

Solar Day 2019

CHASING THE SUN



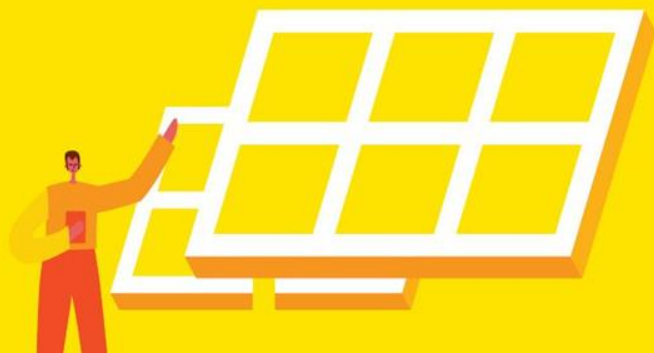


Fabby Tumiwa

Executive Director



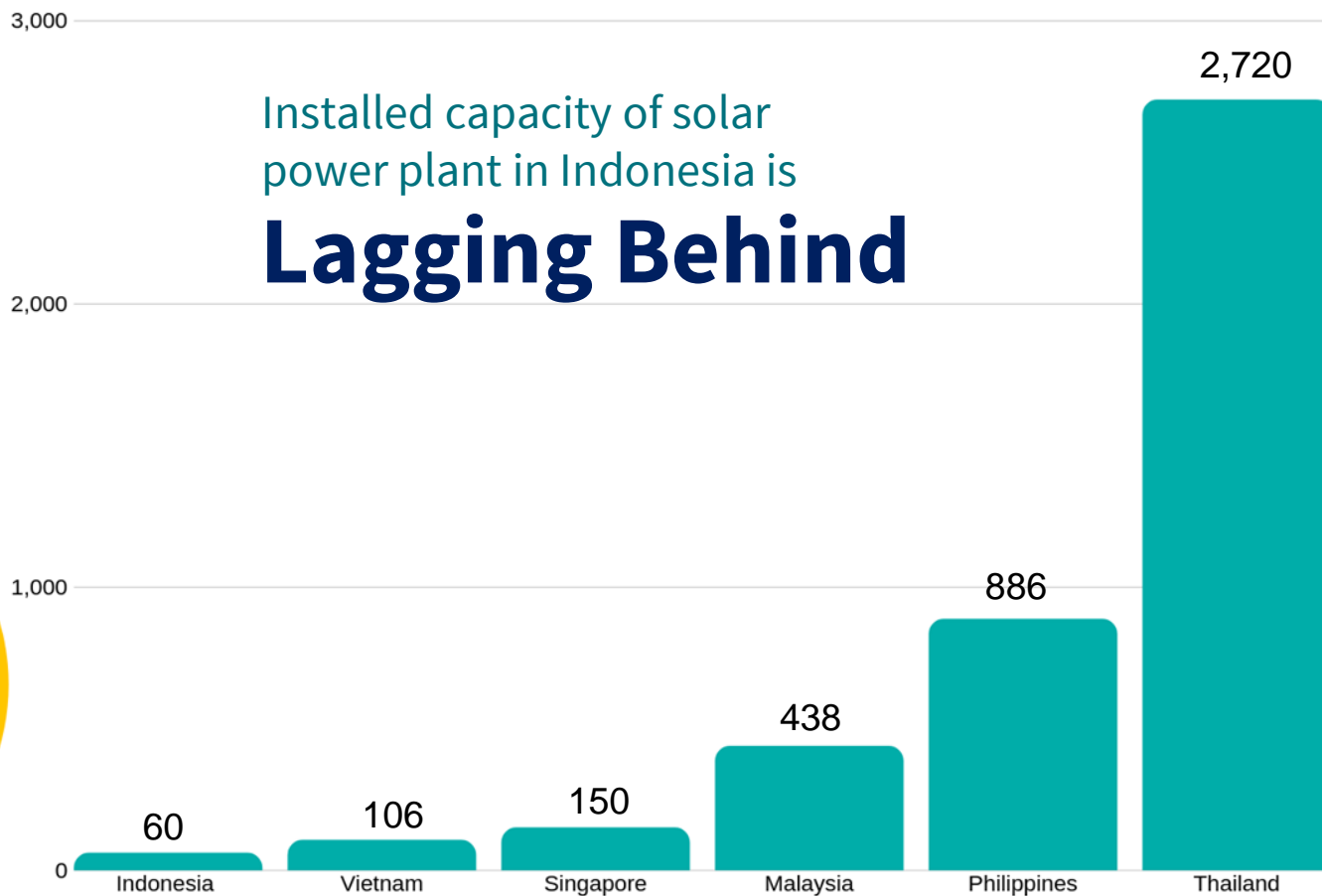
4.36 GW Total Asean

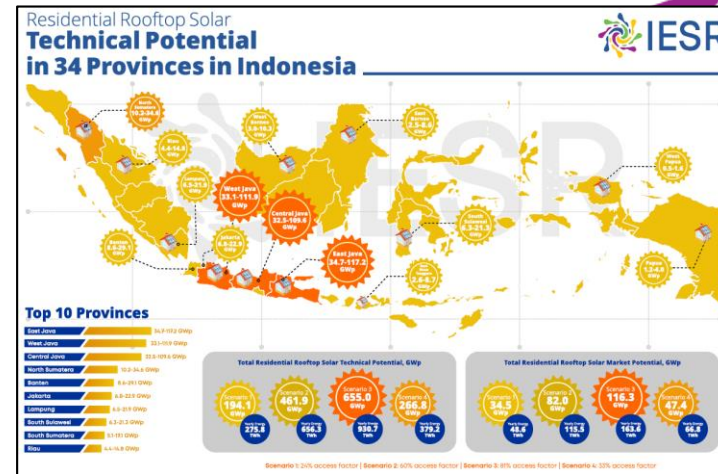


Source : IRENA

Installed capacity of solar
power plant in Indonesia is

Lagging Behind





Pamela Simamora

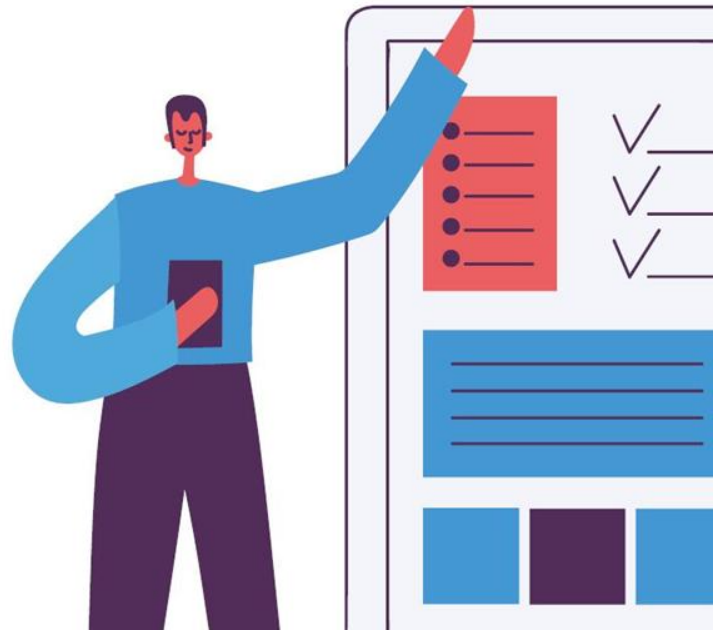
Research Coordinator
Renewable Energy and Power System Specialist



India's latest 1.2 GW of solar capacity awarded at \$0.036 ahead of safeguarding duty fall

The Solar Energy Corporation of India's 1.2 GW auction saw four companies – Ayana Renewable, ReNew Power, NYSE-listed Azure Power and Mahindra Susten – secure a combined capacity of 1.15 GW at INR2.54/kWh. Avaada Energy landed the remaining 50 MW, at Rs2.55.

JUNE 14, 2019 **UMA GUPTA**



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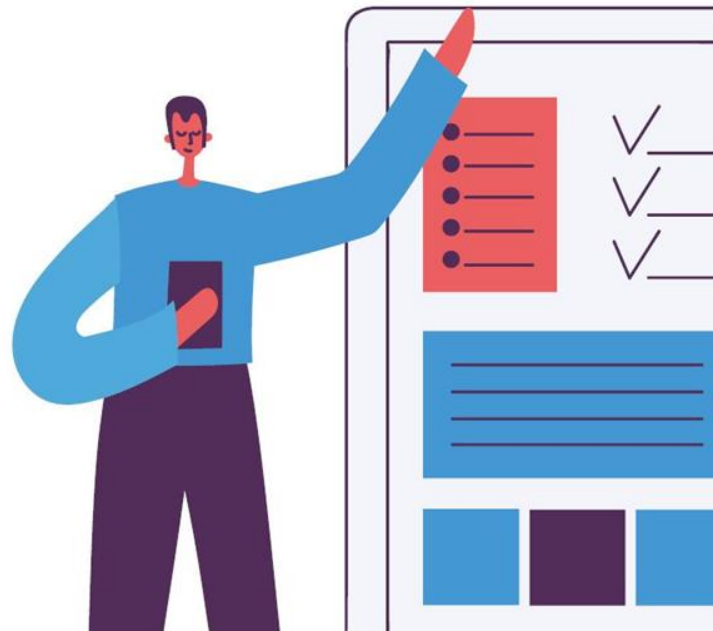
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Dubai: Tariff for large-scale PV hits new low at \$0.024/kWh

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NOVEMBER 5, 2018 **EMILIANO BELLINI**



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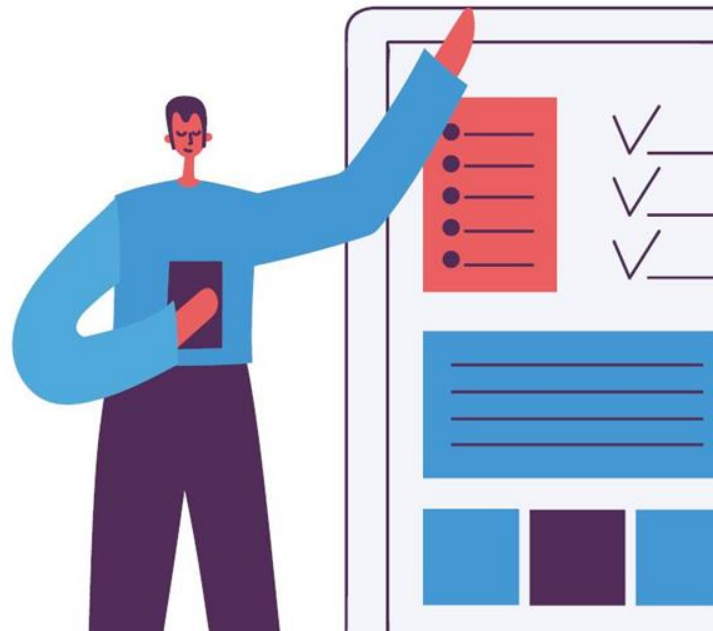
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NOVEMBER 5, 2018 **EMILIANO BELLINI**

Brazil auction sets record low solar price of US\$17.5/MWh

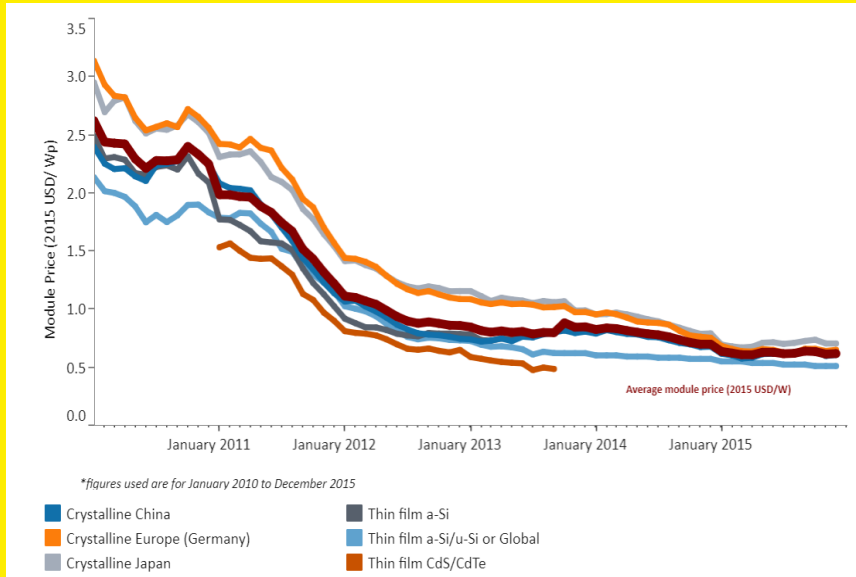
By John Parnell | Jun 28, 2019 9:54 PM BST | 0

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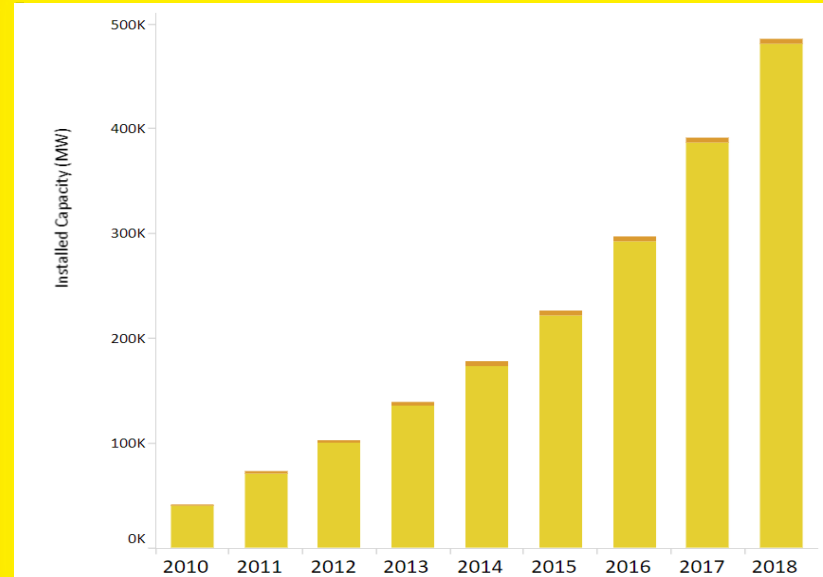


Solar modules

The decline in solar modules' price has a significant impact on the massive solar deployment globally



Price of solar modules in global market



Installed capacity of solar PV in the world

Indonesia faces challenges to achieve its solar energy target

Solar PV installed

capacity in Indonesia



- RUEN target: 23% renewable energy by 2025, out of which 6.5 GW comes from solar PV
- Solar PV installed capacity in 2018 is still less than 100 MW (90 MW according to MEMR and 60 MW according to IRENA).
- PLN's Business Plan (RUPTL) 2019-2018 only targeted 2 GW solar PV by 2028, lower than RUEN target.

Challenges

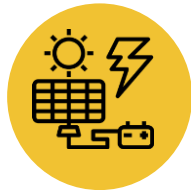
for solar deployment in Indonesia



**Unattractive
price**



**High interest
rate**



**High local content
requirement**

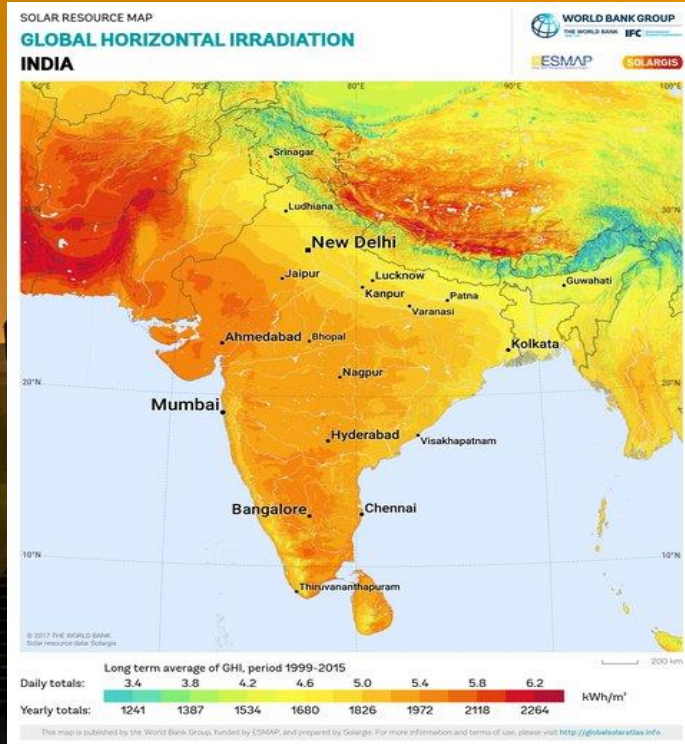


BOOT scheme



Risk allocation

India



Solar irradiation

6-7 kWh/m²/day

Annual energy production

1400-1600 kWh/kWp

Total installed capacity

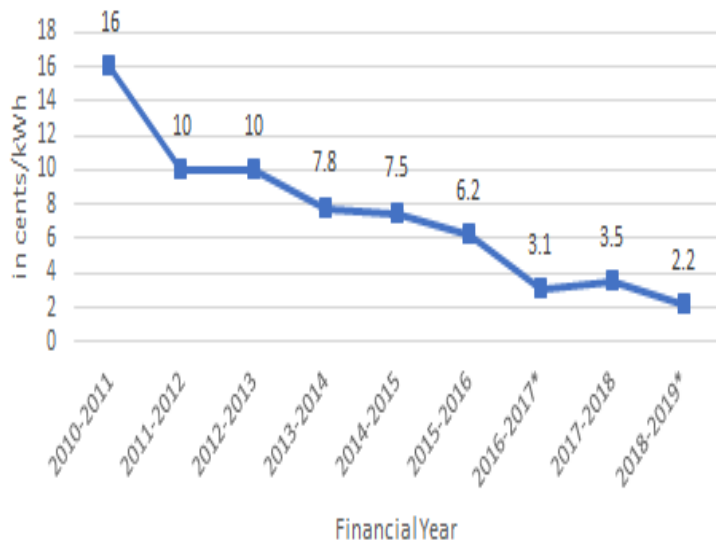
24.2 GW

On-going project

17.7 GW

India

Lowest Solar Bids in India
(2010-2019)*



Solar irradiation

6-7 kWh/m²/day

Annual energy production

1400-1600 kWh/kWp

Total installed capacity

24.2 GW

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17.7 GW

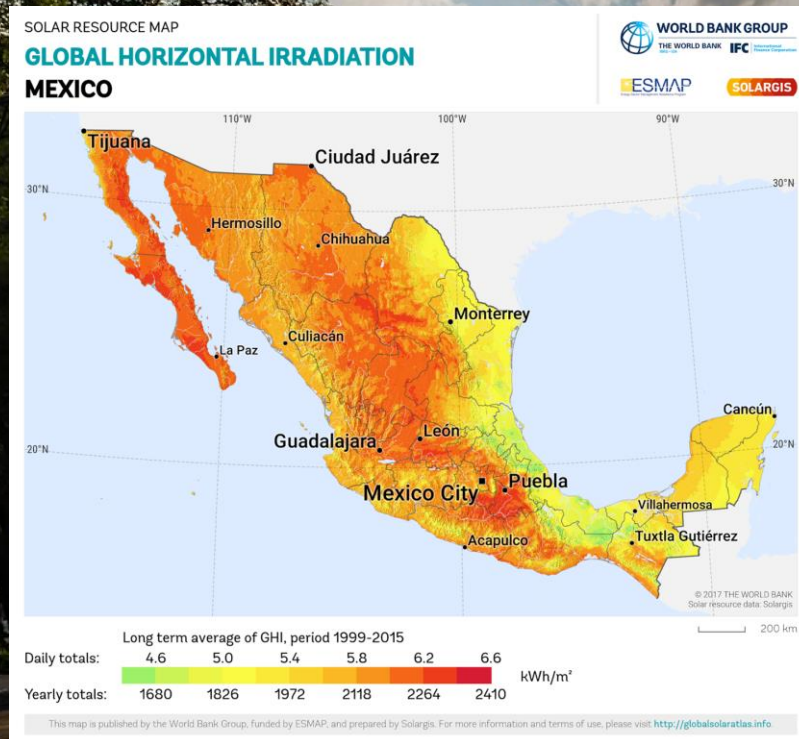
Supporting policies for Solar PV

Reverse auction, Viability Gap Fund (VGF), Renewable Purchase Obligation (RPO), no tax on transmission, no local content requirement

Interest rate

9.55-10.75%

Mexico



Solar irradiation

4.6-6.6 kWh/m²/day

Annual energy production

1620 kWh/kWp

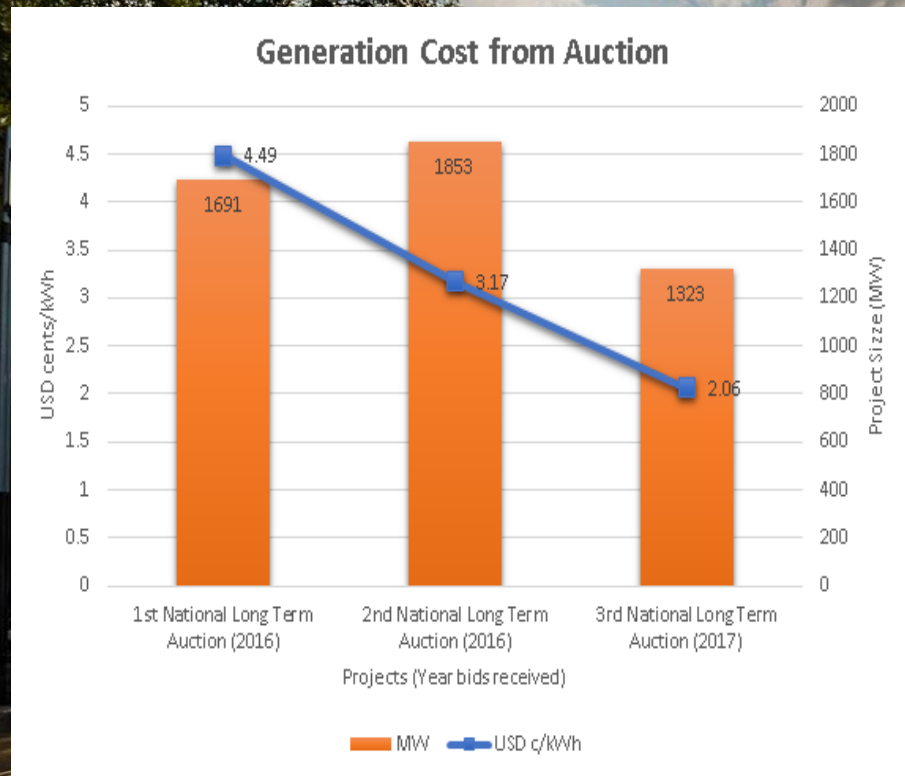
Total installed capacity

3 GW

On-going project

1.8 GW

Mexico



Solar irradiation

4.6-6.6 kWh/m²/day

Annual energy production

1620 kWh/kWp

Total installed capacity

3 GW

On-going project

1.8 GW

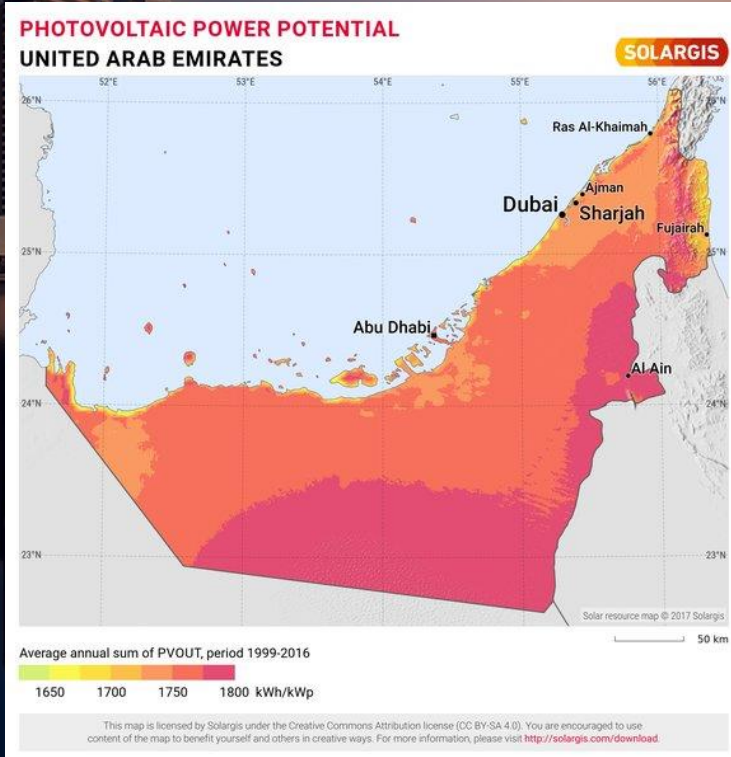
Supporting policies for Solar PV

Reverse auction, Renewable Purchase Standard (RPS), accelerated depreciation, transmission discount and grid connection, no local content requirement

Interest rate

10-11% (local), 3-5% (foreign)

UAE



Solar irradiation

6.5 kWh/m²/day

Annual energy production

1753–2192 kWh/kWp

Total installed capacity

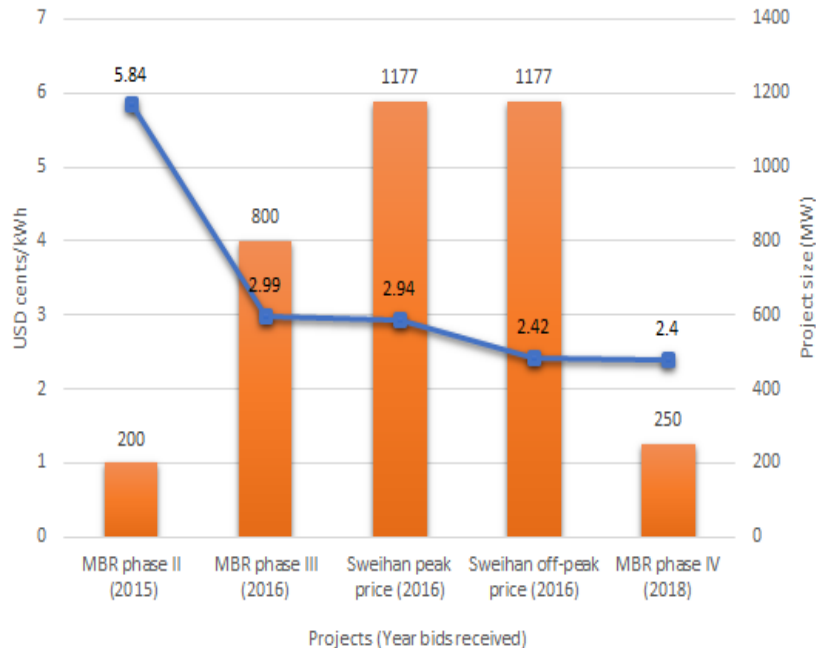
487 MW

On-going project

2027 MW

UAE

Generation cost from auction



Solar irradiation

6.5 kWh/m²/day

Annual energy production

1753–2192 kWh/kWp

Total installed capacity

487 MW

On-going project

2027 MW

Supporting policies for Solar PV

Reverse auction, ease of permit, guarantee of grid connection, no local content requirement, free land

Interest rate

2.6–3.6%

Brazil



Solar irradiation

4.5-6.3 kWh/m²/day

Annual energy production

1230 kWh/kWp

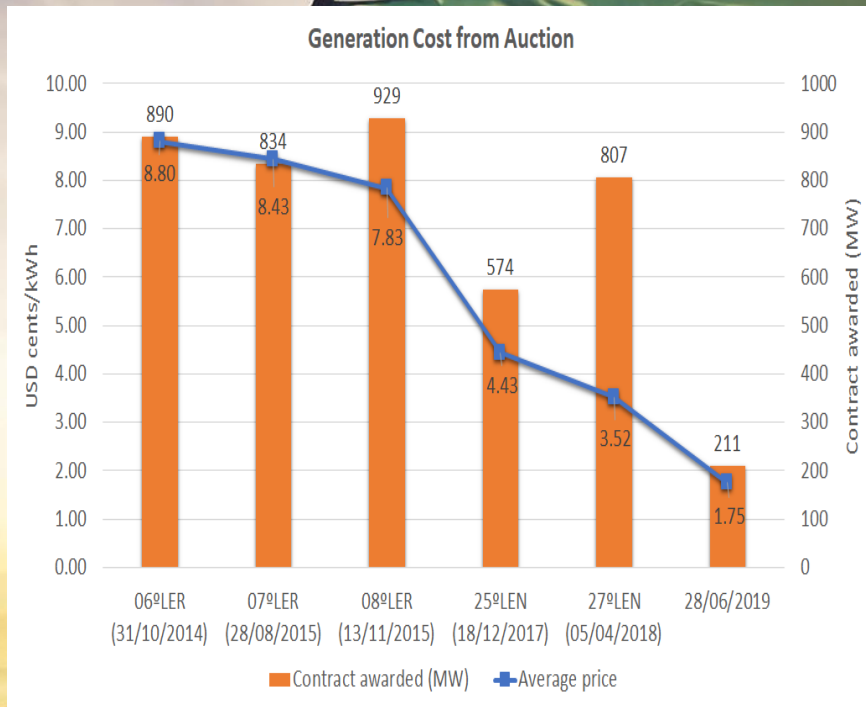
Total installed capacity

2056 MW

On-going project

2728 MW

Brazil



Solar irradiation

4.5-6.3 kWh/m²/day

Annual energy production

1230 kWh/kWp

Total installed capacity

2056 MW

On-going project

2728 MW

Supporting policies for Solar PV

Reverse auction, discount on transmission and distribution cost, local content policy with soft loan incentive

Interest rate

0.9% (BNDES)

Module price is not the only key factor affecting solar generation costs



Geographical condition

Suitable location, high solar irradiation, ideal temperature and humidity



Financing scheme and incentives

Supportive financial incentives (low interest rate and long loan tenor) and de-risking fiscal instruments to reduce risk, capital cost, and project financing



Technology

Improved efficiency through research and development



Policies and Regulations

Enabling policies and regulations, such as incentives, provision of public land, no or minimum local content requirement, and suitable procurement model (e.g. auction).



Project Scale

Economies of scale matter to reduce unit cost of generation and transaction costs.



Sediakan lahan

Adakan **A**uction

Turunkan suku b **U**nga

Besarkan skala pro **Y**ek

Relaksasikan TKDN





Hapsari Damayanti

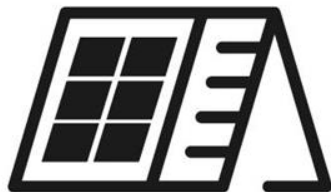
Program Officer

Sustainable Energy Access





**The available
roof space**



**Suitable roof
space for
solar panel**

Access factor (%)

shading, slope, and orientation effects, as well as climate condition are incorporated into the estimation





**Suitable roof
space for
solar panel**

Access factor (%)

shading, slope, and orientation effects, as well as climate condition are incorporated into the estimation



**5 samples for
each of 5 cities
in 5 provinces**

4 

Scenarios Add

Add with power density



194-655 ^{GWp}

Technical Potential

01

East Java

34-117.2 GWp

02

West Java

33-111.9 GWp

03

Central Java

32-109.6 GWp

194-655 GWp
Technical Potential



Household with
installed PLN
capacity ≥ 1300 VA



17.8%

34.5-116 GWp
Market Potential

01

Jakarta
6-20.8 GWp

02

West Java
5-19.5 GWp

03

East Java
3-12.5 GWp

Marlistya Citraningrum

Program Manager

Sustainable Energy Access



A very, very potential target group
Open for new and modern technology
Willing to invest with their own money
Crowd-financing





Quantitative, random sampling
Pre-selected respondents
No gender preference

Samples:

500 (Greater Jakarta)

400 (Surabaya)



13%

Market potential
(early adopters and early
followers) for Greater
Jakarta

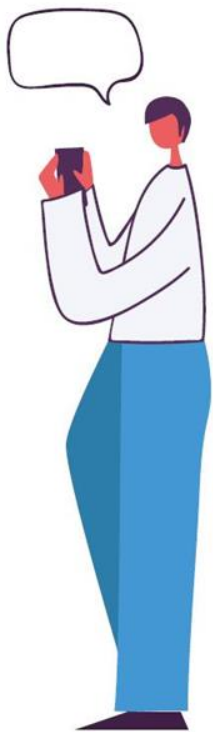
570,000 - 630,000 households
~ 1.1 - 1.2 GWp



19%

Market potential
(early adopters and early
followers) for Greater
Surabaya

85,000 - 93,000 households
~ 170 - 186 MWp



People are aware of rooftop solar

Their dominant source of information is **mass media**. They perceive rooftop solar as something interesting

People in Greater Jakarta focus more on financial consideration, economic benefit, and practicality;

while people in Surabaya consistently mention environmental concern and rooftop solar's high-tech.

Purchase intention exist in both cities,
with different consideration
Price and benefit affect their intention
Expected electricity saving: > 50%



Financing

Preferred financing scheme:
instalment, < 5 years period

Procurement

Preferred procurement scheme: EPCs,
package includes O & M and after
sales service, local products





**More
information,
more channels**



**Use tailored
message**



**Supportive
policies and
attractive
incentives**



Collaboration



Agus Tampubolon

Researcher

Power System & Energy Management Specialist



- **Government buildings**
- **Ministeries**
- **Shopping Mall**
- **Hospitals**
- **Universities**
- **Hotels**
- **Schools**



Jakarta

22.204 kWp

	Number of Sample	Total Potential (kWp)
Shopping Mall	5	6.741
Ministry	32	5.988
Hospital	17	4.739
University	2	3.096
Government Building	19	1.631

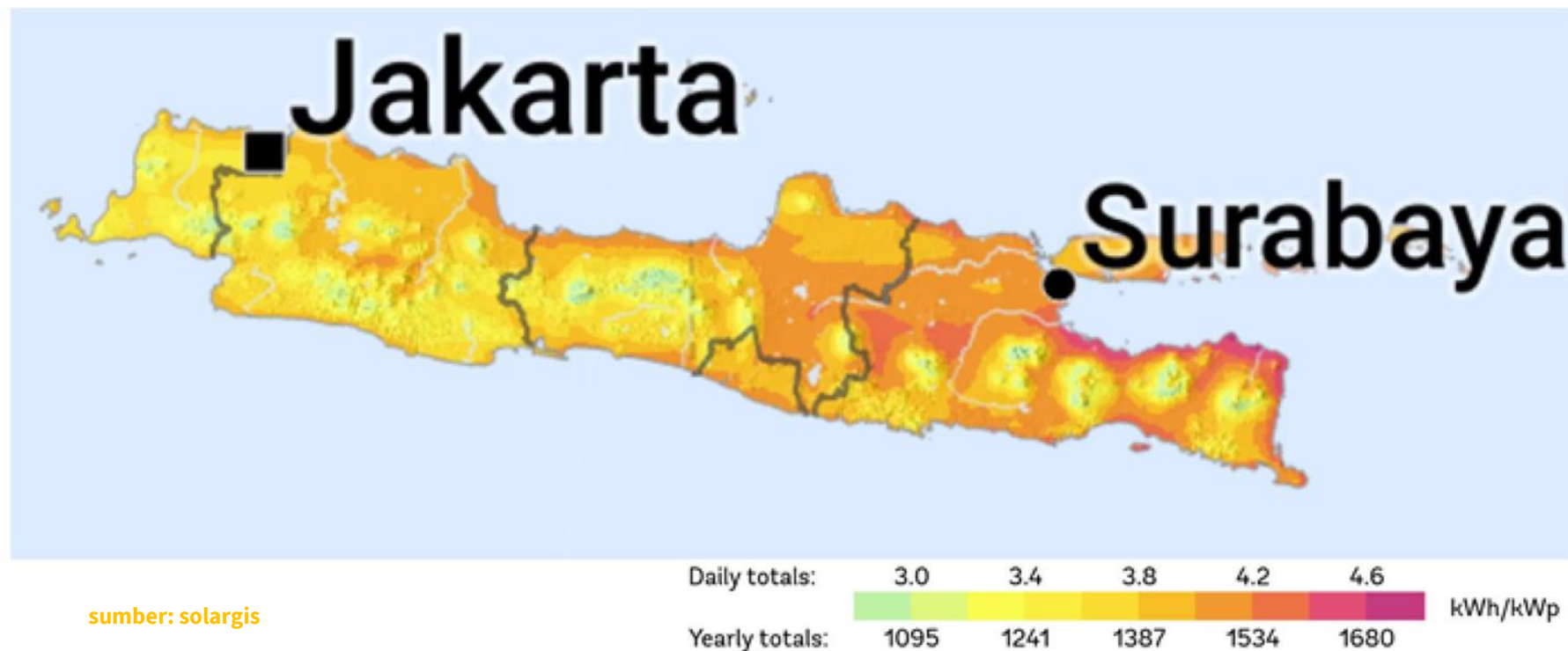
	Number of Sample	Total Potential (kWp)
Shopping Mall	8	10.979
Hospital	9	8.163
University	2	7.414
Government Building	39	5.112
Hotel	7	2.849
School	4	10.61



Surabaya

35.579 kWp

Rooftop solar potential
for Jakarta and Surabaya is still big.



sumber: solargis





Rooftop solar, a smart way
to electrify our home, office,
and building.

With this big potential, it is
possible to electrify cities in
Indonesia with **rooftop solar**.

#SuryaNusantara

We proudly support:





Thank You