



**Ditrolic Solar
Philippines Inc.**

DRIVING ENERGY TRANSFORMATION: A ROADMAP TOWARDS 100% RENEWABLE ELECTRICITY

We're committed to

**BUSINESS
AMBITION FOR**

1.5°C



**OUR ONLY
FUTURE**

When, Where and How it Began

- 1991- Ditrolic Sdn. Bhd. incorporated
- 2009- Solar Photovoltaic (PV) founded
- One of pioneer Solar PV company in Malaysia
- Leveraging on founder experience in electrical engineering
- Over 300MW installed by Ditrolic throughout South East Asia (SEA) on more than 500 roofs/sites



Company Track Record

>12yrs

Industry
Experience

6

Countries
Presence
(2021)

~300MW

Development
Track Record

Offering Environment Focused Solution by Compelling Economics

- Provide solutions to major organisations focused on climate change initiatives, emissions reductions, and energy efficiency
- Offering tangible and measurable energy carbon reduction solution throughout Asia Pacific region



Renewable Energy (RE)



Technology Platform



Energy Management



Energy Storage



Solving the World's Climate Change Problem

61.7%

of electricity
is generated from
fossil fuels

+7%

rise in carbon dioxide
CO₂ emission from
electricity generation in
2021

580g CO₂/kWh

Asia Pacific (APAC) is the
most carbon intensive
power grid globally

>4x

average wholesale electricity
price in Q4 2021 compared
to average from 2015-2020

2.7%

average annual electricity
demand growth from 2022-
2024

43%

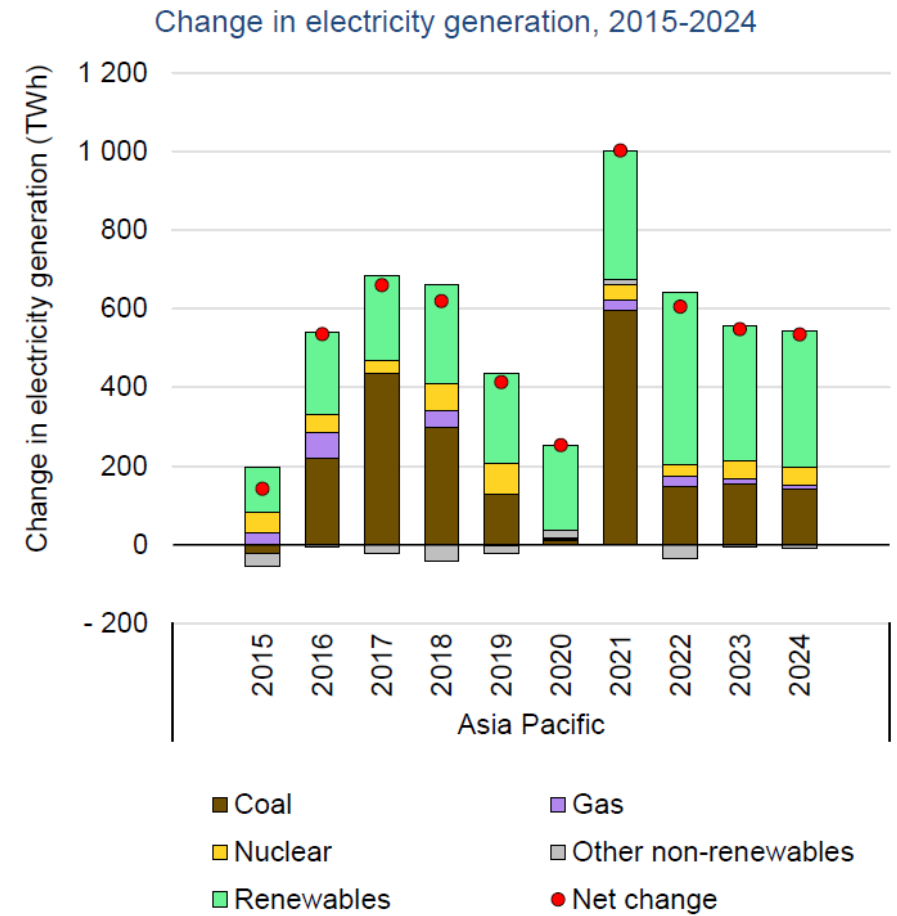
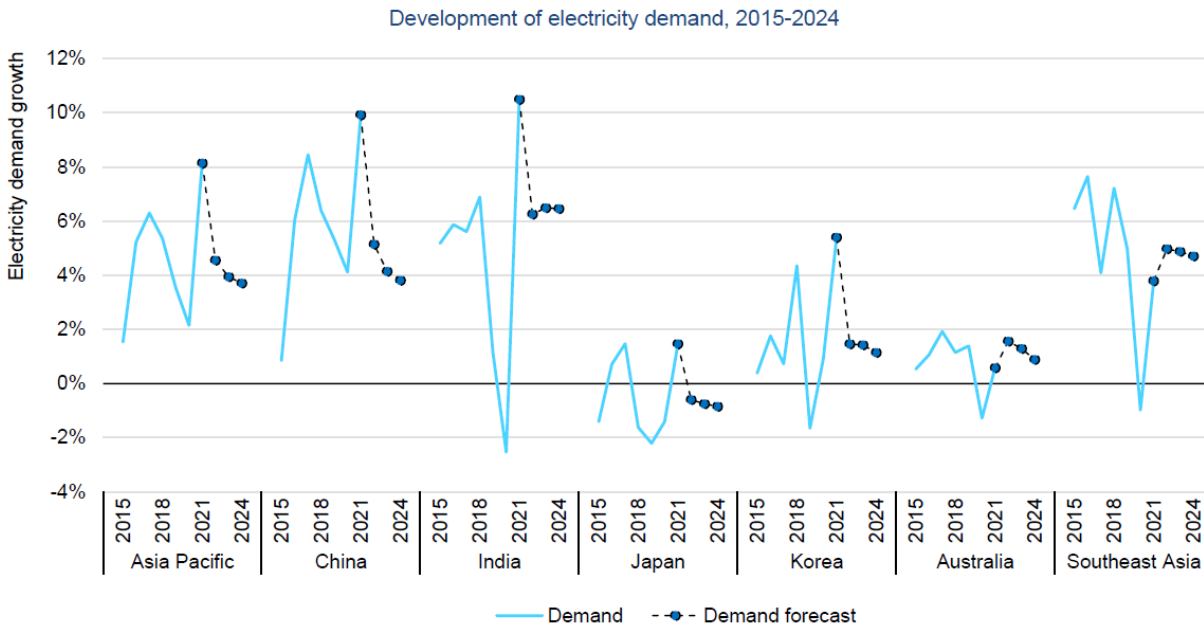
of electricity supply in
S.E.A coming from coal

Asia's growing but changing electricity mix demand

Global electricity demand growth is concentrated in emerging and developing Asia

- Asia is the **fastest growing region** in the world in terms of electricity consumption **led by China, India and S.E.A**
- Renewable energy will be the **dominant additional energy source** to be added

Renewables share in energy generation rapidly exceeding other sources but remains low



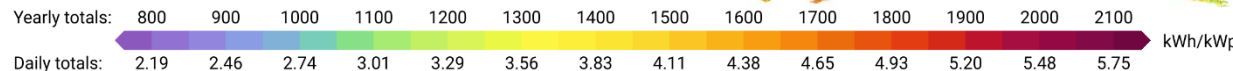
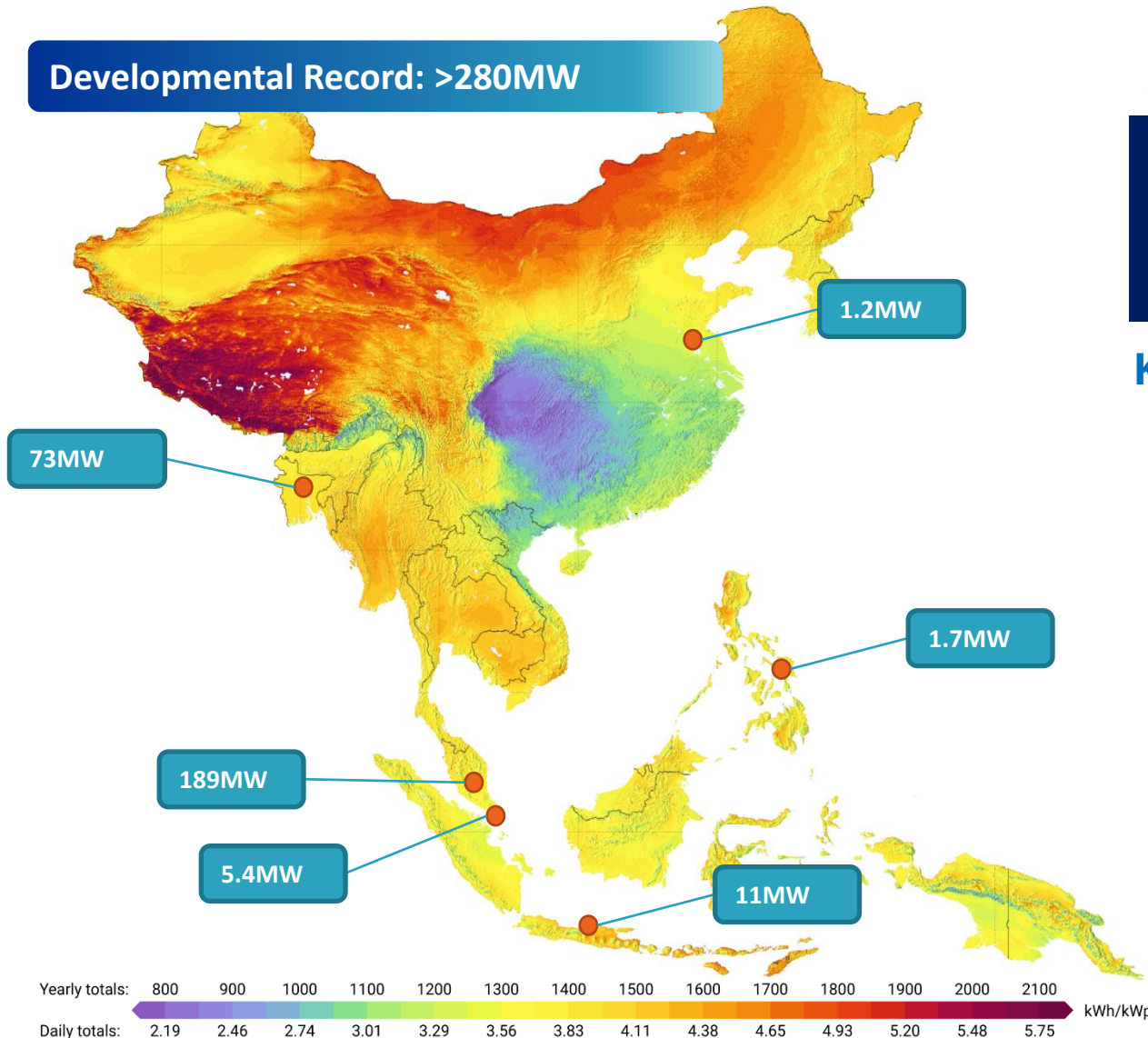
Source: IEA Electricity Market Report – Jan 2022

Ditrolic Introduction

An established Pan-Asian clean energy player



Developmental Record: >280MW



Ditrolic Energy is currently present in 6 countries serving a large addressable Pan Asian market.

39
PROJECTS

6
COUNTRIES

275
MEGAWATT

KEY CLIENTS



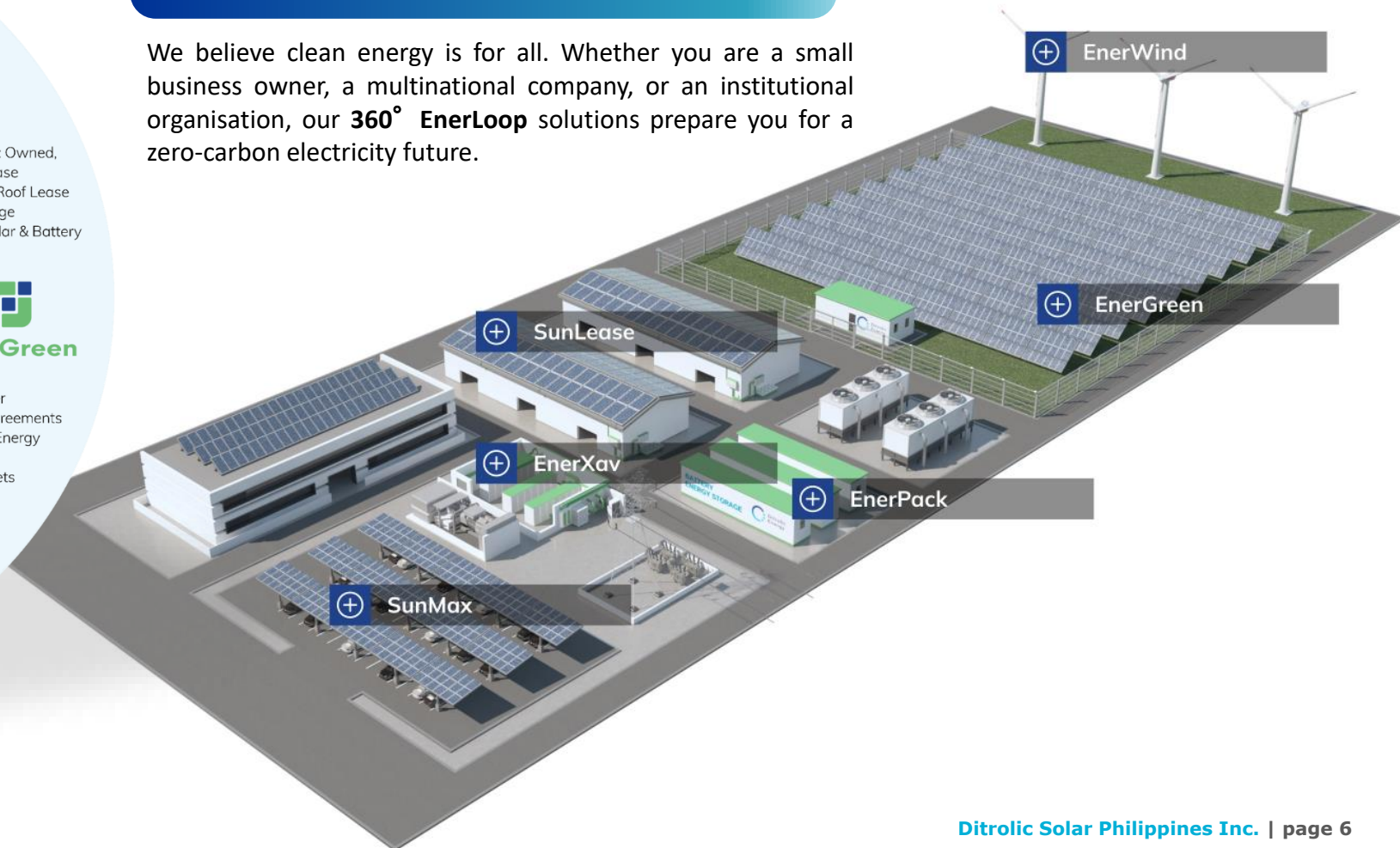
Business Solutions

360° EnerLoop Solution



When the future is ZERO
There isn't any compromise

We believe clean energy is for all. Whether you are a small business owner, a multinational company, or an institutional organisation, our **360° EnerLoop** solutions prepare you for a zero-carbon electricity future.



Growth Opportunity

Impending disruption and growth opportunity

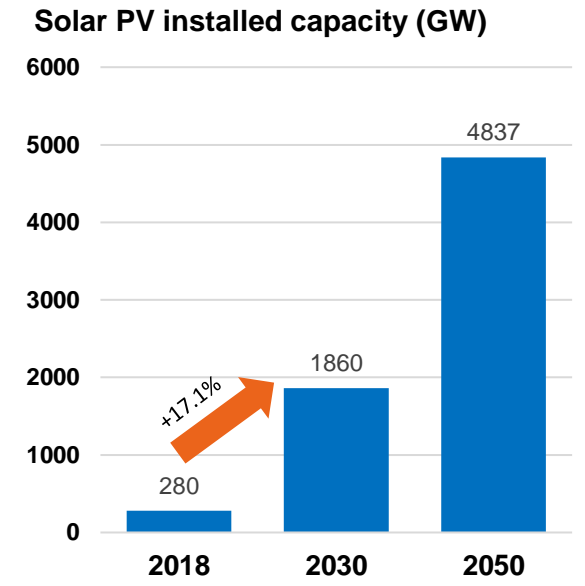
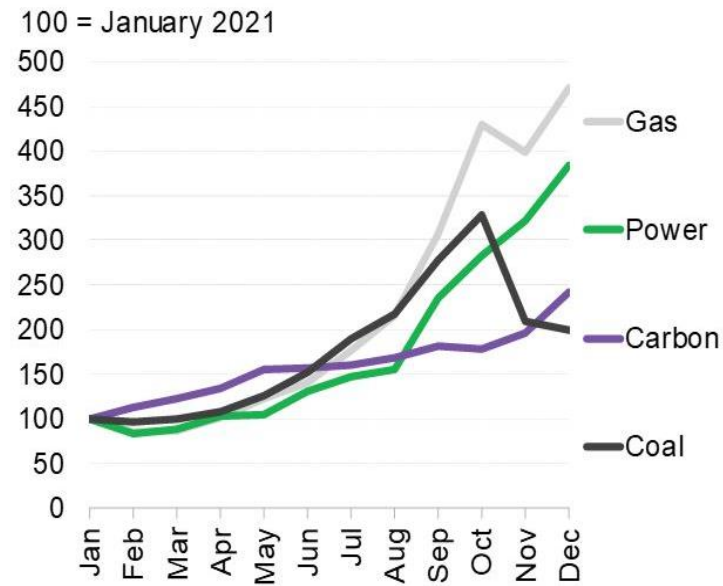
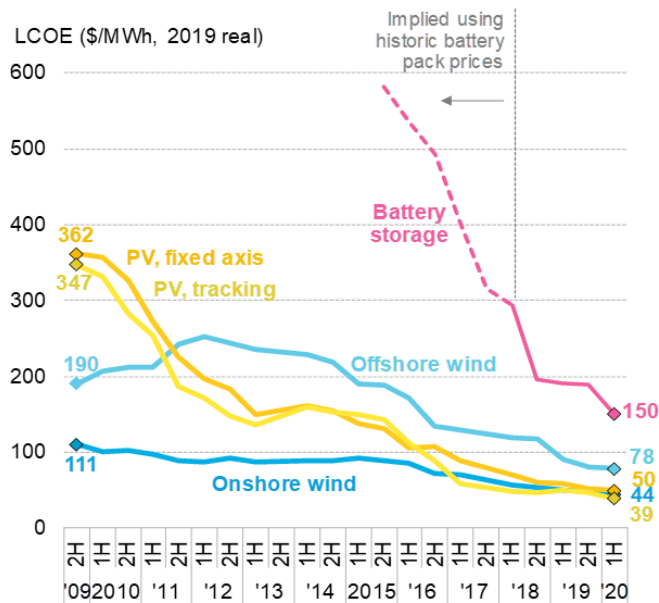
Dropping Renewable Energy Cost¹



Increasingly Volatile Non-RE Cost²



17.1% CAGR Growth for Asian Market³



The decreased in cost of RE generation and energy storage coupled with increasing volatility of non-RE generation cost is expected to accelerate the segment growth in Asian market. Asia (mostly China) is poised to dominate solar PV installations, with more than half of global installation by 2050.

^{1,2}Source: BNEF 2020, ³Source: IRENA Insight, 2019

Progressive electricity markets restructuring around Asia present huge opportunity

- It is a known fact that net-zero ambition could only be achieved through liberalization of electricity sector
- An open market allows for decentralisation of electricity services and drive value for consumer
- Together with incumbent utilities companies, participation of various electricity market players are crucial towards acceleration to zero carbon electricity solution/services

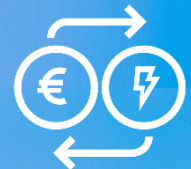
Potential market services










Energy Retail



Ancillary Service



Energy Trading

Country	Green Tariff (Bundled)	REC (Unbundled)	On-Site Generation	Off-Site Generation	Power Market Structure
 Malaysia	Yes Limited	Yes	Yes SELCO/NEM (exhausted)	In planning MESI2.0/MyRER	Single Buyer model with IPPs
 Singapore	Yes	Yes	Yes SELCO/Backflow	Yes	Electricity future market
 Thailand	No	Yes	Yes SELCO	No	Single Buyer model with IPPs
 Indonesia	No	Yes	Yes SELCO/NEM	No	Single Buyer model with IPPs
 Vietnam	No	Yes	Yes SELCO/FIT	In Planning DPPA to start in 2022	Wholesale spot market
 Philippines	Yes	Yes	Yes SELCO/NEM (100kW)	Yes	Retail Competition
 China	No Negligible	Yes Green Elec. Cert.	Yes SELCO/NEM	In Planning Pilot Projects Ongoing	Single Buyer / Wholesale spot market

Source: Ditrolc Energy Internal

Philippines C&I solar landscape

The Philippines' solar rooftop market is nascent, with a total installed capacity of around 100 MW

From just two megawatts in 2011, this figure reached 1048 megawatts in 2020

As of March 31, 2021, the Department of Energy reported a total of 270 solar renewable energy projects in the Philippines for commercial use

Department of Energy estimates showed that a total of 3,795 qualified end users have registered for the net metering program with a total rated capacity of 30 megawatts-peak, as of end-2020



Rooftop



Carport



Floating



Ground mount



PHILIPPINES

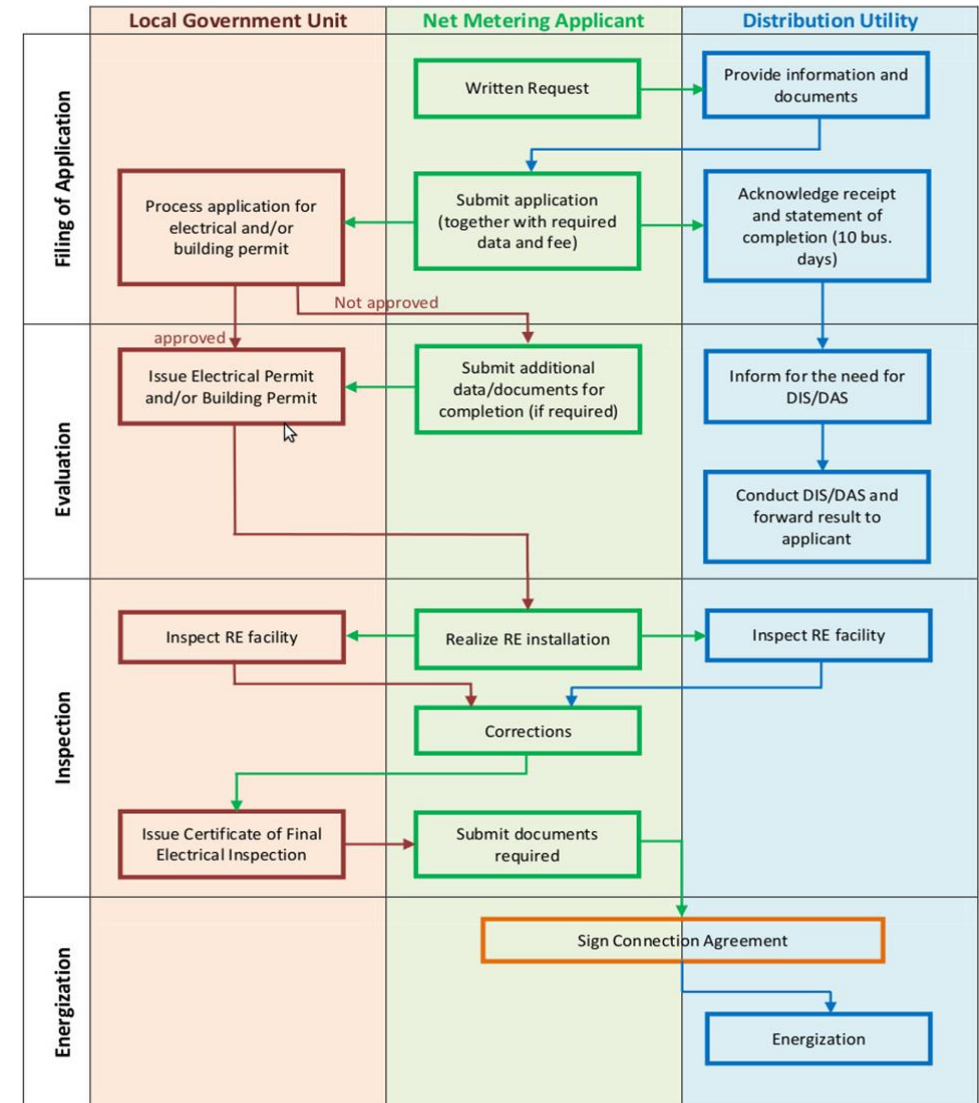
Philippine Development Plan (PDP)

- Feed-In-Tariff scheme (Discontinued)
- Net Metering scheme
- Distribution of Electricity in On-Grid Areas (Power Supply/ Leasing Agreement)

Local Perspective

Regulatory framework

- **FEED IN TARIFF** – program was **closed** to new applicants on March 31, 2019
- **Net-metering** is the first policy mechanism of the Renewable Energy Act of 2008
- Net-metering allows customers of Distribution Utilities (DUs) to install an on-site Renewable Energy (RE) facility not exceeding 100 kilowatts (kW)
- The DU gives a peso credit for the excess electricity received equivalent to the DU’s blended generation cost, excluding other generation adjustments
- DU customers who are in good credit standing are qualified to participate in the Net-Metering and referred to as “Qualified End-Users” or **QE**
- Contestable customers getting their power supply from an **RES** are not eligible to join the Net-Metering program
- Customers directly-connected to the National Grid Corporation of the Philippines (NGCP) transmission grid are not DU customers & thus not eligible for Net Metering.



Reasons behind building renewable energy switch



Create Customer Value

- Nielson study revealed that **66%** of the people willing to pay more for goods and services offered by companies with visible green practices like solar.
- Corporates with active RE practice will have a higher opportunity to get company investment.



Security in Cost

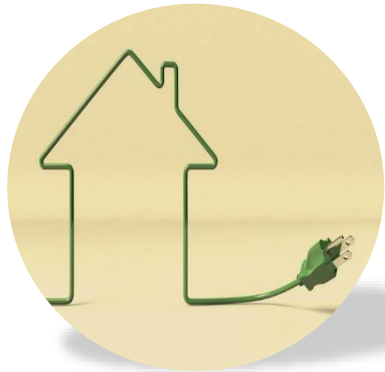
- Businesses can access to a cheaper electricity.
- A more steady and stable electricity costs with solar systems. Businesses are protected from having to deal with the rising electricity costs that will inevitably happen in the future.



Profit & Loss

- Solar system reduce businesses operating costs by providing a cheaper energy compared to local tariff rate.
- Businesses can enjoy the benefits of renewable energy without having a large upfront investment from PPA.

4 ways to procure renewable energy



Supplier Green Tariffs

- Bundled power & RECs; subscriber program (share if utility PPA); sleeve PPA
- Limited availability, but options increasing
- Often premium on electricity cost



Energy Attribute Certificates (EAC)

- The way clean energy use is tracked and traded
- Environmental claims is needed
- Unbundled and bundled
- Short-term Green Tariffs



Onsite/Distributed Generation

- Direct reduction of energy
- High visual appeal & meets additional test
- Hard to achieve scale
- Fixed to real estate portfolio
- Ownership, lease, or PPA


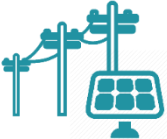




Off-Site Generation

- Typically Ground Mounted scale projects
- PPA (Direct, Sleeved Retail)
- Achieves additionality and scale
- Includes EACs
- Long term Green Tariffs

Key Considerations

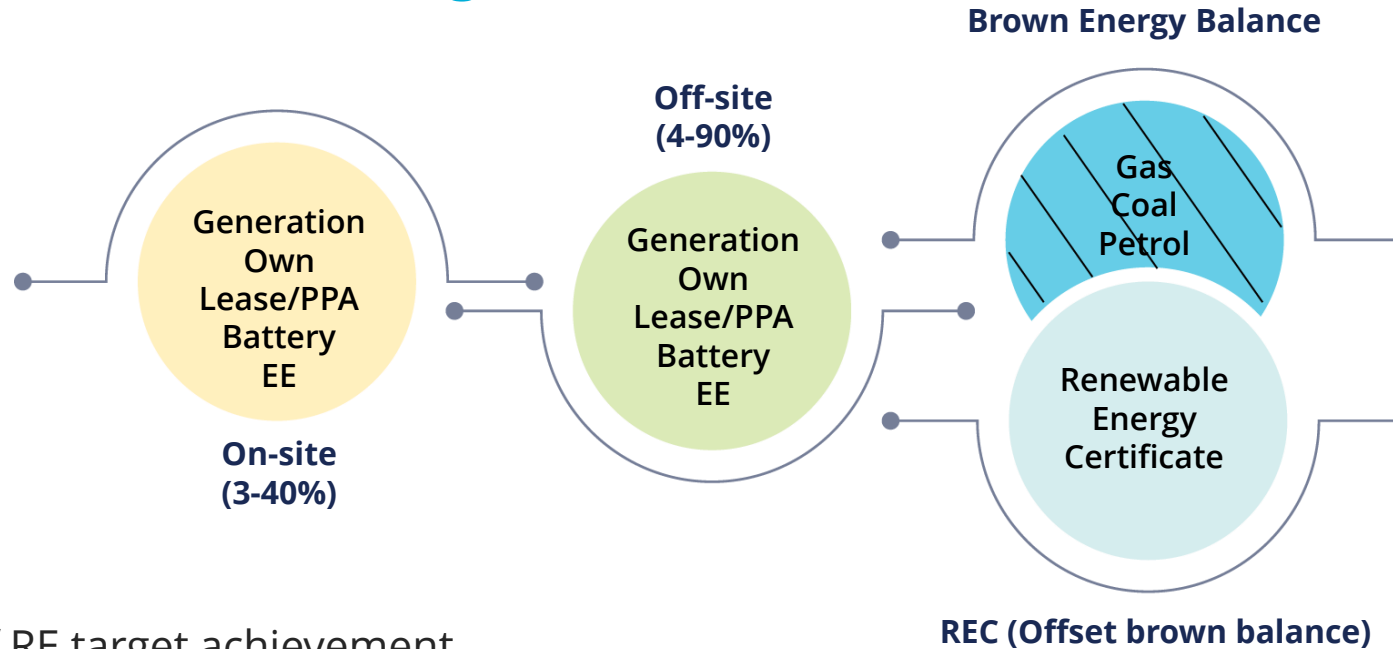
Pro & cons of each procurement

Option	Key Consideration – Pros and Cons		
Onsite generation 	●	Financial	Generally costly to the corporate as it includes both develop and build costs
	●	Carbon	Measurable changes, may not contribute large proportion of energy demand
	●	Brand	Visible change understood by stakeholders
Offsite PPAs 	●	Financial	Locked in contract with protection against power price volatility
	●	Carbon	Long-term solution that is easily measurable and can have make significant contribution towards being 100% renewable (given size of projects)
	●	Brand	Direct association with a project more easily understood by the public
Tariffs or certificates 	●	Financial	Costly to business without any direct financial benefit
	●	Carbon	Low quality tariffs may not fulfil carbon targets and considered a means of last resort
	●	Brand	High quality tariffs can enhance brand as they are externally recognised, lower quality tariffs less so
Carbon offsetting 	●	Financial	Simply a cost to the business
	●	Carbon	Helps corporates avoid fines relating to carbon emissions
	●	Brand	Does not protect brands and can lead to accusations of "green washing"

Source: E&Y

Roadmap Towards 100% RE

Roadmap to achieve RE target



Consideration of RE target achievement



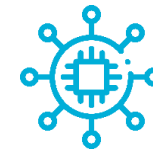
Business Model

Scale retrofits of 5% of global buildings annually



Policy

Enact policies to support electrification and building standards



Technology

New less costly zero-carbon building technologies



Finance

Funnel investment to support retrofit uptake

Roadmap Towards 100% RE

Clean energy cost



Lowest Cost

Behind The Meter ONSITE

A system provides power that can be used on-site without passing through a meter.

- Philippines
- Malaysia
- Indonesia
- Thailand
- Vietnam
- China

Medium Cost

OFFSITE PPA

Offsite PPA (Sleeved or Virtual):-

- A PPA where the RE installation is not sited at the location of the company's electricity usage.

Energy Storage (Battery)

The capture of energy produced at one time for use at a later time to reduce imbalances between energy demand and energy production.

Energy Efficiency

Using less energy to get the same job done and in the process, cutting energy bills and reducing pollution.

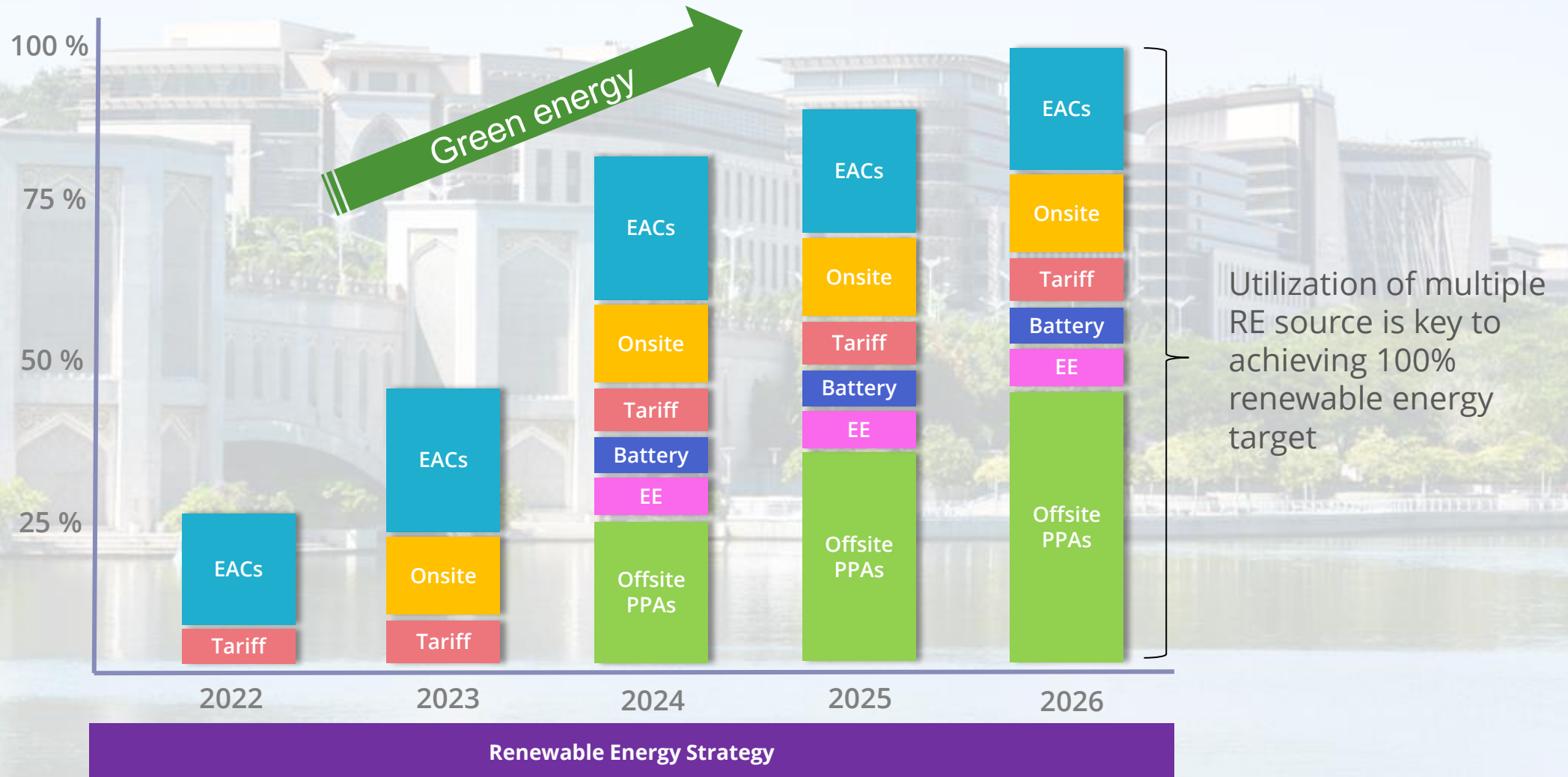
Highest Cost

Green Tariff or REC

Renewable energy certificate as a market-based instrument which represents the property rights to off-set the brown energy generated by fossil fuel from renewable energy generation.

Roadmap Towards 100% RE

Portfolio approach to meet renewable targets



Available Solar Scheme

EPCC (SunMax) VS Solar rental (SunLease)



	SunMax	SunLease
Up-front cost	YES	ZERO
Performance Responsibility	YES	NO
Pay for Inverter / BoS Replacement	YES	NO
Pay for Maintenance Cost	YES	NO
Pay for Insurance, Licensing, as per local requirement	YES	NO
Financing Repayment (Above Utility Bills)	NO - if 100% self-finance YES - if loan payment	NO
Accounting	On balance sheet	Operating Lease

PHP 0 DOWN

- Rental fee payment based on the performance of the solar PV system.
- We will assist in determining the size of carbon footprint produced and obtaining carbon credits
- We insure, maintain and repair the system at no additional cost to you.
- We will pay for Insurance, Licensing as per local requirement
- We will warranty your roof against leak.
- Guaranteed expected annual solar production or money back.
- Ditrolic is the legal owner of the system
- At the end of lease term, 3 options:-
 - i. Remove the system at no additional cost to you or;
 - ii. You may renew your contract with at least 50% discount to prevailing tariff
 - iii. Transfer the asset ownership to you

Solar rental mechanism



Solar Rental
Payment
(PHP)

Solar
Generation
(kWh)



**SOLAR RENTAL
ELECTRICITY TARIFF
IS SIGNIFICANTLY
CHEAPER THAN
LOCAL UTILITY
ELECTRICITY TARIFF**

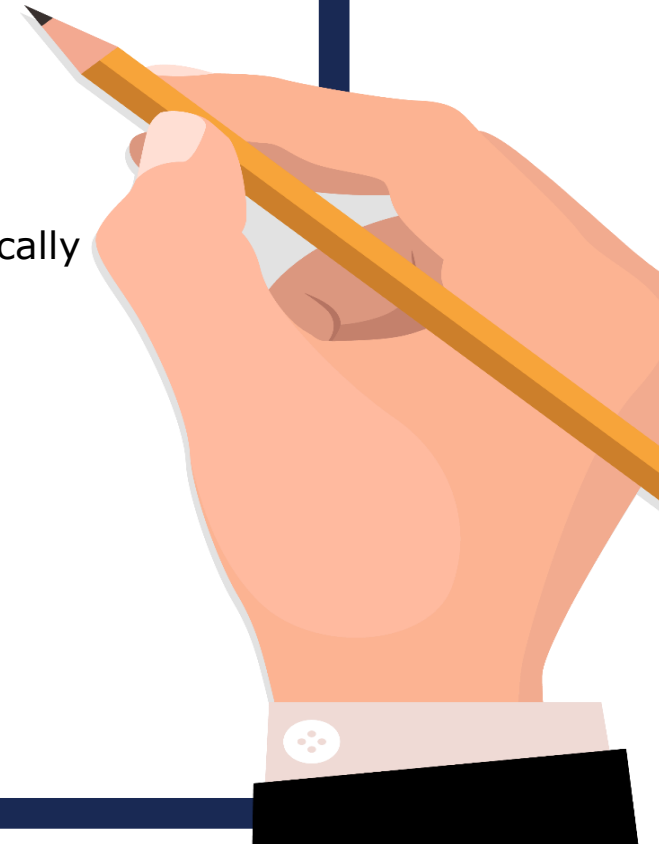
**LOCAL UTILITY
PROVIDER**

Utility Bill
Payment
(PHP)

Utility Supply (kWh)

CHECKLIST

- Compare** more than 1 proposal
- Audit the solar company on their **local presence and support**
- Check that your Solar Rental company is **licensed**
- Ensure the company has **experience** implementing Solar Rental project locally
- Ask about the **finance capability** of the Solar Rental company
- Ensure the company have strong knowledge on **local policy**
- Ask about performances **output guarantee**
- Ensure the company have **Asset Management/O&M capability**
- Ensure the company can give a **mature and fair rental agreement**



Project References

Solar rental project in Philippines



Client

Gaisano Capital

Location

Cebu

Surigao City

Ozamiz City

Installed Capacity

1,738.2kWp

Estimated Annual Produced Energy

2,425.5MWh

Average Annual Saving

12,855,150 PHP

Estimated Lifetime CO₂ Reduction

25,855.83 tonnes

Completed

2020/2021

About the Customer

Gaisano Capital, community store features a supermarket, a variety of food outlets, a salon, a pharmacy, massage services, and various retail kiosks. Saversmart is one of Gaisano Capital Group's three store concepts alongside Gaisano Capital and Gaisano GMart. It is a chain of community stores strategically located in smaller residential communities.



Gaisano Capital Ozamiz, Philippines



Gaisano Saversmart T. Padilla, Philippines



Gaisano Capital Surigao, Philippines



KEY CHALLENGES?

01 Safety issue such as high wind speed during the typhoon season

- Extra mounting design have to be designed to ensure the propose solar installation will be able to stand the high wind speed during typhoon.
- Regular check on system is also conducted to ensure the mounting system is intact

03 Risk of fire origination from solar is also a key concern of mall management

- Rapid shutdown system are also installed on module level in place to prevent such incidents, checking on voltage for average voltage and other indication of risk of fire.

02 Potential energy backflow is also not allowed as net energy metering only allow up to a maximum of 100kW

- System is designed for self-consumption with curtailment from power meter equivalent control to ensure there is no backflow to the supply grid

Our Customers

Diverse Market Segments

AIRPORTS



EDUCATIONAL



MANUFACTURING



DATA CENTRE



DEFENSE



LOGISTICS



SHOPPING MALL



COMMERCIAL



LOCAL GOV'T



UTILITIES



Smart Energy, Sustainable Future

Our group subsidiary – Sunstep Global Pte. Ltd. is a **Singapore EMA Wholesaler License**

Notable Projects

Our energy solution portfolio – Indonesia and Singapore



Location: Karawang, Indonesia
Capacity: 4.7 MWp
Contract: 15 years PPA with Nestle Indonesia



Location: Batang, Java, Indonesia
Capacity: 2.8 MWp
Contract: 15 years PPA with Nestle Indonesia



Location: Panjang, Sumatera, Indonesia
Capacity: 1.3 MWp
Contract: 15 years PPA with Nestle Indonesia



Location: Bedok, Singapore
Capacity: 1,652 kWp
Contract: 13.5 years PPA with NCS Pte Ltd (Singtel Subsidiary)



Location: Changi Airport, Singapore
Capacity: 3,600 kWp
Contract: 20 years PPA with SATS (Divested)



Location: Jurong, Singapore
Capacity: 120.9 kWp
Contract: 25 years PPA with ST Kinetics Ltd.

Notable Projects

Our energy solution portfolio – Malaysia



Location: Kampar, Perak
Capacity: 4.1 MWp
Contract: 21 years PPA with UTAR



Location: Setapak, Kuala Lumpur
Capacity: 1,134 kWp
Contract: 20 years PPA with Royal Selangor International



Location: Mersing, Johor
Capacity: 309.6 kWp
Contract: 25 years PPA with Majlis Daerah Mersing



Location: Chembong & Shah Alam, Malaysia
Capacity: 1.8 MWp
Contract: 15 years PPA with Nestle Malaysia



Location: Papar, Sabah
Capacity: 1,000 kWp
Contract: 21 years PPA with SESB



Location: Kuala Sawah, Negeri Sembilan
Capacity: 3.30 MWp
Contract: EPCC

Notable Projects

Our energy solution portfolio – Airports



Location: Bayan Lepas Airport, Penang
Capacity: 2,600 kWp
Contract: 20 years PPA with Malaysia Airports



Location: Subang Airport, Selangor
Capacity: 1,600 kWp
Contract: 20 years PPA with Malaysia Airports



Location: Kuantan Airport, Pahang
Capacity: 404 kWp
Contract: 20 years PPA with Malaysia Airports



Location: Melaka Airport, Melaka
Capacity: 404 kWp
Contract: 20 years PPA with Malaysia Airports



Location: Kota Kinabalu Airport, Sabah
Capacity: 3,540 kWp
Contract: 20 years PPA with Malaysia Airports



Location: Langkawi Airport, Kedah
Capacity: 1,109 kWp
Contract: 20 years PPA with Malaysia Airports

Notable Projects

Our energy solution portfolio – BIPV Carpark



Location: Perlis, Malaysia
Capacity: 47.85 kWp



Location: Selangor, Malaysia
Capacity: 8.6 MWp

Notable Projects

Local and International Large Scale Solar



**LARGEST IN
MALAYSIA**

Location: Perak, Malaysia
Capacity: 136,440 kWp
Contract: 21 years PPA with TNB



Location: Mymensingh, Bangladesh
Capacity: 73,700 kWp
Contract: 20 years PPA with Bangladesh Power Development Board (Sovereign Guarantee)



SCAN ME

SCAN here to
PLAY Video



Location: P. Pinang, Malaysia
Capacity: 10.6 MWp
Contract: 20 years

**1.8GW
PIPELINE PROJECT
(2021-2023)**



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