



Southeast Asia Rooftop Solar Markets Snapshot

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Clean Energy Investment Accelerator (CEIA)



is an innovative public-private partnership focused on improving opportunities for corporate clean energy purchasing



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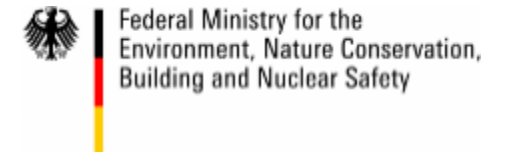
- World Resources Institute (WRI)
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Examples include:



Clean Energy Investment Accelerator (CEIA)

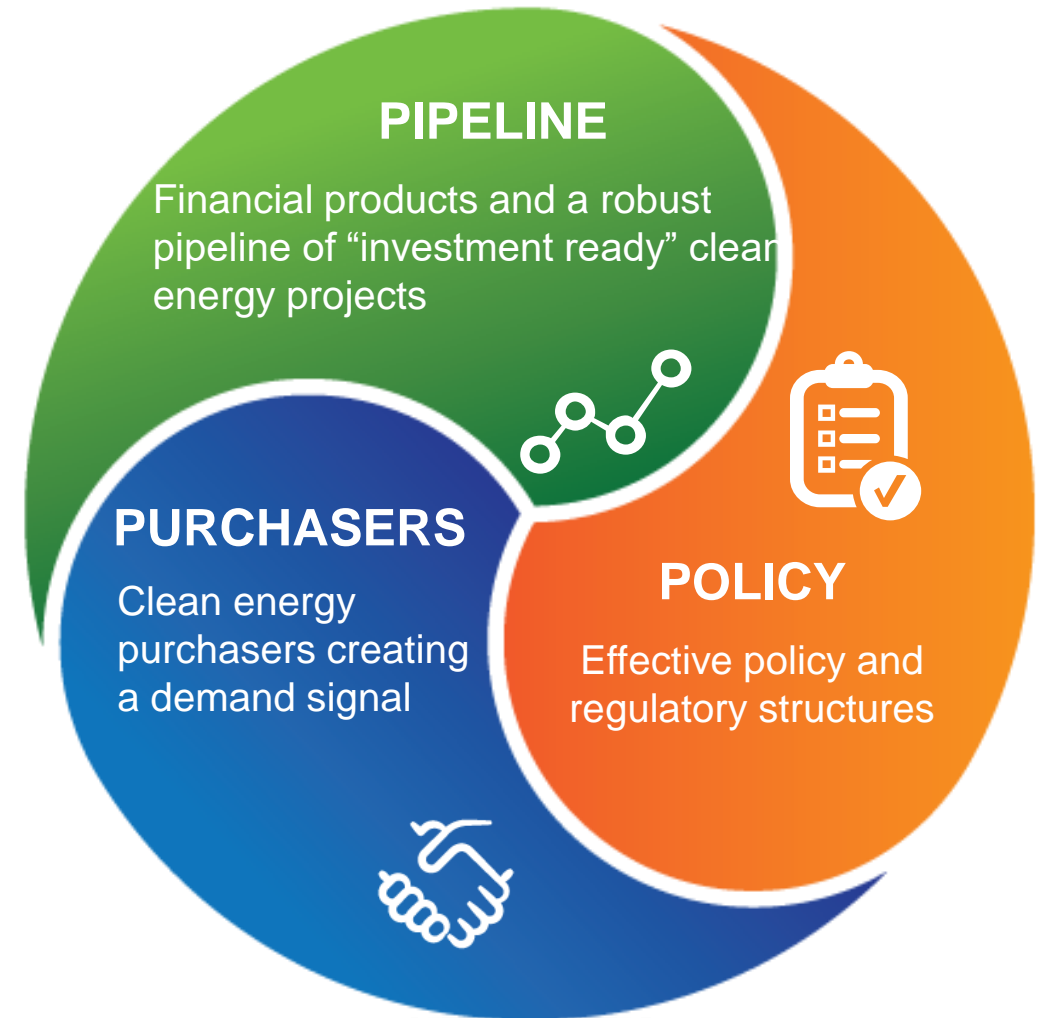
is an innovative public-private partnership focused on improving opportunities for corporate clean energy purchasing

We work across emerging markets including:

- Vietnam
- Mexico
- Indonesia
- Colombia
- Philippines

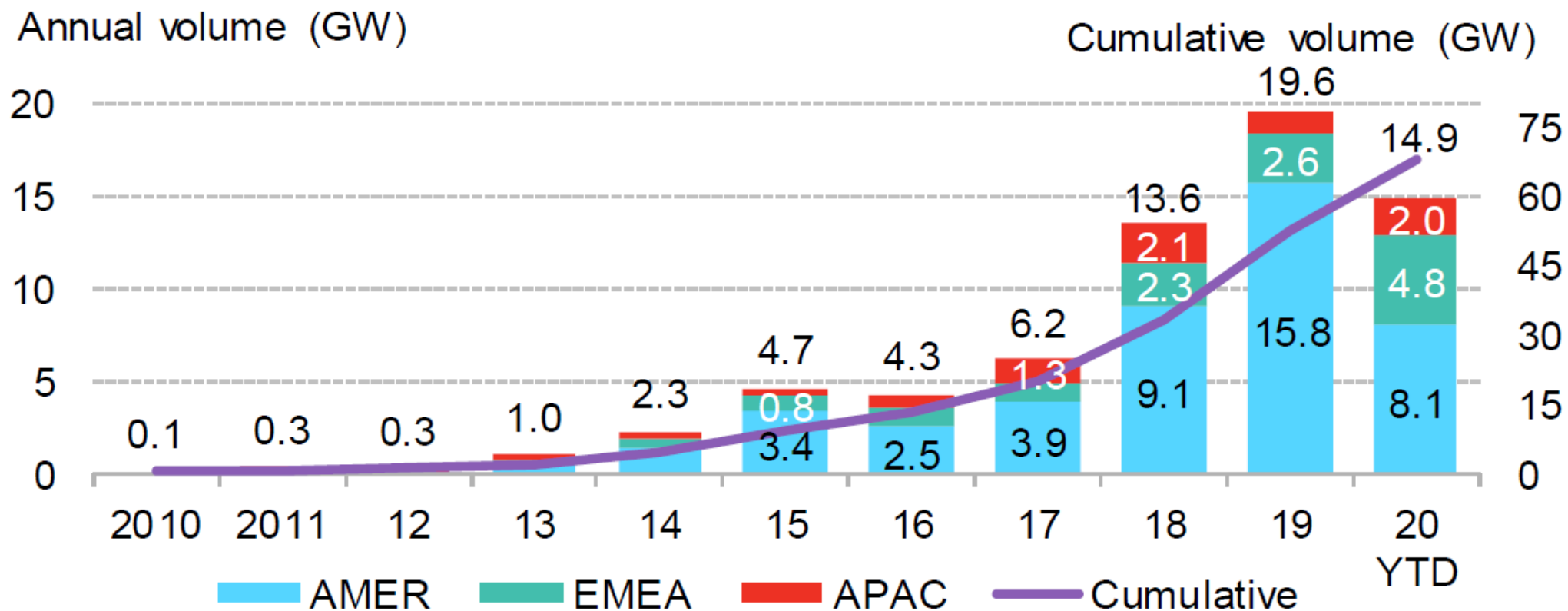
We support market development through a range of activities:

- Innovative procurement models and pilot projects
- Information, guidebooks, tools, template and capacity-building
- Corporate RE Buyer Working Groups
- Clean energy policy and regulation



Corporate Clean Energy Demand Rising

Global Corporate PPA Volumes, by region



Corporate RE Procurement Driven by....

Sustainability and climate action commitments



- 270+ global companies committed to 100% renewable electricity (to-date)
 - 40% of new commitments from Asia-Pacific companies (2019)
- 1000+ companies setting emissions reduction targets through SBTi
 - Increased focused on supply chain (scope 3) emissions

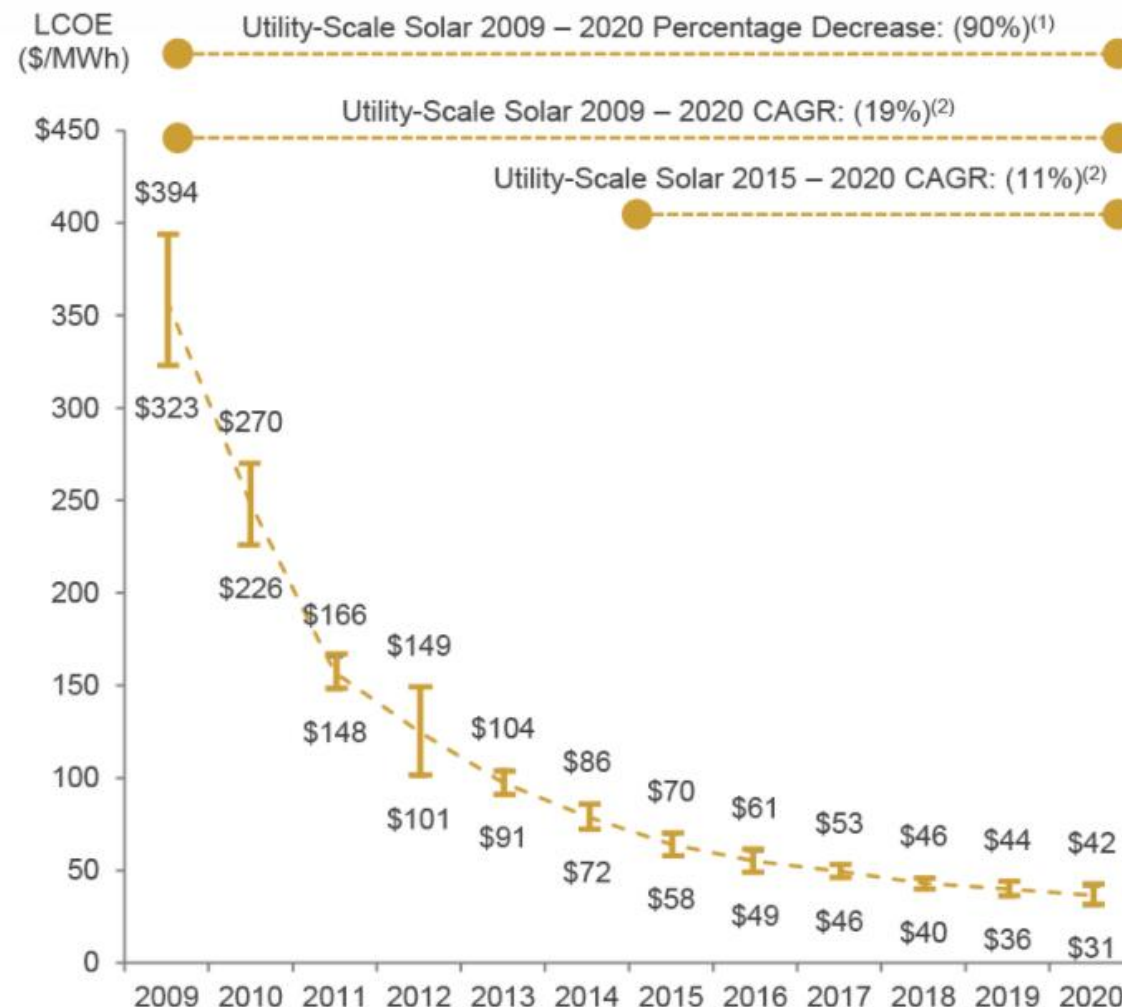
Corporate RE Procurement Driven by....

...and cost effectiveness

- Global: 90% LCOE decrease (2009-2020)
 - 11% LCOE CAGR (2015-2020)
- Hardware cost declines
- Soft cost declines
- Financing cost declines

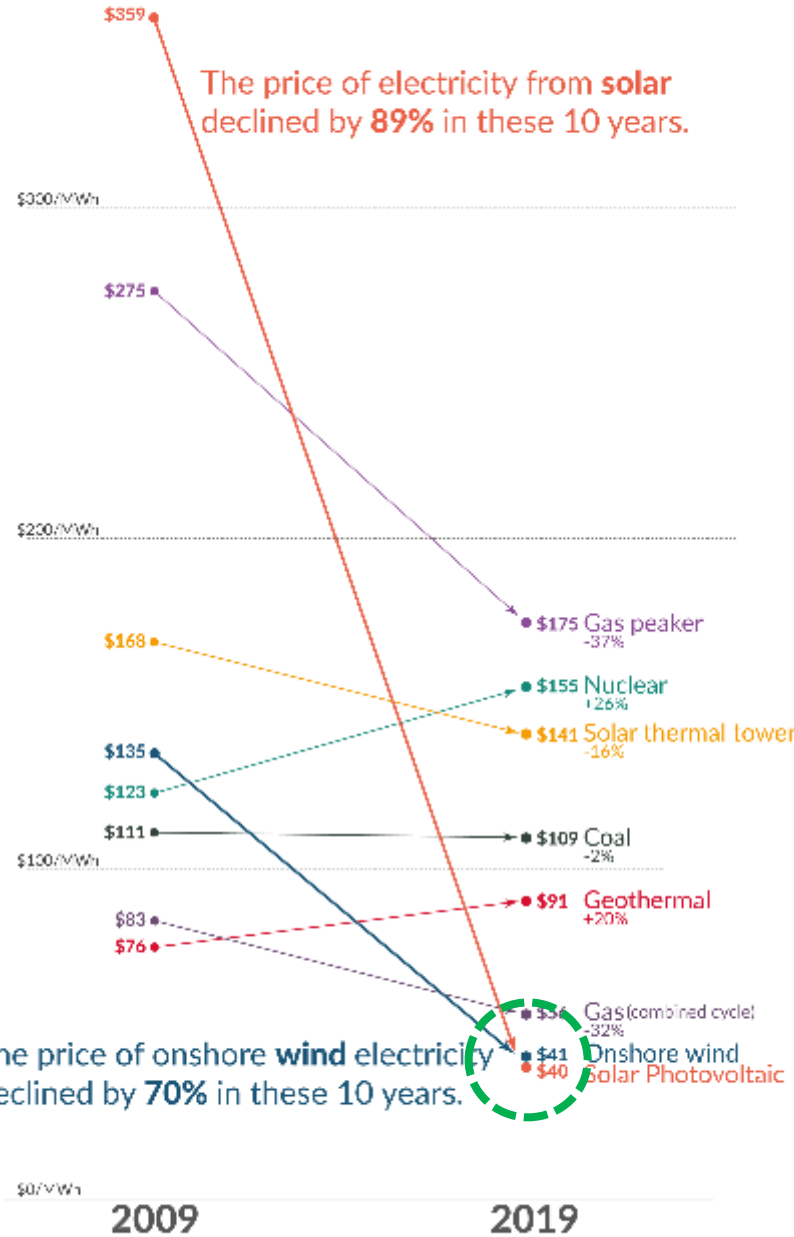
Rooftop solar is cheaper, or at par, with retail grid-based electricity in most Southeast Asia markets.

Unsubsidized Solar PV LCOE



The price of electricity from new power plants

Electricity prices are expressed in 'levelized costs of energy' (LCOE). LCOE captures the cost of building the power plant itself as well as the ongoing costs for fuel and operating the power plant over its lifetime.



...including in Southeast Asia

**SunStar**

Yokohama tire firm installs 4-megawatt solar power plant

CNN tech

Microsoft is buying solar energy from Singapore rooftops



Chip Mong Insee Cement Corp opens 9.8MW solar power plant

THE NATION

Sharp to build 16MW rooftop solar systems on Big C stores

Vietnam Example: Apparel Manufacturing

Basic Information



System Size
4.6MWp

Generation Amount (Year 1)
6,478 MWh

Solar Energy Consumed
4,395MWh
(57% of Total Consumption in 2018)

Actual GHG Reduction
Appx. 1,900 tCO₂e
(43% Reduction compared from 2019)

Cost Saved
USD 170,000+ per year

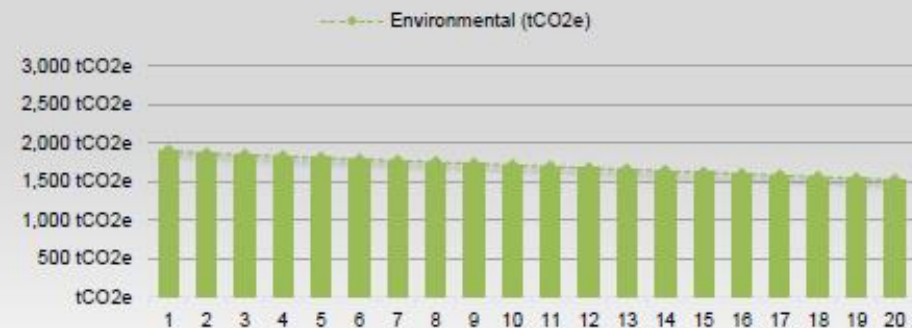
Earnings from Electricity Sales*
USD 160,000+ per year

* Subject to change depending on the new FIT

Estimated Financial Benefit



Estimated Environmental Benefit



C&I Rooftop Solar: Markets Snapshot

COUNTRY	CAPEX Self-Own	OPEX PPA / Lease	Retail Price Parity / Cost Saving	Sell Excess Solar to Grid	Capacity Limit
Vietnam	✓	✓	✓	✓	Self-Consumption (Net metering <1.25MW)
Thailand	✓	✓	✓	✗	Self-Consumption
The Philippines	✓	✓	✓	✓	Self-Consumption (Net metering <100 kW)
Cambodia	✓	✗	✓	✗	Self-Consumption
Myanmar	✓	✓	✓	✗	Self-Consumption
Indonesia	✓	✓	✓	✓	Equal to contracted capacity from PLN

C&I Rooftop Solar: Markets Snapshot

COUNTRY	Installed Capacity (MW)	Primary Barriers	Market Maturity	Legend
Vietnam	2,986	<ul style="list-style-type: none"> • Policy uncertainty • Installed capacity limits 		Most Mature Policy, Incentives Financing, Buyers/Sellers
Thailand	~1,000	<ul style="list-style-type: none"> • Lack of ability to sell excess solar to grid • Policy uncertainty 		
The Philippines	~120	<ul style="list-style-type: none"> • Capacity limits for net metering • Lengthy permitting process 		Mature Missing at least one: Policy, Incentives, Financing, Experienced Buyers/Sellers
Cambodia	~20	<ul style="list-style-type: none"> • No legal pathway for OPEX models • Grid price uncertainty 		
Myanmar	10-15	<ul style="list-style-type: none"> • Lack of policy and regulation • Lack of ability to sell excess solar to grid 		Needs Improvement Missing two or more: Policy, Incentives, Financing, Experienced Buyers/Sellers
Indonesia	12-15	<ul style="list-style-type: none"> • Lack of market experience • Policy uncertainty 		

Closing Points

- Attractive economic case in most scenarios.
- Opportunity for meaningful emissions reductions.
- Barriers do exist but can oftentimes be managed.
- Tools, templates and information oftentimes available.
- Qualified, experienced vendors locally and regionally.
- Self-assessment followed by organized RFP is recommended.

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