

# Experience Sharing: Utility Scale Solar Development

Bursa Stratum on RE

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CONFIDENTIAL AND PROPRIETARY



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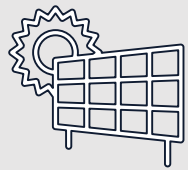
TNB Renewables Is Your Partner Of Choice

To be a  
**leading sustainable clean energy  
asset developer and asset manager  
in Malaysia and South East Asia**



# TRe's 4 Key Trusts

## Driving Renewable Energy Business



### Win LSS

Largest driver which focuses on winning local LSS bids, exploration of new entry points : NEDA and Green Corporate PPA. Expansion on Asset Management Services



### Secure Small RE

Focus on mini hydro, biogas and Waste to Energy through the existing Feed-In Tariff Scheme and other initiatives



### Capture Growth in South East Asia

Exploration of South East Asia focusing on Vietnam and Indonesia as the main targets. Solar and Wind as the focus technology at the moment



### New RE Tech

Exploration and Pilot Investments for high potential RE and RE related technologies such as Battery Energy Storage, low wind technology and others.

## Malaysia's RE Journey

Renewable Energy is in the Mainstream

90s : Research stage, 1998 – Uniten Grid Connect



00s: MBIPV Program, houses, offices. REPPA for grid connect RE



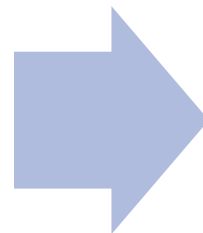
2011-2014 : Feed in Tariff (for Solar PV), other RE continue post 2014



2016 and Beyond: LSSPV Bid

# What's Next?

Distributed Generation, Battery Energy Storage, Electric Vehicles, Clean Energy



Supported by regulations, cost efficiency (financing), technology, digital


# RE/Solar Development Model

## Feed-in Tariff, PPA and Merchant models

<u>Scope</u>	<u>FiT</u>	<u>PPA</u>
<b>Capacity allocation</b>	Quota assignment/ pre qualification	Bid/Direct awards
<b>Tariff</b>	Fixed	Based on submission by developer
<b>Timeline</b>	Tariff is tied to COD, potential change	Specific based on bid requirement
<b>Interconnection Point</b>	Various	Various
<b>Interconnection</b>	Main Intake Substation within the vicinity of development	Need to connect to the nearest Main Intake Substation
<b>Interconnection Scheme</b>	Up to the site boundary only	Up to the Main Intake Substation
<b>Land</b>	Allocated, pre-determined	Developer to own/lease
<b>Permits and approvals</b>	Less and more straight forward approval	Depending on local authorities scope

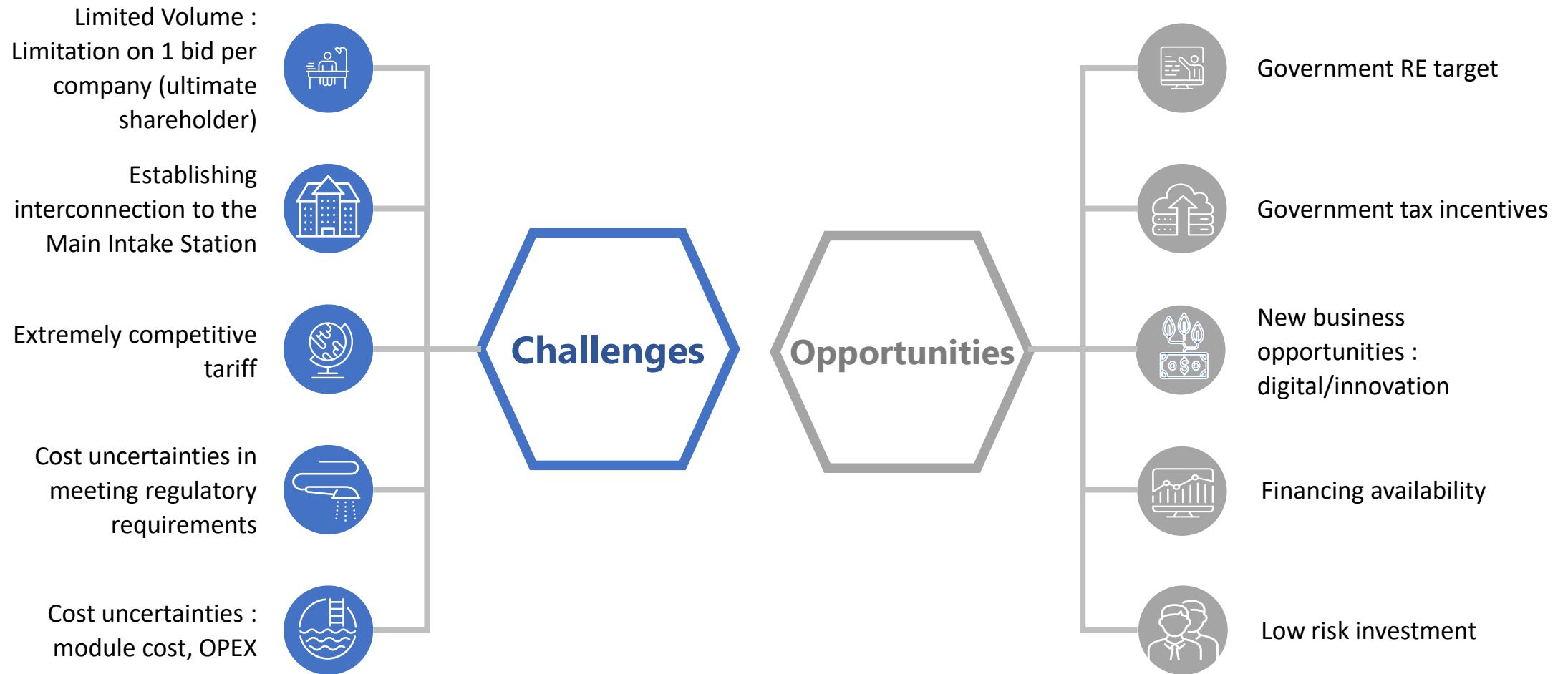
# Malaysia vs. Others

## Various Large Scale Solar Development Models

Scope	 <u>Malaysia</u>	 <u>Abu Dhabi</u>	 <u>Egypt</u>	 <u>Saudi</u>	 <u>Vietnam</u>	 <u>UK</u>
Program	Bid	Bid	FiT	Bid	FiT	FiT
Development site	Developer Site	Centralize	Centralize	Centralize	Developer Site	Developer Site
Development Structure	Developer (local min 51%)	Developer (40%) + Utility (60%)	Developer	Developer	Developer (local min 20%)	Developer
Interconnection	Developer to connect to substation at HV or MV	Substation next to development	Substation within vicinity. Provide connection at boundary (22kV)	LILO to 132kV- within vicinity, to establish substation within site	Developer to connect to substation at MV	Developer to connect to substation at HV or MV
Permits and local approval	Developer	Provided	Provided	Provided	Developer	Developer

# Challenges and Opportunities

## Large Scale Development





# Conclusion

## Large Scale Solar is a viable option

- 1 Solar is a low risk investment, investors are keen to invest, financing scheme widely available
- 2 Cost management in solar is essential with very competitive tariff and competition
- 3 Robust regulation and strong program is very important to attract investments

**TRe is keen to play an active role in RE development and asset management in Malaysia and within the South East Asia region, we can be your sustainability partner**

# Thank You

Yusrizal Mohd Yusof

TNB Renewables

[mmohdyus@tnb.com.my](mailto:mmohdyus@tnb.com.my)

+60193517717