



SUNSEAP

New Business Models for Solar Proliferation





# SUNSEAP

Group of Companies

*"Affordable Clean Energy for Everyone"*

- With over 30 years of history and experience in the solar industry, Sunseap is a full spectrum clean energy solutions provider with a build, own and operate model focusing on rooftop- and ground-mounted solar PV projects
- With close to 200 MWp contracted as of October 2017 and more than 110 employees across 8 regional offices, Sunseap is Singapore's most established solar PV provider

## INTERNATIONAL

- Development of grid parity solutions in high potential, power-deficient and growth economies in the ASEAN and Pacific region

## LEASING

- Singapore's largest Clean Energy generator with more than 80 MWp fully constructed in portfolio
- Forms the "generator" arm in the vertically integrated clean energy utility

## ENERGY

- Executed the first Clean Energy Retail contract in Singapore with Apple as off-taker
- Poised to participate in Full Retail Competition and become Singapore's largest Clean Energy Gen-tailer

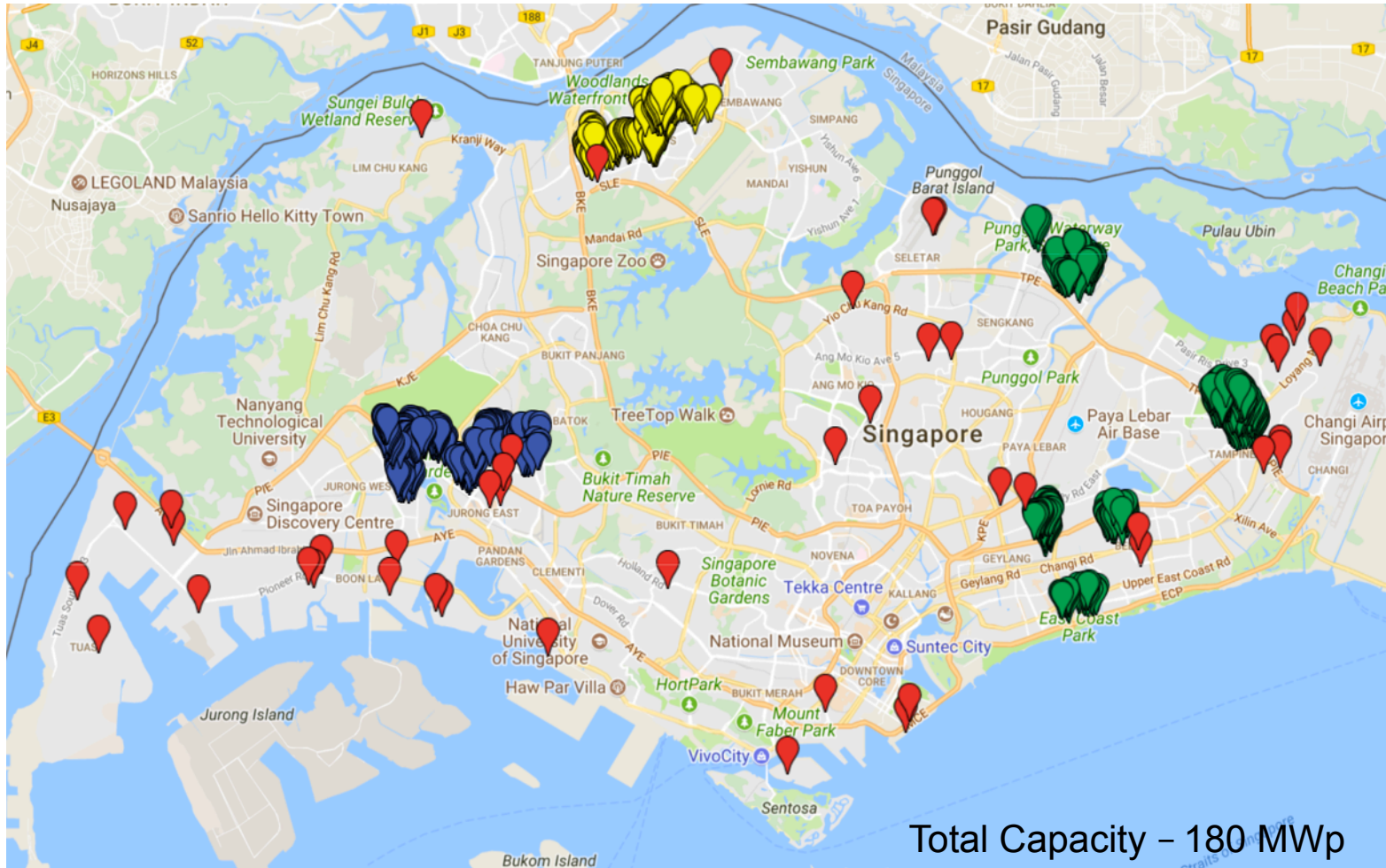


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# Sunseap's Singapore Footprint

Over a thousand sites across the island



## PUBLIC HOUSING PROJECTS

North

West

East

## COMMERCIAL PROJECTS

Various locations



Annual Carbon Offset – 100k Tons



Equivalent Trees Planted – 2.5M Trees

Proprietary and Confidential

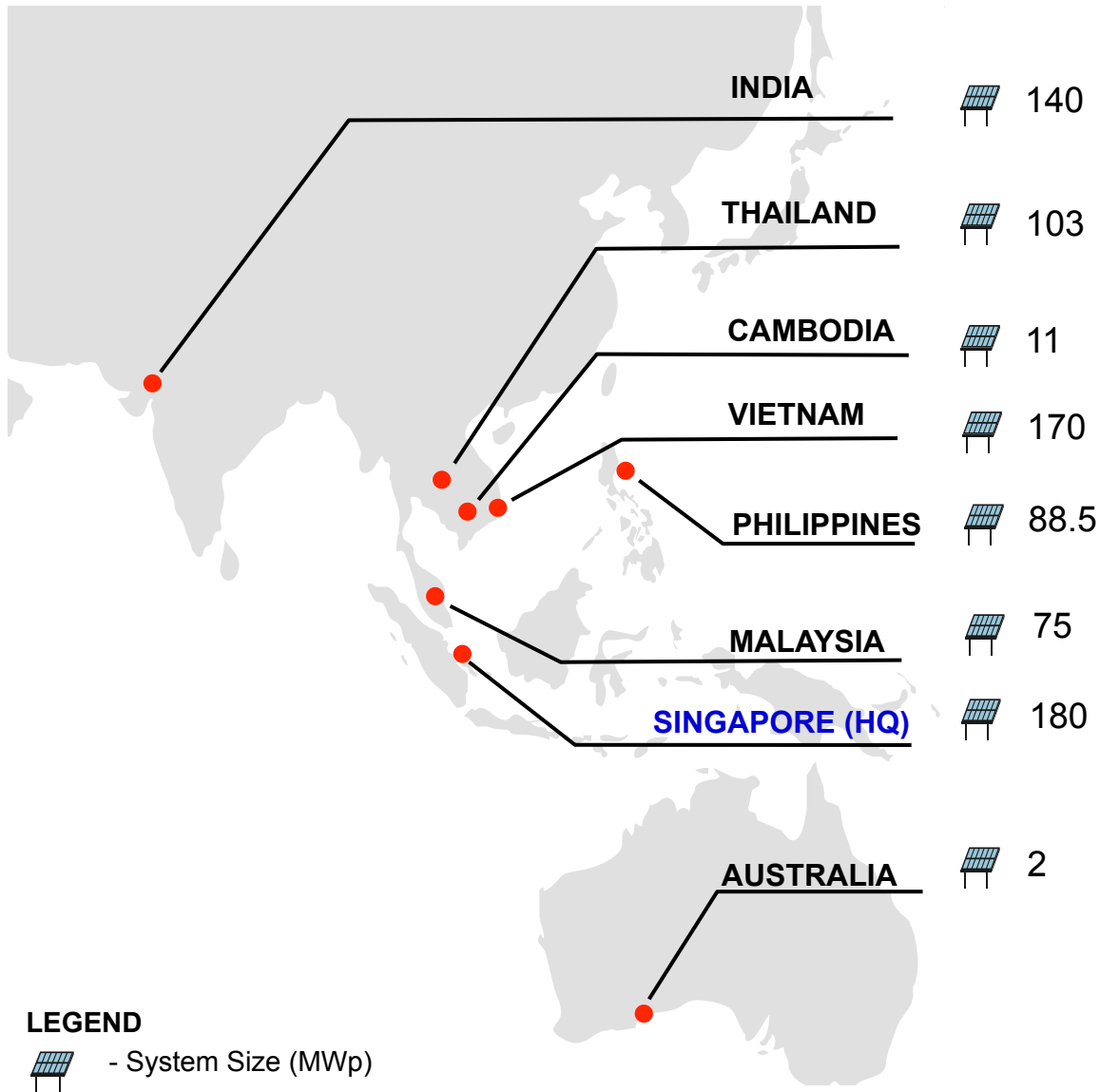


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# Internationalization

Growing in Asia in Utility Scale, Rooftops and Other Capabilities



## India

- Awarded 140 MWp FiT with NTPC as part of a consortium

## Thailand

- Implementation of a 100 MWp rooftop portfolio
- Developing a solar farm of 3MWp
- Floating solar potential >10MW

## Cambodia

- 11 MWp solar farm PPA with EDC COD on 29 Aug 2017
- Potential solar park discussions with EDC / ADB

## Vietnam

- Developing a 170 MWp solar farm

## Philippines

- Awarded a 62.5 MWp bilateral PPA with Meralco
- 6MWp microgrid solution under development
- Rooftop portfolio of 20 MWp under development

## Malaysia

- 1 MWp greenhouse-mounted project in operation
- Negotiating solar farm and participated in large scale solar
- Potential ADB funded 100MWp rooftop portfolio

## Singapore (HQ)

- 90 MWp commissioned
- 80 MWp under construction
- >20MWp pipeline

## Australia

- Exploring rooftop solar development in East and West Coast
- Exploring floating PV and Shell 250MW project

# Various New Business Models

## The Energy Value Chain and Value-added Services

### Roof Lease

Typically requested by multi-strata title building and Reits.



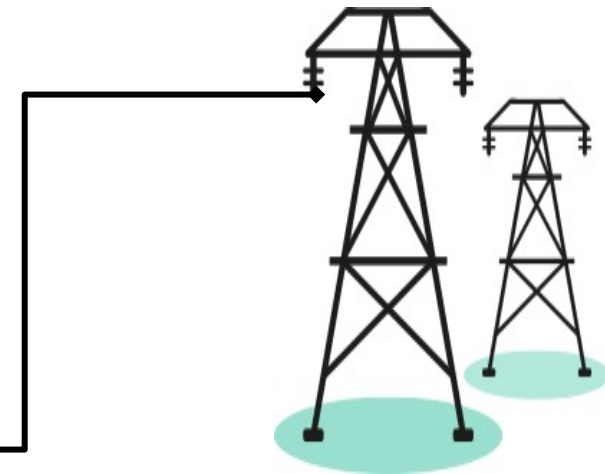
### Solar Leasing/Onsite PPA

20% of Energy Demand provided by Solar Generation



### Clean Energy/Offsite PPA

80% of Energy Demand provided by Energy Retail



### Floating PV/ Mobile Solar Farms

Singapore's answer to Large Scale Solar Farms



### Demand Side Management

Demand Response, Load Shifting, Max. Demand Management, Contracted Capacity Reduction

### Off-Grid Systems

Diesel reduction via PV Energy Storage Hybrid System



# Sunseap's Capabilities

Key Areas to Differentiate Offering and Deliver via a Unique Platform



## Solar Rooftop Installations



- Rooftop specialist
- Utility scale growth



## Floating Solar



- 200kwp in reservoir (Singapore)
- Discussing >15MW opportunities in the region



## IoT monitoring, Green-Fi



- Energy IoT metering,
- Platform to monitoring multiple equipment Green-fi



## 100% Clean Energy PPA



Source: Channel News Asia

- Clean energy relationships with GFAMs
- Singapore then regional demand



## ESS and Batteries



- Batanes project in Philippines
- Rural electrification
- Micro Grids

Proprietary and Confidential



## Innovative Financing



- Portfolio project financing
- Asset back securitization (Singapore)



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# Sunseap Capabilities

## Strategic & Financing Partners

### Equity & Debt Funding Partners



NOVEL  
INVESTMENTS



### Lender's Advisors





# Singapore Floating PV At Tengah Reservoir

## Touted the World's Largest Test Bed



### Commercial Intent

1. Singapore reservoir has 3.7GWp potential
2. Singapore 10MW turnkey in 2018, then 100MW in 2-3 years
3. Challenge of merchant risk, greed
4. Government strategy to attract GFAMs and reduce evaporation of reservoirs

### Technical Considerations

- Single pitch vs dual pitch
- Environmental studies and anchoring
- Deployment approach (phased)
- Grid ability and bearing of the relevant costs

### Current Work in Progress

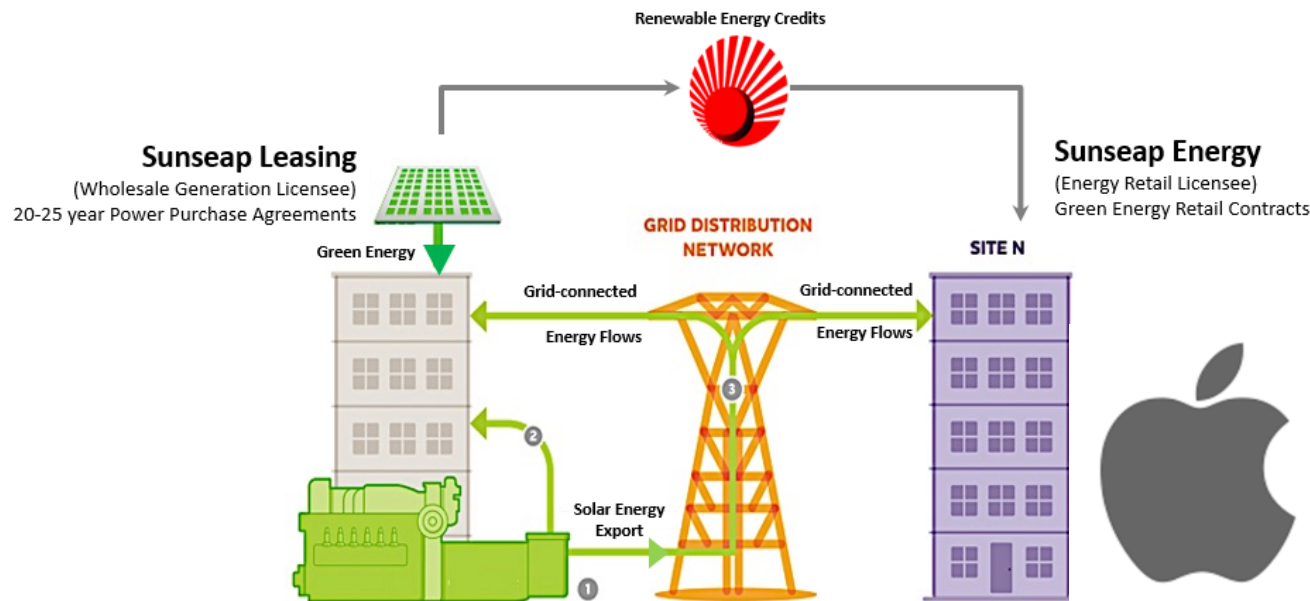
- a. Suitable float manufacturing
- b. Clean energy business model with PPA, Virtual PPA, Floating for Fix swaps
- c. Capital markets link for large scale
- d. Storage to regulate frequency

YouTube feature by TODAYonline: <https://www.youtube.com/watch?v=8hSSPfOYZ-I>



# Clean Energy Business Model

## 1st Landmark Transaction in Singapore with Apple



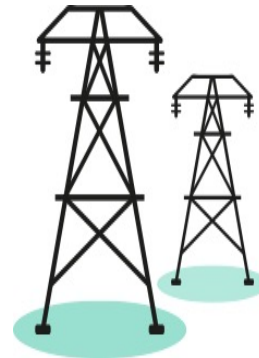
### Distributed Energy Generation

1. Solar System supply solar energy to Site 1 via a solar leasing agreement
2. Any excess of solar energy is exported into the grid at wholesale prices and is “sold” to Site N who commits solar energy which is less carbon intensive

- Sunseap → Wholesaler (Generator) & Energy Retailer Licences from the Energy Market Authority of Singapore
- Bundles exported energy and Green Attributes to provide a clean energy solution for consumers, with the landmark deal by **Apple Singapore to supply 40GWh per annum.**
- Sunseap is also exploring Virtual PPAs with large MNCs with entire off-take of green capacity, and retail solutions to take over the entire energy value chain for our current leasing clients

# Open Electricity Market 2018

Growing in Asia in Utility Scale, Rooftops and Other Capabilities



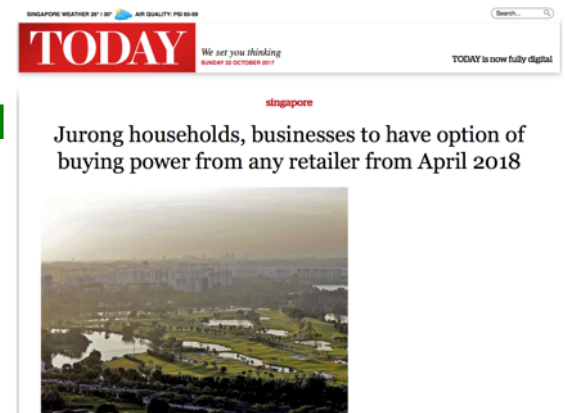
MNCs



SMEs

**NINJA VAN**  
Arbite

1.3 Million  
Household



## **ELECTRICITY IS GENERATED**

through our Solar PV Systems on different locations.



## **ENERGY IS TRANSMITTED**

through the National Grid.



## **SUNSEAP ENERGY SUPPLIES ELECTRICITY TO CUSTOMERS**

through the National Grid.