

Welcome to SBF Global's  
**Sustainable Financing Awareness Series - Episode 2**  
**Financing for Solar Projects**

15 June 2021, Tuesday | 3.00pm to 4.30pm (GMT +8)



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- About markets
- About new customers
- About Free Trade Agreements

**Because knowledge is power.**

## **Land** with us

- Dedicated digital spaces
- Established networks
- Hands-on advice and facilitation

**Scale and grow *smartly*.**

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- Trusted relationships abroad
- Deepen market presence
- Secure long-term sustainability

**Because network is net worth.**

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## PROGRAMME LINE UP

3.00 pm **Welcome Note**  
By SINGAPORE BUSINESS FEDERATION

3.05pm **Driving Environmental Responsibility  
Through UOB's U-Solar Programme**  
Mr JASPER WONG  
Head of Construction and Infrastructure,  
Sector Solutions Group, UOB

3.20pm **Participant Poll 1**

3.25pm **Solar Challenges and Opportunities  
in Indonesia**  
Mr ROBIN PHO  
Founder and CEO, Right People  
Renewable Energy

3.45pm **Participant Poll 2**

3.50pm **Technical Considerations and Risk  
Mitigation for a Photovoltaic (PV)  
Roof Project**  
Mr JEREMY ONG  
Managing Director, V3-Energy

4.05pm **Q&A & Poll Results**

4.25pm **Closing remarks and preview of  
what's next by SBF Global**



## **BUSINESS CONSULTATION SESSION**

**For companies who may have questions on your project's internationalisation and/or financing needs**

**Sign up for a complimentary one-on-one Business Consultation Session with representatives from SBF and UOB after this webinar**

**Contact:** **Chan Zhiquan**  
**Manager, Infrastructure, SBF Global**  
**Email to:** **[zhiquan.chan@sbf.org.sg](mailto:zhiquan.chan@sbf.org.sg)**





# Driving Environmental Responsibility Through UOB's U-Solar Programme

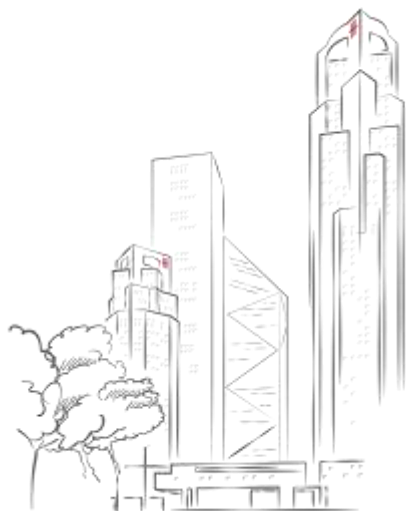
Mr JASPER WONG

Head of Construction and Infrastructure, Sector Solutions Group, UOB



With over 25 years of extensive project and structured finance experience in the region focusing on power, renewable energy, oil & gas, petrochemical, infrastructure and telecoms financing, Mr Wong joined UOB in 2013 to head the Infrastructure & Project Finance team for Asia, under the Group Wholesale Banking before taking up the current role in Sector Solutions Group





# Driving environmental responsibility through UOB's U-Solar Programme

**By Jasper Wong**

Head, Construction & Infrastructure COE  
Sector Solutions Group

15 June 2021

**Private and Confidential**



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# Power Landscape & Opportunities

*Catch the sun, the time for Solar is now!*



# What is happening in the Electricity Market?

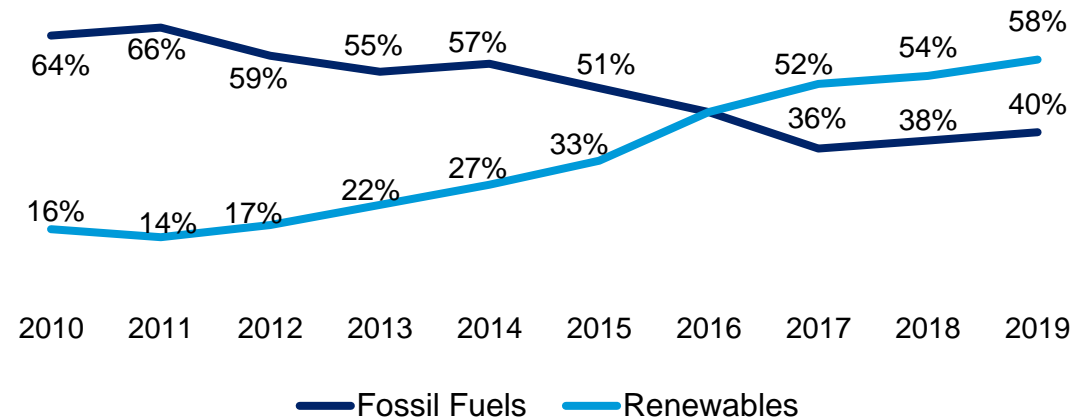


**Germany had so much renewable energy on May 8, 2016, that it had to pay citizens to use electricity. It was so windy and sunny that turbines and solar power sources were supercharged, output exceeded demand, and prices went negative, so customers were actually paid to consume energy.**

Image from <https://inhabitat.com/germany-is-on-track-to-get-a-third-of-its-electricity-from-renewable-resources-this-year/>  
Source: IEA; Bloomberg New Energy Finance

## Global year-on-year capacity changes (2010-2019)

### Share of annual capacity additions by technology in emerging markets



- Since 2017, the emerging market has added more renewables than traditional fossil fuel power generation capacity.
- In 2019, developing economies added 127GW of new renewable energy capacity, with solar+wind representing 86.6% of the new capacity.
- This surge was primarily caused by: (i) rising electricity demand; (ii) decreasing technological cost; (iii) innovative policies



# Disruption in the Electricity Sector...

## General Electric to cut 12,000 jobs in power business

Updated 12:21 PM ET Thu, 7 Dec 2018



**General Electric** announced on Tuesday that it will cut 12,000 jobs at its global power business as the industrial conglomerate responds to the disruption in the fossil fuel power plants.

The US company launched the cuts in 2018, saying it expected current demand to continue. "Traditional power markets and coal have softened," GE said.

Rumors of sweeping job cuts were circulating on Wednesday, with staff layoffs among those badly hit.

"This decision was painful but necessary to respond to the disruption in the power market significantly lower volumes in production," said Russell Stokes, head of GE Power.

"Power will remain a work in progress as market challenges to continue, but we will continue in 2019 and beyond."

## 4 reasons why ASEAN will lead for renewable energy in the next decade

Article from Singapore International Energy Week

ASEAN will become the new hub for renewable energy in the next decade, says KPMG. According to its New Drivers of Growth report, this will be due to four key drivers:

### 1. ASEAN's huge renewable energy potential

Technology will be key to unleash ASEAN's renewable energy potential, led to the steady decline in the overall costs of wind and solar. An attractive option for public and private sector decision-makers. At the 24th Conference of the Parties to the United Nations Framework Convention on Climate Change, renewable energy now competes on cost alone. Additionally, it is a key component of risk and return. This is also driving more countries to invest in renewable energy.

### 2. Governments looking to increase renewable energy

ASEAN member states have turned their focus to raising the share of renewable energy in the ASEAN energy mix to 23 per cent by 2025, up from 10 per cent in 2010. 70 million people without access to reliable electricity in the Philippines. Mindoro to provide electricity supply in other off-grid areas.

### 3. Consumers are looking for cleaner energy sources

Historically, costs have limited government actions with regard to sustainability and an increased willingness to pay premium for cleaner energy.

### 4. New funds continue to flow into ASEAN renewable energy

Renewable deals volume continues to grow in ASEAN, with international organisations with government agencies to co-fund projects. Melaka on its Green City Action Plan roadmap, which includes indicators in environment and economic growth, and concrete actions.

These insights were presented by Sharad Somani, Executive Director, which highlighted the need for accelerating transformation.

## Singapore to import electricity from Malaysia under two-year trial



By Matthew Mohan  
@MatthewMohanCNA

SINGAPORE: Singapore will import electricity from Peninsular Malaysia under a two-year trial, said the Energy Market Authority (EMA) on Monday (Oct 26). The trial aims to "assess and refine the technical and regulatory frameworks" for importing electricity into Singapore, said the authority in a press release.

This would help to facilitate larger-scale imports from the region in future, added EMA. "To meet our climate change commitments, there is a need to change the way Singapore produces and uses energy," said EMA. "Tapping on regional power grids for cleaner energy resources is one strategy to further diversify Singapore's energy supply," it added.

In a keynote speech delivered at the opening of the Singapore International Energy Week, Minister for Trade and Industry Chan Chun Sing said that the move is part of Singapore's plan to strengthen the "regional grid architecture". "We will kick this off by importing 100 megawatts (MW) of electricity imports for a trial period of two years, to see how the market works ... This will allow the region to share the clean energy sources that different countries may have, and we'll start this with Malaysia," he said.

"Once the concept takes off, we'll be able to extend this to other regional players." EMA plans to issue a Request for Proposal by March next year for 100 MW of electricity imports. This will make up about 1.5 per cent of Singapore's peak electricity demand.

Under this Request for Proposal, electricity imports could begin as early as end-2021, via an existing electricity interconnector between Singapore and Malaysia. An importer will be selected through an open and competitive selection process, said EMA. "Potential importers will have to demonstrate their supply reliability, credibility and track record, ability to secure demand from Singapore consumers, and manage the carbon output of generation supply," it added.



A view of HDB flats at night. (File photo: Xabryna Kek)



# Climate Change is impacting BAU...

## Climate change just claimed its first bankruptcy — PG&E succumbs to fallout from the world's most expensive natural disaster of 2018

Callum Burroughs, Business Insider US

January 29, 2019



The conditions that enabled the fires, said the utility's former CEO and experts, were the result of climate change. Justin Sullivan/Getty Images

## Analysis: Big oil may get more climate lawsuits after Shell ruling - lawyers, activists

Tom Hals, Shadia Nasralla, Reuters

May 28, 2021

A Dutch court's decision to force Royal Dutch Shell (RDSa.L) to make deeper, faster cuts to its climate warming emissions on the basis of human rights could set a precedent, especially in European countries, according to lawyers and activists.

The court on Wednesday ordered the Anglo-Dutch company to slash its global greenhouse gas emissions, which stood at around 1.6 billion tonnes of CO<sub>2</sub> equivalent in 2019, by 45% by 2030. Shell said it would appeal the decision forcing it to cut by an amount roughly equivalent to four times Britain's annual emissions.

"We expect a ripple effect into other jurisdictions. Now that we have this first established liability, it definitely creates a momentum we can build on," said Roger Cox, lawyer for activist group Friends of the Earth, which brought the case along with Greenpeace, other activists and Dutch citizens.

They brought the lawsuit in the Netherlands, where Shell's headquarters are based. The court held that Shell violated its duty of care under Dutch law because its policies and emissions contributed to dangerous climate change. Shell had argued that its global emissions were not subject to Dutch law, that the plaintiffs' claims were a matter for lawmakers and that the company was acting lawfully and its emissions were permitted. The company also said the plaintiffs could not establish that reducing Shell's emissions would have an impact on climate change.

Michael Burger, a litigation specialist who represents local U.S. governments in climate cases including against Shell, said while Wednesday's decision was based on Dutch law, the concept of a duty to care exists in legal systems in Europe and around the globe. "I think it's quite likely that we'll see other lawsuits filed in other jurisdictions, seeking to accomplish the same thing," he said, noting a similar case is pending against Total in France.

Myfanwy Wood, dispute resolution partner at law firm Ashurst, said duplicating the approach will depend on the standard of care that applies to corporations in other jurisdictions. Dutch climate rulings have inspired global climate litigation before. In 2019, the country's High Court ruled that the government had to commit to stronger climate targets in a case brought by the Urgenda Foundation. That decision, which paved the way for the Shell case, established that the government had a duty of care to significantly reduce emissions.



A general view of Royal Dutch Shell's Pulau Bukom offshore petroleum complex in Singapore after a fire was contained September 28, 2011. REUTERS/Tim Chong



# Key Renewable Energy Emerging Themes



## Smart and Sustainable City

Infrastructure is a key enabler in the transition to a smart and sustainable city



## Declining generation cost

*Declining Trends of Levelised Cost of Energy (LCOE) reaching grid parity*



## Lower Battery Storage Cost

*Declining Cost is an Industry Game-Changer to drive adoption and new applications*



## Sustainability & Green Financing Drive

*Companies Going Green & Other Sustainable Initiatives. This is accelerating post COVID-19*





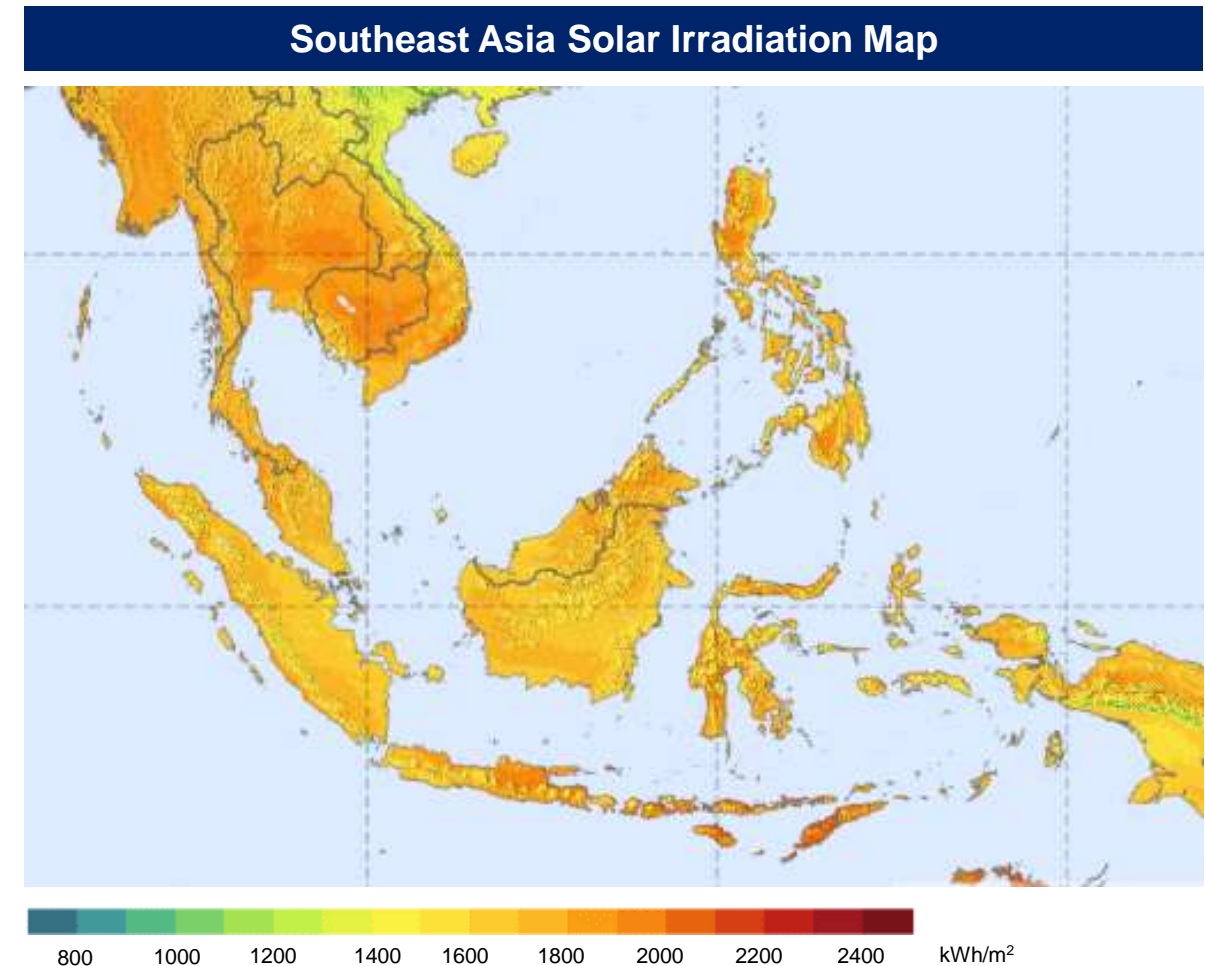
# UOB's Sustainable City Solutions The U-Solar Programme

*Catch the sun, the time for Solar is now!*



# Southeast Asia is well-positioned with optimal solar irradiance levels to meet the electricity demand

- Solar irradiance is the radiant energy from the sun and is measured in watt/m<sup>2</sup>.
- Southeast Asia has annual solar radiation levels ranging from 1,460 to 1,900 kWh/m<sup>2</sup> and **daily sun hours ranging from 3.5 to 6 hours each day.**
- **Growth prospects in Southeast Asia are positive** with a combination of fast growing economies, rapid growth in electricity demand and good solar resource.
- Development of **battery storage can also help to resolve the intermittent issue** of electricity produced from solar power.





# Insights to solar energy opportunities in Southeast Asia



**82%** decline in the  
cost of solar installation

LCOE of solar energy has declined by over 82% between 2010-2019, making solar energy a cheaper energy source than traditional fossil fuel.

**66mn** tonnes of  
CO<sub>2</sub> to be avoided

... this is equivalent to the planting of  
**4,125mn** new trees.

RE target of up to  
**37%** by 2037

Southeast Asia countries have RE targets of up to 37% of total energy mix by 2037.

**590k** new jobs...

...created by 2037 if all the RE projects in the pipeline are implemented and national targets are met.

**>96GW** new  
capacity to be installed

This is equivalent to **3.3x\*** the combined installed capacity of Singapore, Malaysia, Indonesia and Thailand.

\* As at end of December 2018

**Leveraging these data-backed insights enabled us to embark on the U-Solar journey, creating positive parallel outcomes for businesses and the environment.**



# There are several solar rooftop schemes in the market for commercial & industrial segments...



Characteristics	Outright Purchase	Equipment Leasing	Rooftop PPA	Rooftop Rental
<b>Solar Rooftop Schemes</b>	<b>C&amp;I Owner</b> purchases system from <b>Solar Company</b> .	<b>Solar Company</b> installs system on <b>C&amp;I Owner's</b> roof, and <b>C&amp;I Owner</b> pays <b>Solar Company</b> a lease payment	<b>Solar Company</b> installs system on <b>C&amp;I Owner's</b> roof, and <b>C&amp;I Owner</b> pays <b>Solar Company</b> for electricity consumed	<b>Solar Company</b> installs system on <b>C&amp;I Owner's</b> roof, and <b>Solar Company</b> pays <b>C&amp;I Owner</b> a rental payment
<b>Payment Mode</b>	None	Pay monthly fix payment	Pay-as-you-use per kWh	Receive rental monthly payment
<b>Initial Investment</b>	System Cost (Full payment or by installment)	N/A	N/A	N/A
<b>Capex Funding</b>	C&I Owner Self-funded or Bank Loan	Solar Project Developer	Solar Project Developer	Solar Project Developer
<b>System Ownership</b>	C&I Owner	Solar Project Developer, after leasing period will be C&I Owner	Solar Project Developer with option to buy after PPA ends	Solar Project Developer
<b>System Performance</b>	Standard Product Warranties	Negotiated, may have a guarantee on min kWh generated	Negotiated, typically with guarantee on min kWh generated	N/A
<b>O&amp;M Requirements</b>	C&I Owner can undertake separate arrangements for the system.	Solar Project Developer	Solar Project Developer	Solar Project Developer
<b>Tax Credits, Rebates, Incentives</b>	Applicable only for corporate consumer	Solar Project Developer	Solar Project Developer	Solar Project Developer
<b>Solution for C&amp;I Owner</b>	Green Loan	Defer monthly payment	Defer monthly payment	None
<b>Owner Entitlement to Excess Electricity Generated</b>	Yes	Yes	No	No

Note: Standard terms may vary across projects due to negotiation between the consumer and the solar company

Source: SEIA, Various solar equipment supplier agreements (SolarCity, EnergyMatters)



# Purchase or Lease - *What Are My Considerations?*



## Why purchase the system?

- ✓ Be the owner of your solar energy system;
- ✓ Maximise financial benefits through realised tax benefits by treating the solar panel system as a depreciable asset;
- ✓ Increase market value of your building;
- ✓ Greater savings on electricity utility cost over the system lifetime with all attributed benefits



## Why lease the system?

- ✓ Interested in using electricity generated from renewable resources and potential benefit of electricity bill savings;
- ✓ Want to avoid the commitment as well as responsibility of maintenance/repairs over the system lifetime
- ✓ Retain option of ownership of system after the leasing period/PPA, depending on agreement with the solar developer



# U-Solar Programme across Southeast Asia



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# Key objectives of the U-Solar programme

The **U-Solar Programme** is *Asia's first integrated solar energy platform* across UOB's key Southeast Asian markets. It provides financing solutions to attract solar developers, contractors and supports the 'green' agenda of homeowners, businesses and regional governments, in building a sustainable ecosystem and partnership.

## Objectives of the U-Solar platform

1

Promoting  
sustainability  
awareness to  
the public

2

Supporting solar  
ecosystem players with  
end-to-end solutions  
on one platform

3

Simplifying  
sustainability  
with end-user  
solar financing



# Award Recognition



## The Asset Triple A Country Awards 2020

### Awarded: **Best Green Loan in Thailand (Sustainable Finance)**

- UOB Thailand (UOBT) granted a landmark 1.26 billion baht (about S\$55 million) green project finance loan for BECIS-Symbior, one of the leading solar power developers in Asia, under the U-Solar programme.
- The portfolio will enable BECIS-Symbior's clients to save on their energy bills whilst contributing to the reduction of greenhouse emissions (up to ~ 41 kilotons equivalent of CO2 per annum at peak production).
- In supporting the shift to solar power, BECIS-Symbior is also a U-Solar partner, expanding its ongoing efforts in promoting the adoption of clean energy solutions and providing more affordable and energy-as-a-service solutions to its commercial and industrial clients.



## National Energy Awards Ministry of Energy and Natural Resources, Malaysia

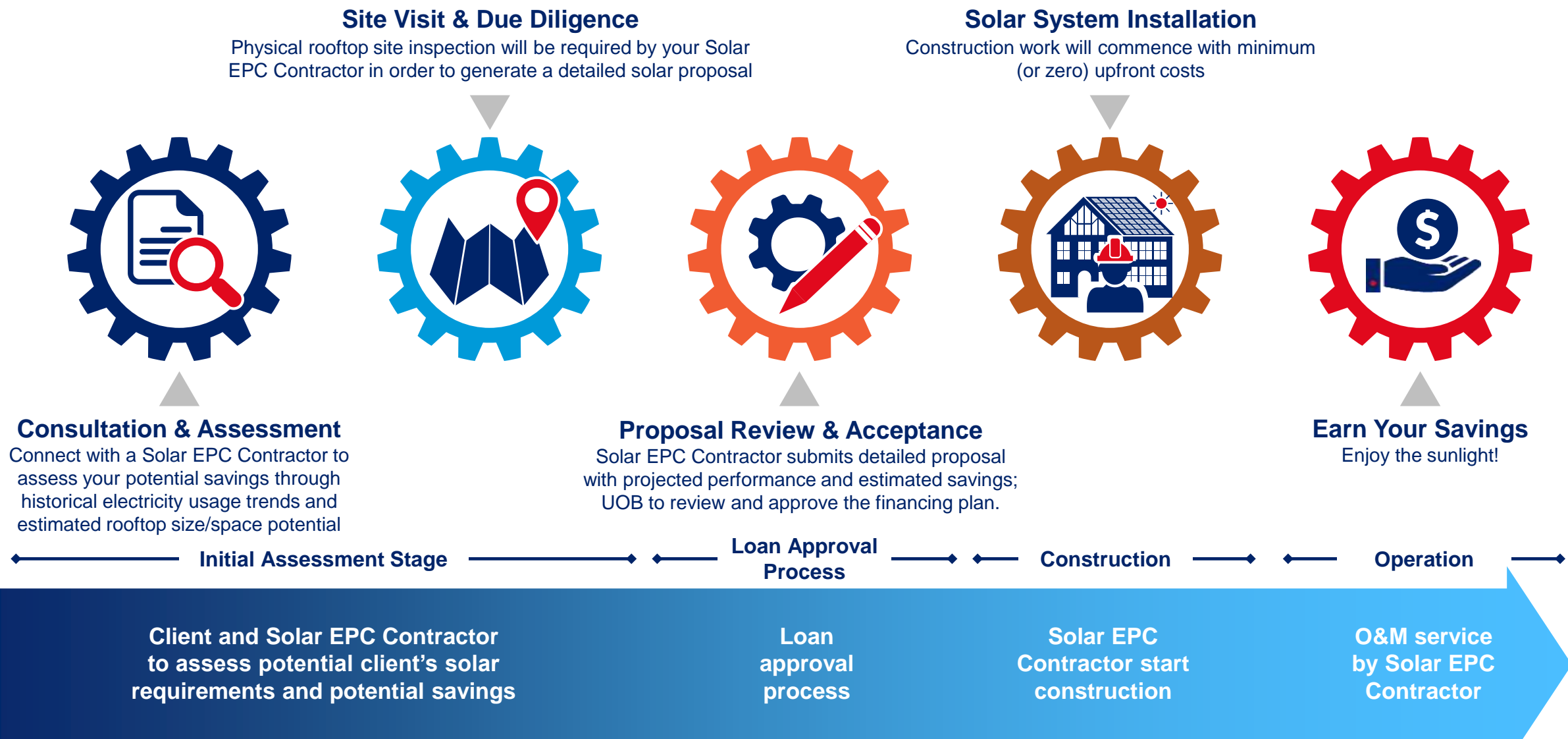
### Awarded: **Special Award – Sustainable Financing (Conventional Financing)**

- In November 2020, UOB Malaysia was recognised for its efforts in promoting solar power adoption to businesses and consumers in Malaysia. The Bank received a Special Award for Sustainable Energy Financing (Conventional Financing) at the Ministry of Energy and Natural Resources Malaysia's National Energy Awards 2020.
- The award was given for the U-Solar Programme as a green financing programme that seeks to connect businesses and consumers across the entire solar power value chain and help each play their role in their collective efforts to transition to a low-carbon economy.





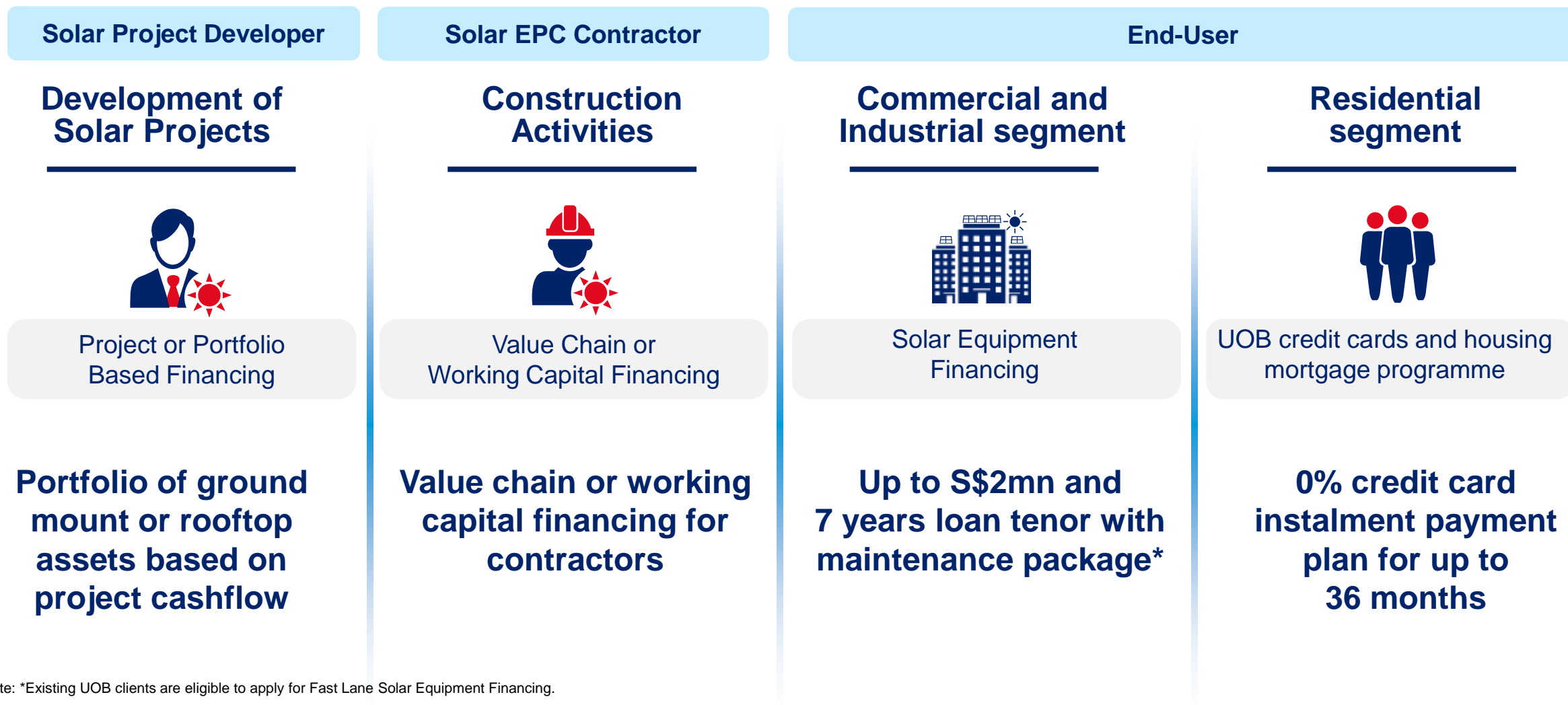
# Promoting sustainability awareness and to journey with our clients



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# Comprehensive financing solutions for the ecosystem

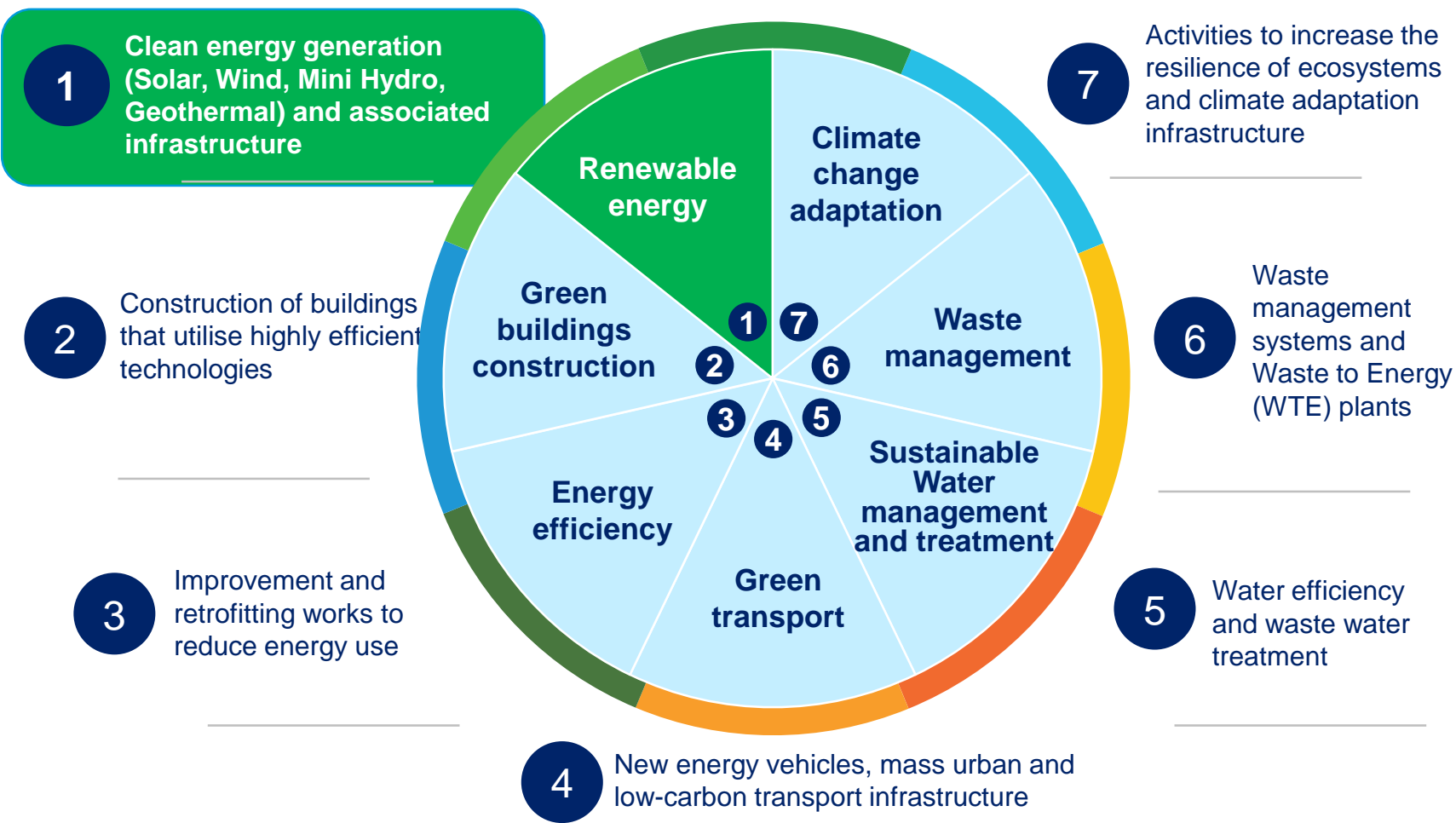


Note: \*Existing UOB clients are eligible to apply for Fast Lane Solar Equipment Financing.

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# U-Solar is supported by UOB's Smart City Sustainable Finance Framework



This framework guides the Bank's financing efforts to encourage the development of smart and sustainable cities across the region through a streamlined and transparent process.

This is done by setting out the eligible activities under each green category and the qualifying criteria for sustainability-linked loans, such as:

- Sustainability strategy and objectives
- Sustainability performance targets

## Carbon Trust provided Second Party Opinion (SPO)



Benefits to clients	Streamlined process Saves time and reduces complexity	No additional cost A universal "umbrella"	Common reporting Standards for impact reporting
	SBF	Webinar - Financing Solar Projects	



# Savings & Benefit Analysis for the C&I End-User / Owner



Illustration

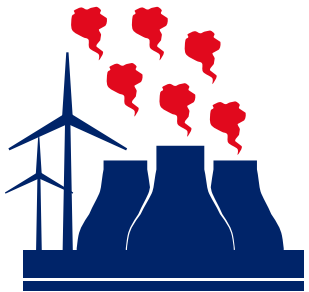
## Singapore C&I Owner



Solar PV system capacity	1,500kW
Estimated system cost (SGD)	1,822,500
Avg. Tariff Rate / kWh (SGD)	0.20



## Benefits for Singapore C&I Owner



**642,634 kg**

Lesser CO<sub>2</sub> per year



**140**

Car taken off the road  
for 1 year



**29,479**

Trees planted per year



**SGD281,944 p.a.**

Estimated average savings

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# Savings & Benefit Analysis for the Residential End-User



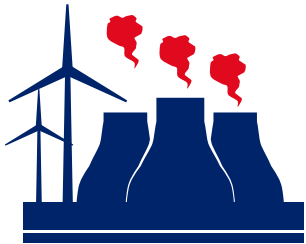
## Singapore Residential End-User



Solar PV system capacity	6kW
Estimated system cost (SGD)	7,290
Avg. Tariff Rate / kWh (SGD)	0.20



## Benefits for Singapore Residential End-User



**51,410 kg**

Lesser CO<sub>2</sub> for 20 years



**12**

Cars taken off the road  
for 20 years



**2,360**

Trees planted for 20 years



**SGD1,136 p.a.**

Estimated average savings

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# Articles featuring the U-Solar Programme Client



## THE STRAITS TIMES

EDITION: INTERNATIONAL SINGAPORE

SINGAPORE ASIA WORLD OPINION LIFE BUSINESS TECH SPORT MORE

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### Saving the environment one rooftop at a time with solar energy



**Joyce Lim**  
Senior Correspondent

There are small steps people can take to reduce their carbon footprint.

That is what Mr Chong Chieh Tseng, 43, thought when he decided to install solar panels on his roof. But his solar journey has gone further than most others.

He took advantage of UOB's U-Solar programme, which offers an interest-free payment plan for the bank's credit card members. He said it cost \$20,000 to install 24 solar panels on top of his three-storey semi-detached house in Coronation Road.

Mr Chong, who lives with his parents, sister, brother-in-law and nephew, saves up to



*After Mr Chong Chieh Tseng installed solar panels on the rooftop of his home and saw the benefits, he was inspired to do more. He quit his job as an engineer and set up his own firm, Energy Lite, to offer solar power to commercial and industrial buildings.*  
**ST PHOTO: GIN TAY**

\$200 a month on electricity bills, since the solar panels were installed six months ago.

The process has been quite seamless and Mr Chong said he has not had any disruption to his electricity at home.

Inspired to do more, he booked an electric car from Tesla, quit his job as an engineer and set up his own firm, Energy Lite, to offer solar power to commercial and industrial buildings. It is a straightforward and meaningful business, said Mr Chong.

His business model is to install the solar panels at commercial and industrial buildings at no cost and sell the solar-powered electricity to the users at a lower price than they are currently paying. "It's a win-win situation. They go green. They don't pay a single cent and they get cheaper electricity," he said.

Despite that, he has found it challenging to convince business owners to install the solar panels. "They say the savings are insignificant," said Mr Chong.

"I am still trying to convince people more on our social responsibility and doing our part to save the environment."

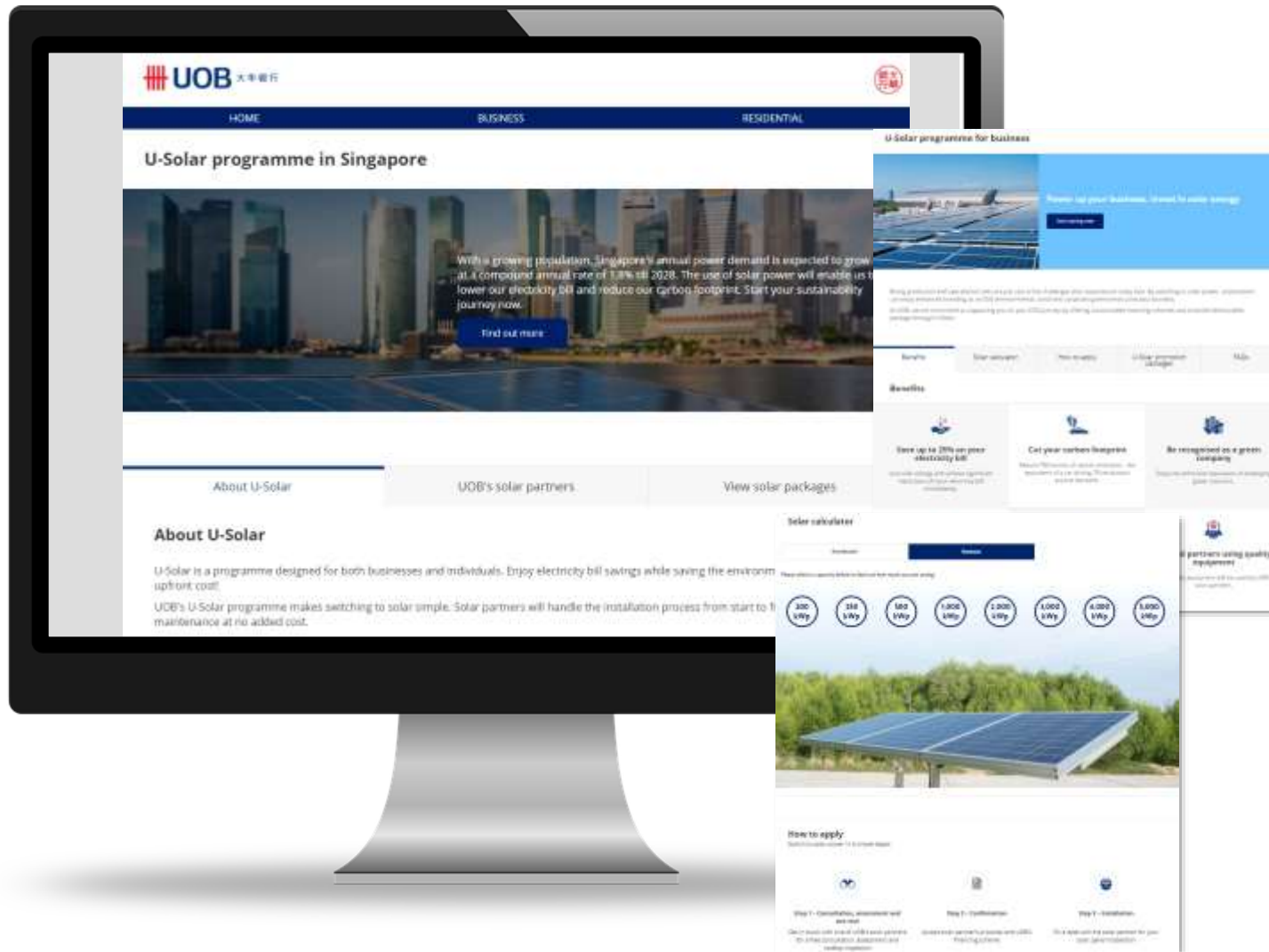
Since Singapore Green Plan 2030 was announced, he has been getting more inquiries and the company is currently handling more than a dozen projects, said Mr Chong.



# Simplifying sustainability for business & home owners



Visit our U-Solar website for more details



- Please visit our website to see how **U-Solar** can help you enjoy a seamless switch to solar power.
- UOB's solar calculator will also help illustrate the **potential electricity bill savings** while you are saving the environment.
- Check out the various **U-Solar launch packages** together with UOB's solar partners



# Catch the Sun, the time to act is now



THE CLIMATE IS  
CHANGING

SO SHOULD WE!

#ACTNOW

“ The world will not be destroyed by those who do evil, but by those who watch them without doing anything. ”

*Albert Einstein*



# Thank You



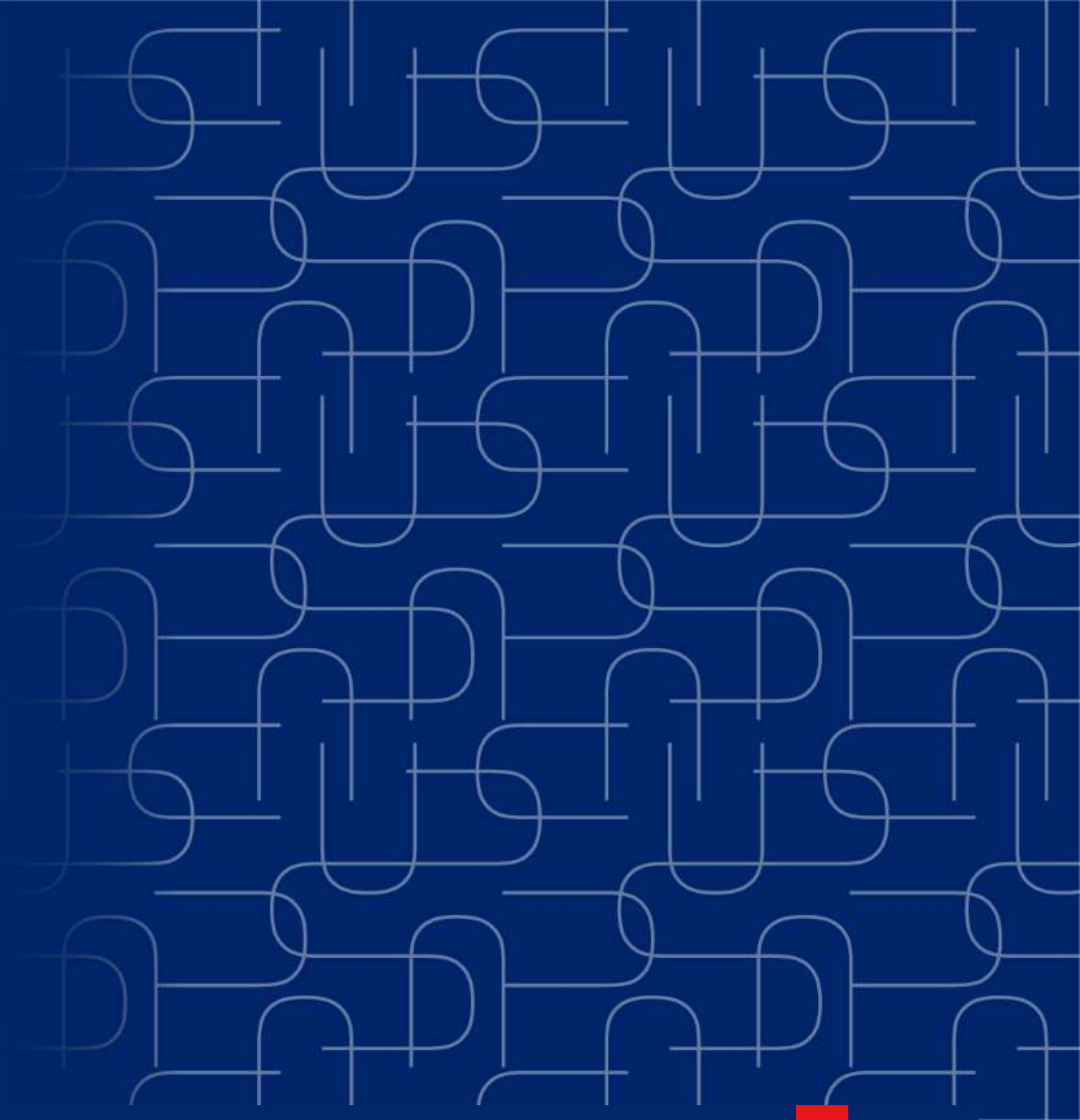
RIGHT BY YOU







About us





# Who we are



UOB is a leading bank in Asia with:



> 500

Branches  
and offices



19

Countries and territories  
in Asia Pacific, Europe  
and North America



> 7

Offices in Asia;  
Singapore (Head office),  
China, Hong Kong,  
Indonesia, Malaysia,  
Thailand, Vietnam



2020

Rated among the world's  
top banks; "Aa1" by  
Moody's and "AA-"  
Standard & Poor's and  
Fitch Ratings

**At UOB, we believe in being a responsible financial services provider and we are committed to making a difference in the lives of our stakeholders and in the communities in which we operate.**



# What we do



UOB provides a wide range of financial services globally through our business segments:

## Group Wholesale Banking (GWB)

**Covers:** corporate and institutional client segments which include medium- and large-sized enterprises, local and multi-national corporations, financial institutions, government-linked entities, financial sponsors and property funds.

### Products and Services

- Capital Markets Solutions and Advisory
- Cash Management
- Commodities
- Credit
- Equities
- Financing
- Foreign Exchange
- Interest Rate
- Management of Funding and Liquidity
- Market Making Activities
- Structured Investments
- Trade Services
- Treasury Products





# UOB Awards and Accolades 2020



## **Alpha Southeast Asia**

14th Annual Best Financial Institution Awards (Indonesia)

- Best Digital Bank in Indonesia

## **Asia Asset Management**

- 2020 Best of the Best Regional Awards  
2020 Best of the Best Awards (Singapore)  
– Fintech Innovation in Asset Management
- 2020 Best of the Best Country Awards (Brunei)  
– Best Investor Education

## **AsianInvestor**

- Asset Management Awards 2020
- Asia Fund House of the Year

## **Euromoney**

- Awards for Excellence
- Asia's Best Bank for SME

## **Refinitiv**

- 2020 Refinitiv Lipper Fund Award
- Equity Japan Sm&Mid Cap (3 & 5 year)  
Mixed Asset MYR Conservative (3 year)

## **The Edge**

- The Edge Refinitiv Lipper Fund Awards
- Mixed Asset MYR Conservative – 3 Years (Malaysia)

## **Special Award from the Ministry of Energy And Natural Resources (Malaysia)**

- Sustainable Energy Financing (Conventional Financing) category

## **The Asian Banker**

- Excellence in Retail Financial Services International Awards
- Best SME Bank in Singapore
- Best SME Bank in Asia Pacific
- Financial Inclusion Project, Vietnam

## **The Asset**

- Triple A Treasury, Trade, Supply Chain and Risk Management Awards 2020
- Best Payments and Collections Solution  
– Singapore (6), Malaysia (3), China, Indonesia, Hong Kong (1 each)
- Best Working Capital Solution (Singapore, HK)
- Best Transaction Bank (Malaysia)
- Best Payments and Collections Solutions (Malaysia)
- Best Supply Chain Solutions (Malaysia)  
Best Supply Chain Solutions (Thailand)
- Sustainable Finance Awards - Best Green Loan, Thailand

## **Wealth Briefing Asia**

- Best Domestic Private Bank (Malaysia)



# Solar Challenges and Opportunities in Indonesia

Mr ROBIN PHO

Founder and CEO, Right People Renewable Energy (RPRE)



Robin Pho is the Founder and CEO of Right People Renewable Energy (RPRE). RPRE is a 2nd generation family business and the only certified B Corp in SEA providing renewable energy services. Prior to this, Robin was running the legacy family business offering specialised manpower services to energy companies in Singapore and Indonesia. Robin is from the pioneer batch of SMU and did his Global Executive MBA at INSEAD. He is a board member of the Family Business Network Asia, and Forum for the Future Asia. He is married and a father of twin boys and enjoys outdoor activities such as hiking and tennis.



# Solar Challenges & Opportunities in Indonesia

15 June 2021 (Tuesday)  
3pm - 4.30pm

**by Robin Pho**  
Founder & CEO

AN INITIATIVE OF



SUPPORTED BY



PRESENTATION BY



IN PARTNERSHIP WITH





- 1. Intro to RPRE**
- 1. The Indonesia Opportunity**
- 1. Working in Indonesia**



# 1. About RPRE



# What We Do

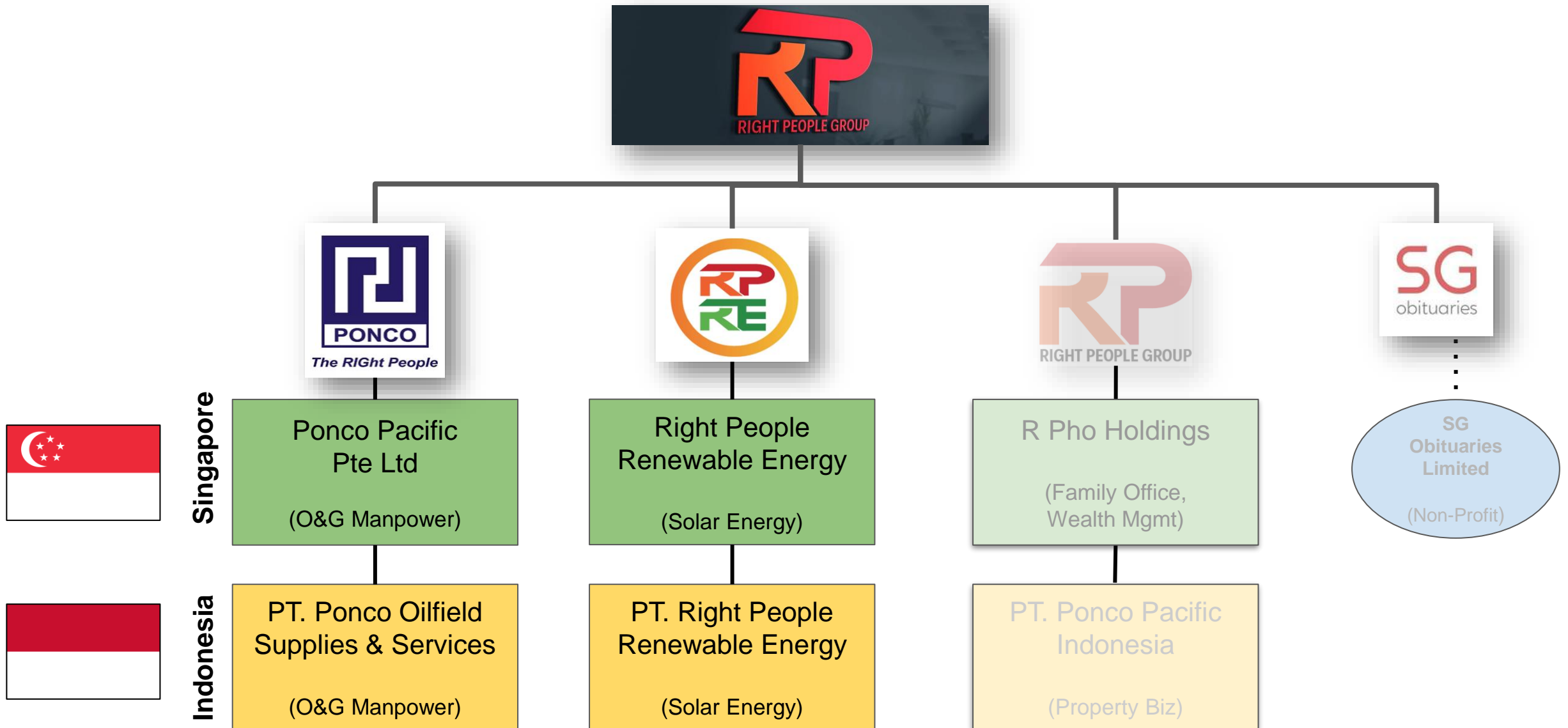


- **Energy Audits** to better understand clients energy profile
- **Energy Efficiency** solutions
  - Peak Shaving, Peak Shifting, UPS Consultancy
- **Decarbonise** using Solar PV & Batteries in
  - Off-Grid Areas (higher margins), and
  - Grid Tied markets (larger deal sizes)
- Provide **Operations & Maintenance** for peace of mind
- Facilitate **Financing**, including Carbon Credits and RECs





# 2nd Generation Family Business





# Family Business as a Force for Good





# Our Branches



Our presence spans 4 cities: Singapore, Jakarta, Bali and Manado





# Our Branches



## Singapore

Mapletree Business City,  
20 Pasir Panjang Road, Level 3,  
Singapore 117439



## Jakarta, Indonesia

Permata Kuningan Building  
Jl. Kuningan Mulia Kav 9C, #17-01, Setiabudi  
Jakarta Selatan 12980 Indonesia



## Manado, Indonesia

Jl. Tountemboan no 489.  
Wawalintouan, Tondano Barat  
Sulawesi Utara, 95616 Indonesia



# RPRE Team



Singapore Team



Jakarta Team



Manpower for Construction



# About Us



## Our Mission

Help off-grid commercial & industrial clients transition from dirty energy to clean renewable energy.

## Our Vision

Our vision is to make the planet a better place by focusing on the triple bottom line of **People, Planet, and Profit**, and to leave a better planet for our future generations.

## Core Values

**Safety**

**Teamwork**

**Education**

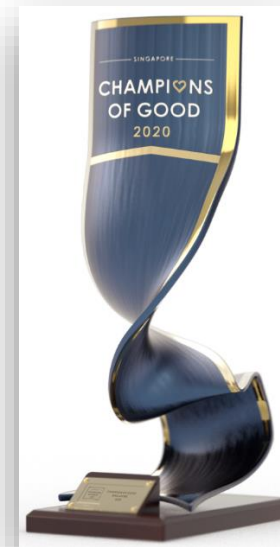
**Professionalism**



# Awards & Recognition

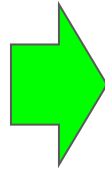


- ❑ Global Solar & Energy Storage Awards - Energy Storage Project of the Year 2019
- ❑ SG Enable - Enabling Employers Award 2019
- ❑ NS Mark (Gold) 2019 Accreditation
- ❑ FBN NxGen Lombard Odier Award 2019
- ❑ Singapore Apex Corporate Sustainability Awards 2019
- ❑ INSEAD Business as a Force For Good Award 2020
- ❑ NVPC Champions of Good 2020



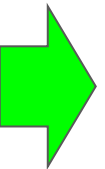


# Our Business Model - B to B to BOP



## *Our Target Businesses*

- Transition C&I from dirty to clean energy
- Bring immediate and scalable solutions to local communities
- Help Social Service Agencies and NGOs achieve long-term sustainable energy savings



## *B to BOP (Base of Pyramid)*

### *Social*

- Employ, train and re-skill local communities
- Community solar help local communities access affordable energy
- SSA and NGOs channels energy savings back into creation of greater impact

### *Environmental*

- Reduction in air, noise, water land pollution leading to improvement in health on land and below water

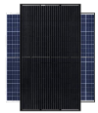


# Our Value Chain



## Manufacturers

Tier One players  
End life recycling



JA SOLAR

Jinko Solar

GermanSolar

AEROCOMPACT®

VYNCKE

XANT  
WIND POWER MADE EASY



Fronius  
SHIFTING THE LIMITS

Schneider  
Electric

SUNGROW

Growatt

Narada  
Rechargeable Batteries

GenPlus®

LG Chem



RESU RESU3.3

SAFT



## Distributors

(Agent for many brands  
across Sg & Indonesia)

## Engineering

(Advisory, Consulting &  
Design Services)

## Procurement

(Proper Indonesia Import  
and Company Licenses)

## Construction

(Leverage on existing  
manpower company)

## Operations & Maintenance

(Leverage on IOT & smart  
drone technology)



## Financing

Solve Capex  
Challenge through  
bridging Impact  
Investors



[RPRE issues First Mini Green  
Bond for Impact Investors](#)



## Customers

Singapore & Indonesia

Off Grid  
Grid Tied

Energy Efficiency  
Improvements

B2B  
Commercial  
Industrial

Community/impact  
Solar Projects



# Addressing the UN SDGs



SUSTAINABLE  
DEVELOPMENT  
GOALS



SPIRITUAL



ECOLOGICAL



PEOPLE

SUSTAINABLE DEVELOPMENT GOALS



## 2. Indonesia's Potential

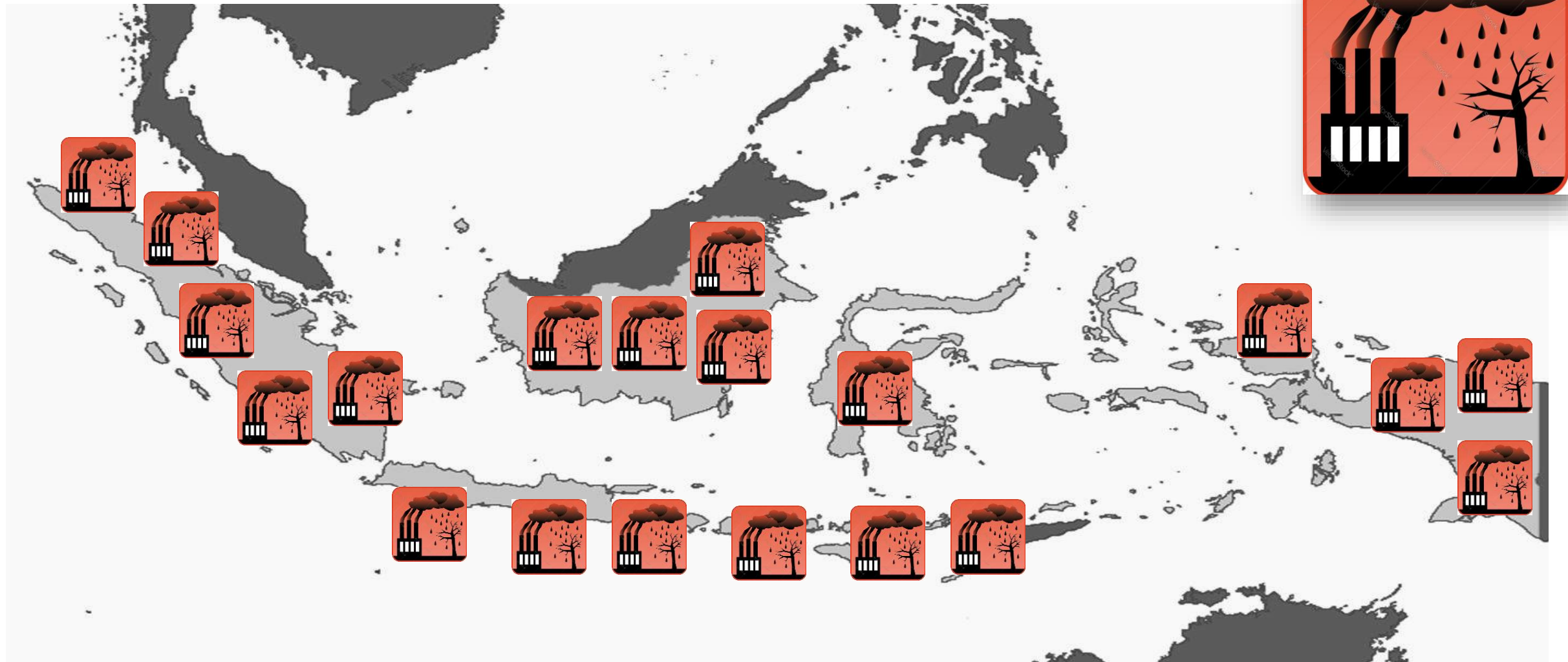


# Indonesia





# Indonesia still powered by fossil fuels





# Gangga Island Resort & Spa, Manado, Indonesia



## Project Highlights

- This eco-dive resort was previously running on dirty, expensive, diesel generators.
- RPRE installed a solar PV and battery system and financed them allowing them to pay over 5 years.
- A mini green bond was issued to impact investors to monetise the future cash flows.
- Local villagers were engaged to help build the system, and 180 trees were planted at the solar field.

## Technical Specifications

System Type	Off-grid
System Size	214.4 kWp
Solar Panels	640 x 335 Wp Solar Panels
Inverter	1x 100 kW Off- Grid Inverter 250 kW DC-DC Charge Controller
Batteries	556 kWh Lead Carbon Batteries



## Status

Commissioned Oct 2019

## Environmental/Social Impact

- Estimated 6 GWh of clean energy production over 20 years
- 2009 tons of avoided lifetime CO2 production
- Local Indonesian villagers were engaged to build the system



1,116 4-room HDB households for one year



51,510 Tree seedlings grown for 10 years



# RPRE's Mini Green Bond



- Resort used to spend about US\$10k a month
- RPRE finances project using own balance sheet
- Client pays down payment, procurement, transport, installation takes place.
- Remaining amount (\$8k) is paid monthly over 5yrs (Free energy after 5yrs!)
- RPRE issues USD390k MGB to Family Office & Impact Investor
- RPRE receives USD300k
- Impact Investors are repaid over 4yrs (7.7%pa)
- Pro-bono legal assistance from Latham and Watkins
- Corporate Guarantee required
- Personal Guarantee required
- Impact reporting required (Environmental & Social)



# RPRE's Mini Green Bond



RPRE gets USD300k upfront  
Investors will receive USD390k over 4 years



Pro bono Legal Support:

**LATHAM &  
WATKINS** LLP



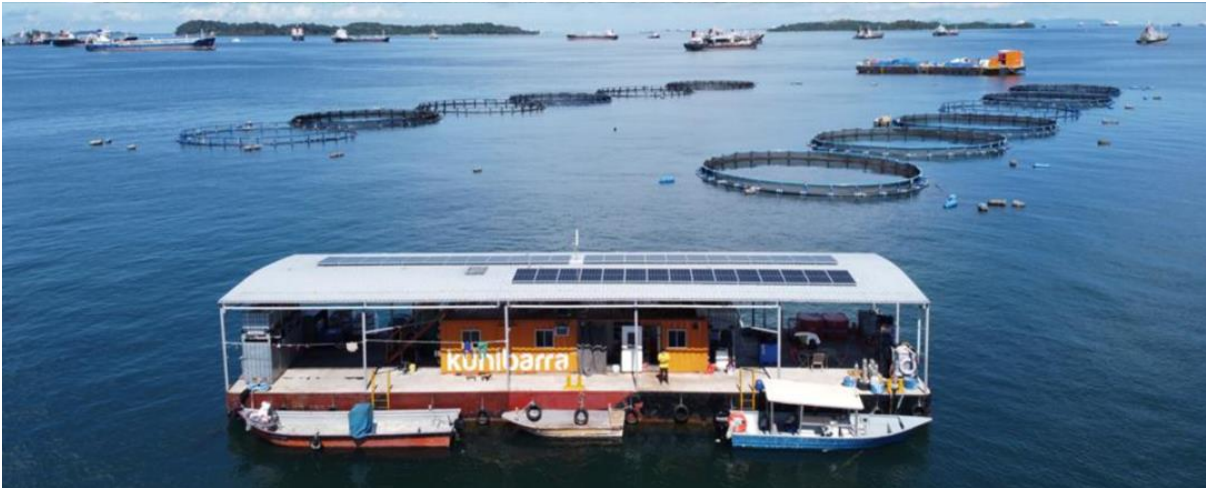


# Floating Fish Farm Barge, Singapore



## Project Highlights

- Barramundi Asia, Kuhlbarra, operates floating fish farms off Singapore's Pulau Semakau
- The operations were previously run solely on diesel generators which were noisy, pollutive, expensive and requires maintenance
- RPRE installed solar PV and batteries and now the client enjoys silent operations, no maintenance, energy and manpower savings
- This is In line with the company's commitment to sustainability reflected in their daily operations



## Technical Specifications

System Type	Off-grid
System Size	15 kWp
Solar Panels	39 x 370 Wp Solar Panels
Batteries	100 kWh Batteries
Status	Commissioned on Nov 2019

## Status

Commissioned

## Environmental/Social Impact

- 358,000 kWh of Estimated energy production over 20 years lifespan
- 141 tons of Avoided lifetime CO2 production



78 4-room HDB households for one year



3,604 Tree seedlings grown for 10 years



# Upcoming Project - Floating Hospital Barge



## Project Highlights

- Operated by Indonesian NGO called DoctorShare (founded in 2010)
- Provide **post-disaster trauma** and **health counseling** for the affected communities in Central Sulawesi
- Onboard Medical Facilities include **Operating Rooms, X-Ray, Medical Labs**, and **In-patient care** for 50 patients, **accommodation facility** for 60 volunteers
- Currently running on donated diesel generators which are expensive to run, unreliable, noisy, pollutive
- Unable to stay long term in remote locations due to refuel requirement



## Technical Specifications

System Type	Hybrid - Solar & ESS to replace Diesel Genset
System Size	150 kWp
Solar Panels	328 panels x 460wp
Inverter	1 x 150kw
Batteries	250 kWh of Lithium Batteries

## Status

Currently fundraising - USD200k of USD400k target achieved

## Environmental/Social Impact

- Allows DoctorShare to focus on medical work to remote villages
- Litres of Diesel avoided: TBC
- Carbon emissions avoided: TBC



XXX 4-room HDB households for one year



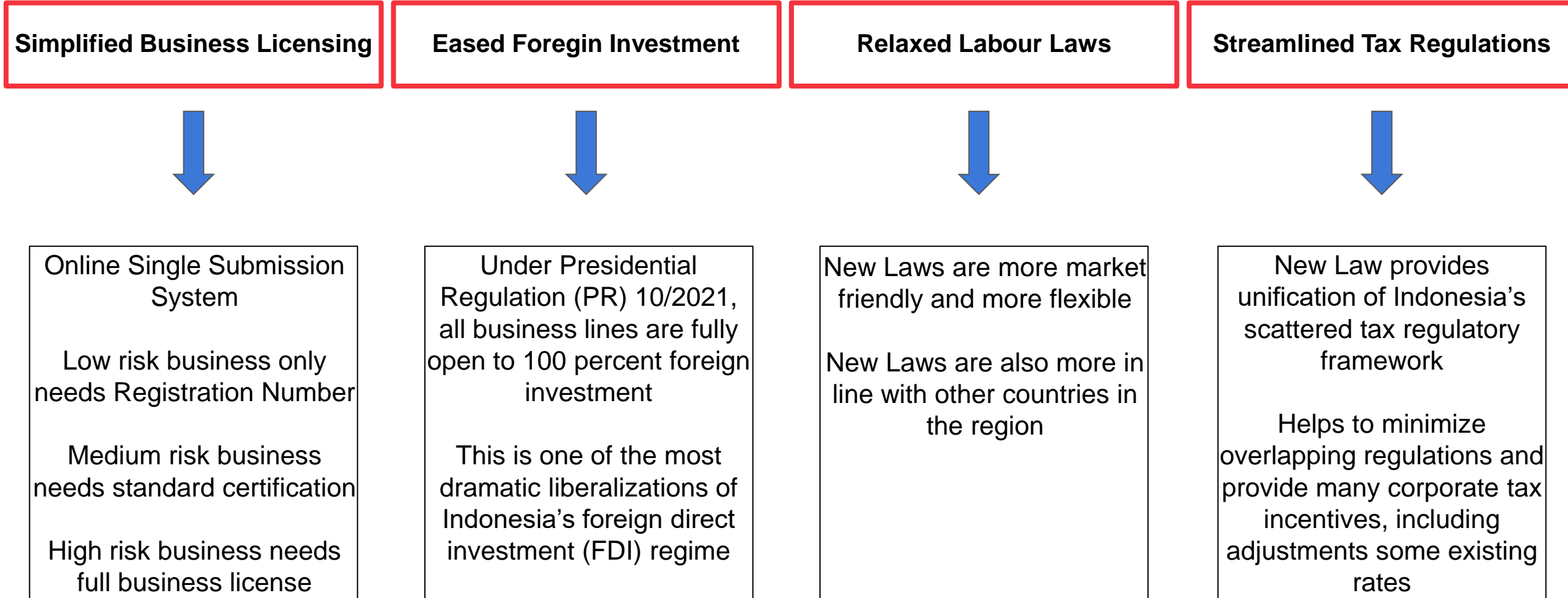
XXX Tree seedlings grown for 10 years



# 3. Working In Indonesia



# New Omnibus Law Overview





# Working in Indonesia



1. Dealing with corruption, possible not to pay bribes
2. Logistical challenges
3. Internet connection reliability
4. Unstable power supply, use of DG is common
5. Work with the Right People



# Useful Organisations/Terms to know



<u>Indonesian Bodies</u>	<u>Singapore Equivalent</u>
PLN	SP - Singapore Power
ESDM	EMA - Energy Market Authority
BKPM/IIPC	EDB - Economic Development Board
Depnaker	MOM - Ministry of Manpower
BPJS	CPF Board - Health and Social Security
KPK	CPIB - Corrupt Practices Investigation Bureau
Ministri of Investment	MTI - Ministry of Trade and Investment
Direktorat Jenderal Imigrasi	ICA - Immigration and Checkpoint Authority
KBLI	ACRA – Business Industry Classification
SKTTK	WSQ – Skills Certification for Employees
IUJPTL	ACRA/GeBiz - Business License to do Solar



# WORK WITH RPRE TO HELP



PEOPLE



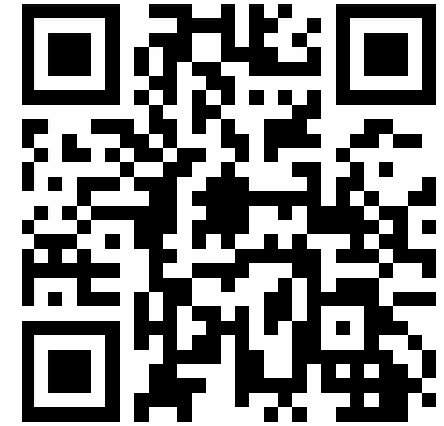
PLANET



PROFIT



Robin Pho



[www.RPREasia.com](http://www.RPREasia.com)





# Technical Considerations and Risk Mitigation for a Photovoltaic (PV) Roof Project

Mr JEREMY ONG

Managing Director, V3-Energy



Jeremy is the Managing Director of V3 Energy and has more than 13 years of solar experience since 2008, with gigawatt-hours (GWh) in energy storage solutions experience. He previously led regional teams in Phoenix Solar, Schneider Electric and most recently in DNV as the Head of APAC in solar.



# Financing for Solar Projects -Technical Considerations and Risk Mitigation for a Photovoltaic (PV) Roof Projects

Date: 2021-06-15



Jeremy Ong  
Managing Director



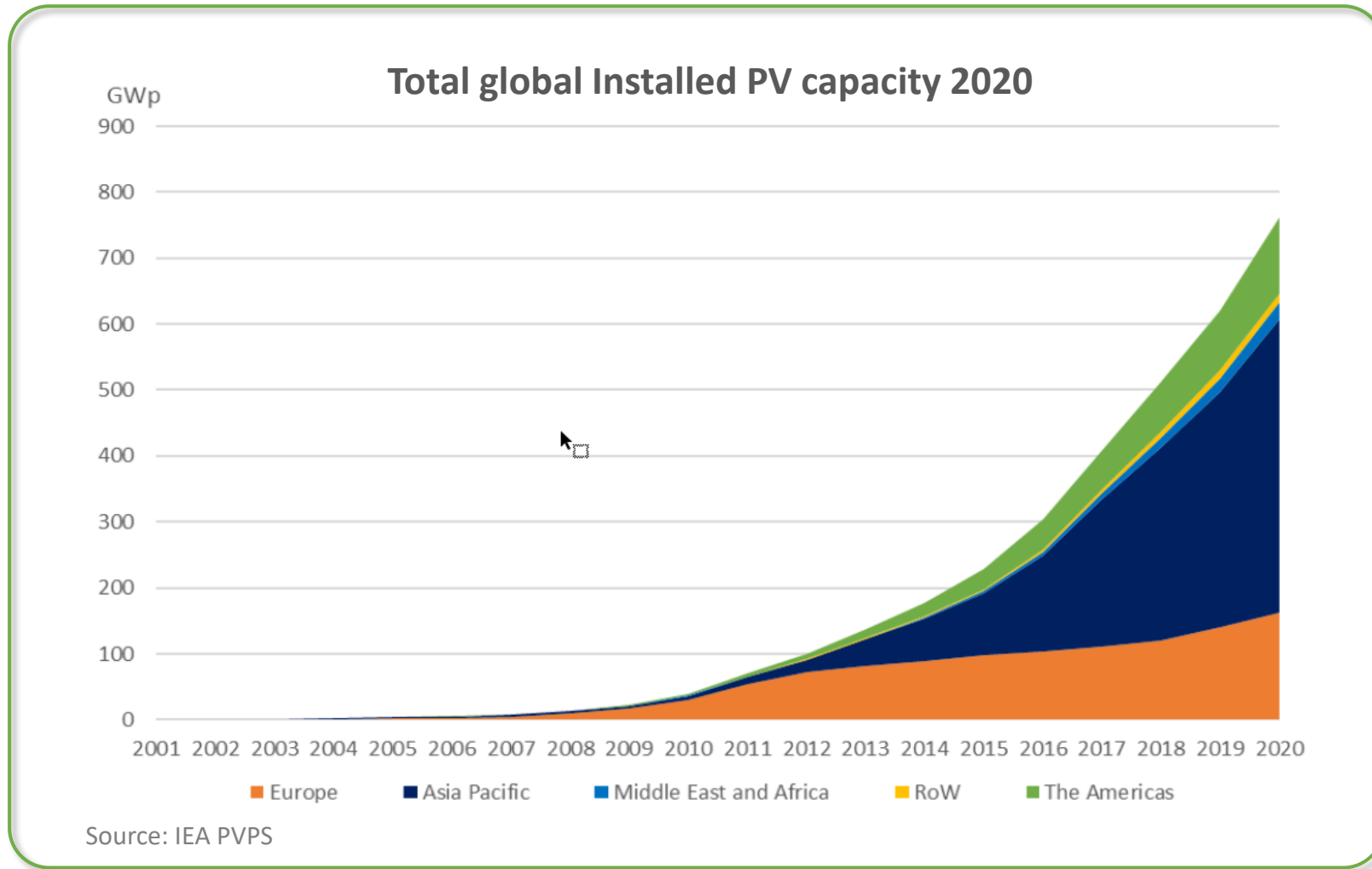
# Contents

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1. Global PV market overview
2. Singapore PV market overview
3. Project development risks
4. PV roof system risks overview
5. Design and Technology
6. Installer / EPC selection
7. Positive & negative installation examples
8. Conclusion



# 1. Global PV Cumulative

























Total cumulative installed PV capacity at the end of 2020 globally amounted to at least **758.9GWp**

- APAC is the largest market at **424GWp** followed by Europe at **151GWp**
- Americas are following increasing steadily lead by USA at **91.1GWp**



# 1. Global PV market overview - 2020

## Total global Installed PV capacity 2020

FOR ANNUAL INSTALLED CAPACITY				FOR CUMULATIVE CAPACITY			
1		China	48,2 GW	1		China	253,4 GW
(2)		European Union	19,6 GW	(2)		European Union	151,3 GW
2		United States	19,2 GW	2		United States	93,2 GW
3		Vietnam	11,1 GW	3		Japan	71,4 GW
4		Japan	8,2 GW	4		Germany	53,9 GW
5		Germany	4,9 GW	5		India	47,4 GW
6		India	4,4 GW	6		Italy	21,7 GW
7		Australia	4,1 GW	7		Australia	20,2 GW
8		Korea	4,1 GW	8		Vietnam	16,4 GW
9		Brazil	3,1 GW	9		Korea	15,9 GW
10		Netherlands	3 GW	10		UK	13,5 GW

Source: IEA PVPS

Total global Installed capacity 2020:

**139.4GWp**

### APAC Markets - 2020

- 6 of the top 10 PV markets are in APAC and installed 80.1GW
- 76% of the global market

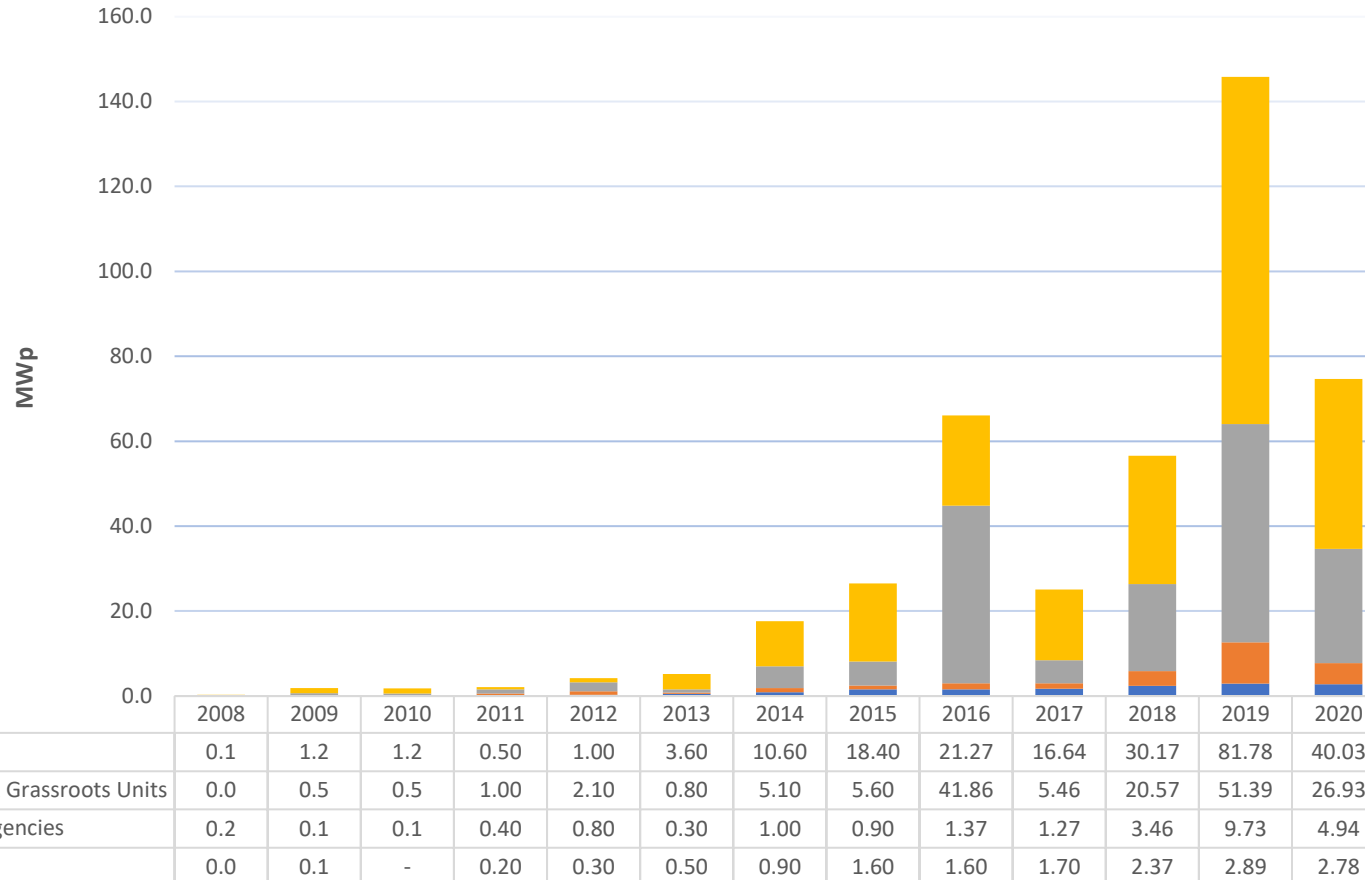
### APAC Markets Cumulative installed capacity - 2020

- 6 of the top 10 PV markets are in APAC and installed 424 GW
- 61% of the global market



## 2. Singapore PV market overview

Singapore total Installed PV capacity [MWp] from 2008 - 2020



Source: EMA & SPPG

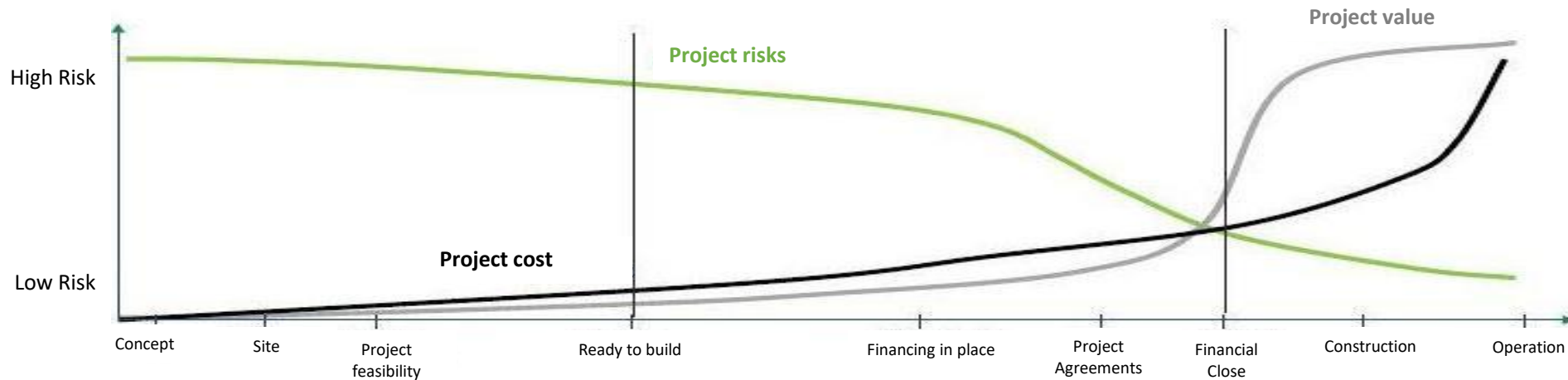
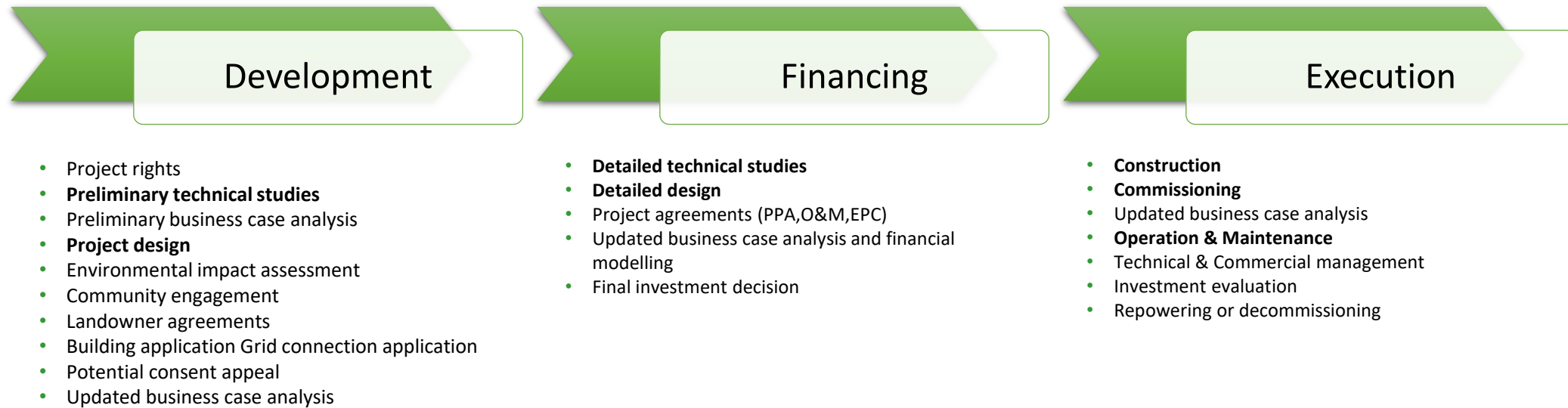
Total installed capacity as of end of 2020 is **427.8 MWp**

- Residential market **14.9 MWp**
- Govt Agencies: 24.6 MWp
- Town Councils: 161.8 MWp
- Private Sector: **226.5 MWp**





## 2. Project Development Risks





## 2. PV Roof Systems Risks Overview



### Commercial & Industrial

- Industrial/Commercial roof
- Up to MWp capacity
- MV/HV grid connection



### Private Residential

- Private landed homes
- usually up to 20kWp
- Low voltage grid connection

The impact of the risks will have a financial impact.



Result in less than expected energy generation

- Non - optimised design: 0.5-3%
- Poor installation quality: 1-2%
- Inaccurate energy model assumptions: 2-4%
- Wrong specification: 1-2%
- Wrong installation methods: 0.5-1.5%
- Equipment quality issues: 0.5-2%

**Loss potential : 5.5% - 14.5%**

No. Risks	Commercial / Industrial	Residential
1 Site Assessment – structure design and loading	xx	x
2 Design review - electrical, structural & mechanical	xx	x
Technology review : - Key Equipment Bankability - Minimal Functional Specification 3 - Manufacturing Inspection	xx	xx
Independent Energy yield assessment and uncertainty analysis: - Energy resource review 4 - Accurate energy loss assumptions	xxx	xx
Installer/EPC selection 5 - Experience and track record	xx	xxx
6 Agreements review	xxx	xx
7 Construction Risk	xx	x
8 Operational Risk – O&M Asset management	x	x



## 2. Design and technology risks

To ensure the **design risks** are **kept to a minimum** on the electrical and mechanical and as they will all **eventually impact** the **energy generation risk** in the immediate to long term either on the initial electrical or mounting structure used or **PV module** and **inverter technology** selected.

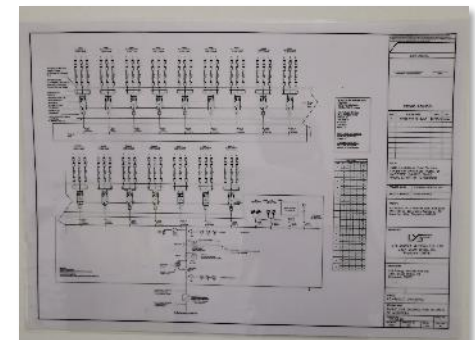
### System design and technology:

#### Technology selection:

Correctly prescribed specification of PV modules, PV inverters and BoS for the project location. Manufacturing audits and quality checks.

#### Optimised system design:

EPC uses accurate and correct site data to optimise the electrical DC & AC system design parameters for the project site.



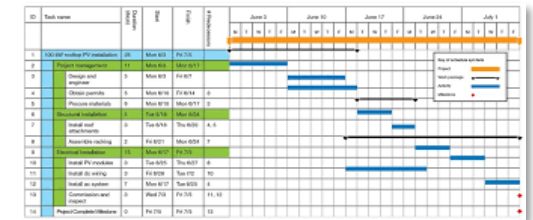


## 2. Risks – Installer/ EPC selection

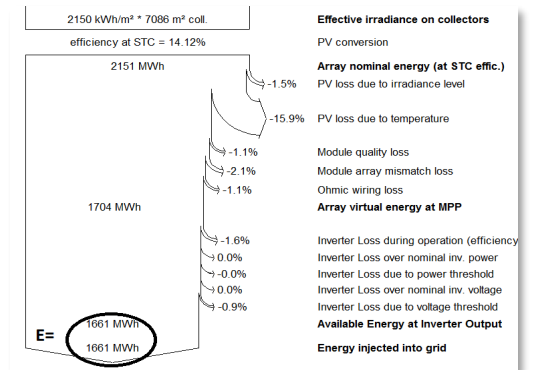
Why having an **experienced installer and EPC** is crucial in a project?

Because they are responsible for majority of the technical risks associated with the project.

- Compliance to **local codes** and **international standards and best practice**
- Good **project planning and execution** within schedule and safely
- Correct PV technology and system **components specification**
- **Optimised design** for the site with right **technology selection**
- **EPC contracts** with sufficient **Liquidated Damages** and **termination clauses**
- O&M contracts with contracts with suitable key **equipment warranty terms** & appropriate **system performance guarantees**.



Project planning and execution



Optimised design with correct loss assumptions



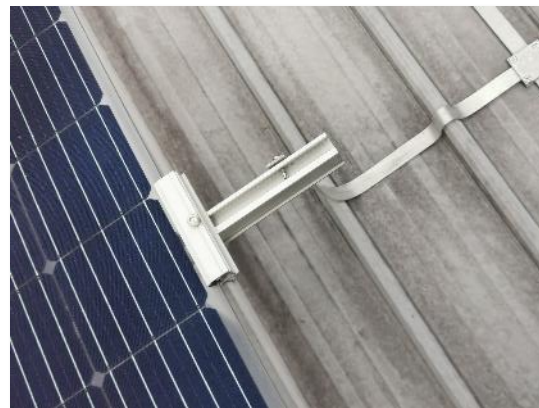
O&M and performance guarantees



## 2. Positive installation examples



**DC cables on cable trays**



**PV system Earthing**



**PV inverters mounting with ventilation**



**Cable management and labelling**



**Module mounted with sufficient ventilation**



**Good cable management**



**Non-penetrating roof clamps**



**Safety warning labels and string labels**



## 2. Product Quality and Installation Risks



**Burnt DC junction box**



**Cracked PV module glass over heating Junction box**



**PV string fire due to DC arcing**



**Module Junction box and hot spot DC arcing**



**Water ingress to combiner box**



**DC connectors arcing poor connection**



**DC connectors arcing**



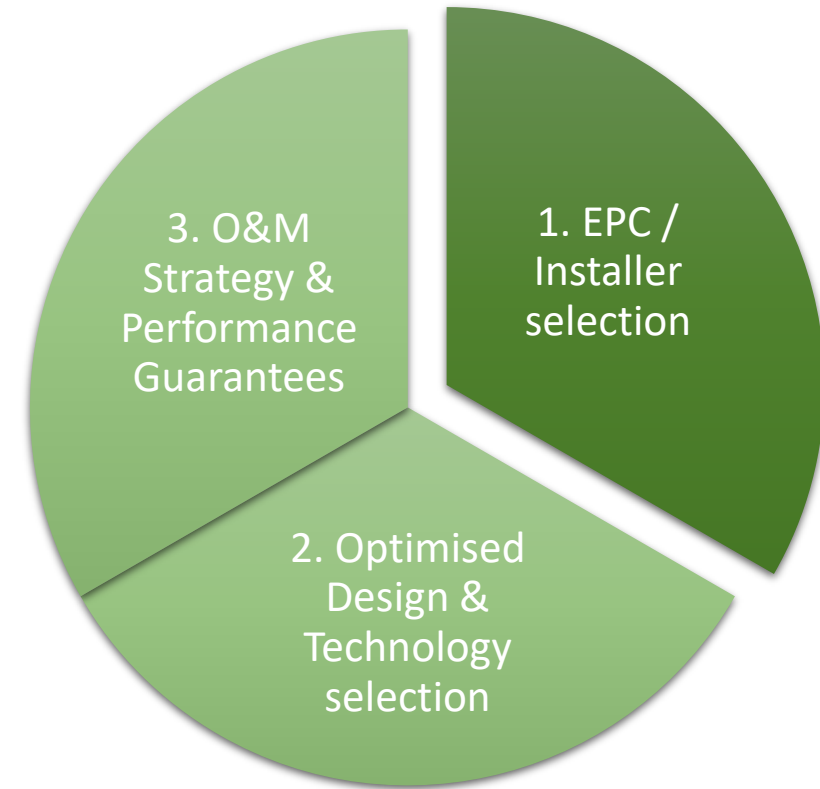
**DC cables live arcing**



## 6. Conclusion

1. **Engage a reputable experienced PV installer or EPC** - have a great impact and value to your project by helping to mitigate many of the technical risks.
2. **Optimised design and technology selection** – start off the project on a good design foundation without need to make costly fixes after project commissioning.
3. **O&M strategy and performance guarantees** – ensuring good energy yield is maintained without increasing operational costs to meet intended IRR goals.

By starting to address these three points will quickly help mitigate the main technical risks which ultimately improves your project returns.







**Jeremy Ong**

Managing Director

[Jeremy@v3-energy.com](mailto:Jeremy@v3-energy.com)

+65 9820 4212





**Next up by SBF Global**

# Fostering Malaysia-Singapore Partnership Through Smart Cities Projects in Penang and Johor

Jointly organised by Singapore Business Federation  
and Smart Cities Network

29 June 2021 / 3pm



**Others by SBF Global**

# Sustainable Financing Awareness Series Episode 3

## Financing for Circular Economy

22 July 2021 / 3pm



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webinar.**



**Chan Zhiquan**  
**Manager, Infrastructure**  
**SBF Global**  
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