

8 September 2021

Utilities | Power

## Power

## Overweight (Maintained)

### Net Zero Emissions; Keep OVERWEIGHT

- **Stay OVERWEIGHT; Top Pick: Tenaga Nasional (TNB).** TNB's recent net zero emissions pledge reflects a stronger commitment towards energy transition. While its coal capacity target seems achievable, a clear plan is needed to tackle carbon neutrality. Meanwhile, we expect more solar EPCC contracts to be awarded to contractors. However, elevated solar panel prices could erode project returns of both asset owners and contractors.
- **Net zero emissions pledge.** Last week, TNB pledged net zero emissions and to be coal free by 2050, with an interim target to reduce emission intensity by 35%, and coal capacity by 50% by 2035. Assuming no new coal capacity additions, and based on the current plant retirement schedule, TNB's coal capacity (excluding JV& associates) will be reduced by 48% by 2030, and all its coal plants will be fully retired by 2045 when the current power purchase agreements (PPAs) are honoured. Therefore, TNB should have no problem achieving its coal capacity targets. Apart from expanding its renewable energy (RE) footprint, TNB will also accelerate investments into emerging green technologies – eg green hydrogen, carbon capture and utilisation (CCU) – to achieve its carbon neutrality goals.
- **More LSS4 EPCC works.** Following the signing of the 21-year large scale solar (LSS) photovoltaic (PV) PPA agreements between TNB and most of the shortlisted public listed players, we expect more LSS4 EPCC contract flow in the coming months – discussions with other shortlisted bidders are ongoing. Apart from Solarvest, players including Samaiden (SAMAIDEN MK, NR), Pekat (PEKAT MK, NR) and Uzma (UZMA MK, NR) are also eyeing for a share of the pie. We understand that solar panel prices remain fairly elevated at USD0.28-0.29/W – a huge jump from USD0.20-0.21/W during Jun 2020's LSS4 tender period. The price impact will be shared between asset owners and solar EPCC contractors, depending on negotiations. We believe EPCC contractors with bulk orders tend to enjoy better economies of scale, while asset owners with internal EPCC capabilities see better cost management. Some players have a wait-and-see approach as they believe solar panel prices will cool off.
- **ESG update.** We have decided to be more cautious on our scoring to reflect a company's current status, rather than its plans. TNB's "Environment" score is revised to 1.3 from 2.0 to reflect the current high coal capacity mix and elevated carbon intensity. While we are positive on its pledge to reduce carbon neutrality and ramp up its RE capacities, we will only revise upwards our score when a better report card is seen. With that, TNB's average ESG score is lowered to 2.9 (from 3.1). Post revision, the average ESG score for utilities firms under our coverage drops marginally to 3.09 from 3.12, with Solarvest remaining the top scorer (3.3), with TNB scoring the lowest. Risks include unfavourable regulatory changes, inability to ramp up its RE mix, and weaker project margins.

Stocks Covered 6  
Rating (Buy / Neutral / Sell): 4 / 2 / 0  
Last 12m Earnings Revision Trend: Neutral

#### Top Picks

Tenaga Nasional (TNB MK) – BUY

#### Target Price

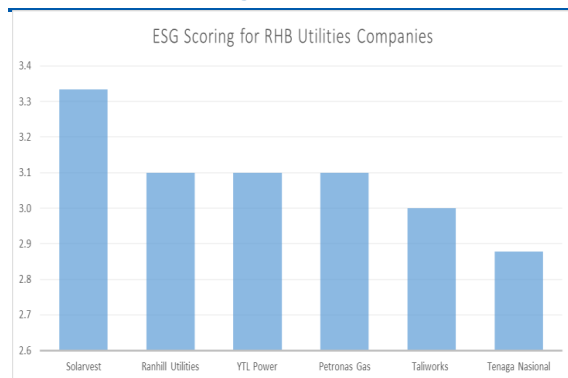
MYR12.49

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#### Revised ESG scoring



Source: Company data, RHB

Company Name	Rating	Target (MYR)	% Upside (Downside)	P/E (x) Dec-21F	P/B (x) Dec-21F	ROAE (%) Dec-21F	Yield (%) Dec-21F
Petronas Gas	Neutral	17.06	1.5	16.9	2.6	15.4	4.9
Ranthill Utilities	Buy	0.89	22.7	22.5	1.9	8.0	2.8
Solarvest	Buy	1.51	10.3	47.6	5.4	13.3	0.1
Taliworks Corporation	Buy	0.94	12.7	30.7	1.9	6.0	7.9
Tenaga Nasional	Buy	12.49	20.8	13.2	1.0	7.8	4.4
YTL Power	Neutral	0.77	7.5	13.0	0.5	3.8	6.2

Source: Company data, RHB

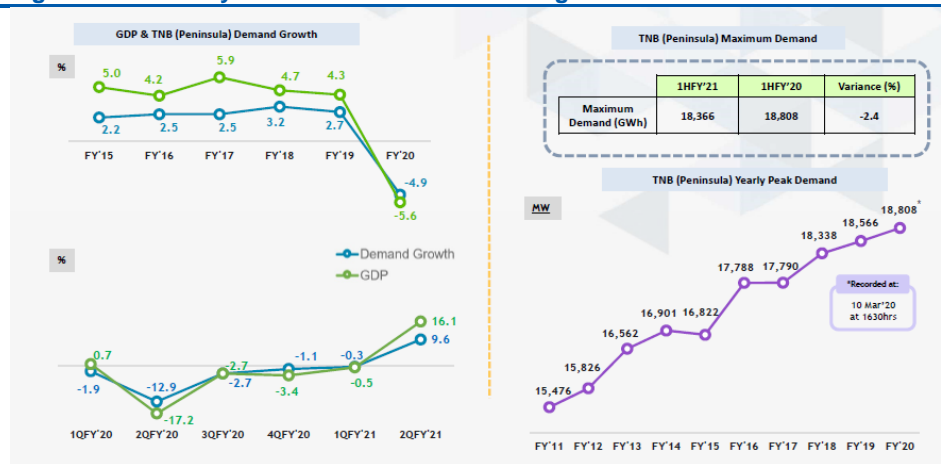
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## TNB's Net Zero Emissions Pledge

Electricity demand improved 16.1% YoY and 0.7% QoQ in 2Q21. Industrial and commercial consumption fell 4.9% and 0.5% QoQ, while domestic consumption improved 10.7% QoQ. We expect electricity demand to pick up, led by industrial and commercial recovery – in tandem with the gradual reopening of the domestic economy and in accordance with the 2.9% approved demand forecast under the Regulatory Period 2 (RP2). The reserve margin is estimated at 52% in 2021, and is expected to drop below 25% in 2030, before settling at 21% by 2039. Note: The Energy Commission (EC) has projected a net electricity demand growth of 0.6% pa for 2021-2030 and 1.8% pa for 2030-2039.

Figure 1: Electricity demand is in line with GDP growth



Source: TNB

Last week, TNB pledged to achieve net zero emissions by 2050, with an interim target of emission intensity reduction by 35% and coal capacity reduction by 50% by 2035. By 2050, TNB aspires to achieve net zero emissions and be coal free. It currently has total gross installed capacity of 16,031 MW (excluding JVs and associate investments), of which 48% or 7,680MW are coal plants. Assuming no new coal capacity additions, and based on the current plant retirement schedule, TNB's coal capacity will be reduced by 48% by 2030 and all the coal plants will be fully retired by 2045, when the current PPAs are honoured. If we were to include the 25% owned 1,400MW Jimah Energy Venture coal plant and 30% owned GMR 1,650MW coal plant, TNB's gross coal capacity will be reduced by 47% by 2033. Therefore, TNB should have no problem in achieving its coal capacity targets.

### No new coal plants for Malaysia?

According to a press release by the Ministry of Energy and Natural Resources, Malaysia will not be building new coal power plants. However, the Ministry does not discount the possibility of extending the operations of current plants – depending on future availability of technologies to reduce emissions, and the cost of adopting such technologies. This is somewhat contradictory to the EC's earlier publication in March, which noted new coal plants with a total capacity of 2800MW and commercialisation scheduled between 2031 to 2037. As TNB has pledged not to invest in coal plants, we believe it will not participate in the tenders if these plans do materialise.

Figure 2: TNB's total installed capacity

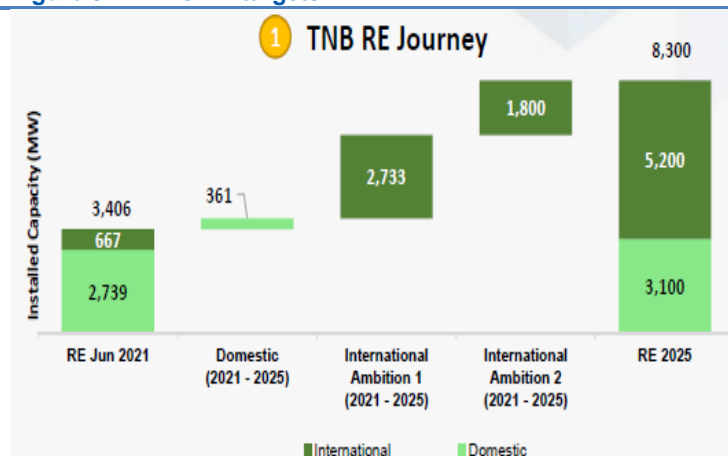
No	TNB Power Plants	Type	Expiry Date	Extension	Capacity (MW)
1	PGPS (Sultan Iskandar)	CCGT	Aug 2017	Aug 2022	275
2	S.J Temengor	Hydro	Aug 2022	-	348
3	S.J Bersia	Hydro	Aug 2022	-	72
4	S.J Kenering	Hydro	Aug 2022	-	120
5	S.J Chenderoh	Hydro	Aug 2022	-	41
6	S.J Sg.Piah	Hydro	Aug 2022	-	69
7	Gelugor	CCGT	Aug 2024	-	310
8	Serdang (Putrajaya)	CCGT	Aug 2015	Aug 2025	252
9	S.J. Kenyir	Hydro	Aug 2025	-	400
10	S.J Sultan Yusof (JOR)	Hydro	Aug 2027	-	100
11	S.J Sultan Idris (WOH)	Hydro	Aug 2027	-	150
12	Tuanku Ja'afar PD1	CCGT	Aug 2028	-	703
13	Kapar Energy Ventures (KEV)	Coal	Jul 2029	-	1,600
14	Kapar Energy Ventures (KEV)	Gas	Jul 2029	-	600
15	Tuanku Ja'afar PD2	CCGT	Jan 2030	-	708
16	SJ Janamanjung (Unit 1-3)	Coal	Aug 2030	-	2,070
17	CBPS Redevelopment	CCGT	Mar 2037	-	375
18	TNB Prai	CCGT	Feb 2037	-	1,071
19	S.J Pergau	Hydro	Aug 2037	-	600
20	TNB Sepang Solar	Solar	Nov 2039	-	50
21	Manjung 4	Coal	Apr 2040	-	1,010
22	TNB Bukit Selambau	Solar	Sept 2041	-	30
23	Southern Power Generation (SPG) (Unit 1)	CCGT	Feb 2042	-	720
24	Southern Power Generation (SPG) (Unit 2)	CCGT	Feb 2042	-	720
25	Manjung 5	Coal	Aug 2042	-	1,000
26	Jimah East Power (JEP) (Unit 1)	Coal	Aug 2044	-	1,000
27	Jimah East Power (JEP) (Unit 2)	Coal	Jan 2045	-	1,000
28	Hulu Terengganu	Hydro	Dec 2045	-	265
29	Ulu Jelai	Hydro	Sep 2046	-	372
TOTAL TNB INSTALLED CAPACITY (MW)					16,031

Source: TNB

### Multiple strategies to carbon neutrality

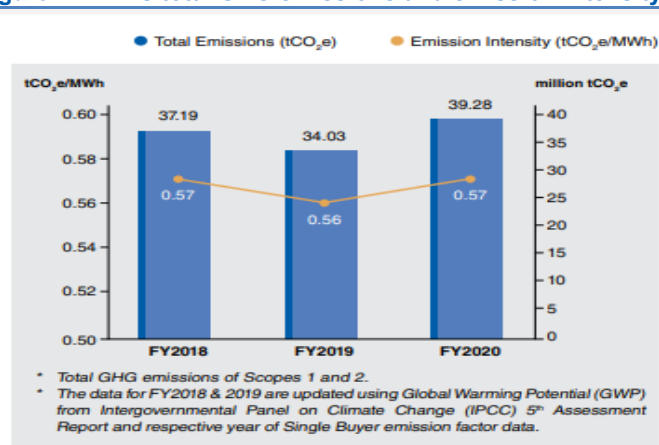
While the coal capacity reduction target appears to be achievable, we have yet to see a clear plan of how TNB can achieve its interim emissions targets, as well as its ultimate net zero goal. In 2020, its greenhouse gas (GHG) emissions intensity was slightly higher than that of 2019 at 0.57, but total GHG emissions mitigated rose 11.3% from 5.37m tonnes of carbon dioxide equivalent (tCO<sub>2</sub>e) to 5.98m tCO<sub>2</sub>e, as a result of efforts to promote low-carbon generation, RE, and Energy Efficiency (EE) solutions. The carbon intensity, in our view, should be lower in the long run, following the gradual retirement of existing coal plants and the increase of RE capacities. Apart from expanding its RE footprint, TNB will accelerate investments into emerging green technologies (eg green hydrogen, CCU) to achieve its carbon neutrality goals. At this juncture, carbon capture technology has yet to achieve commercialisation breakthrough for most installations.

Figure 3: TNB's RE targets



Source: TNB

Figure 4: TNB's total GHG emissions and emission intensity



Source: TNB's annual report 2020

### 300MW Nenggeri hydropower plant to close the domestic gap

Yesterday, TNB announced that it has received a Letter of Notification from the Ministry of Energy and Natural Resources to develop a 300MW hydropower plant at Mukim Ulu Nenggeri, Kelantan. Construction works of the project is estimated to take five years and the expected scheduled commercial operations date (SCOD) is 1 Jun 2027. We are not surprised by the news as it has been guided by management earlier on. Despite the hydro plant will increase its existing total gross capacity by 1.4%, we are positive on the news as it raises TNB's existing hydro capacity (gross capacity) by 11% to 2,989MW, lifting the total RE capacity by 9% to 3,706MW. With that, hydro and RE capacity will account for 14% and 16% of its total capacity. We have yet to get further details from management but the capex is guided at c.MYR5bn.

This would also close the bulk of the domestic gap of another 361MW RE capacity by 2025. Following that, we understand that the EC has not planned for any new hydro plant of similar size in Peninsular Malaysia until 2039. Hence, the focus will be on bidding for LSS voltaic plant projects and small RE jobs, ie mini hydro, bio-gas and waste-to-energy through the existing feed-in tariff scheme and other initiatives. Positioning as an infrastructure provider, TNB has also stepped up efforts to accelerate domestic electric vehicle (EV) adoption, which include a recent MoU with DHL and the establishment of an internal EV team.

### Prioritising international RE capacities

TNB has set an overall RE target of 8.3GW by 2025 (from 3.4GW in Jun 2021), and more than 90% of the gap will be filled up by international RE capacity expansion. It is not surprising for TNB to focus on the market abroad given the local market's growth potential could be too small for its earnings base. The formation and establishment of Vantage RE Ltd or Renewable Asset Company (RACo) was completed on 1 Jul 2021. This platform will own, operate and manage a portfolio of RE assets in the UK and throughout Europe, while the recent divestment of India-based GMR Bajoli Holi Hydropower Pvt Ltd's compulsory convertible debenture allows TNB to defocus on India and turn to other markets ie the UK, Europe and South-East Asia.

While we acknowledge RE opportunities are aplenty in the key markets targeted by TNB, concerns remain over the deterioration of returns on investments as compared to conventional fossil fuel. The earlier generation of PPA for typical thermal plants provides much greater returns and has normalised to c.10-12% IRR in recent years. With significant investments pouring into the RE space, the average returns for these projects, especially onshore solar, tend to be kept at single digits.

## Malaysia's RE Roadmap

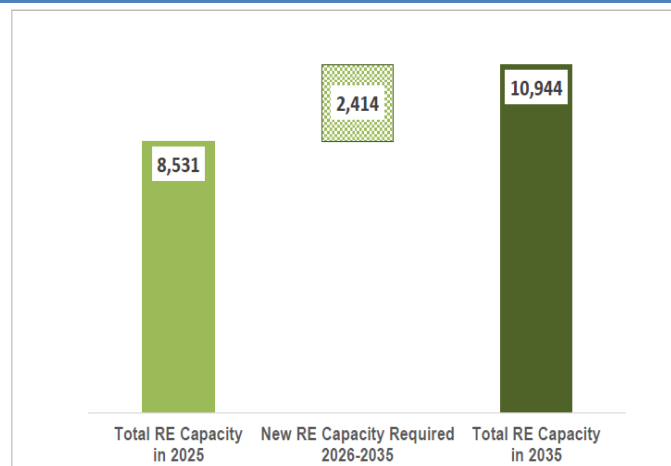
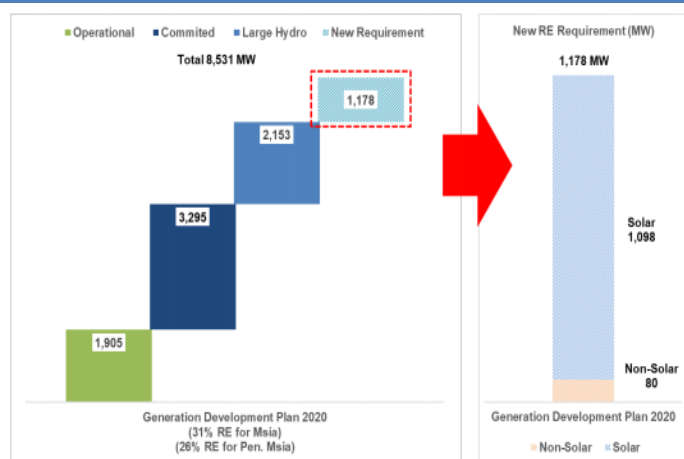
Malaysia is targeting to achieve 31% RE capacity mix target by 2025, and further increase to 40% by 2035. Current installed capacity for RE in Malaysia is 7,995MW and is projected to increase more than double to 18,000MW by 2035. This is higher than the initial target of 20% in 2025 set by the previous administration. The revision also took into consideration the large hydro resources as part of RE definition for Malaysia, consistent with practices adopted by other countries internationally.

The current large hydro capacity domestically stands at 5,684MW, with West Malaysia contributing about 2,232MW. In order to achieve the 31% RE capacity mix target for Malaysia by 2025, a total of 1,178MW of new RE capacities needs to be developed in Peninsular Malaysia from 2021. The additional RE capacities consist of 1,098MW of solar and 80MW of non-solar.

It was reported in the media in July that the Economic Planning Unit will be launching Malaysia's National Energy Policy soon. This will be followed by specific action plans for a better energy transition towards a low-carbon future.

**Figure 5: Peninsular Malaysia's new requirement to meet 31% RE capacity mix by 2025**

**Figure 6: Peninsular Malaysia's new requirement to meet 40% RE capacity mix by 2035**



Source: Report on West Malaysia Generation Development Plan 2020 (2021-2039)

Source: Report on West Malaysia Generation Development Plan 2020 (2021-2039)

## Balancing energy trilemma

The decline in solar panel prices has helped to push down average tariffs in the past few years. The bidding tariff range under LSS1 in 2017 was 39-65 sen per kWh and we are guided that shortlisted tariff averaged at c.45 sen per kWh. Fast forward to 2020, the bidding tariff range under LSS4 was 13.99-26.10 sen per kWh and the tariff range of shortlisted bidders was 17.68-24.81 sen per kWh. Such tariffs have narrowed the price gap with conventional fossil fuels. Based on TNB's disclosure, coal generation cost per unit was at 15.12sen per kWh in 1H21 when coal prices averaged at USD86.00 per tonne while gas generation cost per unit was at 11.70sen per kWh with gas reference market price at MYR15.40-18.92 per mmbtu in 1H21. Although generation cost excludes capacity payment made to plant owners, it is clear that it is just a matter of time before RE tariff becomes comparable, or even cheaper than conventional fossil fuels.

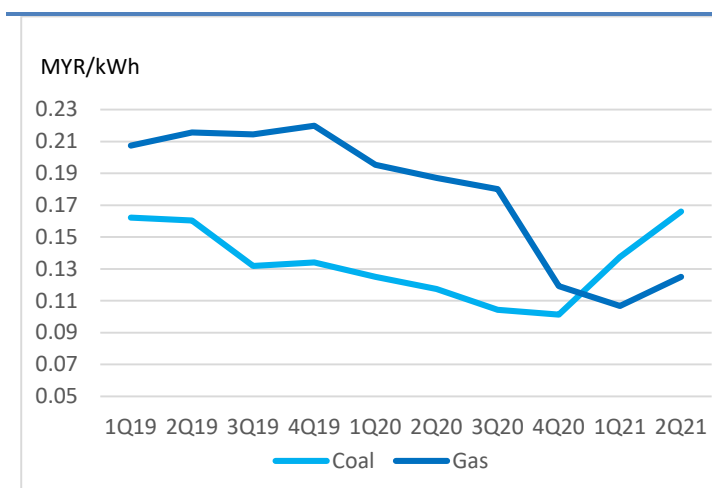
In spite of this, it is essential to manage the three elements in the energy trilemma – affordability, energy security, and sustainability – to ensure stable long term electricity supply. The next problem emerges with the integration of the higher renewable energy into the power grid, which carries huge variability in generation. Generally, solar and wind are known as variable renewable energy (vRE) as they are only available in certain weather conditions, far from the centre of demand and non-synchronous power sources (sources that have a power electronic interface with the grid, rather than a rotating mass that is directly connected). As such, this could pose a threat to grid stability, which generally relies on the “inertia” provided by synchronous generators.



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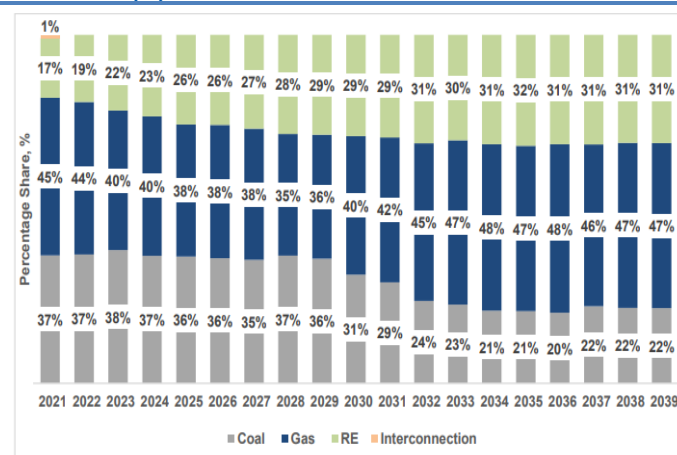
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Figure 7: Peninsular Malaysia's average generation cost



Source: TNB, RHB

Figure 8: Peninsular Malaysia's capacity mix by fuel from 2021-2039 (%)



Source: Report on West Malaysia Generation Development Plan 2020 (2021-2039)

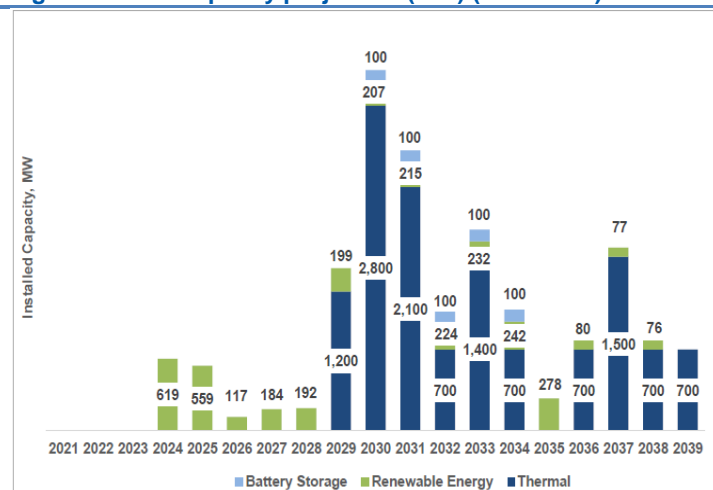
### The duck curve and the solutions

The duck curve, named after its resemblance to a duck, was introduced by California Independent System Operator (CAISO) back in 2013. The chart depicts how the impact of solar PV deployment to the net electricity demand throughout the day in California during springtime. Solar energy peaked during day time and tapered off at night when electricity demand increased. This would require other electricity generators to ramp up energy production in the short span of time when the sun sets. As such, it may not bode well for conventional generators which require longer time to heat up and cool down and operate much more efficiently for long hours continuously.

The curtailment of solar PV generation is a way to relieve the over generation problem when battery storage technology is not massively viable and mature enough. We believe solar tracker and bifacial solar modules would better capture sunlight, and hence, extend the solar PV generation. In planning for firm capacity, the amount of power generated that can be guaranteed to meet demand at any given time is important to provide grid stabilisation. Hydropower is deemed as a relatively stable source of renewable energy as it can be injected into the grid the fastest, and hence, could be used to complement solar and wind to derive a more stable output curve. Essentially a smart grid is needed, equipped with smart meters. The system should be able to perform data collection, monitor power plant performance as well as execute and provide solutions to accommodate volatility arising from renewable energy plants. Energy storage system is one of the final solutions to all these as the electricity output could be stabilised and smoothened.

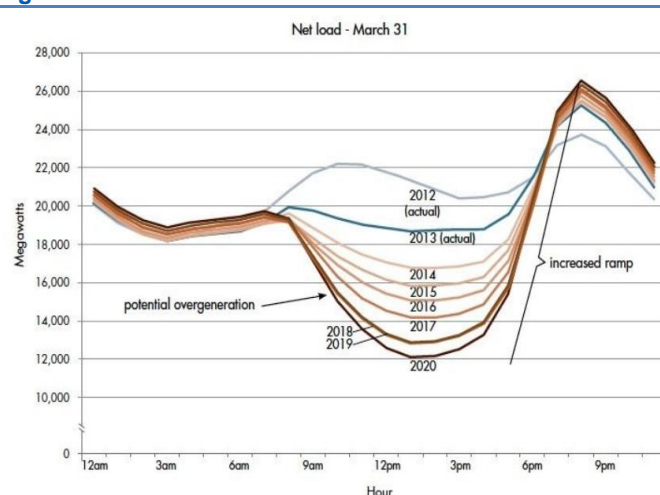
According to the EC, the penetration limit for grids connected solar PV is set at 24% of the estimated peak demand and will increase to 30% in 2035 to ensure continuity of electricity supply in unexpected circumstances, and to cope with generation uncertainty and availability from vRE. This is done by having new thermal capacities to replace retired plants along the way. Besides this, the grid infrastructure would be further strengthened and enhanced with technical enablers such as energy storage systems. Five units of Battery Energy Storage System (BESS) with a capacity of 100MW have been planned for installation annually into the system from 2030-2034.

Figure 9: New capacity projection (MW) (2021-2039)



Source: Report on West Malaysia Generation Development Plan 2020 (2021-2039)

Figure 10: The duck curve



Source: California Independent System Operator

### LSS progress remains slow in 2021

Prior to LSS4, the EC has awarded a total 1634MW capacities to different players in the past few years. However, only 54% or 875MW of these solar capacities are operational as of 1Q21, which included 19MW new capacity as compared to 4Q20. While the EC has yet to update the latest numbers, we expect progress of the new LSS capacity in operations to remain slow due to the enhanced movement restrictions. We are of the view many of the LSS2 & LSS3 projects are facing the risk of missing the scheduled COD. As such, the total RE addition into the grid in 2021 could be lower than the EC's earlier expectation of 860MW.

Figure 11: LSS (1-3) progress by region

Region	Capacity Awarded (MW)	Operational Capacity (MW)	In progress (MW)	Percentage (%)
Perlis	33.996	33.996	0	100
Kedah	355.77	194.99	160.78	55
P. Pinang	21	21	0	100
Perak	248.87	138.88	109.99	56
Kelantan	30	0	30	0
Terengganu	306.99	106.99	200	35
Pahang	209.916	79.916	130	38
Selangor	66.98	66.98	0	100
N. Sembilan	121	61	60	50
Melaka	56.8	56.8	0	100
Johor	68.99	63.99	5	93
Sabah	113.9	50	63.9	44
	<b>1634.212</b>	<b>874.542</b>	<b>759.67</b>	<b>54</b>

Source: Energy Commission

### More EPCC works for LSS4 to be rolled out

On the other hand, following the announcement of LSS4 contract awards totalling 830.06MW to 30 players in March, there has been no word on the next round of LSS tenders. We expect the solar capacity to further expand with more capacity rolled out at the soonest by end of this year. Tariff rates may also continue to be under pressure, with more new players venturing into this space and intensifying competition within this segment. As of August, Tenaga has signed 21-year LSS PV PPA agreements with most of the listed shortlisted players. Most players under Package P2 (50MW) have scheduled commercial operations date (COD) between Sep and Dec 2023, except for JAKS Resources' COD in Mar 2023, while some listed players under Package P1 (10-30MW) have an earlier COD in Dec 2022.

**Figure 12: Package P1: Plant capacity from 10MW to less than 30MW (listed companies )**

No.	Selected Shortlisted Bidders	Export Capacity	Scheduled Commercial Operations Date (SCOD)
1	Advancecon Solar	26.00 MW	31 Dec 2023
2	Atlantic Blue (Solarvest)	25.0 MW	31 Dec 2022
3	Atlantic Blue (Solarvest)	13.0 MW	31 Oct 2023
4	Atlantic Blue (Solarvest)	12.0 MW	31 Dec 2022
5	M K Land Resources	10.95 MW	31 Dec 2022
6	Tan Chong Motor Assemblies, APM Shock Absorbers and TCIM	20.0 MW	30 Nov 2023

Source: Energy Commission

**Figure 13: Package 2: Plant capacity from 30MW to 50MW**

No.	Selected Shortlisted Bidders	Export Capacity	Scheduled Operation Date (SCOD)
1	Asiabina Properties	50 MW	30 Dec 2023
2	Classic Solar Farm	50 MW	20 Dec 2023
3	Gopeng	50 MW	31 Dec 2023
4	JAKS Solar Power	50 MW	30 Mar 2023
5	Perbadanan Kemajuan Negeri Pahang and KPower	50 MW	30 Sep 2023
6	Ragawang	50 MW	30 Nov 2023
7	Ranhill Utilities	50 MW	31 Dec 2023
8	Sharp Ventures	50 MW	31 Dec 2023
9	TNB Renewables	50 MW	31 Dec 2023
10	Uzma Environergy	50 MW	29 Sep 2023

Source: Energy Commission

**Elevated solar panel prices...**

We have been seeing EPCC works for LSS4 being dished out. Assuming MYR4m capex per MW (excluding land cost), the EPCC works for total LSS4 are estimated at MYR3.3bn. Last week, Solarvest was awarded the EPCC works for a 50MWac LSS4 plant in Chuping, Perlis, by Classic Solar, bringing its LSS4 EPCC contract wins to date to MYR371m. This is Solarvest's fourth win in two months. We expect more LSS4 EPCC contract flow in the coming months, as discussions with other shortlisted LSS4 bidders are still ongoing. Apart from Solarvest, other players such as Samaiden, Pekat, and Uzma are also targeting for a share of the pie. With the completion of Founder Energy SB's 51% equity stake acquisition, Reservoir Link is also eyeing to grab sub-contractor jobs (focusing on mounting system module installation) from these solar EPCC contractors.

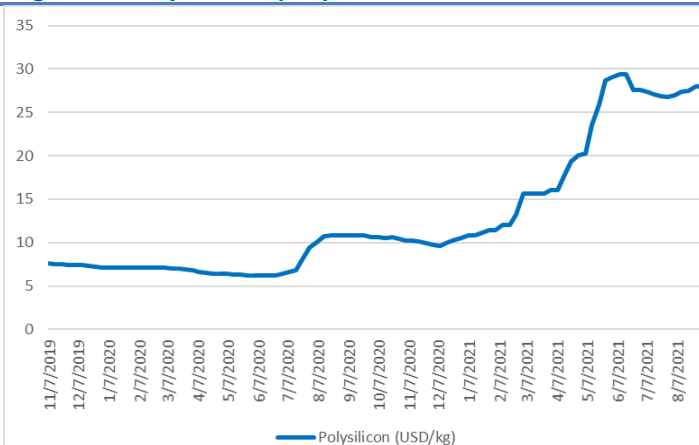
We understand that solar panel prices remain fairly elevated at USD0.28-0.29 per watt, which is a huge jump from USD0.20-0.21 per watt as compared to the LSS4 tender period back in Jun 2020. This is mainly led by higher raw material prices in tandem other commodity prices with the anticipation of a global economic recovery. Polysilicon and aluminium are the major raw materials for the solar panel. Average polysilicon spot prices have surged by 1.9x YoY to USD27.30 per kg in the past two months while aluminium spot prices have also hiked 50% YoY to above USD2,600 per tonne in early September.



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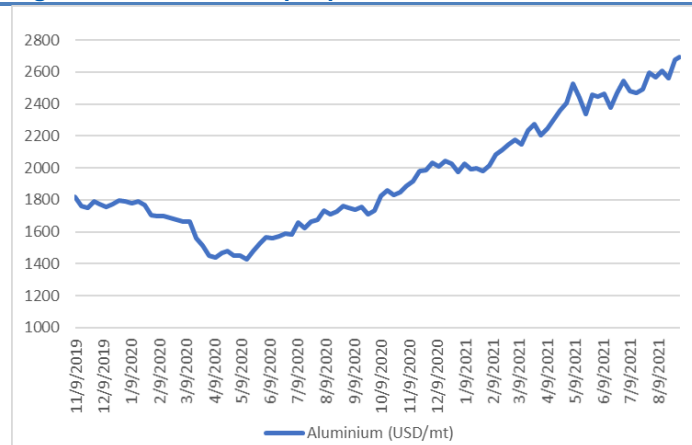
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Figure 14: Polysilicon spot prices



Source: Bloomberg

Figure 15: Aluminium spot prices



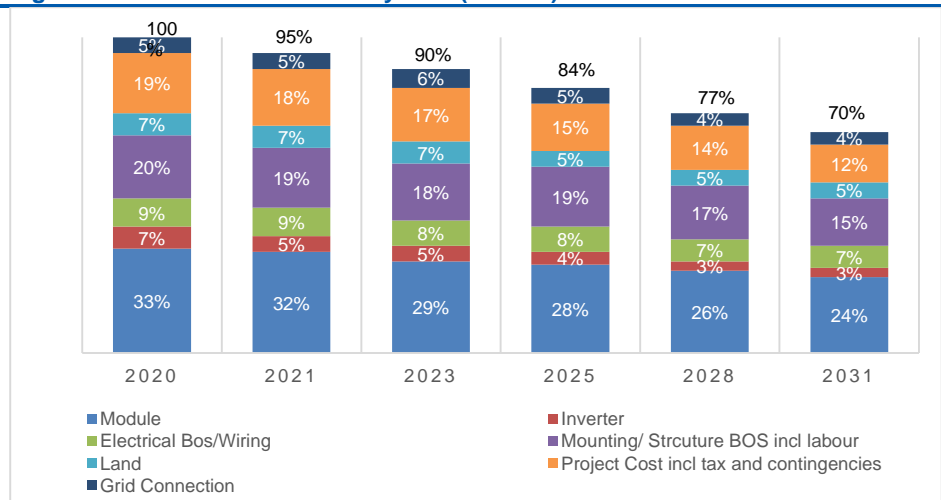
Source: Bloomberg

### ...could affect project returns and margins

With that, we believe the elevated solar panel prices will affect both solar asset owners, especially the shortlisted LSS4 bidders that have scheduled COD in end-2022 and 2023. As a rule of thumb, the solar panel module is the biggest cost component, at about one-third of total capex. Therefore, a 30% increase in solar module prices could increase total capex by 10%, which in turn translates into 1% project IRR erosion, caeteris paribus. Based on our channel checks, we believe both asset owners and solar EPCC contractors may have to bear the cost pressure, depending on their negotiation skills. We believe EPCC contractors with bulk orders tend to enjoy better economic of scale, while asset owners with internal EPCC capability will have better cost management. With that, we see Solarvest emerging as a better candidate from both perspectives.

We also gather that some players would not want to lock in solar panel prices at this juncture. The wait-and-see approach is to delay solar panel procurement to 2022 as they believe solar panel prices would cool off. This is mainly premised that the price rally of polysilicon is partially led by panic buying with the fear of shortage and material hoarding by speculative traders. In our view, such strategy should not affect the timeliness of the players' COD given the actual construction and PV installation works could be completed within six months, as highlighted by experienced contractors. Moreover, most CODs for Package P2 are scheduled in late 2023. Based on International Technology Roadmap for Photovoltaics (ITRPV), solar capex will still be on a declining trend in the longer run, down by 30% in 2031 as compared to 2020 despite recent higher solar panel prices due to higher material prices. The solar module will still be the largest cost component, followed by the mounting structure in the next 10 years.

Figure 16: Cost elements of PV system (&gt;10MW) worldwide



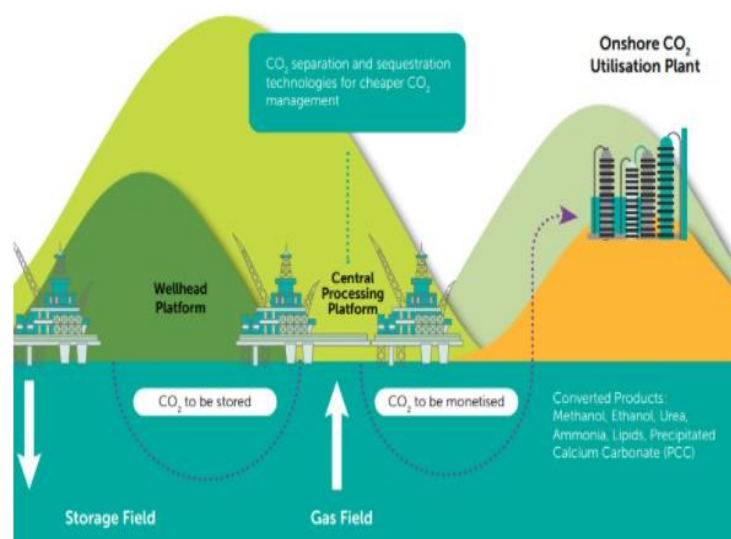
Source: International Technology Roadmap for Photovoltaics (ITRPV), 2021 Web Seminar Presentations, RHB

## Carbon Capture And Storage

Carbon capture and storage (CCS) is one of the potentials for TNB to achieve its net zero emission target by 2050. It involves the process of capturing carbon dioxide (CO<sub>2</sub>) before it enters the atmosphere, before it is transported and stored (carbon sequestration) permanently. The gas is typically captured from heavy industries and then stored underground.

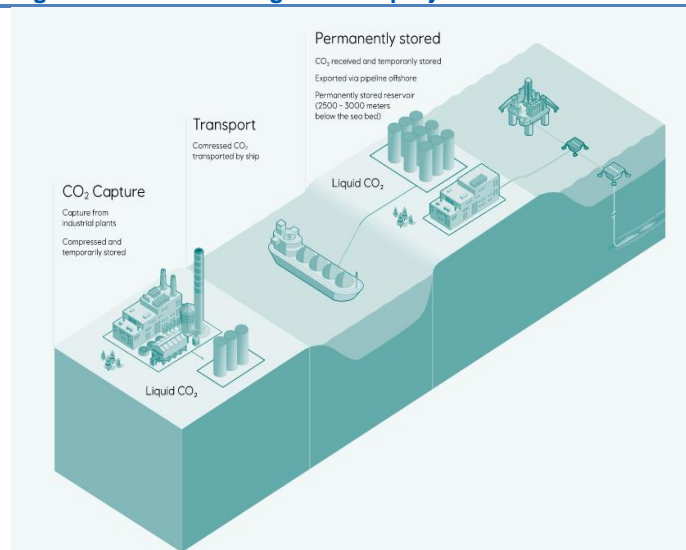
According to Petronas, CO<sub>2</sub> content in natural gas can be reduced from 70% to 6.5% using the carbon capture, utilisation and storage (CCUS) technology, separated in liquid form and eventually stored in carbonate reservoirs offshore. The national oil company is deploying this technology at its Kasawari development with first injection planned in 2025. Last month, Petronas awarded a conceptual engineering design contract for this first complete CCUS project offshore Malaysia.

Figure 17: Petronas' CCUS pilot project



Source: Bloomberg

Figure 18: Northern Lights' CCS project



Source: Equinor

Indonesia's national oil company Pertamina has also teamed up with its Japanese partners, JGC, J-Power and Janus, together with the Bandung Institute of Technology to launch a feasibility study for an ambitious CCUS and enhanced gas recovery (EGR) project at its Gundih field onshore Central Java, Indonesia. The Gundih project has the potential to reduce emissions by 300,000 tonnes pa of CO<sub>2</sub> and boost gas production at the onshore field.

Norway is one of the most experienced countries in operating large scale CCS projects. The Longship project is the full scale CCS project launched by the Norwegian Government, and the Northern Lights project is part of this big project to develop the world's first open source CO<sub>2</sub> transport and storage infrastructure. Liquefied CO<sub>2</sub> collected from capture facilities will be transferred by ships to an onshore terminal on Norway's west coast and subsequently, to a subsea storage located in the North Sea via pipelines.

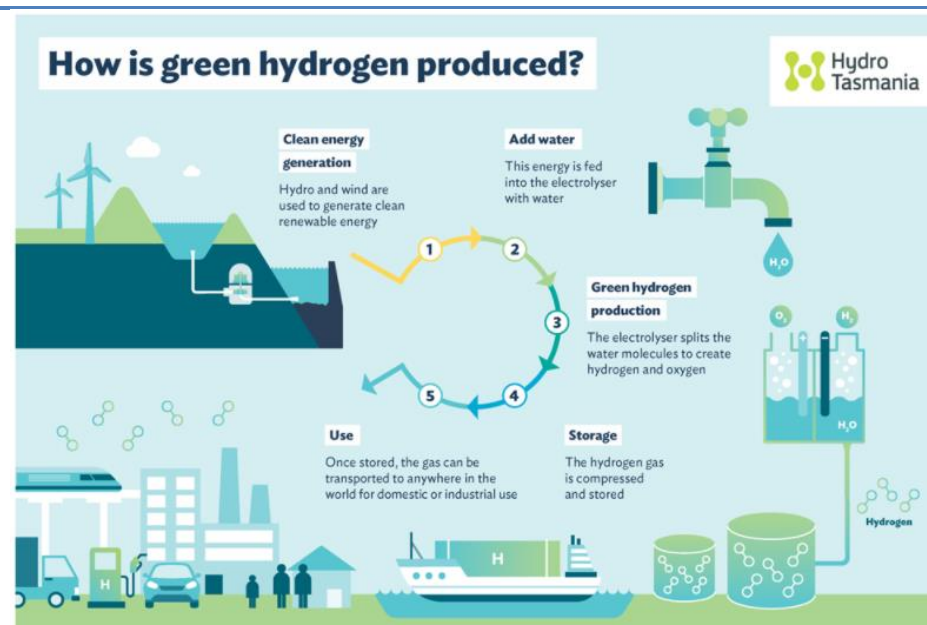
Should there be a huge progress in CCS implementation, gas with CCS can provide flexible or baseload capacity, and CCS with coal can provide baseload/mid-merit capacity. CCS technology has not been proven at scale in the context of power generation and storage. We believe a stronger policy push is needed to achieve emission targets, to mature storage technology, and develop CCS or hydrogen. Hydrogen production could also be bundled with gas and CCS to produce blue hydrogen, a grade lower than green hydrogen, which is produced using water electrolysis fuelled by RE.

## Future Of Green Hydrogen

Hydrogen technology has been gaining unprecedented global attention especially in Europe. The share of hydrogen in Europe's energy mix is projected to grow from the current less than 2% to 13-14% by 2050. In the first phase (2020-2024), EU plans to install at least 6GW of renewable hydrogen electrolyzers and produce up to 1m tonnes of renewable hydrogen. In the second phase (2025-2030), hydrogen is expected to be part of an integrated energy system with a targeted 40GW of renewable hydrogen electrolyzers by 2030 and production of up to 10m tonnes of renewable hydrogen.

Currently hydrogen is being used in oil refining and chemical production and demand has been on the rise. However, bulk of the hydrogen is produced from fossil fuels – natural gas and coal. According to the International Energy Agency (IEA), the global hydrogen production creates CO<sub>2</sub> emissions of around 830m tonnes of CO<sub>2</sub> pa, which is equivalent to the CO<sub>2</sub> emissions of the UK and Indonesia combined. Hence, green hydrogen, which is produced via electrolysis of water with electricity generated by renewable energy, could be one of the major solutions to net zero. The decline of RE prices and increase of RE installed capacity could be key catalysts for green hydrogen applications, especially in areas that cannot be electrified such as long haul aviation and shipping. Green hydrogen can also be used in heavy industries to reduce carbon emissions and also serve as a form of energy storage to store the surplus generated from RE.

Figure 19: Manufacturing process of green hydrogen



Source: HydroTasmania

Domestically, Petronas has signed a MoU with Sarawak Energy Berhad (SEB) to perform a joint techno-commercial study of green hydrogen production and its value chain. This collaboration is expected to provide an insight into the potential of hydrogen supply chain in Asia. With the partnership, both parties could explore the possibility of developing a large-scale hydrogen production facility through electrolysis process – the electricity of which is generated by SEB's RE plants.

Although we see green hydrogen being relevant in the future, it is important to also acknowledge that significant technology advancement is needed to unlock this potential. At the moment, hydrogen production via electrolysis is still very costly and it is difficult to store and transport given its combustible nature. Hence, upgrades are needed on existing natural gas pipelines and infrastructure. There are also observations green hydrogen of not being efficient in the hydrogen car given the complexity to compress hydrogen and subsequently convert back into electricity when starting the vehicle.

## ESG Update

Following the introduction of our proprietary ESG scoring system, we have been engaging with investors and corporates in order to fine tune our methodology. We acknowledge that governance is equivalently important as it reflects more event risk while carbon emissions and generation mix could be a long term issue to tackle. However, we have received a lot more queries from fund managers and institutional investors regarding the stance of utilities companies in energy transition and the carbon emissions issues exposed in the Environment pillar is far greater of importance than the other pillars.

As such, we have decided to be more cautious over our scoring to reflect status rather than what a company plans to do. We have revised TNB's "Environment" score to 1.3 from 2.0 to reflect the current high coal capacity mix and elevated carbon intensity. While we are positive over the company's pledge to reduce carbon neutrality and ramp up its RE capacities, we will only revise up our scores upon a better report card demonstrated down the road. With that, TNB's average ESG score is lowered to 2.9 (from 3.1).

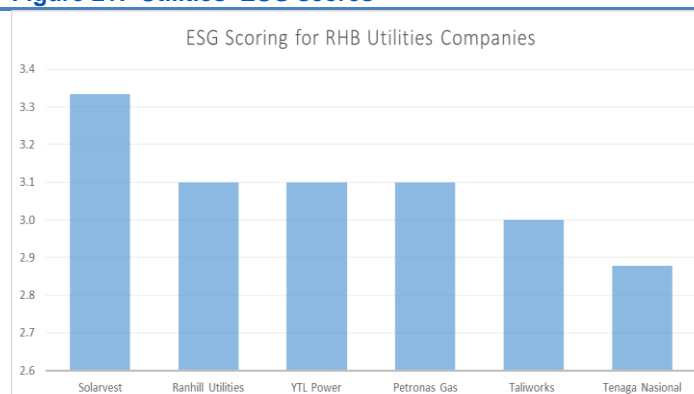
**Post revision, the average ESG scores for the utilities firms under our coverage have reduced marginally to 3.09 (from 3.12), with Solarvest remaining the top scorer of 3.3, with TNB scoring the lowest among companies under our coverage.**

**Figure 20: Utilities' ESG heat map**

	Environment	Social	Governance	Revised Score	Previous Score
Solarvest	3.7	3.3	3.0	3.3	3.3
Ranhill Utilities	3.3	3.0	3.0	3.1	3.1
YTL Power	2.2	4.0	3.3	3.1	3.1
Petronas Gas	2.0	3.3	4.0	3.1	3.1
Taliworks	3.0	3.0	3.0	3.0	3.0
Tenaga Nasional	1.3	3.3	4.0	2.9	3.1

Source: RHB

**Figure 21: Utilities' ESG scores**



Source: RHB

## 2Q21 Results Review And Recommendations

In the recently concluded reporting quarter, four companies under our coverage released their 2Q21 results, with three coming in within expectations. Only one disappointed – Ranhill (RAHH MK, BUY, TP: MYR0.89) – due to higher-than-expected operating costs for the water segment for its fifth operational period or OP5. Post results, we cut FY21F core earnings by 12%, after factoring in that and rejigging the Ranhill Power I (RPI) accounts to reflect the IC12 reclassification changes. This was partially offset by the introduction of a new revenue stream from the service segment (ie Ranhill Bersekutu and Ranhill Worley) – with further turnover of MYR4.5m, MYR14m and MYR14m expected for FY21F-23F. This also raises our FY22-23 earnings forecasts by 4% and 1%. YTL Power and Solarvest have postponed their results announcements to September.

**We maintain OVERWEIGHT on the sector with four BUYs and TNB remains our Top Pick.** Electricity demand overall is still likely to register growth, albeit, at a slower-than-expected pace due to the enhanced movement restrictions. Energy transition will remain one of the key priorities, as we should see utility players continuing to expand their RE exposure. The Regulatory Period (RP) 3 (2022-2024) or RP3 details will be known by 2H21 – we believe it will largely be similar to RP2 with a higher asset base and lower WACC.

**Top Pick: TNB.** We continue to favour this counter for its earnings defensiveness under the Incentive Based Regulation (IBR) mechanism. The recent net zero emissions pledge further demonstrates its commitment to the energy transition journey. We see its ambitious RE targets possibly fuelling medium- to long-term growth. TNB is trading at slightly above its 7-year low and foreign shareholdings are at 11.9% as of July (Dec 2019: 18.4%).

**Solarvest.** We like the stock as a beneficiary of Malaysia's strong demand for solar energy. Given its proven track record, Solarvest is likely to continue seeing robust contract wins, which should fuel investor optimism towards the stock. The potential Main Board listing transfer could further re-rate the stock. Notwithstanding the weaker 1H FY22F (Mar) results – due to lockdown measures – we believe results should recover strongly once EPCC works are allowed to resume. This is backed by Solarvest's all-time high c.MYR583m outstanding orderbook. Further upside could stem from potential solar asset wins in Sarawak and contract wins in Taiwan – we have yet to impute these into our earnings forecasts.

**Taliworks.** We continue to like Taliworks for its defensive earnings base, stable growth outlook, and attractive c.8% FY21F yield. 3Q21F should see a healthy boost to earnings, following the MYR43.5m cash compensation from the Government for the non-increase in 2020's scheduled toll hikes for the Cheras-Kajang highway. We also expect the water treatment, supply and distribution segment, and its waste management associate to remain robust, while both its highways should see average daily turnover recovery following the easing of the lockdown.

**Ranhill.** We believe the recent share price dip is an opportunity to accumulate, as: i) The stock is trading at -1.7SD from mean EV/EBITDA, ii) its new earnings stream should offset Ranhill Powertron I's (RPI) lower tariff, supporting c.50% FY22F earnings growth, and iii) multiple potential rerating catalysts include higher than-expected rate hikes for its Johor water operations, positive outcome for its ASEAN expansion plans, and water and renewable energy project wins.



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