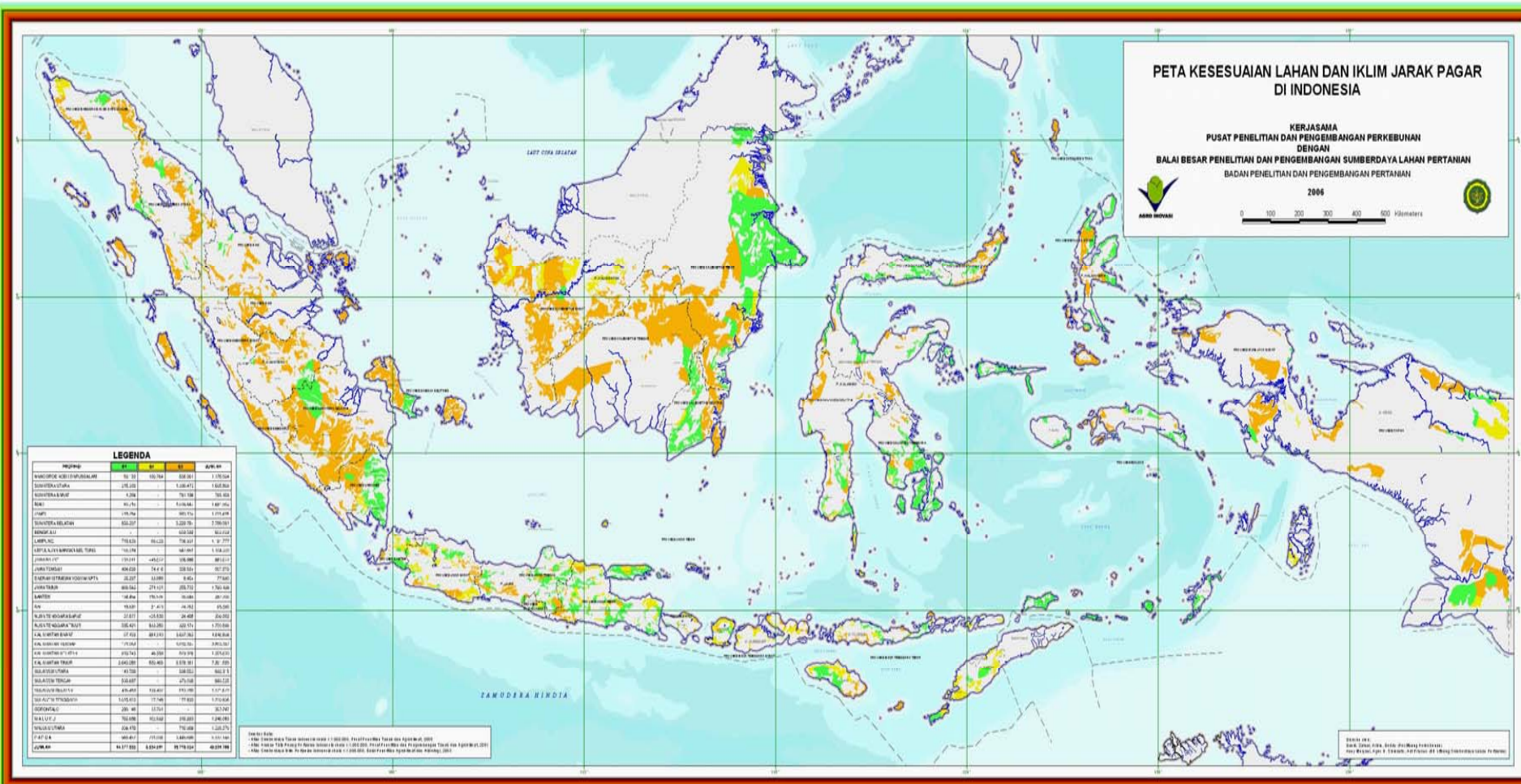




Jatropha as a biofuel source

- 1. Jatropha curcas is an option for developing biofuel-biodiesel. In Indonesia, Jatropha contains toxic.**
- 2. There are several kinds of Jatropha with other functions such as traditional medicine. Only, Jatropha curcas is now being developed for Biofuel.**
- 3. There are millions land suitability in Indonesia for Jatropha planting, classified as:**
 - ✓ 14.2 mill ha : very suitable**
 - ✓ 5.5 mill ha : suitable**
 - ✓ 29.7 mill ha : marginally suitable.**
- 4. Estimated yield :**
 - ✓ year 1 ~ 0.5 – 1.0 ton/ha**
 - ✓ year 5 ~ 5- 8 ton/ha**

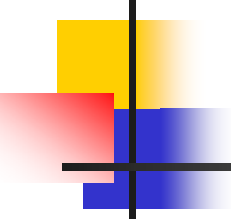
Land suitability for Jaropha



R&D in Biodiesel Plant

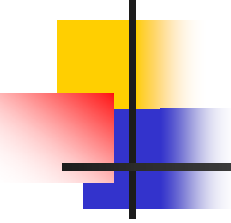


Emission of NO_x of Indonesian biodiesel (made of palm, or jatropha) is lower than that of diesel oil



Investment Opportunity

1. Land availability:
 - ✓ a number of companies have obtained reserved approval from Ministry of Forestry about 4 million ha, but they do not continue to release the area.
 - ✓ unutilized plantation (grade V) about 302 thousands ha.
 - ✓ inactive plantation about 2 million ha.
2. Human resources are available.
3. Technological availability (i.e. seed development).
4. Government support (regulations).
5. Maximum area for Palm (100,000 ha) and Jatropha (50,000 ha).
6. Foreign company should cooperate with Indonesian company.



Conclusion

1. There are a lot of potency for biofuel development using Palm and Jatropha as feedstock in Indonesia.
2. Palm and Jatropha are priority commodities to be developed as biofuel-biodiesel in Indonesia.
3. Feedstock from palm is ready to be used for biofuel domestically, but has competition with cooking oil.
4. Jatropha is still being developed, but seed technology is improving. Jatropha for biofuel is not conflict with food.
5. Government of Indonesia is supporting biofuel development program, as one alternative energy, with regulations, policies, and disseminations.
6. Land availability are abundant for biofuel development, without converting natural forest areas.



Thank You