

ISSUE 13 - DATE 7 SEPTEMBER 2015

TOPIC 13 - SOLAR POWER PLANT INSTALLATIONS IN MALAYSIA

INTRODUCTION AND OBJECTIVE

In this article, I wish to tabulate some published information obtained from my research by going through public announcements in the public domain, both the company's websites, news in the media, annual reports of the relevant companies and other available public information to gather some relevant statistics for high level evaluation of solar industry in Malaysia.

A. SOLAR SITES IN MALAYSIA AS EXTRACTED FROM PUBLIC DOMAIN

<u>SOLAR SITES - FROM PUBLIC DOMAIN</u>	
	Installed Capacity, MW
<u>Cypark Resources Bhd</u>	
1. Kuala Perlis, Perlis	1.0
2. Rimba Terjun, Pontian, Johor	2.0
1. Kuala Sawah, Rantau, Negeri Sembilan	5.3
4. Pajam, Negeri Sembilan	8.0
5. Bukit Palong, Negeri Sembilan	3.0
	19.3
<u>Gading Kencana Sdn Bhd</u>	
1. Hang Tuah, Ayer Keroh, Melaka	8.0
<u>Amcorp Power</u>	
1. Gemas, Negeri Sembilan	10.3
<u>KLIA</u>	
1. Rooftop of KLIA	4.0
2. Parking canopy, near KLIA 2	10.0
<u>Kumpulan Melaka</u>	
1. Alor Gajah	5.0
TOTAL	56.6

Commentary:-

1. The largest solar farm based on announcement at this juncture, seems to be 10.25 MW, which was completed sometime in December 2013. The owner of the project is Amcorp Power Sdn Bhd. A general idea of the size of a **10 MW Solar farm** is that it is able to power the electrical consumption of 3,315 typical residential homes in Malaysia.

B. SOLAR ANNUAL PRODUCTION CAPACITY IN GWH/MW

<u>SOLAR SITES - FROM PUBLIC DOMAIN</u>	Annual output, GWh (announced)	Installed Capacity, MW	Annual output in GWh/MW
<u>Cypark Resources Bhd</u>			
1. Kuala Sawah, Rantau, Negeri Sembilan	6.5	5.3	1.22
<u>Gading Kencana Sdn Bhd</u>			
1. Hang Tuah, Ayer Keroh, Melaka	10.1	8.0	1.27
<u>Amcorp Power</u>			
1. Gemas, Negeri Sembilan	14.4	10.3	1.40
Average			1.30
Minimum			1.22
Maximum			1.40

Commentary:-

1. There is an important measurement ratio that could be used to determine the performance of a solar farm, namely the annual output measured in GWh dividend by the installed capacity in MW. It is noted that based on the above three selected sites' published information, the average annual output is approximately **1.3 GWh/MW**.
2. The significance of this ratio is that it could be converted to annual revenue in **RM millions per MW**, if we multiply the rate of Power Purchase Agreement measured in **RM per KW** with the annual annual output measured in **GWh/MW**.

Example:-

In Malaysia, if the basic feed in rate in **RM per KW**, for above 10MW and up to and including 30MW is say, RM0.874 per KW, and the average annual output is **1.4 GWh/MW**, the average annual revenue for such plant is approximately **RM1.2 million per MW**. ($0.874 \times 1.4 = 1.2$). This allows an analyst to provide a fast way to work out the annual average revenue for a solar farm.

C. SOLAR LAND SIZE IN HECTARES OVER INSTALLED CAPACITY.

SOLAR SITES - FROM PUBLIC DOMAIN			
	Installed Capacity, MW	Land size, hectares	Land size in hectares / MW
<u>Gading Kencana Sdn Bhd</u>			
1. Hang Tuah, Ayer Keroh, Melaka	8.0	6.9	0.87
<u>Amcorp Power</u>			
1. Gemas, Negeri Sembilan	10.3	13.8	1.34

COMMENTARY:-

1. Land constitute a component of investment cost. Based on the above two sites it is noticed that the land size is approximately **0.9 hectares per MW** and **1.3 hectares per MW** for Gading Kencana Sdn Bhd and Amcorp Power respectively.
2. The size of the land is generally dependent on the manner of the solar panels are laid down to capture sun light. It varies and it is noted that in a published article on 9 March 2015, on Star Online, Gading Kencana Sdn Bhd had claimed that their solar farm is deemed to be one of the most resource-efficient in the world, as it produces 1MW per 0.6ha (1.5 acres) against the worldwide norm of 1MW per 2ha (5 acres).

D. SOLAR INVESTMENT COST IN RM MILLIONS PER MW.

SOLAR SITES - FROM PUBLIC DOMAIN			
	Cost, RM millions	Installed Capacity, MW	Cost per MW. RM millions / MW
<u>Gading Kencana Sdn Bhd</u>			
1. Hang Tuah, Ayer Keroh, Melaka	84	8.0	10.5
<u>Amcorp Power</u>			
1. Gemas, Negeri Sembilan	87	10.3	8.5

COMMENTARY:-

1. Based on the above two sites it is noted that the average cost incurred to construct a solar farm **per MW ranges from RM8.5 million to RM10.5 million**. The cost may be dependent upon a number of factors **including year of construction, prevailing exchange rate** as substantial category of the cost components are solar panels and are imported.

THANKS FOR READING.

This article is prepared by Ong Tee Chin, CFA, FRM, and represents the view of the author. He can be contacted at ong@atlantiscapital.org for any further enquiries on the contents of this article. The author wishes to declare that this article is not sponsored by any party and it is solely prepared of the author with aim to share knowledge with readers having common interest.

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