



RICES

RESEARCH INNOVATION COMMERCIALISATION & ENTREPRENEURSHIP SHOWCASE
via "Immersive Virtual" environment

HUMANIZING INNOVATION

9 DECEMBER 2020

Wednesday @ 10:00 a.m. – 11:00 a.m.



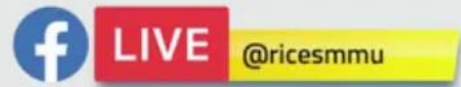
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Acceptance Letter

To:
Dr Rafia Afroz
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On behalf of the RICES Committee, we take great pleasure in inviting you to attend the **Conference at RICES 2020** which is going to be held from 9th to 10th December 2020. The conference will be held on the 10th December 2020.

We welcome you to join with us and share your research and views on the theme “Humanizing Innovation”. We are glad to inform you that your submitted abstract entitled “Alternative Source of Financing for Start-up Solar Companies in Malaysia” has been accepted for virtual presentation at RICES 2020.

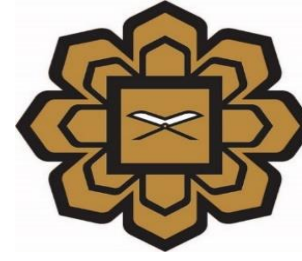
We hope to receive your extended abstract by 27th November 2020. The template of the extended abstract is attached herewith. Please email the extended abstract together with the copyright transfer form to ricesmmu2020@gmail.com. Kindly adhere to the deadline to ensure that your extended abstract can be published as proceeding in MMU Press.

We look forward to seeing you during the event.

For more details about RICES 2020, visit our website at <https://rices.mmu.edu.my/>

With Regards,

RICES 2020 Conference Coordinator



الجامعة الإسلامية العالمية ماليزيا
INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA
يُونِبْرِسِيَّتِي اِسْلَامُهُ اِنْتَارَا اِبْعَثَا مِلْدِيَّتَا

Alternative Source of Financing for Start-up Solar Companies in Malaysia

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Acknowledgement

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Background of the Study

Malaysia is a growing economy and its GDP per capita (current US\$) is 11414.8 based on a stable GDP growth rate of 4.3% in 2019 (World Bank, 2020).

Energy commission of Malaysia (2017) confirmed that energy consumption also expected to be increased by 6% per annum along with this economic growth.

In the first half of 2010 alone, 21% of the electricity generated in Malaysia was consumed by residential sector and the average annual consumption of per household is 3300kwh (Taha, 2003).

Presently, the total number of residential dwellings are about 7.3 million and it is projected that this number will be increased by 150,000 each year (REHDA, 2010).

At the same time the, energy demand in the industrial sector also increased by 9.1% in 2018 compared with the previous year (Energy Commission, 2020).

Background of the Study

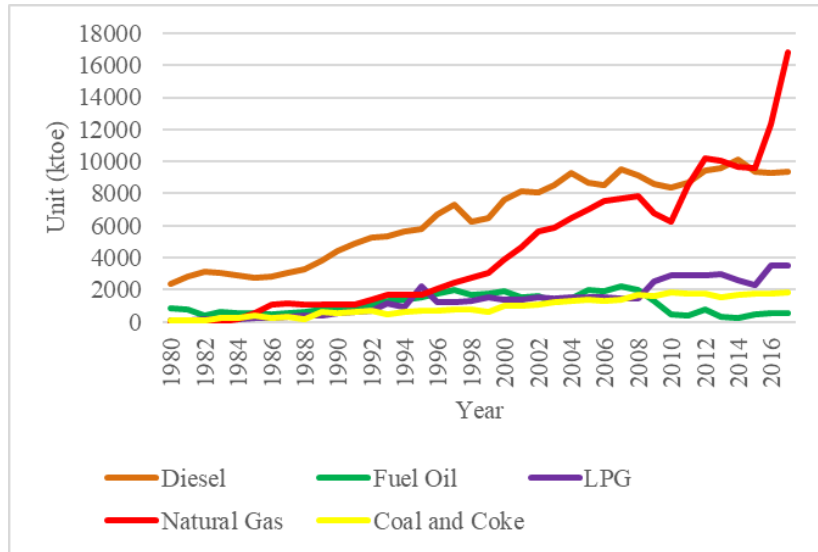


Figure 1. Consumption of non-renewable energy sources in Malaysia during 1980 to 2017 (Energy Commission Malaysia, 2020)

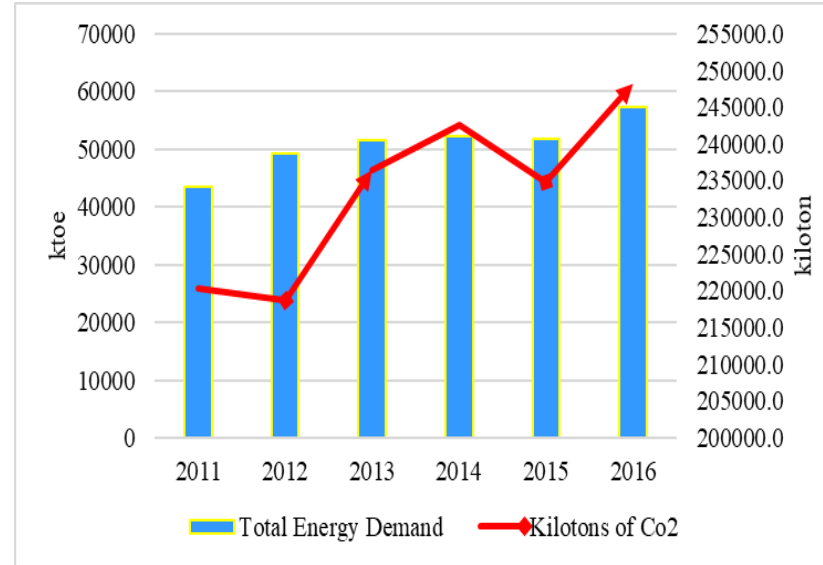


Figure 2. CO2 emission (kt) and total energy demand in Malaysia during 2008 to 2018 (Energy Commission, 2019)

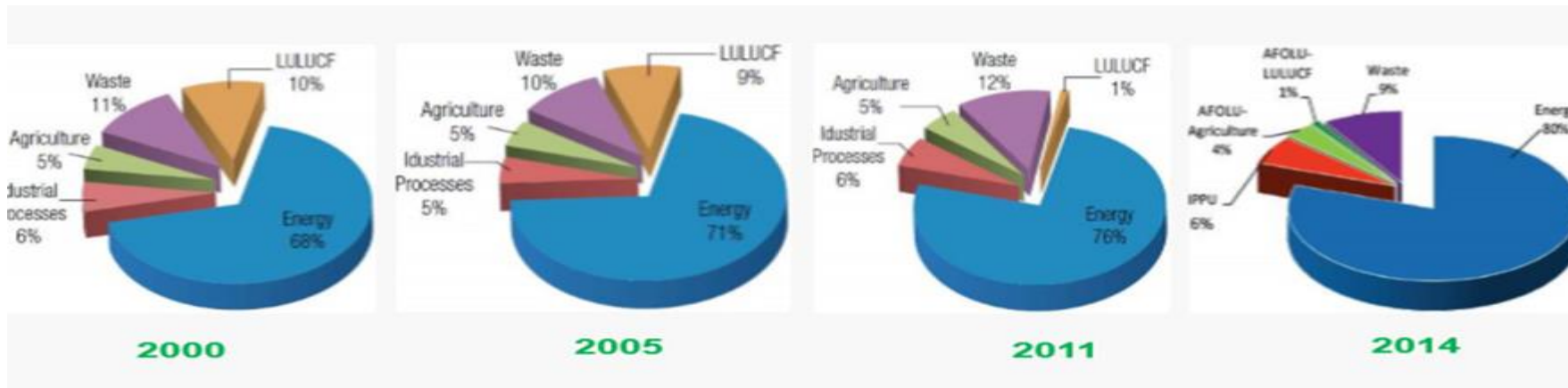


Figure 3. Green House Gas Emission (GHG) in Malaysia during 2000-2014

Background of the Study

Although Malaysia has a total reserve of 4.73 billion barrels' crude oil in 2017 (Energy Commission, 2019) and is ranked 16th in terms of the size of its natural gas reserves (Central Intelligence Agency, 2011), , the people of Malaysia must realize that one day this reserve may be depleted if they cannot find an alternative source of this non-renewable energy (Štreimikienė & Baležentis, 2015; Ashnani et al. 2014).

At the conference of Parties in Copenhagen, Malaysia has pledged to reduce 40% carbon discharge by the year 2025 from the base year 2005 (COP15, 2009).

This means that to sustain the increasing electricity demand, while cutting dependency on the fossil fuels, Malaysia needs to shift its electricity generation to alternative energy resources.

As a country that is rich in fossil fuels, this is not an easy obstacle to Malaysia must quickly move away from its dependence on these resources.

More concerted efforts are clearly required by government and various stakeholders and institutions to make a more meaningful contribution of RE in the energy mix.

Background of the Study

- In Malaysia, electricity from RE sources could reach 11,227 GWh by 2020, in line with the RE Policy and Action Plan (NREPAP).
- However, out of 194 GWh (1.7%) of solar PV, the signal of solar PV system in the power structure is expected to improve to 13,540 GWh by 2050.
- The increase in electricity generation from solar is due to the availability of sufficient sunlight and irradiance levels.
- Malaysia has more than four million buildings with rooftop solar potential in Peninsular Malaysia.

Solar Panel Installation



- The installation of a home solar panel system will add value for households as every month it saves money from bills of utilities.
- As the prices of residential electricity in Malaysia increase by about 3% each year, households can ensure that their finances do not suffer from increased electricity costs.
- Household expenditure survey, HES (2019) Malaysia report shows that household expenditures are increasing, and highest consumption expenses of household is on the Housing, water, electricity, gas and other fuels (25.1%) (DoSM, 2020b).
- This system will cut down on electricity costs of the households.

Green Finance in Malaysia

	Green Investment Tax Incentive (GITA) and Green Income Tax Exemption (GITE)	Green Technology Financing Scheme (GTFS)	Green Financial Incentives
Pros	It reduces greenhouse emissions and promotes the use of RE or recycles waste materials used.	Develop sustainable and widespread green technology markets and enhance human competency and capacity in green technology applications.	to encourage investors to invest in green technology industries as well as to encourage private sectors to adopt green technology
Cons	Uncertain delivery of credits	The most crucial barrier in adoption of green technology is the economic barrier which is the cost	Lack of knowledge and expertise, lack of market demand, lack of green building codes and regulations, lack of incentives and lack of databases and information.

Climate change Mitigation Policy in Malaysia

- At the conference of Parties in Copenhagen, Malaysia has pledged to reduce 40% carbon discharge by the year 2020 from the base year 2005 (COP 15 2009).
- The Feed-in-Tariff (FiT) instrument was recognized under the Renewable Energy Act to deliver for the establishing and implementation of a different tariff system to expedite the generation of RE (Petinrin & Shaaban 2015).
- Malaysia is implementing its 500 megawatts (MW) of capacity for net energy metering (NEM) beginning 2016 until 2020, with 100MW capacity limit a year in Peninsular Malaysia and Sabah.
- It is a new mechanism designed to replace the Feed-in Tariff which already closed for registration since 2016. NEM allows self-consumption of electricity generated by solar photovoltaic (PV) system users, while selling the excess energy to Distribution Licensee at prevailing Displaced Cost.

FiT and New Energy Metering System

The FiT is Malaysia's new mechanism under the Renewable Energy Policy and Action Plan to catalyse generation of RE, up to 30 MW in size. This mechanism allows electricity produced from indigenous renewable energy resources to be sold to power utilities at a fixed premium price for a specific duration. (SEDA 2017).

Owing to the high costs involved in funding such a project, the FiT scheme is not viable in the long run. Therefore, net energy metering (NEM) was implemented in 2016 by the government.

NEM 2016, however, failed to allow RE to reach its growth target after two years of implementation. One of the key reasons is that all energy imported into the grid will be charged only at a displacement cost of RM0.31 per unit per kWh, which is not financially attractive.

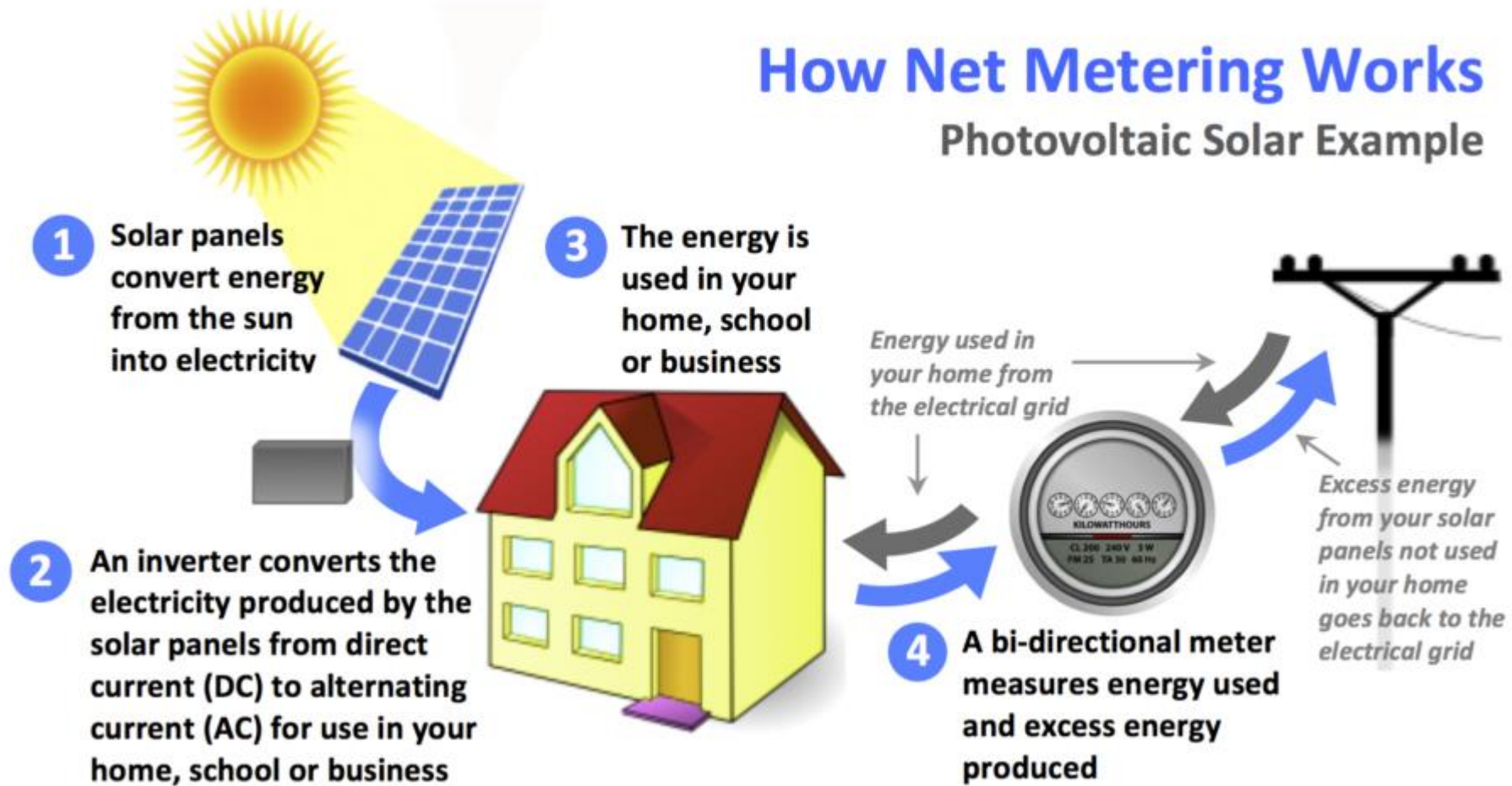
NEM2019 offers better cost savings in most cases, hence may attract more electricity consumers to install PV system in their homes compared to NEM2016.

However, the cost savings is only apparent for large and some medium consumers.

For small consumers, both NEM schemes will not be able to provide any savings to justify PV system installation due to the low electricity tariff charged and the high capital and maintenance cost of the PV system.

How Net Metering Works

Photovoltaic Solar Example



How to calculate Electricity Bills under NEM 2016 and NEM 2019

- Under NEM 2019

Bill= (electricity generation-electricity consumption)X tariff

Under 2016

Bill= (electricity generation x displacement cost) - (electricity consumption X tariff)

NET ELECTRICITY BILL AMOUNT: RM168.85**Total imported electricity from TNB**

Block tariff (kWh)	Usage (kWh)	Rate (RM/kWh)	Amount (RM)
1 – 200	200	0.218	43.60
201 – 300	100	0.334	33.40
301 – 600	300	0.516	154.80
601 – 900	50	0.546	27.30
901 onwards	0	0.571	0.00
TOTAL	650		259.10

Total exported electricity to TNB

Block tariff (kWh)	Usage (kWh)	Rate (RM/kWh)	Amount (RM)
1 – 200	0	0.218	0.00
201 – 300	0	0.334	0.00
301 – 600	122	0.516	62.95
601 – 900	50	0.546	27.30
901 onwards	0	0.571	0.00
TOTAL	172		90.25

SOURCE: SEDA MALAYSIA

Effective on 1st January 2019, the Net Energy Metering (NEM) will be improved by adopting the true net energy metering concept and this will allow excess solar PV generated energy to be exported back to the grid on a "one-on-one" offset basis. This means that every 1kWh exported to the grid will be offset against 1kWh consumed from the grid, instead of at the Displaced Cost previously.

This rate does not benefit large consumers since they are paying more expensive electricity tariff. To overcome the problem, the government introduced a new NEM scheme in 2019 by setting the pay rate at retail rate per kWh energy export to the grid. As of Jan 1, 2019, under this scheme, 11 MW of energy was saved and the Government set a target of 20% by 2030

Challenges/Barriers of usage of solar energy in Malaysia

- ✓ the initial costs and the lack of support lack of support and confidence from local investors and a lack of experience and understanding of renewable energy among financial institutions
- ✓ the tax exemptions and incentives provided to the renewable energy industry are not adequate to cover costs administrative problem
- ✓ lack of coordination among investors and involved authorities,
- ✓ lack of awareness and financial support

Crowdfund and Types of Crowdfund

- ✓ Crowdfunding is defined as an open call over the internet of financial resources in the form of donations, sometimes in exchange for a future product, service or reward (Kleemann, Rieder, 2008; Nordin et al., 2018).
- ✓ Massolution (2012) defines four categories of crowdfunding platforms (CFP): crowdfunding based on
 - ❑ equity, loans,
 - ❑ donations, and
 - ❑ rewards.
- ✓ The three main differences between conventional and Islamic classifications are that the Shariah-class separation is
 - ❑ socially responsible for investing in halal projects/products,
 - ❑ sharing the risks of investment, and
 - ❑ the absence of interest or *riba* (Marzban, Asutay, & Boseli, 2014).

Crowdfunding Platform in Malaysia

Abdullah et al. (2017) identified six platforms registered in Malaysia such as

- ✓ Alix Global,
- ✓ Ata Plus,
- ✓ Crowdonomic,
- ✓ Eureeca,
- ✓ pitchIN and
- ✓ Propellar Crow.

Why we need Crowdfund for Solar Energy?

Traditional source of finance might fail to support these green policies during this COVID-19 financial crisis. Hence, a significant gap will be created between supply and demand of financial resources for solar energy projects across many countries as both governmental funding and bank financing shrank.

In this context, Shariah Compliant Equity Based Crowdfunding(SCF) could be an alternative approach which will support NEM and will finance the start-up solar farms who might face the shortage of fund.

Furthermore, crowdfunding is not only a mean to finance a project, but also a way to enact a more inclusive and democratized society.

Hence, SCF model will support the NEM program, reduce the barriers and risks faced by the solar farms, increase Gross Domestic Product (GDP) , create job opportunity and develop a low carbon society.

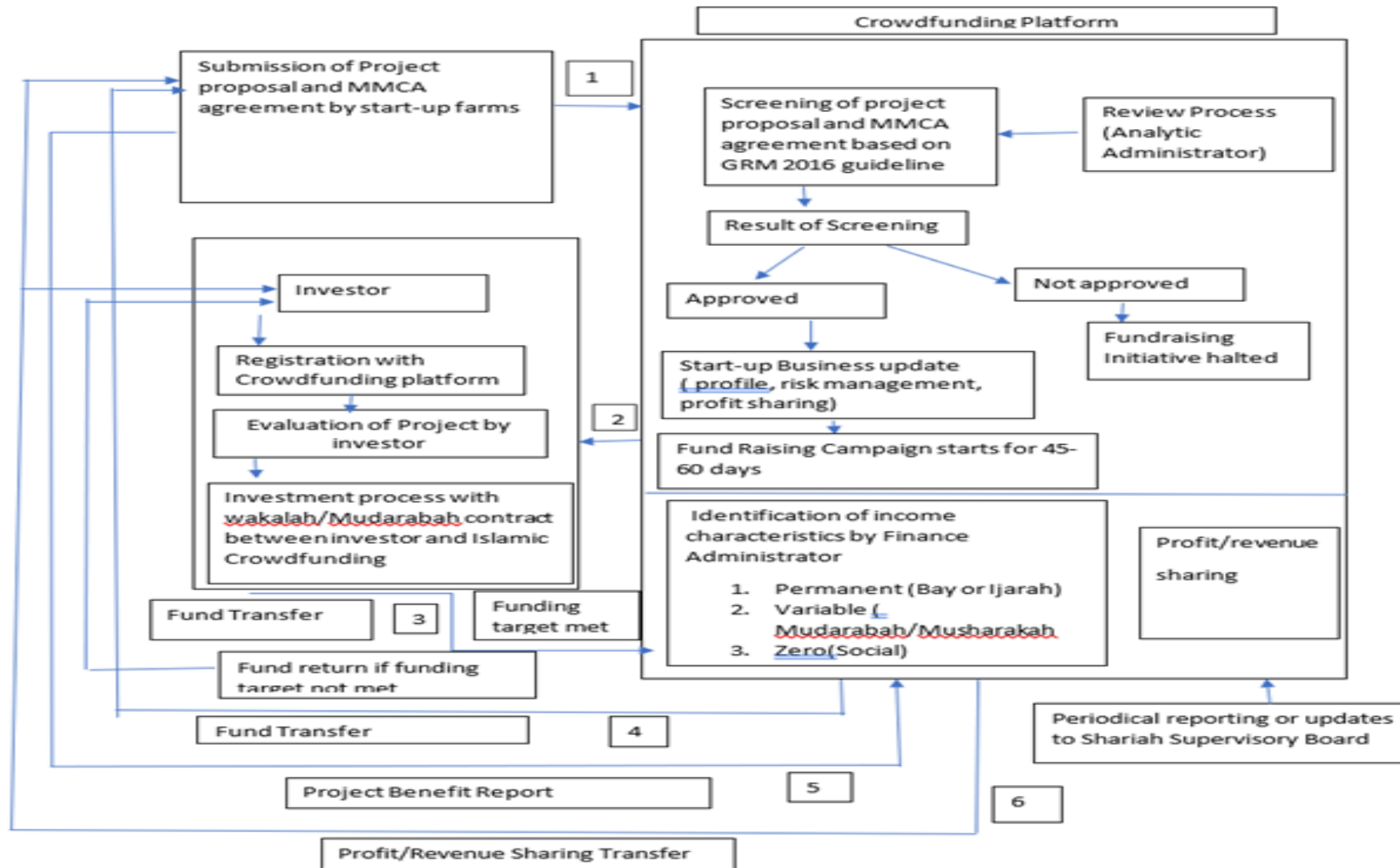
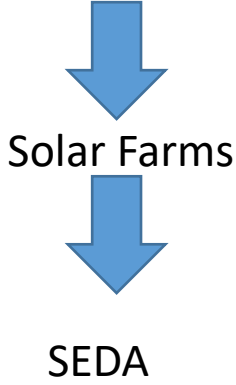
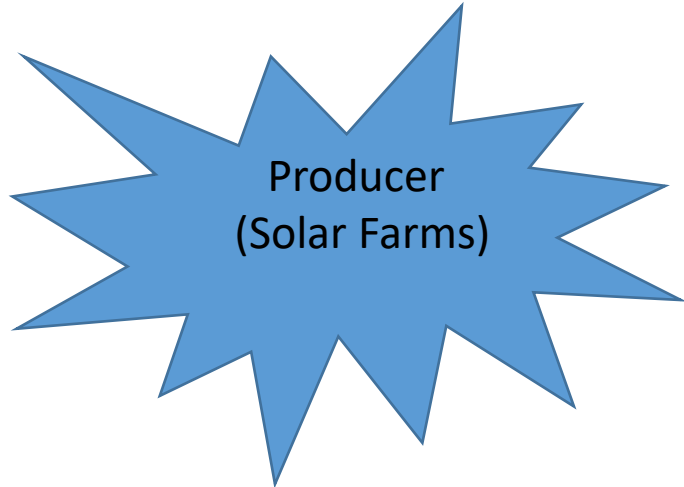


Figure 4. Proposed Shariah Compliant Equity Based Crowd Funding Model for Organic Solar Energy

Shariah Compliant equity-based crowdfund



HERE ARE THE OPTIONS OF SOLAR PV PURCHASING MODES THAT YOU CAN CHOOSE FROM

OUTRIGHT PURCHASE

- Cash
- Credit Card
- Loan

www.seda.gov.my/rpvsp

Registered Solar **PV Service Provider (RPVSP)**

The RPVSP will apply for NEM on behalf of customer.

LEASING

- Solar Power Purchase Agreement (PPA)
- Solar Leasing Programme

www.seda.gov.my/rpvi

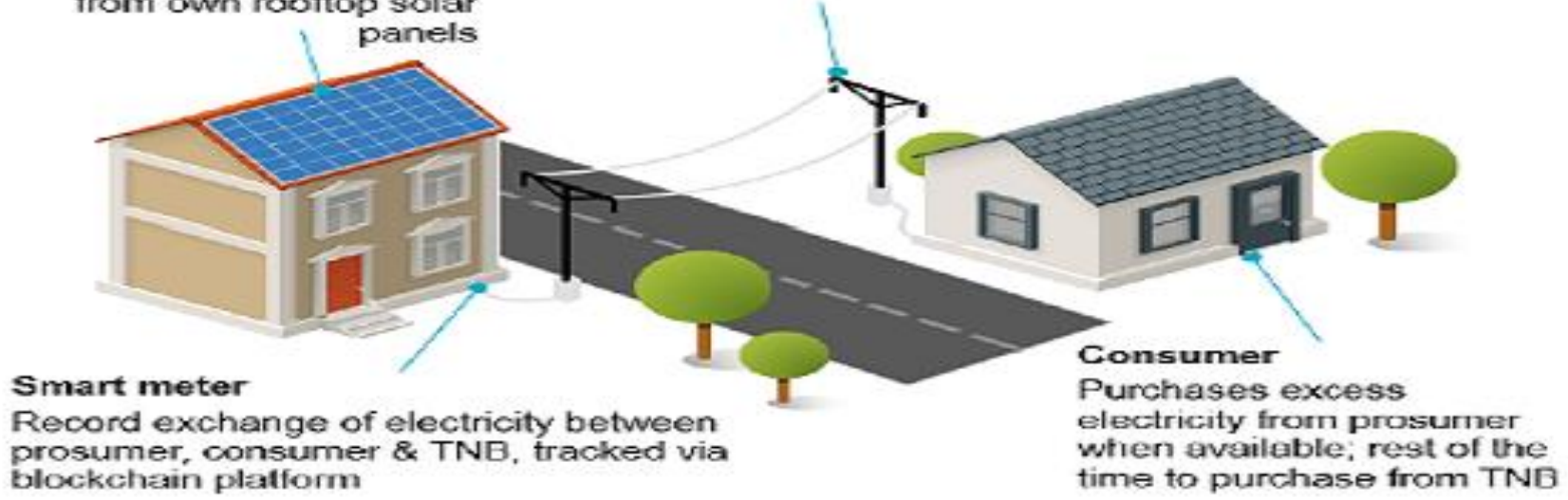
Registered Solar **PV Investor (RPVI)**

The RPVI will apply for NEM on behalf of customer.



Prosumer (NEM user)
Produces excess electricity from own rooftop solar panels

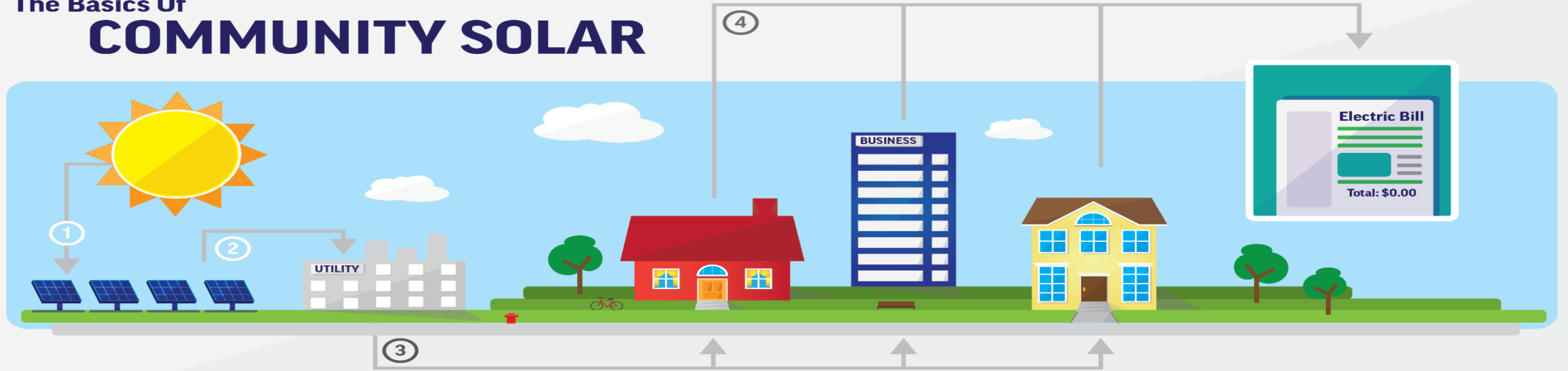
TNB's grid
Use of TNB's grid



Community Solar

The Basics Of

COMMUNITY SOLAR



1. Sunlight hits the solar panels in the community solar field, generating electricity.
2. The electricity generated flows through an on-site meter to the electrical utility grid.
3. The utility company measures the electricity generated, calculates a dollar value for the power, and distributes this dollar value proportionately to the members of the community solar program (residents, businesses, municipalities and institutions).
4. The value of the solar electricity produced from the array is applied as a monetary credit to each member's electric bill.

Community Solar

- ✓ As a community solar member, you will also get a bill from the owner of the community solar project, charging you for the credit they have applied to your electric bill.
- ✓ The benefit of community solar is that you purchase a dollar credit at a discounted rate. For example, you would pay for electricity generated by the community solar project at a discounted rate of \$0.85 for \$1.00 worth of energy – ultimately saving 15% off your electric bill.
- ✓ Think of it like a Groupon for solar – where you might pay \$10 for a \$20 gift certificate.
- ✓ During particularly sunny months, your solar credits might exceed your electricity consumption. In that case, you remain obligated to pay the solar company for the credit assigned to your account. Any unused credits will roll over month to month, and they never expire.

Conclusion

- Malaysia seeks to achieve a renewable energy target of 20% by 2025. This model may make the grid relevant through the front-of-the-meter (FTM) business opportunities available to solar farms through NEM.
- It is expected that the proposed model can save money on household electricity bills, help to meet carbon reduction targets and generate income.
- It will also create health benefits such as reduction of cardiovascular and respiratory disease and improve economic productivity from a healthier and more productive workforce (WHO, 2015).
- It can also create jobs for those engaged in managing, installing and maintaining projects and throughout the supply chain, which has a knock-on impact on local economies.
- So, the model can act as a catalyst to stimulate employment opportunity. Finally, it will be able to help the country to conserve the energy by utilizing the solar energy.

Conclusion

To achieve the sustainable development goals by 2030, Malaysia will require an estimated US\$5 trillion to US\$7 trillion of annual investment across sectors and industries. This model can play an important role to bridge financing gaps.