Providing Cleaner Energy Access for Indonesia:

Case Study from Kerosene to LPG Conversion

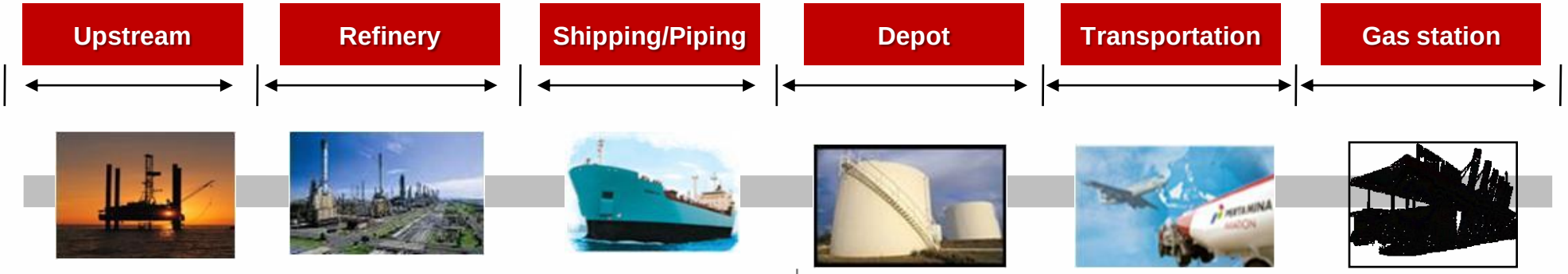
Practitioners Workshop on
Energy Access for Urban and Peri-urban Poor
ESMAP – Cities Alliance – World Bank
Washington D.C, 7-8 May 2012

Washington, May 2012

PERTAMINA

As Indonesia's integrated Oil, Gas and Petrochemical Company, Pertamina has strong presence in both Domestic & Regional Level

Pertamina's Scope of Business



Upstream

- Producer of oil and gas domestically and overseas
- Supplier for geothermal energy
- Gas transporter & trader

Corporate

Employees

- 15,190 persons

Subsidiaries & Affiliates

- 19 Subsidiaries
- 13 Affiliates

Downstream

- Refining
- Fuel business (kerosene, HSD/Diesel/MFO, etc) for industry
- Special fuel business for retail (PertaminaDex, Pertamax/PertamaxPlus)
- Aviation business
- Lube base and Lubricants business
- LPG business
- Petrochemical business
- Responsible for distributing fuel for Public Service Obligation (PSO), such as kerosene, gasoline, HSD
- Executor for kerosene conversion to LPG

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We See the Growing Importance of Renewable

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

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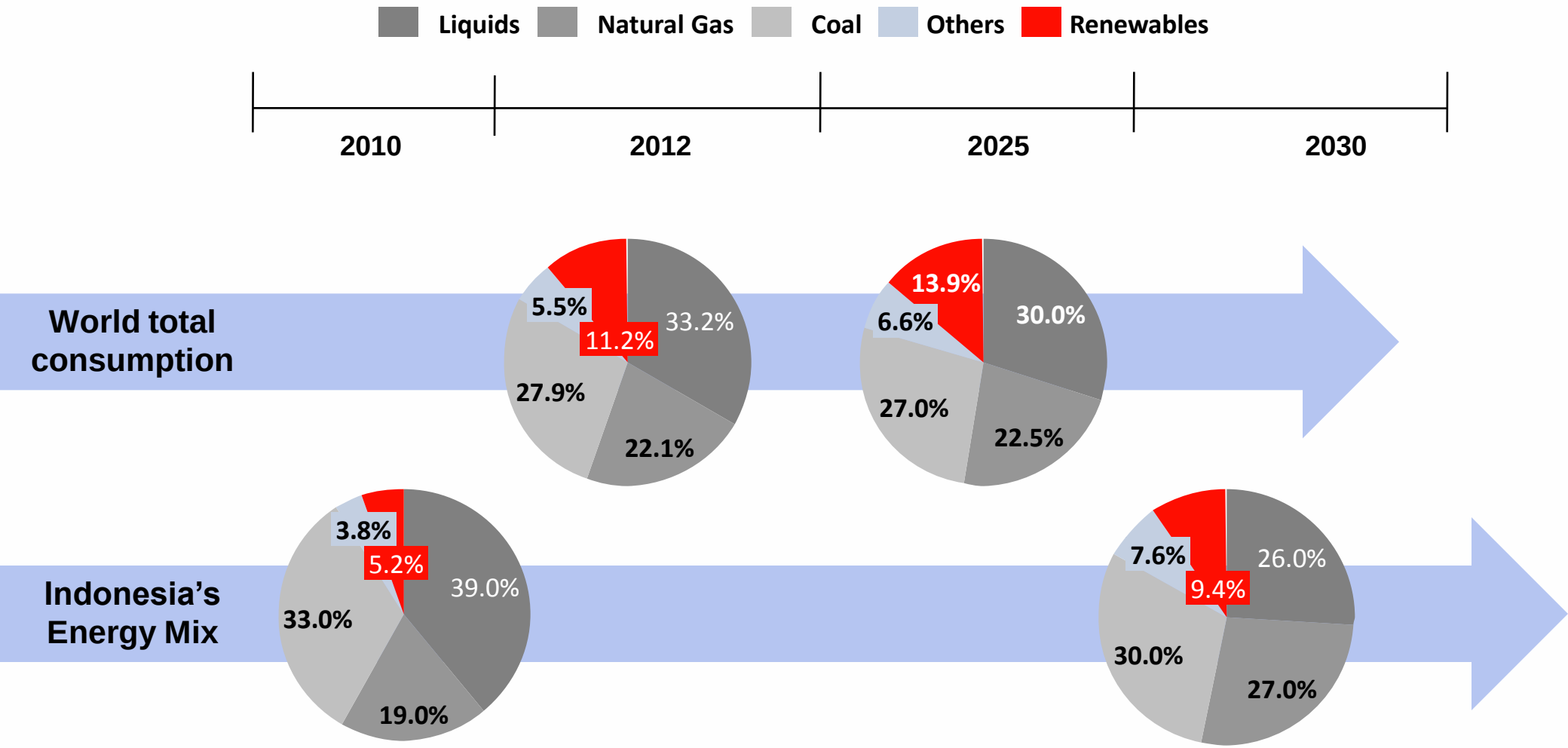
Indonesia's energy mix for renewable energy will increase around 4.2% to 9.4% by 2030



Source: EIO 2011, EIA

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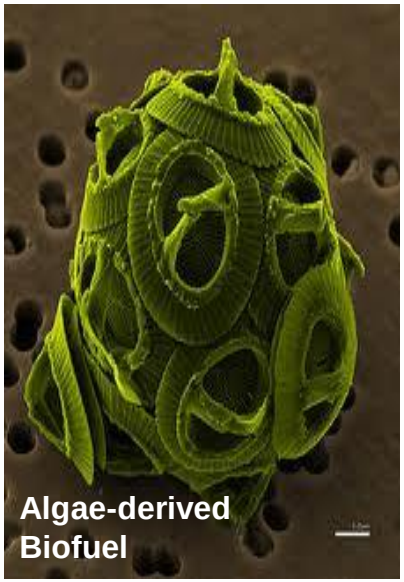
Pertamina's clean energy initiatives will contribute in achieving Indonesia's energy mix target

Pertamina's Scope of Renewable Business

Upstream

Downstream



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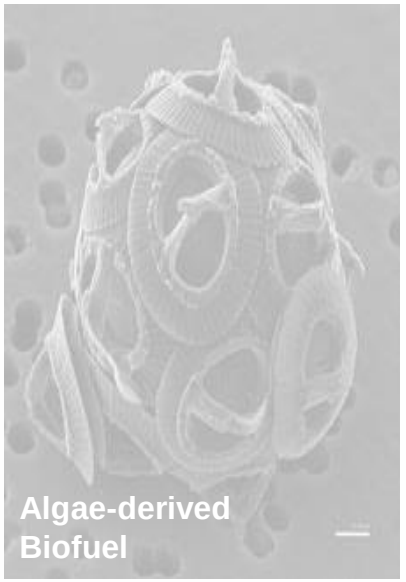
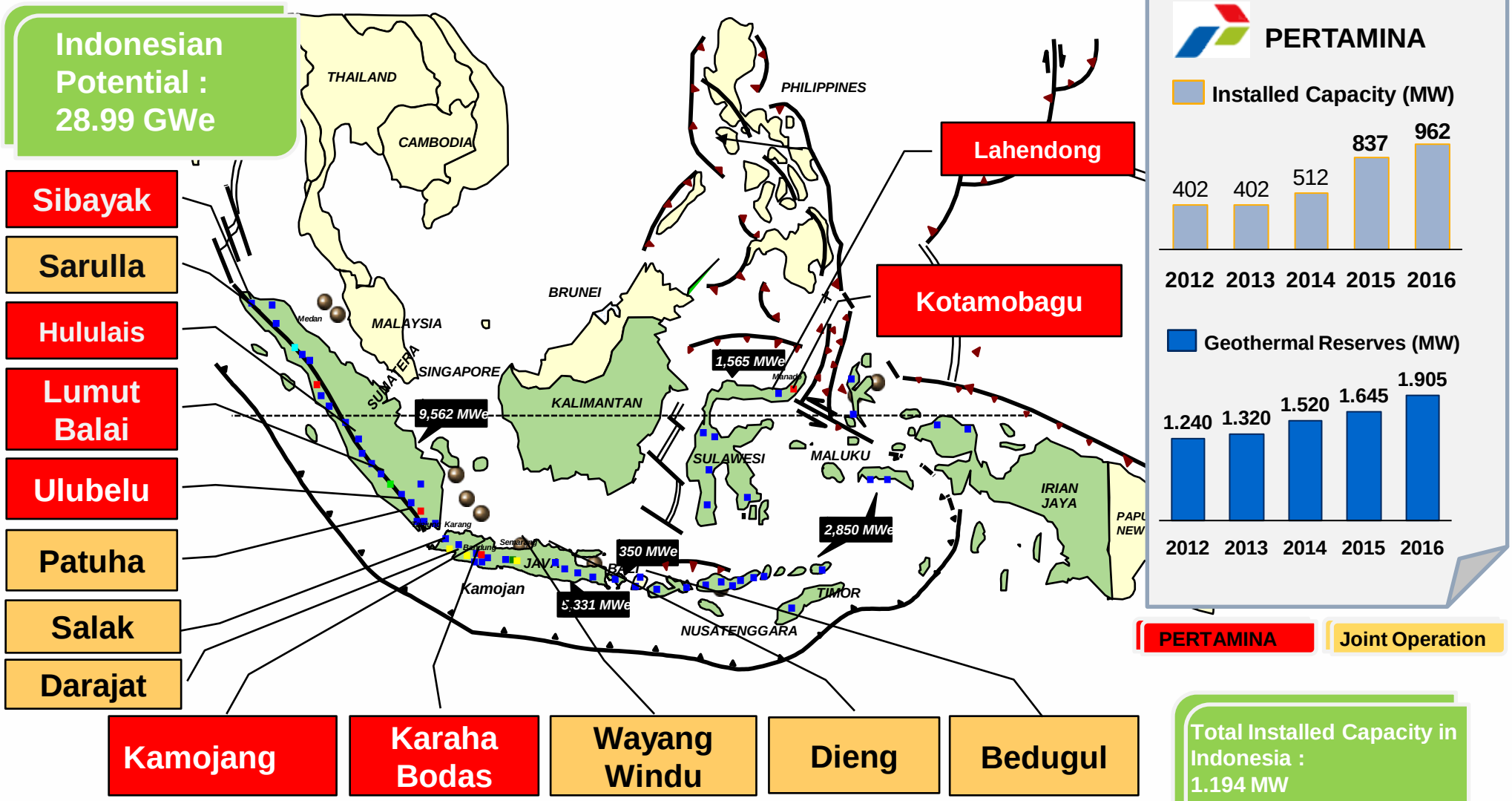
Upstream

Downstream



For upstream sector, Pertamina's geothermal installed capacity will increase around 24% (CAGR) in the next 5 years

Indonesian Potential : 28.99 GWe



PERTAMINA | Joint Operation

Total Installed Capacity in Indonesia : 1.194 MW

Installed Capacity (MW)

1 USA : 2,544

2 Philippines : 1,931

3

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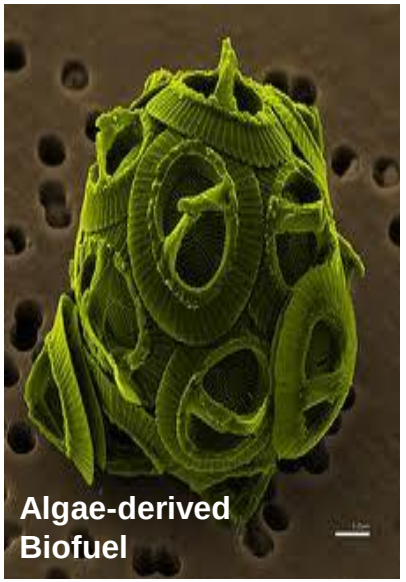
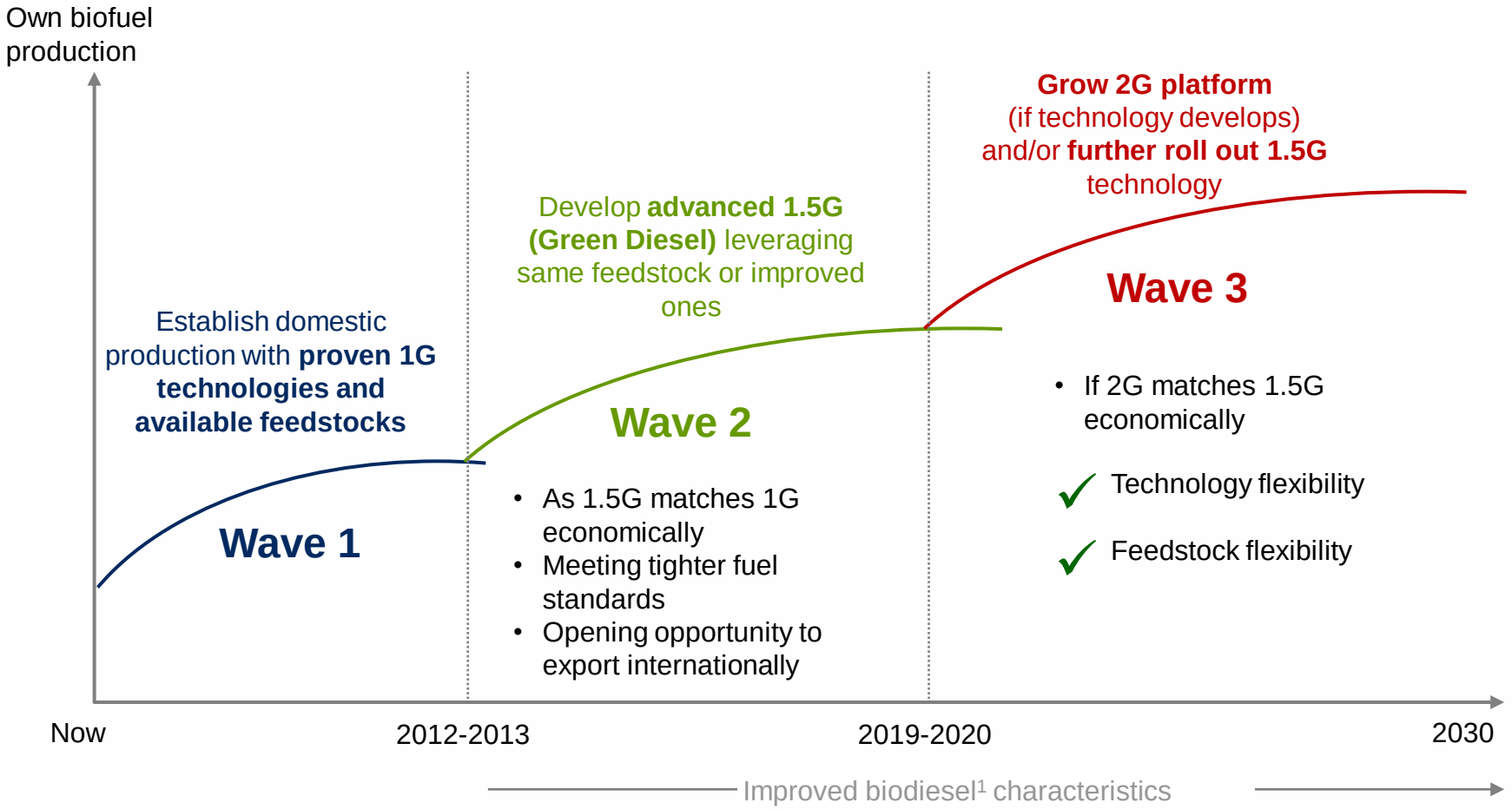
Upstream

Downstream



Biofuels development in Pertamina will be sequenced along three stages



Biofuel products	Bioethanol, FAME/Biodiesel	Hydrotreated Biodiesel (Green Diesel)	As well as Algae based Biofuel (3G)
Biofuel's share in Pertamina product mix	~1%		~9%

Source: Biofuel Strategy Pertamina-BCG, 2009

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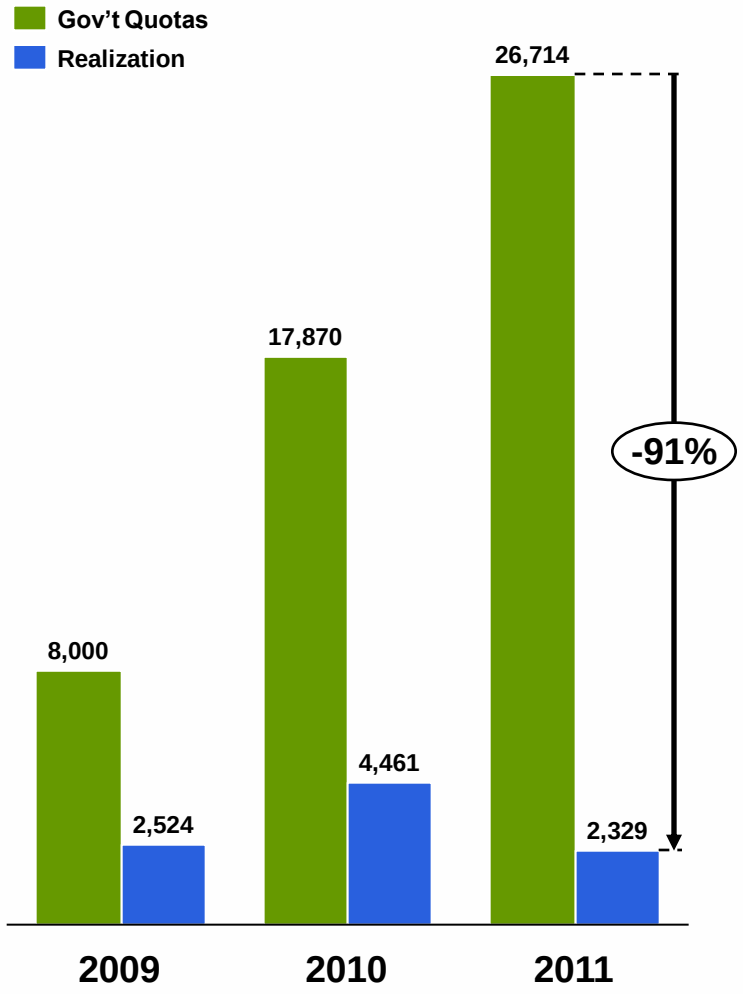
Current Condition: Unsustainable Biofuel Feedstock Supply presents the biggest obstacle in Biofuel Implementation …

Pertamina's Biofuel Sales 2009-2011

In 000 KL



We have identified the following issues	Possible solution
1 Lack of feedstock supply	• Negotiate better subsidy scheme to Government
2 Volatile feedstock price	• Take equity in plantation to reduce sensitivity to CPO price fluctuations
3 Constraint on 1G biofuel handling & market acceptance	• Emphasize biodiesel and bioavtur which Pertamina already implemented in lab scale

"Optimizing biofuel processing technology from upstream to downstream is very important to meet efficiency and to reduce the price of biofuel"

Evita Legowo

– Head of Oil and Gas Directorate, Energy Ministry

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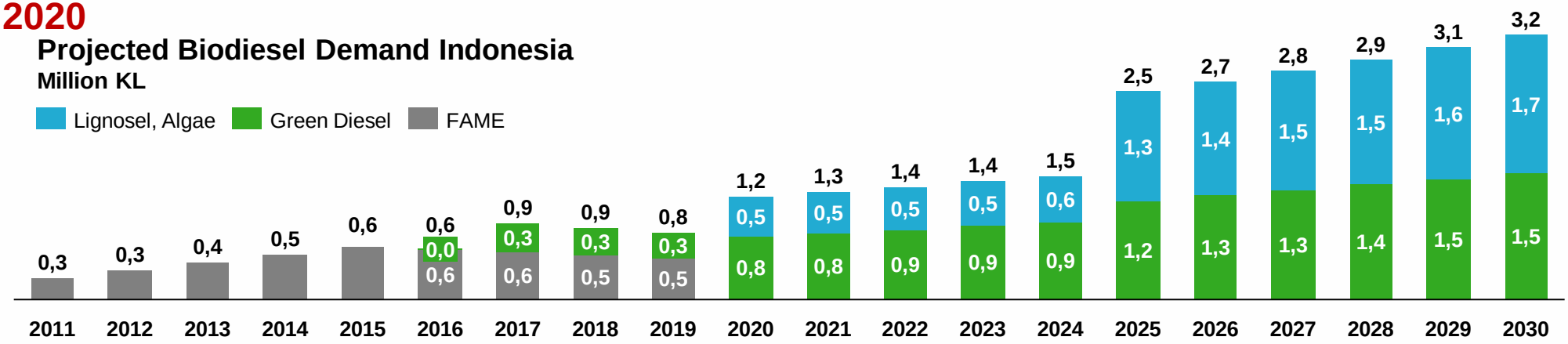
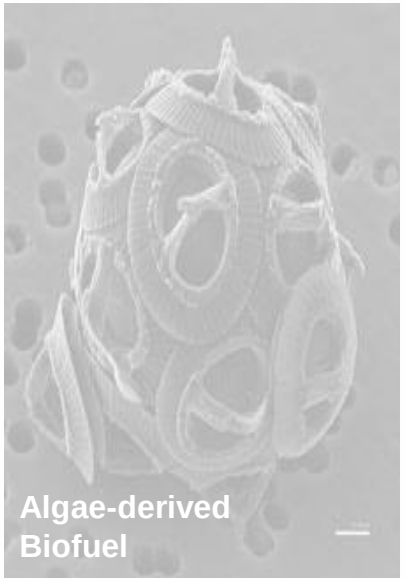
With the limited technology available and the process of collecting raw materials, Pertamina is projected to begin the use of non-food biofuel conflicting (lignosel, Algae) in 2020



Product	Upstream	Refining	Local Market	Export Market
Green Diesel (from CPO)	Crude Palm Oil • JV in plantation • Potential partners : PTPN IV & PT SMART Tbk		Domestic demand	Europe (ARA Market)
Green Diesel (from Algae)	**Algal - Oil** • **Join-research w/ LIPI (strain)** • **Join-research w/ BPPT (P.bioreactor)** • **Join-research w/ ITB (Recovery)**	**Hydrotreated Plant** • **Study in Existing Facilities Refinery**	**Domestic demand**	**Europe (ARA Market)**
Bio avtur	Coconut Oil • Offtake in feedstock • Potential partner is Pacific Easten Coconut Utama (Lippo Group)		Local Airlines	European Airlines
Bio ethanol	Cassava Molasses • Offtake in feedstock • Potential source is importing from Vietnam & Thailand or local supplier	Flex Plant • JV in ethanol plant • Potential partners are Medco and Molindo	Domestic Demand	

Upstream

Downstream



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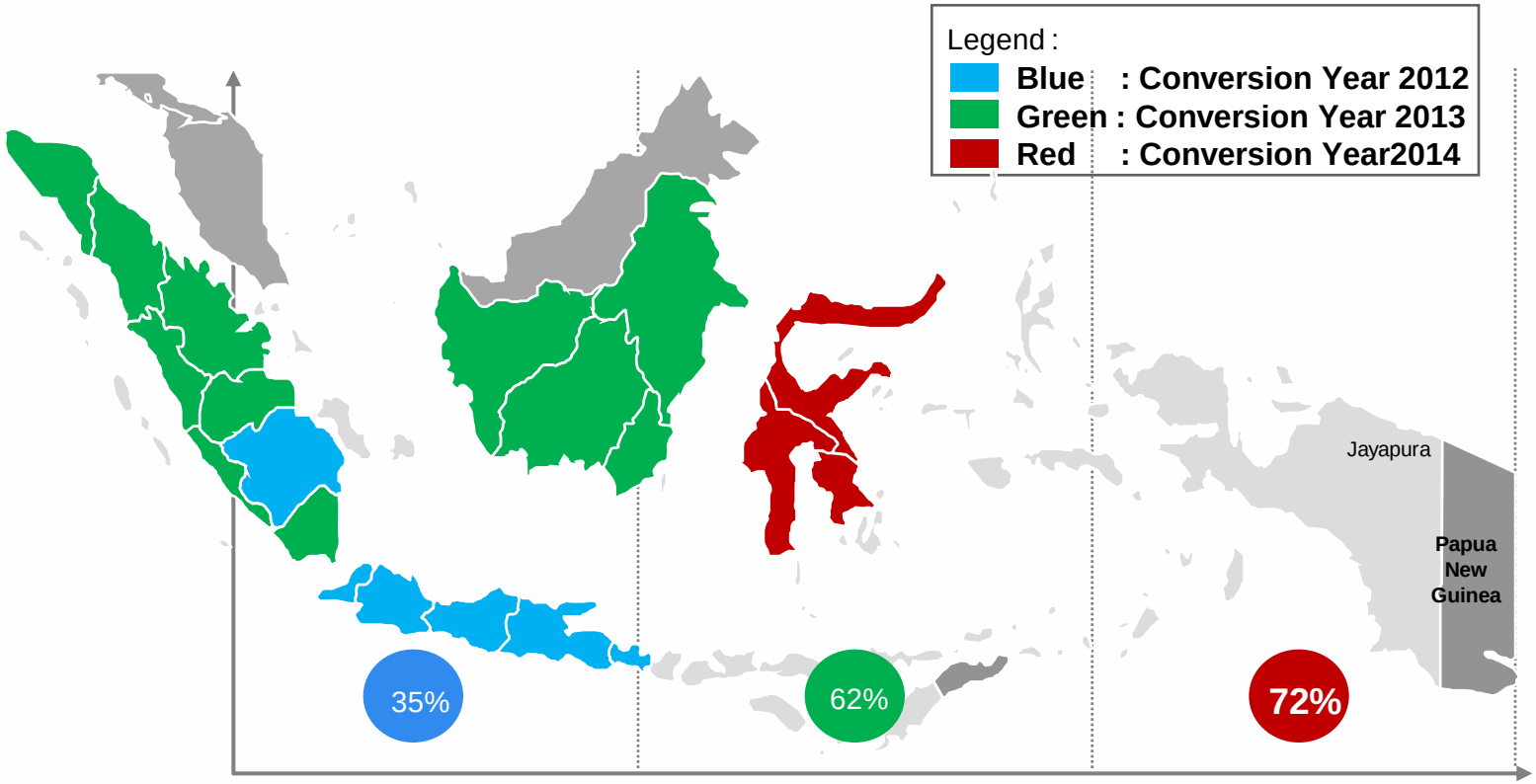
Pertamina also support government mandates to win the compressed natural gas (CNG) conversion programme with conversion target as much as 72% public transport will be converted by the end of 2014



Gas supply	33 **mmscfd**	75 **mmscfd**	**97 mmscfd**
Unit converted	46,777 **vehicles**	**107,980 vehicles**	**136,855 vehicles**
Mother Station	11 **Unit**	26 **Unit**	38 **Unit**
Daughter Station	36 **Unit**	82 **Unit**	105 **Unit**
Tube trailer	179 **Truck**	**408 Truck**	**527Truck**

Key Success Factor

1. Continuity of supply of natural gas.
2. Availability of land close to the source gas for the development of online CNG station
3. Support the government in the provision of converter kit.
4. CNG selling price adjusted to the escalation of gas prices (raw material).
5. Public acceptability of CNG

CNG is dedicated to public transport
Source : Permen ESDM 19/2010, materi presentasi wapres 2012

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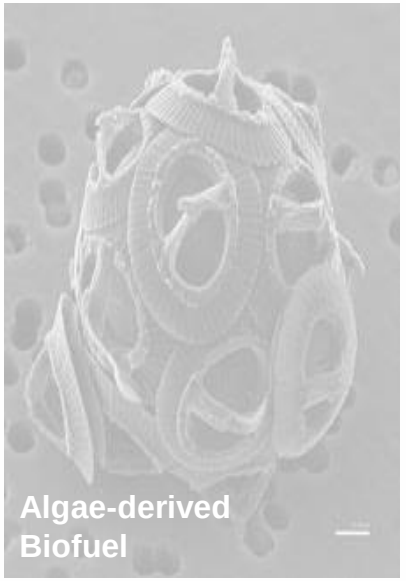
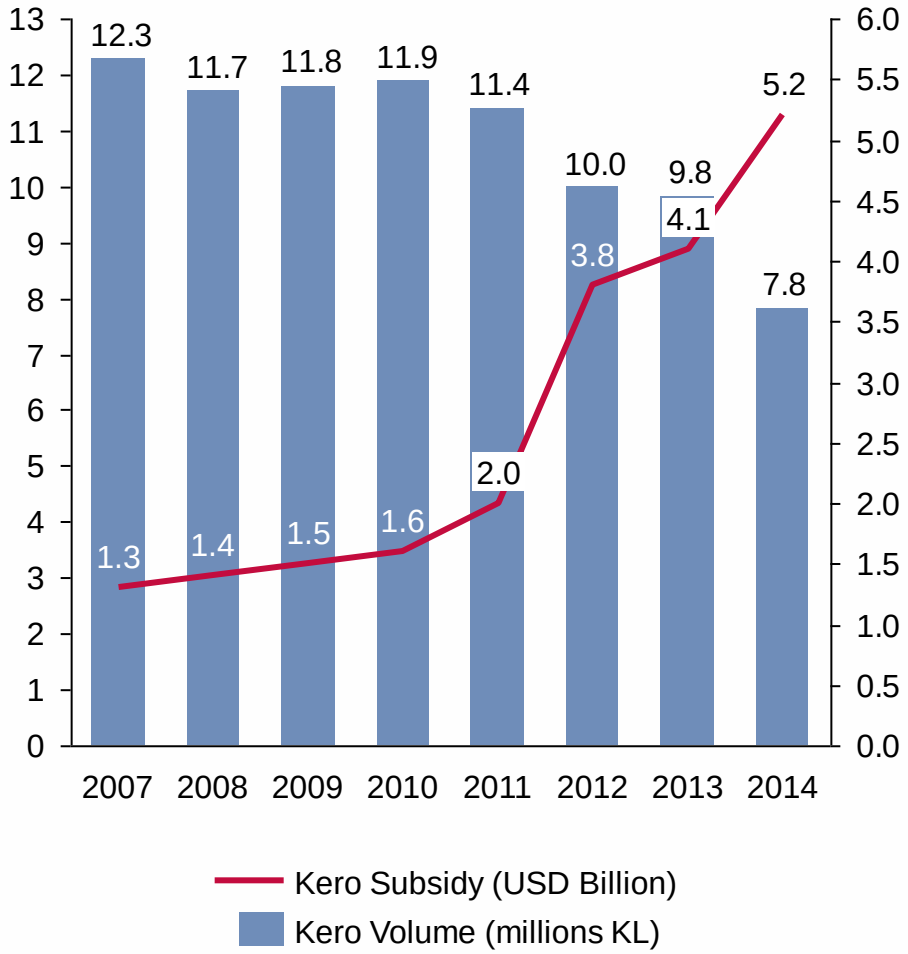
Upstream

Downstream



For many years kerosene has been heavily subsidized by the Government of Indonesia (GOI) as the primary fuel for households and SME.



- In 2007 the Kerosene subsidy reached USD 4.1 Billion. It became a big burden on the Government's budget.
- Unfortunately there were indications of misuse of subsidized kerosene bu unsubsidized industries, mixed with gasoline as well as smuggled to other countries.
- The Indonesian Government launched several initiatives to reduced fuel oil consumption and the Kerosene to LPG conversion Program is one of its biggest initiatives.

Intoduction

LPG was chosen as the alternate fuel due to several main reasons:

1. Based on it's calorific value, the subsidy for LPG is much lower than kerosene. 1 liter of kerosene equals to 0.4 kg of LPG.
2. LPG is a cleaner burning fuel than kerosene.
3. Indonesia has many potential huge gas reserves compared to kerosene, which 30% of it is imported.
4. In terms of infrastructure, LPG was the most ready to be implemented compared to other fuel alternatives such as coal and natural gas.
5. LPG subsidization has been successfully implemented in neighboring countries such as Malaysia and Thailand.

Methods – Preparation Stage

- In 2006, GOI leader (former Vice President Jusuf Kalla) arranged the program to be implemented in a very short period of time (3 years compared to 6 years in Pertamina's proposal).
- His strong leadership urged this program to commence in only 8 months after a simple feasibility study and one-month market trial conducted by Pertamina in various secluded areas in Jakarta.
- The Ministry of Energy and Mineral Resources has been taken into account as the official government representative to lead this program and Pertamina as the single NOC in Indonesia to be finally appointed as the executor of the program.
- In May 2007, the program was launched in Jakarta. The GOI Decree to support this program was issued later in December 2007.
- Meanwhile, the roadmap and planning of the program was underway to be improved. Pertamina was to finance this program upfront to then be reimbursed by the Government later.

Methods – Planning Stage

- The Program is aimed to convert 42 millions Household and SMEs into using LPG, which now expanded to be 53 – 55 million throughout Indonesia in only 4 years' time.
- Every eligible citizen has the right to get one Initial Package for free, consisting of 3 kg LPG canister, initial gas, single burner stove, hose and regulator.
- The program had to start in an area which was most ready in LPG infrastructure, had the highest kerosene consumption, but also narrow in area. Therefore, the program launched in Jakarta as the landmark of Indonesia (it's was a big stake).
- Pertamina has been doing a very hard work to build mega infrastructures. Regions needed to carry out this program to be well accepted by each local government, local NGOs as well as people with different perspectives of the situation.

Methods – Implementation Stage

1. **Survey**:
   determine areas and eligible household which deserve to receive the stoves and cylinders, including the first initial gas.
2. **Socialization**:
   educate people, agents and retailers that the program will be implemented in their area.
3. **Distribution**:
   provide stoves, cylinders and initial gas for free to eligible households and SME.
4. **Kerosene withdrawal**:
   withdraw kerosene gradually starting at 50% allocation and increasing.

Free Initial Package LPG 3 Kg





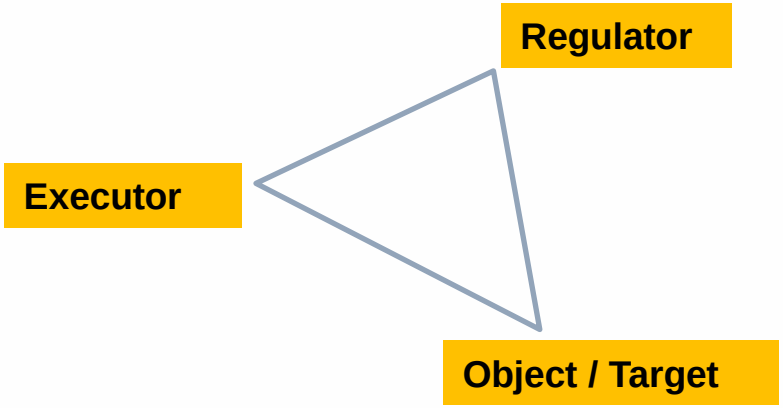
Key Success Factors

1. Strong Government Policy

- One Strong Leader : Vice President → Cut the Bureaucracy
- Effective Ministerial Coordination
- Who : EMR, Industrial, Internal Affair.

2. Strong & Effective Implementation

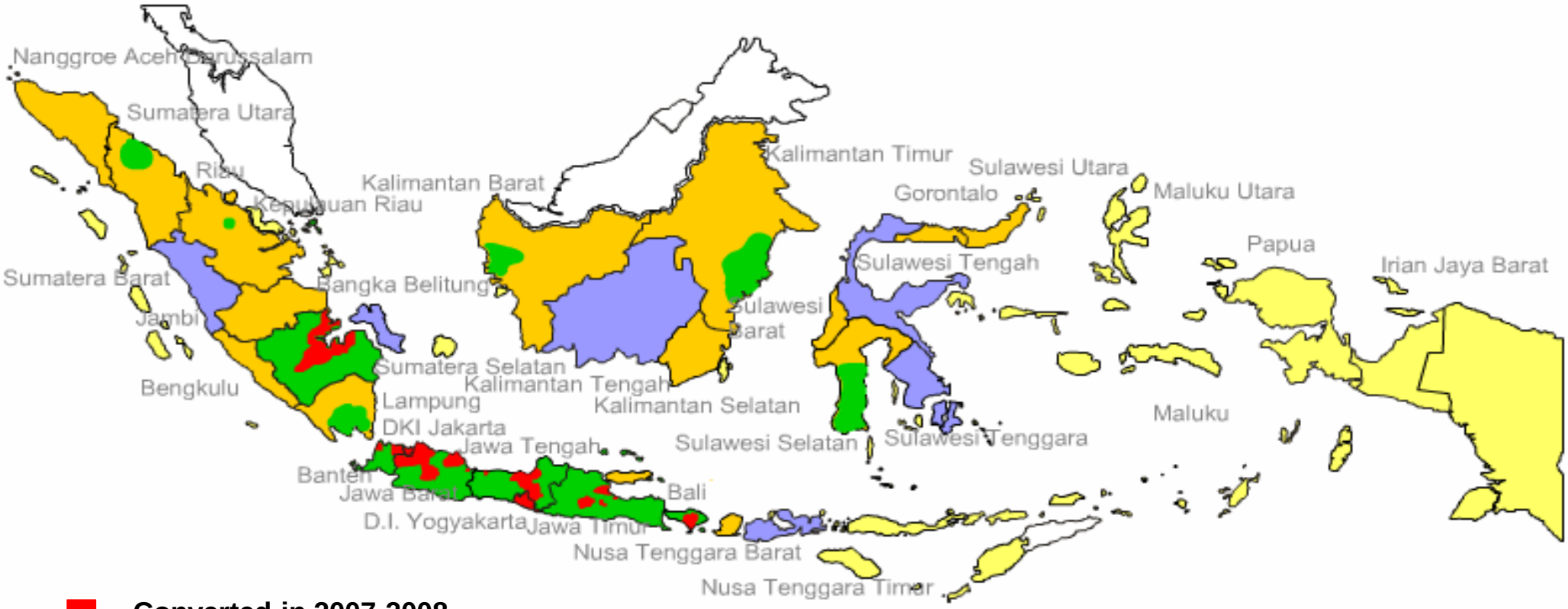
- Create Effective Model using Conversion Cycle
- Ensure the Readiness Logistic & Infrastructures.
- Strong Financial Capability
- Who : Pertamina



3. Real Benefit for End Users

- Fulfill their basic needs : cheaper, always available and safe.
- Quick benefit that they can feel it for instance.
- They don't concern about subsidy.
- Who : Household and SME

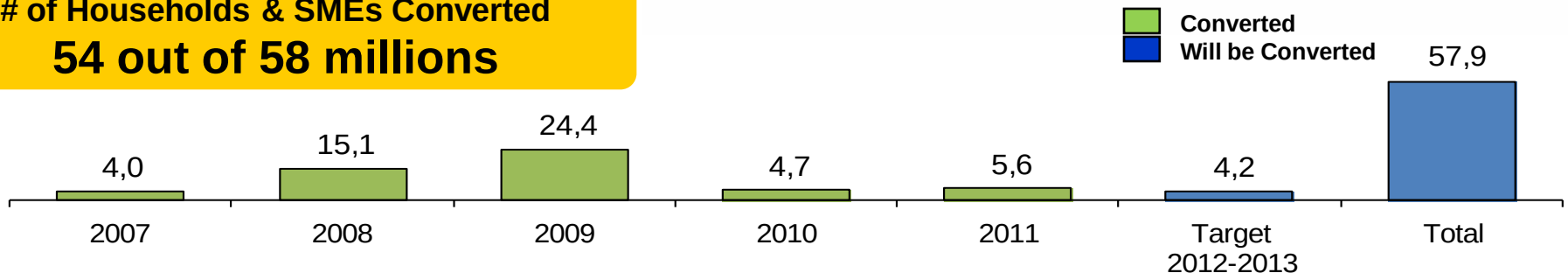
Results – Up To Date Progress :The Program Has Been Widely Implemented in 23 Provinces



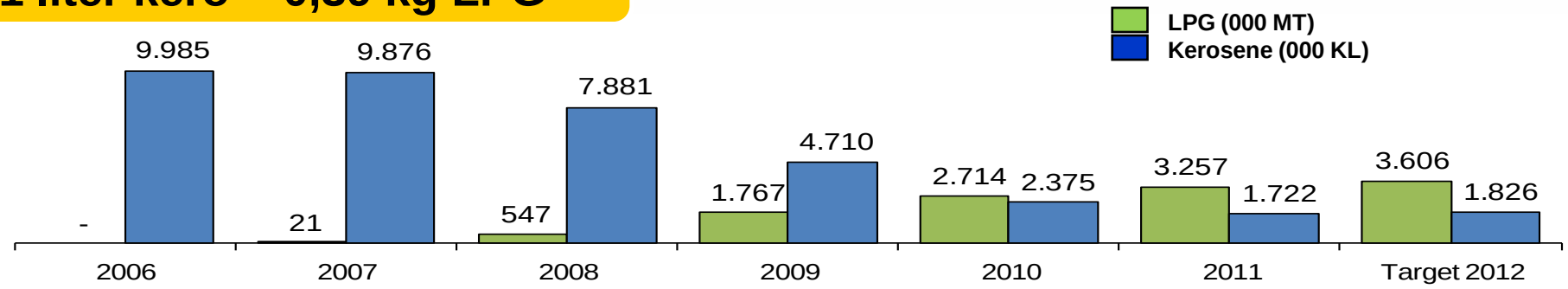
- **Converted in 2007-2008**
- **Converted in 2009**
- **Converted in 2010-2011**
- **Will be converted in 2012**
- **Will not be converted**

Results – Benefits to The Government

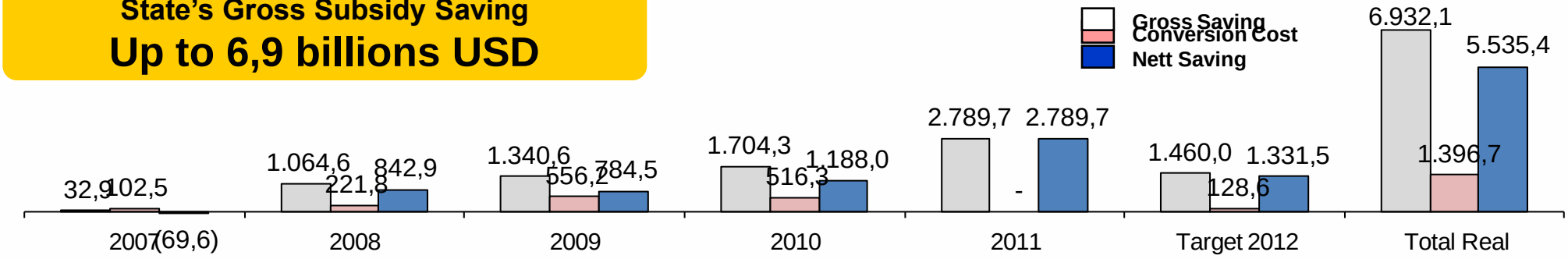
# of Households & SMEs Converted
54 out of 58 millions



Replacement Value Kerosene vs LPG
1 liter kero ~ 0,39 kg LPG



State's Gross Subsidy Saving
Up to 6,9 billions USD



Results – Benefits to The People

Now I can cook faster, especially in the morning when I have to work and leave at 5.30 A.M. Previously, I never had time to prepare breakfast for my children. But since I could cook faster, I can serve them breakfast even if it's only tempe", said Nining, one of the Conversion Package Receivers, on Internal Survey, November 2009.

SURVEY RESULT

- **92.5%** will continue using LPG in the future
- **95.2%** feel LPG save their money
- **89.9%** know better the program
- **94.1%** support this program

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Results – Benefits to The Whole Nation

Indonesian Government	Business Environment	End Users	Environment CO2 Reduction
State's Gross Subsidy Saving Up to 6,9 Bio USD	**# of New Investors & Jobs** 529 investors & 38.000 Jobs	**Energy Cost Saving** 42% (4 USD/Month)	**# of Trees saved **)** 46,6 Mio
Nett Saving 5,5 Bio USD	**Value of Investment** 1,9 Bio USD	**% of program Supporters *)** 94,1 %	**# of Cars taken Equivalent **)** 2,8 Mio

**) Based on Internal Survey. November 2009*

***) Modified from GreenworksAsia Report on Emission Reduction from Conversion Program, November 2008*

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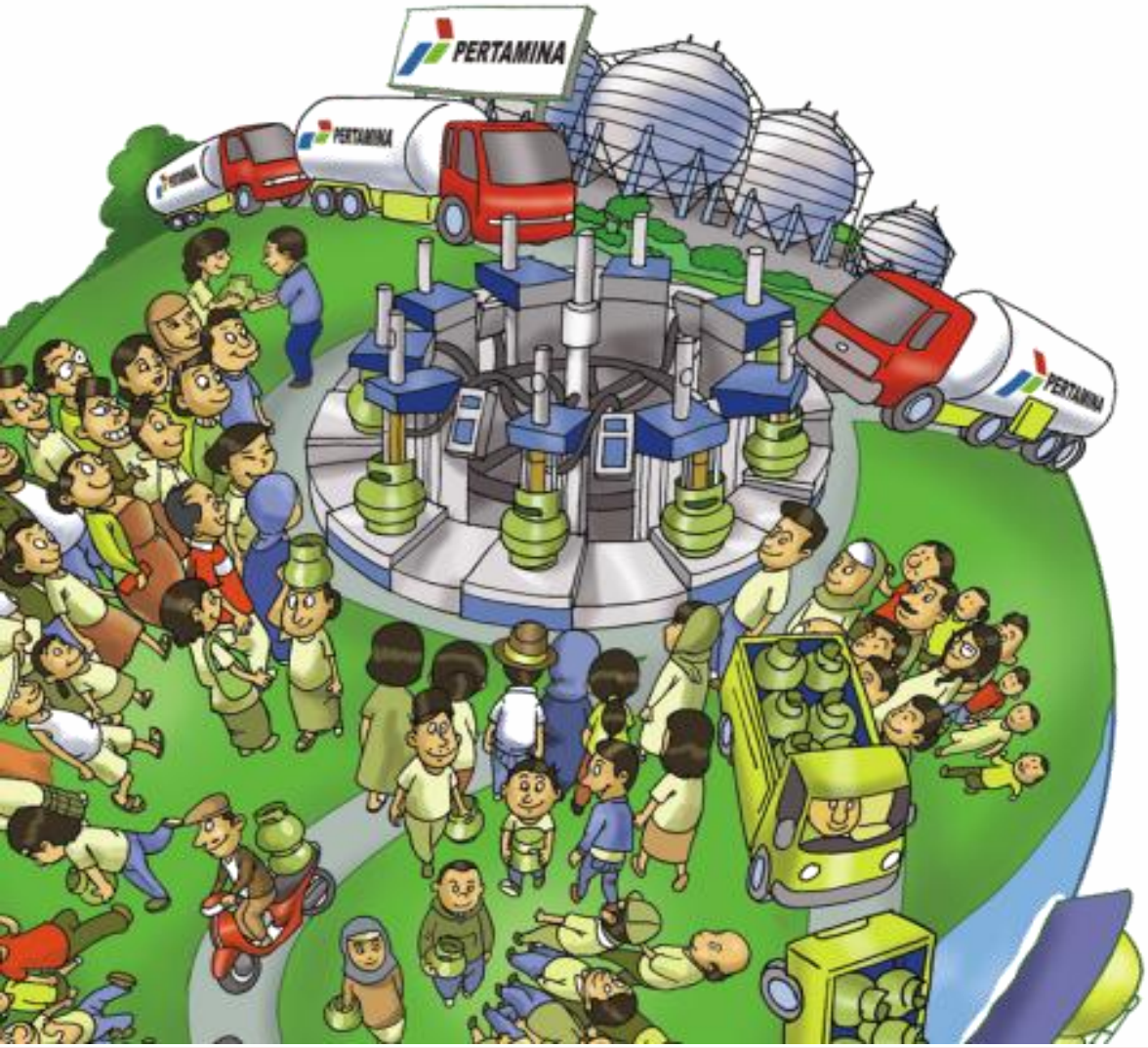

THANK YOU

Terima Kasih

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