Tables

Table 1. Profile of Research Participants

Variables	**Classification**	**Frequency (*n*=30)**	**Percent (%)**
Gender	Male	22	73.3
	Female	8	26.7
Age	21 – 29	9	30.0
	30 – 39	16	53.3
	40 – 49	5	16.7
Highest Level of Education	Bachelor's degree/Professional Qualification	24	80.0
	Postgraduate	6	20.0
Occupation*	Architect	5	16.7
	CEO	3	10.0
	Civil Engineer	3	10.0
	Construction Manager	4	13.3
	Electrical Engineer	4	13.3
	Mechanical Engineer	1	3.3
	Others	13	43.3
Years in Construction Related Industry	1 – 10 years	14	46.7
	11 – 20 years	14	46.7
	> 20 years	2	6.6
Knowledge of Solar-related Project	Unfamiliar	1	3.3
	Somewhat Familiar	6	20.0
	General Knowledge	9	30.0
	Familiar	9	30.0
	Very Familiar	5	16.7

Note: * Participants may select more than one option.

Table 2. Perceptions of Participants on Key Enablers

Superordinate Categories	Categories	Examples of selected quotes
Motivation	Compliance with green initiatives	*"So I think if this is successful, so this could be one point that we can gain for this GBI point." (Interview session 2)*
		"We use this solar because of this GBI. Otherwise we won't." (Interview session 6)
	Promote Corporate social responsibility (CSR)	*"Solar can help reduce carbon emission" (Focus group session 1)*
		"But I also support it because like it's a good step in terms of environment." (Focus group session 7)
	Dual functionality	*"I would say the reason why we're doing this is because we're trying to utilize space or area that is exposed to sunlight that is not used right now." (Focus group session 1)*
		"So they can use existing road to generate more energy, save the carbon emission." (Interview session 6)
Opportunity	Financial incentives	*"I think last month the UOB bank launched a U-Solar package. So I think UOB acts as a bridge, bridging this with the end user and solar panel provider." (Focus group session 2)*
		"For the industrial, if let's say you install the solar, you will get some investment tax allowance from there, so this is an encouragement also." (Interview session 5)
	Sunny climate	*"In Malaysia case particularly, we are near to the equator, so this is all the advantage we are having." (Focus group session 4)*
		"Any country along the equator is actually having the best irradiance on the flat surface." (Focus group session 7)
	Increased environmental awareness	*"I think people are more and more aware of this kind of environmental benefits from using solar." (Focus group session 7)*
		"People have started to get some awareness on solar. Also one of the reason our MESTECC[1] is pushing for renewable energy. So it is a good time to promote this solar paver." (Focus group session 7)
Ability	Green experience	*"One of the projects landed was doing GBI, basically you need to consume less than 1000 kilowatt of light, that's why end up one of our ABC jobs is basically all solar lights to achieve the GBI rating." (Focus group session 1)*
		"So for landscape aspect that we had to propose some planting that can last for case drought tolerance. That mean that it requires less water. We will also work together with M&E engineer. They have to design a rain harvest water tank that can do the water irrigation for the plantings." (Focus group session 2)
	Experts network	*"It involves a lot of trade from architects to mechanical to civil to structure." (Interview session 6)*

	Familiarity with solar technology	*"In terms of solar panels, we adopted some. We have parks and we are actually very keen on adopting green technology including solar pavers." (Interview session 1)*

Note: GBI= Green Building Index; UOB= United Overseas Bank; MESTECC=Ministry of Energy, Science, Technology, Environment & Climate Change; ABC=Pseudonym to protect participant's identity; M&E=Mechanical and Electrical. 1 Ministry of Energy, Science, Technology, Environment and Climate Change (MESTECC) (2019).

Table 3. Perceptions of Participants on Key Barriers

Superordinate Categories	**Categories**	**Examples of selected quotes**
Challenges	Reluctant authority	*"We may create problem for the authority. Like last time, I am using decorative special street lighting. The authority doesn't want it. They reject it."* (Focus group session 1) *"A lot of times we actually submitted, but in the end, we got rejected because they do not have the capability or the condition to maintain it. So hence we reverted back to the normal street lightings, or LED street lightings."* (Focus group session 2)
	Vandalism	*"This is not like overseas where you know, people are more disciplined [laughs] and what you have shown is like developed country."* (Focus group session 2) *"There are people that crazy enough to go to the highway and tried to open it up and take it. Just like the, the CatEye. People will go and vandalise it. So, those are the realistic things that will happen."* (Focus group session 3)
	Complexity of installation and maintenance	*"If it's a Lego, plug and play, easy installation, less maintenance obviously, yes. But then, based on your current block [laughs], it is like not really easy to handle each block. That's why it's quite hard for developers to implement this."* (Focus group session 3) *"You don't know which one is spoiled, so once you have a failure, you change the whole thing."* (Focus group session 3)
	High humidity and rainfall	*"My concern is on the disadvantages. I mean, the waterproofing issues. Because in Malaysia, our rainfall is very high. So, this is the most difficult part to tackle. Think of the technical issue. Ground lighting has this water seeping issue."* (Interview session 2) *"Firstly, I would think about the weathering problem come in. Because I believe like, our humidity is quite high, so we always like selecting the right fittings for the external compound lighting. If it's the enclosed surface and we always have the water vapour problem."* (Focus group session 4)
	Negative environmental impact	*"Basically the energy already absorbs it, then it will convert and store inside the battery like lithium batteries. But some of the people actually say that the lithium battery actually has the environmental issue. If lithium battery, let say you want to dispose it, then how you going to manage it?"* (Focus group session 1)

		"Suddenly have all these things [solar paver], it's going to be heat island or become suddenly like something so mechanical and hard. So how are going to replace something natural with something like this in the justifications of I'm doing green?" (Focus group session 2)
Weakness	High cost	*"You are building a block (solar paver) that is like resist to pressure, weatherproof and whatever, then the cost would go up."* (Focus group session 3) *"In short, I really like solar [laughs] but the cost is pulling me out."* (Focus group session 4)
	Design flaws - Material - Shape - Technical design	*Material* *"The sealant won't last. Take a heavier car, run it over 10 times a thousand times, I think it would have peeled off."* (Interview session 4) Shape *"But we don't really look at square pavers these days, we want pattern, can it change in colour, otherwise everyone's pavers look the same."* (Focus group session 2) Technical design *"One thing I notice is actually, because solar paver works on area. Maybe you might want to look into maximizing the cell area? Because looking at this unit itself [solar paver], the receivable area is less than 50%." (*Focus group session 1*)*
	Low efficiency	*"We are using the highest efficient solar panel but we still can only achieve two hundred and sixteen kilowatt peak hour, which is two percent of my hospital power consumption. [laughs]. We use up the whole piece of multi-level car park, rooftop area to install with the solar. But we only can use up, save up to two percent only. We still have 98% to go."* (Interview session 6) *"LED is more energy saving. So how much this one can compete with the LED cost is also a concern."* (Interview session 6)
	Questionable practicality	*"Because of the shading, when we put it on the ground, there's a lot of inefficiency."* (Focus group session 7) *"Heating of the panels from the ground because especially on roads. Roads can get really hot and that will affect not just efficiency but also the lifespan."* (Focus group session 7)
	Better comparative opportunities	*"And comparing to that existing solution, roof top solar don't have to consider all these, relatively the maintenance is lower than pavement because it doesn't undergo all the load. It's also using exposed surface. It's just above you. If you build the roof top, a simple support system will probably cost less than the entire lifecycle of a concrete paver. And then it also provides shade in a lot of places, in Malaysia especially, you actually want more shade than expose sunlight, right?" (Focus group session 1)* *"You are putting it under disadvantage because of the angle itself, cannot get the top efficiency. I think this is the reason why currently we are putting on top of the*

	roof. Because they actually do measure the angle of slab. Because it's not installing flat right. It is slanting, so that is actually the way to get the top efficiency. So you have this efficiency lost. Meaning if you implement on the road paver, you cannot expect the efficiency." (Focus group session 4)

Note: LED=Light-Emitting Diode