



**Energy Efficiency Committee Meeting
21st June 2021**

Meeting via Zoom

Minutes

No	Name	Company	Signature
1	Vincent Low	G-Energy Global Pte Ltd	Present
2	Karthik Pillai	AGC Asia Pacific Pte Ltd	Present
3	Branger Branger	BeeBryte Pte Ltd	AWA
4	Elodie HECQ	BeeBryte Pte Ltd	Present
5	Petra Pontier	BeeBryte Pte Ltd	Present
6	Tracy Liu	Building and Construction Authority (BCA)	Present
7	Koon Siang Ng	C & W Services (S) Pte Ltd	AWA
8	Zhenyi Lee	C & W Services (S) Pte Ltd	Present
9	Joshua Kramer	Clime Capital Management	Present
10	Douglas Duncan	Durapower Technology (Singapore) Pte Ltd	Present
11	Benjamin Ng	Ecoverse Ptd. Ltd.	Present
12	Joseph Tan	Energreen Technologies Pte Ltd	Present
13	Peter Godfrey	Energy Institute	Present
14	Syed Mubarak Abdul Razaak	EPS (S) Pte Ltd	AWA
15	BP Loh	Hassell	AWA
16	Heng Seng Meng	ITE College East	AWA
17	Alvin Tay	JTC Corporation	Present
18	Joey Lim	JTC Corporation	Present

No	Name	Company	Signature
19	Kevin Lee	JTC Corporation	Present
20	Shu Qing Yeo	JTC Corporation	Present
21	Marius Toime	K&L Gates	Present
22	Krishan Kumar Ralhan	Kaltimex Energy (Singapore) Pte Ltd	Present
23	Victor Low	L-QuBE Pte Ltd	Present
24	Pedro Esteban	Merus Power Dynamics Oy	Present
25	Quentin Fouesnant	Metron Apac Pte Ltd	Present
26	Lekha Patmanathan	Nexergy Pte Ltd	AWA
27	Weixin Jin	Ngee Ann Polytechnic	AWA
28	Jan Yeo	Nippon Koei Pte Ltd	Present
29	Craig Morgan	Northmore Gordon Pte Ltd	Present
30	Yang Thee Quek	Republic Polytechnic	Present
31	Kelvin Ong	Schneider Electric	Present
32	Jiayi Chen	Sembcorp Industries Ltd	AWA
33	Prannoy Chowdhury	Sembcorp Solar Singapore Pte Ltd	AWA
34	Veronika Shabunko	SERIS	Present
35	Laurence Kwan	Sunseap Group	Present
36	Peter Lau	Sustainable Development Capital (Singapore) Pte Ltd	Present
37	Srinivasan Sivaraman	Tendrill International Pte Ltd	Present

Description	Action By
<p>1. Opening by Chairman (VL)</p> <p>VL welcomed all to the meeting and invited members to introduce themselves. This meeting was hosted online only.</p>	
<p>2. Presentation by JTC</p> <p>Mr Alvin Tay (AL) from JTC's Urban Solution Team joined us on our ee committee meeting to share Jurong Innovation District(JID) and CleanTech Park.</p> <p>JID is a 600Hectare next gen facility. It stretches from Tengah to NTU.</p> <p>The entire estate can house and support full value range of activities from research, test bedding to manufacturing.</p>  <p>The JID will be ready by 2026, it will be served by 3 MRT lines, specifically the Jurong Region Line. It will introduce Singapore's 1st 11km car free sky corridor.</p>  <p>Industry 4.0's ecosystem can be housed within the JID, it host different groups of stakeholders in the ecosystem (R&, prototyping, testing, production to manufacturing).</p> <p>Cleantech Park (CTP) is the first eco-business park, green and sustainability is in the core of the facility. It also acts as a living lab for real life environment for companies to test bed; there are 37 companies with over 1000 working professionals working there.</p>	

Multiple research agencies are housed in both cleantech park 1 and 2. The Cetran AV testing centre is housed there too. It is a joint effort of JTC, LTA & NTU.

Jurong Eco Garden is situated in the cleantech park too.

Surbana Jurong Campus will be shifting to CTP in 2022, CTP 3 & 2P is in development will be ready by end of 2021. A future MRT station will be completed in 2027 too.

CTP has 5 value:

- a. Ready access to talent
 - a. NTU is readily nearby, with over 3300 graduates annually
- b. Abundant opportunities to form business partnership
 - a. There are a large collection of private labs and commercial organisations houses in CTP
 - b. Large collection of start-ups houses in CTP
- c. Ability to test-bed new products or services in real world setting
 - a. JTC will provide access to building and parks for test-beds upon request at CTP, technologies such as solar and energy storage are tested there
- d. Ideal building specifications and facilities to meet business needs
 - a. Multi-function halls, board rooms and seminar rooms are available
 - b. Lab spaces for high spec heavy labs
 - c. Vibration sensitive lab spaces
- e. Vibrant liveable & well-connected estate
 - a. Wildlife corridor & eco garden housed in CTP

CTP 3 is a new development ready by end of 2021, there are r&d spaces and a living lab.

It will consist of 8 blocks of labs and 1 block of office, heavy and vibration sensitive labs are available.

3. Presentation by BCA

Ms Tracy Tay from BCA Greenmark department shared on Greenmark 2021.

The Greenmark program started in 2005, it has since gone through 3 revisions, the aim is for 80% GFA by 2030, today we are at 40%. The next lap is for super low energy buildings

The Green Building masterplan(SGBMP) is part of green plan 2030. SGBC and BCA have come together to setup this masterplan. There are more than 80 stakeholders. Over 5000 stakeholders are engaged over various initiatives through this effort.

The SGBMP aims for 3 outcomes:

- a. 80% of building to be green by 2030
- b. 80% of new developments to be Super Low Energy by 2030, all buildings to be SLE eventually
- c. 80% Energy Efficiency improvements (from 2005 levels) by 2030

Measures to achieve the 3 outcomes:

- a. Regulations
- b. Greenmark 2021
- c. Greengov.sg
 - a. Public sector to take the lead to SLE
- d. Data Transparency
 - a. Publish building energy performance data
- e. Support Measures

GM2021 will be officially launched in sept 2021.

Key features of GM2021

- a. All in one green mark framework for buildings
 - a. Single GM for New and Existing, Non Residential and Residential Buildings. Sunsets the legacy frameworks, lifts the performance for all projects.
- b. Simple, flexible and smart rating system
 - a. Streamlined criteria and assessment methodology. Energy efficiency pathways mapped to building types parallel routes for compliance.
- c. Globally relevant and leading
 - a. GM 2021 pushes the boundaries of sustainability, aligned to the UN SDGs, International Green Building movement, finance taxonomies and global real estate reporting platforms.

GM 2021 criteria:

Energy Efficiency >50% (GoldPLUS) >55% (Platinum) >60% (SLE)

Intelligence

- Aligned to smart building certification systems, IDD, data ethics, digital twins, real time analytics

Health and Wellbeing

- Physiological (Physical)
- Psychological (Mental)
- Sociological (Inclusive)

Whole of Life Carbon

- Embodied Energy
- Construction
- Fit Out

Design for Maintainability

- Use of Design for Maintainability appraisal tool— the score will translate to section achievement

Resilience

- Protect
- Manage
- Restore

3 pathways to demonstrate energy performance

- Energy Utilisation intensity (EUI)
 - Expanded for more building types based on a larger data set. >60% to SLE
- Fixed metrics
 - Key performance metrics (ingredients) that make an Energy Efficient project
- Energy Savings
 - Enhanced Energy modelling framework, to look at holistic energy performance

GM 2021 In Operation Requirement

**Unified EE requirements
with two pathways**

+

Other Sustainable Requirements


Rating	Gold*	Gold ^{PLUS}	Platinum	SLE
% Energy efficiency improvement over 2005 levels*	40%	50%	55%	60%

Applicable EE Pathways: Pathway 1 – EUI;
Pathway 2 – Fixed metrics

*Aligns with mandatory minimum energy efficiency requirements to raise energy performance standards of existing buildings

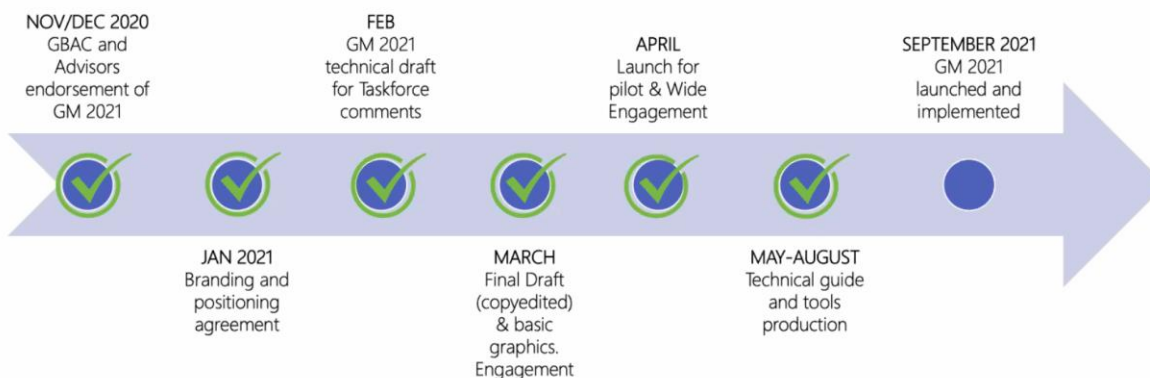
*Gold rating is only applicable for GM: 2021 (In-Operation)

For more info on GM:2021 (In-Operation), please visit <https://go.gov.sg/qm2021>



GM: 2021 In-Operation is designed to encourage buildings certified with Green Mark to continuously improve and maintain their environmental practices in operation. It is a streamlined certification process with the submission of key performance indicators in energy efficiency, indoor environmental quality (IEQ) and smart operations. GM ratings based on GM2021 standardized energy efficiency performance. Gold rating is available for GM: 2021 (In-Operation) only

Timeline



1st Nov 2021, all new applications will be subjected to GM2021 criteria.

4. Update by Secretariat

KG started by sharing the activities that SEAS has been hosting. SEAS's AGM is coming up very soon on the 2nd of July, all members are welcomed to join. Dr Amy Koh will be joining this year for a fireside chat with Bloomberg New Energy Finance as the moderator. As the meeting will be a hybrid model, only a small number of members can join us in person.

Multiple webinars were hosted, we have showcased at least 8 webinars in 2020 alone, all members are encouraged to join us for future expert series webinars.

Exciting training has been lined up for Q3 this year, SEAS will be hosting training in EE, SCEM, and solar system installation and design. Multiple solar projects are in the pipeline, the entire SCEM is being revamped now.

ACES this year is confirmed for 26-28 Oct, we hope that we could have more in person activities for ACES, this is however subjected to the covid situation. It should be much bigger than last year. A new track on Energy Efficiency will be introduced this year. Another new area introduced will be Electrical Vehicles.

APEIA is a consortium of 9 ESCO companies within the region spanning multiple countries, there are a total of 15 members within APEIA.

5. Any other matter

Next EE committee meeting is from the 3rd of Nov 2021.

Recorded by : Tom Chua
Vetted by : Kavita Gandhi
Approved by : Vincent Low