



Solar Rooftops, Getting It Done..

Solar Rooftop Presentation, RCR Club, Hua Hin
May 20 2022

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About Kunini Electrical & Solar EPC

Timeline;

Established 2002

Security Business 2002 – 2009

Electrical & Lighting Business 2005 – Present

Solar PV Business 2011 – Present

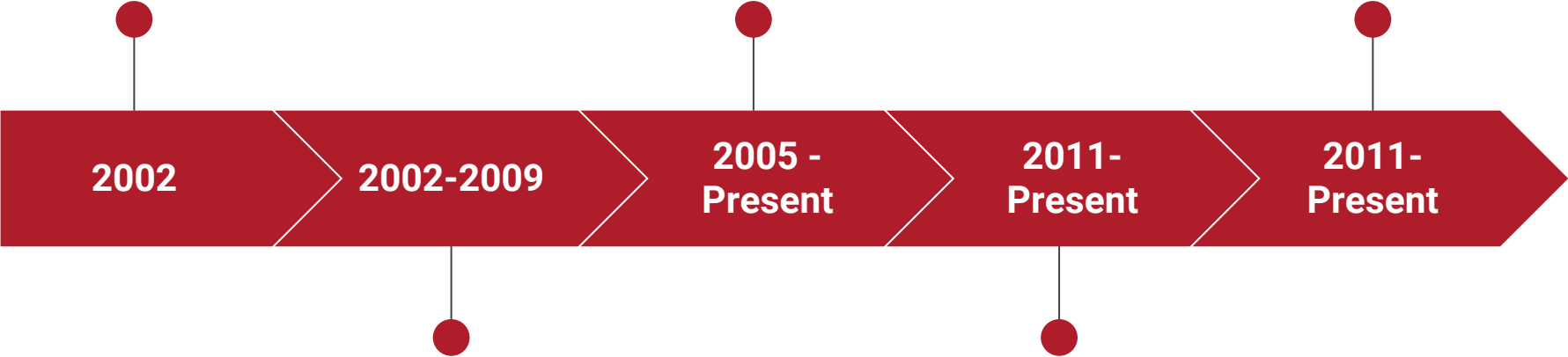
Consulting / Design Business 2010 – Present

EV Charging Stations 2021 - Present

**Kunini Began Trading
as Kunini Security**

**Electrical & Lighting
Contractor**

**Solar PV & EPC
Business Division**



**Security Systems
Designer / Installer**

**Electrical Consulting
& Design Business**

Why Solar? What Are The Benefits?



Save Money from day 1



Be your own power producer



Reduce your carbon footprint



Keep your building cooler



Produce Clean, Green Energy

The time to install a Solar Roof is now..

Three Key Points



Costs



Technology



Regulations

The time is now.

Costs

The costs for Solar PV equipment have come down, allowing the Solar PV market to expand rapidly. Especially Solar Rooftops for commercial businesses, factories, hotels etc.

Technology

Technology has improved, enabling systems to be designed more efficiently. There has been explosive growth in the Solar Panel and Solar Inverter technologies.

Regulations

Regulations and rules for installing a Solar PV Roof have been made clear. Clarity on the rules around installing a Solar PV system are more clear. Guidelines are in place.

What you need to know.

Regulations and Rules

It is permitted to install a Solar Rooftop for 'self-consumption' as long as the rules are followed.

Follow ERC CoP Guidelines. Comply with EIT Standards for Solar Rooftops. Apply for MEA / PEA Grid Connection.

Regulations and Rules

Zero export policy.
Complete the Solar Rooftop Design in accordance with ERC, MEA, PEA guidelines;
Power Consumption plan, SLD's, Solar Roof Layout, AC Connection etc.. Roof Structure Inspection
Equipment on MEA/PEA List.

Ownership Options

Self Financed /Owned
Finance with a PPA
Contract (Third Party)
Solar Service Provider
Bank or Other Finance

What you need to know... cont.

Starting the process

The initial step is to have a consultation with a Solar EPC Contractor or Solar Service Provider to determine; 1. Is the project viable? 2. If it is viable, what size system would be right for you? 3. Ownership options. It needs to make sense!

Sizing the PV Array

The PV system must be sized so that there is no excess electricity feeding into the grid (under the current policy). So the system size has to match the building's daytime consumption.

Equipment

The basic components.

Solar Inverter

Solar Panels

Solar Mounting Structure

Distribution Panel

Monitoring Device

Procedure Step-by-Step

Procedures Step-by-Step

Consultation or Self Evaluation..

Site Evaluation (Solar Survey)

Due Diligence, Contracts & Legal

Financing (if applicable)

Permits & Licencing

Construction

Operating the system

Construction

Grid Connection

Commissioning

O&M

“After consultation with a Solar Service Provider the Facility Owner will have a good idea on the suitability of their roof for solar PV system installation and the type of preferred business model.”

	Self Financed Model	Third Party Ownership Model
Description	The facility owner buys the system 100%. A Solar EPC Constructs the system	The Solar Service Provider developer builds, owns, operates (BOO) the PV system and sells electricity to the Facility Owner at a discounted price for the agreed contract period
Investment Cost	Depends on system size	Minimal
Electricity Saving	Full electricity cost saving is achieved for the facility owner	Part of the savings is obtained by the Facility Owner (depending on the discount rate agreed upon with the Solar Service Provider)
Ownership	Facility owner	The Solar Service Provider
O&M	By Developer / EPC Contractor for two years. After depends on owner to contract out this service	By Developer / EPC Contractor for the contract duration
Benefits	Receive full savings from generated energy Lock in electricity rate for 25 years Has full control of the system No long term contract obligations	Limited Investment cost & O&M cost Guaranteed savings for 25 years A buy back option to switch to self finance Model may be agreed.

Next Steps

The Solar Survey

While there are good intentions and the outlook is positive, not every business can install a Solar Roof.

As we saw above the first critical step is the consultation, the next step in the process is the Solar Survey.

The Solar Survey

01	Site Location - GPS Coordinates	<ul style="list-style-type: none">• Complete Address• GPS Location• Orientation
02	Building Plans	<ul style="list-style-type: none">• Floor Plans• Roof Plans• Electrical Plans
03	Electricity Consumption Costs	<ul style="list-style-type: none">• Monthly Electricity Consumption (Kwh)• Customer Type (TOU, ROU)• Monthly Electricity Costs (past 6• 12 months)• PEA customers can typically access the load profile via PEA Website
04	Load Profile (utility)	<ul style="list-style-type: none">• MEA customers need to make a request• The Facility Engineer can usually supply this
05	Photos of Site and Roof Area	<ul style="list-style-type: none">• For preliminary assessment of the roof construction,• surrounding obstacle, etc.

Case Study - Solar Roof 200 kWp - Self Financed

System Details

Factory

200kWp Solar Rooftop

Self Consumption Model

Operating Hours / Days

Mon-Sat 9-7 - Sunday

Closed

Capital Cost

Bt. 5,500,000

- **Complete EPC Contract**
- **2 Years O&M**

Savings & ROI

5 Years ROI

Savings Approx. Bt. 100,000 PCM

Annual Savings Bt. 1,200,000 per year

20 Year's Further Savings

Case Study - Solar Roof 200 kWp

Construction

Construction Period

The construction period from start to operation is around 30 days. Depending on site conditions.

Equipment

Equipment Used.

380 Solar Panels Jinko*
540Wp Mono

Huawei Solar Inverters
100wp 3P 2 Units

Reverse current relay ad
zero export control

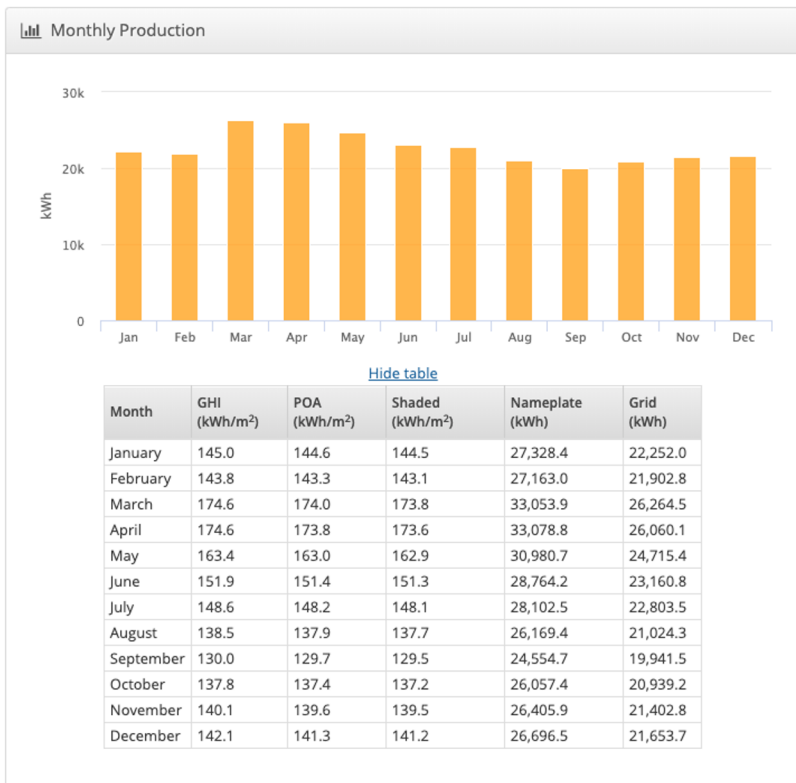
Huawei Fusion Solar App for
monitoring

Challenges

Challenges

The biggest challenge is with Permits and Licencing. There is generally resistance at each stage so you need patience. You can operate the plant while waiting for final permits.

Solar Rooftop 200kW, Bangkok



System Metrics

[PDF](#) [CSV](#)

Design	Existing Design
Module DC Nameplate	200.6 kW
Inverter AC Nameplate	160.0 kW Load Ratio: 1.25
Annual Production	272.1 MWh
Performance Ratio	76.0%
kWh/kWp	1,356.5
Weather Dataset	TMY, 10km Grid, meteonorm (meteonorm)
Simulator Version	e597e0d104-f5c925990a-93b3fab770-3840632e51
Shade Report	View Shade Report

What Kunini can offer..

Free Consultation

Free Solar Survey

Possible Financing (*as Solar Service Provider*)

All Solar Roofs come with a two year O&M contract which can be extended by three-year increments.

**Kunini offers a complete EPC service
- A Turnkey solution for any sized Solar Rooftop.**

Final Notes

Kunini thanks you for attending the presentation today.

If you would like to consult with us regarding your project please contact me at;

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or

Mobile 0818921992

