# International Workshop: Future Perspective of Bioenergy Development in Asia

## Session 1:
## Setting the Scene - An overview of Asian Bioenergy Policy and Market

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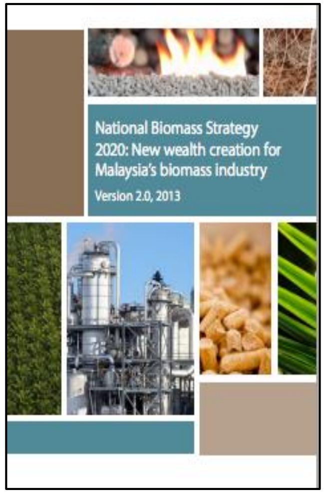
# The National Biomass Strategy

## Waste to Wealth Scenario for Malaysia




2013:
Expanded Scope to Cover Forestry and Dedicated Crops As Source of Biomass


2011:
Oil Palm Biomass

i. Availability, Mobilisation Cost, Location of Biomass in Malaysia

ii. Technology Available to Process Biomass (Maturity)

iii. Advocates Portfolio of Uses for Biomass, Location Specific

iv. Malaysia's Biomass Opportunities

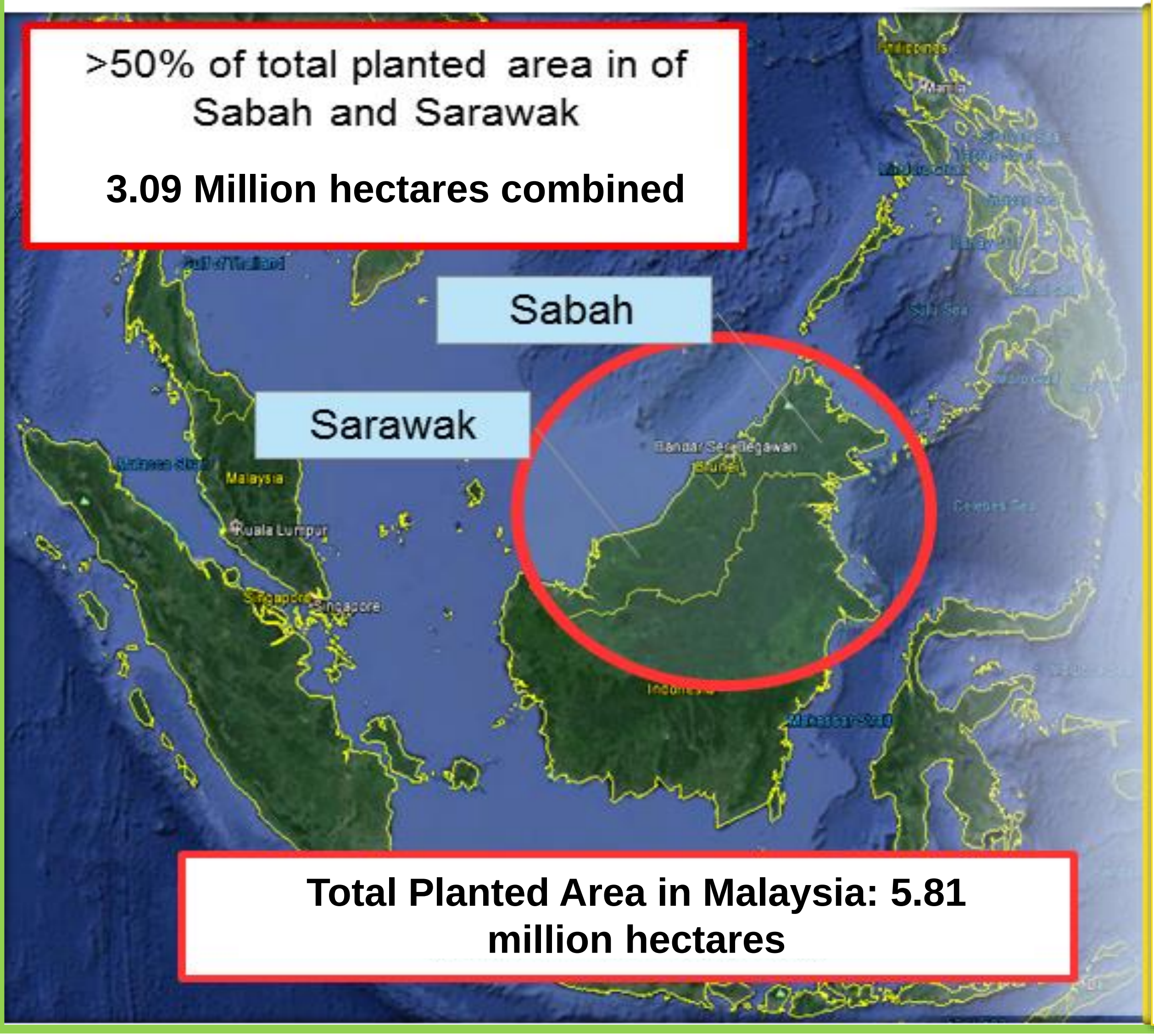
### OBJECTIVE

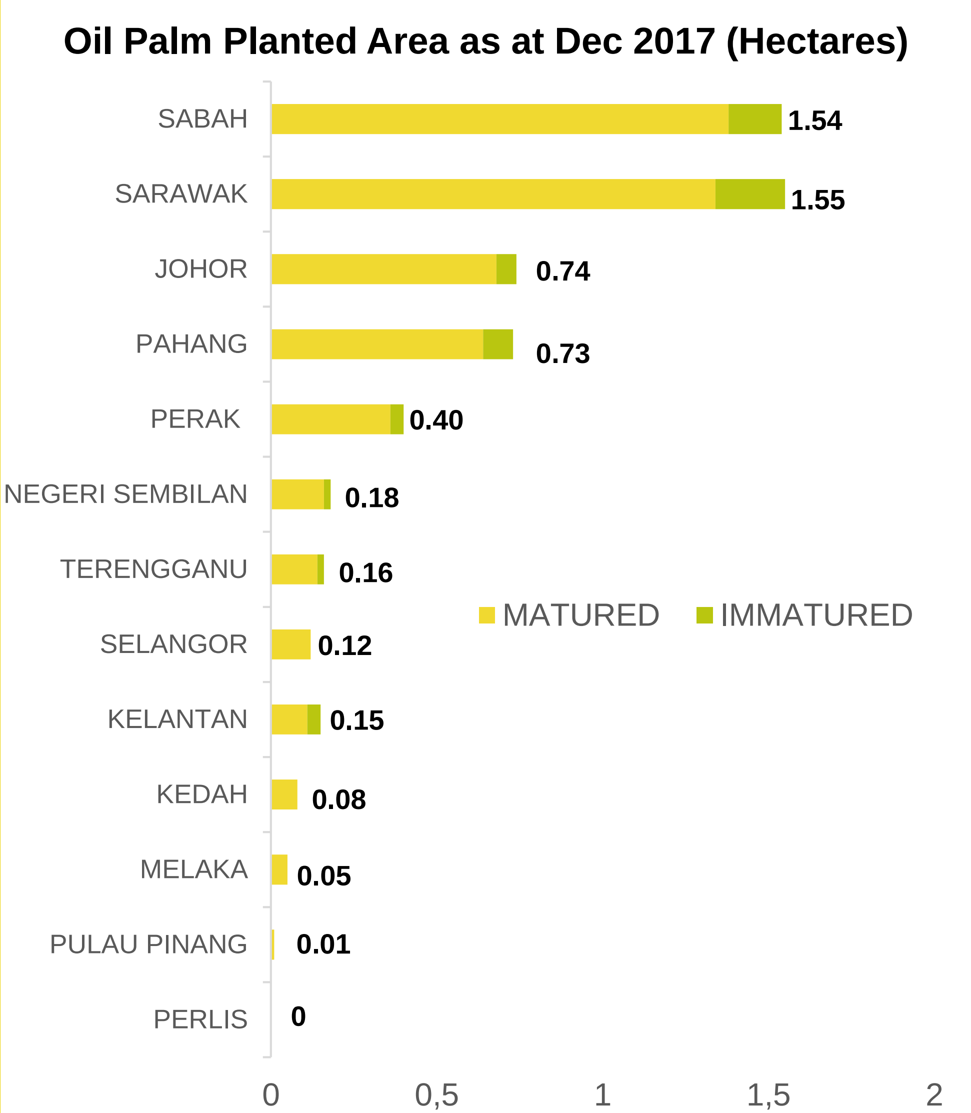
Creation of balanced portfolio of high value downstream activities (e.g. ranging from bio energy, bio fuels, bio chemicals)

### STATUS TO DATE

- Facilitated companies and promote higher value biomass investments and ventures – Total of **226** projects with investment worth of **RM 2.9 Billion** to date
- Malaysia is now one of the region's leading biomass investment destination

# Total Palm Oil Planted Area in Malaysia






*SOURCE: As at December 2017 ; MPOB*

# MALAYSIA generates sufficient amounts (>90 million dry tonnes) of dry palm biomass per year and availability subjected to mobilisation cost

| | Biomass Type | | Description | Site of production | Annual Availability: Per ha (tonnes) | Annual Availability: National total (m dry tonnes)[1] |
|---|---|---|---|---|---|---|
| **Solid** (dry weight) |  | **Fronds** | Leaves of oil palm tree | Plantation | 9.6 | 55.8 |
| |  | **Trunks** | Tree trunk available at end of plantation lifecycle | Plantation | 3.0 | 17.4 |
| |  | **EFB** | Remains after removal of palm fruits | Mill | 1.4 | 8.1 |
| |  | **Shells (PKS)** | Remains after palm kernel oil extraction | Mill | 0.8 | 4.6 |
| |  | **Fiber (MF)** | Remains after oil extraction from mesocarp | Mill | 1.4 | 8.1 |
| **Liquid** (wet weight) |  | **POME** | Liquid by-product from sterilization and milling process of FFB | Mill | 12.2 | 70.7 |

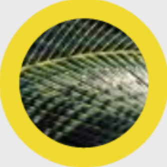
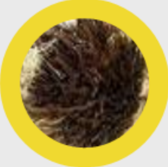
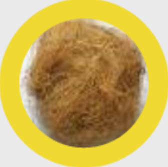
~94 million dry tonnes

1 Based on end 2017 records, 5.81m ha total planted areas in Malaysia, 4% replanted area per year and company specific information

*SOURCE: MPOB; Interviews*

# A detailed costing methodology has been developed to illustrate how biomass can be mobilized in a Sustainable Way

**Biomass types** (USD per tonne dry weight)

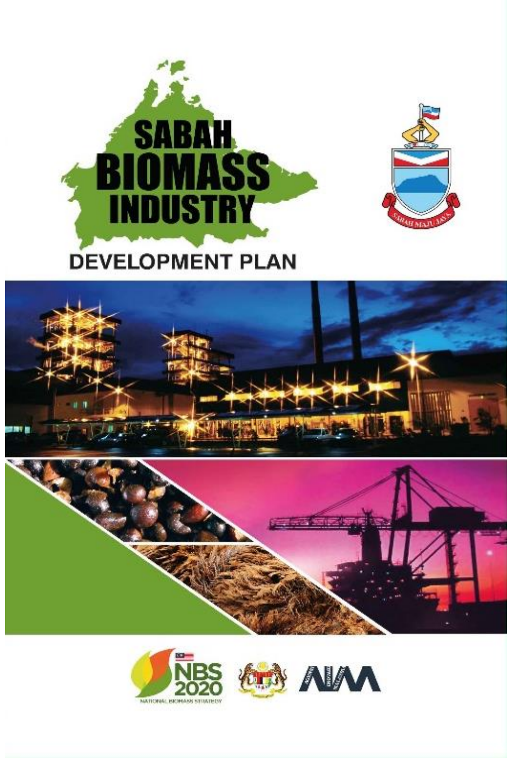
| | Fronds | Trunks | EFB | PKS | Fiber |
|---|---|---|---|---|---|
| |  |  |  |  |  |
| 4 Transport-ation | 9 - 80 | 8 - 81 | 0 - 113 | 0 - 40 | 0 - 97 |
| 3 Pre-processing | 19 (chipping) | 26 (chipping) | 31 (shredding + compacting) | 0 | 5 (compact ing) |
| 2 Harvesting & collection | 5 - 21 | 15 | 0 | 0 | 0 |
| 1 Substitu-tion | 11 (fertilizer) + 5 (appli-cation) | 24 (fertilizer) + 3 (appli-cation) | 29 (fertilizer), no application cost | 41 (2010 price) | 13 (2010 price) |

*SOURCE:, M. Islam et al.; K. Haron et al.; H. Kalid et al;. Lazaro A. et al.; ICIS; MARDI; MPOB; Field visit; Interviews*

# Sabah/ Sarawak Biomass Industry Development Plan

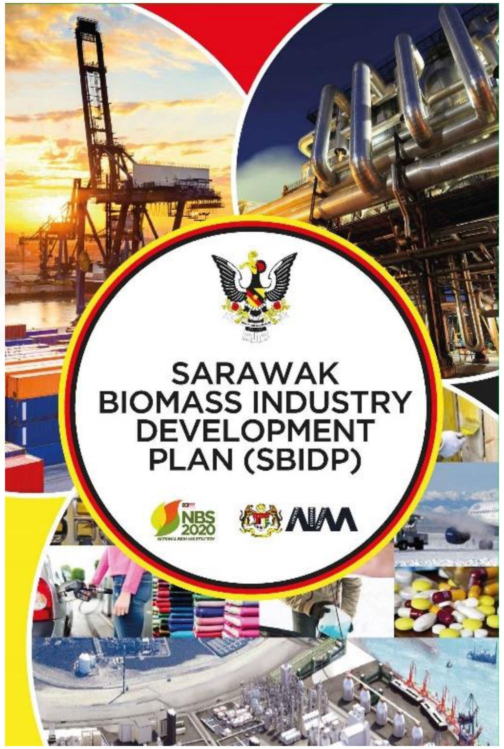
## Localised Development Plan to Maximise Biomass Potential

**Officially launched**
**On 25th February 2016**




**SBIDP**
SABAH BIOMASS INDUSTRY DEVELOPMENT PLAN

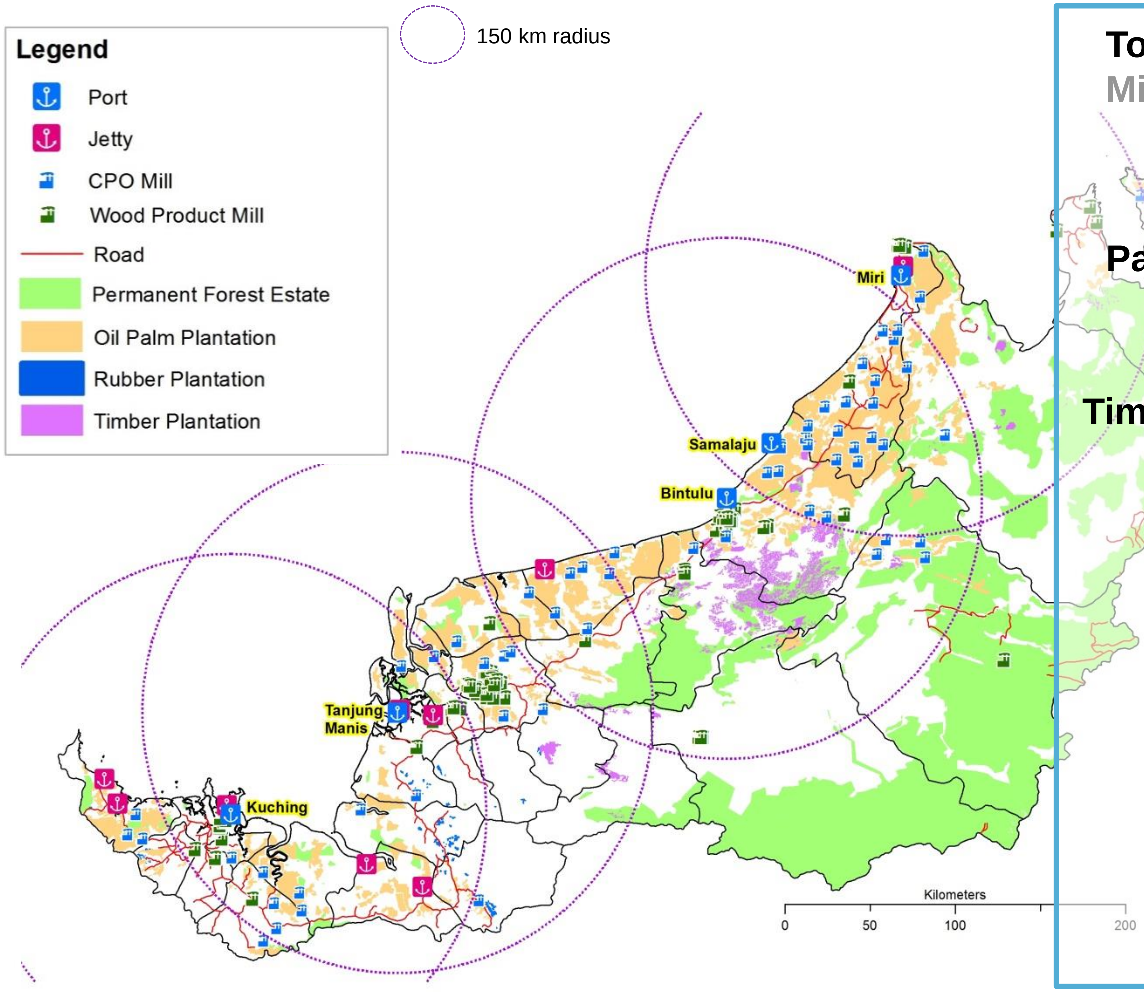
- Potential clusters for biomass downstream projects: Tawau, Lahad Datu, Sandakan and Labuk Sugut
- **4.8 million** dry tonnes
- **RM 3.2 billion** additional GNI
- **~25,000** jobs
- **RM 13.5 billion** investment opportunities

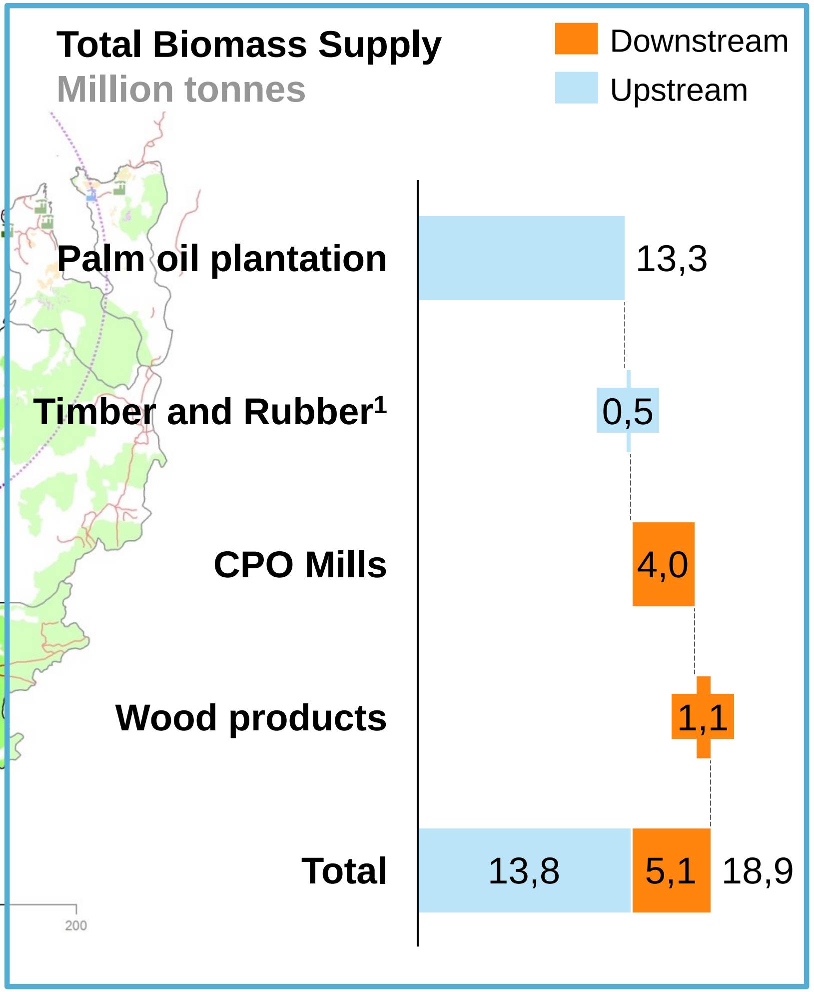



**SBIDP**
SARAWAK BIOMASS INDUSTRY DEVELOPMENT PLAN

- Potential clusters for biomass downstream projects: Kuching, Tanjung Manis, Bintulu, Samalaju and Miri.
- **6.0 million** dry tonnes
- **RM 4.8 billion** additional GNI
- **~30,000** jobs
- **RM 18 billion** investment opportunities

# 1 SARAWAK HAS A TOTAL SUPPLY POTENTIAL OF 19 MILLION DRY TONNES CONCENTRATED IN 4 MAIN CLUSTERS

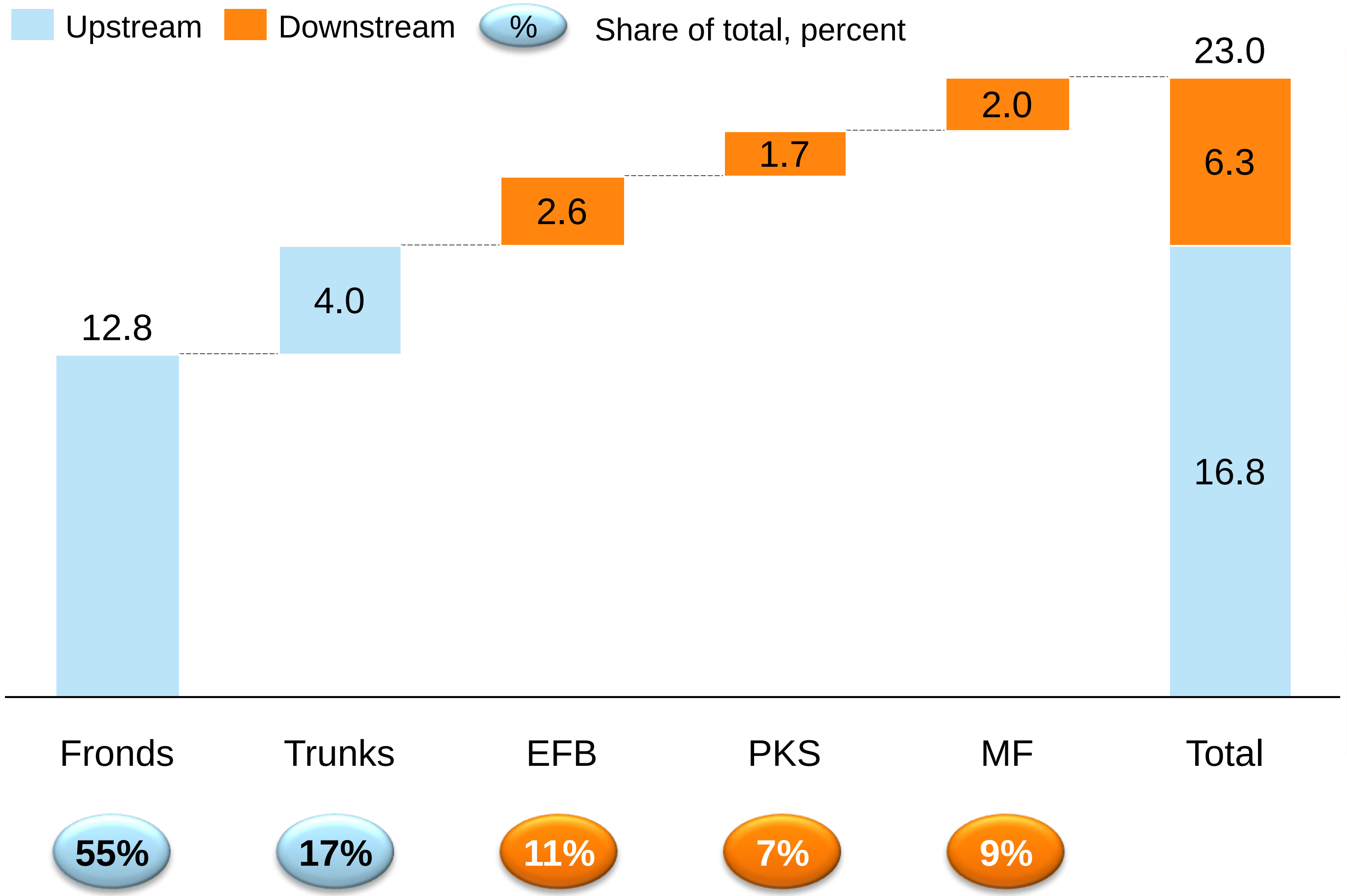



Note: [1] Biomass of harvesting residues from timber and rubber plantations excluding natural forest

# THE SABAH PALM OIL SECTOR GENERATES 23 MILLION DRY TONNES OF BIOMASS PER YEAR IN UPSTREAM AND DOWNSTREAM

**Palm Oil Biomass Supply in Sabah, 2014**
Million dry tonnes



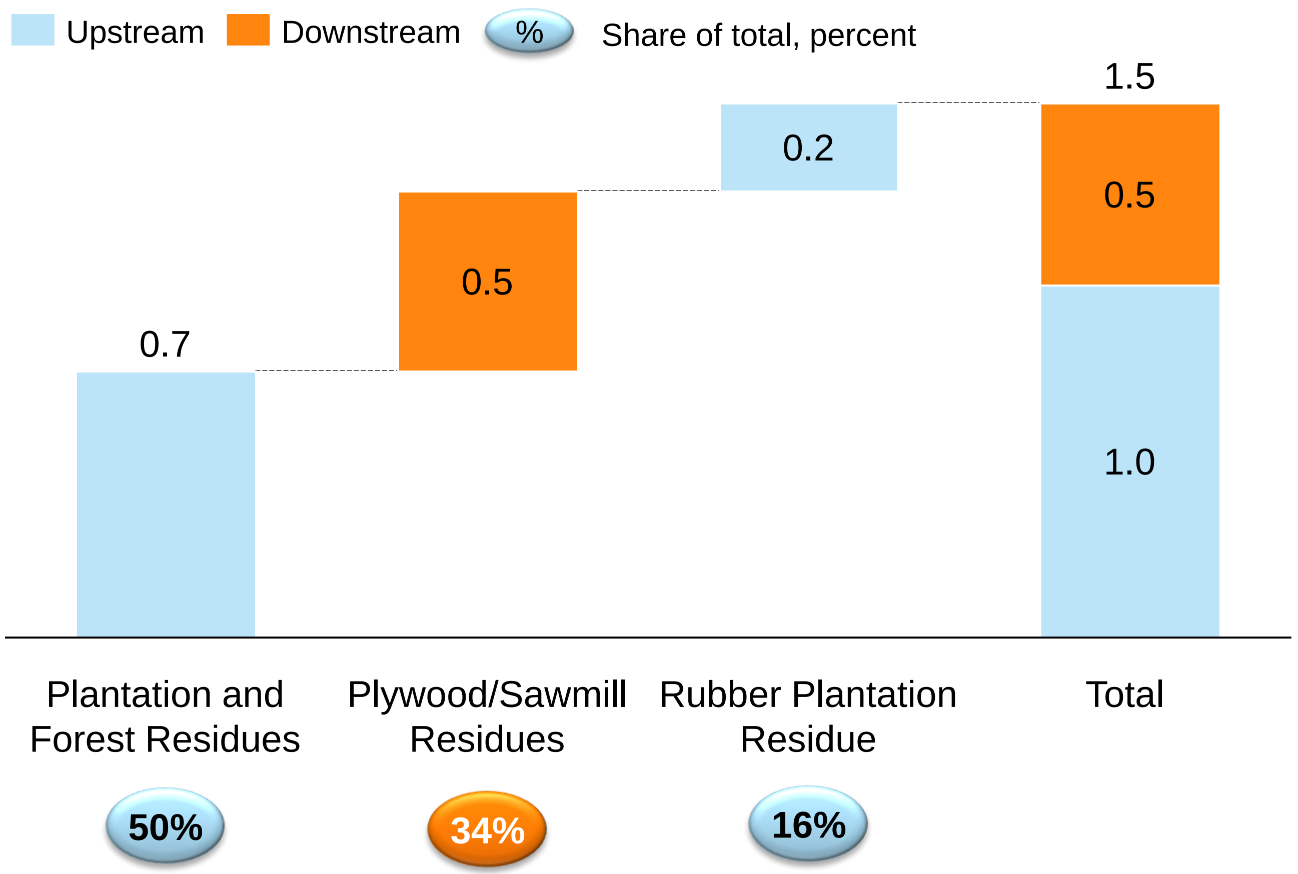

**Assumptions**:

- 1.3 million ha of mature palm oil plantations (total 1.5 million ha)
- 27.8 million tonnes of FFB intake per year and biomass yield (in wet tonnes per FFB tonne):
  - 21% EFB/FFB
  - 6% PKS/FFB
  - 12% MF/FFB

# THE SABAH TIMBER AND RUBBER INDUSTRY CONTRIBUTE TO 1.5 MILLION DRY TONNES OF BIOMASS PER YEAR

**Woody Biomass Supply in Sabah, 2014**

**Million dry tonnes**




**Assumptions**:

- 1.1 million $m^3$ of timber production
- 1.5 million $m^3$ of natural forest logs production
- 250K $m^3$ of sawtimber production
- 800K $m^3$ of plywood/veneer production
- 130K ha of rubber plantation

# National Biomass Key Stakeholders

## Holistic Approach – Engagement with Various Stakeholders

### Government

MPOA, FRIM (Forest Research Institute Malaysia), MIDA, SIRIM, MARDI, MPOB, MPOC, Delft, POIC, Maybank, United Plantations Berhad, CIMB, Felda, Biotechcorp, East Coast Economic Region, moa Incorporated (Kementerian Pertanian dan Industri Asas Tani Malaysia), MITI Malaysia, EPU, Khazanah Nasional, seda Malaysia, MTIB, GreenTech Malaysia, MOSTI, MOF (Khazanah Treasury), KeTTHA (Kementerian Tenaga, Teknologi Hijau dan Air), NRE, Kementerian Kerja Raya (KKR), Global Science and Innovation Advisory Council Malaysia, UPM, Universiti Kebangsaan Malaysia (National University of Malaysia), UTM (Universiti Teknologi Malaysia)

### Embassies

Kingdom of the Netherlands, Embassy of the Republic of Korea Kuala Lumpur, Delegation of the European Union to Malaysia, Embassy of Japan in Malaysia, Royal Danish Embassy, Sweden Sverige

NBS 2020 NATIONAL BIOMASS STRATEGY

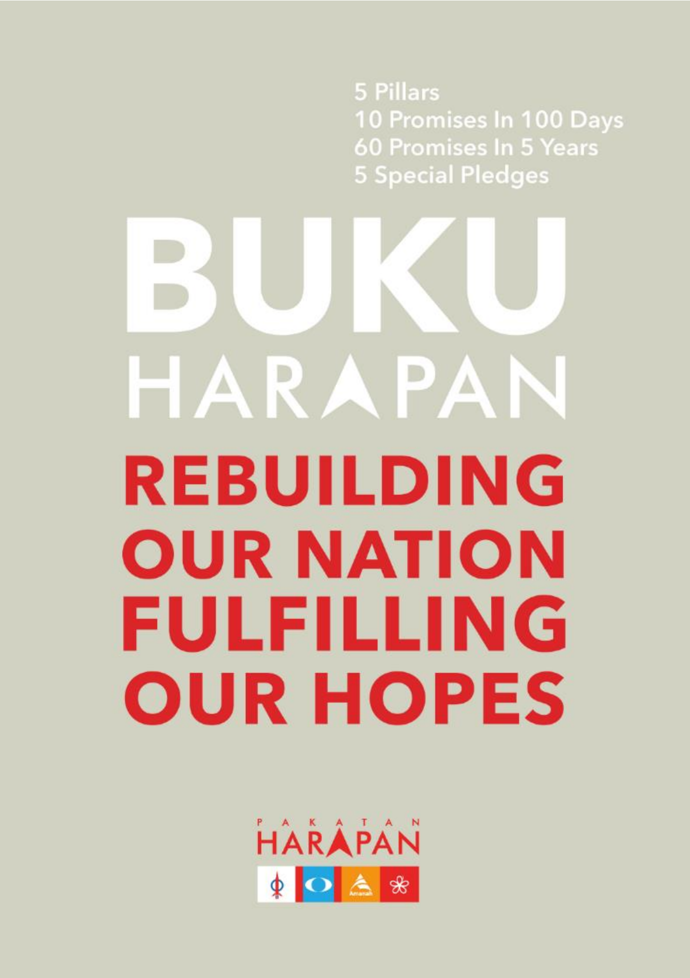
### Private Companies

purac, Sime Darby Plantation, Sime Darby Developing Sustainable Futures, Genting Plantations, Rabobank, Sumitomo, Evonik Industries, BASF The Chemical Company, Battelle The Business of Innovation, punjab national bank, Bank Negara Malaysia (Central Bank of Malaysia), Frost & Sullivan, Petronas, novozymes, DuPont, IOI Group, dmt, Bursa Malaysia, premium renewable energy, ECN, MOTIE (Ministry of Trade, Industry & Energy), GS Caltex, Trienekens País Vasco, sojitz, LEAF Resources, JETRO (Japan External Trade Organization)

### Associations/ Others

p.a.m., Federation of Malaysian Manufacturers (Making Malaysian Industries Globally Competitive), TBIA (Thai Bioplastics Industry Association), GreenPower conferences, mbic (Malaysia Biomass Industries Confederation), JBPA 日本バイオプラスチック協会 Japan BioPlastics Association

# Mandate of the New Malaysian Government of Malaysia




**Renewable Resources**

- Renewable energy through **renewable resources** will be increased from the current **2% - 20%** by **2025**.

**Reduction of Coal Plants**

- The Government will also **reduce the dependence on coal power plants** which is one of the power generation methods which has serious effects on $CO_2$ emission.

**Investment Policy**

- The county's investment policy will also be re-evaluated to give **priority to the high technology industries** and to **use energy from renewable resources**. All laws and regulations pertaining to environmental management and protection will be revised so that proper governance structures can be created in line with the increasingly demanding modern times.

# NBS Objective In Alignment With The Direction Of The New Government Of Malaysia

## NBS 2020

Primary objective : **maximize sustainable GNI impact** from biomass in the 2020 time frame

- **high-value downstream activities (e.g., bioenergy, biofuel, biochemical)**
- High value **job creation**
- **"Indigenous technology"** creation within Malaysia (direct and indirect value creation)
- **Sustainability** impact and emissions impact
- **Using Biomass as leverage** to form smart partnerships with downstream companies
- Strategy Design principles **- Private Sector Led**

## World Standard: United Nations Development Program

**The 17 sustainable development goals (SDGs) to transform our world:**


Goal 1: No Poverty
Goal 7: Affordable and Clean Energy
Goal 8: Decent work and economic growth
Goal 9: Industry, Innovation and Infrastructure
Goal 11: Sustainable Cities and Communities
Goal 12: Responsible Consumption and Production
Goal 13: Climate Action
Goal 17: Partnerships to Achieve the Goal

## New Government of Malaysia Direction

**PILLAR 1: Reduce the People's Burden**
- Promise 3: Sharing the nations's wealth in a targeted and equitable way
- Promise 5: Reduce the burdens faced by young people
- Promise 10: Guarantee people's basic food needs and taking care of the welfare of farmers

**PILLAR 2: Institutional and Political Reform**
- Promise 21: Empowering the public service

**PILLAR 3: Spur Sustainable and Equitable Economic Growth**
- Promise 30: Support the economic growth of bumiputera and all citizens in the country
- Promise 31: Spur investment and simplify business processes and trade
- Promise 34: Enhance the income of the majority
- Promise 35: Raising the dignity of workers and creating more equality jobs
- Promise 37: Ensuring the long-term prosperity of the rakyat/people
- Promise 39: Balancing economic growth with environmental protection

**PILLAR 4: Return Sabah and Sarawak to the Status Accorded by the Malaysia Agreement 1963**
- Promise 41: To ensure the prosperity of the people of Sabah and Sarawak by enhancing the states' economic growth
- Promise 42: Create more employment opportunities for Sabahan and Sarawakian youths
- Promise 45: Advancing the interest of the rural and remote populations
- Promise 47: Decentralisation of power to Sabah and Sarawak

**PILLAR 5: Create a Malaysia that is Inclusive, Moderate and Respected Globally**
- Promise 54: Empowering societal institutions, civil society and social entrepreneurship
- Promise 55: To increase the space for diversify the activities of young people

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# Q & A