SUNSEAP

AFFORDABLE CLEAN ENERGY FOR EVERYONE

SIEW 2021

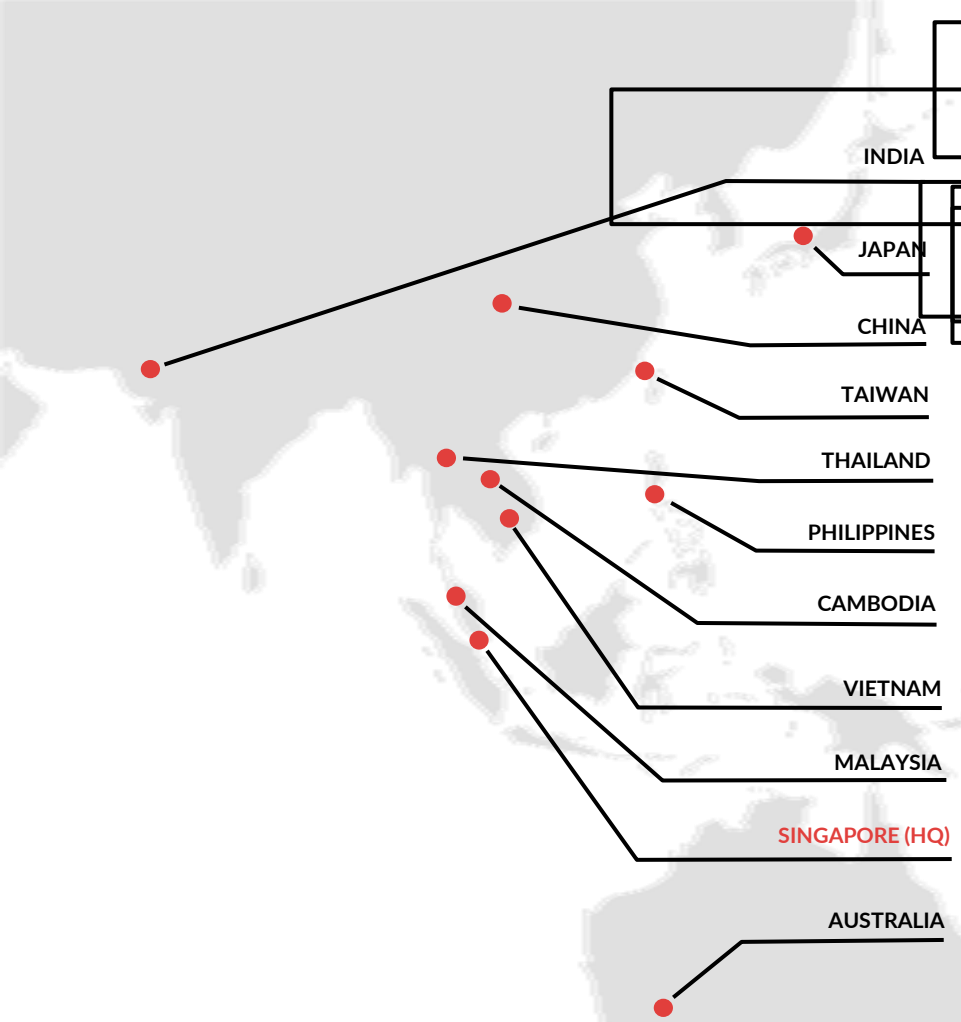
Asia Clean Energy Summit (ACES)

27 October 2021

Best Practices on Demand-side, Energy Efficiency

Peter Goh
Vice President
Sunseap Group

SUNSEAP



We are a full spectrum clean energy solutions provider

With more than **2 GWp** of solar capacity contracted, across **11 countries** and **6 regional offices**, Sunseap is Singapore's most established solar PV developer.

Our Valued Clients

Sunseap is proud to serve clients of all sizes and across all market segments, from residential consumers to commercial businesses and government organisations.

HOUSING & DEVELOPMENT BOARD · PSA The World's Port of Call · Keppel · Microsoft · amazon · facebook

Our Trusted Partners

Sunseap is also supported by an extensive network of financial institutions and business partners. Together, we are able to provide a greater range of financial and engineering services for our clients.

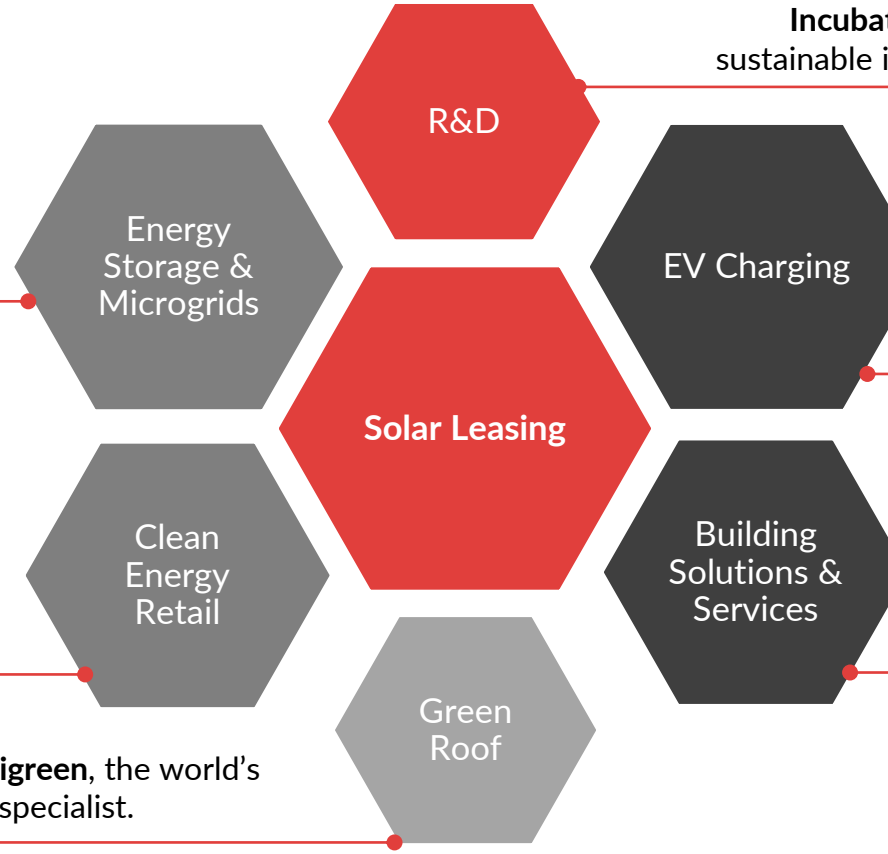
TEMASEK HOLDINGS · UOB · DBS · BOUSTEAD · BANPU · ING

SUNSEAP

Providing a suite of energy and sustainability solutions

While solar leasing forms the cornerstone of our business, we have also expanded to offer the full spectrum of clean energy solutions. This ranges from rooftop solutions to EV charging, building energy performance consultancy, contracting, and energy storage.

Our businesses at a glance



Incubator platform to develop innovative and sustainable ideas into viable products and services.

To improve the resilience of our electricity network, we are **expanding our energy storage capabilities** to enable microgrid solutions in a distributed generation future.

Provider of **smart EV charging solutions**. We aim to install 10,000 charging points across the island by 2030.

Singapore's **largest clean energy retailer**, provider of Renewable Energy Certificates (RECs) with over 1,000 accounts, including Apple, Microsoft and Facebook.

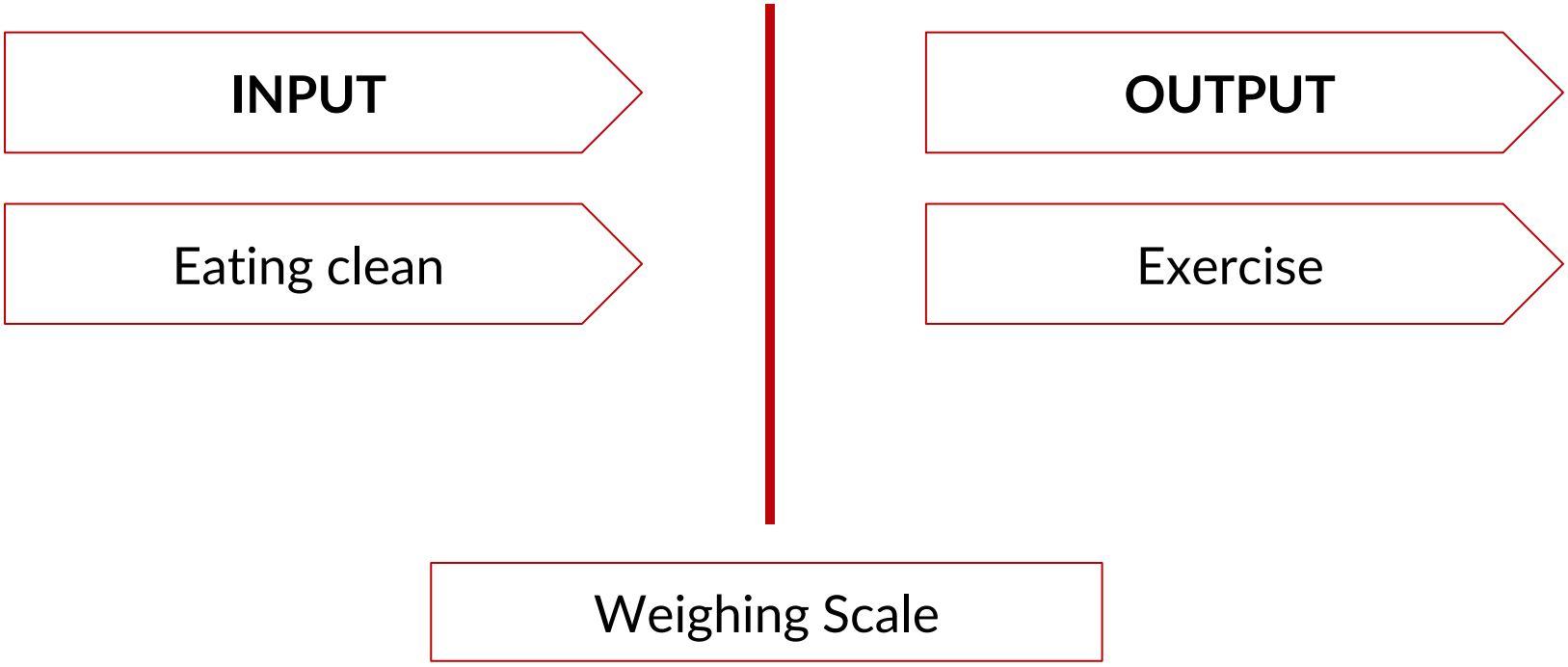
Fully financed energy improvement projects with specific focus on building systems. Our solutions can help clients save up to 50% of their energy consumption.

Regional distributor for Optigreen, the world's largest green roof solutions specialist.

SUNSEAP

Decarbonization… is like a weight-loss journey

1. Understand where you stand now
2. Set your targets
3. Draw up a plan
4. Understand that it is a journey – it doesn't happen overnight!
5. Weigh-in at every milestone
6. Prepare to make sacrifices but know that the efforts will eventually pay off
7. Seek professional help



In a building context

INPUT

- Solar (and/or other DERs)
- Energy Storage Systems
- Renewable Energy Certificates
- Clean energy imports

OUTPUT

- **Energy efficiency**
- Passive features/design

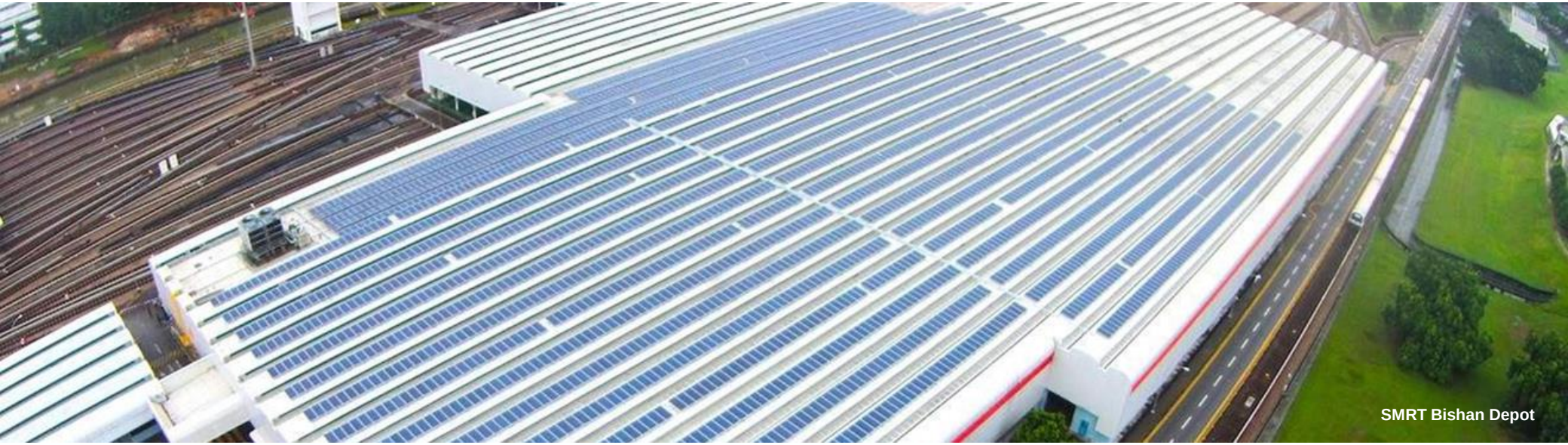
Digitalization of Energy
Measurement & Verification

SUNSEAP

Solar is the most reliable source of renewables in Singapore

There are various commercial models for clients to choose from, from CAPEX-free Power Purchase Agreement (PPA) to conventional EPC-type outright ownership.

Design	Finance	Build	Maintain
Tailored design of solar PV system to suit client's requirements	Zero capital expenditure Sunseap finances the entire project	Sunseap conducts the engineering, procurement and construction of the solar PV system	The system will be fully maintained by Sunseap, including monitoring and replacements, to ensure optimal operations



SUNSEAP

…and can be deployed under different circumstances

Woodlands Offshore Floating system, 5 MWp

Solar Farm in Vietnam, 168 MWp

Jurong Port, 9.5 MWp

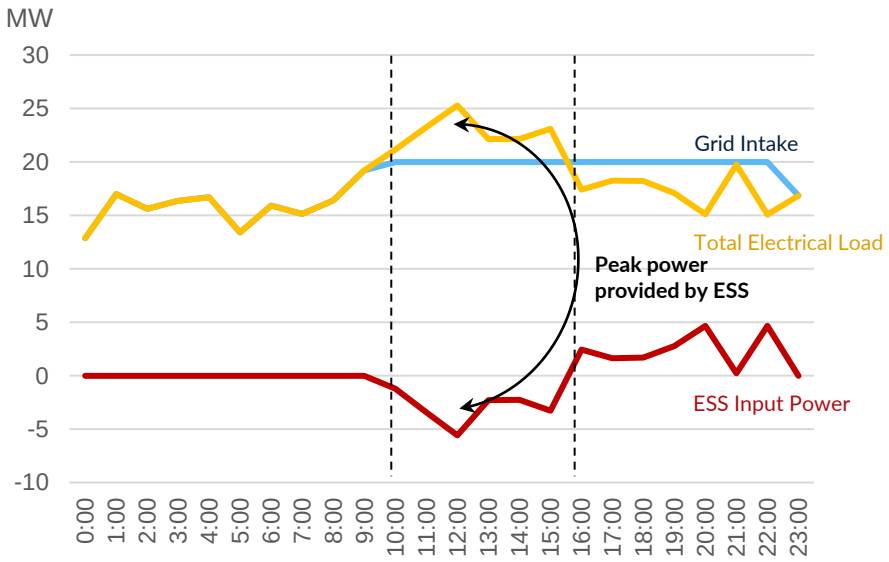
Singapore American School, 1.2 MWp

SUNSEAP

Peak-shaving through Energy Storage System (ESS)

ESS can provide an array of services to the end user, providing not only energy security but also extract energy efficiency and optimise energy consumption of the electrical system.

Load Profile of industrial facility



Applications of ESS

- **Peak-shaving to reduce demand charge**
- Power quality and frequency regulation
- Dynamic tariff response; energy arbitrage
- Contingency backup power
- Deferral of electrical equipment upgrade

How does ESS reduce your demand charge?

- Demand charge ($/kW per month) of a facility is commonly set higher than the average load to account for peak periods.
- ESS can reduce power intake from the grid during peak periods by supplementing the additional power.
- This reduces the power draw from the grid, therefore reducing the contracted capacity required.

SUNSEAP

Energy Efficiency Retrofit

Air-conditioning and lighting typically makes up **more than 50%** of a building's total energy consumption.
30-60% energy cost reduction can be achieved via optimisation and retrofit to energy efficient models.

Complimentary energy audit of the building.
Understanding the existing system, operational schedule and requirements.

Assess situation and evaluate system equipment upgrades.
Non-obligatory proposal is provided to the client.

Upgrades can be fully financed; no upfront costs required.
Equipment and project management of the retrofit are included.

Potential co-sharing of monthly cost savings with the client.
Contract duration is based on amount of savings shared.

Warranty and maintenance provided during contract period.
Operating risks are fully covered.

SUNSEAP

Energy Performance Contracting (EPC)

Sunseap will fully finance all upfront costs to the Client. Energy savings as a result of the retrofit will be shared between Sunseap and the Client over the contract period.

Example of cost savings calculation

Monthly Baseline Consumption	X	45,000 kWh
Post-retrofit Consumption	Y	25,000 kWh
Energy Saved every month	A = X - Y	20,000 kWh
Average Tariff Rate^	B	$ 0.210 / kWh
Monthly Cost Savings	**A x B = C**	**$ 4,200**
Savings kept by Client	**10% of C**	**$ 420**
Savings payable to Sunseap	**90% of C**	**$ 3,780**
Contract duration		**4 years**

^ Average tariff rate is based on a weighted average of the tariff rates from each electricity retailer

SUNSEAP

Selected Project References

Lighting retrofit and optimisation is a low-lying and fast turnaround upgrade that can provide substantial savings. Sunseap is experienced in managing a **variety of unique operational environments**.

SingPost Paya Lebar Headquarters

Postal sorting facility and offices

Scope:
Retrofitting of high bay lighting at postal sorting areas and common area lighting to LED.

Retrofit duration: 4 months
Monthly energy savings: 137,000 kWh
Monthly cost savings: $17,000

Hamilton Sundstrand Asia Pacific (Changi)

Aerospace component production facility

Scope:
Retrofitting of high bay lighting at precision engineering production area.

Retrofit duration: 2 months
Monthly energy savings: 35,000 kWh
Monthly cost savings: $4,000

SUNSEAP

Selected Project Reference: Storhub Self Storage

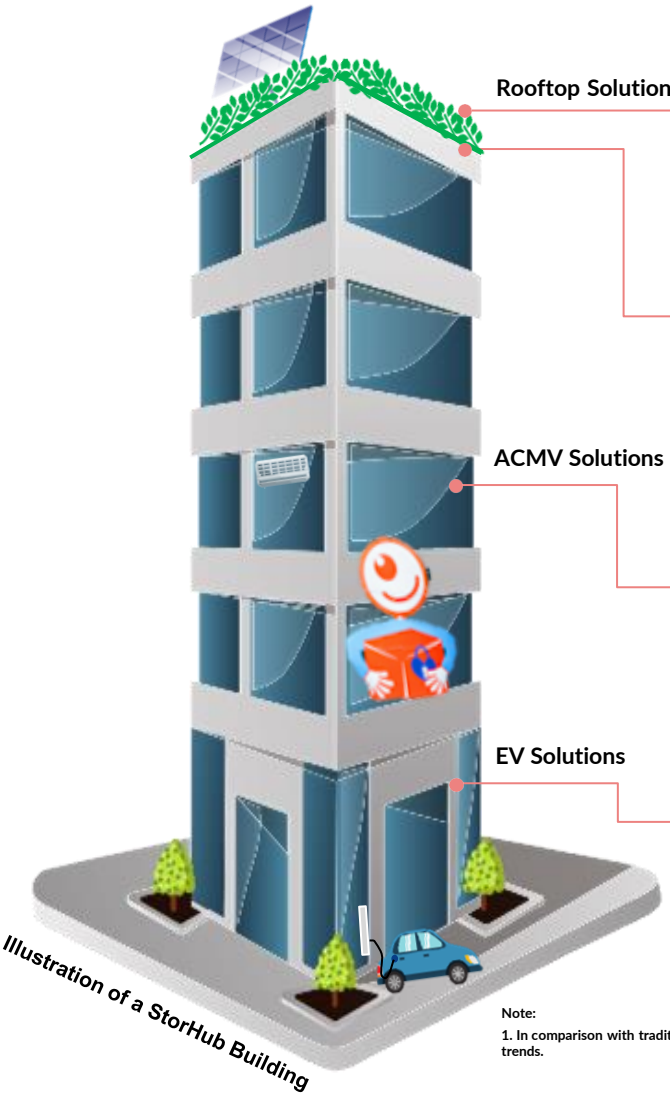


Illustration of a StorHub Building

Solar System Installation

- Nine sites in total
- Zero capex
- Projected energy generation of 1.8GWh in the 1st year

Green Roof Installation

- One flagship site
- Additional productive/recreational space for StorHub's customers and employees

Smart Air-conditioning System Installation

- Eight sites in total
- Ensuring optimum temperature for customers and employees

EV Charging-as-a-Service

- Two sites in total
- Zero capex
- In support of Singapore/ministry's push to phase out internal combustion engine vehicles by 2040

Note:

1. In comparison with traditional ACs with no overview of energy consumption trends.

Client Profile

Largest operator of self storage services in Singapore with presence in the Asian region.

Environmental Benefits

- Annual CO_2 emission savings amounting to 770,388kg
- Green roofs cut down heat transmission up to 90%
- EVs have zero tailpipe emissions which helps improve air quality of Singapore, public health, and minimising ecological damage

Business Benefits

- The increase in energy efficiency brings cost savings
- Smart air-conditioning control function supports efficient resource planning.
- Sunseap's zero capex model allows for financial flexibility

Defraying upfront costs with bank financing

U-Energy UOB

UOB's U-Energy is Asia's first integrated financing platform that simplifies the adoption of energy efficiency projects. With this platform, building owners can easily connect with U-Energy partners (energy service companies (ESCOs)), and access flexible financing options for their energy efficiency projects.

U-Energy and its partners support air-conditioning, chiller, elevator, energy and power management system, façade, lighting control and solar projects across commercial, industrial and public buildings.

https://www.uobgroup.com/u-energy/singapore/business.page

SUNSEAP

Sunseap Group of Companies

Contact Information
Peter Goh
Vice President
E peter.goh@sunseap.com
M (65) 9146 6708

SUNSEAP