DATAMETRICS RESEARCH AND INFORMATION CENTRE

MOVING MALAYSIA TOWARDS SUSTAINABLE GREEN ENERGY

AGENDA

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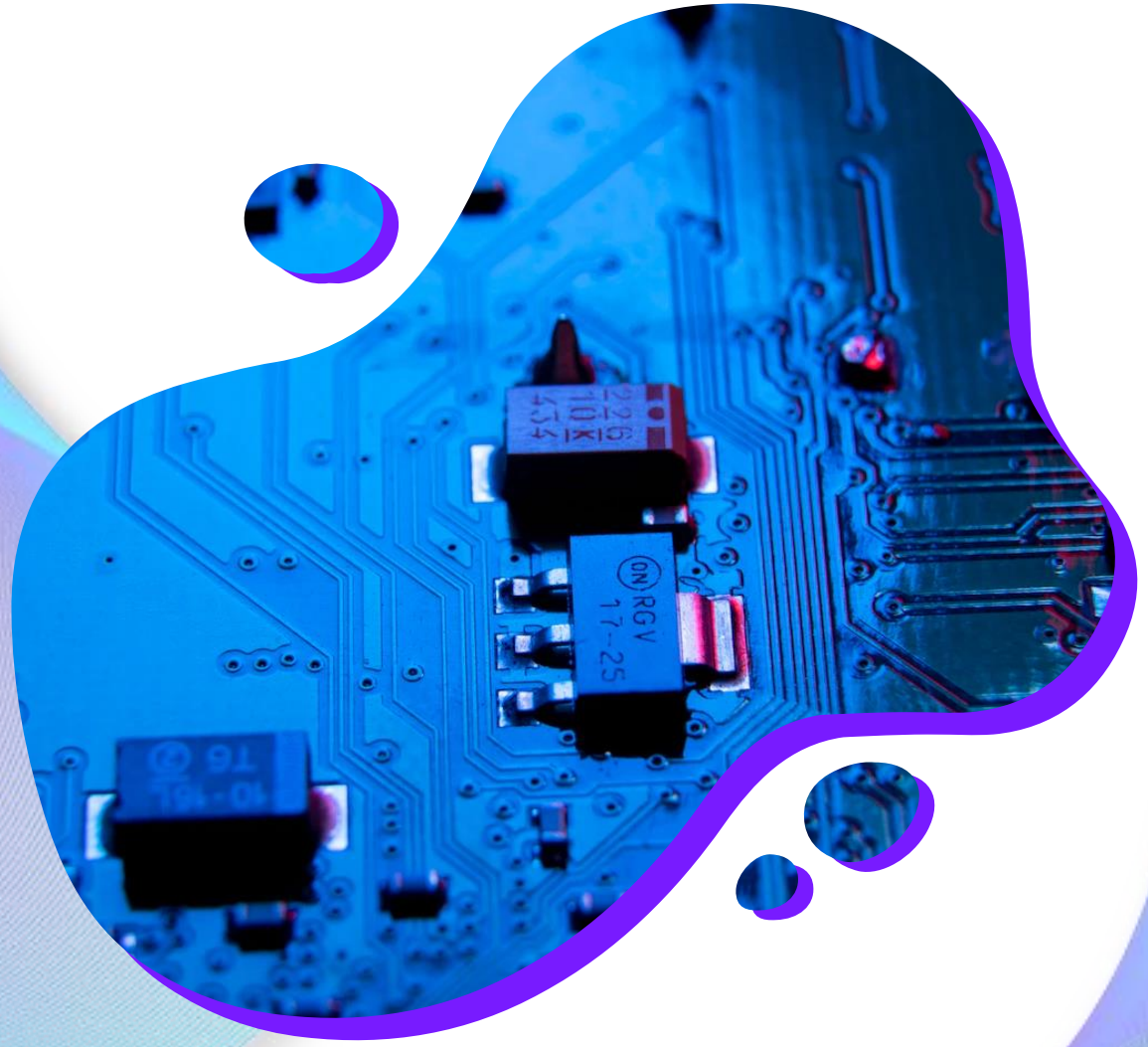

1. **INTRODUCTION**

   Why Its Important For Malaysia To Embark on A Sustainability Journey

2. **RATIONALE**

   Addressing Malaysia's Quest for Economic Growth, Job Creation & Environmentally Friendly

3. **PROPOSED STRUCTURE**

   A workable structure using the Private Public Partnership Model funded via Green Sukuks

4. **RECOMMENDATION**

   Action plan to roll out solar installation for residential segment

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1.

INTRODUCTION

Why Its Important For Malaysia To Embark on A Sustainability Journey

A SUSTAINABLE JOURNEY

To take Malaysia to the next level in terms of adoption of Solar Energy as means of electricity output, especially for the residential sector

To generate economic activity that is sustainable in the long run

To create jobs for Malaysians and to embrace green energy solutions for our future generation

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MALAYSIAN SOLAR SECTOR

We are **at an inflection point of sustainable growth** with the renewable energy objective of achieving 31% generating capacity by 2025 and 40% in 2035, with Solar accounting for 80% of capacity. *(2021 RE Share: 8,898 MW or 23%)*

Net Energy Metering (NEM) 3.0 scheme, Large Scale Solar (LSS) and extension of tax allowances till 2023 are main **drivers of solar adoption.**

Moreover, solar enables electricity bills and lowers consumer carbon footprint.

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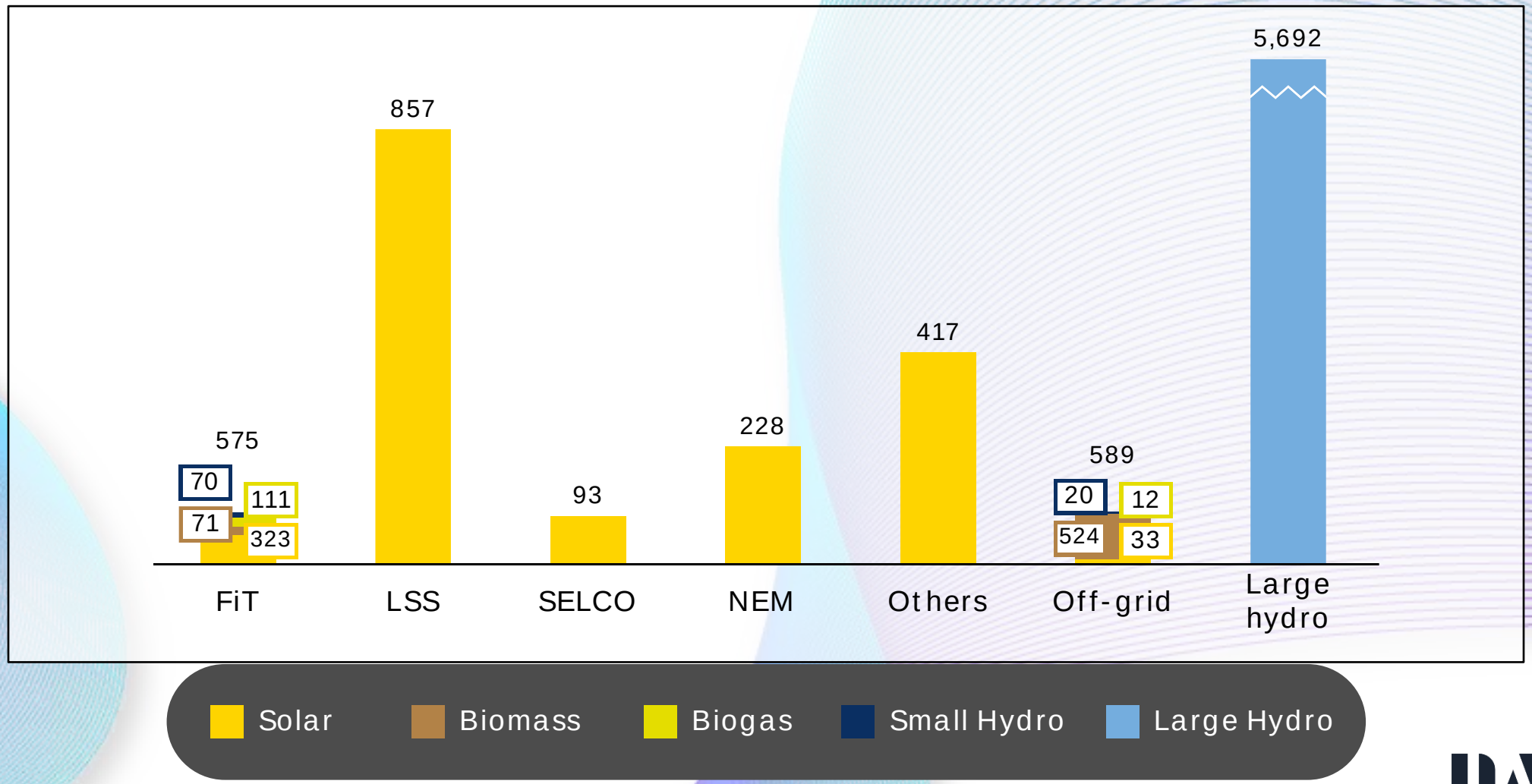
MALAYSIAN RE SECTOR – 8,451MW AS AT END OF 2020



Source: SEDA

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MALAYSIAN RE PROGRAMS

Mechanism	Year Started	Lead Organization	Program Specification	Key Insights
Feed in Tariff (FiT) - Solar	2011	seda	• MYR 0.50 - 1.77/ kWh • 4 kW - 30MW • 21 years	• Discontinued in 2017 and replaced by both LSS, SELCO and NEM • Only P. Malaysia and Sabah
Feed in Tariff (FiT) - Biomass	2011	seda	• MYR 0.27 - 0.31/ kWh • Up to 30 MW • 21 years	• Includes agriculture residues: palm oil and rice husk and straw • PPA revised to 21 years from 16 years in December 2019
Feed in Tariff (FiT) - Biogas	2011	seda	• MYR 0.27 - 0.32/ kWh • Up to 30 MW • 21 years	• In 2019, PPA tenure period extended from 16 years to 21 years • FiT rate offered for agriculture waste and landfill waste
Feed in Tariff (FiT) - Waste To-Energy (WTE)	2011	seda	• MYR 0.27 - 0.31/ kWh • Up to 30 MW • 21 years	• Effective 2019 new WTE projects who wishes to apply for FiT can apply under Biomass FiT (w/o use of solid waste as fuel source bonuses) • Government to implement auction/ bidding system for WTE projects started in 2020 by KPKT
Feed in Tariff (FiT) - Small Hydro	2011	seda	• MYR 0.23 - 0.29/ kWh • Up to 30 MW • 21 years	• No degression rates due to long gestation period • FiT rate for low head and high head introduced in 2019
Large-scale Solar (LSS)	2016	Suruhanjaya Tenaga Energy Commission	• MYR 0.17 - 0.45/ kWh • 1 - 100 MW • 21 years	• 3 auctions completed • 4th LSS released in 2020 with system size capped at 50 MW • Only P. Malaysia and Sabah
Solar Net Energy Metering (NEM)	2016	seda Suruhanjaya Tenaga Energy Commission	• Based on consumers retail tariff • Up to 5 MW per applicant subjected to respective sectors • 10 years (one to one offset)	• Cumulative of 1 GW capacity to promote rooftop solar market • Revision of compensation rate to 'one-on-one offset' for 10 years in 2020 to induce uptake • Implementation of VNM allowing excess energy to be exported to designated permises under wholly owned subsidiary company • Only P. Malaysia
Solar Self-consumption (SELCO)	2017	Suruhanjaya Tenaga Energy Commission	• Tariff not applicable for SELCO • 75%of max demand / 60%of fuse rating • No tenure period	• Regulation began in 2017 but activity started before 2017 • SELCO replaced NEM in Sabah starting 2019

Source: SEDA

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MALAYSIAN SOLAR SECTOR

The total solar PV installed capacity in Malaysia stood at **1,787MW* in 2021**, and is targeted to grow to 3,322MW by 2023. (*Includes 857MW in LSS) based on SEDA's statistics.

For 2021, Under the LSS Program, some 2,457 MWac has been awarded.

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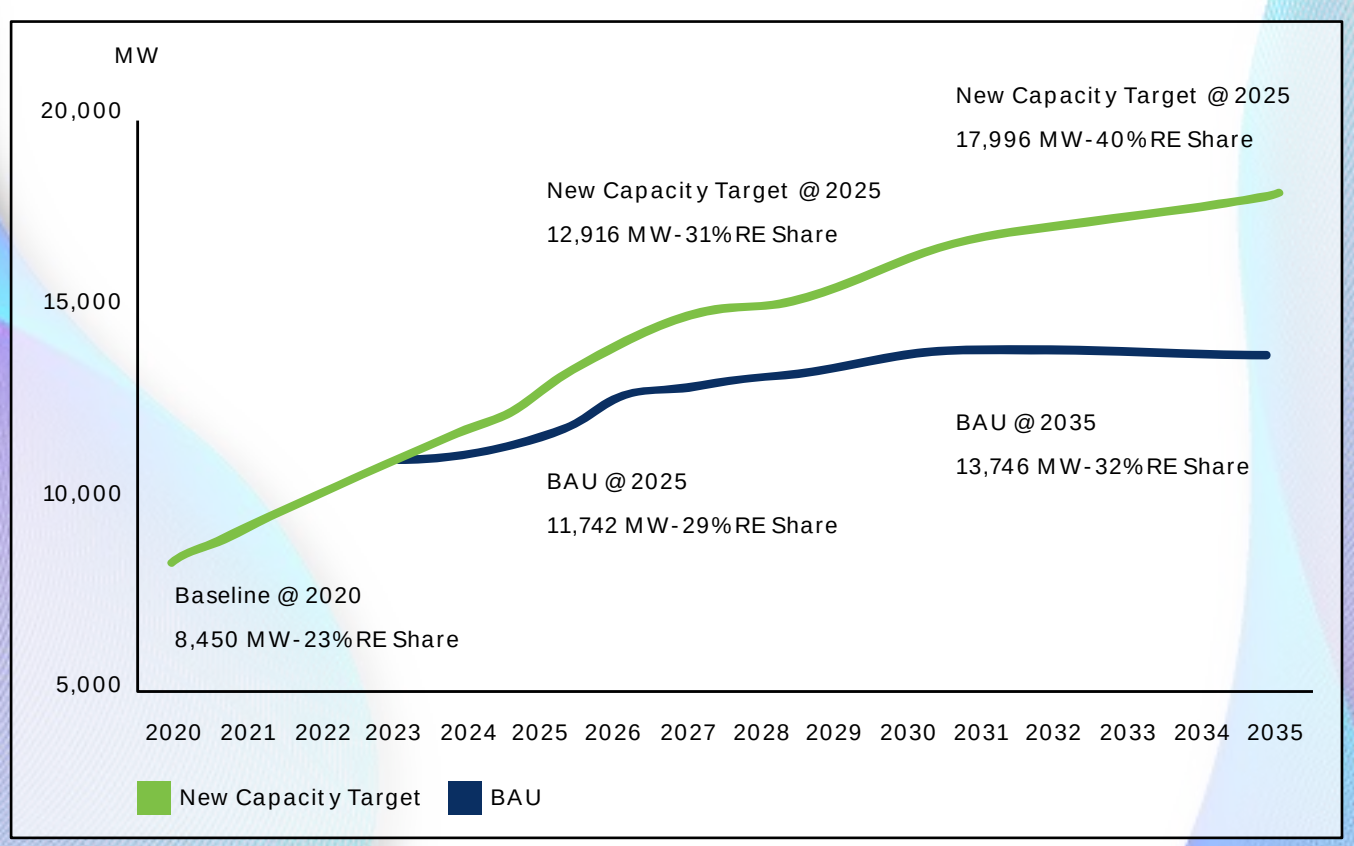
MALAYSIAN RE SECTOR – CAPACITY TARGETS



Source: SEDA

Under BAU: Based on existing policies and programs without further extension and/or introduction of new programs leading to 11.7 GW projected RE capacity in 2025. Share of renewables in the installed capacity shall reach 29% in 2025 with minimal future RE growth, resulting in 32% in 2035

Under New Capacity Target (NCT): A higher RE capacity by 2035. designed to achieve the national target of 31% RE share with 12.9 GW of RE installed capacity by 2025. Post 2025 foresees greater RE deployment with RE target of 40% by 2035, in which penetration of solar during peak demand reaches 30%.

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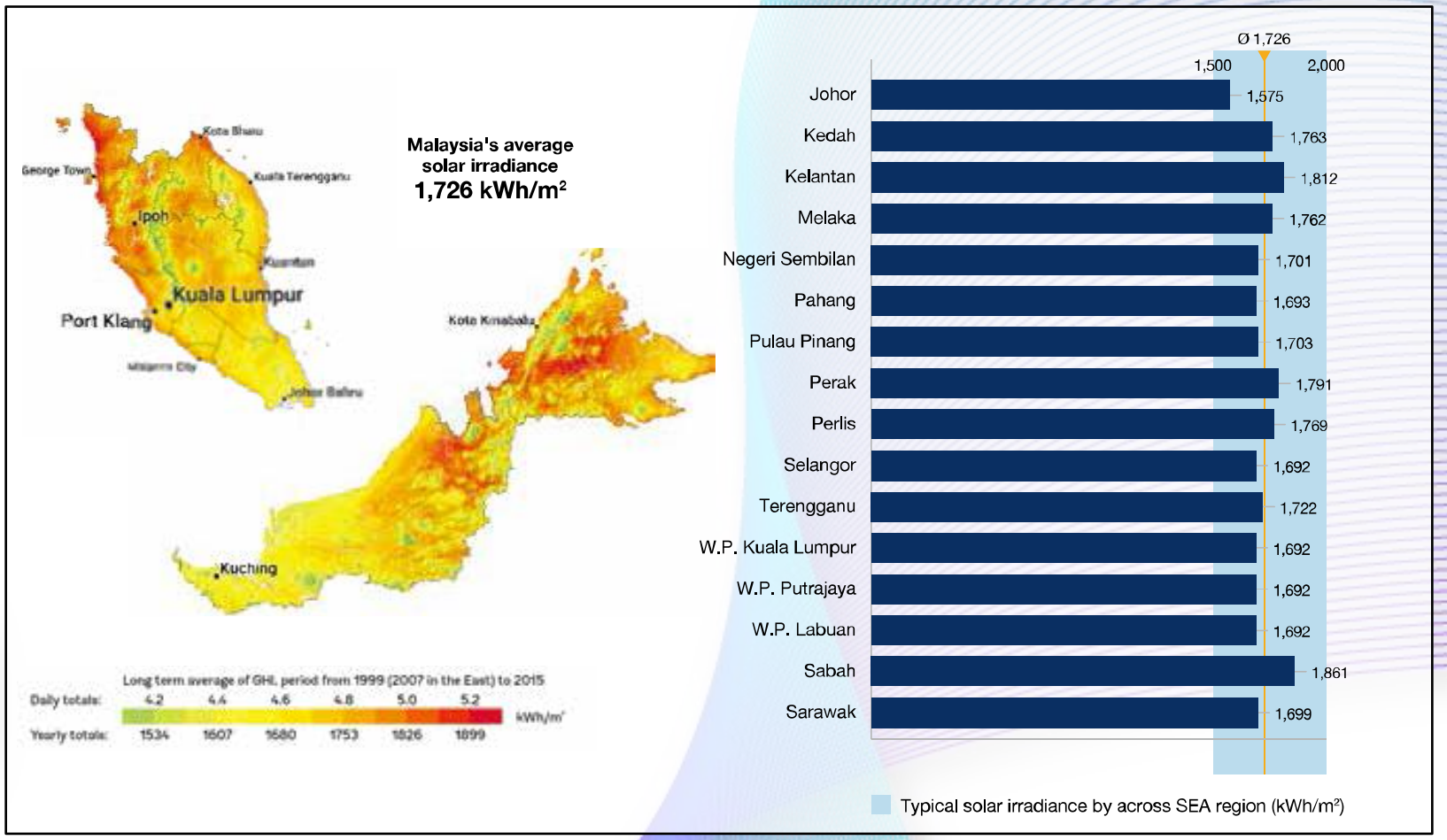
MALAYSIAN SOLAR ENERGY SECTOR – HIGH SOLAR IRRADIANCE



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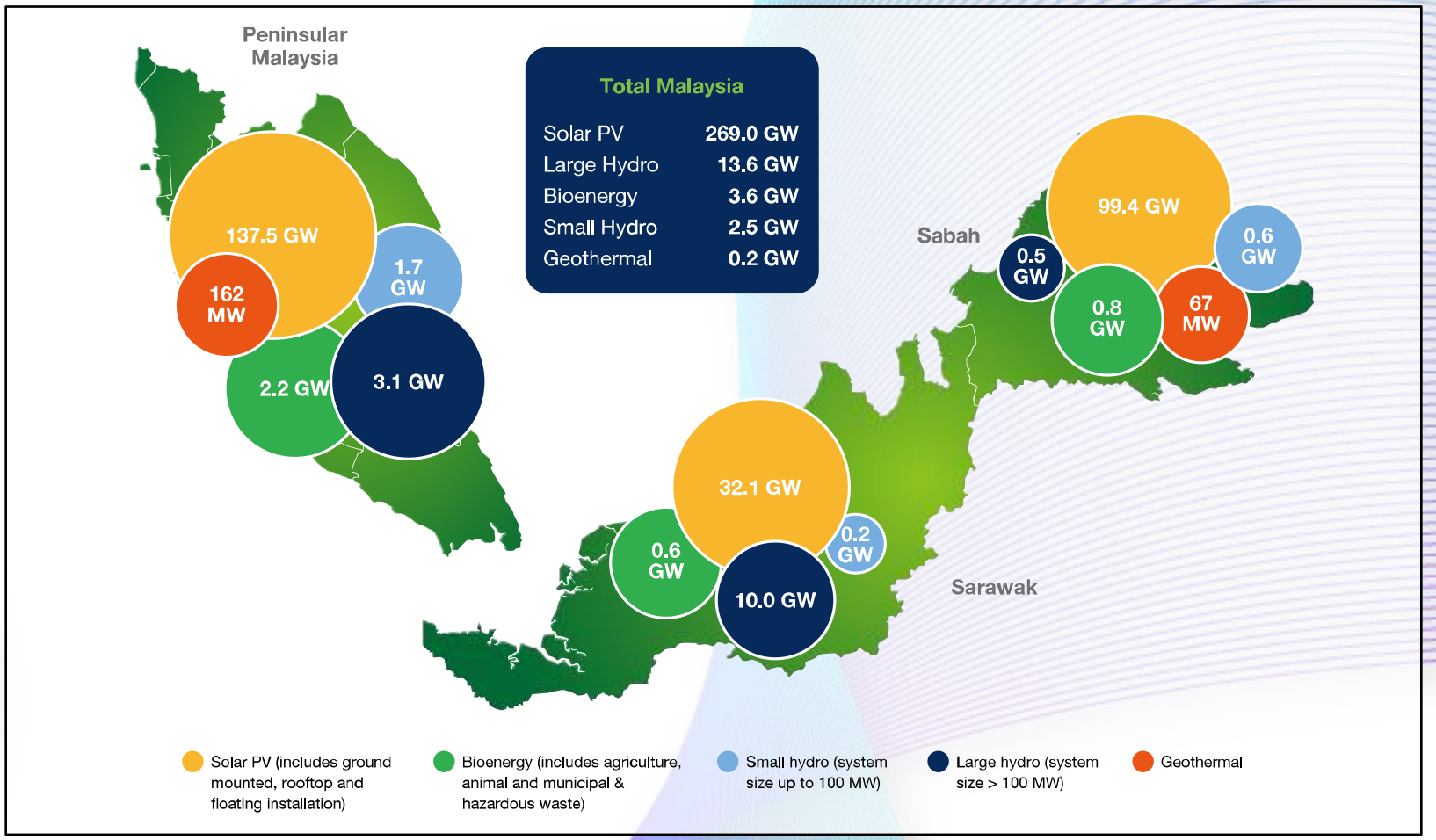
MALAYSIAN SOLAR SECTOR – AN UNTAPPED POTENTIAL OF 269 GW



Source: SEDA

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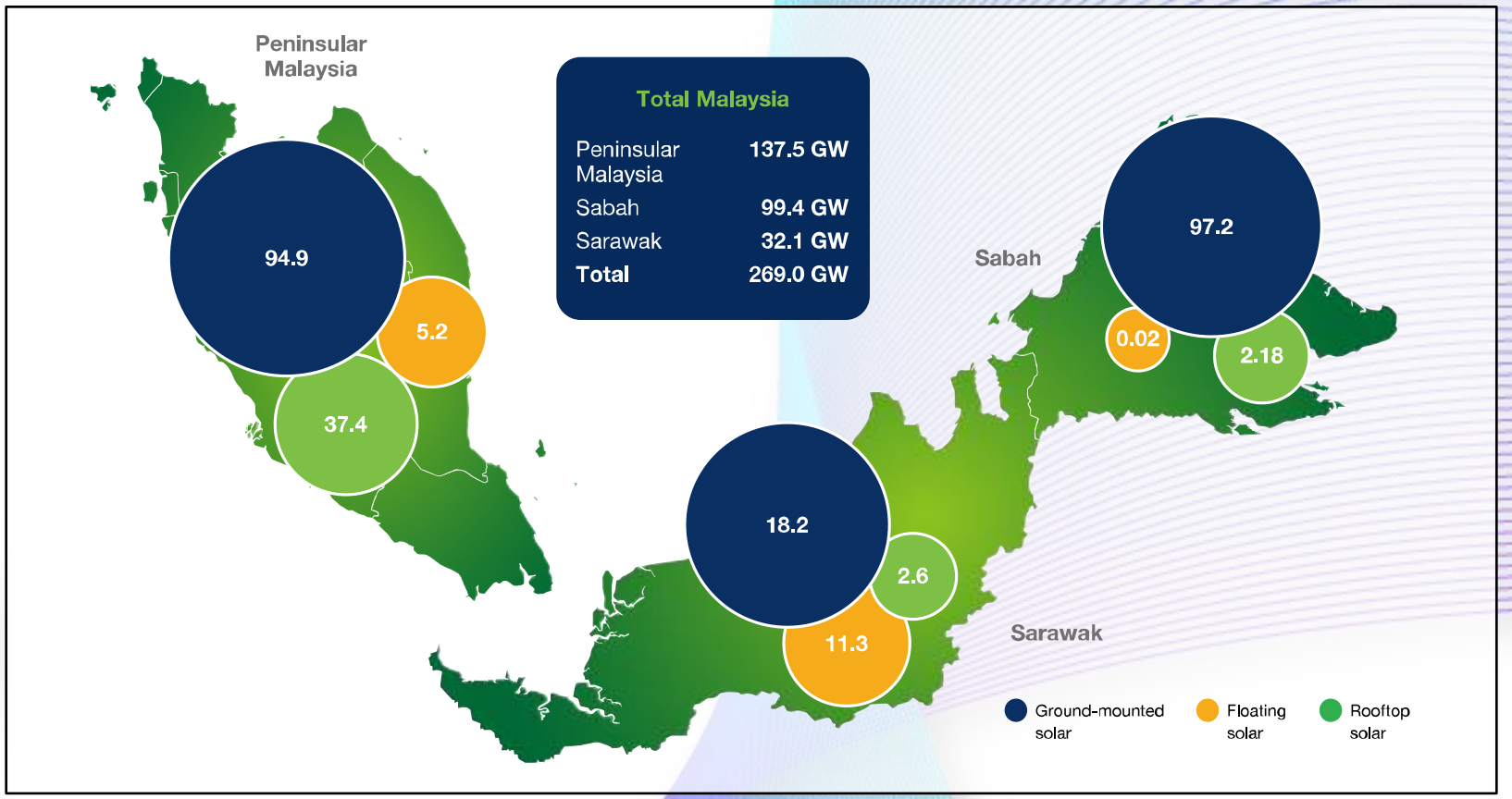
MALAYSIAN SOLAR ENERGY SECTOR –SOLAR PV RESOURCE AVAILABILITY BY INSTALLATION AND BY REGION



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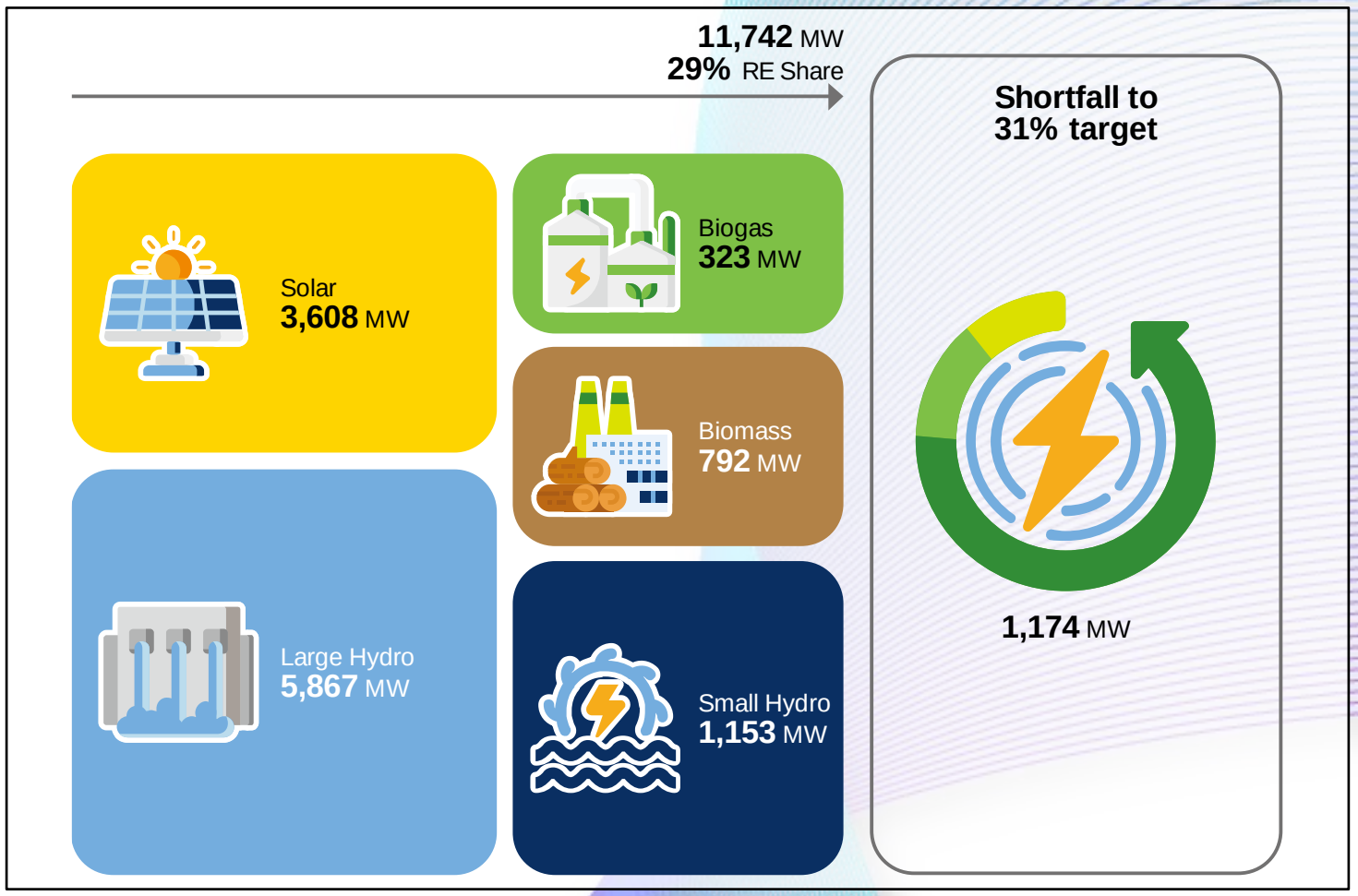
MALAYSIAN RE SECTOR – BAU SCENARIO BY 2025



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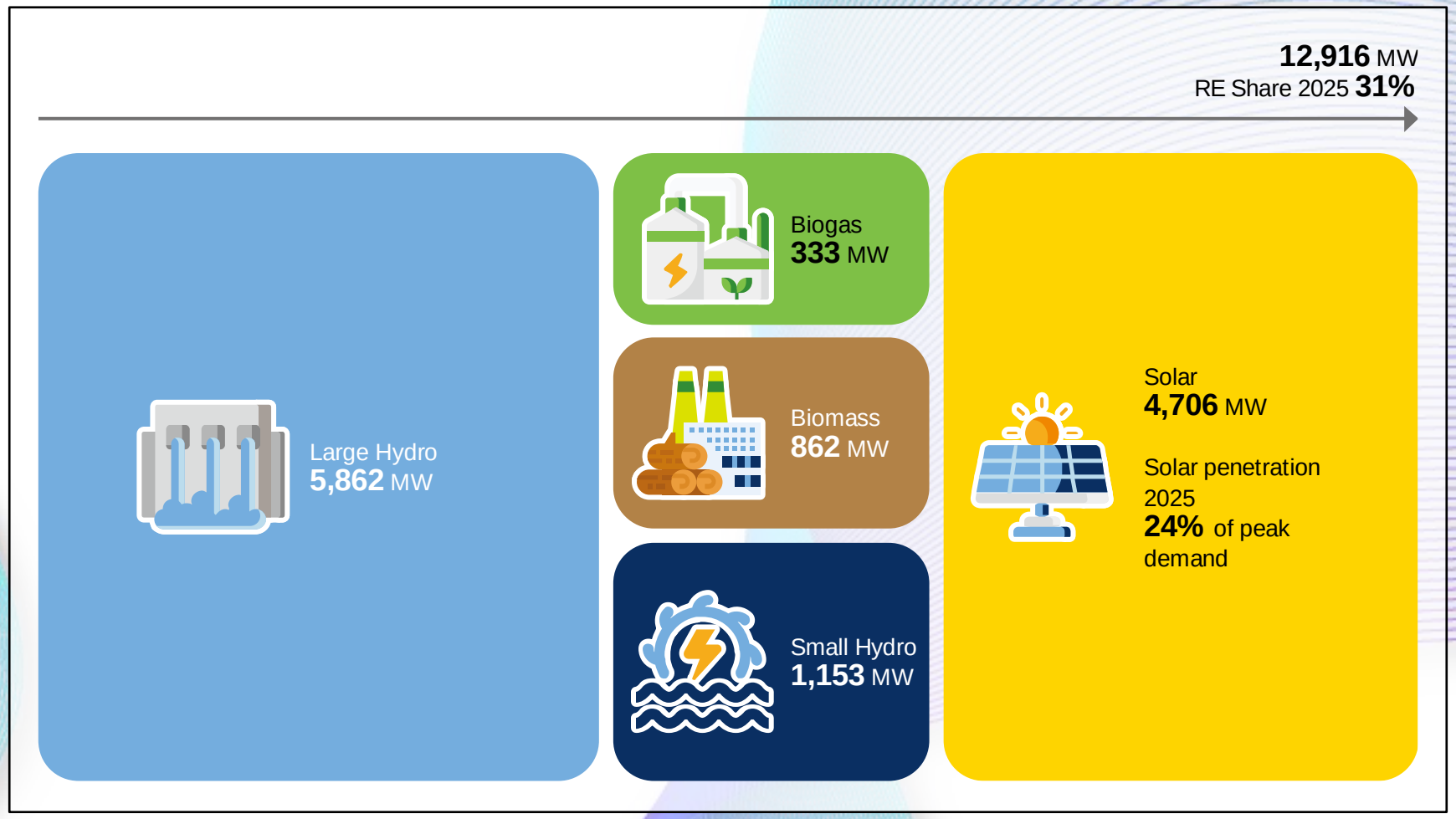
MALAYSIAN RE SECTOR – PLANNED 2025 TARGET



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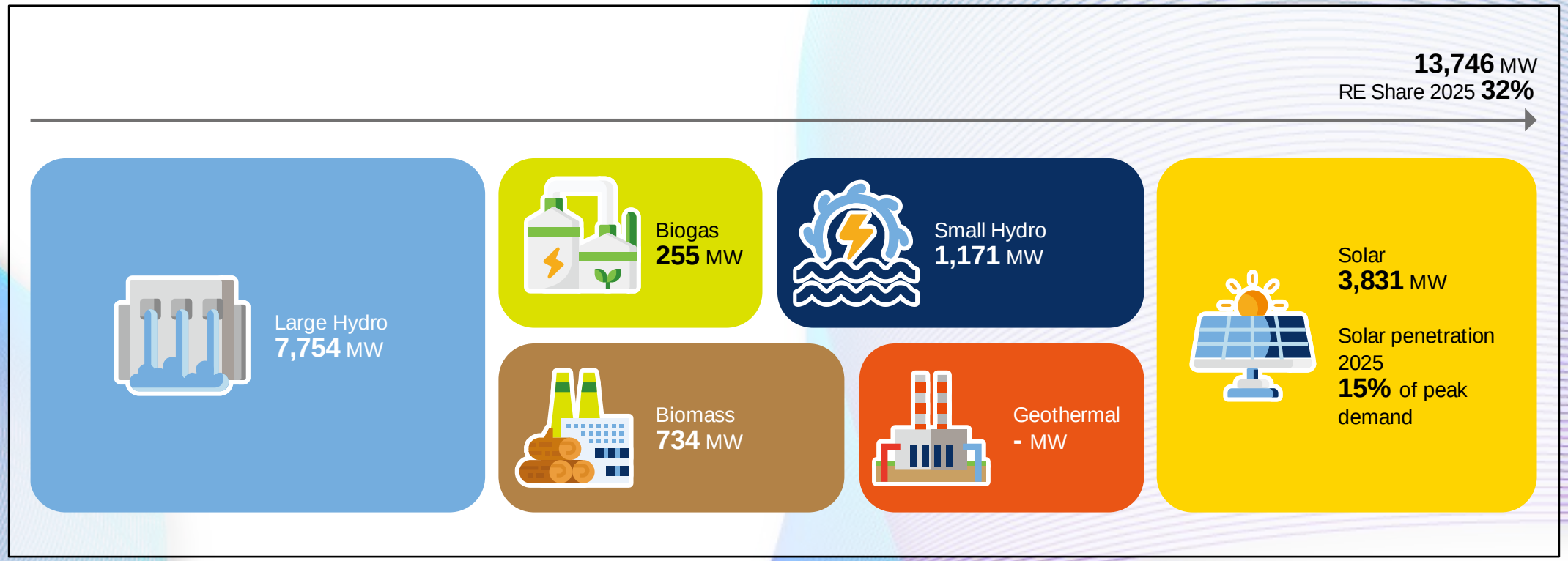
MALAYSIAN RE SECTOR – BAU SCENARIO BY 2035



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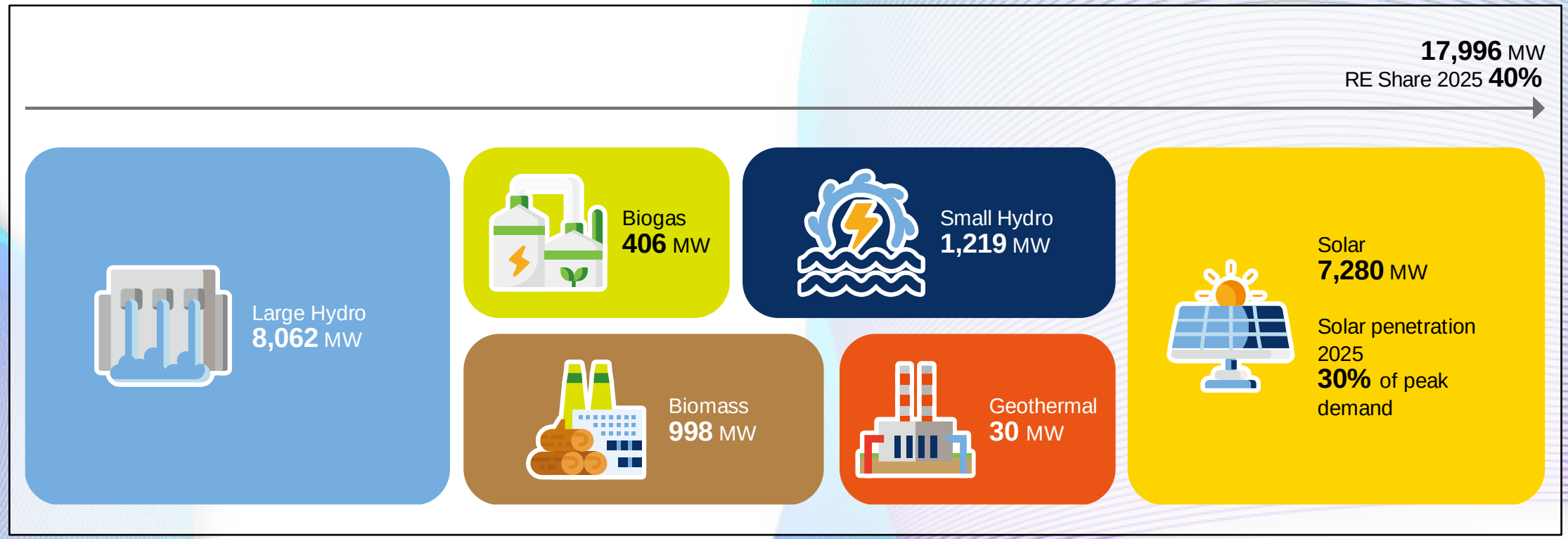
MALAYSIAN RE SECTOR – PLANNED 2035 TARGET



Source: SEDA

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MALAYSIAN SOLAR SECTOR – KEY ACTION PLANS:

SOLAR INITIATIVES	KEY ACTIONS UP TO 2025	KEY ACTIONS POST 2025
1.1 Accelerate Net Energy Metering (NEM)	• Enhancement of existing NEM programme - Accelerate NEM approval procedures - Promote awarness of NEM - Explore potential for government rooftop tendering program • Future NEM programmes - Review net metering tariff - Lift capacity limit restriction - Include Virtual Net Metering	• Liberalization of NEM tariff and new retailers to take role of off-takers • Continued implementation of government rooftop tendering program
1.2 Introduce new business model	• Enable corporate PPAs in line with Third Party Access framework • Pilot and implement P2P energy trading • Enhanced platform for RECs trading from rooftop and large scale solar, supporting corporate PPAs and Green tariff	• Large scale adoption of corporate PPAs in line with market reforms
1.3 Enhance large scale solar auctions	• Continue to promote floating solar PV in LSS auctions • Identify new LSS sites with states level cooperation	• Auction design to align with evolving technological advances and global best practices

Source: SEDA

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MALAYSIAN RE SECTOR – HUGE FUTURE ECONOMIC IMPACT

	Scenario BAU		Scenario New Capacity Target	
Cumulative Investment (MYR bn)	2021 - 2025 16.12	2026 - 2035 19.51	2021 - 2025 19.93	2026 - 2035 33.07
Emplyment Impact (# of Jobs)	2025 20,385	2035 27,786	2025 28,416	2035 46,636

Source: SEDA

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MALAYSIAN SOLAR ENERGY SECTOR – 5 KEY CHALLENGES

- Securing land for LSS;
- Securing affordable debt financing for solar PV rooftop systems;
- Capacity limits;
- Limitation of NEM scheme to assets on customers' own premises; and
- Lack of regulatory framework supporting customer choice.

Malaysia has a substantial amount of solar resources. With solar irradiation of 1,575 – 1,812 kWh/m2, higher than in some of the temperate regions where solar market is already well developed

Source: SEDA

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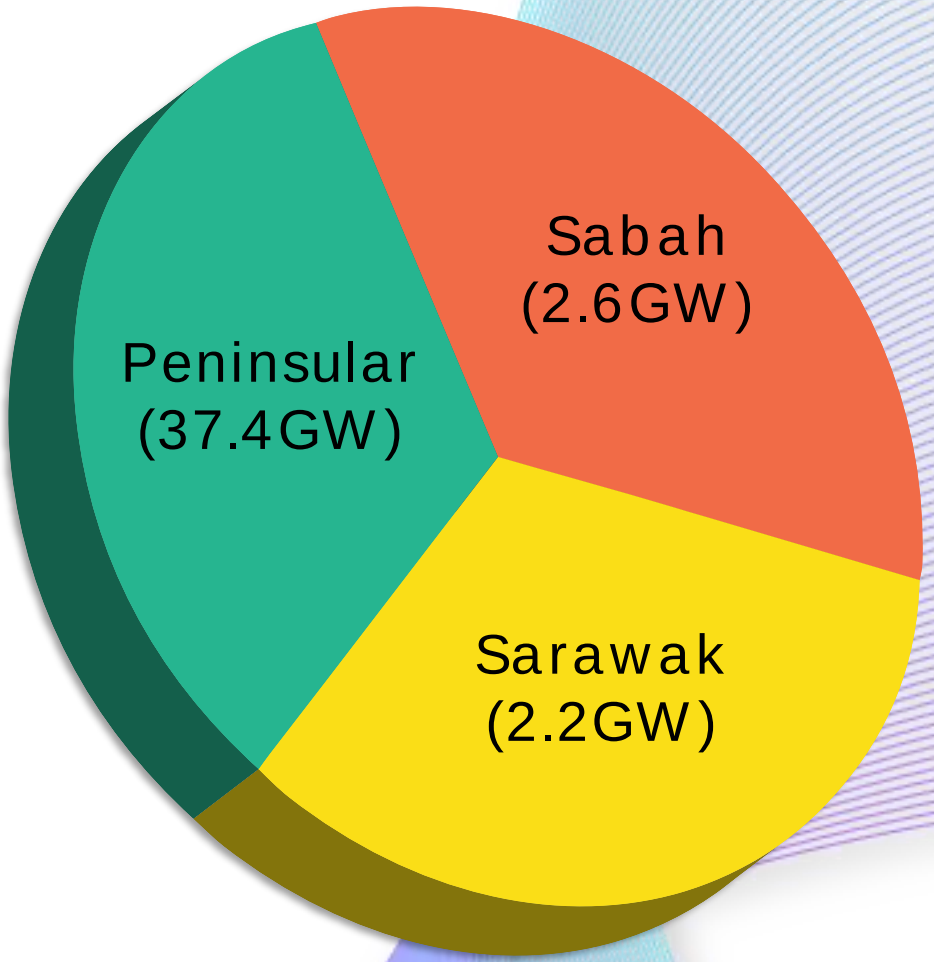
MALAYSIAN SOLAR ENERGY SECTOR – ROOFTOP SOLAR (BY REGION)



Source: SEDA

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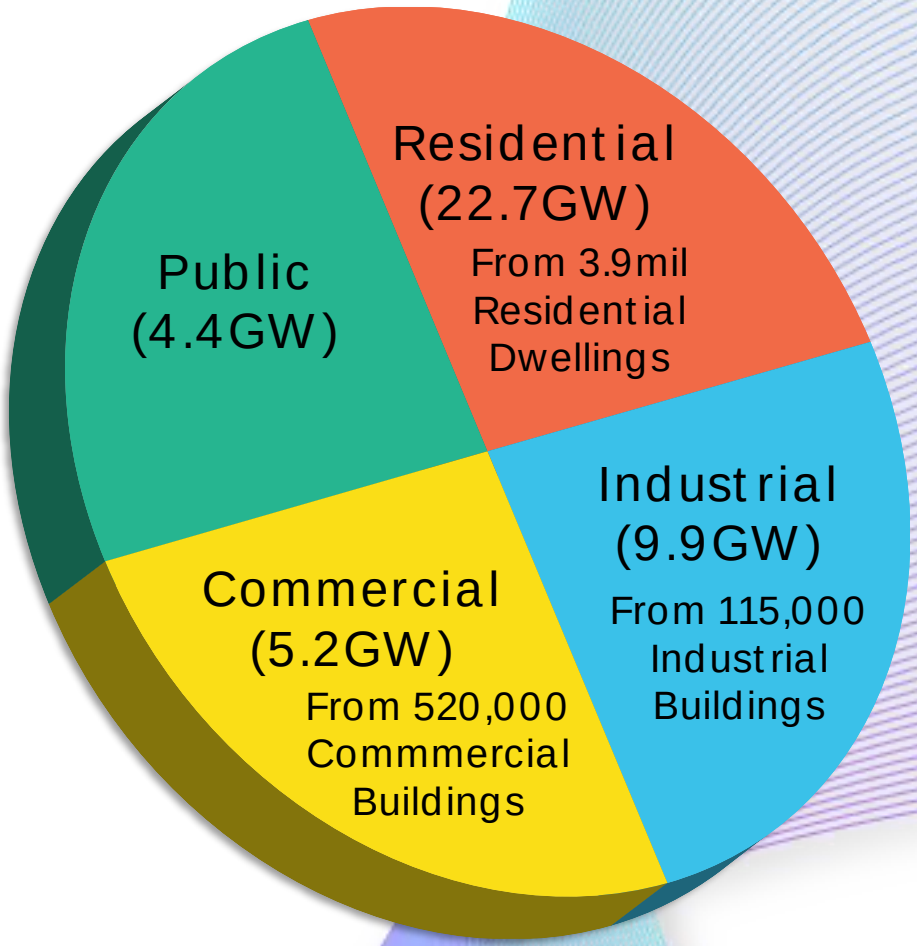
MALAYSIAN SOLAR ENERGY SECTOR – ROOFTOP SOLAR (BY INSTALLATION)



Source: SEDA

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MALAYSIAN SOLAR ENERGY SECTOR – ROOFTOP SOLAR (GOVT BUILDINGS)

Type of buildings	Rooftop availability: Potential capacity (MW_{AC}[1])		Rooftop availability: Rooftop space (km^2)	Jurisdiction: Centralized	Jurisdiction: Agencies involved
Government offices	35	PM 33 MW Sabah 1.26 MW Sarawak 0,96 MW	0.25	No	• Individual Ministries
Low cost flats	178	PM 164 MW Sabah 11 MW Sarawak 3 MW	1.24	Partial	• Ministry of Housing & Local Government • State level agencies
MOH Hospitals	179	PM 131 MW Sabah 26 MW Sarawak 22 MW	1.25	Yes	• Ministry of Health
Flats	210	PM 197 MW Sabah 10 MW Sarawak 4 MW	1.47	Partial	• Ministry of Housing & Local Government • State level agencies
Universities	591	PM 492 MW Sabah 37 MW Sarawak 61 MW	4.12	Yes	• Ministry of Education
Schools	3,229	PM 2,479 MW Sabah 524 MW Sarawak 226 MW	22.53	Yes	• Ministry of Education
Total	4,422		30,86		

Source: SEDA

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2.

RATIONALE

How Can We Address Malaysia's Quest for Economic Growth, Job Creation & Environmentally Friendly

A NEW HORIZON

Malaysia has struggled to generate economic activity in a sustainable manner and creating jobs has been a challenge

Objective is to cover the **top 20% of Residential users,** accounting some 780,000 households with solar PV over a period of next 10 years and accounting for 4.7 GW in Capacity (20% of total residential potential)

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RM17.78BIL ROLL OUT

With a capacity of 6KWp per household to enable households to reduce energy cost by RM350 per month, to roll out the **Solar PV plan will generate RM17.8bil* in economic output**

Manpower needs will be tremendous as this can provide at least **2,000 jobs** to installers and marketers.

**Cost per household is estimated at RM3,800 per KWp*

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WITH RM22.93BIL REVENUE

Based on a 7-year break-even point, residential households will continue to pay RM350 monthly fixed rate to Solar SPV and thereafter, enjoy free electricity worth the same amount for the next 18 years.

With 780,000 households (20% target of the 3.9mil household dwellings), the **total revenue generated is RM22.9bil between 2023 up to 2037.**

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WITH ROOM TO GROW

Malaysia can also explore higher penetration rate of the residential market with target of **40-50% of households** as price of Solar PV declines over time

In addition, **LSS** is another area to explore, especially in relation to **utilizing unused large track of land**. Malaysia should also **explore wind energy** although seen economically unviable for now due to limited wind speed.

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3.

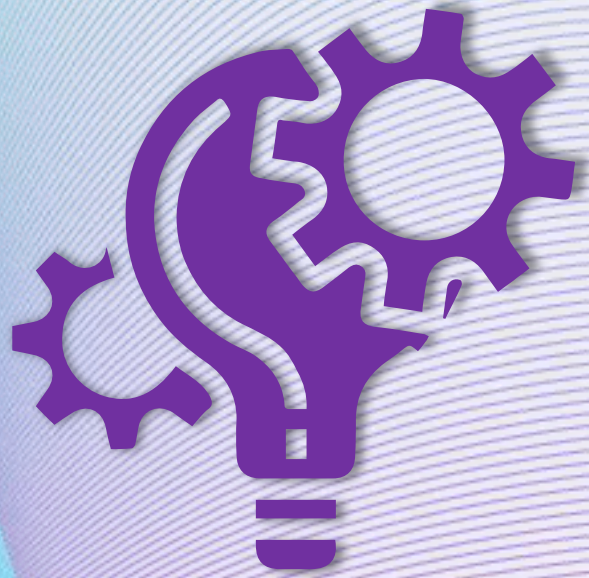
PROPOSED STRUCTURE

Its All About Numbers - Making it Work Via Cleverly Structured SPV and Funding

A RE PROGRAM CAN BE A PRIVATE PUBLIC PARTNERSHIP (PPP) MODEL

Government
(80%)

Private
(20%)



Project
Matahari

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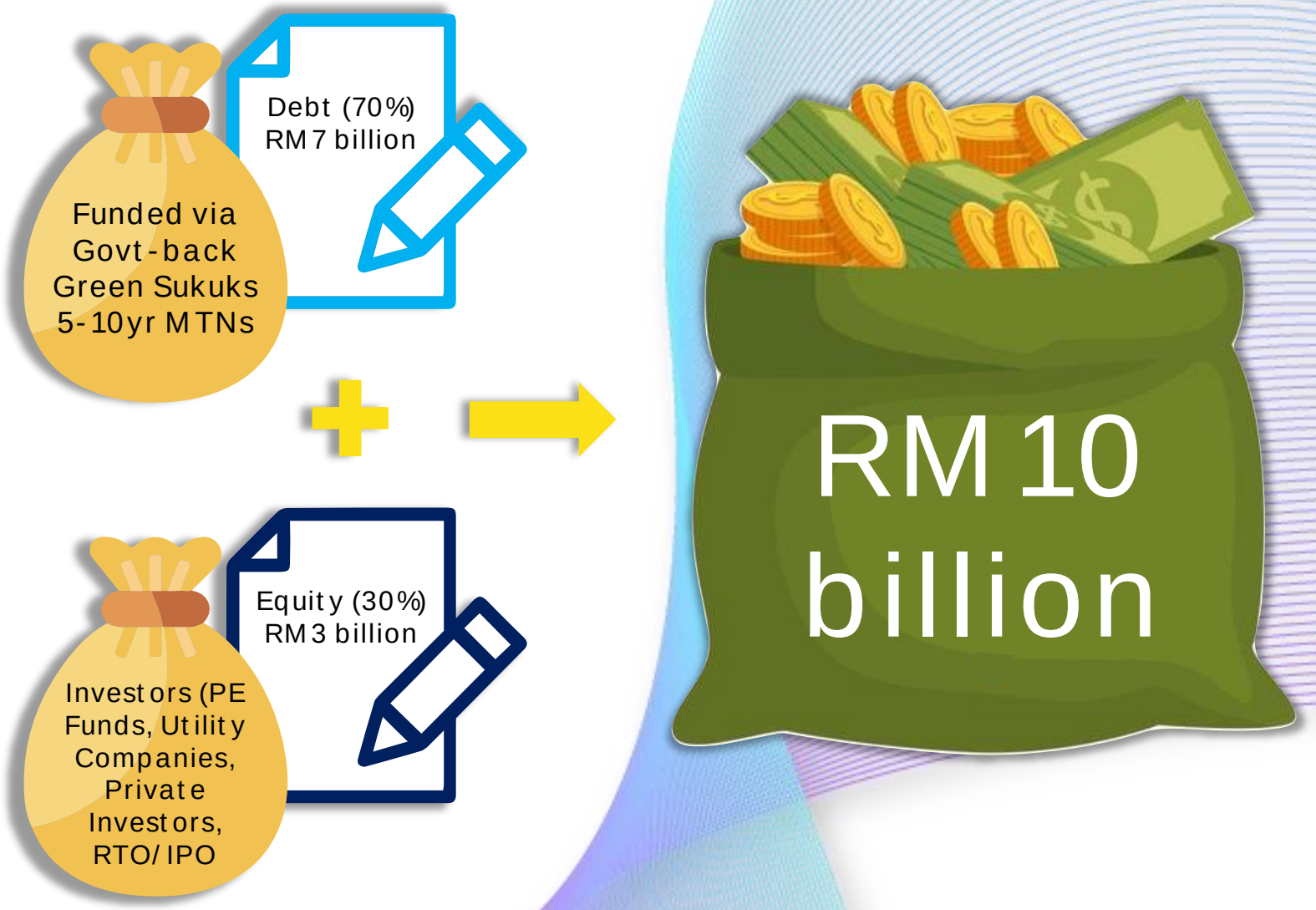
FUNDED VIA 70:30 DEBT/EQUITY



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FUNDING FOR PROJECT MATAHARI

Government (80%)
RM8 billion

Private (20%)
RM2 billion

Debt (70%)
RM5.6 billion

Equity (30%)
RM2.4 billion

Debt (70%)
RM1.4 billion

Equity (30%)
RM0.6 billion

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FUNDING FOR PROJECT MATAHARI

Both the equity and debt needed for the **first 2 years** of operations will be raised from the first year onwards (RM2bil in total or RM1.4bil in debt and RM600mil in equity) right up to the year 2027 progressively.

For the government, its share of equity is RM480mil based on its 80% equity ownership and the Project Matahari promoters will chip in RM120mil.

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4.

RECOMMENDATION

What is The Expected Government Support Required to Make Malaysia's RE Journey A Success?

A POLICY STATEMENT

Given the scale of incentives that are being planned, it is necessary for the government to first introduce a policy guidelines in the form of a **Proposed Households Solar Panel Rollout from 2022 onwards**

The Government could also provide a financial grant to roll out a comprehensive feasibility study over the next 3-6 months. Following that, a newly set-up SPV, owned by the private sector, will undertake the rollout of the planned programs

Funding will be via issuance of Green Sukuks

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A MULTI-PRONG ACTIONABLE PROJECT

This is an important milestone for Malaysia as it will transform the nation to be environmentally conscious and adopting climate change issues.

At the same time, the rollout will not help to generate economic activity but help to create employment as well as attract FDIs as Malaysia cannot afford and sit back while our neighboring countries are moving forward.

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THANK YOU